nsecticide Water Dispersible 'owder Concentrates

ıeir Composition, Characteristics and ɔrption into the Mud Surfaces

H. L. BAMI

MALARIA INSTITUTE OF INDIA, DELHI

The biological activity of Insecticide Water Dispersible Powder Concentrates in relation to their sorption on the mud surfaces is of considerable practical importance for the National Malaria and Filaria Control Programmes. This subject has been studied in this paper with special reference to composition and physical characteristics, including particle size of DDT, BHC and dieldrin water dispersible powder concentrates. It has been observed that both dispersion stability as well as sorption into mud surfaces of these water dispersible powders vary inversely with the size of the insecticide particles involved. However, greater dispersion stability and lower sorption into mud surfaces are essential for high biological activity in the case of these insecticide formulations. Consequently, specifications for the particle size of the materials in these insecticide formulations present a serious problem. A practical approach to solve the problem has been suggested in this paper.

This paper was presented at the Technical Session on Modernization of Farming Practices of the Indian Standards Convention held at Madras last December — *Ed.*

AMONGST a large variety of synthetic residual insecticides and their formulations now available, DDT, BHC and ɨldrin water dispersible powder ıcentrates are being widely used this country for control of insects public health importance. The ɔice of water dispersible powder ıcentrates in preference to oil utions, emulsions, pastes, etc, was marily due to ease of handling, v cost, better residual action and ;h quality of these products made ssible by the latest manufacturing ɨhniques. During the last five ars, consumption of insecticide ter dispersible powder concentrates s enormously increased in India a result of increased indigenous ɔduction and import of very large antities of these formulations from ɜ USA for the National Malaria ntrol Programme and the National aria Control Programme. The ılaria Institute of India has not ly been the single largest purchaser these formulations, but is also ɨponsible for the quality of ıterials accepted; this entails exısive analytical and quality conɔl work both in the laboratory and the field[1, 2].

This analytical and developmental ɔrk has not only been of help in tting the relevant national stanrds formulated by ISI, but it has ɔo elucidated various physical and emical characteristics of these oducts as well as factors governing em. Extensive investigations into e failure of DDT and dieldrin ıter dispersible powder concenıtes to control mosquitoes when rayed on sorptive mud surfaces, vealed that apart from other ctors, the physical characteristics these powders, especially size of e insecticide particles, were chiefly sponsible for this. The present ıper deals with important physicoıemical characteristics of insecticide water dispersible powder concentrates and factors responsible for their loss on mud surfaces through sorption.

Composition

Studies on the composition of several samples of 50 percent DDT, 75 percent DDT, 50 percent BHC, and 50 percent dieldrin water dispersible powder concentrates revealed that products conforming to Indian Standard Specifications[3-5] and WHO[6] specifications, contained the specified amount of the toxicant; about 10 percent of wetting and dispersing agents including soluble stabilizer; and remainder of fine clay (inert carriers) (*see* Table I). These materials were thoroughly ground in modern air-attrition mills or conventional grinding mills to a smooth, fine, free-flowing, powder, which wetted with water readily and formed a relatively stable aqueous suspension for final spraying. It may be pointed out that stability of a suspension is very vital to efficient and satisfactory mechanical application of the insecticide.

Physical Characteristics

Analysis of several thousands of samples of these water dispersible powder concentrates revealed that apart from quality and quantity of insecticide contained, the most important single property to be verified was suspensibility of the product. Suspensibility of a powder is largely governed by the particle size of the toxicant and clay (inert carriers) components; quality and quantity of wetting and dispersing agents used; and *p*H of the final aqueous suspension. All these factors have to be simultaneously regulated in order to get a product which will meet the suspension stability requirements[3-6]. As already indicated, quality products contained adequate amount of dispersing agents and the formulations were normally neutral or varied between very narrow permissible limits of acidity or alkalinity.

Particle Size

As regards the particle size of insecticide and clay components, 50 percent DDT water dispersible powder concentrates with varying suspensibility were studied using sedimentation method[7] and this work has been further extended to include 75 percent DDT, 50 percent BHC and 50 percent dieldrin water dispersible powder concentrates.

Particle size distribution curves for pure clay component (insoluble carriers as separated from the formulation) as well as for toxicant and clay in the formulations, both before and after accelerated tropical storage, are illustrated in Fig 1 to 4 for

TABLE I COMPOSITION AND PHYSICAL CHARACTERISTICS OF VARIOUS INSECTICIDE WATER DISPERSIBLE POWDER CONCENTRATES (CONFORMING TO INDIAN STANDARD SPECIFICATIONS)

Property Tested	Water Dispersible Powder Concentrate			
	50% DDT	75% DDT	50% BHC	50% Dieldrin
1. Composition				
a) Insecticide content, percent	48·9	74·9	49·8	49·9
b) Clay (inert carrier) content, percent	41·7	14·9	40·2	40·0
c) Dispersing agents content (water soluble constituents), percent	9·4	10·2	10·0	10·1
2. Physical properties				
a) Suspensibility, percent	64·8	73·7	56·3	64·6
b) Suspensibility after accelerated tropical storage, percent	56·6	60·1	54·8	58·4
c) *p*H	9·2	7·0	7·0	7·0
d) *Particle size of the active toxicant*				
i) Below 74 microns percent*	99·4	100·0	100·0	100·0
ii) Below 40 microns percent†	96·0	98·0	97·0	95·0
iii) Below 20 microns percent†	83·0	90·0	80·0	85·0
iv) Below 10 microns percent†	65·0	72·0	63·0	63·0
	(Fig 1)	(Fig 2)	(Fig 3)	(Fig 4)

*Results of sieve analysis.

†Calculated from Fig 1 to 4.

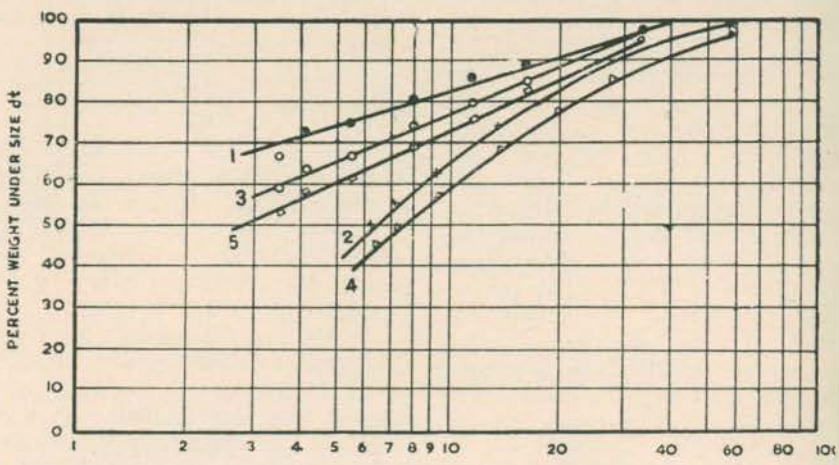
50 percent DDT, 75 percent DDT, 50 percent BHC and 50 percent dieldrin water dispersible powder concentrates, respectively (*see* Table I). Data in Table I as well as particle size distribution curves (*see* Fig 1 to 4) show that in order to have a suspensibility of above 50 percent, as required by the specifications[3-6], at least 50 percent of the active toxicant in a formulation should have a particle size below 10 microns. Particle size of clay components in all these cases was much finer (80 percent below 10 micron size). Accelerated tropical storage pretreatment also did not normally increase the particle size of the components by agglomeration to an appreciable extent (*see* Fig 1 to 4) as supported by usually small decrease in the suspensibility values (*see* Table I). It could be summarized that a quality insecticide water dispersible powder concentrate should normally be neutral and consist of superfine clay (or other inert carriers), thoroughly ground insecticide (at least 50 percent below 10 micron size) and adequate amount of wetting, dispersing and stabilizing agents (about 10 percent) all of which exert their action collectively in order to give a neutral and stable aqueous suspension.

Sorption into the Mud Surfaces

Insecticides in solution or emulsion were mostly sorbed into the inner layers of a sorptive mud surface and thus could not exert their biological action effectively. It was thought earlier that suspensions would leave out most of the active toxicant particles on the surface and thus would have better initial and residual toxicity. The use of oil solutions or emulsions of insecticides for the control of insects, was, therefore, largely replaced with aqueous suspensions prepared from insecticide water dispersible powder concentrates. Several reports, however, were soon available on the rapid loss of biological activity of insecticide residues in case of suspensions being sprayed on mud surfaces[8-14]. Sharr and Bami[15] while comparing the ef cacy of 50 percent dieldrin wat dispersible powder concentrate wi 50 percent dieldrin formulation co taining resins* on mud pane estimated that an average of 83 a 65 percent of dieldrin respective was sorbed into the mud surfac Such high loss of active toxicant fr the surface was proportionately flected in the initial percenta mortality of the insects and t duration of residual effectivene During the control of culici mosquito with 75 percent DDT a 50 percent dieldrin water dispersil formulations in villages arou Delhi, it was observed that re dual action of the insecticides did r last more than a week in all case This led to detailed studies into t causes of such high loss of biologi activity from various angles.

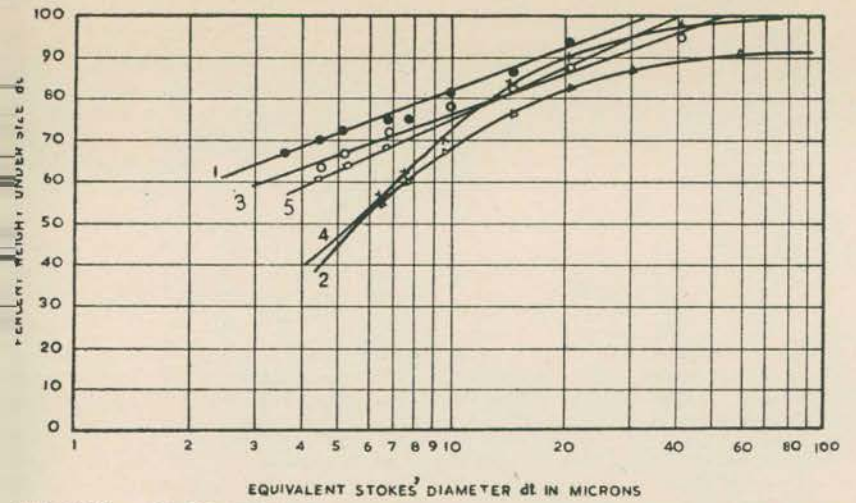
Composition, percentage porosit and carbon tetrachloride absorptio of the mud samples obtained fr the above experimental villa around Delhi were studied. T mud had good capacity to inactiva these insecticides through sorpti as indicated by the physical measu ments mentioned above. Aquec suspensions made from 75 perce DDT and 50 percent dieldrin wa dispersible powder concentrates we sprayed on the panels made fr this mud and subsequent chemi studies revealed that 80 to 90 perce of the active toxicant, in both cas had penetrated into the inner lay of the mud within 24 hours where

*A formulation produced by t Burmah-Shell Workers at Woodst Research Centre, UK, with a view retarding the sorption of dieldrin i the sprayed mud surface was used.



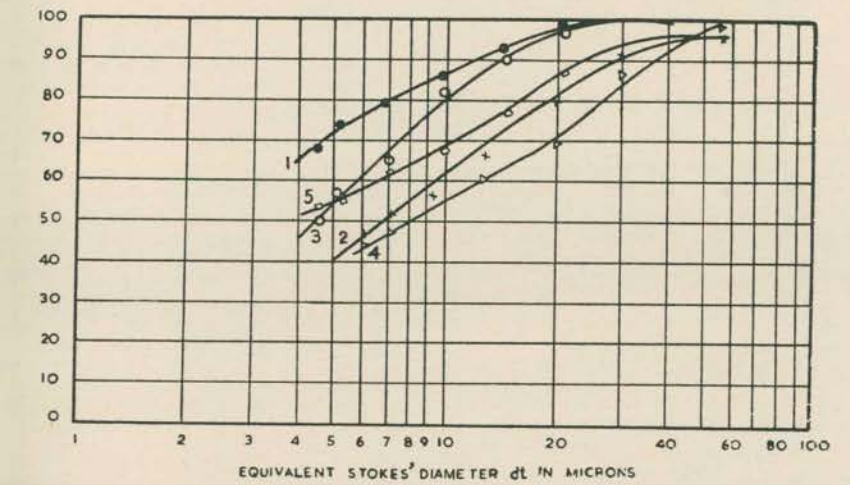
1) PURE CLAY 2) DDT IN THE FORMULATION 3) CLAY IN THE FORMULATION
4) DDT AFTER ACCELERATED STORAGE 5) CLAY AFTER ACCELERATED STORA

Fig 1 Fifty Percent DDT Water Dispersible Powder Concentrate



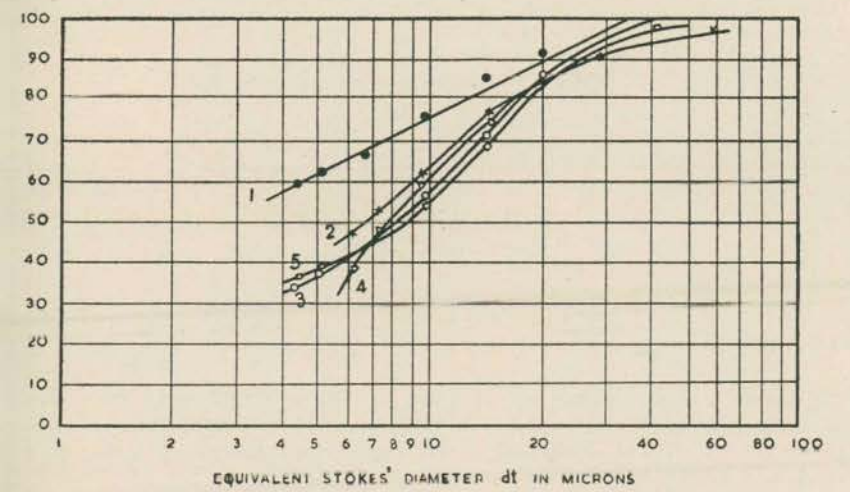
URE CLAY 2) DDT IN THE FORMULATION 3) CLAY IN THE FORMULATION
)DT AFTER ACCELERATED STORAGE 5) CLAY AFTER ACCELERATED STORAGE

Fig 2 Seventy-five Percent DDT Water Dispersible Powder Concentrate



'URE CLAY 2) BHC IN THE FORMULATION 3) CLAY IN THE FORMULATION
:HC AFTER ACCELERATED STORAGE 5) CLAY AFTER ACCELERATED STORAGE

Fig 3 Fifty Percent BHC Dispersible Powder Concentrate



PURE CLAY 2) DIELDRIN IN THE FORMULATION 3) CLAY IN THE FORMULATION
DIELDRIN AFTER ACCELERATED STORAGE 5) CLAY AFTER ACCELERATED STORAGE

Fig 4 Fifty Percent Dieldrin Water Dispersible Powder Concentrate

as no longer available for insect ntrol. It can, thus, be concluded at high degree of sorption is related not only to the type of mud involved but also to the particle size of the toxicant.

Physically, insecticidal formulations behave like pure crystals of these insecticides and it had been observed that sorption on mud surfaces was generally inversely proportional to the size of the particles. However, it might be pointed out that insecticide particles above 40 microns size are not easily picked up by the mosquitoes and as such coarse particles up to 74 micron size, even though available on the surface, would have limited biological activity. An upper limit of 74 microns for particle size was thus fixed by the ISI[3,5] to safeguard this point fairly adequately. The effective particle size from the biological point, however, is between 0 to 40 microns, amongst which particles between 10 and 20 microns size are most efficient. On the other hand, insecticide particles below 10 microns size are highly prone to sorption on active mud surfaces and their biological efficacy on such surfaces is extremely poor. Particles between 10 and 20 microns were also sorbed to a fairly large extent[20-21]. BHC being a strong fumigant as well, is, however, an exception in the sense that even if its particles were sorbed into the surface, due to its vapour toxicity the comparative loss of biological activity is less[21].

Considering that particle sizes most suitable for biological efficacy are also extremely vulnerable to loss through sorption on active mud surfaces, it is not difficult to correlate the failure of 75 percent DDT and 50 percent dieldrin water dispersible powders with the particle size distribution of their active constituents. It has already been stated that in order to meet the present ISI specifications on suspensibility, a water dispersible powder concentrate should have a minimum of 50 percent of its insecticide content reduced to a particle size of less than 10 microns, while percentage weight of the insecticide below 20 microns particle size should be around 80 percent (*see* Table 1). This would mean that a very large portion of the active material would be mechanically lost on mud surfaces before it was biologically effective. In fact in the case of formulations used in villages around Delhi, nearly 70 percent of their insecticide constituents were below 10 microns particle size resulting in proportionately high loss of biological activity through sorption[17].

Fairly high dispersion stability requirements as laid down in Indian Standard Specifications[3-5] and WHO[6] specifications, have resulted in very fine grinding of the materials and

according to the present trends, the powders are being air-milled to such a fine particle size that dispersibility values may even range between 70 and 90 percent. Thus the advantage gained in respect of suspensibility has been largely counter-balanced by excessive loss of such fine material on sorbtive mud surfaces. The problem has great significance when insect control operations are being taken up on a country-wide scale in rural areas having mostly mud houses. Various attempts to prevent sorption by penetrating a surface with sorption resistant materials[12, 14, 19, 22-26] have proved neither practical nor economical in the case of large scale field control operations. A possible solution to the problem could be to fix the lower limit of the size of the particles contained in a powder so as to exclude very fine particles. It may be added, however, that technical difficulties involved in manufacturing a dispersible powder having a very narrow limit of particle sizes, say 10 to 40 microns or 10 to 60 microns, are really very great and may effect the cost of these products very adversely. A more practical approach would be to achieve the required degree of suspension stability by using more and better dispersing agents and not by grinding the materials to an extra-fine particle size.

References

1. PAL, R., BAMI, H. L., KRISHNASWAMY, A. K. & KRISHNAMURTHY, B. S. DDT Water Dispersible Powders, *Bull. Nat. Soc. Ind. Mal. Mosq. Dis.* Vol. 2, p. 20-24 (1954).
2. BAMI, H. L. Testing of 75 Percent DDT Water Dispersible Powder and Possible Causes and Cure for the Defective Materials. *Bull. Nat. Soc. Ind. Mal. Mosq. Dis.* Vol. 3, p. 161-164 (1955).
3. IS : 562-1955 Specification for BHC Water Dispersible Powder Concentrates. Indian Standards Institution.
4. IS : 565-1955 Specification for DDT Water Dispersible Powder Concentrates. Indian Standards Institution.
5. IS : 1053-1957 Specification for Dieldrin Water Dispersible Concentrates. Indian Standards Institution.
6. WHO Expert Committee on Insecticides Specifications for Pesticides. 1956. World Health Organization.
7. BAMI, H. L. & CHEEMA, L. S. Studies in Particle Size Distribution in Relation to Suspensibility, Part I. 50 percent DDT Water Dispersible Powders, *Indian J. Malariol.* Vol. 11, p. 173-182 (1957).
8. HADAWAY, A. B. & BARLOW, F. Sorption of Solid Insecticides by Dried Mud. *Nature.* Vol. 167, p. 854 (1951).
9. HADAWAY, A. B. & BARLOW, F. Studies on Aqueous Suspensions of Insecticides, Part III. Factor, Affecting the Persistance of Some Synthetic Insecticides, *Bull. Entomological Res.* Vol. 43, p. 281 (1952).
10. DOWNS, W. G., BORDAS, E. & NAVARRO, L. Duration of Action of Residual DDT Deposits and Adobe Surfaces. *Science.* Vol. 114, p. 259 (1951).
11. JASWANT SINGH, PAL, R. & SHARMA, M. I. D. Field Studies on the Comparative Effectiveness of DDT and BHC Against Mosquitoes when Applied Separately and in Combination. *Indian J. Malariol.* Vol. 5, p. 235 (1951).
12. PAL, R. & SHARMA, M. I. D. Rapid Loss of Biological Effectiveness of DDT Applied to Mud Surfaces. *Indian J. Malariol.* Vol. 6, p. 303 (1952).
13. VISHWANATHAN, D. K. Analysis of Residual Deposits of DDT on Sprayed Surfaces. *Indian J. Malariol.* Vol. 6, p. 265 (1952).
14. BORDAS, E., DOWNS, W. G. & NAVARRO, L. Inactivation of DDT Deposits on Mud Surfaces. *Bull. World Health Organisation.* Vol. 9, p. 39 (1953).
15. SHARMA, M. I. D. & BAMI, H. L. Comparative Efficacy of 50 Percent Dieldrin-Resin Dispersible Powder and 50 Percent Dieldrin Dispersible Powder. *Indian J. Malariol.* Vol. 11, p. 169-172 (1957).
16. GEROLT, P. Improved Persistence Dieldrin Deposits on Sorptive M Surfaces. *Nature.* Vol. 180, p. 394-(1957).
17. SHARMA, M. I. D., BAMI, H. L KRISHNAMURTHY, B. S. Studies the Rapid Loss of Biological Effic of DDT and Dieldrin Suspensions Mud Surfaces Against Culicine M quitoes. *Indian J. Malariol.* Vol. p. 209-319 (1957).
18. ALESSENDRINI, M. E. & PLACUCCI, Selected Scientific Papers from In tute Superior D. Sanita. Vol. 1, 103 (1956).
19. BARLOW, F. & HADAWAY, A. Studies on Aqueous Suspensions Insecticides, Part V. The Sorptior Insecticides by Soils. *Bull. Ento logical Res.* Vol. 46, p. (1955).
20. HADAWAY, A. B. & BARLOW, Studies on Aqueous Suspensions Insecticides, Part II. Quantitat Determination of Weights of D Picked up and Retained. *B Entomological Res.* Vol. 42, p. (1952).
21. BARLOW, F. & HADAWAY, A. Some Factors Affecting the Av ability of Contact Insecticides. *B Entomological Res.* Vol. 43, p. (1952).
22. CLAPP, J. M., FAY, R. W. & SIMMO S. W. The Comparative Resid Toxicity of DDT to *A. quadrima latus* when Applied on Different S faces. *Public Health Reports,* Vol. p. 158, Washington, USA (1947).
23. MAES, H. Phosphorus as a Fac Preventing DDT — Dehydrochl nation, *Nature.* Vol. 170, p. (1952).
24. MAIER, J., RENDTROFF, R. C. SUAREZ, M. The Duration of Resid Effect of DDT Sprays on Build Materials Used in Rural Venezu *Amer. J. Trop. Med.* Vol. 28, p. (1948).
25. HADJINICOLOU, J. & BUSVINE, J. Toxicity of Limewash Contain DDT or "Gammexane" to Mosc toes. *Bull. Entomological Res.* Vol. p. 179 (1948).
26. HAQ, S. S., MISRA, J. N. & RAN NATHAN, S. K. Studies on Cont Toxicity, Part III. The Effect Pretreatment on Persistence of D on Cement Surfaces. Proceedings the Indian Academy of Scien Vol. 30, p. 284-290, 1949.

ADOPTING METRIC WEIGHTS AND MEASURES

Changeover to Begin from First October

The first important step to effect the changeover to metric system will be taken on 1 October 1958 when the provisic of the Standards of Weights and Measures Act, 1956, in so far as they relate to units of mass, will come into force in respect transactions involving sale and purchase of goods in the areas of States and Union territory specified in a Notification dat 24 June 1958 of the Union Ministry of Commerce & Industry.

Simultaneously, the provisions of the Act will also come into force in respect of certain specified classes of undertakings a goods to the extent specified in Tables A and B of another Government Notification of the same date. Table A specifies t undertakings as under :

1) The Indian Airlines and Air India International Corporations, in so far as they undertake air transport services, exce in matters relating to air distances and speed of aircraft ;

2) Government Departments and commercial and industrial undertakings, owned or controlled by Government, in so far they undertake the purchase or supply of stores, including drugs ;

(*Continued on page* 19

Graphite for Pencil Manufacture

T. R. GOPALASWAMY IYENGER, B. R. MARATHE & G. D. JOGLEKAR

NATIONAL PHYSICAL LABORATORY OF INDIA

With development of industrialization and widespread literacy in recent years, consumption of pencils has been steadily increasing in India. Appreciating the need for maintaining a uniformly high level of quality of pencils, the ISI took up the work of formulating national standards for grading and other general requirements. The National Physical Laboratory (India) is assisting the ISI in successfully pursuing this work which is now well in hand. Two papers, in the first of which Tests for Quality Evaluation of Black Lead Pencils were described and discussed, and the second dealing with Measurement of Coefficient of Friction of Lead Pencils were published in earlier issues of this Bulletin*.

This paper deals with experimental investigations carried out at the NPL to explore the possibilities of using Indian graphite in pencil manufacture. A comparative study of the properties of beneficiated graphite prepared from indigenous ore with those of eight other samples obtained from pencil manufacturers has been made. These properties cover particle size distribution, ash content and percentage reflectance. On the basis of these studies, the authors have suggested the lines on which specification for graphite for soft and hard pencils should be laid down — *Ed.*

INTRODUCTION

1 Graphite is one of the two incipal raw materials used in the anufacture of pencil slips, clay ing the other. The availability of aphite in India, its properties and es, have been discussed in an rlier publication[1]. The ore is irly widely distributed[2,3,4] in the untry and its distribution is shown Fig 1. The quality of the ore und in different parts of India ıries from place to place. For the neficiation of Indian ores, froth ıatation process[4-12] and phase sepation method[13,14] have been tried ıt so far no serious attempt has en made to supply the treated ores r use in the manufacture of pencils, ucibles or dry cells. The authors, wever, made an attempt to supply neficiated graphite for the manucture of brushes for electric motors ıd generators, and are now examing whether Indian graphite can be ed for pencil manufacture, partiılarly in view of their work on the sts for evaluation of quality of ack lead pencils[15,16,17]. This cessitated a comparative study of aphites used in pencil manufacture. ı this connection, indigenous graıite was ground, froth floated, parated in fine fractions, and then ıpplied to a pencil manufacturer in ıantity sufficient for a large scale ial.

.2 The present paper deals with sts on eight different graphite mples used by some of the Indian ıanufacturers as well as on the mple prepared in the laboratory. ost of the Indian manufacturers se either Mexican, Ceylonese or erman graphites. The tests deal ith the measurement of the particle ze distribution, ash content and flectivity of the samples.

. GRAPHITE FOR PENCIL MANUFACTURE

.1 Depending upon the shape and ize of its particles, natural graphite has been classified into three main types, namely flaky, crystalline and amorphous. Although each one of these types has been used at one time or the other in the manufacture of pencils[18], present-day practice seems to favour a blend of one of the first two types with the amorphous variety.

2.2 Graphite deposits are found in several parts of the world, the principal producers being Korea (amorphous), Ceylone (lump, chip, dust and amorphous), Madagascar (flake), Mexico (amorphous and crystalline), Norway (small flake), USSR and USA (flakes, crystalline and amorphous)[19]. India mines a limited quantity of graphite. Most of it is crystalline and only a small amount of the amorphous variety is available in the states of Mysore and Madhya Pradesh[4].

About eight percent of the world's production of graphite is consumed in the manufacture of pencils[20]. The world's principal sources of amorphous graphite suitable for the pencil industry are Korea and Mexico. The amorphous varieties available in India, are low in graphite content and they do not lend themselves to beneficiation, due to intimate association of the gangue material with it[8,9].

2.3 The preference for the amorphous variety by the pencil manufacturers may be due to the fineness and the shape of the particles. The particles of the amorphous variety are finer than the other two varieties, and are less flaky or crystalline. With the modern techniques of fine grinding, it is now possible to reduce graphite to suitable fineness and quality for pencil manufacture starting with almost any type of ore, provided beneficiation of the ore can be carried out economically.

3. SELECTION AND PREPARATION OF INDIGENOUS ORE

3.1 Based on previous work carried out in this laboratory on the beneficiation of Indian graphite ores, Patna State Graphite No. 555 was selected for the present investigation. The ore was obtained in a lump form; it was jaw-crushed and ball-milled to pass through BS Sieve 150 (equivalent —IS Sieve 10). The fine material was froth floated using kerosene oil as collector and sodium silicate as depressant. It was found necessary to refloat the concentrate two or three times to obtain the final concentrate sufficiently low in ash content. The final concentrate was then passed through a hydroclone to separate the fines [approximately

*See ISI Bull, Vol 7, pp. 16-22 (1955) and Vol 8, pp. 132-134 (1956).

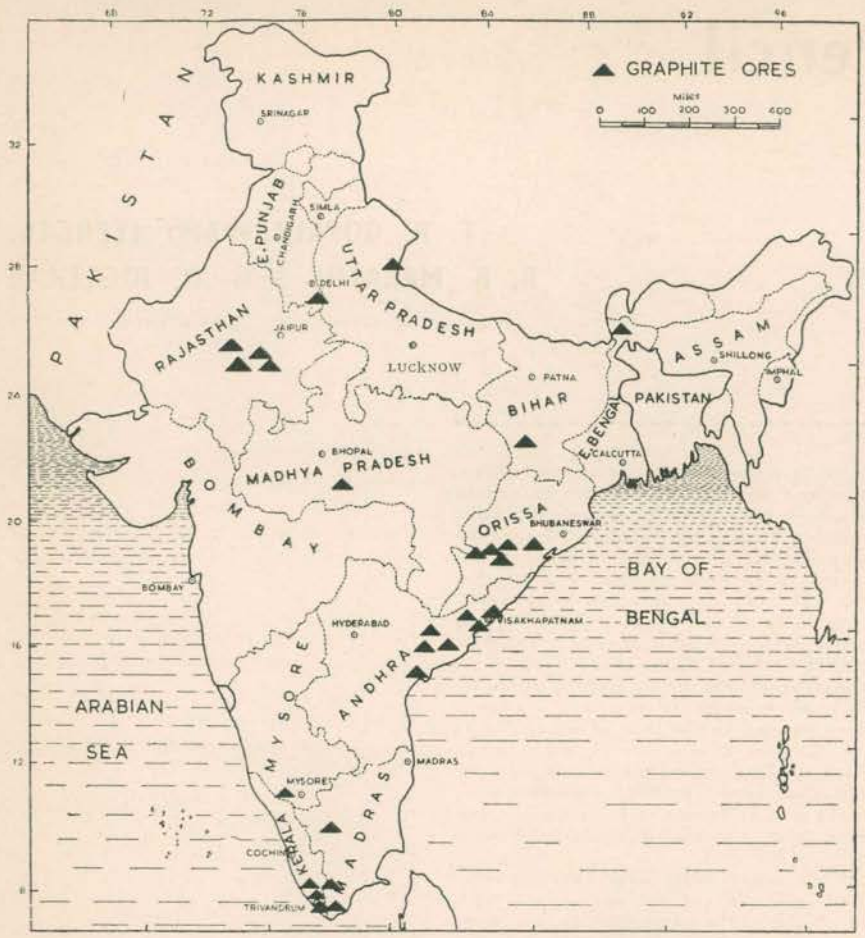


Fig 1 Map of India Showing Distribution of Graphite Ores

passing through BS Sieve 300 (nominal opening 53μ) or IS Sieve 5] from the coarse particles. The coarse material was subjected to wet-grinding till it passed through BS Sieve 300 (or IS Sieve 5). The material was then filtered and dried. A sample of this material was taken for comparative studies.

3.2 Particle Size — The particle size distribution of the powder was determined by the sedimentation method using Andreasen Pipette. Ethyl alcohol was used as the dispersing medium and the concentration of the material was 2·5 g per litre. Photo-micrographs of two samples (No. 4 and 5) are shown in Fig 2 and 3, respectively.

3.3 Ash — Ash content was determined in the usual way by burning a known quantity of the powder to constant weight between 800° and 1 000°C.

3.4 Reflectivity — The sample was poured in a glass cup with flat bottom and was lightly tapped. The percent reflectance was then measured by a Photovolt Reflection Meter.

Results of the tests described above are given in Table I and the size distribution curves are shown in Fig 4.

4. DISCUSSION

4.1 Fineness — It is obvious fro Table I and Fig 4 that among th nine samples tested, excepting f two samples, namely No. 6 and the rest have about 95 percent of th powder less than 50μ [rough equivalent to BS Sieve 300 (or Sieve 5)]. It appears, therefor that graphite suitable for pen manufacture should not have residue of more than 5 percent BS Sieve 300 (or IS Sieve 5 Except for samples No. 5 and the rest of the samples have 95 pe cent of the material coarser than microns. It appears from the abo results that the graphite powd suitable for pencil manufactu should be finer than say 50 micror The finer the graphite, the bett would be the quality of pencils, as would then be possible to have smooth and uniform marking. Th fineness of powder required for d ferent grades of pencils wou naturally be different. Compar tively coarser powder would be us for soft pencils, while finer powd would be required for hard pencils

4.2 Ash — As the blackness of pencil marking is due to graphite the pencil lead, it follows that if th ash content is high the blackne would be adversely affected. Hig ash graphite containing hard pa ticles may also scratch the pape This defect can, however, be mir mized by grinding the graphite ve fine. The ash content of graphi

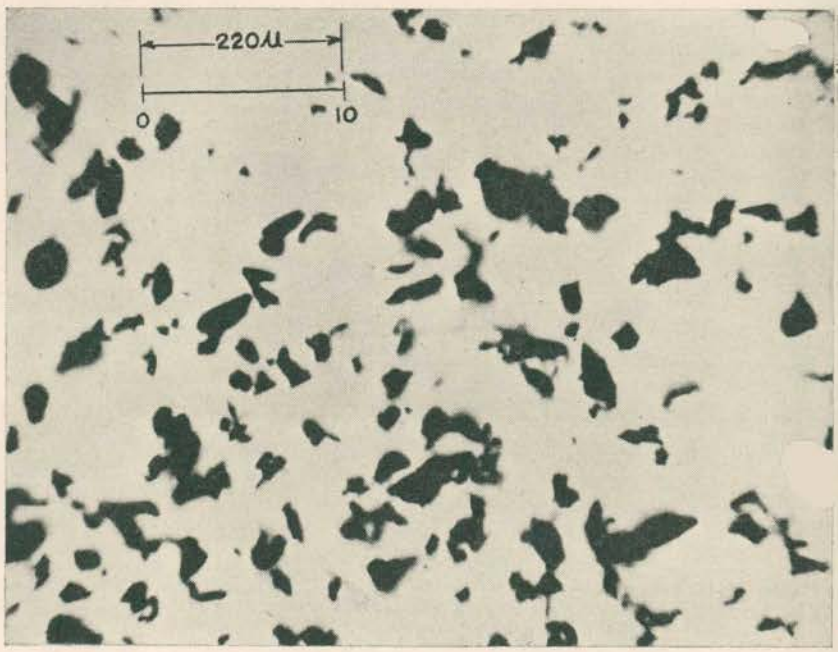


Fig 2 Photo-micrograph of Graphite Sample 4

E/33

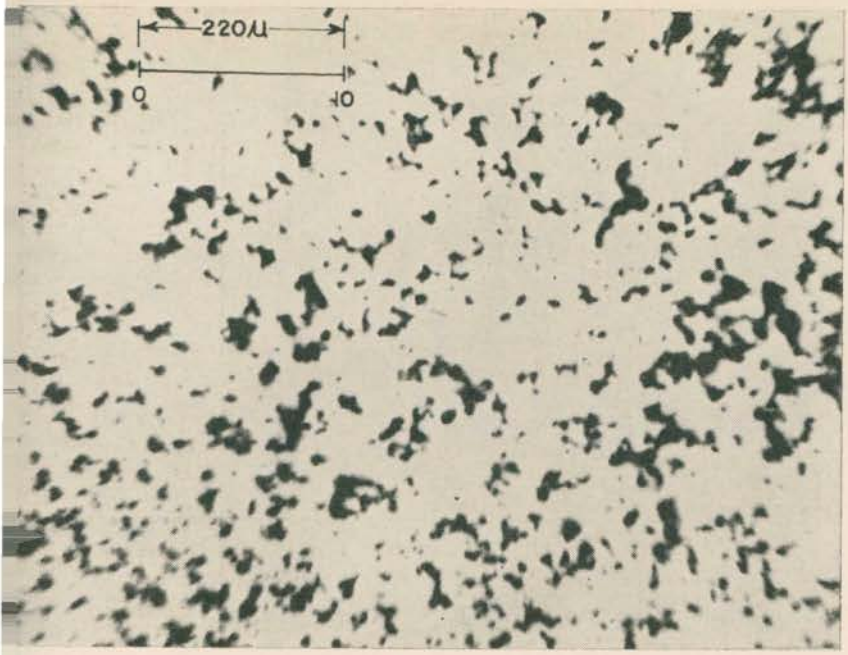


Fig 3 Photo-micrograph of Graphite Sample 5

E 33

would be seen from Table I varies ughly from 2 to 32 percent. antell[20] has stated that Mexican aphite with 86 percent carbon is itable for pencil manufacture. ow ash graphite would be prefer- le though high ash graphite (ash ntent going up to say 15 percent) ed not necessarily be rejected. ie upper limit for the ash content a graphite sample would be de- led by considerations like the nding and the fusibility of the ash. iis latter property is important ice the slips are baked at about 100°C. If the ash is fusible it is tely to form grit in the baked slips, matter how fine the original aterial had been ground.

3 Reflectivity — The reflectance alues given in Table I vary from 5 to 16·2 percent. These values epend upon the particle size, ash ntent, nature and origin of the mple. The values would be low r those powders which are fine, norphous and have low ash content. he blackness of markings would epend upon the percent reflec- nce of the powder. The lower ie percent reflectance, the darker ill be the marking. This would be n important consideration while ying down the specification for ft pencils.

. SPECIFICATIONS FOR GRAPHITE

.1 As far as the authors are aware here is only one specification[21] for graphite used for pencil manufacture which specifies the ash, the moisture content and the fineness of the graphite powder. If purchase specifications for graphite suitable for pencil manufacture are to be drafted then the following minimum requirements may be stipulated under two grades, namely Grade 1 and Grade 2 suitable for soft and hard pencils, respectively:

Particle Size for Grade 1 — Grade 1 graphite powder shall pass through BS Sieve 300 (or IS Sieve 5).

Particle Size for Grade 2 — Particle size for Grade 2 graphite powder shall be below 20μ.

Ash Content — The ash content of graphite powder shall be not more than 5 percent for Grade 1 and not more than 10 percent for Grade 2. For both grades, the ash shall not be fusible at a temperature of 1100°C.

Reflectance — The reflectance values of graphite powder shall be not more than 10 percent for Grade 1 and not more than 15 percent for Grade 2.

Volatile Matter — Volatile matter in graphite powder of both grades shall not exceed 3 percent by weight. (The floatation oils, if used during beneficiation, shall be removed by the suppliers by heating the graphite to 300°C.)

6. ACKNOWLEDGEMENT

6.1 Our thanks are due to Dr. D. Sen of the Optics Division of the National Physical Laboratory of India for his help in the measurement of the reflectance values.

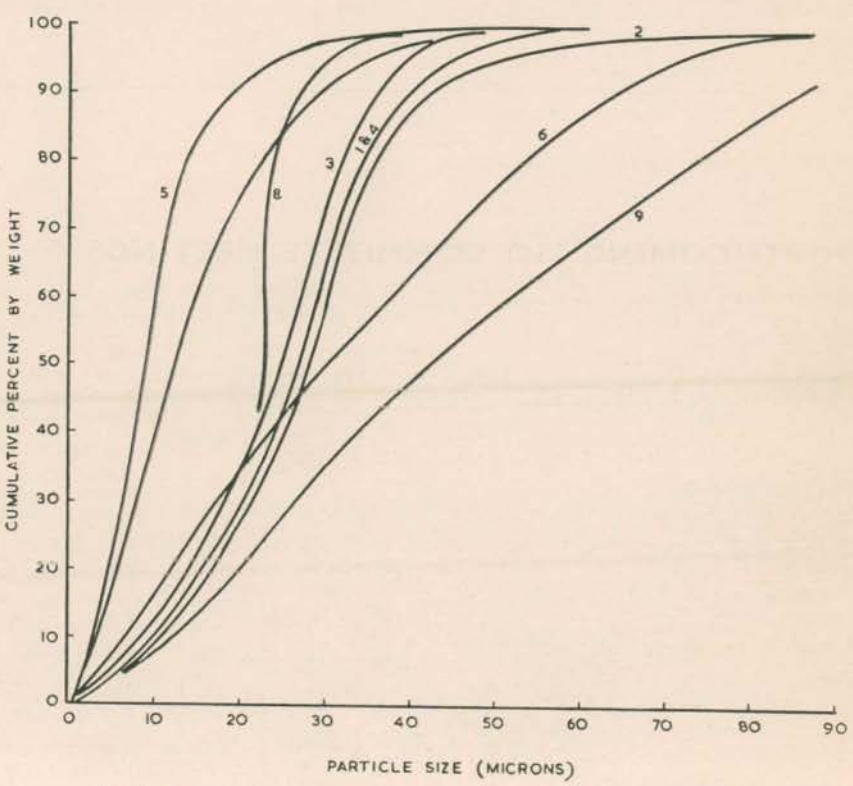


Fig 4 Particle Size Distribution of Various Samples of Graphite

TABLE I ANALYSIS OF NINE SAMPLES OF PENCIL GRAPHITE

		1 NPL	2 Mexican	3 German	4 Ceylonese	5 Unknown	6 Unknown	7 Mexican	8 Ceylonese	9 Indi.
1. Particle Size Distribution										
Particle Size microns										
88	Cumulative Percent by Weight	100	96	99	98	100	98	100	98	92
62		99	96	99	98	100	91	96	98	69
43		94	93	99	96	100	67	96	96	51
29		66	60	66	70	97	50	87	91	32
21		30	29	35	33	91	31	77	34	24
14		15	15	19	18	82	23	50	18	13
10		10	10	13	12	58	9	42	9	13
8		6	8	4	9	45	7	28	3	7
5		6	5	4	4	24	5	16	3	7
2. Density g per cc		2·31	2·42	2·18	2·32	2·3	2·3	2·27	2·19	2·36
3. Reflectance, Percent		11	7·5	13	8·5	9·5	8·5	10·2	10	16·2
4. Ash Content, Percent by Weight		11·6	12·76	3·44	1·64	4·36	18·86	32·30	2·64	26·34

References

1. Joglekar, G. D. & Gopalaswamy Iyenger, T. R. Utilization of Indian Graphite. *Bull. Nat. Inst. Sci.* (*India*) No. V, p. 66-71 (1955).
2. Wadia, D. N. Mineral Resources of India. Fourth Empire Min. and Metall. Cong. No. A-B7 (1949).
3. Gupta, G. C. Graphite. *Indian Minerals*. Vol. 3, p. 17 (1949).
4. Ghosh, J. C., Banerjee, R. & Rao, M. R. A. Indian Graphite — Its Beneficiation and Probable Uses. C.S.I.R. Monograph.
5. Narayanan, P. I. A. & Rowbottom, H. H. Min. Geo. and Metall. Inst. (India). Vol. 41, p. 107-126 (1946).
6. Mazumdar, K. K. *J.S.I.R.* Vol. 7B, p. 167-168 (1948).
7. Karunakaran, C. & Narasingh Rao, M. Proc. Ind. Aca. Sci. Vol. 27, Sec A, p. 192-195 (1948).
8. Mathur, G. P. & Narayanan, P. I. A. *J.S.I.R.* Vol. 14B, No. 5, p. 236-241 (1955).
9. Mathur, G. P. & Narayanan, P. I. A. *J.S.I.R.* Vol. 15B, No. 3, p. 154-157 (1956).
10. Mathur, G. P. & Narayanan, P. I. A. *J.S.I.R.* Vol. 15A, No. 1, p. 33-35 (1956).
11. Mathur, G. P. & Narayanan, P. I. A. *J.S.I.R.* Vol. 16A, No. 1, p. 38-41 (1957).
12. Mazumdar, K. K. *Proc. Ind. Sci. Cong. Abs.* p. 529, 1958.
13. Ghose, T. K. *Science & Culture.* Vol. 17, p. 47-49 (1951).
14. Weingartner, E. & Ghose, T. K. *Chem. Abs.* Vol. 47, p. 5599 b (1953).
15. Joglekar, G. D. & Marathe, B. *J.S.I.R.* Vol. 13B, No. 1, p. 78- (1954).
16. Marathe, B. R., Iyengar, G. Joglekar, G. D. *ISI Bull.* Vol. p. 16-22 (1955).
17. Marathe, B. R., Kanwar Chand Joglekar, G. D. *ISI Bull.* Vol. p. 132-134 (1956).
18. Encyclopaedia of Chemical Techr logy, New York. Interscience Public tion, Vol. 3, p. 102 (1949).
19. *Indian Minerals.* Vol 11, No. p. 138 (1957).
20. Mantell, C. L. Industrial Carbc New York. Van Nortrand Compar 1944 (p. 36).
21. GOST 4404-1948 Graphite Penci All Union Standards Committ (USSR).

FORTHCOMING ISO COMMITTEE MEETINGS

The programme given below includes only the finalized items:

ISO Committee Meetings (August to September 1958)

Date of Meeting	Place of Meeting	Name of Committee	Secretari Held by
28-29 August	London	ISO/TC 76 — Transfusion Equipment for Medical Use	UK
15-17 September	The Hague	ISO/TC 46 — Documentation	Netherland
18-20 September	London	ISO/TC 86 — Refrigeration	UK
24 September-1 October	Paris	ISO/TC 54 — Essential Oils	Portugal
29 September	Bruxelles	ISO/TC 74/SC 2 — Hydraulic Binders/Plasters	Poland
29 September-1 October	Vienna	ISO/TC 19 — Preferred Numbers	France
30 September	Bruxelles	ISO/TC 74/SC1 — Hydraulic Binders/Methods of Chemical Analysis of Cements	Belgium

ompulsory Quality Control of xports in Japan

D. V. KARMARKAR

N an article on 'How Japan Has Tackled the Problem of Inspection of Goods for Export'*, some information has en given relating to the Export spection Law (Law No. 97, 1957), e new legislation promulgated by pan, which came into effect on February 1958. In this article, ference has been made to Japan one of the biggest competitors of dia in engineering goods. Both fore and after the war, Japanese ods had the reputation of being eap but inferior. As a result, ere was a feeling in some quarters at all goods with the trade mark Made in Japan' were inferior. hen Japan's trade with the world -opened after World War II, this eakness of Japanese export re-ived considerable attention, and it as decided by the Government of pan that efforts should be made ensure that Japan exported good ality products at reasonable prices.

ie Export-Control Law of 1948

Keeping this in view, the 'Law ncerning Control of Export Commodities' (Law No. 153) was acted in 1948, by virtue of which overnment established 181 items goods requiring inspection and eir standards and packing requirements as well as the marks to be dicated on the goods in question. f these, 59 items of goods were tablished by Government as exptions, which were subject to mpulsory inspection by Government Inspection Organs, or the inpection organs authorized by overnment. The remaining 122 ems were left to the manufacturers nd exporters themselves who were quired to make such indication on ie goods in question which passed iccessfully their inspection.

However, as brought out in the rticle referred to above, with the nsiderable increase in the Japanese reign trade during the past decade many sections of the original law became outmoded and inadequate to fulfil the original purpose.

'One of the short-comings of the law was that even the most inferior goods could be exported if they were correctly graded as **low quality goods.** Thus it was impossible under the law to stop entirely the export of inferior products. Further, the very fact that inspection was left to the producers and the exporters themselves, there was bound to be laxity. Among the authorized inspection agencies, there were some who had small facilities for efficient inspection. The penalties imposed were so small that some of the exporters did not mind sending inferior goods even though they knew that they would be penalized'.

The New Export Inspection Law

The defects enumerated above have been attempted to be remedied by the new legislation which covers 411 items against the 181 covered under the old law.

The essential features of the new law are as follows:

1) The export goods designated by Cabinet orders shall not be exported unless they are inspected by Government Inspection Organs or inspection organs authorized by the Government Ministry concerned.
2) The inspection standards and inspection methods for such designated export goods are established for each of the goods by Government ordinance concerned. In case of necessity, the standards for grading the export goods shall be established.
3) If some of the export goods require thorough inspection in respect to the quality of the materials used in production, or in respect of their manufacturing processes, such materials and manufacturing processes shall be subject to inspection.
4) In view of the public nature of inspection organs, the State Minister concerned appoints inspection organs from among those corporations which applied for inspection organs, and which are substantially strong both in respect of personnel as well as inspection facilities, and are characterized as neutral and impartial inspection organs covering nation-wide areas.
5) In view of the public nature of the inspection organs, the State Minister concerned exercises strict supervision on the operation of the inspection organs and controls appointments and dismissals of their officials or inspections, planning, revenue and expenditure budget of the inspection organs, and in case of necessity, can order the dismissal of inspectors or alteration of their business rule.
6) A special case for inspection is provided where the State-operated inspection organs or authorized inspection organs are found unfit to perform inspections. In such cases, the exporters or manufacturers themselves are allowed to conduct their own inspection on their export goods in accordance with the inspection standards specified in the new law, and indicate the result of their inspection on the goods in question as required by the same law.

The purpose of the new law is to achieve sound development of export trade and to maintain and enhance good reputation of export commodities by carrying out inspection on export goods.

Article 3 of the Export Inspection Law provides that the designated commodities, i.e. the commodities of which the maintenance or improvement of quality is necessary and which belong to the list of commodities prescribed by a Cabinet order, shall not be exported unless they have been inspected in accordance with the method prescribed by

(*Continued on p.* 192)

*See Home Bulletin, Vol II, No. 17, ated 1 May 1958 of the Engineering xport Promotion Council, Calcutta.

ISI to Hold Standards Convention at New Delhi

THE fourth Indian Standards Convention will be held in New Delhi from 24 to 29 November 1958. The earlier Conventions, organized by ISI, were held in Calcutta, Bombay and Madras in December 1954, January 1956 and December 1957, respectively.

The first Convention held at Calcutta covered engineering and building industries, the second at Bombay, chemical and textile industries, and the third at Madras focussed its attention on subjects mainly related to food and agriculture.

The technical work of the fourth Convention will be carried out in eight technical sessions. The various subjects likely to be discussed at these sessions are listed below:

S-1 Consumer Standards and Certification

History of Standards movement — how standards bodies came into being primarily to formulate standards for the industry. Growing demand for standards for consumer goods.

Consumer demand — education of the consumer so as to make him quality conscious; protection against fraud and spurious goods; guarantee about getting his money's worth.

Consumer goods — preparation of Indian Standards for consumer goods; production of consumer goods with Certification Mark.

ISI Certification Mark — certification on the basis of established standards; a protection to consumer and benefit to producer; recognition of the mark by the organized purchase agencies of the Central and State Governments and other public bodies; creating consumer demand for certified goods; industries' demand for certified raw materials and semi-finished products.

Voluntary nature of the Indian Standards — advantages accrued to the Indian trade and Industry by the adoption of Indian Standards; machinery for exercising control and executing and implementing the standards; desirability of making some consumer standards obligatory.

Consumers' associations — need for the formation of consumers' and housewives' associations; what the existing women's associations can do; role of such associations in the formulation and implementation of consumer goods standards; history and role of similar associations in other countries.

S-2 Metric Conversion

Basic principles — conversion of quantities expressed in one system of units into others; IS: 787-1956 Guide for Inter-Conversion of Values from One System of Units to Another may be used as a basis for discussion.

Problems of metric conversion in the engineering drawings — IS: 1105-1957 Method for Precise Conversion of Inch and Metric Dimensions to Ensure Interchangeability would be used as a basis for discussion.

Problems of the metric conversion in the engineering and other industries — all specifications to state technical requirements, such as dimensions, tolerances, etc, in the metric system; difficulties in production, distribution and exchange of goods and services; need for planning transactions and executing orders in an orderly manner; redesigning of certain components as a consequence of the change in the standard sizes of basic and semi-processed raw materials; engineering care involved in the conversion of existing dimensions; technical and organizational problems involved in the change-over and in the mathematical conversion from the FPS system to the metric system.

S-3 Standardization and Productivity

Role of standardization in scientific management, improving techniques, production control, quality control and cost control.

Standardization as a means to increased productivity — standardization leads to reduction of variety, simplification and specialization; results in low ing operation costs and incre ed production; streamlining t supply of raw and semi-finish materials.

History of productivity in forei countries — study of produc vity and standardization as r lated to productivity in i dustrially developed countri such as USA, UK, We Germany, etc.

S-4 Standardization and Export Promotion

Quality control and exports need for improving and mai taining the quality of exportal goods at an acceptable lev consumer satisfaction in ov seas markets leads to increas exports.

Standardization and quality co trol — standardization as means to quality control.

State Quality Control dire torates — their relationship wi ISI; role of quality control d partments of the State Gover ments in the maintenance of t quality of goods; decision the State Governments to acce Indian Standards for quali marking; quality marking; co tribution to export promotic by ISI Mark, AGMARI TEXMARK and States' Qualit Marks.

ISI Certification Marks — speci merits and demerits of I Marking Scheme; recommend tion of Export Promotion Cou cil, Tariff Commission; con pulsory use of Certificatic Marks in the export of son commodities like aluminiu utensils; further extension ISI Marks aimed at promotir exports.

S-5 Safety and Health Standards

Compulsory standards — limit tions of voluntary standar from safety and health points view; spheres in which sta dards may have to be mad compulsory, where, problems public safety are concerned, where public health is likely t

(*Continued on p.* 182

:TANDARDS NEWS

:port Promotion Forum

The need to set up an Export romotion Forum represented by :porters, importers, professors, re-arch workers and newspaper men,) disseminate information about the cilities available to exporters and bring to the notice of the Govern-ent what the exporter required ost in regard to facilities was cently stressed by Shri K. Ranga-vamy, Joint Chief Controller of nports and Exports.

Shri Rangaswamy, who was speak-g to businessmen of Hyderabad and :cunderabad under the auspices of ie Secunderabad Local Advisory ommittee of Andhra Chamber of ommerce, mentioned the various eps taken by the Government, such participation in international :hibitions, sending out trade dele-ations to other countries and setting of commodity boards like Coffee, ea and Coir Boards. The signi-:ance of the work of ISI in this nnection was pointed out by Shri angaswamy, as export promotion as dependant on two factors, amely quality and price.

ack of Nickel Anodes and ISI

The Development Council (Bi-cles) at its tenth meeting had, on ie suggestion of Shri Manubhai hah, Union Minister for Industries, ferred to the ISI the matter re-arding the difficulty in getting pply of nickel anodes for electro-lating of bicycle parts, to examine id suggest to industries ways and eans as to how best the nickel uld be conserved, or the use of ickel could be avoided.

The problem as it is, was discussed y the Electroplating Sectional Com-ittee of the Electrotechnical Divi-on of ISI on 28 March 1958, and it as recommended that the bicycle dustry should be encouraged to use ore and more of copper nickel mposite coatings as a substitute. his, in the Committee's view, would o a long way in conserving nickel.

The ISI has, for this purpose, just nalized a draft Indian Standard pecification for Copper, Nickel and hromium Plating. In the foreword f the draft standard mention has een made of the short supply of ickel, and the use of copper nickel omposite coating has been recom-mended. The standard will be made available to the industry soon.

The Electroplating Sectional Committee of ISI has also recommended the use of tin-nickel alloy coating as a measure to tackle the situation, but the Committee, at present, is not in a position to take up the standardization work in this respect due to lack of data.

Rolled Steel Beam, Channels and Angles — IISCO to Produce Indian Standard Metric Sections

The Indian Iron & Steel Co. Ltd. have announced their programme of rolling Indian Standard Metric Sections according to IS : 808-1957 Indian Standard Specification for Rolled Steel Beam, Channel and Angle Sections.

In a pamphlet giving details of their provisional programme, IISCO have stated that they are the first Indian manufacturers to undertake to roll material in metric sections. Their first metric sections were rolled and marketed in the middle of 1957. However, since it will take several years before they can convert their entire production to metric sections, they will roll both 'inch' and 'metric' sections during the transition period.

The pamphlet gives, in a series of tables, particulars of the medium weight beams, channels and equal and unequal angles to be produced and a schedule of rolling dates for each section.

ECLA Steel Economy Project on Lines of ISI

The Economic Commission for Latin America, ECLA, has recognized the work done in India with regard to the standardization of hot rolled sections through a resolution as under:

> "That ECLA should prepare a project for rationalizing and standardizing rolled steel shapes, with a view to its official adoption by all Latin American Countries. It was proposed that this should be done along the lines of work carried out by the Indian Standards Institution and possibly with the assistance of this Institution as well as with the co-operation of the specialized agencies."

The ISI had contributed a paper 'Standardization in the Production and Use of Rolled Steel Sections in India,' at the request of ECLA to a meeting of the Latin American experts on steel-making and transforming industries organized by the Commission. The ISI had been requested by ECLA to participate in the meeting and also to contribute a paper on the work in progress in India regarding redesign of rolled steel sections.

It was not found possible to depute a representative of the ISI to attend the meeting, but a paper was presented by ISI for discussion at the meeting. From the report of the meeting received from the ECLA office it is understood that this paper was accorded excellent reception at the meeting.

The paper dealt with the improved structural sections and was mainly based on IS : 808-1957 Specification for Rolled Steel Beam, Channel and Angle Sections.

Introduction of Standard Voltage in France

According to a news item in the December 1, 1957 issue of *France Actuelle*, the Electricite de France (EDF) is carrying out a vast programme to replace progressively the existing voltage of 127/300 by the 220/380 three-phase system in order to give better radio and TV reception, and to insure improved performance of electrical appliances.

This action is in conformity with what has been recommended by the International Electrotechnical Commission (IEC) in its Publication No. 38 Standard Voltages, published in 1954. The IEC Publication gives two sets of voltages in this range, namely (1) 220 volts single-phase and 220/380 volts three-phase, and (2) 240 volts single-phase and 240/415 volts three-phase, since it was not possible to secure general agreement on a single set of voltages at the international level.

In France, this change-over was completed for 150 000 consumers in 1956. In 1957, another 200 000 consumers benefited. Taking into account the installation of new services, which affects between 300 000 and 400 000 subscribers a year, it is estimated that another

(*Continued on p.* 170)

ISI Certification Marks

Standard Marks and Marking Fees

In the last issue of this Bulletin we published details of the 24 standard marks and marking fees which the ISI had specified up to 15 February last. Seven more standard marks and marking fees relating to their use were specified during the period 16 February to 30 April 1958, details of which are given below. With regard to the marking fee for magnesium chloride, technical, which had already been specified as ' 25 nP per unit ', a minimum of Rs 250·00 has now been fixed.

New Licences

Under the provisions of the ISI (Certification Marks) Act, 1952, licences were in force on 15 Februa 1958, of which 40 were covered in t March 1958 issue of this Bullet and the remaining in the last issu During the period 16 February 30 April 1958, 16 more licences ha been granted, details of which a given on p. 167.

STANDARD MARKS SPECIFIED AND MARKING FEES PRESCRIBED DURING THE PERIOD 16 FEBRUARY T 30 APRIL 1958

Sl No.	Product/Class of Product	Standard Mark Specified	Number and Title of Relevant Indian Standard	Unit	Marking Fee per Unit
1.	Copper Sulphate, Technical	IS:261 ISI	IS: 261-1950 Copper Sulphate, Technical	One ton	Rs 2·00
2.	Denatured Spirit	IS:324 ISI	IS: 324-1952 Denatured Spirit	One thousand bulk gallons	Rs 8·00 per unit f the first 200 unit Rs 6·00 per unit f the next 300 unit Rs 4·00 per unit f the 501st unit a over
3.	Threephase Induction Motors for Industrial Use	IS:325 ISI	IS: 325-1956 Threephase Induction Motors for Industrial Use (*Amended*)	One horse power	15 nP
4.	Enamelled High-Conductivity Annealed Round-Copper Wire (Oleo-Resinous Enamel)	IS:449 ISI	IS: 449-1953 Enamelled High-Conductivity Annealed Round Copper Wire (Oleo-Resinous Enamel)	One ton	Rs 5·00
5.	Concrete Pipes (With and Without Reinforcement)	IS:458 ISI NP 1	IS: 458-1956 Concrete Pipes (With and Without Reinforcement)	One ton	Rs 2·50
6.	BHC, Technical	IS:560 ISI	IS: 560-1955 BHC, Technical	One ton	Re 1·00
7.	DDT, Technical	IS:563 ISI	IS: 563-1955 DDT, Technical	One ton	Rs 2·00
8.	Magnesium Chloride, Technical	Already specified (*see* last issue of this Bull.)	IS: 254-1950 Magnesium Chloride, Technical	One ton	*25 nP with a mini mum of Rs 250·00

Note — The relevant grade to be inserted in place of NP 1 in the Standard Mark for IS: 458.
*This is the amended marking fee. The marking fee for this item as fixed previously was ' 25 nP per unit '.

NEW LICENCES GRANTED

The 16 licences listed in this table authorizing the licensees to use the relevant standard mark were granted during the period 16 February to 30 April 1958

). OF LICENCE AND ATE OF ISSUE	PERIOD OF VALIDITY From	To	NAME AND ADDRESS OF THE LICENSEE	ARTICLE COVERED BY THE LICENCE AND NUMBER OF RELEVANT INDIAN STANDARD
CM/L-71 13-3-1958	1-4-1958	31-3-1959	M/s Travancore Chemical & Manufacturing Co. Ltd., Alwaye	Copper Sulphate, Technical (IS: 261-1950)
CM/L-72 13-3-1958	1-4-1958	31-3-1959	The Hindustan Electric Co. Ltd., Faridabad	Threephase Induction Motors for Industrial Use (IS: 325-1956)
CM/L-73 14-3-1958	1-4-1958	31-3-1959	M/s Devidayal Cable Industries Private Ltd., Bombay	Enamelled High-Conductivity Annealed Round Copper Wire (Oleo-Resinous Enamel) (IS: 449-1953)
CM/L-74 14-3-1958	1-4-1958	31-3-1959	M/s Devidayal Cable Industries Private Ltd., Bombay	Hard-Drawn Copper Solid and Stranded Circular Conductors for Overhead Power Transmission Purposes (IS: 282-1951)
CM/L-75 14-3-1958	1-4-1958	31-3-1959	The Alkali & Chemical Corporation of India Ltd., Calcutta	BHC Water Dispersible Powder Concentrates (IS: 562-1955)
CM/L-76 24-4-1958	1-5-1958	30-4-1959	The Rampur Distillery & Chemical Co. Ltd., Rampur (UP)	Rectified Spirit Grade A (IS: 323-1952)
CM/L-77 24-4-1958	1-5-1958	30-4-1959	M/s Concrete Spun Pipe Works, Kanpur	Non-Pressure Concrete Pipes (With and Without Reinforcement) (IS: 458-1956)
CM/L-78 24-4-1958	1-5-1958	30-4-1959	M/s Crossley & Tower Private Ltd., Calcutta	Tea-Chest Plywood Panels (IS: 10-1953)
CM/L-79 24-4-1958	1-5-1958	30-4-1959	M/s National Timber Industries, Calcutta	do
CM/L-80 24-4-1958	1-5-1958	30-4-1959	M/s Das & Co., Calcutta	do
CM/L-81 24-4-1958	1-5-1958	30-4-1959	National Plywood Industries, Calcutta	do
CM/L-82 24-4-1958	1-5-1958	30-4-1959	Dhubri Plywood Factory, Dhubri	do
CM/L-83 24-4-1958	1-5-1958	30-4-1959	Bando Plywood Works, Calcutta	do
CM/L-84 24-4-1958	1-5-1958	30-4-1959	National Saw & Plywood Works, Tinsukia	do
CM/L-85 24-4-1958	1-5-1958	30-4-1959	Hindustan Timber Industries, Calcutta	do
CM/L-86 24-4-1958	1-5-1958	30-4-1959	M/s Surma Match & Industries Private Ltd., Calcutta	do

LICENCES RENEWED

The following two licences were renewed for a period of one year each:

SL NO.	NO. OF LICENCE AND DATE OF ISSUE	PERIOD OF VALIDITY From	To	NAME AND ADDRESS OF THE LICENSEE	ARTICLE COVERED BY THE LICENCE AND NUMBER OF RELEVANT INDIAN STANDARD
.	CM/L-25 21-3-1957	1-4-1958	31-3-1959	M/s Associated Battery Makers (Eastern) Private Ltd., Calcutta-20	Lead-Acid Storage Batteries (Dry Separators) for Motor Vehicles, Light Duty (IS: 395-1952)
.	CM/L-26 21-3-1957	1-4-1958	31-3-1961	M/s Carew & Co. Ltd., Rosa, Distt. Shahjahanpur	Rectified Spirit — Grade A (IS: 323-1952)

ISI Building Fund

Contributions received from 16 March to 15 May 1958

Contributions to the ISI Building Fund received up to 15 March 1958 amounting to Rs 958 337 were reported in th last issue of this Bulletin. The following is the list of contributions received thereafter up to 15 May 1958 which nc make up the total of Rs 962 837.

Contributor	*Contribution*
	Rs
Indian Plywood Mfg. Co. Ltd., Bombay	
(Contribution already reported Rs 6 000)	
Additional Contribution	2 000
Andhra Pradesh Government, Hyderabad	
(Contribution already reported Rs 1 000)	
Additional Contribution	1 500
Coir Board, Ernakulam	1 000

			Rs
Total contributions received between 16 March to 15 May 1958	...	...	4 500
Contributions reported in the last issue of ISI Bulletin	...	...	958 337
Grand total of contributions received up to 15 May 1958			**962 837**

Besides the actual collection, the ISI has received promises of contributions worth Rs 19 800.

New ISI Members

Enrolled during the period 16.3.58 *to* 15.5.58

Sustaining Members

Atic Industries Private Ltd., Post Atul, via Bulsar
Bengal Waterproof Works (1940) Ltd., Calcutta
Bharat Woollen Mills Ltd., Calcutta
Cycle Manufacturers' Association of India, Calcutta
Eastern Ore Corporation, Madras
Gotan Lime Syndicate, Jodhpur
Hakimji Lookmanji, Bombay
Indian Central Sugarcane Committee, New Delhi
Indian Explosives Ltd., Calcutta
Indian Refractory Makers Association, Calcutta
Industrial Supplies Corporation, Bombay
Janshi, G. & Co., Madras
Khem Chand Vijay Kumar, Jullundur City
Kosmek Plastics Manufacturing Private Ltd., Bombay
Kumar Industries (Private) Ltd., Allahabad
Lewis & Tylor (India) Ltd., Calcutta
Mechanical Engineering Co. Private Ltd., Calcutta
National Engineering Co. (Madras) Private Ltd., Madras
Paneser Mechanical Works Private Ltd., Ludhiana
Patanwala Glass Works Private Ltd., Bombay
Premier Industries, Bombay
Prestressed Concrete Co. (S.I.) Private Ltd., Hyderabad
Radio & Electricals Ltd., Madras
Raptakos, Brett & Co. Private Ltd., Bombay
Shree Krishna Private Ltd., Calcutta
Sreevatsa Chemicals & Drugs (Private) Ltd., Madras
Stein, Chatterjee & Polk, Calcutta
Tractor & Equipment Corporation (Private) Ltd., New Delhi
Universal Engineering Works, Amritsar
Vishwakarma Constructions (Private) Ltd., Calcutta

Sustaining Members (Associates)

Ajit Industries, Bombay
Andhra Ceramics Company, Bhimadole, Andhra Pradesh
Anglo American Brush Manufacturing Co., Ghaziabad
Army Brush Factory, Delhi
Asia Engineering Corporation, Bombay
Bells Electrical Corporation (Private) Ltd., Calcutta
Bhogal Sons, Ludhiana
Cassava (India), Calcutta
Chemicals & Solvents Private Ltd., Calcutta
Engineering Association of Northern India, Batala
Institution of Telecommunication Engineers, New Delhi
Madras Cement Tiles & Concrete Products Co. (Private) Ltc Madras
Murari Engineering Works, Ludhiana
Naran Lala Metal Works, Navsari, Dist. Surat
Nathella Sampathu Chetty & Son, Madras
Somayaji, A.S.R., Madras
Sunflower Cycle Private Ltd., Ludhiana
Superintendence Company of India (Private) Ltd., Calcutta
Timken Engineering Corporation, Calcutta
Tamil Chamber of Commerce, Madras
United Electric & Engineering Co. Ltd., Calcutta

Ordinary Members

Chanan Lal, L., Batala
Des Raj, Ambala Cantt.
Freeman, H., Oorgaum
Gian Singh, Amritsar
Joshi, B. B., Amritsar
Lentin, M. P., Bombay
Mulla, D. S., Bombay
Patel, G. M., Coimbatore
Sagar, G. P. Lal, Ludhiana
Shroff, J. C., Bombay
Vadra, Devinder Jit, Aligarh

With the enrolment of these new members, the membershi of ISI on 15 May 1958 was as follows:

Sustaining Members	1 234
Sustaining Members (Associates)	200
Ordinary Members	119
Total	**1 553**

mplementation of ndian Standards

The following Government purasing or consuming departments ve adopted the Indian Standards ted under them during the period March to 30 April 1958. In all, standards were adopted during e period. On 30 April 1958, 982 dian Standards were in force, which 894 had been adopted by rious Government departments.

rectorate General of Supplies & sposals (DGS&D)

IS: 309-1956 Compressed Oxygen Gas, Industrial (*in lieu of DGI & S Specification G/ Chemicals*-33/*A*)
IS: 616-1957 Code of Safety Requirements for Mains-Operated Radio Receivers
IS: 710-1957 Marine Plywood
IS: 816-1957 Code of Practice for Use of Metal Arc Welding for General Construction in Mild Steel
IS: 848-1957 Synthetic Resin Adhesives for Plywood (Phenolic and Aminoplastic)
IS: 850-1957 Natural Sour (Lactic) Casein for Glue Manufacture
IS: 875-1957 Code of Practice for Structural Safety of Buildings: Loading Standards
IS: 882-1956 *gamma*-BHC (*LINDANE*)
IS: 989-1956 Scissors
IS: 990-1957 Spoons, Stainless Steel
IS: 993-1957 Forks (Table, Fish and Serving), Brass and Nickel Silver
IS: 997-1957 Limestone for Glass Industry
IS: 1006-1957 Arrowroot Starch
IS: 1019-1957 Rim Latches
IS: 1032-1957 General Requirements and Tests for Pressure Unit Operated Horn Loudspeaker Systems
IS: 1034-1957 Loudspeaker Systems for Community Radio Receivers
IS: 1035-1957 Methods of Sampling and Test for Bleaching Earths Used for Decolourizing Vegetable Oils
IS: 1050-1957 Lime Sulphur Solution
IS: 1078-1957 Copper Naphthenate
IS: 1083-1957 White Oil, Light, Technical
IS: 1088-1957 Oil, Clock and Watch
IS: 1095-1957 Handloom Cotton Dress Material, Bleached, Dyed, Printed, Striped or Checked
IS: 1102-1957 Handloom Buckram Cloth
IS: 1105-1957 Method for Precise Conversion of Inch and Metric Dimensions to ensure Interchangeability
IS: 1106-1957 Distilled Water Glass Bottles
IS: 1107-1957 Aerated Water Glass Bottles

Central Standards Office (now Research Design & Standardization Organization, Ministry of Railways) (CSO)

IS: 27-1956 Pig Lead (*Revised*)
IS: 163-1950 Ready Mixed Paint, Dipping, Fire Resisting, for Gangways of Coaching Stock (1) Black, (2) Other Colours as Required
IS: 507-1953 Grease L No. 3
IS: 640-1956 Ready Mixed Red Oxide Paint for Hessian (Colour Unspecified)
IS: 657-1956 Materials for Use in the Manufacture of Magnesium Oxychloride Flooring Compositions (*Tentative*)
IS: 658-1956 Code of Practice for Magnesium Oxychloride Composition Floors
IS: 728-1956 Method for Determination of Weight, Thickness and Uniformity of Coating on Galvanized Articles Other Than Wires and Sheets
IS: 740-1956 Wrought Aluminium and Aluminium Alloys, Rivet Stock for General Engineering Purposes
IS: 779-1956 Water Meters with Threaded End Connections
IS: 798-1955 Orthophosphoric Acid, Technical
IS: 842-1956 Smith's Swages
IS: 846-1956 Smith's Flatters
IS: 869-1956 Ethylene Dichloride, Technical
IS: 991-1957 Spoons, Brass and Nickel Silver
IS: 994-1957 Fish Knives and Butter Knives
IS: 1025-1957 Glossary of Terms for Primary Cells and Batteries
IS: 1099-1957 Oil, Clock and Watch

Other Organizations

1) The Engineer, Water Works, Municipal Board, Bhopal, has intimated that their purchases will be made to Indian Standards.
2) The Master, Assay Department and Silver Refinery Project, Calcutta, has stated that they will make use of Indian Standards wherever useful.
3) Nangal Fertilizers & Chemicals Private Ltd., Nangal, have stated that they are making use of Indian Standards wherever possible.

NEW PREMISES FOR ISI BRANCH OFFICE, MADRAS

The ISI Branch Office, Madras, shifted to First Line Beach from 23 Nungambakkam High Road on 9 May 1958. The new address of the Branch Office is as under:

Indian Standards Institution
(Branch Office)
2/21 First Line Beach
Madras 1

Phone : 3836

Grams : ' Manaksanstha ', Madras

Standardization in Commonwealth Countries

DRAFT STANDARDS

The following draft standards from the Commonwealth countries were received for comments during March-April 1958. Copies of these are available in the ISI Library for reference.

Australia

Doc-375 Plug, Plug Sockets, Plug Socket Adopters and Cord Extension Socket
Doc-376 Aminoplastic Moulding Materials

Ireland

S.79/14 Liquid Driers for Oil Paints
S.79/15 White Spirit

New Zealand

D.5500 Isolating Transformers

South Africa

SABS 15/12/39/6 Bottles for the Liquor Trade
SABS 15/14/14/4 Paper Insulated Electric Cables for General Purposes
SABS 15/30/56 Classification of Pesticides

United Kingdom

CY(MEE)2425 Worm Gear Reduction Units
CY(T)2762 Cotton Fibre Maturity Test (Estimation by Classification of Fibres Swollen in Sodium Hydroxide Solution)
CY(M)2787 Minimum Safety Requirements for Childrens' Wooden Cots for Domestic Use
CY(M)2788 Childrens' Wooden Cots for Residential Nurseries and Day Nurseries
CY(MEE)2821 Adjustable Hand Reamers (with Inserted Blades)
CY(TIB)2857 Structural Timber — Part I Softwood
CY(RUC)2956 Non-Silver-Staining Natural Rubber Compounds
CY(RUC)2957 Method of Testing Vulcanized Rubber: Determination on Water Extract
CY(P)3063 Glass Container Finishes — Part 2 Bottle Finish for Crown Corks
CY(ACM)3114 Frequency Characteristics for Magnetic Sound Recording on Film
CY(ELE)3127 Track Circuit insulation
CY(MEE)3179 High Strength Friction Grip Bolts for Structural Engineering
CY(T)3189 Method for the Quantitative Chemical Analysis of Binary Mixtures of Polymide Fibres and Certain Other Fibres
CY(MEE)3327 Dimensions of Gaskets for Flanges
CY(FHC)3328 Hydroquinone (Quinol *P*-Dihydroxy-Benzene) Photographic Grade
CY(FHC)3329 Metol (P-Methyl-aminophenol Sulphate) Photographic Grade
CY(TPC)3330 Pyridine
CY(TPC)3331 Pyridine Bases
CY(WEE)3529 The Rating of Resistance Welding Equipment
CY(ACE)3761 Light Alloys Ingots and Castings for Aircraft
CY(MEE)3992 Pallets for Materials Handling Suitable for Transport
CY(ACE)4234 100° Countersu Head Steel Rivets
CY(ACE)4235 100° Countersu Head High Nickel — Copp Alloys Rivets
CY(ZEC)4455 Baby Carria Safety Horness
CY(FHC)4475 Sulphuric Ac for Use in Lead Acid Ba teries
CY(MEE)4712 Gibson Ring Ra way Tyre Testing

NEW WORK

United Kingdom

Asbestos Cement Flue Pip Heavy Quality
Fireman's Axe with Rubb Insulated Handle
Tar Acids in Disinfectant Fluids
Flax Canvas Unlined Hose f Fire-Fighting
Milling Machine Arbors
Gear with Double Circular A Tooth Form
Gear Planning and Gear Shapi Machines
Gear Holes
Engineering Drawing Practice
Extract from B.S. 308 f Students
Schedule of Electric Dischar Lamps
Electric Hair Dryers
Definitions of Terms Relati to Watch
Case Finishes
Definition and Tests for Physic Characteristics of Watches
Washers for Unified Hexagon f Aircraft
Aircraft Lamps
Safety Features for Ground Pow Units for d.c. Aircraft Servi and Engine Starting

---

STANDARDS NEWS — *Continued from p. 165*

twenty years will be required to effect a complete change-over for all consumers. Here is an excellent example of spreading the cost of standardization over a long period, so as to avoid undue hardship on interests concerned and yet secu benefits of lasting value to co sumers.

Railway, a minute of dissent was recorded proposing that since all engineering standards were to be ratified by the Engineering Division Council, the EDC be requested to take into consideration the relative importance of the various interests represented at the meeting, and to give a directive.

2) The Indian delegation to the ISO/TC 1 meeting be asked to make sure of the attitude of the metric countries to the ISO basic profile in view of the latest move of the inch countries to adopt unified threads throughout the range.
3) After the draft had completed three months' circulation (which would include circulation to the members of the Engineering Division Council as well), the question should be brought up first before the Sectional Committee, and thereafter before the Engineering Division Council.

Regarding the composition of ıdian delegation to attend the ırthcoming meeting of ISO/TC 1 — ɔrew Threads, the ISI was autho-ɔed to finalize the names, and the ɔlegates themselves were given the ıoice to elect their leader.

The Committee also appointed an *ɨ hoc* Panel to study the agenda for ıe meeting of ISO/TC 1, and to repare a brief for the Indian ɔlegation.

JILDING DIVISION

ɹilding Division Council

Shri E. A. Nadirshah, the Chair-ıan, presided over the sixth meeting the Building Division Council 3DC), on 25 March 1958 held at the ɔI Headquarters. Speaking about ıe new premises of the ISI, Shri 'adirshah observed:

'Each one of us who had a share in the raising of this building should feel happy and proud that our united voluntary efforts have produced for us such a concrete evidence of the solidarity of the industry and consumers working together towards common aims of the general welfare as reflected in this building of the Indian Standards Institution'.

The Chairman also reviewed the ork of the Division done in the ɔreceding year, and referred to the ork of standardization of quality f building materials and methods of onstruction already done by ISI which, he was sure, would help in achieving substantial economies in construction work. But there was one aspect of the construction industry which had been responsible for a very substantial loss to the industry, and that was lack of planning and organization in building operations at site in this country. Except in a very few cases, he said, it was common experience to see complete disorganization of work at any construction spot. There was lack of planning in regard to labour force, sequence of operations and even in the supply of materials and progress of work. Proper organization of work, he was convinced, would achieve for the construction industry economies of the order of 15 to 20 percent and it was a very important saving which should be achieved.

The Chairman felt that by the application of standardization, programming in the building industry could be introduced, although builders and construction departments did not have any clear ideas as to how this would be done. He, then, invited the members to give thought to that aspect of standardization which, he was sure, would help to consolidate the gains achieved in the standardization of materials, design and construction methods.

The Council then considered the question of preparing a Code of Practice for Planning and Programming of Building Construction. Since it was reported that the item in question was already on NBO's programme of work, it was decided to leave the subject to NBO but to request it to keep the Council informed of any progress made in this direction.

The Council re-elected Shri Nadirshah as its Chairman for a further term of three years. Shri C. P. Malik was elected Vice-Chairman in place of Shri Sarup Singh who had retired.

The Council approved the proposal of formulation of an Indian Standard on polythene pipes and entrusted the work to the Water Supply and Sanitation Sectional Committee, BDC 24.

The Council also reviewed the work in the field of international standardization and noted the meetings of the ISO technical committees to be held in the near future. In case of ISO/TC 77 — Products in Asbestos Cement, the Council authorized the Cement and Concrete Sectional Committee, BDC 2, to decide on the composition of the Indian delegation.

Sanitary Appliances and Water Fittings

The Sanitary Appliances and Water Fittings Sectional Committee, BDC 3, held its fifth meeting on 19 and 20 February 1958 at Calcutta under the chairmanship of Shri K. R. Bhide of the Public Health Engineering Department, Government of Bihar.

The Committee discussed and finalized for publication the draft specifications covering the following two items, subject to a number of changes decided upon during the meeting:

1) White Glazed Earthenware Sanitary Appliances, and
2) Sand-Cast Brass Screw Down Bib Taps and Stop Taps for Water Services.

One more draft specification for finalization covering Water Meter Boxes was considered, and it was decided that the specification should cover both a box as well as a cover for bigger meter to fit masonary or concrete chambers built in site. The draft was, therefore, referred back to the subcommittee concerned for revision.

The following new subjects for the formulation of Indian Standards were also approved by the Committee:

1) Pillar taps,
2) Mixing valves,
3) Ball valves,
4) Float valves,
5) Ferrules,
6) Self closing taps,
7) Drinking fountains,
8) Manhole covers,
9) Stall type urinals,
10) Squatting urinals,
11) Orissa type water closet pans,
12) Vitreous sanitary-ware, and
13) Laboratory sinks.

It was reported that the drafts for items 1 to 7 were being prepared by Shri J. D. Daroga and would be dealt with by the Domestic Water Fittings Subcommittee, BDC 3:2. The subject of manhole covers was also entrusted to BDC 3:2. The work on items 9, 10, 11 and 12 was decided to be taken up by Shri R. M. Mehra, and the last item was allotted to the Domestic Sanitary Appliances and Accessories Subcommittee, BDC 3:1.

The Committee also reconstituted the various subcommittees and appointed the following as conveners:

1) Shri R. M. Mehra — Convener to the Domestic Sanitary Appliances and Accessories Subcommittee, BDC 3:1,

2) Shri J. D. Daroga — Convener to the Domestic Water Fittings Subcommittee, BDC 3 : 2, and
3) Shri R. K. Singh, Convener to the Water Meters Subcommittee, BDC 3 : 4.

Wood Products

The finalization for publication of the draft specification for Decorative Plywood was one of the technical items disposed of by the Wood Products Sectional Committee, BDC 20, at its fifth meeting held on 21 and 22 February 1958, in Calcutta.

The Committee also discussed and, subject to a number of changes agreed upon in the meeting, approved for wide circulation the draft Revision of IS : 303-1951 Plywood for General Purposes and two draft specifications covering the following items:

1) Extenders for Use in Synthetic Resin Adhesives for Plywood (Urea Formaldehyde), and
2) Packing Cases.

Shri G. D. Joglekar who was entrusted with drafting of a preliminary specification for Pencil Slates suggested that due to certain considerations, the subject be undertaken by a member from the Forest Research Institute, Dehra Dun. Shri M. A. Rehman was, therefore, entrusted with the work.

For the work of preparing a draft specification for Compregs, the Chairman, Dr. D. Narayanamurti, offered himself, and the Committee accepted the offer.

The Committee discussed the decision taken by the Standing Working Committee Building (SWCB) that it would be preferable to indicate suitability of different grades of plywood for different purposes in the relevant standard itself. It came to the conclusion that a separate Code of Practice for Manufacture of Plywood for Tea Chests and Recommendation for Use of Different Types of Plywood should be prepared in view of the fact that the code was intended to cover the use of the decorative plywood and block board also. The work was entrusted jointly to the Plywood Manufacturers' Association, Calcutta and the South India Plywood Manufacturers' Association, Feroke.

The draft Amendment to IS : 652-1955 Wooden Separators for Lead Acid Storage Batteries for Motor Vehicles was also discussed in detail and approved for circulation for one month to all interests concerned.

Fire Fighting

Addressing the members of the Fire Fighting Sectional Committee, BDC 22, which held its second meeting on 27 February to 1 March 1958 at the ISI Headquarters, the Chairman, Shri L. G. Mirchandani of the Ministry of Home Affairs, Government of India, said: " Only the other day I had the Managing Director of Bhilai Steel Plant discussing these fire problems with me and I stated that they should take these things more seriously. As a result they have put in necessary fire engines and other equipment. Now, unfortunately the knowledge about fire fighting and fire prevention, and the need for it has not been sufficiently understood. Recently in Madras I found that they did not even have a turntable ladder. When I enquired, they said that they never felt the need. Should anything happen, then they would realize that there was need for it. Similarly, in places like Delhi where tall buildings were being constructed, unless there were suitable equipment, the chief officer would be called upon to explain in a case of accident, why he had not the necessary equipment. Actually, this is not a subject taught in a college, nor has it been included in the ordinary curriculum. Therefore, we were forced to open a separate college for the purpose to ensure that the knowledge is spread and we get qualified persons for various jobs."

Shri Mirchandani further told the members that the Government was conscious of the problem and wanted to see that the fire services developed properly all over the country. He added: " As a matter of fact we have taken steps to prepare a model draft bill on fire services. We want to see that there are reasonable equipment available with the fire services all over the country. This has come out as a result of study of the various emergencies and natural calamities the country has faced."

Concluding his remarks, the Chairman mentioned that with the Committee were associated not only the departments as users but manufacturers also who could manufacture the equipment in the country. He also recalled the biggest problem of foreign exchange so far as the purchase of foreign made equipment was concerned, and emphasized the need to resort to indigenous purchases. He assured the industry that the Government would place reasonable orders to encourage the industry.

Afterwards, the Committee to up the following 21 out of the draft specifications for finalizati which had completed wide circul tion, and discussed them in the lig of the comments received and r commendations made by the su committees concerned:

1) Couplings, Double Male ar Double Female, Instantaneo Pattern for Fire Fighting Pu poses,
2) Fire Hose Delivery Couplin Branch Pipe, Nozzles ar Nozzle Spanner,
3) Suction Hose Couplings f Fire Fighting Purposes,
4) 2-Way and 3-Way Suctic Collecting Heads for Fire Figh ing Purposes,
5) Branch with Revolving He for Fire Fighting Purposes,
6) Delivery Breechings, Dividi and Collecting, Instantaneo Pattern for Fire Fightir Purposes,
7) Suction Strainers, Cylindric and Shoe Types for Fi Fighting Purposes,
8) Hydrant, Stand Post Type,
9) Combined Hydrant, Hydra Cover Lift and Lower Val Key,
10) Under Ground Hydrant, Slui Valve Type,
11) Under Ground Hydran Double Valve Type,
12) Washers for Water Fittings f Fire Fighting Purposes,
13) Fireman's Axe,
14) Fire Hooks,
15) Fire Bell,
16) Portable Chemical Fire E tinguishers, Foam Type,
17) Portable Chemical Fire E tinguishers, Soda Acid Type,
18) Portable Chemical Fire E tinguishers, Carbon Tetra chloride Type,
19) Blower and Exhauster,
20) 360-550 LPM (or 80-120 GPM Portable Pump Set for Fir Fighting, and
21) 550-1000 LPM (or 120-22 GPM) Trailer Pump for Fir Brigade Use.

The Committee changed the title of items 19, 20 and 21 to read a ' Blower and Exhauster for Fir Fighting ', ' 275 LPM (or 60 GPM Portable Pump Set for Fire Fight ing ', and ' 680 LPM (or 150 GPM Trailer Pump for Fire Brigad Use ', respectively. It decided tha the above draft specifications b revised in the light of modi fications agreed upon during th meeting and circulated among th members for their final approva for publication.

Regarding the remaining 16 draft ecifications awaiting finalization, e Committee directed that they ould be revised in the light of the commendations made by the submmittee concerned and be cirlated among members for their rutiny and comments.

The Committee also approved the o draft specifications covering Fire ctinguisher, Water Type, and Fire ctinguisher, CBM Type, for wide culation for three months.

The proposed draft specifications vering the following seven items re also discussed and approved r wide circulation:

1) Stirrup Pump for Fire Fighting Purposes,
2) Self-Contained Breathing Apparatus for Fire Brigade Use,
3) Electric Motor Sirens for Fire Brigade Use,
4) Helmets, Firemen,
5) Oxy-Acetylene Cutting Set Used for Fire Services,
6) Snatch Block, Single Sheave for Brigade Use, and
7) Jacks, Screw, 5 Ton for Fire Brigade Use.

Considering the new subjects to be ken up for formulating Indian andards, the Committee allotted e subjects of Crow's Foot Coupling id Quick Closing Clack Valve to e Water Fittings for Fire Fighting irposes Subcommittee, BDC 22: 1, id the subject of Small Fire Engine the Fire Fighting Units Subcomittee, BDC 22: 3.

The following two new subjects hich had been deferred in the past, re also approved for formulation Indian Standards:

1) Towing Tender for Trailer Pump for Fire Brigade Use, and
2) Dividing Breechings with Control.

The latter was entrusted to the 'ater Fittings for Fire Fighting urposes Subcommittee, BDC 22:1.

ilding Limes

The Chairman, Shri R. C. Hoon, the Central Water & Power ommission, in his opening address ld the members of the Building imes Sectional Committee, BDC 4, iat the Fourth Irrigation and Power eminar held by the Ministry of rrigation & Power, Government f India had decided that lime could e used as a substitute for cement pecially in structures where delayed evelopment of strength was not of ital concern. Shri Hoon was speakig at the fourth meeting of the Committee held on 15 and 17 March 1958 at New Delhi. He added that the Indian Standard on Building Limes had already been formulated and the National Buildings Organization had brought out a note giving recommendation for the use of lime in housing construction.

The Chairman emphasized the collaboration of NBO with the work of the Committee on several matters relating to building lime, such as examination of the present difficulties of the lime manufacturing industry, the compilation of test results on various samples of lime with a view to working out regional differentiations, and the preparation of codes of practice for the burning and slaking of limes. The NBO he stated, was actively examining the various matters related to the above and bringing out useful recommendations and he hoped that it would be shortly possible for the Committee to have for study the notes and other literature prepared by the NBO on this subject.

Afterwards, the Committee discussed the comments on the magnesium content in building limes as laid down in IS: 712-1956 Specification for Building Limes. The Committee was of the view that the current use of magnesian lime should not be precluded for want of establishment of the correct limit of magnesia content and corrected the clause concerned to read as:

> 'The percentage of magnesium oxide (MgO) in any class of lime given under **3.1** shall not exceed 5·0 percent. Where it exceeds 5·0 percent, the limit of magnesium oxide content shall be subject to mutual agreement between the purchaser and the vendor.'

The proposed amendment was sent for wide circulation for one month for eliciting comments.

The Committee further took note of the fact that the standards to be formulated in future on building limes would fall under two main categories, namely those connected with the manufacture of building lime and those connected with the use of lime in construction work. It set up the Use of Building Lime Subcommittee, BDC 4: 1, and the Manufacture of Building Lime Subcommittee, BDC 4: 2, with Prof C. H. Khandilkar and Shri N. Macedo as their respective conveners. The Committee also asked the Use of Building Lime Subcommittee, BDC 4: 1, to take up work immediately on the code of practice for use of building lime and on simple field test for building lime. The second Subcommittee, BDC 4: 2, was also entrusted with drafting the following standards:

1) Standards for the design and performance of lime kilns, and
2) Code of practice for burning and slaking of lime.

It was reported in the Committee that much of the test data on lime samples supplied by laboratories did not facilitate comparison with the standard requirement. The Committee decided that the Chairman Shri Hoon and Shri A. C. Banerjee should prepare standard procedure of laying down the manner in which lime should be sampled, packed and despatched, including the following as well:

1) Details of method of sampling, the quantity of sampling and type of packing, and
2) The form in which the test data should be recorded and findings reported.

The Committee directed that the standard procedure should then be sent to all manufacturers and standard laboratories along with requests for detailed investigation and report on lime samples.

On reviewing the composition, the Committee co-opted a representative of the Indian Bureau of Mines as its member.

Doors, Windows and Building Furniture

The draft Indian Standard Specification for Industrial Windows was finalized for publication and the draft Indian Standard Code of Practice for Fixing and Glazing of the Steel Doors was approved for wide circulation, both of them subject to a number of modifications at the fourth meeting of the Doors, Windows and Building Furniture Sectional Committee, BDC 11, held on 24 March 1958 at Manak Bhavan.

But with the preparation of a Code of Practice for Steel Doors and Windows it was felt necessary to cover the fixing of doors and windows also by a code of practice, and the work of drafting the code was entrusted to Shri M. K. Subramanian.

The following three new subjects for formulation of Indian Standards were also considered:

1) Casing and Capping,
2) Code on Wastage in Timber, and
3) Venetian Blinds.

The first two subjects were decided to be referred to their appropriate sectional committees, and the work on the third was taken up by the Chairman himself.

While reviewing the composition of the subcommittees, it was found

that the work of the Timber Doors and Windows for Domestic Buildings and Offices Subcommittee, BDC 11:1 and that of the Flush Doors and Windows Subcommittee, BDC 11: 3, was a great deal in common. The Committee, therefore, amalgamated the two subcommittees into one and added the Hindustan Housing Factory to its membership.

The Committee also reorganized the Wooden Furniture Subcommittee, BDC 11: 4, and the Metal Furniture Subcommittee, BDC 11: 5, and appointed Shri N. B. Shroff and Shri J. P. Billimoria as their respective conveners.

Pozzolanas

The Pozzolanas Sectional Committee, BDC 16, held its second meeting on 28 March 1958 at Manak Bhavan.

To start with, the Committee agreed upon the definition of pozzolana as follows:

> 'A pozzolana is an essentially silicious material which while in itself possessing no cementitious properties will in finely divided form and in the presence of water react with calcium hydroxide at ordinary temperature to form compounds possessing cementitious properties.'

The Committee was considering and taking decisions on various aspects of the pozzolana with a view to facilitating the work for future. On the problem of classification of the material, it was agreed that there was no need of subdivisions and the classification of natural and artificial was sufficient.

A preliminary draft Indian Standard Methods of Tests for Pozzolanic Materials was, however, put up before the Committee. It was discussed in detail, a number of changes were agreed upon and instructions were given that the draft so revised should be circulated among the members of the Sectional Committee for approval for wide circulation.

The representation to the Engineer-in-Chief's branch on the Sectional Committee was also approved

TEXTILE DIVISION

Textile Division Council

Shri Bharat Ram, Chairman of Textile Division Council (TDC), briefly reviewed the activities of the Division at its eighth meeting held on 11 April 1958 at Bombay. He further observed that textile goods being largely the kind which fall within the category of consumer goods, the Textile Division, in keeping with practice and experience abroad, had to confine its activities to such kinds of textile fibres as were required for large purchasers like the Defence Services or those which were used by the industry, such as filter cloth, etc.

The Council, then, reviewed the composition of the sectional committees. The terms of reference of the Sampling Methods Sectional Committee, TDC 33, were amended to read as:

1) to prepare sampling manual for guidance of the various sectional committees of Textile Division, and
2) to scrutinize on request sampling clauses of standards formulated in Textile Division.

The Council re-elected Shri B. C. Munshaw to represent the TDC on the General Council for another term of three years ending 31 December 1960.

New subjects for formulation of Indian Standards were also considered, and the subject of umbrella cloth was decided to be taken up. It was assigned to the Cotton Yarn and Cloth Sectional Committee, TDC 2.

The recommendations of the Textile Standards Sectional Committee, TDC 1, to take up work on the following subjects were also approved:

1) Methods for Determination of Whiteness of Cotton Materials,
2) Methods for Determination of Lustre in Cotton Materials,
3) A Glossary of Terms for Describing Fibre Content of Fabrics Containing Wool, and
4) A Glossary of Terms for Describing Fibre Content of Fabrics Containing Silk.

The Committee decided that the meetings of TDC should preferably be held in conjunction with the annual meeting of the General Council.

Spindle Tape and Tubular Banding

The draft Indian Standard Specification for Cotton Tubular Banding to Drive Spindles (for Cotton Textile Mills) was finalized for publication at the third meeting of the Spindle Tape and Tubular Banding Sectional Committee, TDC 25, held on 25 February 1958 at Bombay.

Considering the proposed new subject of cotton spindle tape in basket weave, the Committee decided that the tape of basket weave, should be included in the draft Indian Standard Specification for Cotton Spindle Tape by amendi it suitably. The finalization of t above draft specification was ke in abeyance by the Committee t the results of tests on the samp of spindle tape in respect of t tension on the tape during acti working and the elongation, we available.

Jute Bags for Packing Sugar

At the third meeting of the Ju Bags for Packing Sugar Sectior Committee, TDC 28, held at Calcut on 31 March 1958, the Chairma Shri T. Prasad, Chief Director Directorate of Sugar & Vanaspa Ministry of Food & Agricultu referred to the data obtained as result of necessary tests carried o on 'A' twill bags received from jute mills. He remarked that t data were very revealing. T variations in the quality of 'A' tw bags manufactured by different mil particularly in respect of weight a tensile strength, were very wic He was of the opinion that the resu confirmed the early findings whi showed that 'A' twill bags manufa tured by certain mills were inferi to superior quality 'L' twill bags some other mills. The Chairm felt that it was very important th the bags used by sugar indust were of a standard quality. It w particularly so, as the weight sugar to be packed in each bag ha been fixed by the Government 2 md 30 sr, and variation in tl weights of bags made it difficult pack and check the net weight sugar.

He further added that some of th countries to which sugar was e ported had complained of the qualit of bags used for packing sugar. T his understanding complaints ha also been received from UK refine regarding the higher moisture cor tents of bags supplied to ther Certain Indian mills had also mac similar complaints.

The point of complaint, namel moisture content of jute bags fc packing sugar referred to by th Chairman was taken up by th Committee. Messrs Raza Bulan Sugar Co. Ltd., New Delhi, ha suggested that while important cha racteristics of jute bags, such a breaking strength, bursting strengtl seam strength and air permeabilit were being considered, it was als necessary to consider the moistur content of the jute bags which the found sometimes as high as 12 t 13 percent, and also the weight o the bag itself. Dr. W. G. Macmillan

fact, found these moisture content ures considerably below what ›uld be expected in a normal gar bag. The Committee con-lered these and certain other points d came to the conclusion that, in ew of the fluctuations in the at-›spheric conditions from hour to ur and from place to place and the groscopic nature of jute fibre, it is neither feasible nor practicable make the jute industry (or any-dy else) responsible for moisture ntent of jute bags for packing gar.

The Committee also approved the aft Indian Standard Specification · ' A ' Twill Jute Bags for Packing gar for wide circulation with a ew to inviting comments on it.

—ir and Coir Products

The Chairman, Shri Ravi Karuna ıran of the Coir Board, Ernakulam, his opening remarks at the fifth eting of the Coir and Coir Pro-cts Sectional Committee, TDC 9, id:

" Most of us assembled here are so closely connected with the coir industry that each one realized its importance. Our difficulties are many, and when dealing with coir and coir products, in the production of which every process is done by manual labour in a traditional way, these difficulties are seldom appreciated. Coir unlike, *khaddar*, for example, has no commodity to compare with for which there are specifications in existence. Nevertheless, many of us have been engaged for the past few years in finding out the best means of laying down specifications. We, cannot, however, prolong this any more, as, in the meantime, for the improvement of our export trade, standard specifications are becoming urgent."

The Committee, then, reviewed e activities of its subcommittees ith a view to apprising itself of the ›rrect position of work regarding ıe formulation of specifications for grades of anjengo type of yarn, ıd specification for coir mats and atting. It set up a Panel for Coir arn, TDC 9 : 1 : 12, with Shri V. V. ›b as its Convener. The Committee lso requested the Coir Board to lace the services of the required umber of investigators at the dis-osal of the Panel for the purposes f collecting samples of and data egarding Anjengo type of coir yarn omdifferent producing areas during esh water and salt water seasons. The Panel was authorized to draw up a questionnaire for the guidance of the investigators and to give them necessary instructions from time to time. On the basis of the conclusions and recommendations of the Panel, the Subcommittee for Coir Fibre and Coir Yarn, TDC 9 : 1, was directed to formulate a draft specification for anjengo type yarn.

With a view to bringing about a reconciliation between IS: 898-1957 Specification for Coir Fibre (*Tentative*) and the Boxed Coir Fibre Colour Standards, an amendment to the Indian Standard was approved for wide circulation. The Coir Board was further requested to take on the responsibility of preparing Boxed Coir Fibre Colour Standards every year through the agency of the Cochin Chamber of Commerce, Cochin, and securing the approval of the Boxed Standards from the Panel for Boxed Coir Fibre Colour Standards TDC 9 : 1 : 1, appointed by TDC 9 for the purpose.

The meeting was held on 8 April 1958 at Ernakulam.

CHEMICAL DIVISION

Chemical Division Council

The tenth meeting of the Chemical Division Council (CDC) was held under the presidentship of the Chairman Dr. A. Nagaraja Rao on 18 March 1958 at Calcutta. The Chairman said that it was encouraging that most of the large number of Indian Standards formulated by the Chemical Division had been adopted by the various Government purchasing agencies. He advised the manufacturers that in the interest of national economy and the industrial development of the country, they should increase their production with simultaneous maintenance of quality standards.

The Council then re-elected many retiring members for another term of three years ending 31 December 1960. It also approved the nomination of each of the following as Chairman of the Sectional Committee noted against him:

1) Shri Raman M. Patel — Treated Fabrics Sectional Committee, CETDC 3,
2) Dr. M. B. Ichaporia — Oils, Fats and Soaps Sectional Committee, CAFDC 5,
3) Dr. K. L. Moudgill — Essential Oils Sectional Committee, CDC 11, and
4) Mr. R. Lawford — Metal Containers Sectional Committee, CDC 28.

In the case of the Alcohol and Allied Products Sectional Committee, CDC 2, and the Inks Sectional Committee, CDC 13, the Council offered representations to the following organizations:

Alcohol and Allied Products Sectional Committee

1) Carew & Co. (Private) Ltd., Rosa, U.P,
2) Mysore Sugar Co. Ltd., Bangalore, and
3) Alkalies & Chemical Corporation of India Ltd., Calcutta.

Inks Sectional Committee

1) Bengal Chemical & Pharmaceutical Works Ltd., Calcutta, and
2) Hoogly Ink Co. Private Ltd., Calcutta.

It was reported that the joint responsibility borne by Engineering, Chemical and Textile Divisions in case of the Pulleys and Belts Sectional Committee, ECTDC 4, for formulating Indian Standards on Rubber and Leather Beltings, for the last five years had led to considerable duplication and delays. To tackle the problem speedily, the Council agreed to transfer all the work relating to beltings of different materials of construction to the Pulleys and Belts Sectional Committee, EDC 42, making the work the sole responsibility of the Engineering Division.

It was also pointed out that the subjects of bicycle tyres and tubes, which were at present being dealt with by the Bicycles Sectional Committee, EDC 26, under the Engineering Division should have appropriately been handled by the Rubber Products Sectional Committee, CDC 6, under the Chemical Division. But as the work had already gone half way, the Council decided that the draft specifications on these subjects, when issued in wide circulation, should also be sent to the members of CDC 6 for their views. The Council further directed that CDC 6 should be adequately represented by manufacturers of bicycle tyres and tubes.

The Council gave its approval for the formulation of Indian Standards of some 36 new subjects already taken up by various sectional committees anticipating the approval of the CDC. It further approved the following three subjects and allotted them to the Sectional Committees as shown below:

Coal Carbonization Products Sectional Committee, CDC 23

1) Nitro-Benzene for Defence Purposes

Acids and Fertilizers Sectional Committee, CDC 24

1) Ground Rock Phosphate, and
2) Nitro-Lime Stone (as Agricultural Fertilizer).

The Council felt satisfaction at the progress of the work done. So far 451 chemical standards have been published and out of these 399 standards have been adopted by the various purchasing agencies of the Government.

The Council also considered the amendments to the following Indian Standards. Since they were of a non-controversial nature, the Council dispensed with their wide circulation, and finalized them for publication:

1) IS: 220-1950 Fountain Pen Inks, Blue-Black and Red,
2) IS: 534-1955 Benzene, Ordinary,
3) IS: 535-1955 Benzene, Pure, Nitration Grade,
4) IS: 536-1955 Toluole, Industrial, Solvent Grade, and
5) IS: 537-1955 Toluene, Pure, Nitration Grade.

The names of the Heavy Chemicals (Miscellaneous) Sectional Committee, CDC 3, and the Inks Sectional Committee, CDC 13, were changed to the Chemicals (Miscellaneous) Sectional Committee, CDC 3, and Inks and Allied Products Sectional Committee, CDC 13, respectively.

Fine Chemicals

The Fine Chemicals (Organic and Inorganic) Sectional Committee, CDC 4, finalized for publication two draft specifications, one covering activated carbon, and the other, precipitated calcium carbonate, grade I, at its eleventh meeting held on 17 March 1958 at Manak Bhavan.

Two draft specifications covering the following two items were also approved for wide circulation:

1) Dicalcium Phosphate for Dentifrice, and
2) Tricalcium Phosphate for Dentifrice.

On considering certain comments received from Shri K. K. Chatterjee and M/s Kesar Sugar Works Ltd., on IS : 247-1957 Specification for Anhydrous Sodium Sulphite (*Revised*), the Committee decided to relax the requirements for sodium sulphite content for the technical grade.

With a view to formulating Indian Standards on reagent grades of benzene and toluene, the Committee appointed a Panel, CDC 4/P1, with the representative of the Sindri Fertilizers & Chemicals Ltd., as its convener.

Reviewing the composition of the subcommittees, the Committee noted that Dr. N. F. Desai, Shri V. S. Mainker and Shri S. R. Bageshwar had accepted respectively the convenership of the Alcohol and Esters Subcommittee, CDC 4:1, the Chloroderivatives Subcommittee, CDC 4: 4, and the Inorganic Salt Subcommittee, CDC 4:5.

The Committee also appointed Dr. P. N. Bhatt as the convener of the Vegetable Tallow and Turkey Red Oil Subcommittee, CDC 4: 6, in place of Shri P. C. Mehta who is now alternate to Dr. Bhatt.

AGRICULTURAL AND FOOD PRODUCTS DIVISION

Edible Starch, Confectionery and Cereal Products

The Edible Starch, Confectionery and Cereal Products Sectional Committee, AFDC 10, held its sixth meeting in joint session with the third meeting of the Edible Starches Subcommittee, AFDC 10:1, on 7 and 8 April 1958 at ISI Headquarters.

The draft Indian Standard Specifications covering the following three items were considered in the light of comments received on them, and were finalized for publication subject to a number of modifications:

1) Covering Chocolate,
2) Cocoa-Powder, and
3) Cocoa-Butter.

The Committee also approved a set of draft Indian Standard Specifications covering the following items relating to tapioca for wide circulation:

1) Edible Tapioca Starch,
2) Edible Tapioca Chips, and
3) Edible Tapioca Flour.

A draft Indian Standard Specification for Baker's Yeast was also modified and approved by the Committee for wide circulation for eliciting comments.

The Committee, further, approved the new subject of 'groundnut cake flour' for formulation of an Indian Standard, and for this purpose set up a Groundnut Cake Flour Subcommittee, AFDC 10:6, with Dr. D. S. Bhatia as its Convener.

In anticipation of the approval of the AFDC, the subject of rolled oats was also undertaken by the Committee for the formulation of an Indian Standard on it, and was allotted to the Cereal Products Subcommittee, AFDC 10:3.

On reviewing the composition the Yeast Subcommittee, AFI 10:5, the Committee co-opted t following as members:

1) Dr. D. S. Bhatia (subject approval of CSIR), and
2) Shri S. L. Venkateswaran Development Wing of the Mi istry of Commerce & Indu try.

STRUCTURAL AND METALS DIVISION

Structural and Metals Division Council

Shri J. J. Ghandy, the Chairm of the Structural and Metals Di sion Council, SMDC, observed in h opening remarks at the secoi meeting held on 24 March 1958 Manak Bhavan that the standar zation work falling within the pu view of the Division Council h progressed evenly in all directio and had covered ferrous and no ferrous metals. In all, 44 standar had been prepared out of which were published and the rest we under print. In addition 14 sta dards had been finalized and 18 c culated for comments. He al made it known that further 1 standards were under preparatio of which about 20 were shortly goi to be circulated.

When the other activities of tl Council were taken up for revie a member pointed out the difficulti experienced by the various Gover ment Departments in carrying o research and testing work emanati in the course of work of technic committees of ISI. In his opinio the time had come when the Mini tries of the Government of Indi and the State Governments shou be approached by the ISI to issu directions to the various depar ments under them to give maximu co-operation whenever any reque for investigations was received fro the technical committees of IS The Council recommended to tl Executive Committee of the ISI t consider the proposal and approac the Ministries of the Government India and the State Governmen in this connection.

The Council nominated the follow ing persons as Chairman of the Sec tional Committee noted agains each:

1) Shri A. V. D'Costa — Struc tural Engineering Sectiona Committee, SMDC 7,
2) Dr. Pran Lal Patel — Cas Iron and Malleable Cast Iro Sectional Committee, SMDC 9

Shri J. J. Ghandy, Delivering the Chairman's Address at the Second Meeting of the Structural and Metals Division Council at Manak Bhavan. From Left to Right are Shri R. G. Bhatawadekar, Shri S. L. Kumar, Dr. Lal C. Varman, Shri J. J. Ghandy, Shri B. S. Krishnamachar, Dr. A. N. Ghosh, Shri R. N. Kapur, Dr. B. R. Nijhawan, Shri P. H. Kutar and Shri K. N. P. Rao

3) Shri B. K. Bose — Precious Metals Sectional Committee, SMDC 13, and
4) Shri N. G. Chakravarty — Foundry Sectional Committee, SMDC 17.

Regarding the chairmanship of ıe Pig Iron and Ferrous Alloys ɔctional Committee, SMDC 8, it as decided that Dr. A. K. Malik ɔ requested to continue as Chair- ıan, and failing him, Shri K. H. harma of Indian Iron & Steel o. Ltd. be nominated in his place.

The Council also modified the ɔpe of work of the Manganese Ore ɔctional Committee, SMDC 16, to ıclude the specification for ores and ıw materials for the metallurgical ıdustry and, accordingly, changed ıe title of the Committee to read ɔ the Ores and Raw Materials Sec- onal Committee, SMDC 16. To art with, the Committee was lotted work pertaining to manga- ɔse ore (battery grade), manga- ɔse ore (metallurgical grade) and on ore.

A representative of the State rading Corporation of India and ıother of the Indian Iron & Steel o. Ltd., were co-opted as members f this Sectional Committee.

Shri J. S. Mathur and a represen- ıtive of the Ministry of Transport Communications were co-opted s members of the Standing Working ommittee (Structural and Metals).

About 52 new subjects were ap- roved for formulation of Indian tandards and allotted to the various ectional Committees of the Divi- ion.

The Council also expressed the iew that maximum publicity should ıe given to the work done by the SI in connection with the economy f steel with a view to implementing Indian Standards in this regard. It was agreed that the ISI Directorate should bring it to the notice of various Ministries of the Government of India, the State Governments, industries, manufacturers and consumers, and the public in general should be acquainted with the recommendations contained in the Steel Economy Report, and particularly regarding the hot rolled steel beam, channel and angle sections in metric dimensions.

Foundry

The **first meeting** of the Foundry Sectional Committee, SMDC 17, was held under the chairmanship of Shri S. S. Roy of the Directorate General of Supplies & Disposals (Inspection Wing) on 24 March 1958 at Manak Bhavan.

Before being transferred to the Structural and Metals Division Council, the Foundry Sectional Committee, had been the responsibility of the Engineering Division Council.

After the procedure of work was explained to the members, the Committee discussed the draft Indian Standard Specification for Foundry Moulding Boxes in the light of comments received, and finalized it for publication subject to a number of modifications.

The Committee also approved the draft Indian Standard Specification for Foundry Facing Materials for wide circulation for comments.

It was decided that Indian Standards should be formulated on the recommended methods of testing of foundry sands and on wooden pattern equipment for foundries, and a one-man drafting panel, SMDC 17/P1, consisting of Shri R. M. Krishnan was appointed to prepare a draft on the former subject. Regarding the latter, it was decided that the draft prepared by the ISI Directorate be circulated to the members of the Sectional Committee for their approval for wide circulation.

Two more one-man drafting panels namely SMDC 17/P2 consisting of Dr. S. Ramamurthy and SMDC 17/P3 consisting of Shri R. M. Krishnan were set up to prepare preliminary drafts on the following two subjects respectively:

1) Recommended Methods of Testing of Building Materials, and
2) Silica Sand.

The Committee reviewed its composition and made a number of co-options with a view to making it fully representative of the interests.

Lead, Zinc, Tin, Antimony and Their Alloys

The draft Revision of IS : 211-1950 Specification for Antimony was finalized for publication by the Lead, Zinc, Tin, Antimony and Their Alloys Sectional Committee, SMDC 12, at its second meeting which was held on 26 March 1958 at Manak Bhavan.

The Committee also discussed the following draft standards for approval:

1) Specification for Zinc Sheet and Strip,
2) Specification for Antimonial Lead,
3) Specification for Type Metal, and
4) Code of Protective Coating of Zinc Base Alloys.

The titles of items 2 and 3 were changed to read as 'Specification for Lead Cable Alloy' and as 'Specification for Printing Metals' respectively, and the four draft standards were approved for wide circulation for three months. Consequent upon the change of title in item No. 2 it was decided that a draft Indian Standard Specification for Antimonial Lead should also be prepared and Mr. J. McCutcheon undertook to prepare the preliminary draft.

The Committee also approved the draft Revisions to following Indian Standard Specifications to be issued in wide circulations:

1) IS: 25-1950 Antifriction Bearing Alloys,
2) IS: 193-1956 Soft Solder,
3) IS: 404-1952 Lead Pipes for Other than Chemical Purposes, and
4) IS: 405-1952 Lead Sheets for General Purposes.

The items of work allotted to the Committee were also reviewed, and it was decided that the subject 'Recommended Method for Polarographic and Spectrographic Analysis of High Purity Zinc Alloy for Die Casting' be transferred to the Methods of Chemical Analysis Sectional Committee, SMDC 2, and the other subject 'Zinc Granules for Use in Chemical Analysis' be dealt with by one of the sectional committees under the Chemical Division Council.

Approving the subject of hot dip galvanizing and zinc impregnation for formulating an Indian Standard, the Committee set up a Subcommittee for Code of Practice for Hot Dip Galvanizing and Zinc Impregnation, SMDC 12 : 1, with Shri P. Visvanathan of TISCO as its Convener.

Precious Metals

The Precious Metals Sectional Committee, SMDC 13, considered the draft Indian Standard Specification for Gold Alloys in the light of comments received at its second meeting held on 7 and 8 April 1958 at Calcutta. It was decided that the draft standard should cover gold and its alloys and subject to this change, it was finalized for publication.

The draft specification for Fine Gold in the Form of Sheet, Bar, Wire and Grain for approval was also pruned to deal with only the physical aspects of sheet, bar, wire and grain as the fine gold part of the draft was being covered by the draft Indian Standard Specification for Gold and Gold Alloys. Subject to this modification, the draft specification was approved for wide circulation.

But in the case of the draft Indian Standard Specification for Fine Silver in the Form of Sheet, Bar, Wire and Grain it was decided that silver and silver alloys be covered by a separate draft standard, and the physical aspects of sheet, bar, wire and grain be covered by another draft standard.

The Committee also considered the new work and entrusted Shri V. Pandurangayya with the preparation of a preliminary draft on solder for goldware.

ELECTROTECHNICAL DIVISION

Electrotechnical Division Council

In the absence of the Chairman Shri M. Hayath, Shri B. V. Baliga, the Vice-Chairman, presided over the second meeting of the Electrotechnical Division Council held on 26 March 1958 at Manak Bhavan. In his opening remarks Shri Baliga informed the members that the ECAFE and several of the member countries who did not have national standards bodies of their own, had evinced very great interest in the work of Indian Standards Institution, particularly in the standardization work in the electrical field. He mentioned that these countries had requested the ISI to provide them with data whenever it became possible. The Vice-Chairman also touched upon the subject of the forthcoming IEC meetings in India in 1960, and appealed that efforts should be made to make it a success. For that purpose, a lot of assistance — financial and otherwise — was needed, and he also appealed to the industry to come forward with liberal contributions, so that India could play host in a befitting manner.

Dr. A. N. Ghosh, Joint Director ISI, then, gave further information regarding the IEC session in India. He stated that 400 to 500 delegates were expected to attend the meetings. Of the total estimated expenditure of 3·5 lakhs of rupees, the Government had promised to contribute a sum of 2·5 lakhs. For the remaining he also appealed to the industry to come forward to extend the necessary help.

It was reported at the Council that the two Indian Standards on mica, namely IS : 13-1949 Methods for Grading Processed Mica and IS : 14-1949 Classification of Processed Muscovite Mica, published in 1949 as tentative standards had been split up into three as follows:

1) Definitions of Mica Terms,
2) Methods of Grading and Classification of Muscovite Mica Blocks, Thins and Condenser of Films, and
3) Methods of Grading and Classification of Muscovite Mica.

After some consideration, the Council withdrew the two Indian Standards mentioned above.

The Council also approved the following new subjects for formulation of Indian Standards and allotted them to the various sectional committees of the Division:

1) Plastic Sleevings for Covering Electric Cables (Aircraft),
2) Micanite,
3) Electric Table Lamps,
4) Wall Brackets,
5) PVC Insulation and Sheath for Electric Cables,
6) Rubber-Insulation and Sheath for Cables,
7) Polythene Insulated and PVC Sheathed Cables Up to 650 V,
8) PVC Insulated (Heavy Duty Cables for Electricity Supply etc,
9) Signal Batteries,
10) Industrial Fans, and
11) Scientific Instruments Use in Laboratories.

The Countil was informed tha Shri M. M. Kaul had been re-nom nated to represent the ETDC on th General Council for a further perio of 3 years ending 31 December 196

The Structural and Metals Divisio Council had transferred the subje of arc welding equipment from or of its own sectional committees the ETDC as it felt that the ETD was more competent to handle suc a subject. The Council decided tha since the work to be tackled imm diately was restricted in scope, would be sufficient for a subcommi tee of the Plant and Switchgear Se tional Committee to handle the sul ject, and the question of forming separate sectional committee for th subject should be considered later.

Electrical Conductors and Accessori

It was the **first meeting** of th Electrical Conductors and Access ries Sectional Committee, ETDC which was held under the chairma ship of Shri V. Venugopalan of Ce tral Water & Power Commission c 26, 27 and 28 February 1958 Calcutta. The work of this Con mittee was previously handled b the former Electrical Conductors ar Insulators Sectional Committe EDC 5, under the Engineering Div sion Council.

The Committee, first of all, toc up the re-organization of its subcon mittees. It amended the title the Bare Conductors Subcommitte to the Bare Conductors and Acce sories Subcommittee, ETDC 2 : and co-opted representatives of (Aluminium Industries Ltd., Kur dara, and (2) Aluminium Union Ltd Calcutta. A representative of th Kirloskar Electric Co. Ltd., Banga lore, was included in the Instrument and Machine Winding Wires Sub committee, ETDC 2 : 2. Mr. F Boyer representing Indian Cable Co Ltd., was appointed the Convene of the Insulated Cables Subcom mittee, ETDC 2 : 3.

Afterwards, the Committee finaliz ed for publication the draft India Standard Code of Practice for Ins tallation, Operation and Maintenanc of Impregnated Paper Insulate Cables Up to and Including 33 kV subject to a number of modification made in the light of comment received on it.

But in case of the draft specifications covering the following items, the Committee authorized the Secretary to finalize them for publication in consultation with the Chief Electrical Inspector of Mines:

1) Rubber-Insulated Flexible Trailing Cables for Use in Coal Mines, and
2) Rubber-Insulated Flexible Trailing Cables for Quarries and Metalliferous Mines.

The Committee also decided to revise the following two Indian Standards and, making a number of changes, put the draft revisions in wide circulation:

1) IS : 398-1953 Hard Drawn Stranded Aluminium and Steel Cored Aluminium Conductors for Overhead Power Transmission Purposes, and
2) IS: 482-1953 Reels for Covered, Solid, Round Electrical Winding Wire.

The following three new subjects were included in the programme of work of the Committee:

1) PVC insulation and sheath for electric cables,
2) Rubber insulation and sheath for cables, and
3) Polythene insulated and PVC sheathed cables up to 650 V.

Shri P. S. S. Modaliar had already prepared the Draft Proposal covering item 3, and it was circulated to the members of the Insulated Cables Subcommittee, ETDC 2 : 3. He also undertook to prepare preliminary draft on item No. 1.

The Committee also appointed a Panel consisting of the following three members to examine the tests and requirements included in the Draft Indian Standard Specification for PVC Insulated (Heavy Duty) Cables for Electricity Supply and Control Purposes for Working Voltages Up to and Including 11 kV, and to make recommendations to the Insulated Cables Subcommittee, ETDC 2 : 3, which was authorized to approve the draft for wide circulation:

1) Shri T. S. Rao,
2) Shri P. S. S. Modaliar, and
3) Mr. G. Wilhem.

Regarding the draft Indian Standard Specification for Enamelled Round Copper Wire (Synthetic Base), it was decided that it should be put into wide circulation after making the necessary alterations in consultation with the Chairman and the representative of Dr. Back and Co.

The Committee also discussed and named Shri P. S. S. Modaliar as the Indian representative on the Working Group set up by the Commonwealth Standards Conference, 1957, to carry out investigation on hot deformation test, ageing test and heat shock test.

Electroplating

The draft Indian Standard Specifications covering the following two items were discussed and approved for wide circulation at the fourth meeting of the Electroplating Sectional Committee, ETDC 12, held on 28 March 1958 at ISI Headquarters:

1) Electro-Tin-Plating, and
2) Hard Chromium Plating on Steel.

The Committee included the following subjects for formulation of Indian Standards in its programme of work:

1) Brass plating,
2) Industrial silver plating, and
3) Lead plating.

A new Panel, ETDC 12/P1, with Shri Kantilal T. Dalal as Convener, was set up to prepare the preliminary draft standard on brass plating. As for industrial silver plating, Shri A. S. Santiago undertook to prepare the preliminary draft for the consideration of the Silver Plated Finishes Subcommittee, ETDC 12 : 1.

The work of formulating Indian Standards on Anodizing and Bonderizing was also decided to be taken up.

On reviewing the composition, the Committee decided to co-opt the representatives of the following as its members:

1) Indian Telephone Industries Ltd., Bangalore, and
2) Great Eastern Electroplaters Ltd., Allahabad.

CERTIFICATION MARKS ADVISORY COMMITTEE

The Certification Marks Advisory Committee (CMAC) held its second meeting under the chairmanship of its new Chairman, Shri Prabhu V. Mehta of All India Manufacturers' Organization, Bombay, on 24 March 1958 at Manak Bhavan. In his opening remarks, the Chairman said:

> " I have always been emphasizing that the Certification Marks Scheme in any country cannot succeed unless and until a good demand is created for the certified products by the consumers. Today, our consumers do not know that we have such a scheme. The common man had long ago felt the need that there should be some sort of guarantee in respect of the quality of manufactured items whether in capital goods section or in consumer commodities, but, unfortunately, we have not been able to get enough popularization of our scheme."

He, further, recalled the Conference of the Ministries of the Government of India, State Governments, representatives of the manufacturing units in the public sector held last year which made a strong plea to the Government agencies for the due recognition of the ISI Certification Mark if it were to be made popular and useful for the general consumer. The Chairman made it known that it was felt in the private sector that unless Government showed by example that they were giving recognition to ISI Certification Mark, no progress could really be made in that sector. For this purpose, he suggested the following:

1) The ISI Certification Mark on a product could be recognized and accepted at the time of registration of a firm, no other testing being required as a proof for the quality of the product.
2) In the case of rate contract, the ISI Certification Mark licensees should not be required to send samples at intervals to the Government Test House, and there should not be double inspection by the ISI and DGS&D Inspectors.
3) In the case of established manufacturers, ISI certified goods should be accepted by the DGS&D without further inspection. The DGS&D may like to have some experience with new firms coming up and using the ISI Certification Mark.
4) It would help the extension of the ISI Certification Mark if the DGS&D were to make known to the general public, through their tender notices, that, other things being equal, ISI certified goods would be given preference.
5) A price preference is really called for. But it is understood that on account of the financial regulations, it is not possible to have a price preference.

Shri Mehta also spoke of certain difficulties in the small scale industries sector. The first difficulty was that the small scale industries were not in a position to meet the expenses as required under the ISI Certification Marks Scheme. The point had been considered by the Certification Marks Advisory Committee and would also be considered

again. After all, it was a point which was not impossible of solution. The ISI Certification Marks Scheme was required to be self-supporting. In case the industry would not pay, the Government would have to pay, either in the form of subsidy or in some other form. The second difficulty was relating to the quality control in the small scale units, and in this field, the Small Scale Industries Organization must come to the help of the ISI. The Small Industries Service Institutes should make available to the small scale units facilities for testing free of cost. The next difficulty was that, in order to propagate the quality marking schemes on a larger scale, it had been observed that the state governments were likely to leave aside the specification laid down by the ISI and follow their own specifications as convenient for the quality marking scheme. This was a step which should not be encouraged.

As far as protected industries were concerned, he added, it was gratifying to note that the Tariff Commission had given due recognition to the ISI Certification Mark and its advantages, and in two cases, like beltings and conductors, they had recommended that the manufacturers should obtain the ISI Certification Mark. He hoped that the Tariff Commission would continue to lay stress on the quality of the products and the Certification Mark at the time of their enquiries about other products.

The Committee next reviewed the actions taken on recommendations made by it in its last meeting. Regarding its recommendation on popularization of ISI Certification Mark in protected industries, the Committee recommended that the Tariff Commission should:

1) make the use of ISI Certification Mark compulsory for such industries which have enjoyed protection for about five years and for whose products Indian Standards are available, and
2) advice the new industries being considered for protection to join the Certification Marks Scheme.

The Committee reconstituted as under the Subcommittee it appointed at its last meeting to evolve a formula for fixing the rate of fees in the case of small scale manufacturers for consideration of the CMAC:

1) Shri Prabhu V. Mehta,
2) Shri Shri Pat,
3) Dr. Lal C. Verman, and
4) Shri R. V. Ramaiah.

An early meeting of the Subcommittee was also agreed to.

Exploring the ways and means of promoting the ISI Certificatic Marks, the Committee stressed tha the use of Certification Marks shoul be made compulsory by the Gover ment of India for certain goods c classes of goods where the questio of public safety, hygiene and expo promotion were involved. Th Committee took this decision i support of the following recomme dation made by the Conference c State Representatives, Union Mini tries, etc, held in New Delhi last yea

> " The Central Government ma from time to time, declare the u of the Standard Mark compulsor for certain goods or classes c goods where the questions c public safety, hygiene and expo promotion are involved."

With a view to publicizing the IS Certification Marks Scheme, an making people Certification Mark conscious, the Committee made recommendation to General Counc to sanction Rs 15 000 for th purpose.

ISI TO HOLD STANDARDS CONVENTION AT NEW DELHI — *Continued from p. 164*

be affected; whether there should be a public demand for such compulsory standards; responsibility of public utility concerns and medical profession in making safety and health standards obligatory.

Sphere and scope of safety standards — agricultural and food products; need for ensuring supply of wholesome eatables free from harmful ingredients; safety or health standards for drugs, chemicals, toilet goods, domestic electrical appliances; role of manufacturers and producers in ensuring public safety and health; implementation and execution of safety standards.

S-6 Sampling for Quality Evaluation

Sampling during production; control chart and other techniques; lot by lot sampling; types of acceptance; sampling schemes and their merits; bulk sampling; economics of sampling, sampling schemes in company and association standards and national and international standards.

S-7 Steel Economy and Alloy & Special Steels

Steel economy — production of higher efficiency sections including beams, channels, equal and unequal angles, bulb angles, tee bars, etc, on the basis of three Indian Standards for Hot Rolled Sections, prepared by the Indian Standards Institution, under the Steel Economy Programme; saving of steel through the use of cold formed light gauge steel sections; popularizing the use of steel tubes as structural material; wide scale adoption in India of IS: 800-1956 Code of Practice for the Use of Structural Steel in General Building Construction; making effective use of commercial quality steel; welding as a means of economy in the use of steel in structures.

Alloys and special steels — classification of engineering and industrial steels; rationalizatio and standardization of a common set of carbon and allo steel specifications keeping i view the indigenous materials preparation of Indian specifica tions for substitute/alternat steels; initiating their produc tion in the country; necessit for early adoption of suitabl Indian substitute/alternat steels in lieu of foreign steels.

S-8 Modular Planning, Design an Construction in the Building Industr

Principle of Modular Co-ordina tion and its application to th design of buildings and buildin components, and in genera construction work. Preferred modular sizes for principa building components and equip ments, scuh as doors, windows, fitments and furniture. Modular planning in relation to acces sories, such as pipes, conduits, joints, etc.

NEW INDIAN STANDARDS

Indian Standards recently published are briefly described here.

ass Globes for Lanterns

The Indian Standard Specification r Glass Globes for Hurricane nterns (IS:1116-1957) covers two ost popular sizes of glass globes. ıe requirements specified are in spect of dimensions and weight, anufacture, sampling for tests and iterion for acceptance. The sts prescribed are for the determi- tion of absorption of light, thermal ock and chilling. Requirements r marking and packing are also cluded.

The standard has been prepared the instance of the Tariff Com- ission and the Development Wing the Ministry of Commerce & dustry.

eel Doors and Windows

With the rising tempo of construc- ɔn activity, metal doors and ndows are being extensively used this country. The Experts Com- ittee of the Ministry of Works, ousing & Supply, therefore, re- mmended the standardization of ɔors and windows as a means of hieving substantial economy in e construction of buildings.

It was realized that the dimen- ɔnal specifications for doors and ndows had to be related in a tional manner to the dimensions other components and the dimen- ɔns of the rooms in a building. ecognizing the importance of intro- ıcing modular dimensions, the oors, Windows and Building Fur- ture Sectional Committee, BDC 11, lopted a module of 10 cm to govern ıe sizes of doors and windows, in :cordance with the recommenda- ɔns of the Modular Co-ordination ctional Committee, BDC 10.

The Indian Standard Specification ır Steel Doors, Windows and Venti- tors (IS : 1038-1957) covers the quirements regarding fabrication ıd dimensions of the material anufactured from uniform rolled eel sections to standard sizes and esigns, complete with fittings and ady for being fixed into the build- ıgs. The standard does not cover ıe requirements for doors, windows nd ventilators for use in industrial uildings.

The standard gives terminology of various components, fully illustrated in a diagram, in addition to sizes, tolerances and designations, materials, position of holes for fixing screws and lugs, and requirements for finish, glazing and packing.

Symbols for Timber Species

Different species of timber require different methods of storage and precautions to be taken during storage. Besides, they need to be identified prior to seasoning so that the kiln-schedules for different species can be properly adhered to. It is, therefore, apparent that a list of abbreviated symbols for different species of timber, commonly used in the country, would prove handy for the users as well as for the forest departments in the purchase, storage and utilization of timber. The Indian Standard Abbreviated Symbols for Timber Species (IS:1120-1957) is intended to serve this purpose.

The abbreviated symbols, according to the requirements of the standard, shall consist of the first three letters from the trade names as given in IS:399-1952 Classification of Commercial Timbers and Their Zonal Distribution (*Tentative*). In case two or more timber species have the first three letters in common, the third letter of the next or subsequent species arranged alphabetically shall be substituted by the next letter or subsequent to it which is not common in the relevant names. Where the standard trade name is in two words, the first letter of the first word and the first two letters of the second word shall be taken to form the abbreviated symbol.

Coach Screws

The Indian Standard Specification for Mild Steel Square or Hexagon Head Coach Screws with Gimlet Points (IS:1120-1957) is intended to guide the small-scale industries in the selection of the raw material and the manufacture of mild steel coach screws. The specification lays down requirements for material, shape and dimensions, and prescribes general requirements for manufacture, workmanship and finish. Tests for material as well as zinc coating on the coach screws have been specified. The standard covers coach screws of size $\frac{3}{4}$ in. to 8 in. This range is considered to meet the normal requirements of the industry.

Synthetic Resin Adhesives

Adhesives form one of the important raw materials used in the plywood industry and woodwork and joinery industry. The selection of the adhesive and its correct use are important factors controlling the quality of the plywood or the joinery work produced. The raw materials for adhesives are not all found in this country and a large quantity of raw materials and synthetic resin adhesives is imported. In the context of this background, it has been found necessary to lay down standards governing the quality of the raw materials and the performance expected from the prepared glues.

The Indian Standard Specification for Synthetic Resin Adhesives for Construction Work in Wood (IS: 851-1957) is one of a series of Indian Standards on glue adhesives. Other standards in the series are on synthetic resin adhesives for plywood, cold setting casein glue for wood, natural sour (lactic) casein for glue manufacture and animal glue.

The standard covers the following three types of material depending on their degree of resistance to water and micro-organisms:

1) Weather and Boil Proof (WBP),
2) Moisture Resistance (MR), and
3) Interior (INT).

Other requirements specified are for keeping qualities and marking. The standard also gives instructions for use and procedure for tests for determining various characteristics of the material.

Building Stones

Stone forms one of the important building materials in India due to its availability, strength, durability and adaptability for a variety of architectural purposes. Several types of stones are found in different

parts of the country. Before their use in the buildings, it is very essential to ascertain their properties in order to determine the location where each of them could be used from structural considerations.

The Indian Standard Methods for Determination of Compressive, Transverse and Shear Strengths of Natural Building Stones (IS:1121-1957) covers requirements of sampling and specifies the test pieces, the apparatus and the procedure for reporting the test results of the various characteristics of building stones.

Methods of testing other characteristics of stones like specific gravity and porosity, water absorption, weathering, durability, and petrographical examination have been covered in five other Indian Standards so far published.

Methods of Analysing Cotton Textiles

The revised Indian Standard Methods for Estimation of Moisture, Total Size or Finish, Ash and Fatty Matter in Grey and Finished Cotton Textile Materials (IS : 199-1957) prescribes methods, which are generally applicable wherein starch or tamarind kernel powder or both and water soluble or easily soluble finishing agents, such as oils, fats, china clay, etc, have been used. The original standard was first issued in 1950. In this revision, methods of estimation of (a) total size and (b) ash, have been modified and method of estimation of starch deleted. The method prescribed in the original standard for the removal of size was found to be ineffective when the sizing mixture contained tamarind kernel powder, a product which was becoming popular with the cotton textile industry. The hydrolysis method prescribed in the original standard for the determination of starch also failed to give useful results when tamarind kernel powder had been added in the sizing mixture. Suitable modifications have, therefore, been made in this revision.

Shuttles for Hessian Looms

Shuttles used in the jute industry are made mostly of wood, but have some metal parts and a porcelain ' eye '. The wooden body is long, narrow, pointed at the ends, and hollowed out to take the cop. The metal parts consist of a movable cover, shaped tips, and a ' drag ' to regulate the flow of yarn as it leaves the shuttle.

The Indian Standard Specification for Shuttles for Hessian Looms, (IS:1186-1957) covers five dimensional patterns of shuttles used in weaving hessians. The standard includes general requirements for design, timber to be used, smoothness of surface, etc, and specific requirements for materials, dimensions and packing of the various patterns of shuttles. Details of sampling, atmospheric conditions for testing and conditioning of test sample are also given.

Cotton Fabrics

Four more items of cotton fabrics have been covered by the following Indian Standard Specifications:

IS: 1142-1957 Cotton Cambric, Scoured, for Oil Dressed Fabric
IS: 1143-1957 Cotton Mosquito Netting, Square Mesh, Dyed
IS: 1144-1957 Cotton Cellular Shirting, Dyed
IS: 1178-1957 Filter Cloth, Grey, for Sugar and Oil Industries

Each of these standards prescribes requirements in respect of variety, warp and weft, ends and picks, weight, breaking strength, width and length of the fabric, etc. In addition, requirements for sampling and marking have also been specified.

Maize Starch

The Indian maize starch industry had its beginning in 1938, and it developed rapidly during the last World War when imports of starch on which the cotton textile industry principally relied, suddenly stopped and the industry had to draw its requirements from indigenous sources. Today, Indian maize starch industry is sufficiently developed to meet the entire local demand.

The Indian Standard Specification for Maize Starch for Use in the Cotton Textile Industry (IS : 1184-1957) deals with maize starch, as manufactured by the sulphitation process, for use in the cotton textile industry as a sizing and finishing material. Requirements specified are in respect of size of granules; contents of moisture starch, ash and protein; ether extract; free acidity; viscosity; and cold water solubles. Methods of estimating these characteristics together with sampling, marking and packing details are also included in the standard.

Sodium Thiosulphate and Sulphite

The following two Indian Standard Specifications, which were first published in 1950 as tentative sta dards, have been revised and ma firm in the light of the recommend tions made by the Tariff Commissi in 1955:

IS: 246-1957 Sodium Thiosulpha (*Revised*)
IS: 247-1957 Anhydrous Sodiu Sulphite (*Revised*)

The pharmaceutical grades of t material have been left out from t revised specifications as the formul tion of specifications on these grad of materials comes under the purvi of the Ministry of Health, Gover ment of India. Besides, pure gra of the materials have been include

In the revised specification f Sodium Thiosulphate (IS: 246-1957 the limits of *p*H value have be modified, requirements of sulphat and sulphites for photographic a technical grades have been delet and the requirements of thiosulpha content for the technical grade ha been made less stringent than th of the photographic grade.

As regards the specification f Anhydrous Sodium Sulphate (I 247-1957), the requirement of *p* value has altogether been delet and new requirement for free a for the photographic, pure a analytical grades has been add Some methods of tests have also be modified.

Inks

Inks for fountain pens and duplication purpose have been cov ed in the following two Indian Sta dard Specifications:

IS: 1221-1957 Dye Based Founta Pen Inks (Blue, Green, Viol Black and Red)
IS: 1222-1957 Ink, Duplicatin All Weather, Black for Rota Type Machines

Dye based types of coloured ink covered in IS : 1221-1957, are gettin popular and production of these in in India is now increasing rapidl In order to make this specificati comprehensive, red ink has also be included in it. The red ink shall excluded from the revised editi of IS: 220-1950 Fountain Pen Ink Blue-Black and Red.

The Indian Standard covers r quirements for sediment, dye co tent, keeping quality and perfo mance together with methods packing and marking. Tests f determination of keeping qualit and testing of strips in respect intensity, ultra-violet ray exposur and water and alcohol immersio have been given in two appendice to the standard.

The requirements covered in IS: 22-1957 are in respect of consis-ıcy, stability, drying time, perfor-ance, keeping quality, sampling, cking and marking. Two appen-ces give testing procedure for termination of drying time and rformance.

ar Lubricants

-Gear Lubricant is a refined petro--im product, with suitable additive ents. It is primarily intended for e in hypoid gears but is also used other types of differentials and -nsmissions.

The Indian Standard Specifica-n for Gear Lubricant, Multipur-se (Extreme Pressure Gear Oil) S: 1118-1957) covers three grades the lubricants, namely SAE 80, .E 90 and SAE 140. Require-nts and methods of tests are pres-bed in respect of flash point, nematic viscosity, viscosity index, annel point, etc.

ttering Brushes

The Indian Standard Specification Brushes, Lettering (IS: 1104-57), covers 12 sizes of lettering ushes and prescribes requirements their shapes and designs; dimen-ns; description and weight of istles; the requirements and the ecies of timber suitable for manu-cture of handles; and the material quirements of the ferrules, silk nding and the cement used for lding the bristles. In addition, includes details regarding work-anship and finish, their packing d preservation, the performance st, and methods for determining e weight of the bristles.

The standard also brings to the notice of the manufacturers the need to issue hints for the guidance of the users, along with the brushes they manufacture, so that their life and serviceability are not unnecessarily reduced due to the lack of adequate knowledge of correct painting routine.

Edible Casein

Casein is considered to be a good protein nutritionally. It, therefore, finds use in the manufacture of predigested protein foods for oral administration in cases of protein malnutrition, gastric disorders and other symptoms, which call for protein supplementation.

The Indian Standard Specification for Edible Casein (IS: 1167-1957) deals with the edible casein prepared by the acid precipitation method. Requirements and methods of test prescribed are in respect of moisture, total ash, acid insoluble ash, fat and nitrogen.

Biscuits

The term 'biscuits' embraces a great variety of products. As such, it is not possible to lay down detailed specification for each variety of biscuits. However, there are certain requirements, both positive and negative, to which all varieties of biscuits must conform.

The Indian Standard Specification for Biscuits (IS: 1011-1957) prescribes the essential requirements and methods of test for biscuits of all varieties, except wafer biscuits, baked from dough made from a mixture of certain specified essential materials with or without the addition of other ingredients, which have also been specified in the standard.

The essential requirements to which biscuits should comply are in regard to moisture, acid insoluble ash and acidity of extracted fat.

Fumigant

A mixture of ethylene dichloride and carbon tetrachloride is extensively used in India for the fumigation of food grain and other products. Ethylene dichloride by itself is a powerful fumigant for pests of stored food grains. Carbon tetrachloride too is a fumigant, but it is added to ethylene dichloride primarily to reduce the flammability of the latter. So far, no detailed specification for the ready made mixture has been laid down by any organization in the world, although specifications for the two components exist individually.

The Indian Standard Specification for Ethylene Dichloride Carbon Tetrachloride Mixture (IS: 634-1957) prescribes requirements for specific gravity, refractive index, distillation range, chlorine content and flash point, the mode of packing and marking, the methods of sampling and tests, etc. The requirements prescribed in the standard are based on actual results of physical and chemical analysis, carried out in various national laboratories. The standard is one of a series of Indian Standards on pesticides. Other standards are on BHC, DDT, dieldrin, nicotine, etc.

Two-Pin Plugs and Sockets

The Indian Standard Specification for Reversible Protected Type Two-Pin Plugs and Sockets with Earthing

(*Continued on p.* 191)

NDIAN STANDARDS WITHDRAWN AND CANCELLED

The total number of Indian Standards so far withdrawn, superseded and cancelled is eight. Of these, five were notified the September 1957 Issue of this Bulletin and in the Addendum to ISI Handbook 1957. The three Indian Standards withawn recently are:

IS: 13-1949 Methods of Grading Processed Mica
IS: 14-1949 Classification of Processed Muscovite Mica
IS: 22-1950 98 Percent Aluminium Notched Bars and Ingots for Remelting Purposes (*Tentative*)

The items covered in IS: 13-1949 and IS: 14-1949 have been covered by the following three more comprehensive Indian andards:

IS: 1174-1957 Definitions of Mica Terms
IS: 1175-1957 Methods of Grading and Classification of Muscovite Mica Blocks, Thins and Condenser Films
IS: 1176- Methods of Grading and Classification of Muscovite Mica Splittings

Of these, the first has been printed, the second is under print and the third is being processed.

DRAFT INDIAN STANDARDS

Brief reviews are given here of draft Indian Standards issued recently for wide circulation to elicit comments from interested parties in India and abroad. Comments are considered by the Sectional Committee concerned at the stage of finalization of the draft.

Glossary of Cataloguing Terms

Recent developments in the field of cataloguing in libraries have brought out a number of new concepts, thereby introducing new terms to represent them. In order to avoid ambiguity and confusion arising out of misinterpretation of terms, it is necessary to standardize the cataloguing terminology as far as possible. The draft Indian Standard Glossary of Cataloguing Terms is intended to help in fixing more precise meanings to words used in cataloguing work. For ease and economy in definition, the cataloguing terms, about 150 in number, covered in the draft are grouped under eleven broad subjects, namely normative principles, work, author and collaborator, document, series, sponsor, catalogue, section of entry, heading, arrangement of entries and card technique.

The section on ' work ' defines thought as ' knowledge-unit ' and work as ' expressed thought ', i.e. thought expressed in language or symbols, or in any other mode, and thus made communicable '. Again, in the section on ' author and collaborator ', the draft glossary defines under ' corporate body ', terms like government, institution, conference and organ. The section on ' document ' deals, among others, with the various terms relating to the title page of a book or a periodical publication, such as title statement, imprint, volume, collation, etc.

Steel Wire Ropes

The wire rope used for various purposes in mines, and steel wire for these ropes have been covered by Indian Standard Specifications for:

1) Steel Wire Ropes for Winding Purposes in Mines;
2) Steel Wire Ropes for Haulage Purposes in Mines; and
3) Steel Wire for Ropes.

The first two draft specifications lay down requirements relating to the quality of wire ropes, their construction and sizes. The strength requirements, as well as the methods for determining them, have also been specified.

The third draft specification prescribes the qualities of steel to be used in the manufacture of the wires, their finish, sizes and the mechanical requirements, together with the tests for determining the same.

Cement Concrete Flooring Tiles

These tiles are now a days finding extensive use in building construction. Tiles are preferred for floorings on account of facility for quick installation, adaptability to minor sub-grade settlements and easy replaceability on staining or breakage. Besides, they have good strength, durability, resistance to wear, good appearance and finish.

The draft Indian Standard Specification for Cement Concrete Flooring Tiles covers three types of tiles: plain cement, plain coloured and terrazo tiles. The classification is based on the nature of their performance. Requirements for the raw materials, for the manufacturing process and for the finished shapes and dimensions have been specified. Tests for performance characteristics, such as transverse strength, resistance to wear and water absorption have also been included. Photographs of terrazo textures have been shown with a view to aiding the designer or purchaser in the selection of terrazo composition.

Prestressed Concrete

Prestressed concrete is a comparatively recent development, and in many respects, it is markedly dissimilar to reinforced concrete. It is, therefore, desirable that prestressed concrete should be looked upon as a separate subject and should not be approached merely as another form of reinforced concrete.

The draft Indian Standard Code of Practice for Prestressed Concrete has been so compiled that it provides reasonable scope for further development of this technique and also permits a justifiable latitude in its design and construction.

This draft code deals with the structural uses of prestressed concrete. It covers both work carried out on site and the manufacture of precast prestressed concrete uni It is also applicable to compos structures comprising prestress concrete units and plain or re forced concrete units.

The code follows closely IS: 4 1957 Code of Practice for Plain a Reinforced Concrete for Gene Building Construction (*Revised* and IS : 457-1957 Code of Practi for General Construction of Pl and Reinforced Concrete for Dan which have been published recent

The present code is based on cc siderations applying mainly to sta cally determinate structures. In t case of statically indeterminate str tures the provisions of the code m be applied with such modificatio as found necessary to suit the spec conditions of the case under cc sideration.

The code of practice for prestre ed concrete is primarily intend for engineers and other qualifi persons, who are required to prepa or check designs in prestressed co crete and carry out the constructi of prestressed concrete structur It is expected to be followed by t specifications for high tensile st wire and high tensile steel bars f prestressing purposes.

Timber for Aircraft Purposes

The draft Indian Standard Spec fication for Timber for Aircraft Pu poses covers light timber used f aircraft construction, where th quality and strength requiremen call for a more rigid and controll conversion of the extracted timbe This draft specification will b followed by another covering th needs of the ship-building industr where the requirements in regard t resistance to attack from mari organism and fungi will also be take into consideration.

This draft specification covers th conifers and light hardwoods use for aircraft purposes and specifi the requirements in regard to th selection of material, permissibl defects, conversion and seasonin of such timber. Only three specie of timber, namely *Picea smithian* (spruce), *Abies pindrow* (fir) an *Michelia champacca* (champ) hav

·en prescribed for aircraft cons-uction. Requirements regarding lection of trees, handling of logs, eir storage and transportation ıve also been specified.

rinkage of Knitted Goods and of brics on Washing

The shrinkage behaviour of knitted ods and of fabrics is of considerable -terest to the consumer. Shrink-e in the former may be due to laxation of strains or felting. The laxation of strains is caused when ıitted goods containing wool are -ken off the machine or soaked in ıter. Felting may develop when e goods are subjected to adverse nditions of moisture, pressure, at and friction during washing, ·ar or severe mechanical action ıder moist warm conditions, some-ıat similar to milling.

The draft Indian Standard Method r Determining Shrinkage of -nitted Goods Containing Wool ys down the methods of test for termining the relaxation shrink-e on soaking in water, felting rinkage on washing and felting rinkage on milling of knitted goods ntaining wool. The method for termination of shrinkage due to illing has been designed to simu--te the severe mechanical action ıder moist warm conditions, which ay cause the felting of wool in ›siery goods during wear. These ethods are applicable to both brics and garments.

The shrinkage in fabrics is covered / the draft Indian Standard Method r Determination of Shrinkage on 'ashing of Fabrics Woven from ayon and Synthetic Fibres Not ıable to Felting. Fabrics woven ›m rayon and synthetic fibres are ıble to change in dimensions merely ı soaking in water; the dimensional stability of the fabrics is liable to ² higher when they are washed with ıap.

The draft standard deals with ·rminology, sampling, test speci-ens, their condition, procedure for ²termining shrinkage, etc. The ·ocedure comprises preparation and ıarking of specimens, washing, dry-ıg, pressing and then subsequent ²termination of warpway and weft-ay shrinkage.

ectified Spirit

The Indian Standard Specification ›r Rectified Spirit (IS : 323-1952), ad left the minimum ethanol con-ent to the option of the purchaser nd the vendor subject to a minimum of 91·27 percent by volume (60° OP). Since the publication of this Indian Standard in 1952, the alcohol industry has progressed considerably and it is now in a position to supply 66° OP spirit. Consequently, the standard has been revised, especially with regard to ethanol content, acidity, residue on evaporation, etc. The potassium ferrocyanide method has been prescribed for the determination of copper.

On the basis of a survey, conducted to ascertain the views of the various Indian distillers and the Excise Departments of States, three grades of rectified spirit, namely Grade I, Grade II and Special Grade, have been prescribed in the draft Revision of the Indian Standard. Grade I will be found suitable for use as a reagent for pharmaceutical and medicinal purposes and for the production of potable alcohol liquors, and Grade II for other industrial purposes. The Special Grade of rectified spirit has been laid down for Defence purposes.

The revised draft lays down requirements and methods of test in respect of specific gravity, ethanol content, alkalinity, acidity, aldehyde content, methyl alcohol content, fusel oil content, ester content furfural content, total sulphur, etc.

Plastic Buttons

Plastic buttons, made of thermosetting plastic materials, are being manufactured in the country in increasing quantities. The demand for an Indian Standard came not only from the industry, but also from the Tariff Commission, which has given protection to this industry, with a view to ensuring acceptable quality of these buttons in the market. Defence Departments of the Government of India are one of the major organized consumers of plastic buttons, and their as well as others' requirements have been met with by the two draft Indian Standards on the subject.

The draft Indian Standard Methods of Test for Plastic Buttons (Thermosetting) prescribes methods of tests on curing, fastness to washing, fastness to light, hot pressing, fastness to organic solvents, breaking load, etc, for plastic buttons made from urea-formaldehyde, melamineformaldehyde and phenol-formaldehyde moulding powders.

The draft Indian Standard Specification for Plastic Buttons (Thermosetting) lays down specifications for plastic buttons made from the three main types of resins mentioned earlier. A number of general requirements on colour and pattern, shape, design, dimensions, workmanship, finish, etc, have been given and special requirements for Defence purposes have also been included.

Cube Sugar

The draft Indian Standard Specification for Cube Sugar stipulates limits for minimum sucrose content, minimum permissible moisture and reducing sugars. The purity of sugar has been controlled by specifying a maximum limit for specific conductivity. Suitable methods have also been prescribed in the draft specification to test the two main characteristics of cube sugar, namely it should have certain amount of hardness so that it does not break in packing and transport, and that it should desintegrate quickly in solution.

Beeswax

Beeswax, as obtained from the combs of either wild or domesticated bees after the removal of honey, is called ' raw beeswax '. This is progressively modified by various physical and chemical methods to yield crude, refined and bleached beeswaxes.

The draft Indian Standard Specification for Beeswax specifies requirements of four grades for specific gravity, melting point, refractive index, ash, total volatiles, acid value, saponification value, ester value, ratio number, iodine value, etc. Methods of tests to ensure conformity with these requirements have also been prescribed.

Seam Welding in Mild Steel

Considerable development has now taken place in the field of welding. The draft Indian Standard Code of Practice for Seam Welding in Mild Steel specifies the requirements where the total added thickness of the components to be welded does not exceed 8·0 mm. For a particular weld design to be efficient, safe and satisfactory, the designer should be conversant with the possibilities and limitations of the welding processes which are available for use. It is only in recent years that sufficient information and data regarding resistance welding processes have become available; these give the necessary confidence to designers

(*Continued on p.* 192)

STANDARDS ADDED TO ISI LIBRARY

The list includes full titles of only such standards as, besides being accessioned in the library, are also stocked by the ISI for sale. Numbers of all other standards are listed under their respective general classification headings. Readers, who are interested in obtainining their titles or any other information concerning them, are requested to address the Librarian.

The standards are in the official language(s) of the country of origin.

001.4 Scientific Nomenclature. Terminology

Italy: UNI 3796
USA: ASA C16.30 : 1957 Definitions of Terms on Facsimile

003 Writing. Scripts. Notations. Symbols

Germany: DIN 1350; 15140
Hungary: MNOSZ 102; 106; 4723; 14402; 15000
Israel: S.I. 194
UK: BS 2917 : 1957 Graphical Symbols for Use in Diagrams for Fluid Power Transmission and Control Systems

31 Statistics

Italy: UNI 3797 to 3800

355.14 Uniforms. Badges

India-Ministry of Defence: IND/GS/Drg 2117, 21

389.171 Preferred Numbers

Hungary: MNOSZ 14452

51 Mathematics

Hungary: MNOSZ 256

53 Physics and Mechanics

Canada: 39-GP-18A
Hungary: MNOSZ 1709, 20; 5532 to 35; 11153, 154, 181, 190, 191; 15565; 20075; 22314
India-Ministry of Defence: IND/SL/MED/ 5863
Israel: S.I. 194
Japan: JIS B 7121 to 23; 7506, 07; 0101; 8702
USA: ASA Z24.21 : 1957 Method of Specifying the Characteristics of Pickups for Shock and Vibration Measurement

54 Chemistry

Germany: DIN 12907
Hungary: MNOSZ 2353; 6620 to 28
India-Ministry of Defence: IND/SL/MED/ 5858, 59, 62, 65; MED/IGS/296
Israel: S.I. 213
Japan: JIS K 8094
UK: BS 975: 1957 Density-Composition Tables for Aqueous Solutions of Nitric Acid

614.8 Prevention of Accidents. Safety Measures

Germany: DIN 14302, 322, 365, 420, 520, 701, 703
India-Ministry of Defence: IND/GS 885; 888; 892; Drg 2119; SL/0551
Japan: JIS W 3301 to 04; Z 9101
UK: BS 1689 : 1957 Galvanized Mild Steel Fire Buckets
BS 2909 : 1957 Cabinets for the Electrical Euthanasia of Dogs
USA-Underwriters Laboratories: UL 467

615 Pharmacy. Therapeutics

Germany: DIN 13090 Bl.1
Hungary: MNOSZ 1000, 07; 2354; MSZ 1002
India-Ministry of Defence: MED/IGS/272; 310; 311; 322; 327; 332; 336; 382; Drg. 264
Japan: JIS R 3511, 12
UK: BS 2921 : 1957 Overalls and Uniforms for Hospital Staffs (Sizing and Making-Up)
BS 2927 : 1957 Anaesthetic Airways
BS 2930 : 1957 Surgical Spring Trusses
BS 2931 : 1957 Steel Ankel Joints for Steel Orthopaedic Appliances
BS 2932 : 1957 Steel Knee Joints for Steel Orthopaedic Calipers
BS 2938 : 1957 Dental Amalgam Alloy (Silver-Tin)

620.1 Testing Materials. Faults in Materials

Germany: DIN 51222, 768; 52303
Hungary: MNOSZ 102
Italy: UNI 3789
Japan: JIS L 1006
UK: BS 2910: 1957 General Recommendations for the Radiographic Examination of Fusion Welded Circumferential Butt Joints in Steel Pipes

621-1/-9 Machinery Details

Germany: DIN 2093; 3750, 54; 6341
Japan: JIS Z 9101
UK: BS 2929 : 1957 Safety Colours for Use in Industry

621.1 Steam Power. Engines. Boilers

Australia: SAA.CB.1: Pt 3: 1954 Locomotive Boilers for Railway Purposes
Germany: DIN 33100 Bl. 1 & 2, 101, 105; 35006, 337
Hungary: MNOSZ 1741; 2361; 8748
Japan: JIS B 8203; F 5601, 03; W 5401
UK: BS 1170: 1957 Treatment of Water for Marine Boilers

621.3 Electrical Engineering

Australia: SAA C.118: 1954 Approval and Test Specification for Electric Hand-Lamps
Canada: CSA C22.1; .2 No. 11, No. 54; 0124
Germany: DIN 894; 5032; 40404, 685; 41167, 230, 524, 588, 589, 750; 42515, 962; 43101 Bl. 1, 643, Bl.1, 645 Bl. 676, 682, 712, 732; 45603, 604; 460 056; 48323, 352
Hungary: MNOSZ 9247, 49; 20823; 22(
International Electrotechnical Commissi
IEC Pub. 50(20) : 1958 Internatio Electrotechnical Vocabulary Gr 20 S entific and Industrial Measuring I truments
IEC Pub. 70-3 : 1957 Capacitors Power Systems. Capacitors for U Under Tropical Conditions
IEC Pub. 93 : 1958 Recommenc Methods of Test for Volume and Surf Resistivities of Electrical Insulati Materials
IEC Pub. 97 : 1957 Recommendatic for Fundamental Parameters for Pr ted Wiring Techniques
Israel: S.I. 32; 33; 62; 72; 108; 153; 2 231
Italy: UNI 3795; 3826 to 67
Japan: JIS C 2321; 3405, 06; 6402; 70(09; 2210; 3524; 4301
Netherlands: HCNN NEN 2131; 3062
South Africa: SABS 537
UK: BS 159 : 1957 Busbars and Busl Connections
BS 234 : 1957 Loaded and Unload Ebonite for Electrical Purposes
BS 883: 1958 Cables and Flexible Cor for Electrical Equipment of Ships
BS 1645 : 1957 Domestic Elect Vacuum Cleaners
BS 1791: Pt 2 : 1957 Cotton-Cover Copper Conductors. Rectangular Cc ductors
BS 2899 : 1958 Vulcanized Rubl Insulation and Sheath (Including Pl chloroprene) of Electric Cables
BS 2914 : 1957 Surge Diverters
BS 2928 : 1957 X-Ray Tube Cable Te mination and Receptances Operating 55 kV Peak
BS E.24 Nyvin Type Electric Cables f Aircraft
BS E.25 Spring Covers for Push-Butt Switches for Aircraft
BS 2E. 21 Pren Type Electric Cabl for Aircraft
Ministry of Supply: S.D.M. (1) 177/1
British Electrical and Allied Industri Research Association: B/T101; 10 108; 115; L/T336; M/T121; S/T17 182
USA: ASA C16.29 : 1957 Methods Measurement of Gain, Amplificatio Loss, Attenuation and Amplitud Frequency-Response
ASA C16.25a: 1957 Methods of Measur ment of the Conducted Interference Ou put of Broadcast and Television R ceivers in the Range of 300 KC to 25 M
ASA C16.30 : 1957 Definitions of Tern on Fascimile
ASA C78.1304 : 1957 Dimensional an Electrical Characteristics of 400-Wa BT-37 Fluorescent Mercury Vapo Lamp

USA: ASA C78.1305 : 1957 Dimensional and Electrical Characteristics of 400-Watt BT-37 Mercury Vapuor Lamp
Electronic Industries Association: EIA RS-70; -198; -200; -201; -205; SE-101A; 104
National Electrical Manufacturers' Association: NEMA 201/213; Pub. No. HE1; TR6
Radio-Electronics Television Manufacturers' Association: RETMA RS-196
Underwriters Laboratories: UL 62; 467

.4 Internal Combustion Engines

Japan: JIS D 1606; W 4231 to 34; 4501

.5 Pneumatic Machines. Refrigeration Technology

Germany: DIN 8975
Hungary: MNOSZ 2355
Japan: JIS W 3101

.6 Apparatus for Conveyance and Storage of Gases and Liquids. Conduits and Pumps

Germany: DIN 1230; 1786, 89; 2385, 93, 4; 3900 to 09, 11, 12; 4814 Bl; 7757, 2; 11214, 214, 219; 14301 to 303, 312, 21 to 323, 365; 25570; 33100, 101, 05, 107
Hungary: MNOSZ 87; 3157; 15694; 19016
India-Ministry of Defence: IND/SL/MED/848
Israel: S.I. 195; 214; 222; 226
Japan: JIS F 7311, 12, 86, 87; Z 9102
South Africa: SABS 546
UK: BS 1387 : 1957 Steel Tubes and Tubulars Suitable for Screwing to B.S. 21 Pipe Threads
BS 1689 : 1957 Galvanized Mild Steel Fire Buckets
BS 2915 : 1957 Domed Metallic Bursting Discs and Bursting Disc Assemblies
USA: ASA G37.1 : 1957 Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service

.7 Workshop Practice

Germany: DIN 2236, 37; 3966; 5601; 7182
Hungary: MNOSZ 4723
India-Ministry of Defence: IND/GS/870
Israel: S.I. 195; 241
Japan: JIS B 7506
USA: ASA A21.1 : 1957 Manual for the Computation of Strength and Thickness of Cast Iron Pipe

.791 Soldering. Welding. Cutting

Canada: CSA W 55.2; 23-GP-3, -7
Germany: DIN 2301; 8507
Hungary: MNOSZ 6299
Japan: JIS G 3524; W 0901 to 02; Z 2204
Netherlands: HCNN NEN 1062-1 to -6
UK: BS 1140 : 1957 Spot Welding of Light Assemblies in Mild Steel
BS 2910 : 1957 General Recommendations for the Radiographic Examination of Fusion Welded Circumferential Butt Joints in Steel Pipes
BS 2926 : 1957 Chromium-Nickel Austenitic Steel Electrodes for Manual Metal-Arc Welding
BS 2937 : 1957 General Requirements for Seam Welding in Mild Steel
USA: NEMA Pub. No. EW3
American Welding Society: AWS D3.3

621.798 Packing and Dispatch Equipment

Canada: 43-GP-17, -18, -20
Japan: JIS Z 1402; 1505, 06; 1601, 04
UK: BS 2892 : 1957 Wooden Trays for Tomatoes

621.82/.85 Transmission Parts

Germany: DIN 655; 3966; 7355, 56; 14303, 312; 15140; 75532 Bl.2
Hungary: MNOSZ 15694; 17154; MSZ 7891, 94
India-Ministry of Defence: IND/GS/901
Japan: JIS D 6001; 8102, 03
UK: BS 1069 : 1957 Cotton Belting Ducks
BS 2931 : 1957 Steel Ankel Joints for Steel Orthopaedic Appliances
BS 2934 : 1957 Flat Driving Chains for Carding Engines
USA: ASA B29.1 : 1957 Transmission Roller Chains and Sprocket Teeth
ASA B29.2 : 1957 Inverted Tooth (Silent) Chains and Sprocket Teeth
Antifriction Bearing Manufacturers' Association: AFBMA S2 to 4, 9

621.88 Means of Attachment. Fastenings

Canada: 39-GP-47
Germany: DIN 263 Bl.1; 580; 582; 895; 1160; 7964, 91, 92; 26512; 35006; 40404
Hungary: MNOSZ 231; 232; 1160; 2421; 9013
India-Ministry of Defence: IND/GS 886; Drg 1954; MED/IGS/Drg/262
Israel: S.I. 242
International Standards Organization: ISO/R20 : 1956 (E) Shipbuilding Details for Inland Navigation Rivets for Hatches
Japan: JIS B 4623 to 25; JIS W 1523 to 28, 33, 34; 1616
Netherlands: NEN 1250; 1320; 1650
UK: BS SP.121 : 1958 Collars for Shear Pins for Aircraft
USA: ASA G 38.1 : 2957 Carbon and Alloy Steel Nuts for Bolts for High Pressure and High-Temperature Service

621.89 Lubrication

Germany: DIN 48323
Hungary: MNOSZ 13197

621.9 Machine Tools

Canada: 30-GP-1; 39-GP-43, -49
Germany: DIN 851; 1889 Bl.1 to 3; 2207; 4950; 6341
Hungary: MNOSZ 1295, 97, 99; 1915, 72 to 78; 3875; 96; 5023, 24, 26, 28, 81 to 83; 8567 to 73; 10770; 14402, 473; 17154; 6435; 6679; 9965, 68
India-Ministry of Defence: IND/GS/857; 876; 879; 898
Italy: UNI 3801 to 11
USA-Federal Supply Service: GGG-F-331a

622 Mining

Hungary: MNOSZ 1230; 3158, 59, 80; 3351, 52; 5189; 10664; MSZ 3353
UK: BS 236 : 1957 Wire Ropes for Colliery Winding
BS 330 : 1957 Wire Ropes for Colliery Haulage and Manriding Purposes

624 Civil Engineering

Germany: DIN 1350; 4149
Hungary: MNOSZ 1197, 98; 15000 to 009; MSZ 4488
Italy: UNI 3838
Netherlands: HCNN N 1055
USA: ASA G24.1 : 1957 Steel for Bridges and Buildings

625.1/.6 Railway Engineering

Germany: DIN 43101
Hungary: MNOSZ 1235; 2754; 4203; 12001
India-Ministry of Defence: IND/GS/896
Italy: UNI 3839, 40, 77, 78
Japan: JIS E 1105, 06; 1302, 03; 1501 to 06; 4301; 8101
Netherlands: NEN 1426
UK: BS 1308 : 1957 Concrete Street Lighting Columns
USA: ASA A37.33 : 1957 Standard Definitions of Terms Relating to Materials for Roads and Pavements

628 Public Health Engineering

Germany: DIN 4040, 41; 19525
Hungary: MNOSZ 260; 19016
Israel: S.I. 239
Japan: JIS F 8402
Netherlands: NEN 1123

629.11 Land and Road Vehicles

Canada: 20-GP-58
Germany: DIN 7757, 82; 14520; 75532
Hungary: MNOSZ 11058
Israel: S.I. 217; 218; 224; 225
Japan: JIS B 9202, 03; C 3405, 06; D 2401; 4311; 4411; 4601; 5601 to 06; 5701, 03, 04; 6001; 6401, 02; 8001, 02, 03; 8201; E 4201

629.13 Aeronautics. Aircraft Engineering

Japan: JIS W 0101; 0901, 02; 1501, 02, 31; 2001, 02, 06; 3101; 4341 5403; 6106, 08; 6401

63 Agriculture. Forestry. Stock-breeding. Animal Produce. Hunting. Fisheries

Germany: DIN 11212, 214, 219, 857
Hungary: MNOSZ 2349; 3578, 79, 89; 6316; 13300; 17671; 19076; 19134; 21157
Israel: S.I. 237
Netherlands: NEN 962; 1392; 1563; 2271; 3059
USA: ASA K62.2 : 1957 Common Name for the Pest Control Chemical: 3 (*p*-Chlorophenyl)-1, 1-Dimethyl Urea; Monuron
ASA K62.3 : 1957 Common Name for the Pest Control Chemical: 3-(3.4-Dichlorophenyl)-1, 1-Dimethyl Urea; Diuron
ASA K62.6 : 1957 Common Name for the Pest Control Chemical: 2-(2,4, 5-Trichlorophenoxy) ethyl 2, 2-Dichloropropionate; Erbon
ASA K62.8: 1957 Common Name for the Pest Control Chemical: 1-n-nitri; -3-(3,4-Dichlorophenyl)-1-Methyl Urea; Neburon
ASA K62.9 : 1957 Common Name for the Pest Control Chemical: 2, 2-dichloropropionic acid; Dalapon
ASA K62.10 : 1957 Common Name for the Pest Control Chemical: 2-(2, 4, 5-Trichlorophenoxy propionic acid; Silvex
ASA K62.11 : 1957 Common Name for the Pest Control Chemical: *p*-Chlorophenyl *p*-Chlorobenzenesulfonate; Ovex

64 Domestic Science. House Keeping

Canada: CSA C22.2 112; 52-GP-6, 10
Germany: DIN 3255 Bl.1; 48352
India-Ministry of Defence: IND/GS/869; 874; 877; 887; 893; 904; 905; MED/IGS/Drg 263
Israel: S.I. 238

65 Commercial, Office, Business Techniques. Management. Organization. Communication. Transport

Canada: 6-GP-19, -21 to -24
Hungary: MNOSZ 246

Italy: UNI 3797 to 99; 3800, 25
Japan: JIS Z 8101
South Africa: SABS 066
UK: BS 2911: 1957 Letter Plates

661 Chemicals (Fine, Heavy, etc)

Canada: 15-GP-32
Hungary: MNOSZ 8790, 91; 20526; MSZ 13325; 20908; 23118; 24204, 461
India-Ministry of Defence: IND/SL/0549, 50, 53, 54; 1520; 1522 to 24, 42; MED/IGS/304a
Japan: JIS K 1358, 59; 8031, 35, 41, 44, 46, 47, 49, 61, 73, 89, 91, 94, 95, 97; 8513, 17, 19, 22, 28, 48, 57; 8741, 47, 89, 97, 99; 8976, 78, 79, 92; 9001, 03
UK: BS 573 : 1957 Di-n-Butyl Phthalate
BS 575 : 1957 Carbon Tetrachloride
BS 579: 1957 Diethyl Ether (Technical)
BS 1999 : 1957 Tritolyel Phosphate
BS 2941 : 1957 Paraformaldehyde
BS 2942 : 1957 Formaldehyde Solution
BS 2943-4 : 1957 O-Dichlorobenzene (Grades A and B)

662.6/.9 Fuel Industry. Industrial Heating

Germany: DIN 3814 Bl.1, 2 & 3; 51768
Israel: S.I. 70
Hungary: MNOSZ 700
UK: BS 1016: Pt 5 : 1957 Methods for the Analysis and Testing of Coal and Coke: Gross Calorific Value of Coal and Coke

663 Beverages. Stimulants

Canada: 32-GP-212; -213; -215
Hungary: MSZ 9462

664 Preparation and Preservation of Solid Foodstuffs

Hungary: MNOSZ 3577 to 79
Israel: S.I. 228; 229
South Africa: SABS 066

665 Oils. Fats. Waxes

Canada: 37-GP-27
Hungary: MNOSZ 19975; 20977; MSZ 3251
India-Ministry of Defence: IND/SL/2616
Israel: S.I. 221
Japan: JIS K 2208
USA: ASA A37.42 : 1957 Standard Method of Testing Emulsified Asphalts
ASA A37.45 : 1957 Standard Method of Test for Distillation of Cut-Back Asphaltic Products
ASA A37·55 : 1957 Emulsified Asphalt
ASA Z11.2 : 1956 Method of Test for Saybolt Viscosimeter
ASA Z11.6 : 1956 Method of Test for Flash and Fire Points by Cleveland Open Cup

666 Glass. Ceramic Industries

Canada: 1-GP-141A
Germany: DIN 40685; 52303
Hungary: MNOSZ 1197 to 99; 3560; 4702
India-Ministry of Defence: MED/IGS/276
Japan: JIS F 2410; 8402; R 3203 to 05; 3511, 12

668.1 Soap Industry

Hungary: MNOSZ 3654, 64; MSZ 3663, 64, 67; 10960, 961
Israel: S.I. 240

668.7 Tar Distillation and Products

India-Ministry of Defence: IND/SL/4509
USA: ASA A37.9 : 1957 Standard Method of Test for Distillation of Tars and Tar Products
ASA A109.3 : 1956 Coal-Tar Saturated Roofing Felt for Use in Waterproofing and in Constructing Built-up Roofs

669.1 Ferrous Metallurgy

Canada: 39-GP-45
Germany: DIN 17100
Hungary: MNOSZ 106, 321; 4461; 4876; 20994, 995, 997
Italy: UNI 2955; 3351, 52; 3794, 96; 3811, 23, 39, 40, 68, 71, 72
Japan: JIS G 3102; 4102 to 05; 4202
UK: BS 2936 : 1957 Saw Tooth Wire for Carding Engines
BS 2937 : 1957 General Requirements for Seam Welding in Mild Steel
BS 2926 : 1957 Chromium-Nickel Austenitic Steel Electrodes for Manual Metal-Arc Welding
Ministry of Defence: DEF-24
USA: ASA G37.1:1957 Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service

669.2/.8 Non-Ferrous Metallurgy

Germany: DIN 1777 Bl.2, 89
Hungary: MNOSZ 744; 1235; 4461; 19714; 20994; 20996; 21000
India-Ministry of Railways: IRS M 11 : 1957 Silico Manganese Spring Steel
Israel: S.I. 223
Italy: UNI 3724; 3812 to 22
Japan: JIS H 1101, 21; 3701, 02, 11, 21, 31, 32, 41, 51
UK: BS 2920 : 1957 Cold-Reduced Tinplate and Cold-Reduced Blackplate
BS 2938 : 1957 Dental Amalgam Alloy (Silver-Tin)
Ministry of Supply: SDM(L)206/1
USA: ASA H35.1 : 1957 Aluminium Association Alloy Designation System for Wrought Aluminium

671 Precious Metal Gem Industries. Jewellery. Trinkets

Japan: JIS S 4012

672 Iron and Steel Goods

India-Ministry of Defence: MED/IGS/279
Hungary: MNOSZ 10711, 737, 738, 740
UK-Ministry of Supply: S.D.M.(L)178/1

674 Timber and Woodwork Industry

Germany: DIN 1102; 68365
Hungary: MSZ 44 to 46; 6255; 6785, 95; 9757, 59, 62, 65, 66; 13309, 325
India-Ministry of Defence: IND/GS/891
Japan: JIS A 9301 to 05; Z 1402
South Africa: SABS 538, 39
Hungary: MNOSZ 5479

676 Paper and Cardboard Industry

Japan: JIS P 3401; Z 1506
UK: BS 2916:1957 Absorbency Test for Bibulous Paper
BS 2924 : 1957 *p*H Value of Aqueous Extracts of Paper

677 Textile and Cordage Industries

Germany: DIN 655; 64164, 165, 166
Denmark: DS 80; 928
Hungary: MNOSZ 101; 2387, 89
Japan: JIS L 1006
UK: BS 1069 : 1957 Cotton Belting Ducks
BS 1103 : 1957 Cotton Fabrics for the Reinforcement of Rubber Hose
BS 2935 : 1957 Description of Woven and Warp-Knitted Fabrics Containing Man-Made Fibres
BS 2934 : 1957 Flat Driving Chains Carding Engines
BS 2936 : 1957 Saw Tooth Wire Carding Engines
USA: ASA L14.12 : 1957 Standard D nitions of Terms Relating to Tex Materials
ASA L14.26 : 1957 Method of Test Fineness of Wool
ASA L14.29 : 1957 Method of Test Fineness of Wool Tops
ASA L14.32 : 1957 Tentative Metho Test for Fibre Length of Wool Tops

678 Macromolecular Materials. Rubbers and Plastics

Germany: DIN 56055
Hungary: MNOSZ 11058; MSZ 18825
Italy: UNI 3789
Japan: JIS K 6350
Netherlands: NEN 1426; 1455
UK: BS 903 : Pt A6 : 1957 Methods Testing Vulcanized Rubber: Determi tion of Compression Set
BS 903: Pt A7: 1957 Methods of Test Vulcanized Rubber: Determination Hardness

681 Precision Mechanisms. Apparatus and Machines. Instruments

Germany: DIN 41524
Hungary: MNOSZ 1153; 1720; 11154, 1 191; 15565; 20075; 22314
Japan: JIS B 7121 to 23; S 8501 to Z 8702
Netherlands: NEN 1123
UK: BS 2913 : 1957 Measurement Offset Blanket Thickness
USA: ASA Z24.21 : 1957 Method Specifying the Characteristics of Pi ups for Shock and Vibration Meas ment

683 Hardware. Ironmongery. Lamps and Stoves

Germany: DIN 6099
India-Ministry of Defence: MED/IGS/
Japan: JIS S 2016
Hungary: MNOSZ 10770
UK: BS 1252 : 1957 Domestic Solid-F Cookers with Integral Boilers

685 Saddlery. Footwear. Gloves. Travel, Sport, Games and Other Equipment

Hungary: MNOSZ 14277
India-Ministry of Defence: IND/GS/9
South Africa: SABS 421

686 Bookbinding. Gilding. Silverir Mirrors. Glaziery. Writing an Office Articles

Canada: 53-GP-41
Japan: JIS S 6013

687 Clothing. Readymade Clothing Sewing Machines. Toilet Articl Brushes

Hungary: MSZ 18825
India-Ministry of Defence: IND/GS/90
Italy: UNI 3873 to 76
UK: BS 2921:1957 Overalls and Unifor for Hospital Staffs (Sizing and Makir Up)

688 Fancy Goods. Toys. Decoration Work

Japan: JIS S 8004 to 09

Building Industry. Materials. Trades. Construction

ıstralia: SAA CA.30 : 1957 Artificial Lighting of Buildings
rmany: DIN 1102; 18065 Bl.1, 165, 223 Bl.1
ungary: MNOSZ 4702; 11530; 21223; MSZ 6224; 11529
rael: S.I. 7; 215; 226; 227
ly: UNI 3838
pan: JIS A 6003 to 04
therlands: HCNN N 1055; NEN 3080; 3081
uth Africa: SABS 523
SA: ASA A89.1 : 1957 Building Code Requirements for Reinforced Concrete
ASA A109.2 : 1956 Asphalt-Saturated Roofing Felt for Use in Waterproofing and in Constructing Built-Up Roofs
ASA A109.3 : 1956 Coal-Tar Saturated Roofing Felt for Use in Waterproofing and in Constructing Built-Up Roofs
ASA A109.4 : 1956 Asphalt-Saturated Asbestos Felts for Use in Waterproofing and in Constructing Built-Up Roofs

Drawing and Minor Arts

rmany: DIN 3966
ungary: MNOSZ 4723
rael: S.I. 241

77 Photography and Cinematography

Germany: DIN 4512; 16542, 543
Hungary: MNOSZ 5531; 5630
International Organization of Standardization: ISO/R 23 : 1956(E) Emulsion and Sound Record Positions in Camera for 35 mm Sound Motion Picture Film
ISO/R 24 : 1956(E) Emulsion and Sound Record Positions in Projector for 35 mm Sound Motion Picture Film
ISO/R 25 : 1956(E) Emulsion Position in Camera for 16 mm Silent Motion Picture Film
ISO/R 26 : 1956 (E) Emulsion Position in Projector for Direct Front Projection of 16 mm Silent Motion Picture Film
ISO/R 27 : 1956(E) Emulsion and Sound Record Positions in Camera for 16 mm Sound Motion Picture Film
ISO/R 28 : 1956(E) Emulsion Position in Camera for 8 mm Silent Motion Picture Film
ISO/R 29 : 1956(E) Emulsion Position in Projector for Direct Front Projection of 8 mm Silent Motion Picture Film
Japan: JIS B 7109; K 7609
UK: BS 2912 : 1957 Recommendations for 5-Gallon and 10-Gallon X-Ray Film Processing Units
USA: ASA PH4.125 : 1956 Photographic Grade Monomethyl-Para-Aminophenol Sulphate
ASA PH4.127 : 1956 Photographic Grade 2, 4- Diaminophenol Hydrochloride
ASA PH4.129 : 1956 Photographic Grade Para-Aminophenol Hydrochloride
ASA PH4.132 : 1956 Photographic Grade Para-Phenylenediamine
ASA PH4.133: 1956 Photographic Grade Para-Phenylenediamine Dihydrochloride
ASA PH4.134 : 1956 Photographic Grade Chlorohydroquinone
ASA PH4.206 : 1956 Photographic Grade 6-Nitrobenzimidabole Nitrate
ASA PH22.8 : 1957 Projected Image Area of 16 mm Motion-Picture Film
ASA PH22.20 : 1957 Projected Image Area of 8 mm Motion-Picture Film
ASA PH22.35 : 1957 16-Tooth 35 mm Motion-Picture Projector Sprokerts
ASA Z24.21 : 1957 Method for Specifying the Characteristics of Pickups for Shock and Vibration Measurement

EW INDIAN STANDARDS — *Continued from p. 185*

nnections (IS: 1119-1957) is the urth in the series of published andards on electrical wiring accesries. Other Indian Standards in is series are:

IS: 370-1954 Reversible Type Two-Pin Plugs and Socket-Outlets Without Earthing Connections (*Tentative*)
IS: 371-1954 Two- and Three-Terminal Ceiling Roses (*Tentative*)
IS: 1087-1957 Single Pole 5-Ampere Tumbler Switches for AC/DC

The plug and socket combination vered by this Indian Standard IS: 1119-1957) is generally used ith portable electrical appliances ich as electric irons, heaters, radiaırs, etc. An important feature of iis type is that provision for earthıg connection is included in its nstruction and this leads to safety the use of the appliance. Besides iving standard ratings, the specication lays down requirements for ıaterial, construction of plugs and ckets and detailed tests for elecical performance including current reaking test, insulation resistance est, high voltage test, temperature ise tests and softening point test for he plastic material. The specificaion also lays down standard dimenions of the plugs and sockets along vith the permitted tolerance.

AMENDMENT SLIPS

Amendment Slips have been issued to the following Indian Standard Specifications:

No. and Date of the Amendment	No. and Title of Specification
No. 1 March 1958	IS: 203-1950 Leclanchè Type Dry Cells and Batteries for Flash Lamps
do	IS: 226-1955 Structural Steel (*Revised*)
do	IS: 266-1950 Sulphuric Acid
do	IS: 574-1954 Glassy Sodium Metaphosphate, Technical
do	IS: 854-1956 Handloom Cotton Turkish Towels, Bleached, Striped, Checked, or Dyed
do	IS: 855-1956 Handloom Cotton Honeycomb Towels, Bleached, Striped, Checked, or Dyed
do	IS: 856-1956 Handloom Cotton Huckaback Towels, Bleached, Striped, Checked or Dyed
do	IS: 857-1956 Handloom Cotton Napkins, Bleached, Striped, Checked or Dyed
do	IS: 858-1956 Handloom Cotton Table Cloth, Bleached, Striped, Checked or Dyed
do	IS: 859-1956 Handloom Cotton Dusters, Grey, Striped and Checked
do	IS: 860-1956 Handloom Cotton Sponge Cloth, Grey, Striped and Checked
do	IS: 862-1956 Handloom Cotton Ticking Cloth, Grey, Striped

DRAFT INDIAN STANDARDS — *Continued from p. 187*

when they use resistance seam welding in assemblies, where strength and safety are of great importance.

Requirements and methods of tests in respect of materials, welding plant, electrodes, welding procedure, routine tests, design, inspection and testing have been covered in this draft code.

Threephase Induction Motors

The Indian Standard Specification for Threephase Induction Motors for Industrial Use, IS: 325-1951, was first published in 1951. It was later amended and printed in 1956 to include within its scope motors with Class 'B' insulation also.

This Indian Standard has further been revised and draft Revision prepared with a view to incorporating a number of changes in order to bring it in line with the present-day manufacturing practice.

The major changes in the draft Revision relate to the introduction of the concept of continuous maximum rating, introduction of primary and secondary preferred output rating in kilowatt on the basis of international recommendations, revision regarding classes of rating take into account the work done the IEC level with respect to shor time and intermittent ratings, ar introduction of locked rotor test part of the abbreviated tests.

The present draft Revision appli to three-phase induction moto having rated outputs of 0·3 kW (1 HP) and above to 110 kV (150 HP), and having windings wi Class 'A' and Class 'B' insulatio The motors specified in the dra Revision are assigned either con nuous maximum ratings or shc time ratings.

COMPULSORY QUALITY CONTROL OF EXPORTS IN JAPAN — *Continued from p. 1*

competent Ministerial ordinance, by Government organs, or persons designated by the competent Minister, who examine whether the qualities are in conformity with the standards set by the Ministerial ordinance and on which indications have been put to the effect that they have passed the required inspection.

Some of the Japanese Industrial Standards, which are established by the Japanese Industrial Standards Committee, set up under the Industrial Standardization Law, 1949, in order to govern export commodities, provide grades, requirements for quality and minimum requirements of packing. The Japanese Industrial Standards Committee upon making deliberations on the drafts of Japanese Industrial Standards to govern export commodities, watches the industries so that they export commodities of quality sufficiently high enough to meet with the consumer's demands.

The establishment of an Export Inspection Council in the Ministry of International Trade and Industry has been provided for in the Export Inspection Law. The function of the Council is to deliberate on important matters concerning export inspection. It is to be composed of not more than 60 members, and Expert Committees may be established within the Council to carry on studies on special subjects.

For those offending against the provisions of the Export Inspection Law, strict penalties have been laid down. Any person who exports the designated commodities in contravention of the provisions of the Law, is punishable with penal servitude not more than three years or a fi of not more than three hundr thousand yen (approx Rs 4 000— Any officer or employee of th designated inspection organs, wl acts in contravention of the La is punishable with penal servitu and a fine.

Foreign buyers have been advis by the Inspection Section, Minist of International Trade and Industr that they should take full advanta of the inspection standards in tl purchase of Japanese goods l specifying these standards in the contracts as their conditions to e sure the quality of goods in questio In so doing, the foreign buyers c simplify their contracts and m prevent any commercial disput that may otherwise arise.

ADOPTING METRIC WEIGHTS AND MEASURES — *Continued from p. 158*

3) Government Departments in so far as they undertake survey of land or mines ; and

4) Government Departments in so far as they undertake the study or publication of any technical, scientific or marketing da relating to weather, irrigation and power projects, or undertake drawings and specifications of scientific apparatus for use laboratories and educational institutions, except in matters relating to air distances and speed of aircraft.

Table B specifies that the provisions of the Act shall come into force in respect of the following undertakings :

1) Cotton textile mills in their purchase of cotton or sale of cloth ;

2) Iron and steel factories and factories engaged in the manufacture of heavy chemicals in their purchase of raw materi or sale of their products ;

3) Factories engaged in engineering industry in the sale of their products ;

4) Factories engaged in the manufacture of cement, salt, paper, pulp or paper board and refractories in their sale of the items ;

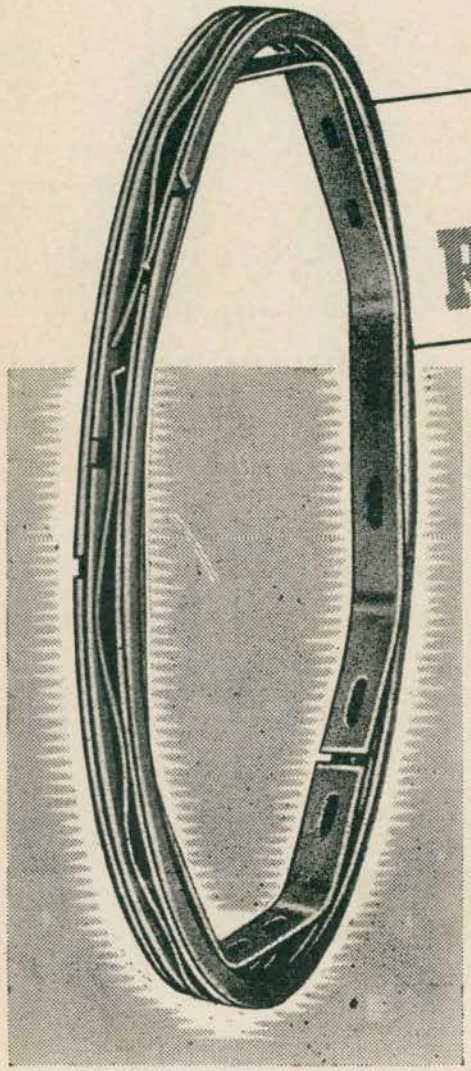
5) Factories engaged in the manufacture of copper, aluminum, lead, antimony and tin in their sale of these metals incl ding their products and alloys ;

6) Coffee Board in its sale of coffee from the surplus pool either by itself or through its agents ;

7) Associations recognized by the Central Government under Section 6 of the Forward Contracts (Regulation) Act, 195 in their regulating and controlling forward contracts in cotton ; and

8) Sale of raw rubber.

This is the Ring which is revolutionising



ENGINE RECONDITIONING

DUAFLEX

REGD. TRADE MARK PAT. NO. 1373

LOW COST OF INSTALLATION

Even allowing for trueing-up ring grooves the cost per piston of Duaflex is only a few rupees. Duaflex is a worthwhile investment because the fitment will pay for itself in costs of oil saved in a few months.

DEFER A REBORE

Duaflex can take over when th normal type of piston ring refus to cope with oil conditions. Duafl will give you thousands of ext economical miles at the time when rebore used to be regarded essential.

EXPENDITURE ON OIL CUT OR COMPLETELY ELIMINATED

Duaflex does stop oil consumption. A careful fitment carried out in accordance with the detailed instructions issued with each set of rings means that the cylinder bore is completely sealed. No oil can get past the ring (or round it) so that the oil on the bore does its job of lubrication and is not burnt to waste by combustion.

READ WHAT MANY SATISFIED USERS SAY IN PRAISE OF DUAFLEX

No Wear with Duaflex!

The Car is a 1946 Austin 10 which had done 47,000 miles when Duaflex Rings were fitted. I have since done a total 86,000 miles and bore wear is of the order of ·009 max.

J. P., Birmingham. 4-5-54.

Economy in Oil

...In 1953 the car was doing less than 150 miles to the pint of oil; after 8,000 miles (with Duaflex) the car is doing 900 miles to 1 pint of oil.

R. W. P., Cornwall. 8-5-54.

A Farmer

In April 1953 my tractor was using approximately a gallon of oil per day. I decided against a rebore and had a set of Duaflex Rings fitted...today the tractor shows a considerable increase in power and does not slow on heavy work ...since then oil consumption has dropped to rather less than a pint per day.

F. S. Hemmant, Norfolk.

A Coach Proprietor Says:

I am sure that the motoring world should know the advantages which can be achieved from Duaflex Rings.

A. Elsey, Lincs. 5-5-54.

For literature on the DUAFLEX oil control rings please write to:

INDIA PISTONS (PRIVATE) LTD., MADRAS-11

or any of their Authorized Dealers

Features built into the NEW DUNLOP *Rayoncord* VEE Belts

Designed to meet the new American Standard Horse Power ratings

Write for Technical Handbook to:
Industrial Rubber
Products Division
The Dunlop Rubber Co. (India) Ltd.

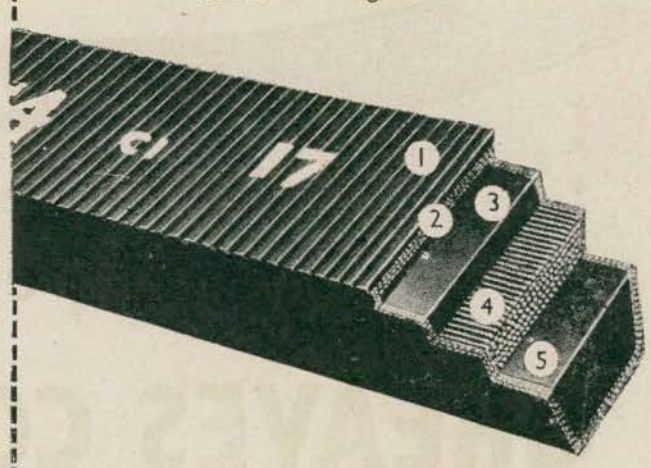
57B Free School St.,
Calcutta 16

DRAC-52

1 **TOPPING RUBBER** seals and protects the Jacket overlap.

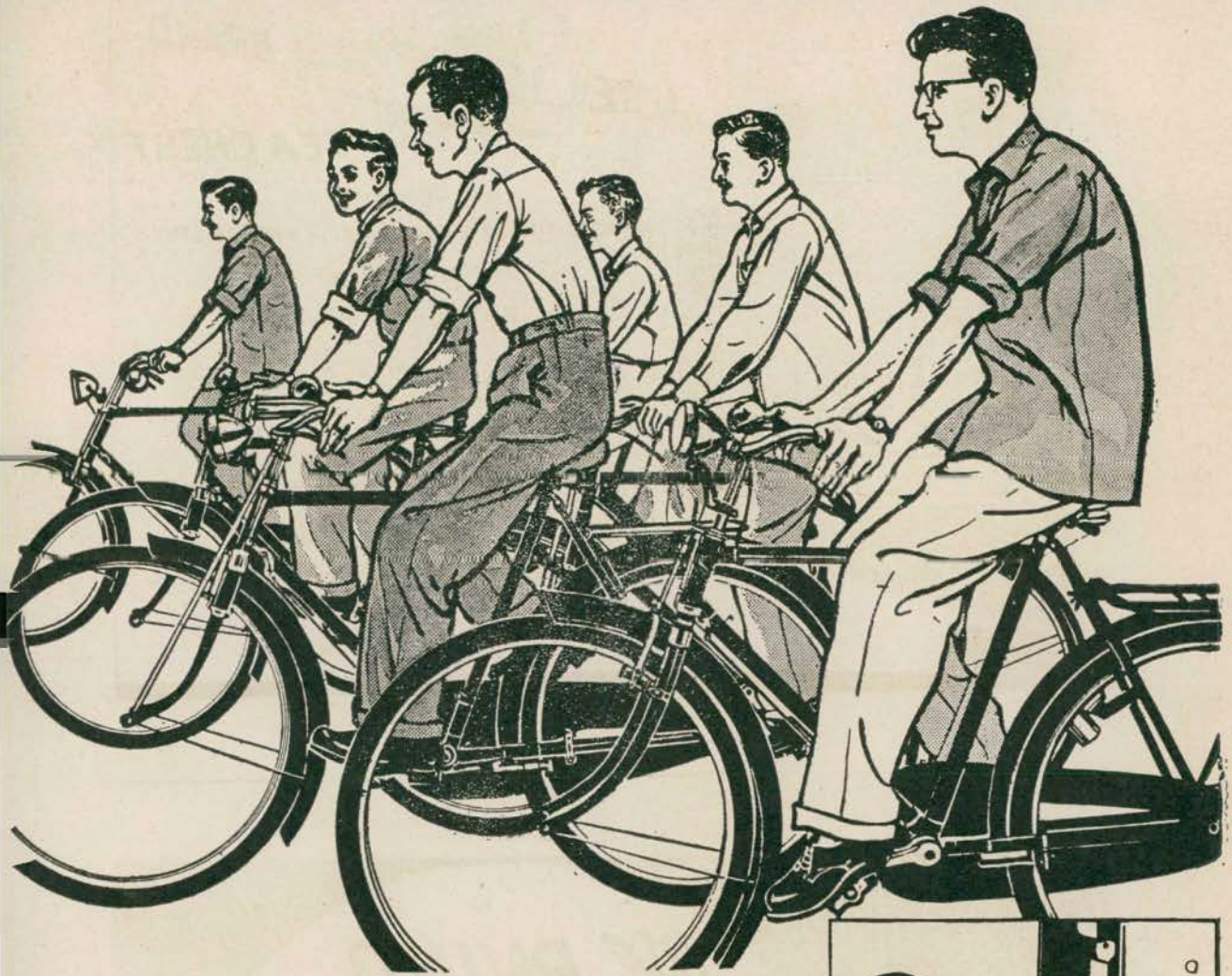
2 **JACKET** of multilayer rubber impregnated fabric armours the belt against surface wear.

3 **FILLER RUBBER** holds the cords in correct place, resists distortion and cushions the cords against sudden starting shocks.



4 **REINFORCING MEMBER** of high strength rubber impregnated synthetic textile cords provides adequate strength and resistance to strain and fatigue.

5 **BASE RUBBER** specially compounded to resist frictional heat provides an ideal foundation for the cords and gives a large gripping surface on the sides



Most visible parts of a cycle consist of TRU-WEL tubes. Tubes provide the framework on which the vehicle is built.

TRU-WEL tubes provide the framework

TRU-WEL tubes have played a decisive part in the evolution of the slim, light and immensely strong bicycle of today.

Pioneered by Tube Products Ltd., Oldbury, England, TRU-WEL tubes have been famous in India for nearly thirty years. These world famous tubes are now made at our factory at Avadi in collaboration with them. We shall be happy to be of service to you in all your plans involving the use of ERW steel tubes.

How tubes are tested

To ensure the soundness of the weld, sections from every TRU-WEL tube are pressed over a cone in this special testing instrument.

TUBE PRODUCTS OF INDIA LIMITED

Avadi (Near Madras)

TP-359

CHANGING OVER TO

THE METRIC SYSTEM

India has at present no common system of weights and measures. There are not less than 143 systems in use. This multiplicity gives room for malpractices. The introduction of a uniform system throughout the country based on Metric Weights and Measures will be very convenient and make calculations extremely easy, especially because the country has already adopted the decimal coinage. The Standards of Weights and Measures Act, 1956 has laid down the basic units under the metric system. The reform will be gradual so as to cause minimum inconvenience to the people.

Even after its introduction in an area or a trade, the traditional weights and measures will be permitted to be used for a period of three years.

THE CHANGE-OVER TO THE METRIC SYSTEM OF WEIGHTS AND MEASURES BEGINS FROM OCTOBER, 1958

KNOW THE METRIC WEIGHTS

The unit of weight is the KILOGRAM = 1 seer 6 tolas (or 86 tolas.) or 2 lb. 3 ozs.

SUB-UNITS

10 milligrams	= 1 centigram
10 centigrams	= 1 decigram
10 decigrams	= 1 gram
10 grams	= 1 decagram
10 decagrams	= 1 hectogram
10 hectograms	= 1 kilogram

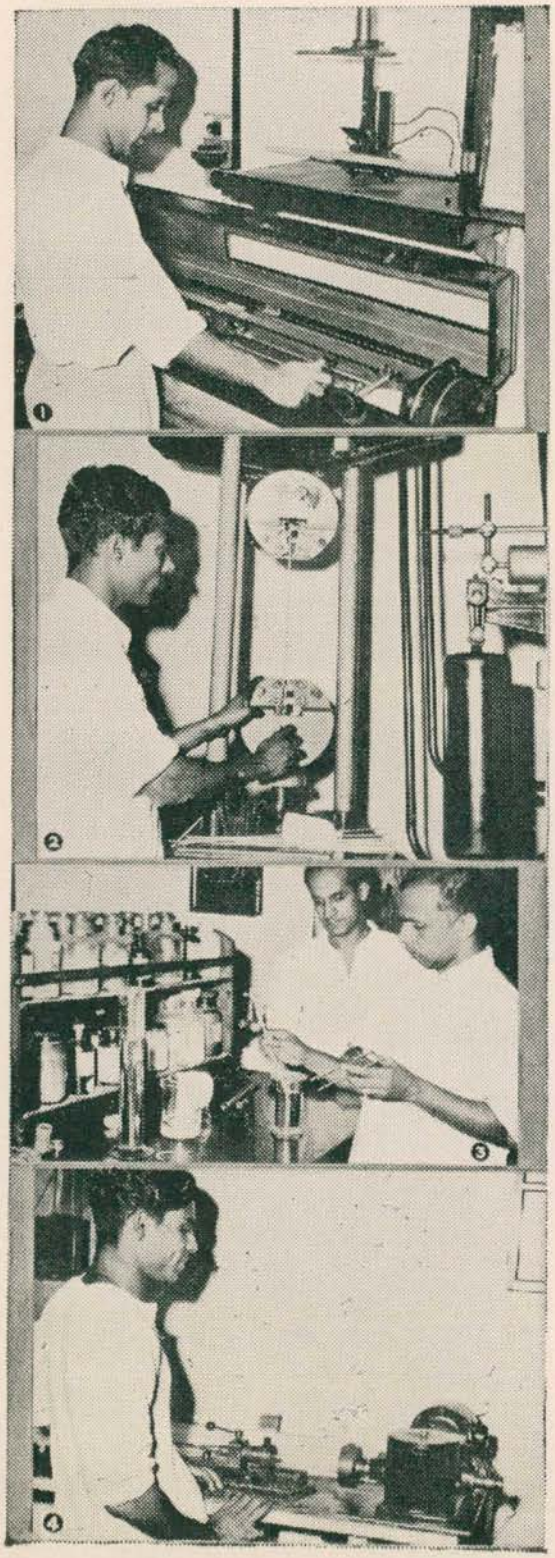
MULTIPLES

100 kilograms	= 1 quintal
10 quintals or 1,000 kilograms	= 1 metric tonne

1

04-57/240

ISSUED BY THE GOVERNMENT OF INDIA



How high is A.I.Q.C?

(Aluminium Industries Quality Control)

IN this country, as in other parts of the world, ACSR (Aluminium Conductor Steel Reinforced) is now accepted as the standard transmission conductor. Because of its light weight, excellent conductivity and mechanical properties—to say nothing of its low cost and abundant availability—aluminium has, throughout its whole life as a commercial metal, found a major user in the electrical industry.

In the manufacture of ACSR—as indeed, in all its other lines—the Aluminium Industries Limited, Kundara, exercises strict quality control···at all stages of production. ALIND's integrated facilities make such control possible. First, the conductor metal is carefully tested for its chemical composition, physical and electrical properties, before being rolled into rod. The rod is then drawn into wire on modern equipment, and before being stranded into conductor, samples of wire are carefully tested for conductivity, ductility and mechanical strength.

The steel wire forming the reinforcing core of the conductor also undergoes rigorous testing of various kinds.

In short, only after the aluminium and steel wires have been thoroughly tested, these two components of ACSR are fed into the machines. And the finished product is again inspected for any defects which may have crept in during the stranding process.

ALIND was among the first to apply for a licence to use the Standard Mark of the Indian Standards Institution, and the very first to get it! **The Aluminium Industries Limited, *India's largest manufacturers of aluminium cables and accessories*, Kundara, Kerala.**

---

(1) Conductivity test on the sensitive Hoopes Conductivity Bridge

(2) Tensile strength testing

(3) Dip test for the zinc coating on high tensile galvanized wires

(4) Torsion test

AL·414

INDIA and ICI

From Rs. 16 crores of ICI research spring new products, new techniques, improved methods and materials.

Scientific research and investigation never cease in the ICI Laboratories in Britain. Specialists are constantly at work—studying, probing and experimenting. In 1956, for example, ICI spent more than £ 12 million, approximately Rs. 16 crores, in employing leading specialists in every field of research.

Basically, that is 'good business'—to keep ahead of competition and abreast of the latest developments.

The outcome of this research is, of course, universally applicable. Here, these new products, processes, discoveries and techniques are speedily made available through the medium of ICI (India) and its associated companies. In India's fields, in her factories, her hospitals, her homes, the standards of living, of health, of technical production—all are being raised by the application of ever-changing, ever-improving methods and materials.

With the establishment of new Industries ICI gives a pledge of faith in the future.

ICI has given solid proof of its faith in the future of India. Numerous projects have been investigated and capital has been invested in schemes where local conditions promised sound development. These are mentioned below.

In addition to production, I.C.I. (India) furnishes free technical advice and service on the use of the products it sells. Specialists are available to assist customers in every way. This free service ranges from training their staff to answering technical problems and even to trying to assist in marketing.

THE ALKALI & CHEMICAL CORPORATION OF INDIA LIMITED, RISHRA, WEST BENGAL: Produces Caustic Soda, Chlorine, Hydrochloric Acid; 'Gammexane' brand B. H. C. Insecticides; 'Duco', 'Dulux,' 'Necol' and Stoving Enamels; 'Deoxidine', 'Granodine' and 'Alocrom' pretreatment products.

A Rs. 3 crore project is under construction for the manufacture of 'Alkathene' brand of Polythene.

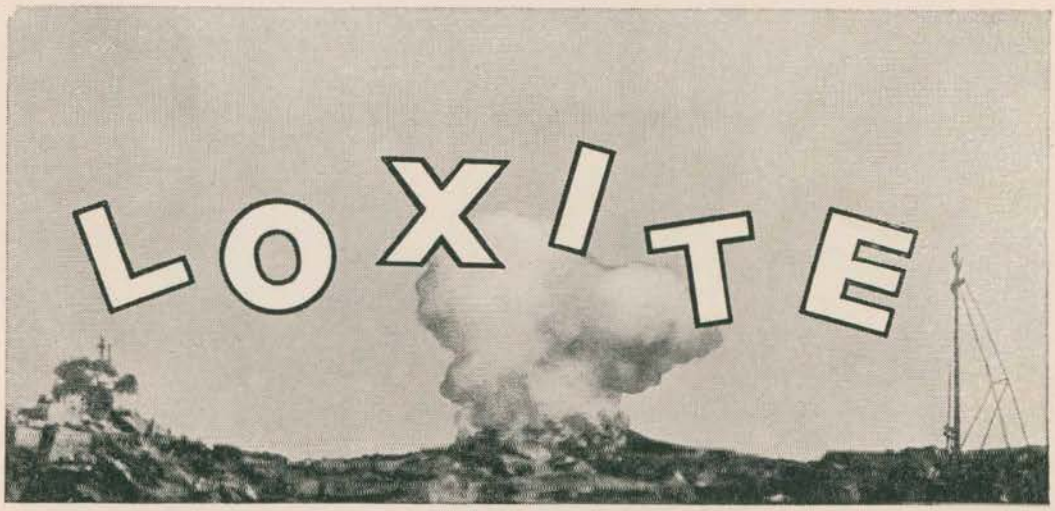
ATIC INDUSTRIES PRIVATE LTD., BULSAR: Manufactures Vat Dyes for the Indian Textile Industry. Atic is a partnership between Atul Products Ltd., and ICI.

INDIAN EXPLOSIVES LTD., GOMIA, BIHAR is a joint venture of ICI and the Government of India. The factory is now under construction at Gomia, close to the Bihar coal fields; it will make industrial blasting explosives.

I.C.I. (INDIA) PRIVATE LTD.: Makes in Calcutta, 'Alkathene' Film and 'Alkathene' Pipe for cold water and irrigation systems; at Sewri, Bombay, dyestuffs are processed and packed to the exact requirements of the Indian market, and a comprehensive range of auxiliary products is manufactured for the bleaching, dyeing, printing and finishing of textile fibres.

IMPERIAL CHEMICAL INDUSTRIES (INDIA) PRIVATE LIMITED

ICG 725C



INDIA'S OWN EXPLOSIVE

This new liquid oxygen explosive is the answer to blasting problems in open pits, quarries, dams, tunnels, etc. Yet another way in which INDIAN OXYGEN serves Indian Industry.

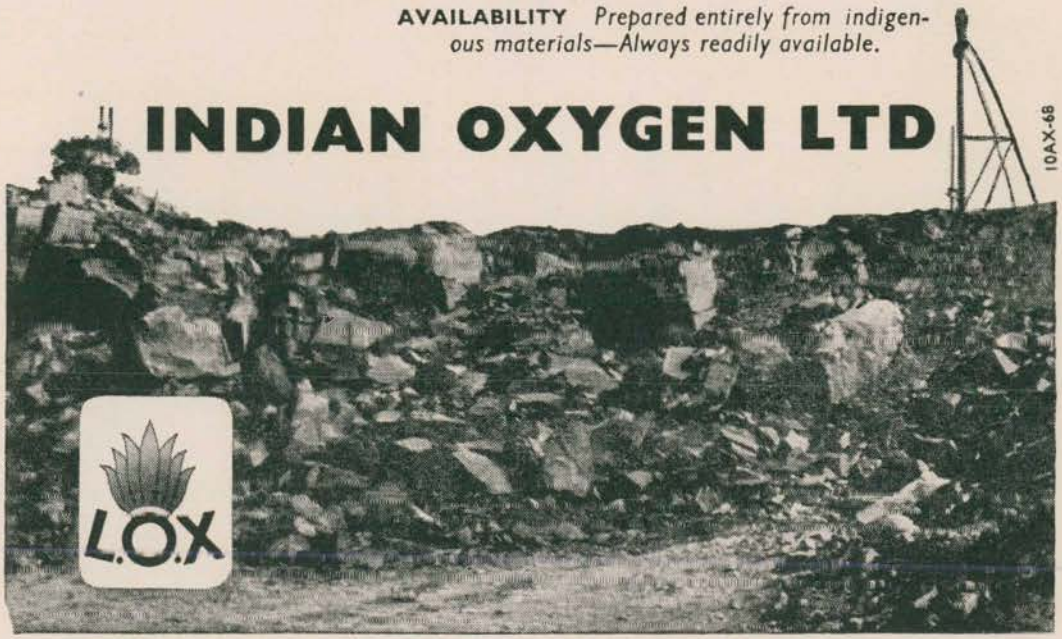
Special Features

SAFETY *Prepared on site as and when required No storage problems—No risks from misfire.*

ECONOMY *Costs 25 to 50 per cent less than conventional explosives.*

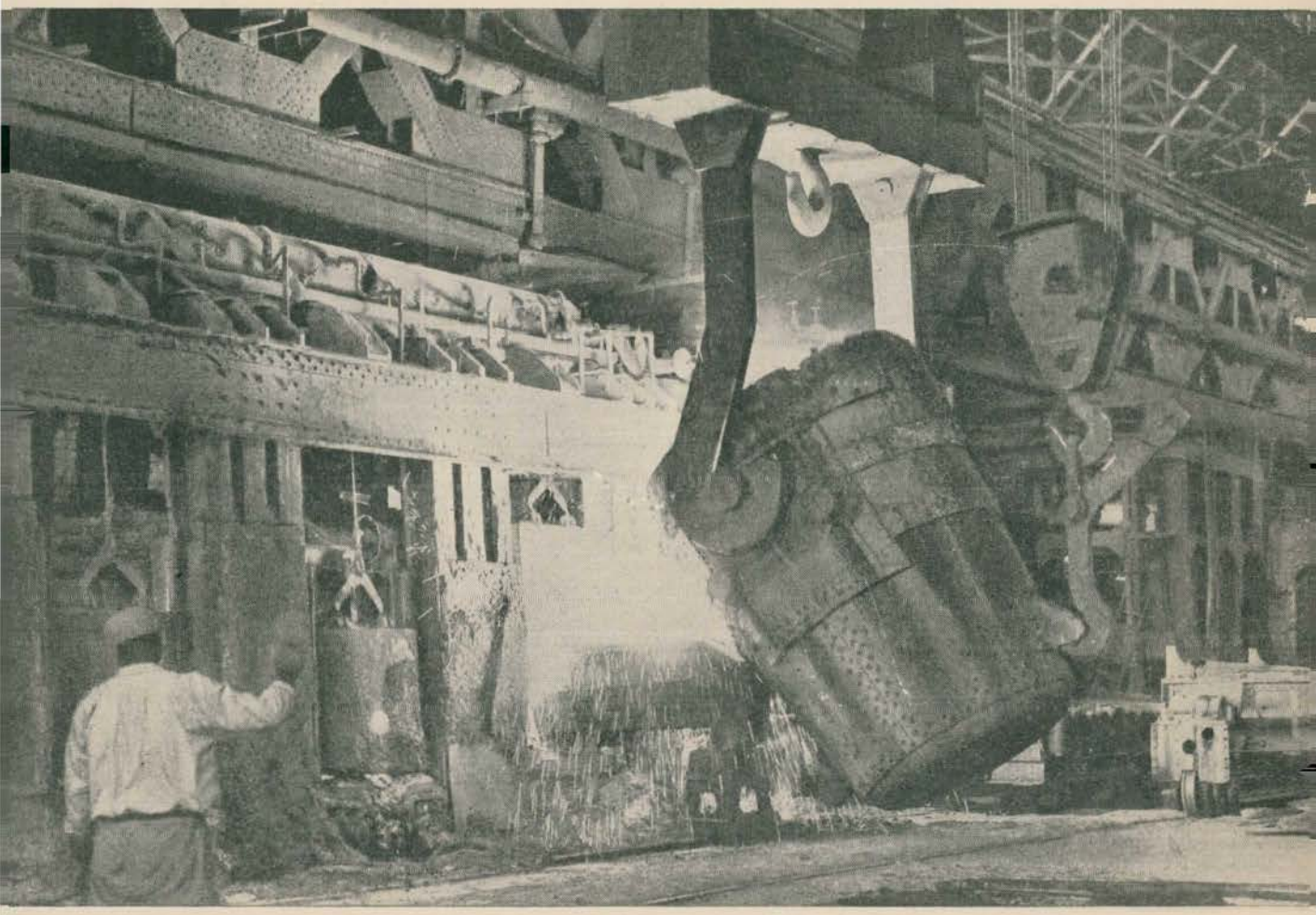
AVAILABILITY *Prepared entirely from indigenous materials—Always readily available.*

INDIAN OXYGEN LTD



ISI BULLETIN

V. 10 No. 5 SEPTEMBER 1958



IN THIS ISSUE

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 MATHURA ROAD
NEW DELHI 1

ISI Bull., V. 10, No. 5, Pp. 193-234, New Delhi. September 1958

The ISI BULLETIN is published every two months and supplied free of charge to all classes of ISI members.

For non-members:

Annual subscription Rs 6·00 (9s or $ 2·25)

Single copy Rs 2·00 (3s or $ 0·75)

All communications should be addressed to

The Chief Editor
Indian Standards Institution
Manak Bhavan, 9 Mathura Road,
New Delhi 1, INDIA

Grams 'Manaksanstha' New Delhi — *Phones*: 45915-9, 43063-4

ISI BULLETIN

FOUNDED 1949

V. 10 SEPTEMBER 1958 No. 5

CONTENTS

Picture on Cover — The first step in the manufacture of rolled steel products — molten metal from the converter being poured into an open hearth furnace in an Indian steel plant.

The Steel Economy Project, which the ISI launched some five years ago, has made considerable progress (*see* p. 194). The work on basic codes, such as the Code of Practice for Use of Structural Steel in General Building Construction (IS : 800-1956), has practically been completed; the latest in the series — the Draft Code of Practice for Oxy-Acetylene Welding for Structural Work in Mild Steel has been reviewed in this issue (*see* p. 229). The published specifications for structural steel sections cover beams, angles, channels, tee bars and bulb angles. The Indian Standard for Structural Steel, first brought out in 1950, has been revised, and a new specification for high tensile steel bars, plates and sections used in bridges and general building construction published. A review of the latter appears on page 227 — *Ed.*

This periodical is produced in accordance with IS: 4-1949 *Practice for Make-up of Periodicals*

Hercules is more than a cycle...
it's a lifetime companion

GIVE a college going boy a HERCULES and see how it transforms the very pattern of his life. He will have more time for his studies, more time for sports. Happy, healthy, he will be helpful at home; make new friends outside. And he will continue to use his HERCULES long after his college days have become a happy memory. For few things in life give so much for so long as a HERCULES.

Backed by the experience of people who have made top quality cycles for nearly 50 years, the sturdy HERCULES is precision-built in T.I. Cycles, ultra-modern factory. Its streamlined beauty, smooth effortless drive make it the finest cycle you can buy today.

Your cycle is an investment

Hercules

is the best value for your money

Made by: T. I. Cycles of India Limited, Madras

T-312 a

SOUNDS GOOD!

LOOKS GOOD!

MODEL 0254

NOW WITH TONE CONTROL

- 6-valve
- All-wave
- 4-band
- AC or AC/DC (Two models)
- Rs. 390 plus local taxes

murphy radio

Yours for Years and Years!

MURPHY RADIO OF INDIA LTD., BOMBAY 12.

MR/46

Distributors :

Bombay and Delhi : Lakhanpal Private Ltd.,
29, New Queen's Road, Bombay-4

Calcutta : Debsons Private Ltd.,
2, Madan Street, Calcutta-13

Madras : Mohamed Ebrahim & Co. Private Ltd.,
Victory House, 7/8, Mount Road, Madras-2

INDEX TO ADVERTISERS

SCHEDULE OF RATES FOR ADVERTISEMENT IN ISI BULLETIN

Position	Full Page	Half Page	Quarter Page
	Rs	Rs	Rs
Fourth cover page:			
1 insertion	180	105	60
6 insertions	900	525	300
Third cover page & page facing second cover page:			
1 insertion	160	90	50
6 insertions	800	450	250
Other pages:			
1 insertion	140	80	45
6 insertions	700	400	225

Note — Blocks intended for use in advertisements should not exceed the following prescribed sizes:

Full page: Height 254 mm (10 in.)
Width 170 mm (6¾ in.)

Half page: Height 124 mm (4⅞ in.) or 254 mm (10 in.)
Width 170 mm (6¾ in.) or 82 mm (3¼ in.)

Quarter page: Height 124 mm (4⅞ in.) or 60 mm 2 5/16 in.)
Width 82 mm (3¼ in.) or 170 mm 6¾ in.)

TATA-FISON on the job

Terrible scourges—malaria and filariasis (*said Tata*).

But the Government's doing a splendid job eradicating them (*said Fison*).

Let's get the job done sooner by helping all we can (*said Tata*).

Tata-Fison help the Government's anti-malaria and anti-filaria campaigns by supplying hundreds of tons of **GEIGY MALARIA SPRAY** *and* **HEXIDOLE 950.** *They are also expanding the manufacturing capacity of their plant to meet further demands.*

As the Mosquito said to the Bed Bug

TATA-FISON

will be the death of us!

TFY-11

BUILT TO CARRY MORE PASSENGERS

The LEYLAND COMET chassis is not just assembled in India. It is being progressively manufactured here. At the end of 1957 40% of the COMET was manufactured in India. It will increase to over 90% by the end of 1959.

LEYLAND COMET

THE BIG CHASSIS FOR THE BIG JOB

The LEYLAND COMET is the longest wheelbase passenger chassis made in India. Its large body space accommodates at least six more passengers in every trip than any other make. Its low fuel consumption and easy maintenance have made it the ideal passenger transport vehicle everywhere. No wonder LEYLAND is the first choice in passenger transport in over 50 countries around the world.

ASHOK LEYLAND LIMITED, Ennore, Madras

Main Dealers: Bombay State and Andhra Pradesh: **Automotive Manufacturers Private Ltd**, 108, Bazaar Ward, Kurla, Bombay 37. ● West Bengal, Bihar & Assam: **Associated Indian Enterprises (Private) Ltd**, 206, Lower Circular Rd., Calcutta-17. ● Uttar Pradesh: **Dharam Singh Ram Singh(Motors)Private Ltd**, 25, Bhopal House, Lal Bagh, Lucknow ● Delhi, Himachal Pradesh, Punjab & Rajasthan: **Globe Motors Private Ltd**, Saraldham, 1/2, Jhandewala, New Delhi. ● Madras, Mysore and Kerala: **T. V. Sundram Iyengar Sons Private Ltd**, West Veli Street, Madurai and **Sundaram Motors Private Ltd.**, Mount Road, Madras. ● Jammu & Kashmir: **Jay Kay Automobiles**, Residency Road, Srinagar (Kashmir). ● Madhya Pradesh: **C. Eduljee & Co.**, Kamptee Road, Nagpur.

AL 271 a

S
BULLETIN

. 10 SEPTEMBER 1958 No. 5

teel Economy Through ndian Standards*

LAL C. VERMAN

STORICAL BACKGROUND

'NDIA has been experiencing steel scarcity for many years but it became much more acute since the Second World War. It interesting to note that the Indian eel industry reached its peak pro-ıction of 1 360 000 tons during the ar but this came down to about 4 000 tons in 1948. Production ıuld be stepped up only gradually about one million tons by 1952. Shortly after the attainment of dependence, ambitious plans for pid industrialization of the country ere formulated. Steel being an sential basic raw material for all dustries, serious thought was given increase its production. It was, ıwever, realized that in spite of the ans for the expansion of production the two existing steel mills, there ould still remain considerable gap etween the supply and demand of eel in years to come. The question import of large quantities of steel as ruled out in view of the necessity give first priority to imports of. od and capital equipment.

It was apparent that production ust be enhanced. Simultaneously, ıe question of effecting savings in eel consumption assumed urgent nportance for a speedy develop-ıent of national economy. The alization of this fact led the Direc-ırate General of Industries & Sup-lies, Government of India, to re-uest the Institution of Engineers India) to examine the question of ınservation of steel from all aspects. The committee, appointed in May 1949 by the Institution under the chairmanship of the late Dr. A. H. Pandya, examined this question in great detail and suggested:

a) the use of alternate materials to the maximum possible extent,
b) making improvements in design procedures by improving the existing codes,
c) the increased use of steel of higher performance and rationalization of steel sections, and
d) the promotion of welding in place of riveting.

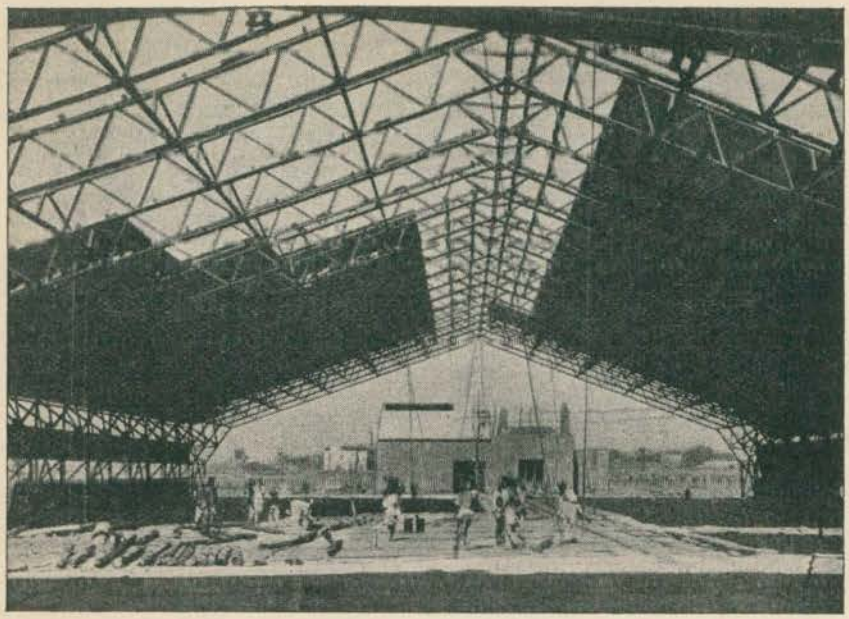
During the same period, Dr. O. G. F. Paulssen, a member of the International Light Weight Steels, Bombay, was trying to develop the use of cold-formed light-gauge steel construction in this country. Apart from submitting a memorandum to the Planning Commission outlining ways and means of saving steel, Dr. Paulssen was actively interested in codifying these practices through standards. The Indian Standards Institution made a proposal to the Government of India for initiating work to attack the problem through a comprehensive project of standardization.

At a special meeting of the iron and steel industry, the Planning Commission considered all these suggestions in December 1950 and appointed a subcommittee under the chairmanship of Dr. A. Nagaraja Rao to examine the problem in detail. The Commission adopted the views of this subcommittee and recommended to the Government of India that the Indian Standards Institution should take up the steel economy programme involving the formulation and implementation of standards relating to steel production and use.

The ISI which was hardly four years old at the time was conscious of the responsibility placed on its shoulders. Such a comprehensive programme of national standardization had never been tackled by any standards organization of the world. Many complex problems were involved, some requiring close study and careful compilation of available data and experience of industrially advanced countries, some requiring critical examination of India's own needs and potentialities, others demanding breaking of new ground and answers to questions of basic engineering importance. It was evident from the beginning that nothing short of bold original thinking and a fresh outlook could assure speedy results, and speedy results were vital if full advantage were to be reaped for the benefit of the fast-developing economy of the country.

It was essential, therefore, that the ground-work be most carefully prepared and competent staff recruited to work under the leadership of an engineer of wide outlook and experience. The ISI was fortunate in procuring the services of Shri T. V. Joseph, a young and wide-awake structural engineer from the Indian Railways. Also, the services of a firm of consultants, Messrs. Ramseyer & Miller of New York,

* This article also appeared in the Steel Supplement of Hindustan Times, New Delhi, dated 7 August 1958 — *Ed.*



A 135 ft Wide Structure Being Built with Very Light Members. The Steel Saved by Using Cold-Formed Light-Gauge Sections Instead of the Usual Heavy Sections in This Building will be About 30 Percent

were secured through the Technical Co-operation Mission of the US Government. Active co-operation of the major steel producers of India, of leading metallurgists and structural engineers, and Government ministries and departments concerned was enlisted in due course.

All this took the best part of three years, for the search for experts had to be made not only in India but also in most leading countries of the world before arrangements indicated were finalized. An expert committee consisting of representatives drawn from industry, science and Government was set up under the chairmanship of one of the most eminent administrators with wide knowledge of steel production, namely Shri J. J. Ghandy, Director-in-Charge of Tata Iron & Steel Co. With the inauguration by Shri T. T. Krishnamachari, the then Minister of Commerce & Industry and President of ISI, the 'Steel Economy Project' was finally launched on 13 February 1954, which incidentally was not a Friday.

While work on this project proceeded and before two years had elapsed, advantages and the need for an all-out attack on standardization of metals and metal products, and for co-ordinating the metallurgical aspects of these products with the use aspect became so apparent that ISI had to decide to create a new Division known as the Structural and Metals Division whose responsibility included not only the 'Steel Economy Project' but also all other metals and structural engineering. This Division was inaugurated by Shri Manubhai Shah, Minister for Heavy Industries, on 26 October 1956.

STEEL ECONOMY PROGRAMME OF ISI

The comprehensive character of the Steel Economy Project may be gauged by the brief statement of its scope:

a) Formulation of standards for hot-rolled sections, such as I-beams, angles, channels, etc;
b) Formulation of standards for cold-formed light-gauge sections, made from sheet steel or the so-called steel strip;
c) Formulation of codes of practice for the design of steel structures, including the question of liberalizing factors of safety;
d) Preparation of standard specifications, codes of practice and other aides for popularizing welding, as a medium of fabrication of steel structures;
e) Sponsoring experimental and other investigations necessary for the formulation of higher efficiency standards, relating to production and use of structural steel; and
f) Preparation of typical designs, drawings and other aids to the implementation of the higher efficiency standards.

Hot-Rolled Sections

During the past 40 years, engineers have come to realize that the capacity of any structural member to take and transfer loads and forces depends upon the arrangement of the metal in the member and that this capacity could be raised by judicious distribution of the material in the cross section of the member, thus increasing the efficiency of the metal used. This realization has led to the development of the so-called science of shape engineering now commonly accepted and widely applied in most branches of engineering. Mathematical analysis and theories coupled with experimental verification, which constitute this science, has resulted in many improvements, such as triangular roof trusses replacing horizontal beam, columns built up of thin members replacing the solid sections, open web girders replacing solid web members for heavy loads, and so forth.

In spite of this development in shape engineering, hot-rolled steel sections standardized over 40 years ago are still being rolled and used in this country. The only attempt at improvement was the example set by the Tata Iron & Steel Co., who had placed on the market just before the Second World War certain light weight beams which were up to 25 percent lighter than conventional sections.

A study of the work being done in other countries of the world with regard to standardization of hot-rolled sections indicated that improvements in standards were carried out mainly through rationalization in the number and grading of sections and through redesign of certain sections. Rationalization in number and improvement to gradation of sections have been attempted in practically all steel producing countries. But, improvements effected through scientific analysis of efficiency properties were particularly noticeable in countries where there was severe competition among the rolling mills in the home market and in the export market, or where the steel industry had to face severe competition from re-inforced and pre-stressed concrete. Whatever the motives, these developments in overseas countries furnished an excellent starting point for the ISI project whose objective was to achieve national economy.

Four years of intensive study by the specialist staff and committee members involving prolonged interchange of views during discussions at a number of sittings of the IS

xpert Committee and its subcom-ittees has resulted in the formula-on of Indian Standards on im-roved and rationalized series of eams, channels, angles, tee bars id bulb angles. For obvious rea-ons, all these standards have been ased on metric system of measure-ents. In formulating the high fficiency standards, note has been aken of many factors, such as the esent production standards in idia; limitations and capabilities the existing mills and of the new ills being installed; the national andards and the competitive com-any standards introduced in other ountries; the unsuccessful attempts ade in other countries towards iprovement of standards for steel ctions; the importance aspect of fficiency in the utilization of sec-ons in structures; the analysis of ie factors which affect the efficiency id the extent to which it is possible achieve efficiency in practice ider Indian working conditions.

These Indian Standards which are ow available when fully imple-ented, will lead to a very definite ving of steel material as compared sections based on existing stan-ards. The extent of saving will, of ourse, vary in individual cases, but is estimated that it will be no less an 5 percent, reaching a maximum 15 percent or even over in some ases. An average saving of 10 per-nt would be considered quite gnificant figure from national point view.

old-Formed Light-Gauge ctions

Another application of shape engi-eering is in cold-formed light-auge steel sections, which are manu-ctured by cold-forming light-gauge eel sheet or steel strip of suitable idths and thickness from 1·2 mm 4·5 mm, in a press brake or a olling mill. Commonly used shapes e angles, channels, zees (Z) and rtain irregular shapes desired to eet requirements of a particular esign. Combinations of sections e made by connecting elements of vo or more simpler sections by seam elds, bolts, screws, or some other itable fastening device.

Cold-formed light-gauge sections e increasingly used in building nstruction, aircraft, automobile nd various other mobile or statio-ary constructions where light weight nd strength are specially desired. hey have become popular in the SA, the UK and certain other uropean countries. In India also, they have been used but to a very limited extent in some of the indus-tries like coach-building, wagon-building and in building construc-tion. Apart from lightness and strength, cold-formed light-gauge sections have an additional advan-tage from fabrication and transpor-tation points of view. It is anti-cipated that the use of these sections will result in economy of steel to the extent of about 40 percent.

Although it is appreciated that the inherent advantage of using light-gauge sections is best exploited by designing individual members to suit the requirements of a given job, yet it is felt that further advantages could be gained, if a set of standar-dized sections were made available which could meet effectively the normal day-to-day requirements of designer and erector. With this end in view, work is now in progress to formulate an Indian Standard for cold-formed light-gauge structural steel sections. So far as known, no other country had attempted na-tional standardization of such sec-tions, but Indian engineers consider that, in the absence of competition among fabricators of such sections and in view of India's peculiar needs, ISI could tackle this job to useful advantage.

Hot-rolled strip of 12½ in. width is already available from the Tata Iron & Steel Co. Steel strip of larger widths and specifically suited for cold-forming is expected to become available by about 1960 from the steel mill at Rourkela. So, in the very near future, ground will be ready for new enterprise to enter this useful field.

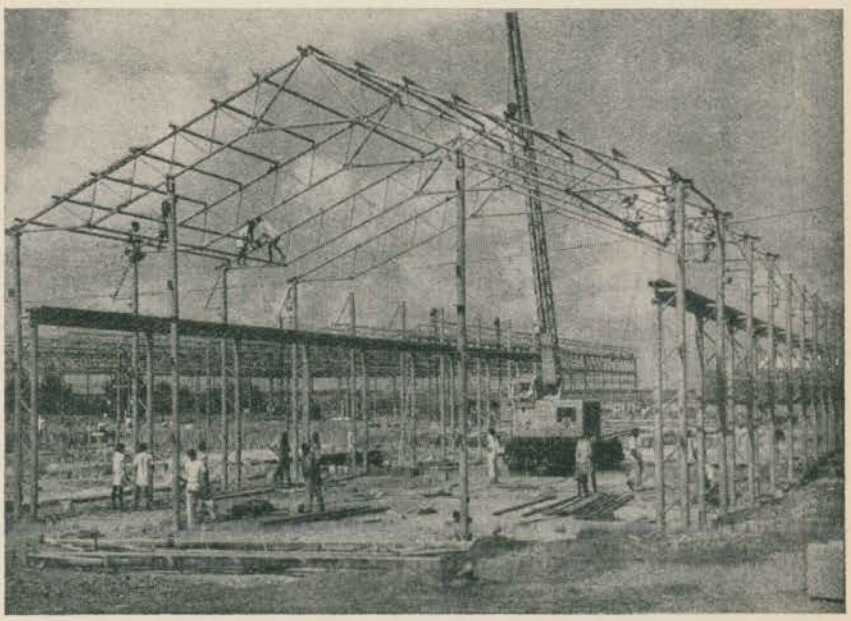
Standards for Tubular Sections

Study of shape engineering force-fully brings out the superior struc-tural characteristics of tubes or pipes. Weight for weight tubular sections could carry much more load than ordinary rolled sections and they are easier to maintain. Their load-bearing advantages become partic-ularly significant where axial com-pressive and torsional stresses are involved. With the development of new fabrication techniques suited to tubular construction, their use in overseas countries has made rapid strides during the past decade or two. They are also becoming in-creasingly popular for common types of structures in India. Two of the existing mills in this country are expected to provide tubes of qua-lities suitable for structural purposes. It has been estimated that the use of tubes in certain types of structures could lead to a saving in steel to the extent of about 15 to 20 percent.

A draft Indian Standard has been prepared for tubes suitable for use in general building construction, which will soon be available.

Standard Design Codes

In the beginning of the present century it was the practice to allow



Slender Tubular Sections Being Used in the framework of a Modern Pump House. Replacement of the Sections Traditionally Used in Such Construction is Estimated to Save Steel between 20 and 30 Percent

large factors of safety, as designers had no adequate and reliable data relating to external loads to which structures might be subjected. There was very little experimental research data on prototype structures. The analysis of structures was rather elementary, and in a number of cases was based on empirical and semi-empirical formulæ with very little theoretical support. Great strides have since been made in analysing the stresses developed under loads in structures, and in more precise determination of loads to be allowed in the design of structures. Actual behaviour of structures under complex loads is also better known today than in the past.

The ISI Committee made an intensive study of national and departmental codes for the use of steel, currently prevalent in India and various countries of the world. Considerable data were also collected in this country from different regions with regard to wind pressures, temperature variations, working loads, earthquake effects, etc. As a result of this intensive study, the basic code for the design of steel structures was formulated, and this has now been published. Some of the design formulæ incorporated in the Indian Standard Code represent a definite improvement over those current in a number of other countries. Further, the permissible stresses have been liberalized. This code also covers the use of high tensile steel for structural purposes. The correct application of this code in the design of structures is expected to result in considerable savings in steel.

Other basic codes for design of structures include one for the use of tubular sections in structures (already published) and another for the use of cold-formed light-gauge sections in general building construction (in print). Work is also in progress on other codes of practice, such as design of cranes, transmission towers, etc.

Welding

The technique of welding came into vogue in America and Europe during the First World War. India took to it slowly sometime during 1935. Although there is a growing appreciation of the advantages of welding, the progress so far made cannot be regarded as satisfactory or adequate. After a detailed study of the present position, the ISI Committee was of the view that development of welding on correct lines in this country could take place only if suitable welding materials and equipment were made readily available, satisfactory design procedures were followed and an acceptable basis was established for the training and periodical testing of welders and for inspection of welds at site. With this point in view a number of Indian Standards of basic importance pertaining to welding have already been published, which include a code of practice for use of metal arc welding for general construction in mild steel, code of practice for training and testing of metal arc welders, qualifying tests for metal arc welders, general recommendations for the radiographic examination of fusion welded joints, code of practice for safety and health requirements in welding, and specifications for electrodes, filler rods and equipment for eye- and face-protection during welding.

It is estimated that the use of welding in place of riveting would result in saving steel from 10 to 30 percent, depending upon the type of structure.

Handbooks

It was realized that merely the formulation and publication of standard specifications and codes of practice would not be sufficient to ensure that these would be correctly interpreted and applied in practice to the maximum advantage. Although the basic training imparted in our engineering colleges is more or less on the same lines as in other countries, our engineering graduates do not have the same opportunity to gain experience in well established design offices under the guidance of experienced engineers. Large majority of young engineers who enter the field of design are left to their own resources in gaining experience. Therefore, the designs prepared by them cannot always be the most economical. Thus, in order to assist young designers and also fabricators, work has been undertaken to prepare a number of handbooks giving worked out design examples of several typical structures, designed to the best advantage as regards economy in material and labour. These handbooks, in addition to providing explanations to the Indian Standard Codes and Specifications, would also give charts, tables and graphs, thus making the task of the designer easy and less time consuming. The first of the series to be shortly published is the Handbook for Structural Engineers giving properties of steel sections.

Structural Research

The ISI Sectional Committe found during its work on the Ste Economy Project that on many sub jects the available Indian data we inadequate, and that the data avai able from outside sources were n directly usable due to the wide different conditions under whic they were collected. On certa other problems, practical experien and experimental data were eith not altogether available or whe available, were incomplete. After close scrutiny of these problems ar with the collaboration of the Counc of Scientific & Industrial Researc various institutions in India we approached to undertake a co-ord nated programme of experiment investigations. Progress made far has not been very substanti due to many difficulties, such as the supply of raw materials a equipment and shortage of technic personnel. These difficulties a now being gradually overcome a wherever possible the required equi ment is being indigenously fabricat at research centres. The results investigations wherever alrea available have been incorporated the published Indian Standard those to follow will help improve t existing standards. Work is now progress with regard to investig tions relating to corrosion protecti of steel structures with particul reference to light-gauge steel. Th programme covers classification areas in India on the basis of corr sion potential of the prevaili atmosphere, development of suitab protective coatings, accelerated m thods of tests to assess the corrosiv ness of various environments, an evolution of corrosion protectic schemes. Other investigatio which are in progress deal with col forming of strip steel into structur shapes through cold rolling and col pressing; methods of fastening col formed light-gauge steel section effect of cold straightening, bendin and punching upon the physical pr perties of steel; and establishin standard welding procedures an improved methods of testing wel test specimens.

IMPLEMENTATION OF INDIAN STANDARDS

In a report of the progress of wor of the Steel Economy Project sub mitted to the Planning Commissio

uring February 1957 by the Tech-
ical Committee of the ISI, certain
ecommendations were made for
ıe implementation of the Indian
tandards so far issued. As a result
the further endorsement of these
ecommendations by the Materials
conomy Committee of the Plan-
ing Commission under the chair-
ıanship of the author, it has now
en decided that hot-rolled sections
nforming to the Indian Standard
ecifications should be produced in
l the new mills as also in the
xpansions proposed in the existing
ills. The existing mills would
rogressively change over to the
roduction of new sections as and
hen it becomes necessary to replace
ıe present equipment. A pro-
amme for the production of these
ctions in the existing mills has
ready been drawn up by the Steel
ontroller. One of the metric sec-
ons has already been produced and
ıarketed by the Indian Iron & Steel
o. during April 1958. Many other
ctions are expected to be produced
y the Tata Iron & Steel Co. and the
ıdian Iron & Steel Co. in the very
ar future. The Iron & Steel Con-
oller has also issued a circular to
l the important consumers of steel
ıtlining the programme of avail-
ility of the new sections and has
quested that all their future de-
ands for steel should be in terms of
ıese sections.

The Directorate General of Sup-
ies & Disposals, and the Railways
ıve already adopted the Indian
andards for hot-rolled sections.
is further understood that the
inistry of Railways have also ad-
ted the Indian Standard Code of
ractice for Use of Structural Steel
General Building Construction.

The manufacturers of welding
ectrodes claim to manufacture
ectrodes conforming to Indian
andard specifications. Although
ıere is at present a scarcity of suit-
le welding equipment, it is ex-
cted that manufacture of many of
ıe equipment items will be started
on in this country. Work is now
ıderway for formulation of suitable
ecifications for welding equipment
suit Indian conditions.

There is also a proposal that uni-
rsities and the technical institu-
ons in India should adopt these
ıdian Standard specifications and
des of practice as a part of their
aching curricula.

NSPECTION AND CERTIFICATION

Under the existing procedure,
irector General of Supplies &
Disposals has stationed inspectors at the factories of the Tata Iron & Steel Co. and the Indian Iron & Steel Co. to inspect the structural steel required by the Government departments. These inspectors also inspect and certify the steel for open market put up to them by the firms. The materials which conform to the required properties are certified for sale under the category of ' tested steel '. Nevertheless, an appreciable tonnage of steel meant for structural purposes is at present sold as ' untested steel '. Since the strength properties of this steel are not guaranteed or certified or even known, it is not possible to use it efficiently by allowing stresses and loads to the maximum safe limits. In order to make the best use of this category of steel, a separate standard for commercial quality steel is being drawn up by the ISI, which even though not up to the requirements of the normal tested quality is nevertheless usable, provided its physical and chemical properties were determined and certified or guaranteed by the manufacturer.

A suggestion has also been made that, whereas steel for Government purchases is to be inspected by the Director General of Supplies & Disposals, the material to be sold in the market may be brought under the ISI Certification Marks Scheme. If this proposal is accepted, ISI would formulate the necessary scheme for inspection, testing and certification of steel in collaboration with the Inspectorate of the Director General.

USE OF ALTERNATIVE MATERIALS

One of the important recommendations of the Pandya Committee was to encourage the use of alternative materials in place of steel as far as possible. Such materials include stones, bricks, timber, cement concrete (plain and reinforced), aluminium and other alloys. A number of Indian Standards have been formulated for the use of building stones and bricks. Codes of practice for plain and reinforced concrete for general building construction, dams and other massive structures, have also been formulated. Work is now in progress for the formulation of a code of practice for the use of pre-stressed concrete in structures.

Although timber is a good substitute material, there is an acute shortage of structural timber of the requisite quality. Timber of secondary species could be used for structural purposes, provided it was suitably treated. Further, the structural properties of Indian timbers and methods of joining are not so well known to engineers in this country. In order to make available to engineers data with regard to the types of timber available, the purpose for which they could be used and method of treating them, Indian Standards have been formulated for the classification of commercial timber and their zonal distribution; code of practice for preservation of timber; and code of practice for use of structural timber in building (material, grading and design).

Work is also in progress for the formulation of specifications for aluminium sections for use in structures.

STEEL ECONOMY PROJECT CONTINUES

Work on basic codes and standards for production and use of steel has been practically completed. Work now in progress includes formulation of standards for cold-formed light-gauge sections, piling sections, special channels and aluminium structural sections. Handbooks for structural engineers now under preparation would cover the design of steel beams and plate girders, columns and struts, roof strusses, single-storey industrial and mill type buildings, multi-storey framed structures for offices and residences, transmission towers, cranes and hoists, large span shed-type buildings, tubular structures, structures using light-gauge sections, rigid frame structures, and application of plastic theory in the design of steel structures.

In the field of welding, the work in progress includes a handbook for welders, covered electrodes for metal arc welding of medium and high tensile structural steel, code of practice for training of oxy-acetylene welders, code of procedure for electric arc welding, qualifying tests for welders engaged in welding pipelines, and assessment of welds by radiographic examination.

Another important programme of work initiated by the Indian Standards Institution includes rationalization and standardization of alloy steels and special steels. Practically all our major industries are dependent on alloy and special steels. At present literally hundreds of varieties of alloy and special steels are used in this country, which are required to conform to a multiplicity of specifications of the countries from where they are imported. Apart from the foreign exchange position

emphasizing the need to produce the required steels within the country at the earliest possible date, the situation demands immediate rationalization and standardization of a limited number of types to meet all Indian needs. And, this is what ISI is attempting.

CONCLUSION

The work so far done by the Indian Standards Institution relating to the production and utilization of steel indicates that the nation as a whole, and producers and consumers in particular, have large benefits to derive. The overall economy in steel possible through the implementation of these standards is expected to be at least 25 percent. This would mean conservation of available resources, both material and manpower, and a considerable saving in foreign exchange. In other words, where 100 tons steel was required on the basis of existing standards and practices, only 75 tons will be needed to serve the same purpose, resulting in proportionate economy in material, fabrication and erection costs.

There has been wide scale appreciation abroad of the work done in India with regard to steel economy. The United Nations Economic Commission for Latin America has decided to institute a similar programme of work. The Subcommittee on Iron and Steel of the UN Commission for Asia and the Far East has suggested that a Steel Economy Programme similar to the one initiated by the Indian Standards Institution should be established in each country of the ECAFE region, with the collaboration, if need be, of bodies like the Indian Standards Institution. The Commonwealth countries, which met in New Delhi in 1957 in a Standards Conference, expressly welcomed the lead given by India.

The Technical Committee on Steel of the International Organization for Standardization has accepted India's proposal to take up work on the rational design of hot-rolled structural steel sections for international standardization. When this work is completed and international standards for new sections are generally accepted by all countries, the world as a whole will stand to benefit.

INDIAN STANDARDS CONVENTION, 1958

Prime Minister to Inaugurate Opening Session

Prime Minister Shri Jawaharlal Nehru will inaugurate the Indian Standards Convention, scheduled to be held at New Delhi from 24 to 29 November 1958.

Full particulars about the subjects to be discussed at each of the eight technical sessions of this Convention were reported in the last issue of this Bulletin*. More details have been finalized since then. A Reception Committee comprising representatives of various chambers of commerce and trade, associations of trade and industries, prominent businessmen and industrialists in the northern region has been formed under the chairmanship of Lala Bharat Ram of Delhi Cloth & General Mills Ltd., Delhi. The Reception Committee will, in addition to assisting in the successful implementation of Convention programme, arrange social receptions and technical visits for the visiting delegates.

The technical sessions will be presided over by the following:

Session	Chairman
S 1 Consumer Standards and Certification	Shrimati Kamla Devi Chattopadhyay
S 2 Metric Conversion	Shri K. V. Venkatachalan, Joint Secretary, Union Ministry of Commerce & Industry
S 3 Standardization and Products	Dr. P. S. Lokanathan, Chairman, Productivity Council
S 4 Standardization and Export Promotion	Shri C. R. B. Menon, Director, Commercial Intelligence & Statistics, Calcutta
S 5 Safety and Health Standards	Shri N. S. Mankikar, Chief Adviser, Factories
S 6 Sampling for Quality Evaluation	Dr. V. G. Panse, Statistical Adviser, Indian Council of Agricultural Research (*to be confirmed*)
S 7 Steel Economy and Special Steels	Shri J. J. Ghandy, Director, Tata Iron & Steel Co. Ltd.
S 8 Modular Planning, Design and Construction in Building Industry	Shri A. K. Chanda, Deputy Minister, Union Ministry of Works, Housing & Supply

Over 500 delegates are expected to participate in the deliberations of these sessions for which some sixty technical papers have been received.

*See ISI Bull., V. 10, No. 4, p. 164, July 1958.

Evaluation of Clays Suitable for Pencil Manufacture

B. R. MARATHE, GOPALASWAMY IYENGER, K. C. AGARWAL & G. D. JOGLEKAR
NATIONAL PHYSICAL LABORATORY OF INDIA

With the development of industrialization and widespread literacy in recent years, the consumption of pencils has been steadily increasing. Appreciating the need for maintaining a uniformly high level of quality of pencils, the ISI took up the work of formulating national standards for their grading and other general requirements. The National Physical Laboratory (India) is assisting the ISI Sectional Committee in successfully pursuing the work, which is now well in hand. Three papers* on this subject have already appeared in earlier issues of this Bulletin.

This paper deals with tests on sixteen samples of clays supplied by pencil manufacturers. Clays play an important role in the manufacture of pencil leads as they are responsible for the bonding of graphite particles. Tests on these clays include the chemical analysis, particle size distribution, plasticity index, *p*H value and reflectance of the clay samples. The paper suggests that two or more clays may be blended to get the desired properties which make clays suitable for use in the manufacture of pencil leads — *Ed.*

*1) Tests for Quality Evaluation of Black Lead Pencils. *ISI Bull.*, Vol 7, p. 16-22 (1955).
2) Measurement of Coefficient of Friction of Lead Pencils. *Ibid*, Vol 8, p. 132-134 (1956).
3) Graphite for Pencil Manufacture. *Ibid*, Vol 10, No. 4, p. 159-162 (1958).

INTRODUCTION

1 The quality of a black lead ɔncil depends among other things ı the fineness of the graphite ɔwder and clay which form its main ɔnstituents. The former is resɔnsible for the blackness of the riting and the latter for the bonding the graphite particles[1]. If fine raphite and clay powders are used ı the manufacture of leads the ıarkings would be smooth and uniɔrm. In some pencils of inferior uality one sometimes scratches a aper while writing; this is due to ıe presence of abnormally large clay articles at the tip of the lead. It is, ıerefore, necessary to remove the ɔarser particles of clay from the raphite powder before its use for ıe manufacture of pencils.

. CHEMICAL AND PHYSICAL PROPERTIES OF CLAYS

.0 There is no simple or rapid ıethod for complete evaluation of ıe clays suitable for pencil manuıcture. It is, therefore, necessary ɔ know the chemical and mineral lassification and physical characeristics for complete evaluation of clay mineral. The work reported ere deals with the chemical analysis nd the study of physical characterıtics, such as the measurement of the article size distribution, plasticity, H value and percent reflectance of xteen clay samples used in the encil industry. These were suplied by pencil manufacturers of this ɔuntry. Some of these samples ere imported by them. Mineral lentification has not been underıken in these studies.

.1 Chemical Analysis — The cheıical composition of clays, in eneral, may be written as Al_2O_3. $SiO_2.2H_2O$; some free silica along ith some other silicates of iron, alcium, sodium, etc, is also present. he chemical composition alone, owever, cannot be utilized to valuate the suitability of a partiular clay. It neither brings out he manner in which the elements are combined, nor does it indicate the fineness or shape of clay particles, which influence the behaviour of a clay material, during working. However, chemical analysis of clay is helpful in understanding its behaviour during baking. The chemical analysis of the clay samples is given in Table I; the percentage of alkalies has been determined by the difference method.

1.2 Particle Size Analysis

1.2.1 Ten grams of clay were mixed in 400 cc of distilled water in a high speed mechanical mixer for fifteen minutes. This was passed through BS Sieve 300 (equivalent to IS Sieve 5) and the weight of oversize fraction was determined (*see* Table II). No dispersing agent was used in these tests.

1.2.2 A sedimentation apparatus similar to that used by Carey and Stairmand[2] was used for the determination of particle size of the clay samples. The size distribution was also determined with a Turbidimeter and the agreement between the two sets of results has been found to be quite good[3].

1.2.3 Results of the particle size analysis of the fraction passing through BS Sieve 300 by the sedimentation method are given in Table III. The concentration of the powder used for this test was about 0·25 g in 100 cc of water.

1.2.4 The particle size analysis of all the clay samples was then carried out by using a Wagner Turbidimeter. The concentration of the powder used in these experiments was about 0·03 g in 100 cc of water. After determining the densities of the clay sample and the dispersing medium (water), the viscosity of the latter, and the height of fall of particles in the liquid medium, the time of settling of the different sized particles were calculated (*see* Table IV).

1.2.4.1 A short account of the method of calculating the size distribution of clay particles by Turbidimeter is discussed below. The light extinction measurements are based upon Lambert-Beer Law, which may be expressed as:

$$\log \frac{I_0}{I_1} = \frac{KCL}{d} \quad \ldots \quad \ldots \quad (1)$$

where

I_0 and I_1 = the intensities of the light after transmission through the liquid and the suspension respectively;
K = a constant known as extinction coefficient;
C = mass concentration of particles in g per ml;
L = length of the light path in the suspension in cm; and
d = diameter of particles in microns.

TABLE I CHEMICAL ANALYSIS OF CLAY SAMPLES

(*See* 1.1)

Sample No.	Source	Supplier	Loss on Drying at 105°-110°C	Analysis of Dried Sample							
				Loss on Ignition	Silica	Iron Oxide	Aluminium Oxide	Titanium Oxide	Calcium Oxide	MgO	Total
			percent	percent	percent	percent	percent	percent	percent	percent	percent
1	Indigenous	A	2·50	13·88	40·88	1·86	34·15	5·78	1·43	0·26	98·24
2	Imported	A	4·76	12·52	50·42	1·51	31·58	1·52	0·99	0·86	99·40
3	Indigenous	A	1·88	10·46	45·80	1·37	38·36	—	0·67	0·56	97·22
4	Imported	B	3·53	13·83	46·67	2·25	32·15	1·44	1·12	0·49	97·95
5	Indigenous	B	4·10	9·77	51·70	4·03	24·92	0·76	0·97	1·14	93·29
6	Indigenous	B	12·11	13·63	48·98	2·09	23·60	3·64	2·35	1·15	95·44
7	Indigenous	C	4·41	11·04	55·06	4·50	20·83	1·33	1·43	2·43	96·62
8	Imported	C	3·87	12·85	49·76	0·72	31·56	1·67	0·71	0·74	98·01
9	Indigenous	D	4·13	8·92	55·62	9·29	17·76	1·79	2·23	—	95·61
10	Imported	D	3·21	12·70	49·81	1·96	33·61	1·78	1·67	0·34	100·67
11	Indigenous	E	1·78	11·45	48·81	1·17	31·84	2·31	1·06	0·16	97·80
12	Indigenous	F	2·72	12·57	46·04	7·93	32·02	1·10	1·04	—	100·70
13	Indigenous	F	2·72	11·91	48·11	4·78	27·23	1·29	1·95	0·40	95·67
14	Indigenous	G	7·36	8·64	50·82	7·44	19·22	1·75	1·35	0·21	89·43
15	Imported	G	5·15	12·39	42·84	4·29	33·82	1·30	1·07	0·08	95·79
16	Imported	H	5·20	12·72	47·70	2·15	32·96	1·52	1·39	0·11	98·55

Alkalies by difference.

TABLE II SIEVE ANALYSIS OF CLAY SAMPLES

(*See* 1.2.1)

Sieve Analysis	Sample No.															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Percent retained on BS Sieve 300	0·3	0·2	0·1	0·6	0·6	19·0	0·3	0·1	11·0	1·2	1·7	0·8	2·3	0·6	0·3	0·

TABLE III PARTICLE SIZE DISTRIBUTION OF CLAY SAMPLES

(*See* 1.2.3)

Stokes' Dia	Method	Percent Undersize															
		Sample No.															
Microns		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
20	P	93	91	89	100	95	95	98	94	93	82	91	95	86	99	100	99
	T	97	97	98	98	98	89	99	90	91	78	90	94	82	94	97	99
16	P	92	88	85	99	92	92	96	90	90	77	85	92	80	97	99	97
	T	92	92	93	95	94	83	97	85	88	72	86	90	76	91	95	97
12	P	89	85	78	96	85	85	94	85	85	70	78	86	73	96	99	94
	T	89	89	85	91	86	75	95	78	84	66	81	82	69	89	91	94
8	P	84	80	65	88	75	75	90	74	77	58	67	77	61	90	97	89
	T	84	84	70	84	74	62	91	66	76	58	70	70	55	85	85	87
6	P	80	74	54	81	66	66	87	66	70	50	59	70	51	87	94	85
	T	80	80	60	78	66	55	87	55	72	52	62	60	45	80	82	83
4	P	70	65	40	70	52	52	81	54	59	38	47	58	37	77	85	75
	T	73	73	45	67	51	46	80	42	65	43	50	48	33	80	74	76
2	P	55	45	20	53	30	30	70	34	42	36	29	38	20	58	70	52
	T	56	56	24	50	35	35	60	25	50	36	30	30	16	75	63	66

P — Pipette Sedimentation method; T — Turbidimeter method.

TABLE IV SIZE ANALYSIS OF CLAY (NO. 10) WITH A TURBIDIMETER

(*See* 1.2.4)

Size	Depth	Time	Current (i)	log (i)	log ID_2/ID_1	log $\frac{ID_2}{ID_1} \times D$	Powder in Different Fractions	Cumulative Undersize
ıicrons	cm	sec	microamp				percent	percent
60	15	55	17·3	1·238 0				100·0
					0	0	0	
40	15	120	17·3	1·238 0				100·0
					0·005 0	0·175 0	9·0	
30	15	215	17·5	1·243 0				91·0
					0·007 4	0·185 0	9·6	
20	10	320	17·8	1·250 4				81·4
					0·023 8	0·358 0	18·6	
10	3·3	425	18·8	1·274 2				62·8
					0·022 5	0·180 0	9·4	
6	2·1	584	19·8	1·296 7				53·8
					0·021 4	0·107 0	5·6	
4	2·1	1 680	20·8	1·318 1				47·8
					0·460 1	0·920 2	47·8	
0	—	—	60·0	1·778 2				—

1.2.4.2 The above equation es not help us in obtaining the rticle size unless ' K ' is known. ır this reason, a different form of e equation was used:

$$\log \frac{I_0}{I_1} = ACL \quad \cdots \quad \cdots \quad (2)$$

ıere

A = the projected area of the particles in the light beam.

1.2.4.3 Skinner and Boas aube[4] have stated that according Cauchy, the total surface ' S ' of egularly shaped and randomly iented solids (free from re-entrant rfaces) is four times their pro- ɔted area.

1.2.4.4 The particles in the spension are allowed to settle ıwn and the values of the current e noted down at times t_1 and t_2. time t_1 particles of diameter equal and greater than d_1 settle down d at time t_2 particles of diameter ual to and greater than d_2 settle ıwn. $\frac{1}{CL} \times (\log Id_2/Id_1)$ gives the ojected area of the particles of dia- ɔters between d_1 and d_2.

1.2.4.5 Thus if $d_{1\text{-}2}$ is the mean lue of d_1 and d_2 and ρ the density the material, the weight of the aterial, assuming the particles to be ıherical, in the size range d_1 and d_2 given by:

$$\frac{4\rho d_{1\text{-}2}}{6} \times \frac{1}{CL} \times (\log Id_2/Id_1).$$

1.2.4.6 Similarly the weight of aterial in the size range d_2 and d_3 is ven by:

$$\frac{4\rho d_{2\text{-}3}}{6} \times \frac{1}{CL} \times (\log Id_3/Id_2)$$

nd so on for other size fractions.

1.2.4.7 If the material in different size ranges is determined in this way, then by adding the weight of these fractions, the total weight of the material can be obtained from which the percent weight of material in different size fractions can be calculated.

1.2.4.8 In the above expression $4\rho/6CL$ is a constant term for a given material and for a given apparatus. It is, therefore, necessary only to evaluate ($\log Id_2/Id_1) \times d_{1\text{-}2}$ for different size fractions to carry out the size analysis of a given powder.

1.2.4.9 The last but one column in Table IV gives the weight percentage of powder for clay No. 10 containing particles between the corresponding values of diameters (as given in column 1). The last column gives the cumulative percentage by weight of the undersize powder for the corresponding diameters. It must be remembered here that the value of ' K ' (in equation 1) may vary from one sample of clay to another but this does not affect the results of individual clay samples as they are taken on percentage basis.

1.2.4.10 The results obtained with the Turbidimeter for all the clays are given in Table III.

1.2.5 *Centrifugal Sedimentation*

1.2.5.1 In order to determine the size analysis of particles finer than one micron, centrifugal sedimentation was used. The concentration of clay was 1 g in 100 cc of water. The amount of suspension (5 cc) in each tube was such that the height of the surface of the suspension was one centimetre from the bottom of the tube. Readings were taken at two speeds of the centrifuge and for four different timings for each speed. The diameter of the particles was calculated by the formula given below:

$$d^2 = \frac{18\eta}{(\sigma-\rho)w^2t} \times \log_e \frac{h+r}{r} \quad \ldots(3)$$

where

d = diameter in cm;

η = viscosity of the liquid in poise;

$(\sigma-\rho)$ = the difference in densities of clay and water;

w = the angular velocity of the centrifuge in radians/sec;

t = time in sec;

h = height of the suspension (one centimetre in the present case); and

r = the radius of rotation of the liquid surface (20 cm).

1.2.5.2 At each time interval the centrifuge was stopped, the particular tube removed from it and the liquid decanted out. The tube was dried in an oven, cooled and weighed. The powder in the tube contained particles larger than the value calculated for the particular speed of the centrifuge and the time ' t '. However, it did also contain some smaller particles, which also settled down, because they had to travel a smaller distance than ' h '. In order to determine the amount of such particles, Oden's method of tangential intercept as stated by Jacobsen and Sullivan was used[5]. A 5 cc sample of the suspension was taken in a crucible to determine the concentration of the suspension. The weight of powder settled in the tubes was expressed as percentage of the amount of powder in the 5 cc sample

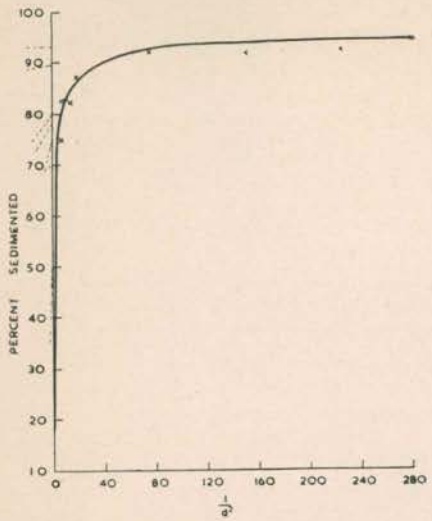


Fig 1 Oden's Method of Tangential Intercept For Clay No. 15 (See 1.2.5)

Marconi *p*H meter immediately after mixing. The results are given in Table VII.

1.5 Percent Reflectance — The clay was loosely packed in a transparent cell and the reflectance was determined with the help of a Photovolt reflectometer. The reflectance values are given in Table VII.

2. EVALUATION OF CLAYS

2.1 Chemical Analysis

2.1.1 The loss on drying at about 110°C for the imported clay samples is about 4 percent. Except for clay samples No. 6 and 14, the rest of the samples have values not appreciably varying from 4 percent. The average percent loss on ignition for all the samples except No. 5, 9 and 14 is about 12 percent. The variation in silica content is small.

2.1.2 Whereas the average iro oxide content of the importe samples is about 2 percent, some c the indigenous samples, like No. 12 and 14 show a much highe value.

2.1.3 The average percentage c aluminium oxide in the importe samples is about 33 while sampl No. 7, 9 and 14 give appreciably lo values. The ratio of silica to al mina is considered to be an index c the characteristic properties of clay The value of this ratio is about 1 for the imported clays found suitab by the manufacturers.

2.2 Particle Size

2.2.1 It would be seen from th results given in Table II that excep for samples No. 6 and 9, all oth samples show only a small amou of powder retained on BS Sieve 30 Table III shows that in the fractic passing through BS Sieve 300 mo than 90 percent of the powder is fin than 20 microns. However, belc this limit the size analysis vari with each sample. Whereas cla No. 7 and 15 have 70 percent powder below 2 microns, clays No. and 13 have only 20 percent belc 2 microns. In order to judge th effect of fineness of clay particl on the quality of leads it is necessa to make and test leads, using cla of different degrees of finene while other conditions remain t same.

2.2.2 Comparison of results wi the ordinary and photo-sediment tion methods shows that the vari tion in the two sets of values small. Although different sampl

TABLE V PARTICLE SIZE ANALYSIS OF CLAY NO. 15 BY CENTRIFUGAL SEDIMENTATION

(*See* 1.2.5)

Speed of Centrifuge rpm	T min	Diameter Microns	Weight Sedimented g	Percent Sedimented	Tangential Intercept	Percent Undersize
500	15	0·46	0·037 8	75	50	50
500	30	0·33	0·041 7	82	75	25
500	45	0·27	0·041 5	82	79	21
500	60	0·23	0·044 3	87	80	20
200 0	15	0·12	0·046 6	92	90	10
200 0	30	0·08	0·046 5	92	93	7
200 0	45	0·07	0·046 9	92	93	7
200 0	60	0·06	0·047 7	94	93	7

of the suspension. This percentage was plotted against $1/d^2$. Tangents were drawn to the curve at different values of $1/d^2$ and the intercepts on the vertical axis gave the values of percent undersize of the powder for the corresponding diameters.

1.2.5.3 A typical set of results for clay No. 15 is given in Table V and graphically represented in Fig 1. Table VI gives the data for all the clays studied. Figure 2 gives the particle size distribution for clay No. 15 after combining the results of the pipette and centrifugal sedimentation method.

1.3 Plasticity Index — The plasticity index of the pencil clays was determined according to the method prescribed by the American Society for Testing Materials[6]. The values of liquid limit, plasticity limit and plasticity index are given in Table VII.

1.4 *p*H Value — Ten grams of clay were mixed with 25 cc of water which had been distilled twice; the *p*H value was determined with a

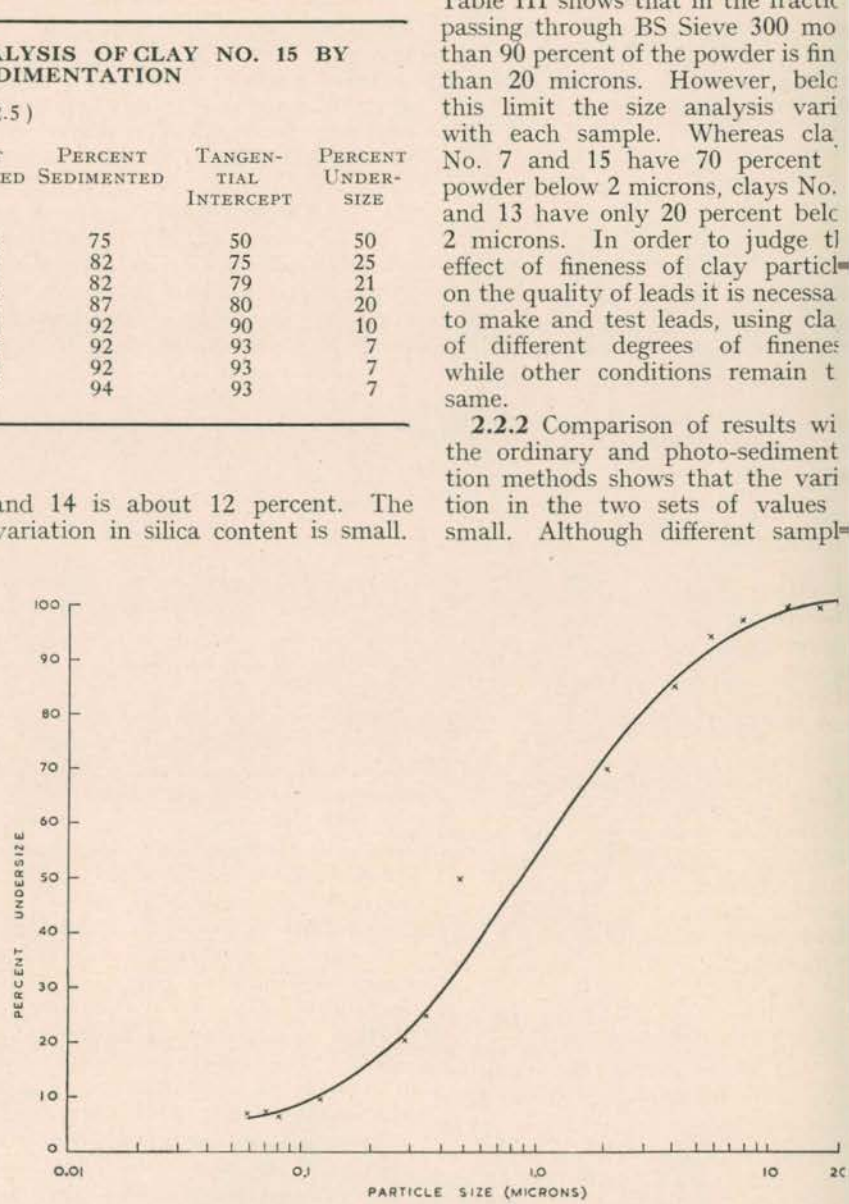


Fig 2 Particle Size Distribution of Clay No. 15 (See 1.2.5)

TABLE VI PARTICLE SIZE ANALYSIS OF PENCIL CLAYS BY CENTRIFUGAL SEDIMENTATION

(*See* 1.2.5)

Clay Sample No.	Size in Microns, Less Than							
	0·46	0·33	0·27	0·23	0·12	0·08	0·07	0·06
1	49	43	43	35	15	11	11	11
2	23	9	—	6	2	2	—	2
3	12	2	2	—	2	—	2	—
4	35	27	26	20	10	6	6	6
5	14	9	7	6	5	5	5	5
6	14	11	—	9	6	6	6	6
7	70	70	—	53	33	14	—	8
8	32	32	28	26	15	10	10	10
9	23	17	—	—	—	14	14	—
10	36	36	—	28	13	11	—	9
11	25	6	2	2	2	2	—	2
12	7	7	7	7	5	3	3	3
13	18	18	16	16	9	6	6	6
14	55	28	—	26	20	—	—	16
15	50	25	21	20	10	7	7	7
16	—	48	—	—	18	13	—	7

ABLE VII PLASTICITY INDEX, *p*H AND REFLECTANCE VALUES OF PENCIL CLAYS

(*See* 1.3, 1.4 *and* 1.5)

Clay Sample No.	Liquid Limit	Plasticity Limit	Plasticity Index	*p*H	Percent Reflectance
1	51	33·3	17·7	9·0	53·0
2	69	32·8	36·2	6·8	22·5
3	51	40·9	10·9	8·5	81·5
4	71	35·6	35·4	5·8	20·0
5	63	29·2	33·8	6·4	23·0
6	107	64·4	42·6	7·8	29·0
7	209	88·8	120·2	7·9	48·0
8	66	44·0	22·0	7·5	18·5
9	74	34·6	39·4	7·5	17·0
10	71	36·8	34·2	6·7	19·5
11	54	27·9	26·1	7·5	51·0
12	79	35·9	43·1	6·4	27·0
13	51	31·0	20·0	5·7	21·0
14	106	43·3	62·7	—	16·0
15	84	42·9	41·1	—	16·0
16	71	32·7	38·3	—	20·0

f clay showed a variation in the -bsorption of light even when the)ncentration of the clay was ap-roximately the same, this did not ffect the size analysis data of each ımple. What is important is the ıange in the light absorption when ıe particles settle down. This ıange in light absorption is pro-ortional to the size and number of articles which settle down. The hoto-sedimentation method which ıkes a much shorter time than the -ther method appears to be suitable ithout affecting the accuracy of ıe results.

2.3 Plasticity

2.3.1 The imported clays which are reported by the manufacturers to be suitable for the manufacture of pencil leads had a value of plasticity index in the range 30 to 40. The plasticity index depends on the type of clays as well as on the degree of fineness. The plasticity of clay affects the extrusion properties, strength of the leads and shrinkage of leads after baking.

2.3.2 It is, therefore, suggested that the plasticity index of clays which are approximately 90 percent below 20 microns and 40 percent below 2 microns should be determined and two or more clays be suitably blended to get the desired plasticity index in the range mentioned above. It may, however, be pointed out here that blending does not necessarily produce an additive effect. A highly plastic clay like No. 7, which would be unsuitable for pencil lead manufacture could be used for blending a less plastic clay. In considering the plasticity index, the liquid limit and the plasticity limit must also be taken into consideration individually. For example, clay No. 6 has a plasticity index of 42·6 but its liquid limit is 107. Such a clay would be unsuitable because the shrinkage on baking would be too high.

2.4 *p*H Value

2.4.1 From the values given in Table VII it can be seen that most of the clays have *p*H value between 6 and 8. It does not appear to be a distinguishing factor in selecting a clay unless the value is too high or too low.

3. ACKNOWLEDGEMENT

3.1 The authors are thankful to Shri R. T. Rajan for his assistance in the experimental work and to Dr. Sen for his help in the reflectance measurements.

4. REFERENCES

1. Iyenger, Gopalaswamy; Marathe, B. R. & Joglekar, G. D. Graphite for Pencil Manufacture. *ISI Bulletin*, Vol 10, No. 4, p. 159-162 (1958).
2. Carey, W. F. & Stairmand, C. J. Measurement of the Fineness of Powdered Materials. *Proc. Inst. Mech. Engrs.*, Vol 140, p. 315 (1938).
3. Wagner, L. A. A Rapid Method for the Determination of the Specific Surface of Portland Cement. *Proc. ASTM*, Vol 33, p. 553 (1933).
4. Skinner, D. G. & Boas Traube, S. The Light Extinction Method of Particle Size Distribution. *Supplement to Trans. Inst. Chem. Engrs.*, Vol 25, p. 57 (1947).
5. Jacobsen, A. E. & Sullivan, W. F. Centrifugal Sedimentation Method for Particle Size Distribution. *Ind. & Eng. Chem. Anal. Ed.*, Vol 18, p. 360 (1946).
6. *ASTM Standards*, Part 3, p. 1769 and 1774 (1955).

Preparation of Laboratory Samples of Coke for Ash Determination

N. N. DAS GUPTA
T. C. TARAFDAR & S. N. SINH
CENTRAL FUEL RESEARCH INSTITUTE, JEALGOR

Coke produced from crushed coal is a more homogeneous product than coal. Some errors may, however, be introduced during the process of reduction involved in the preparation of the gross sample and the final laboratory sample of coke. To avoid these errors, the paper suggests detailed methods of their preparation in two flow sheets. In addition, the paper gives a study of the effects of factors, such as size, selective sampling, grinding appliance, crushing equipment, fineness of grinding, etc, on the ash content in various samples of coke and coal. Also included in the paper are statistical interpretation of the results and errors in analysis.

Investigations carried out on Indian cokes of different ash contents show that if crushing on metallic plates is avoided, the use of cast iron pestle and mortar or porcelain mill is satisfactory since they do not cause any appreciable contamination. The paper suggests that before sub-division at the final stage, the entire sample should be crushed so as to pass through IS Sieve 120, avoiding at the same time the production of too much fines and the segregation of size, prior to further sub-division for final grinding to IS Sieve 20.

This paper was presented at the Technical Session on Testing and Certification for Quality of the Indian Standards Convention held at Madras Last December — *Ed.*

0. INTRODUCTION

0.1 It is generally agreed that coke as produced from coal, usually crushed to an optimum fineness of 80 to 85 percent below $\frac{1}{8}$ in. is a fairly homogeneous product. Consequently, the sampling of run-of-oven coke for general analysis (except for moisture determination) offers a less formidable problem than the sampling of run-of-mine coal ranging in sizes from big lumps to fines.

0.2 The abrasive nature of coke and the poorer grindability of the harder shaly material invariably associated with it, particularly when the coke is made from unwashed coals, are some of the probable sources of error in the determination of ash in coke. Other sources of error are due to non-adherence to standard procedures, faulty weighing, etc.

0.3 For all its industrial uses, the percentage of ash in a coke constitutes one of the major criteria of its price structure. It was thus considered appropriate to investigate the implication of the various factors that influence the percentage of ash in a coke as determined in the laboratory. The results of such a study made at the CFRI are presented in this paper.

1. EFFECT OF SIZE

1.1 Table I shows the screen analysis of three gross samples of run-of-oven cokes along with the percentage of ash in different size fractions. It may be seen that the highest percentage of ash is recorded by fractions of size below one inch. The difference between the maximum and minimum values for the percentage of ash in different fractions is about 2 for all the three samples of coke.

1.2 Two samples of the coke were made from blends of five different coals, crushed so as 80 to 100 percent material passed through BS Sieve $\frac{1}{8}$ in.; crushed coke dust was added in the third sample. In spite of this, the nature of the coke was fairly homogeneous; this is apparent from Table II. It may be noted that the errors introduced by selective sampling, that is taking the coke of only 2 in. and $1\frac{1}{2}$ in. sizes instead of all the cokes, is negligible considering the permissible reproducibility of results of ash determination. This is in accordance with the similar work done on foreign coke[1].

1.3 Table III gives the screen analysis of four run-of-mine samples of coal along with the percentage of ash in different size fractions. In contrast with the samples of coke, it is found that the percentage of ash varies widely from size to size ar the difference between the maximu and minimum values is much great than is observed in the case of cok It is evident, therefore, that coal widely heterogeneous and an i correct representation of differe sizes in the gross sample of coal m lead to considerable variations the percentage of ash in an avera coal. This has been the su ject of a systematic study at t CFRI.

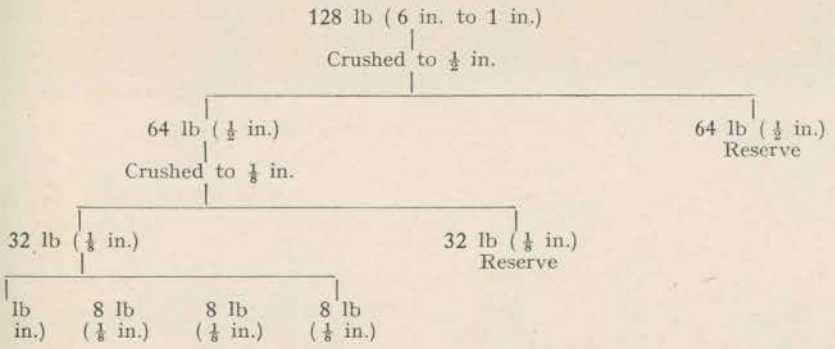
2. METHOD OF PREPARATION OF SAMPLE

2.1 Gross Sample — The schen shown in Flow Sheet 'A' w adopted for the preparation of gro samples to study the errors intr duced by different factors. A gro sample of coke having a size 6 i to 1 in. and weighing 128 lb w crushed to pass through BS Sieve $\frac{1}{2}$ i by using a manganese steel pla and a maul of the same materi The crushed sample was thorough mixed, coned and quartered; was then divided into two par of 64 lb each by combining pai of opposite quarters. One of the was set apart as reserve and t other crushed to pass throu BS Sieve $\frac{1}{8}$ in. by using the san manganese steel plate and mat This was again mixed, coned ar quartered and then divided into tw parts of 32 lb each. One of the parts was further sub-divided int four equal parts of 8 lb.

2.2 Final Laboratory Sample - A sample of 8 lb of coke, passir through BS Sieve $\frac{1}{8}$ in. (*see* Flo Sheet 'A'), was reduced to the siz of $\frac{1}{2}$ in. in gradual stages, which ar shown in Flow Sheet 'B'. Finall eight samples each weighing half pound and passing through B Sieve 72 (equivalent to IS Sieve 20 were obtained. The samples ar designated as A_1, A_2, A_3, A_4, A A_6, A_7 and A_8.

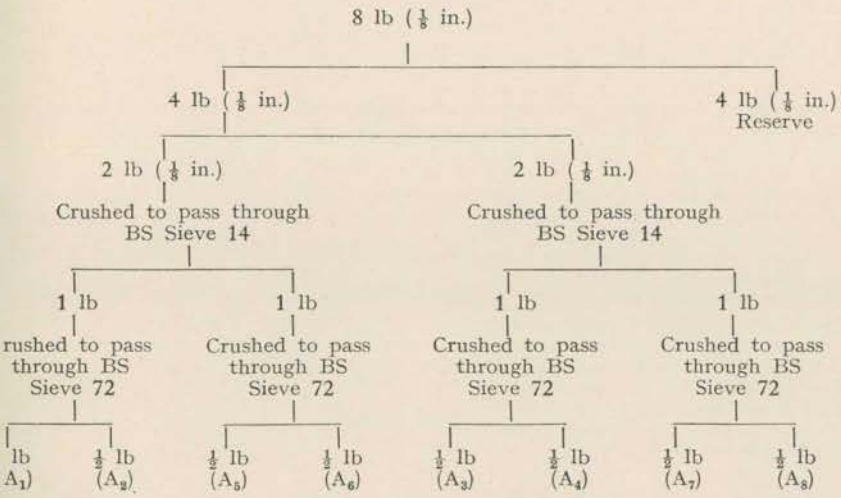
FLOW SHEET 'A'

Preparation of Gross Sample of Coke



FLOW SHEET 'B'

Preparation of Final Laboratory Sample of Coke



3. EFFECT OF GRINDING APPLIANCES

3.1 Final laboratory samples were prepared (*see* **2.2**) from three separate lots of 8 lb sample of coke passing through BS Sieve ⅛ in. (*see* **2.1**) by using three different grinding appliances, namely steel pestle and mortar; iron pestle and mortar; and a small porcelain edge runner mill.

Two other cokes were initially crushed to ⅛ in. size on a manganese steel plate; each of these cokes was divided into 3 parts and crushed to pass through BS Sieve 72 (equivalent to IS Sieve 20) in the manner as mentioned above.

3.2 The average value of the percentage of ash of all the 80 determinations, 10 each for A_1 to A_8 fractions, is shown in Table IV under coke No. 1. Three values for each coke are given and they correspond with the samples prepared in three grinding appliances. The results of coke No. 2 and 3 are also shown in the same table. It may be observed that the percentages of ash in the coke samples ground either in the iron mortar or porcelain mill show slightly higher values than those obtained for coke ground in manganese mortar; the difference is not significant. The percentage of iron and silica in the ash of the cokes prepared in different grinding appliances also does not show any marked difference. The higher value for silica in the ash of the coke ground in the porcelain mill is not

TABLE I SIZE OF RUN-OF-OVEN COKES AND ASH CONTENT

(*See* 1.1)

Size	Coke No. 1			Coke No. 2			Coke No. 3		
	Size, Percent by Weight	Ash, Percent	Deviation from Mean Percentage of Ash	Size, Percent by Weight	Ash, Percent	Deviation from Mean Percentage of Ash	Size, Percent by Weight	Ash, Percent	Deviation from Mean Percentage of Ash
ver 6 in.	—	—	—	9·8	22·4	−0·8	32·7	21·5	0·0
to 5 in.	13·8	22·7	− 0·4	14·0	22·4	−0·8	19·5	20·8	− 0·7
to 4 in.	24·8	22·8	− 0·3	28·1	23·8	+0·6	23·9	21·4	− 0·1
to 3 in.	31·2	23·1	0·0	19·6	23·7	+0·5	10·7	21·9	+ 0·4
to 2 in.	17·0	23·1	0·0	13·1	22·0	−1·2	6·9	21·5	+ 0·0
to 1½ in.	4·3	23·0	− 0·1	3·0	23·2	0·0	2·5	—	—
to 1 in.	2·1	23·8	+ 0·7	1·7	23·3	+0·1	0·5	21·2	− 0·3
to ½ in.	1·1	24·1	+ 1·0	1·0	24·3	+1·1	0·7	21·9	+ 0·4
elow ½ in.	5·7	25·0	+ 1·9	9·7	24·1	+0·9	2·6	22·6 (+¼ in.)	+ 1·1
ean percentage of ash	—	23·1	—	—	23·2	—	—	21·5	—
aximum deviation, percent	—	—	1·9	—	—	1·2	—	—	0·7
inimum deviation, percent	—	—	0·0	—	—	0·0	—	—	0·0
ifference between Max and Min. percentages of ash	—	2·3	—	—	2·3	—	—	1·8	—

reflected in the percentage of ash in the coke.

4. EFFECT OF CRUSHING EQUIPMENTS

4.1 Two other samples of coke were crushed on three separate plates made of three different materials, namely manganese steel, cast iron and mild steel. It may be noted from Table V that the percentage of ash in the coke crushed on the mild steel plate is nearly one percent higher than the percentage of ash of coke, crushed on the other two plates.

4.2 The percentage of iron in the ash of the coke crushed on the mild steel plate is found to be 5 percer higher, and this explains the high percentage of ash.

4.3 Other workers[2,5] have obtain higher values for iron in the co ground in an iron mill or in an ir bucking board resulting in an i crease of more than 2 percent in t ash content. Wedgewood mort was also found to result in an i crease in the siliceous matter in t ash. The present investigatio however, show much less contamin tion by grinding or crushing on d ferent appliances and equipmen It is obvious from this study th the nature of the pestle and mort used for the final grinding has marked effect on the percentage ash as long as the initial crushir so as to pass through BS Sieve $\frac{1}{8}$ i is carefully done without any grin ing action on the metal pla specially if it is of mild steel. T final grinding should be done in

TABLE II EFFECT OF SELECTIVE SAMPLING OF COKE

(*See* 1.2)

Coke Sample (*See* 1.2)	Mean Percentage of Ash	Over 2 in. Size Sampled			Over 1½ in. Size Sampled		
		Size, Percent by Weight	Ash, Percent	Deviation from Mean Percentage of Ash	Size, Percent by Weight	Ash, Percent	Deviation from Mean Percentage of Ash
1	23·1	86·8	22·9	− 0·2	91·1	22·9	− 0·2
2	23·2	84·6	23·1	− 0·1	87·6	23·1	− 0·1
3	21·5	93·7	21·4	− 0·1	—	—	—

TABLE III SIZE OF RUN-OF-MINE COALS AND ASH CONTENT

(*See* 1.3)

Size	Coal No. 1			Coal No. 2			Coal No. 3			Coal No. 4		
	Size, Percent by Weight	Ash, Percent	Deviation from Mean Percentage of Ash	Size, Percent by Weight	Ash, Percent	Deviation from Mean Percentage of Ash	Size, Percent by Weight	Ash, Percent	Deviation from Mean Percentage of Ash	Size, Percent by Weight	Ash, Percent	Deviati fron Mea Percenta of As
Over 6 in.	20·0	9·1	− 0·2	12·7	11·6	− 4·5	—	—	—	—	—	—
6 to 5 in.	10·0	6·7	− 2·6	9·2	16·9	+ 0·8	—	—	—	—	—	—
5 to 4 in.	18·0	8·4	− 0·9	11·6	15·3	− 0·8	8·8	12·7	+ 0·2	48·7	18·0	+ 1·
4 to 3 in.	17·0	11·2	+ 1·9	27·7	17·4	+ 1·3	16·0	11·3	− 1·2	17·7	16·5	− 0·
3 to 2 in.	—	—	—	15·1	16·8	+ 0·7	23·4	12·2	− 0·3	17·7	16·0	− 0·
2 to 1½ in.	5·0	9·8	+ 0·5	5·7	17·4	+ 1·3	25·1	12·0	− 0·5	10·7	15·3	− 1·
1½ to 1 in.	10·0	10·0	+ 0·7	6·0	17·3	+ 1·2	—	—	—	—	—	—
1 to ½ in.	5·0	12·1	+ 2·8	5·2	17·2	+ 1·1	14·8	9·9	− 2·6	3·5	15·0	− 1·
½ to ¼ in.	4·0	10·7	+ 1·4	2·2	16·9	+ 0·8	5·7	10·8	− 1·7	0·9	12·4	− 4·
¼ to ⅛ in.	3·0	8·7	− 0·6	1·6	16·3	+ 0·2	2·3	13·1	+ 0·6	0·4	12·5	− 4·
Below ⅛ in.	8·0	7·8	− 1·5	3·0	13·6	− 2·5	4·0	31·5	+ 19·0	0·4	13·5	− 3·
Mean percentage of ash	—	9·3	—	—	16·1	—	—	12·5	—	—	16·9	—
Maximum deviation, percent	—	—	2·8	—	—	4·5	—	—	19·0	—	—	4·
Minimum deviation, percent	—	—	0·2	—	—	0·2	—	—	0·2	—	—	0·
Difference between Max and Min percentages of ash	—	5·4	—	—	5·8	—	—	21·6	—	—	5·6	—

TABLE IV EFFECT OF GRINDING APPLIANCES

(*See* Item 3)

Grinding Appliance	Coke No. 1			Coke No. 2			Coke No. 3		
	Ash, Percent	Fe_2O_3, Percent in Ash	SiO_2, Percent in Ash	Ash, Percent	Fe_2O_3, Percent in Ash	SiO_2, Percent in Ash	Ash, Percent	Fe_2O_3, Percent in Ash	SiO_2, Percer in Ash
Manganese pestle and mortar	22·8	9·7	51·3	22·9	11·8	—	13·0	—	—
Iron pestle and mortar	22·8	10·1	52·2	23·1	11·8	—	13·0	—	—
Porcelain edge runner mill	22·9	9·7	54·2	23·0	10·7	—	13·2	—	—

TABLE V EFFECT OF CRUSHING EQUIPMENTS

(*See* Item 4)

Crushing Appliance	Coke A		Coke B	
	Ash, Percent	Fe_2O_3, Percent in Ash	Ash, Percent	Fe_2O_3, Percent in Ash
anganese plate	24·2	15·6	23·8	14·8
st-iron plate	24·3	17·6	23·9	15·6
ld steel plate	25·2	20·4	24·8	18·8

stle and mortar made either of st iron or manganese steel.

EFFECT OF GRINDING TO FINER SIZE

1 Table VI gives the results obined by grinding the same coke different degrees of fineness in adual steps using different grinding pliances. It may be seen that ere is a general trend of gradual crease in the percentage of ash as e fineness of grinding increases; ke passing through BS Sieve 240 ves the highest percentage of ash all cases except one. This has en observed by other workers[5] so. The results thus indicate that is advisable to grind the coke to e same degree of fineness for ash termination; preferably it should t be ground finer than 72 mesh.

ERRORS IN SAMPLE SUB-DIVISION

.1 Errors may be introduced while aking further sub-divisions of the mple, crushed to $\frac{1}{8}$ in. for the prearation of final laboratory samples. his may be due to either imperfect ixing before coning and quartering variation in the ash content of the aterial in different sizes of the arent $\frac{1}{8}$ in. size coke. To study is factor, five samples of coke from ifferent sources were crushed to ass through BS Sieve $\frac{1}{4}$ in. and eved into the following fractions:

raction	*Passing Through BS Sieve*	*Retained on BS Sieve*
F-1	$\frac{1}{4}$ in.	$\frac{1}{8}$ in.
F-2	$\frac{1}{8}$ in.	6
F-3	6	10
F-4	10	14
F-5	14	25
F-6	25	36
F-7	36	—

The ash percentage of different ractions was then determined. Fig- e 1 shows the percentage of ash gainst the mean size of the fracions. It may be seen in Fig 1 that for all the cokes, ash percentage is maximum in the fourth fraction; it is lower at larger and smaller size ends. Other workers[3] have observed similar features for cokes of about 7·5 to 10 percent ash. They have observed further increase of ash in the lowest size fractions passing through BS Sieve 240. This was attributed to the presence of very finely ground free shale, which appears in the lowest size fractions.

6.2 Table VII shows the percentage of ash in different sizes of two ground samples of coke passed through BS Sieves 72, 100, 240, etc. The general trend of the ash percentage is the same as seen in Fig 1 but there is a concentration of ash in the finer sizes passing through BS Sieve 240. For both high and low ash cokes, the difference between the highest and the lowest values of percentage of ash is found to be between 4 and 5. Other workers have, however, observed a much larger difference (as high as 10) even for coke having about 11 percent ash on an average. Indian coking coals, in general, may not show exactly the same characteristics as observed for foreign cokes; this is due to the intergrown nature of their mineral matter content. The largest and the smallest sizes of all materials are, however, most difficult to mix uniformly, and as the results indicate they may have widely varying percentages of ash.

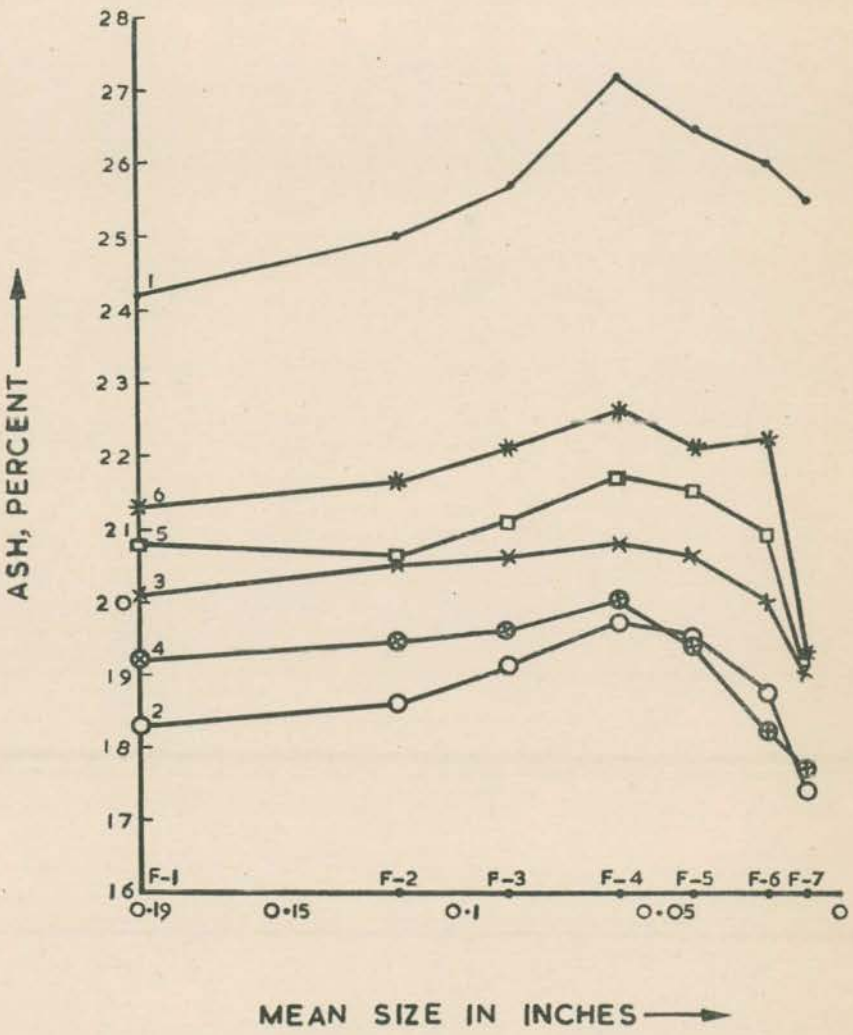


Fig 1 Co-relation Between Ash Percentage and the Size of Seven Different Fractions (Indicated as F-1, F-2, F-3, F-4, F-5, F-6 and F-7; See 6.1) of Six Samples of Coke Obtained From Straight Coals and Their Blends and Represented as 1, 2, 3, 4, 5 and 6

TABLE VI EFFECT OF FINENESS OF GRINDING

(*See* Item 5)

Grinding Appliance	Ash, Percent							
	Coke No. 1 — Sample Passing Through BS Sieve					Coke No. 2 — Sample Passing Through BS Sieve		
	36	52	72	100	240	72	100	240
Manganese pestle and mortar	12·94	13·00	12·98	13·01	13·18	22·68	22·69	23·07
Iron pestle and mortar	12·89	12·96	12·97	13·02	13·00	22·95	22·96	23·29
Porcelain edge runner mill	13·15	13·26	13·23	13·17	13·36	22·68	22·91	22·99

TABLE VII FINER SCREENING OF TWO COKE SAMPLES

(*See* 6.2)

Size of BS Sieve	Sample No. I		Sample No. II	
	Ash, Percent	Size, Percent by Weight	Ash, Percent	Size, Percent by Weight
6	23·4	3·0	11·1	13·1
10	23·6	31·5	11·5	21·9
14	23·9	13·9	12·7	10·2
25	23·8	17·2	13·3	23·4
36	22·7	8·2	12·9	10·2
52	—	—	12·7	6·7
72	21·8	11·4	12·7	5·7
100	21·1	5·2	12·7	2·5
240	21·3	5·1	12·5	3·5
240	25·7	4·5	15·0	2·8
	Total	100·0	Total	100·0

6.3 It is, therefore, suggested that for Indian cokes, the majority of which has an ash of 18 to 24 percent, 2 lb of the sample passing through BS Sieve ¼ in., which can be obtained from gradual crushing and reduction in size of the original gross sample, should be carefully crushed to avoid the production of too much fines. It should entirely pass through BS Sieve 14 before its sub-division to smaller lots to provide the final laboratory sample passing through BS Sieve 72. It should, therefore, be considered unnecessary to crush the sample, passing through BS Sieve 25, to still finer size before its sub-division as is recommended for foreign cokes[3] of ash higher than 10 percent. The crushing may well be done in a pestle and mortar without the use of any special crushing rolls, which are rather costly equipments and are not available in the Indian market.

7. ERRORS IN ANALYSIS

7.1 Ten determinations of ash were made on each of the separate samples, designated as A_1, A_2, A_3, A_4, A_5, A_6, A_7 and A_8; they were prepared by using different crushing equipments. The mean percentag of ash, the variance and the standar deviation of each are shown i Tables VIII and IX. It may be ob served that the variance of analys ranged roughly between 0·002 ar 0·005 with a few exceptions on th higher and lower sides. Simil study of another set of coke ga substantially similar values as ma be seen from Table IX. Mott[3] four the variance to be as low as 0·0(for coke having 20 percent ash; th was ascribed by him to the use of coal mixer. The figures for varian of analysis obtained in the prese paper, however, compare favourab with those obtained by Tomlinson who obtained a figure of 0·012 f coke having 23 percent ash. Co sidering the permissible limits values for reproducibility of resul in ash determination, the varian observed in the present series of tes is not abnormal. It is thus se that careful mixing, coning ar quartering of the laboratory samp by hand, even without the use of mechanical device is satisfacto enough for the Indian cokes.

8. SUMMARY AND CONCLUSION

8.1 Unlike run-of-mine coal, run-o oven coke produced from crushe coal is more uniform in compositic

TABLE VIII ERRORS IN ANALYSIS

(*See* Item 7)

Fraction of Sample No. 1	Crushing Appliances								
	Manganese Pestle and Mortar			Iron Pestle and Mortar			Porcelain Edge Runner Mill		
	Mean percentage of ash	Variance	Standard deviation	Mean percentage of ash	Variance	Standard deviation	Mean percentage of ash	Variance	Standar deviatio
A_1	22·65	0·008 1	0·090	22·86	0·002 6	0·051	22·85	0·008 9	0·094
A_2	22·72	0·001 1	0·033	22·87	0·002 3	0·048	22·86	0·000 9	0·030
A_3	22·75	0·003 3	0·057	22·83	0·004 2	0·065	23·01	0·012 8	0·113
A_4	22·85	0·001 5	0·039	22·84	0·001 5	0·039	23·00	0·003 8	0·061
A_5	22·68	0·007 3	0·086	22·95	0·001 5	0·039	22·68	0·001 6	0·040
A_6	22·71	0·004 3	0·076	22·94	0·001 4	0·037	22·82	0·021 9	0·148
A_7	22·85	0·003 0	0·055	22·66	0·003 5	0·059	23·04	0·002 9	0·054
A_8	22·84	0·001 8	0·042	22·79	0·003 8	0·062	23·06	0·001 8	0·042

TABLE IX ERRORS IN ANALYSIS

(*See* Item 7)

RACTION OF AMPLE No. 2	Crushing Appliances								
	Manganese Pestle and Mortar			Iron Pestle and Mortar			Porcelain Edge Runner Mill		
	Mean percentage of ash	Variance	Standard deviation	Mean percentage of ash	Variance	Standard deviation	Mean percentage of ash	Variance	Standard deviation
A_1	22·63	0·000 5	0·022 0	22·69	0·004 9	0·070	22·83	0·003 3	0·057
A_2	22·56	0·002 8	0·053 0	22·56	0·000 4	0·020	22·84	0·000 4	0·020
A_3	22·73	0·000 9	0·030 0	22·66	0·001 6	0·040	22·87	0·000 9	0·030
A_4	22·79	0·003 7	0·061 0	22·63	0·001 7	0·041	22·81	0·011 2	0·106
A_5	22·67	0·012 1	0·110 0	22·88	0·000 4	0·020	22·94	0·002 6	0·051
A_6	22·71	0·003 7	0·006 1	22·83	0·002 0	0·044	22·80	0·001 7	0·041
A_7	22·74	0·001 0	0·032 0	22·82	0·003 6	0·060	22·83	0·001 7	0·041
A_8	22·73	0·000 1	0·010 0	22·74	0·001 2	0·034	22·87	0·001 7	0·041

ıd hence offers less difficulty in ımpling for analysis (except in the ɜtermination of moisture). The ıgger sizes of a gross sample of coke ɜnerally show lower percentage of ɜh than the smaller size fractions. he results of analyses of the coke ɛcluding the smaller sizes, that is ɜlective sampling, do not however, ıffer appreciably from the analysis f the entire sample including all the zes. Errors may creep in during ıe preparation of final laboratory ımple from gross sample; this is articularly due to the abrasive ature of the coke. Various other ıctors, including errors in analysis, ffect of grinding appliances and ·ushing equipments have also been .udied. It has been found that prearation of the final laboratory sample ı an iron mortar or porcelain mill oes not introduce any appreciable rror due to contamination by iron or lica as observed by others, but rushing on a mild steel plate to the nal size of BS Sieve 72 may introduce rrors due to contamination by iron.

.2 Grinding to a finer size (BS ieve 240) should be avoided as it ɜads to an increase in the percentage of ash. The fraction of crushed cokes passing through BS Sieve 10 and retained on BS Sieve 14 are found to have the maximum ash; the values on either side of this mean size are lower. The fraction passing through BS Sieve 240 shows a still higher ash content even though it forms only a small portion of the entire coke. It is thus advisable to crush the entire sample so as to pass through BS Sieve 14 (equivalent to IS Sieve 120) avoiding the production of too much fines and the segregation of size, prior to subdivision for final grinding to BS Sieve 72 (IS Sieve 20). Many have advocated the use of special crushing rolls and of mechanical devices for mixing and sub-division of the laboratory sample, but grinding may be done in any available pestle and mortar. This will give reproducible results with low variance of analysis if manual mixing and sub-division of the sample has been done carefully.

9. ACKNOWLEDGEMENT

9.1 The authors are indebted to Director, CFRI for suggesting the problem and for granting permission to publish the results. Thanks are also due to Mr. A. Ghosal, Officer-in-Charge, Statistics Section, CFRI, for help in the statistical design of the work and statistical analysis of the results.

10. REFERENCES

1. Mott, R. A. & Wheeler, R. V. The Quality of Coke. London. Chapman & Hall Ltd., 1939 (p. 55-57).
2. Mott, R. A. & Wheeler, R. V. Coke for Blast Furnace. London. The Colliery Guardian Co. Ltd., p. 58 (1930).
3. Mott, R. A. & Turner, R. W. The Size-Reduction and Sample Division of the Moisture Sample of Coke for General Analysis. '*The Gas-World*; Coking Section', Vol 190, p. 31-37 (1955).
4. Tomilson, R. C. Experiments to Determine the Errors Occurring in the Production of Coal Samples for Laboratory Analysis. *Journal of Institute of Fuel*. Vol 27, p. 515-522 (1954).
5. Braunholtz, W. T. K., Nave, G. M. & Briscoe, H. V. A. Correlation of Physical and Chemical Properties of Cokes with Their Value in Metallurgical Process. *Fuel*, Vol 7, p. 100-117 (1928).

TELECOMMUNICATION ENGINEERS' CONVENTION

The Council of the Institution of Telecommunication Engineers will hold its second Technical Convention on 27 and 28 December 1958 at New Delhi. The following subjects have been decided to be discussed in the Convention:

'Antenna and Wave Propagation; Broadcasting in India; Tropicalization of Communication Equipment in India; Semiconductors; Telephone Communications in India; Navigational Aids, Atmospheric and Radio Noise.'

The Council of the Institution has invited papers on the subjects mentioned above for presentation at the Convention.

Papers intended for presentation should preferably deal with original investigations or describe developmental work embodying normal features and should be of 20 minutes reading time. The Council would prefer the authors to present the papers personally but would welcome contributions if it is not possible for the authors to be present at the Convention. The last date for the receipt of abstracts of papers proposed to be presented at the Convention has been fixed as 15 October 1958.

Further particulars can be had from the Honorary Secretary, The Institution of Telecommunication Engineers, Post Box No. 481, New Delhi.

ISO/TC 34—Agricultural Products

First Meeting at Budapest

C. N. MODAWA

THE formulation of international recommendations and standards in respect of agricultural products had been engaging the attention of the International Organization for Standardization (ISO) since its inception in 1946 — ISO/TC 34 having been set up in the same year. The work of this Committee, however, could not be organized satisfactorily for many years, because even in the initial stages of the setting up of this Committee, the ISO member countries had proposed a vast variety of subjects for being worked upon. For re-organizing the work of this Committee, which was at the instance of India, the ISO Council set up, in June 1955, an ISO Working Group comprising France, India, Italy and USSR.

After exchanging views by correspondence, and meeting on two occasions, the ISO Working Group submitted, in July 1956, to the ISO Council, that steps should be taken to reconstitute ISO/TC 34 (with special subcommittees) as an experimental measure, and to assign to it a limited scope, comprising, for the time being, matters of urgent concern to international trade which represent the least difficulties, namely terminology, methods of test, packing, storage and handling in transport, with reference, for example, to certain food grains and processed foods. These recommendations were accepted by the ISO Council and ISO/TC 34 was reconstituted in 1956-57 with the Hungarian Member Body as its secretariat.

At the meeting, besides the representative of India, there were delegations from Bulgaria, Czechoslovakia, Finland, France, Germany, Hungary, Netherlands, Poland, Rumania, UK, USSR and Yugoslavia. Certain international organizations, namely Economic Commission for Europe (ECE), Food and Agricultural Organization (FAO), International Seed Testing Organization (ISTO), International

We publish here extracts from the report of Shri C. N. Modawal, Deputy Director (Agriculture), ISI, who represented India at the first plenary meeting of ISO/TC 34 — Agricultural Products, which was held at Budapest from 22 to 26 April 1958 — *Ed.*

Wine Office (OIV), Permanent International Bureau of Analytical Chemistry (PIBAC), were also represented. From ISO Secretariat, the General Secretary, Mr. Henry St. Leger, was present. The Chairman of the meeting, unanimously elected by members, was Dr. L. Telegdy-Kovats, Prof. of Food Technology and Chemistry, University of Budapest.

It was decided that the scope of work should cover the following groups of subjects:

a) Propagation materials
b) Cereals and pulses
c) Oilseeds and vegetable oils
d) Fruits and vegetables
e) Stimulants (this term is meant to cover such agricultural products as tea and coffee)
f) Meat and meat products
g) Poultry and eggs
h) Milk and dairy products
j) Condiments and spices
k) Raw tobacco (leaving it to ISO Council to decide whether the work should be allocated to ISO/TC 34 or to a new ISO Committee)

It was also agreed that these subjects be dealt with under the following aspects, and the work conducted in close collaboration with other international agencies (e.g. FAO, IDF, OIV, PIBAC, etc):

a) Terminology,
b) Methods of test and sampling,
c) Packing, and
d) Storage, handling and transport.

The following subcommittees were set up:

a) Propagation Materials (ISO/ TC 34/SC 1)
b) Oilseeds and Vegetable Oils (ISO/TC 34/SC 2)
c) Fruits and Vegetables (IS TC 34/SC 3)
d) Cereals and Pulses (IS TC 34/SC 4)
e) Milk and Dairy Produc (ISO/TC 34/SC 5)
f) Meat and Meat Produc (ISO/TC 34/SC 6)
g) Spices and Condimer (ISO/TC 34/SC 7)

In arriving at the above decisio it would be relevant to mention th but for India's presence at t meeting, the subjects of oilsee and vegetable oils, condiments a spices, and raw tobacco would ha gone by default. India, as is know has very important trade interes (from the export point of view) many commodities, particularly o seeds and vegetable oils, which co tribute roughly 30 percent (appro mately valued at Rs 38·3 crore of the world's total export, conc ments and spices about 40 perce

The Chairman of the Meeting, Dr. L Telegdy-Kovats, Professor of Food Technc logy and Chemistry, University of Budapest Exchanging Views with the Indian Delegat

IW-ISO/TC 34

Mr. Gabor Petohazi, Deputy Minister of Agriculture, Government of Hungary, the Chief Host and Mrs. Petohazi with Shri Modawal. In the Back Row, Behind Shri Modawal, is Dr. Kovats, the Committee Chairman

IWA-ISO/TC 34

approximately valued at Rs 10·5 crores), and unmanufactured tobacco about 10 percent (approximately valued at Rs 12·7 crores). Besides, this country has also important interest in other commodities agreed to be worked upon by ISO/CT 34, namely cereals, pulses, coffee, tea, etc — Indian tea contributing about 50 percent of the world's total requirement and earning about Rs 108 crores for India.

Regarding condiments and spices, the first reaction of the Committee was that this group of subjects was automatically covered under stimulants. However, on being explained that in condiments and spices it was mainly the essential-oil content which determined the quality while in coffee and tea, it was the tannin and caffein content, and that the chemical composition of essential oils was entirely different from that of tannin and caffein, the Committee had to agree to treating these two groups of subjects separately.

As for tobacco, some countries were of the opinion that since it was not a food product, it should not be covered by ISO/TC 34. The question was posed that if tobacco could not be brought under ISO/TC 34, particularly when it was an agricultural product, by which other ISO Committee could it be taken up effectively? Finally, it was agreed by a majority vote that work on tobacco should be undertaken by ISO/TC 34, but the subject should also be referred to ISO Council for decision whether a new ISO technical committee should take up this work or a subcommittee under ISO/TC 34.

It is hoped that the active participation of India in this international work, will have an important bearing on not only the export trade of India but also in the development of her own agricultural and food industries.

NON-STANDARD DEFINITIONS

Howler ingenuity was quite an interesting feature of a test recently held by ISI for the recruitment of Lower Division Clerks. We publish here a few samples of original thinking displayed by some of the desperate candidates in devising non-standard definitions of well known entities.

a) **UNESCO**
   1) United Nations Engineering Service Company
   2) United Nations Economical, Social and Commercial Organization

b) **Ph.D**
   Phone Department

c) **F.R.C.S**
   1) Foreign Railway Civil Service
   2) Fellow of Royal Chemical Society

d) **Ft/Lt**
   1) Feet/Length
   2) Father of Literature

e) **P.E.N.**
   1) Please End Now
   2) Pen American Airways

f) **BSI**
   1) Burmah Shell Institute
   2) Bengal Steel Industries
   3) Boy Scouts of India

g) **NPL**
   1) National Pen-friendship League
   2) National Public Library
   3) Abbreviation for Nepal
   4) North Pacific Line
   5) National Planning Loans
   6) Non Political Leader

h) **Sputnik**
   A religious book

j) **Balbir Singh**
   Court Poet of Akbar

k) **Charles de Gaulle**
   1) Emperor of England
   2) A big scientist

Promoting Building Standards

Indian Metal Window Association Inaugurated

THE Indian Metal Window Association has been formed with the co-operation of leading manufacturers and distributors of metal windows, and producers of the steel and aluminium sections from which these windows are constructed. Its first meeting was inaugurated by Dr. Lal C. Verman, Director, ISI, at Manak Bhavan last March. The origin of this project dates back to a discussion held over a year ago among Mr. I. D. Collin of the Indian Galvanizing Co., Shri C. S. Chandrasekhara of ISI and Shri M. J. Jal of Godrej & Boyce Manufacturing Co. followed by three meetings, one at ISI Headquarters, and two others at Bombay.

Dr. Verman Inaugurating the Indian Metal Window Association at Manak Bhavan Seated (from l to r) are Mr. I. D. Collin; the Reporter; and Shri C. S. Chandrasekhara Deputy Director (Building), ISI

B/11

Objects of the Association

The Association aims at promoting the quality of manufactured metal doors and windows, and providing guidance in regard to their right use by encouraging conformity of the manufactured goods to Indian Standards. Another object of the Association is to promote research relating to the manufacture and use of metal doors and windows, and to protect the general interest of the metal window industry in India. The collection of technical information relating to manufacture of these articles from the various similar overseas associations, and its dissemination among the members will also be one of its important functions.

Why the Association was Formed

The need for such an Association was repeatedly felt, during the discussions over the drafting of IS: 1038-1957 Specification for Steel Doors, Windows and Ventilators, since published, when it was felt necessary to have some authoritative body or organization, which could reflect the views of and speak for the metal window makers as a whole. Apart from this, there was a feeling of considerable dismay among the leading metal window manufacturers at the way the industry was being invaded by great numbers of small-scale fabricators producing shoddy articles of poor quality which they called metal windows. What underlined the establishment of such an Association was not the desire to exclude new makers of metal windows but to bring about some kind of organization into the country's industry and see about maintaining standards of quality.

Inaugural Address

Inaugurating the first meeting, Dr. Lal C. Verman, Director ISI, expressed pleasure at the assistance which the ISI had been able to render in organizing the metal window industry from the very beginning, and in helping the setting up of the Indian Metal Window Association. He said, " Four years ago, when we initiated work on standardization of metal doors and windows, there were a number of problems to be faced, and also some important principles such as modular co-ordination relating to standardization to be put into practice. The raw material for manufacture of metal windows, the special steel sections, were being almost totally imported; the supply and purchase of windows were based on individual requirements and specifications through British Standards were generally followed by the industry. The knowledge about manufacture of metal windows, if I may say, was also in its infancy ".

Speaking of the present positio he observed that things had great improved since then. The speci steel sections were being rolled in th country in substantial quantitie the metal window industry ha grown and played a useful role in th construction programmes during th last five or six years; new materia and techniques of manufacture ha appeared on the horizon; and th quality of doors and windows beir manufactured in the country ha improved with the gaining of ex perience by producers in the tech nique of manufacturing metal doo and windows. It was important t maintain the quality and improv upon it. For this, it was befittin that standardization should com to the aid of the industry as a mean to improve production, eliminat unnecessary varieties, rationalize th sizes and bring about a gener economy in the production of thes important building units.

With regard to the very importan role of the Association in preservin and improving quality, Dr. Verma said, " The Association has to brin about quality control in the industr and greater confidence in the con sumer in the use of metal doors an windows, by offering him consistent ly good quality at economic prices The Indian Standard Specificatio

(*Continued on p.* 229

overnment of India and other tate Governments, and not finding nough reliable data on the subject, as set up a Panel consisting of one epresentative each from the follow-ng organizations to study the prob-m on all-India basis and report s findings in this matter:

1) Indian Council of Medical Research,
2) King's Institute, Madras, and
3) Delhi Joint Water & Sewage Board.

The representative of the Indian ouncil of Medical Research will be ne Convener of the Panel.

ubstitutes for Sal and Teak

The Central Advisory Board of orest Utilization which met at ehra Dun last July, has recom-ended that Government depart-ents should stipulate in tenders a inimum of 30 percent treated mber. The intention behind dis-ouraging the use of sal and teak here alternative substitutes could rve the purpose is to conserve these vo species to meet the growing emand on the Indian timber dustry.

Now, sal and teak can be effec-vely replaced by other varieties of mber only if properly preserved nd seasoned. The two standard des of practice brought out by SI, one for the preservation of mber (IS : 401-1954) and the other r the seasoning of timber (IS: 1141-1958) are intended to assist the most economic utilization of ll species of timber in the face of mited availability of the naturally urable species like sal and teak.

The code of practice relating to ne preservation of timber gives ypes of preservatives (such as oil ype, water soluble type, etc) with eir brief descriptions, the types of eatment (such as surface applica-on and soaking) and choice of eatment for various timbers for a umber of uses. It also includes ree appendices, one of which lists mber under three classes (I, II nd III) according to natural durabi-ty and amenability to preservative reatment. The other appendices rescribe the methods of determining oisture content and penetration of reservatives.

The other code of practice classi-es timbers as highly refractory, oderately refractory and non-efractory. For seasoning purposes, efects of the timbers are classified. he code also prescribes details f preliminary treatment, storage, moisture content of seasoned timbers for different uses, seasoning methods, etc. In an appendix, some of the important Indian timbers with regard to their seasoning behaviour and refractoriness have been listed.

The Board also urged that high priority be given to the development of suitable jointed wood poles for electric transmission lines. The ISI has already started work on the formulation of an Indian Standard on this subject.

Standardization of Table Tennis Racket — Views of ITTF Chief

Standardization of table tennis racket would preserve both the qualities of the game and prevent disunity among the table tennis playing associations in the world, according to the Hon. Ivor Montagu, President of the International Table Tennis Federation, ITTF. Discussing the subject in New Delhi sometime back, Mr. Montagu had referred to the controversy which had arisen out of Japanese players' success with the sponge-covered rackets and the subsequent demand by European table tennis associations to ban sponge-covering altogether. He had said that if table tennis was to remain a universal sport, the racket must not be allowed to become too effective to overshadow the desirable qualities of human skill and enjoyment in the play.

It was, therefore, in his opinion both sporting and logical that some sort of standardization of a table tennis racket should be made with the consent of all member associations in the world. He was, however, of the view that changes brought about through standardization of the racket should enter the game gradually under the control of the International Table Tennis Federation.

The general opinion among the various table tennis associations was understood to be for some sort of standardization by thickness of the blade and material and not for elimination of any specified covering material like sponge or pimpled rubber.

It may be recalled that proposals made by the Expert Committee of ITTF about the standardization of table tennis rackets, were circulated last year by the Table Tennis Federation of India to the affiliated units and players in India for their views*. This Expert Committee was appointed at the annual International Table Tennis Congress held in Stockholm in 1957 with a view to studying the possibility of standardization of rackets and to evolve alternative standardization methods. The Committee proposed the standardization of table tennis racket by material, by thickness of material and by total thickness of the racket. While making these three proposals, all technical aspects of wood, rubber and sponge and their effect on speed, spin, chop and bounce of the ball, were duly considered by the Committee. The member associations of the ITTF have sent their opinions to the International Federation and a final decision in this matter will be taken by ITTF when its next annual Congress meets in Dortmund in March 1959.

Training and Testing of Metal Arc Welders

As announced by Messrs. J. B. Advani-Oerlikon Electrodes Private Ltd., they have recently opened a Welding School in Bombay which will train students in metallic arc welding according to IS : 817-1957 Code of Practice for the Training and Testing of Metal Arc Welders. It is proposed to hold four sessions a year, each of 15 weeks' duration, and give graded instructions in theory and practice as laid down in the code. The number of students for training in each session is expected to be 10 to 12.

According to the announcement, the school will also undertake periodical and annual testing and certification of welders already established in industry, as required by the terms of the code.

Amendment of Proceedings

The proceedings of Technical Session T 4 Modern Physico-Chemical Methods of Test and Analysis were published in the March 1958 issue of this journal. Shri Bhatawadekar, Chairman, Boilers Subcommittee, who had participated in the discussions at that session, has suggested improvements in the reporting of his replies to the queries by the delegates. The proceedings may be treated as amended in respect of the following matter appearing in col 3 on page 54 of the March 1958 issue of ISI Bulletin.

Line 16 — Please read ' had to adjust the technique to suit them ' for ' had to adjust them '.

Line 23 — Please read ' from his experience he found the DIN (Germany) penetrameters better than

(*Continued on p.* 220)

*Under print.

**See* ISI Bull., V. 9, No. 6, p. 245 (1957).

Implementation of Indian Standards

The following Government purchasing or consuming departments adopted the Indian Standards listed under them during the period 1 May to 30 June 1958. In all, 14 standards were adopted during the period. On 30 June 1958, 1 001 Indian Standards were in force of which 895 have been adopted by various Government departments.

Directorate General of Supplies & Disposals (DGS&D)

IS : 27-1956 Pig Lead (*Revised*)
IS : 779-1956 Water Meters with Threaded End Connections
IS : 880-1956 Tartaric Acid
IS : 881-1956 BHC, Refined
IS : 1037-1957 General Purpose Low-Frequency Chokes
IS : 1058-1957 Commercial Metric Capacity Measures
IS : 1061-1957 Coal Tar Disinfectant Fluids, Black and White
IS : 1142-1957 Cotton Cambric, Scoured, for Oil Dressed Fabric

Central Standards Office (Now Research, Design and Standardization Organization), Ministry of Railways

IS : 616-1957 Code of Safety Requirements for Mains-Operated Radio Receivers
IS : 776-1957 Water Closet Seats and Covers
IS : 808-1957 Rolled Steel Beam, Channel and Angle Sections
IS : 883-1957 Code of Practice for Use of Structural Timber in Building (Material, Grading and Design)
IS : 989-1956 Scissors
IS : 1105-1957 Method for Precise Conversion of Inch and Metric Dimensions to Ensure Interchangeability

Other Parties

The following parties have stated that their future purchases will be made to Indian Standards:

1) Chief Engineer, Public Health Department, Trivandrum,
2) Electrical Engineer, Depar ment of Electricity, Baroda Borough Municipality, Baroda
3) Malaria Institute of Indi Delhi (for BHC and DD formulations),
4) South Madras Electric Suppl Corporation, Madras (for Al minium Conductors), and
5) Hindustan Steel Private Ltd Rourkela.

Government of Mysore hav directed the Government Electr Factory, Bangalore, to follow India Standards.

Preference to ISI Certified Goods

The following parties have state that they would give preference ISI certified products in their pu chases:

1) Hindustan Antibiotics (Pr vate) Ltd., Pimpri, and
2) Hindustan Electricals (Pr vate) Ltd., Bhopal.

1957 ASTM PROCEEDINGS

The American Society for Testing Materials has announced the publication of its 1957 ASTM Proceedings, Volume 57. T 1430-page volume, recording the technical accomplishments of the year, includes reports and papers together with discussion offer to the Society during the year and accepted for the ' Proceedings '. The volume includes the Summary of Proceedings of the AST 60th Annual Meeting and the Summary of Proceedings of the Philadelphia Spring Meeting, listing by title and author the programm for each session.

In addition to the papers and reports embodied in the ' Proceedings ', there are listed all symposia and other special sessio published separatly as Special Technical Publications, and all papers published in the ASTM Bulletin.

Although the Society's publications programme has expanded in recent years with an increasing number of Special Techni Publications, the ' Proceedings ' remains the repository of factual information and a record of the Society's work. An important adjur is a subject and author index to all papers published in any form by the Society in 1957.

In addition to the reports and technical papers, many of which have been given at the national meetings and some of which ha been preprinted, the ' Proceedings ' contains much discussion not previously published.

Orders for copies of the ' Proceedings ' priced at $ 12.00 each may be placed with the Indian Standards Institution, Manak Bhav 9 Mathura Road, New Delhi 1.

tandardization in ommonwealth Countries

RAFT STANDARDS

The following draft standards from e Commonwealth countries were ceived for comments during May d June 1958. Copies of these cuments are available in the ISI brary for reference:

ustralia

Doc-371 Dental Modelling Wax
Doc-372 Dental Impression Paste
Doc-373 Local Anaesthetics for Dental Injection
Doc-377 Bituminous Felt Roofing Type 1 (a)
Doc-378 Bituminous Felt Roofing Type 1 (c) Coated Fibre Felt Roofing
Doc-379 Body Measurements for the Sizing Sub-Teen and Teenage Girls Ready-to-Wear Apparel
Doc-380 Limits of Radio Interference for Electrical Appliances and Equipment
Doc-381 Industrial Safety Helmets
Doc-383 Boy's Knit Underwear and Nightwear

nada

C22.2, No. 86 Construction and Test of Service Equipment

eland

S.88 Electric Toasters

ew Zealand

D.5590 Fire-Resisting Construction and Means of Egress

kistan

PSI-2/Tex/2(8)/57 Method of Inspection of Cotton Fabrics, Grey

outh Africa

SABS 15/2/41 Dried Whey
SABS 15/4/20 Wooden Ladders
SABS 15/6/10 Finishing Paint, Aluminium Type
SABS 15/22/3/13R Dimensions and Style of Containers for Market Produce

United Kingdom

CY(ACE)3472 Inspection & Testing Procedure for Aluminium and Aluminium Alloys
CY(MEE)4426 Double Circular Arc Type Gears
CY(MEE)4433 Tubular Heat Exchangers for General Purposes
CY(MEE)4434 Explanatory Notes on CY(MEE)4433
CY(SAB)4573 Draw-Off Taps and Stop valves for Water Service (Screw Down Pattern)
CY(SGC)4577 Hospital Sterilizers (Pressure Type) for Water and Saline Solution
CY(T)4607 Yarn Count Systems and Their Conversions
CY(TMT)4609 Healds, Heald Frames and Reeds
CY(INE)4611 Pressure and Vacuum Gauges
CY(PEE)4612 Flexible Tubing or Hose (Including Connections Where Fitted) for Use in Butane/Propane Gas Installations
CY(M)4666 Metallic Slide Fasteners
CY(MEE)4712 Gibson Ring Railway Tyre Fastening
CY(ACE)4749 Washers for Unified Hexagons for Aircraft (Primarily for Facing Purposes)
CY(ACE)4750 Aircraft Fuel Nozzle Grounding Plug and Socket
CY(MEE)4811 Plating of Threaded Components (Part 1)
CY(MEE)4812 Electric Overhead Travelling Cranes for General Use
CY(T)4874 Domestic Sewing Threads (Cotton & Linen)
CY(S)4875 Sizes for Posters
CY(MEE)4876 Fusion Welded Steel Air Receivers (Part I) for Pressure Not Exceeding 500 lb/sq in.
CY(PEE)4877 Flanged and Butt-Welding-End Steel Outside Screw-and-Yoke Wedge Gate Valves for the Petroleum Industry
CY(PEE)4878 Flanged and Butt-Welding-End Steel Plug Valves for the Petroleum Industry (Excluding Well-Head and Flow-Line Valves)
CY(SFE)4931 The Sampling of Coal
CY(B)4967 Kitchen Fitments and Equipment. Part 3, Section C of B.S.1195 Construction of Metal Units
CY(P)5079 Punnets and Punnet Trays
CY(FHC)5100 Corrosion-Inhibited Ethanediol Antifreeze for Water-Cooled Engines
CY(RPE)5245 Method for the Direct Determination of Silica
CY(CHE)5277 Test Sieves for Use with Coke and Similar Abrasive Substances
CY(MBM)5285 Mastic Asphalt for Flooring
CY(TMT)5366 Preferred Diameters of Pins for Lattices, Beaters, Combs and Gills Used on Textile Machinery
CY(INE)5411 Graphical Symbols for the Components of Servo Mechanisms
CY(ACE)5448 Aluminium Copper Magnesium Silicon Manganese
CY(MEE)5842 Railway Mechanical Signalling Apparatus
CY(CEB)5887 Test for Water for Making Concrete
CY(WEE)5893 Class II Metal Arc Welding of Steel Pipe Lines and Pipe Assemblies for Carrying Fluids
CY(PEE)5964 Aircraft Fuelling Hose and Hose Assemblies
CY(S)6017 X-Ray Envelopes
CY(ISE)6054 Phosphate Treatment for Iron and Steel for Petroleum Against Corrosion
CY(MEE)6063 Small Fusion-Welded Steel Air Receivers
CY(CHE)6094 Electroplated Coatings of Nickel and Chromium
CY(ELE)6221 Alternating Current Precision Meters for Testing Purposes
CY(ISE)6277 Flat Bottom Railway Rails
CY(RUC)6292 Loaded and Unloaded Ebonite for General Purposes

NEW WORK

Australia

Steel Tools
Power Switchgear Overhead Transmission Line Materials
Bituminous Felt Roofing

Bituminous Felt Roofing Type I (C) Coated Fibre Felt Roofing

South Africa

Antiseptics
Bridle and Harness Leather
Sterilized Milk
Quaternary Ammonium Compounds

United Kingdom

Galvanized High Tensile Steel Wire for Armouring Cables
Galvanized Mild Steel Wire for Armouring Cables
Polythene Insulation and Sheath of Electric Cables
Dental Chromium Cobalt Casting Alloy
Dental Gold Solders
Flexible Non-Metallic Tubing for Butane/Propane Gases
Yarn Count Systems and Conversions
Adze Eye Hammers
Open Ended Spanners
Socket Spanners
Spring Calipers and Dividers
Terms and Definitions for Single Point Cutting Tools
Aircraft Fuel — Nozzle Ground Plug and Socket
Measurement for Power and Energy for Acceptance Testing
Trailing Cables for Electric Lifts
Reinforced Concrete Poles for Electrical Transmission and Traction Systems
Clay Flue Linings
Tubular Steel Columns for Street Lighting
Filler Rods and Wires for Inert-Gas Arc Welding
Gas-Shielded Metal-Arc Welding
Railway Axles
Railway Wheel Centres and Mono block Wheels
Gibson Ring Railway Tyr Fastening
Classification and Inspection c Castings
Crinkle Washers
Cotton Fabrics for Rubbe Footwear
Outdoor Uniform Cloths
Rubber Hose for Fire Fightin Purposes
Aluminium-Copper-Magnesium-Silicon-Manganese Alloy Bar and Extruded Sections, Solutio Treated and Aged at Roor Temperature
Aluminium-Copper-Magnesium Silicon-Manganese Alloy Bar and Extruded Sections, Solutio Treated and Precipitatio Treated

FORTHCOMING ISO AND IEC COMMITTEE MEETINGS

The programme given below includes only the finalized items:

ISO Committee Meetings (September to November 1958)

Date of Meeting	Place of Meeting	Name of Committee	Secretaria Held by
10-12 September	Lucerne	ISO/TC 38/SC 1 — Textile/Color fastness tests	UK & USA
12-13 September	Lucerne	ISO/TC 38/SC 2 — Textiles/Shrinkage of fabrics in washing	USA
15-17 September	The Hague	ISO/TC 46 — Documentation	Netherland:
18-20 September	London	ISO/TC 86 — Refrigeration	UK
24 September-1 October	Paris	ISO/TC 54 — Essential oils	Portugal
29 September	Bruxelles	ISO/TC 74/SC 2 — Hydraulic binders/Plasters	Poland
29 September-1 October	Vienna	ISO/TC 19 — Preferred numbers	France
30 September	Bruxelles	ISO/TC 74/SC 1 — Hydraulic binders/Methods of Chemical analysis of cements	Belgium
30 September-3 October	Paris	ISO/TC 10/SC 1 — Drawing (general principles Preliminary work)	Switzerland
1-2 October	Bruxelles	ISO/TC 74 — Hydraulic binders	Belgium
6-7 October	Bruxelles	ISO/TC 44/SC 2 — Welding Calculation of welded connections	Belgium
6-10 October	Amsterdam	ISO/TC 20 — Aircraft	UK
14-15 October	Stuttgart	ISO/TC 5/SC 8 — Pipes and fittings/Design formulae and stresses for tubes and pipe lines at all pressures and temperatures	Switzerland
29-31 October	Lisbonne	ISO/TC 87 — Cork	Portugal
3-8 November	Washington	ISO/TC 61 — Plastics	USA
12-13 November	Genes	ISO/TC 8/SC 1 — Shipbuilding details for sea navigation/Conventional colors for the identification of ship pipelines and conventional signs for the accessories of ship pipelines	Netherlands
17-19 November	London	ISO/TC 44/SC 4 — Welding/Arc welding equipment	UK
20-22 November	London	ISO/TC 44/SC 6 — Welding/Resistance welding equipment	UK
16-18 September	Burgenstock	IEC/SC 31 C — Increased Safety Apparatus	Germany
17-22 November	The Hague	CISPR — International Special Committee on Radio Interference	UK

ISI Certification Marks

The ISI specified two new standard marks, one for IS : 203-1950 Specification for Leclanché Type Dry Cells and Batteries for Flash Lamps, and the other for IS : 227-1954 Specification for Malleable Iron Castings, and prescribed the marking fees for their use during the two months ending 30 June 1958. The Institution also granted five new licences and renewed four for the use of standard marks. The former included one licence each for the use of the two new specified marks.

STANDARD MARKS AND MARKING FEES

Product/Class of Product	Design of Standard Mark	Number and Title of Relevant Indian Standard	Unit	Marking Fee per Unit
Leclanché Type Dry Cells and Batteries for Flash Lamps	IS:203 ISI	IS: 203-1950 Specification for Leclanché Type Dry Cells and Batteries for Flash Lamps	One thousand dry cells or batteries	25 np per unit for the first 10 000 units 20 np per unit for the next 10 000 units 15 np per unit for the 20 001st unit and over, for production during a calendar year
Malleable Iron Castings for 1) Cycle Bottom Shells, and 2) Motor Truck Chassis Parts	IS:227 ISI *	IS: 227-1954 Specification for Malleable Iron Castings	One piece	1) *Cycle Bottom Shells:* 1 np with a minimum of Rs 150·00 for production during a calendar year, and 2) *Motor Truck Chassis Parts* 3 np with a minimum of Rs 150·00 for production during a calendar year

*Relevant IS Grade of the material to be given here.

NEW LICENCES GRANTED

No. of Licence and Date of Issue	Period of Validity from	Period of Validity to	Name and Address of the Licensee	Article Covered by the Licence and Number of Relevant Indian Standard
CM/L-87 22-5-1958	2-6-58	1-6-59	Bagdogra Plywood Factory, Bagdogra	Tea-Chest Plywood Panels (IS : 10-1953)
CM/L-88 22-5-1958	2-6-58	1-6-59	The Hindustan Electric Co. Ltd., Faridabad	Aluminium Conductors Steel Reinforced and All Aluminium Conductors (IS: 398-1953)
CM/L 89 22-5-1958	2-6-58	1-6-59	Estrela Batteries Ltd., Bombay	Leclanché Type Dry Cells and Batteries for Flash Lamps (IS : 203-1950)
CM/L-90 20-6-1958	1-7-58	30-6-59	The National Screw & Wire Products Ltd., Calcutta	Hard-Drawn Copper Solid and Stranded Circular Conductors for Overhead Power Transmission Purposes (IS : 282-1951)
CM/L-91 20-6-1958	1-7-58	30-6-59	Arbariya Malleable Industries, Agra	Malleable Iron Castings for Cycle Bottom Shells and Motor Truck Chassis Parts (IS : 227-1954)

LICENCES RENEWED

No. of Licence and Date of Issue	Period of Validity from	Period of Validity to	Name and Address of the Licensee	Article Covered by the Licence and Number of Relevant Indian Standard
CM/L-9 11-6-1956	14-6-58	13-6-61	M/s Jeewanlal (1929) Ltd., Madras	Wrought Aluminium Utensils (IS : 21-1953)
CM/L-10 11-6-1956	14-6-58	13-6-61	M/s Jeewanlal (1929) Ltd., Bombay	do
CM/L-11 11-6-1956	14-6-58	13-6-61	M/s Jeewanlal (1929) Ltd., Howrah	do
CM/L-27 20-5-1957	1-6-58	31-5-61	M/s Electrical Manufacturing Co. Ltd., Calcutta	Hard-Drawn Stranded Aluminium and Steel-Cored Aluminium Conductors for Overhead Power Transmission Purposes (IS : 398-1953)

ISI Building Fund

Contributions Received from 16 May to 30 June 1958

Contributions to the ISI Building Fund received up to 15 May 1958 amounting to Rs 962 837 were reported in th last issue of this Bulletin. The following is the list of contributions received thereafter up to 30 June 1958 whi now make up the total of Rs 966 882.

Contributor	*Contribution*
	Rs
Aluminium Industries Ltd., Kundara	
(Contribution already reported Rs 3 000)	
Additional contribution	2 000
Blue Star Engineering Co. (Bombay) Private Ltd., Bombay	1 795
Central Silk Board, Bombay	
(Contribution already reported Rs 500)	
Additional contribution	250

	Rs
Total contributions received between 16 May and 30 June 1958	4 045
Contributions reported in the last issue of ISI Bulletin	962 837
Grand total of contributions received up to 30 June 1958	**966 882**

Besides the actual collection, the ISI has received promises of contributions worth Rs 18 050

New ISI Members

Enrolled during the period 16.5.58 *to* 30.6.5-

Sustaining Members

American Rubber Mills Co., Shahdara, Delhi
Assam Forest Products Private Ltd., Calcutta
Associated Corporation of Industries (India) Private Ltd., Bombay
Calcutta Glass & Silicate Works (1936) Private Ltd., Calcutta
Collins & Company, Bombay
Great Indian Plywood Manufacturing Co., Calcutta
Haffkine Institute, Bombay
Himatsingka Timber Limited, Calcutta
Hind Electric, Bombay
Indian Plastics Federation, Calcutta
India Tyre & Rubber Co. (India) Private Ltd., Bombay
Jeypore Timber & Veneer Mills Private Ltd., Calcutta
Modern Tiles Co. Private Ltd., Bombay
Ramakrishna, V., Sons Private Ltd., Yercaud, Madras State
West Bengal Flour Mills Association, Calcutta

Sustaining Members (Associates)

Bombay Industries, Bombay
Bombay-Sewree Chemical Manufacturing Co. (Private) Ltd., Bombay
Cieco Private Ltd., Calcutta
College of Engineering, Bangalore
Gandhi Parekh Investment Corporation (Private) Ltd Bombay
Great Eastern Cutlery Works, Calcutta
Indian Metal Window Association, Calcutta
Mahadeoprasad Kashiprasad, Calcutta
Mody Industries (Foreign Collaboration) Private Ltd Bombay
Prynne, Abbott & Davis, Madras

Ordinary Members

Balakrishnan, K. N., Calcutta
Chandavarkar, N. P., Bangalore
Gullapalli, Krishna Das, Tenali, Andhra Pradesh
Jain, Charanjit Rai, Meerut City
Matharoo, Ujagar Singh, Amritsar
Mukharji, A. C., Jaipur
Rangaswami, M., Bangalore
Taliwala, N. R., Bombay

STANDARDS NEWS—*Continued from p.* 215

the BWRA (British) or the ASME (American) ones ' for ' the British tintometers were usually better '.

Line 31 — Please read ' each seam of the firebox had been tested by X-ray examination ' for ' each seam had been tested by the X-ra examination '.

SI ACTIVITIES

KECUTIVE COMMITTEE

The Executive Committee, which ·ld its fiftyfourth meeting on) May last in New Delhi under the ıairmanship of Lala Shri Ram, ›nsidered the question of securing lequate priority for investigation · testing work to be carried out in ›nnection with the work of the ırious ISI Sectional Committees ıd that of the Certification Marks :ction, and decided that the inistries of the Central Government ıd of State Governments should be ›proached by the ISI to issue rectives to the various departments ıder them to give maximum co-›eration and adequate priority for ch work. The EC also suggested at the ISI communication to the ırious governmental authorities ould also state that the question of :tra staff, if any, required by the ›vernment departments for ISI ›rk should receive sympathetic ›nsideration.

The Committee noted that the :xt Standards Convention would be ·ld in New Delhi next November ıd suggested names of distinguished dividuals to be approached for :ceptance of chairmanship and ce-chairmanship of the Reception ›mmittee.

The Committee noted that the embership, as on 19 May 1958, ›nsisted of 1 236 Sustaining embers, 201 Sustaining Members Associates) and 120 Ordinary embers, and that the membership ıbscription collected for the year)58 up to 19 May had amounted to s 3·05 lakhs against Rs 2·56 lakhs · last year.

The EC agreed that the repre-:ntative of the Indian Institute ·f Science, Bangalore, be co-opted ı the Electrotechnical Division ouncil, and Mrs. Jayawati A. ·aji on the Study Group set up y the Aluminium and Alumini-m Alloys Sectional Committee, MDC 10.

The Committee also accepted the epresentation offered to ISI on the ·ational Productivity Council, and ominated the Director or his re-›resentative for the purpose.

The proposal to hold the next ·ommonwealth Standards Con-erence in August-September 1959 n Canada, was also supported by he EC.

ENGINEERING DIVISION

Small Tools

The **first meeting** of the Small Tools Sectional Committee, EDC 45, was held under the chairmanship of Mr. Friedman of the Indian Tool Manufacturers Ltd., on 28 April 1958 at Manak Bhavan.

This Sectional Committee was formed as a result of a decision taken by the Standing Working Committee (Engineering) with a view to meeting the need for intensifying the work on small tools; the need had arisen from the decision of the Government of India to change over to metric system. Prior to this, small tools and machine tools were handled by only one Sectional Committee, namely the Machine Tools and Small Tools Sectional Committee, EDC 11.

The Committee discussed its programme of work and agreed upon the following priorities:

Priority I

1) Twist drills,
2) Taps and dies,
3) Reamers,
4) Milling cutters, including slitting saws, and
5) Single point cutting tools and carbide taps.

Priority II

1) Reducing sockets,
2) Tapers,
3) Spacing sleeves,
4) Spacing reamers, and
5) Lengthening pieces.

The Committee set up the following four subcommittees to handle the work and appointed the representatives of the Indian Tool Manufacturers Ltd., Bombay, M/s Addison & Co. (Private) Ltd., Madras, Small Tools Manufacturing Co. of India Ltd., Calcutta, and Hindustan Machine Tools (Private) Ltd., Bangalore, as their respective conveners:

1) Subcommittee for Twist Drills, Reamers, Tapers, Sockets, Sleeves and Adaptors, EDC 45 : 1,
2) Subcommittee for Milling Cutters, EDC 45 : 2,
3) Subcommittee for Screwing Tools, EDC 45 : 3, and
4) Subcommittee for Single Point Cutting Tools, EDC 45 : 4.

Cutlery

The Cutlery Sectional Committee, EDC 30, considered the draft specifications covering the following 5 items in the light of comments received and finalized them for publication at its fifth meeting which was held in joint session with the first meeting of the Household Cutlery Subcommittee EDC 30 : 2, on 13 and 14 June 1958 at Bombay:

1) Butchers' Knives,
2) Cook's Knives,
3) Carving Knives,
4) Bread Knives, and
5) Pen Knives.

The draft Amendment to IS : 888-1956 Specification for Hollow Ground Razors, Open Type, was also finalized for publication at this meeting.

BUILDING DIVISION

Building Stones and Bricks

The Building Stones and Bricks Sectional Committee, BDC 6, discussed the draft Indian Standard Specification for Dressing of Natural Building Stones at its fifth meeting held on 28 April 1958 at Bombay. After making a number of changes in it, the Committee decided that copies of the amended draft be circulated among the members of the Sectional Committee for their final approval before publication.

Reviewing the composition of its Bricks Subcommittee, BDC 6 : 1, the Committee appointed Shri Ranbir Singh of the National Buildings Organization as its Convener, subject to his consent. It also named Shri T. R. Mahandru in case Shri Ranbir Singh did not find the offer acceptable.

Building Finishes

The Building Finishes Sectional Committee, BDC 8, discussed the following two draft Indian Standards in detail and finalized them for publication after making a number of changes at its fourth meeting held on 20 and 21 May 1958 at Bombay:

1) Code of Practice for Finishing of Iron and Steel in Buildings: Painting and Allied Finishes, and
2) Specification for Cement Concrete Flooring Tiles.

The Committee also approved the following three draft Indian Standards for wide circulation subject to a number of modifications:

1) Code of Practice for Laying and Finishing of Cement Concrete Flooring Tiles,
2) Code of Practice for Applied Wall and Ceiling Finishes, and
3) Specification for Sand for Plaster Work.

The suggestion in respect of preparing a comprehensive code of colours for all purposes was found very useful by the Committee and the proposed draft Indian Standard Code of Practice for Colours for Building and Decorative Paints was discussed in detail. It was decided that the draft code be circulated widely and views invited in regard to other colours, especially those that were normally used under Indian conditions.

Reviewing its own composition, the Committee decided to co-opt a representative of the Paint Federation to establish close liaison between the work of the Paints and Allied Products Sectional Committee, CDC 8, and that of its own.

Timber

Shri G. G. Takle, Inspector General of Forests, Government of India, presided over the ninth meeting of the Timber Sectional Committee, BDC 9, which was held in joint session with the second meeting of the Logs for Plywood and Matches Subcommittee BDC 9 : 11 on 28 and 29 May 1958 at Simla. Speaking of the various systems of classifications followed by different countries in respect of timber logs, the Chairman observed that the timber logs and timber squares were classified in India and other countries working closely with UK, mainly on the basis of size. A great deal of importance had been given in these countries to the length and girth of the log and appropriate deductions were made for the defects found in the logs, thus grading them as first, second, third or fourth grade, depending upon the extent of defects found. There were other countries which followed different method, and classified logs on the basis of not only their length and girth but also defects. Thus a small log, which was free from defects would be considered as falling in the same grade as bigger log having a certain number of defects.

Shri Takle also made a reference to the Bandung meeting which he recently attended. He said he found there that Indonesia attached more importance to the quality of logs rather than to their size. The first method of classifying the logs on the basis of size alone had led to downgrading of otherwise very good logs which he felt could not be considered rational. There were factories which could make use of logs with knots to create decorative veneers and the value of such logs had been found to be more than the value of good logs; in such cases the size did not matter much. He felt, therefore, that in the classification of logs a rational approach should be involved which took into consideration not only the length and girth of the log but also the quality of the log and its specialities such as use of decorative veneers, etc.

Afterwards, the Committee considered the comments received on the draft specifications for finalization covering the following 4 terms:

1) Cut Sizes of Timber,
2) Non-Coniferous Sawn Timber for Further Conversion,
3) Timber for Aircraft Purposes, and
4) Logs for Matches.

The draft specifications were finalized for publication subject to a number of modifications, one of them being to change the title of item 3 to read as ' Indian Standard Specification for Aircraft Timber Intended for Further Conversion '.

The Committee also approved the draft Indian Standard Methods of Testing Timber for wide circulation with a view to eliciting comments.

Draft amendments to the following published Indian Standards were also discussed in the light of comments on them and were approved for publication subject to certain changes made by the Committee:

1) IS : 190-1953 Specification for Coniferous Sawn Timber Intended for Further Conversion (*Revised*),
2) IS : 287-1951 Recommendations for Maximum Permissible Moisture Content of Timber Used for Different Purposes in Different Climatic Zones (*Tentative*),
3) IS : 399-1952 Classification of Commercial Timbers and Their Zonal Distribution (*Tentative*), and
4) IS : 401-1954 Code of Practice for the Preservation of Timber (*Tentative*).

On reviewing the composition, the Committee co-opted a representative of the Directorate General of Supplies & Disposals as its member.

TEXTILE DIVISION

Rayon and Rayon Products

Altogether 13 draft Indian Standard Specifications covering following items of rayon were considered and approved for wide circulation at the fourth meeting of the Rayon and Rayon Products Sectional Committee, TDC 10, held on 29 April 19[illegible] at Bombay.

1) Rayon Taffeta,
2) Rayon Crepe,
3) Rayon Satin and Sateen,
4) Rayon Half Crepe Sari Cloth,
5) Rayon Georgette,
6) Rayon Voils, Ninons and Chiffons,
7) Rayon Linen,
8) Rayon Sari,
9) Rayon Half Crepe,
10) Rayon Crinkle Georgette,
11) Rayon Jacquard,
12) Rayon Baby Sharkskin, and
13) Rayon Sharkskin.

The Committee amended the title of the Rayon Yarn Subcommittee TDC 10 : 1, and the Rayon Grey and Finished Products, TDC 10 : 2, to Subcommittee for Rayon Yarn Specifications, TDC 10 : 1, and the Subcommittee for Rayon Grey and Finished Fabrics, TDC 10 : 2, respectively. Shri Shantilal M. Mehta was appointed as Convener of the Rayon Yarn and Estron Yarn Method of Test Subcommittee, TDC 10 : 3. The Committee further co-opted Shri J. G. Parikh as member of the Sectional Committee and also of Subcommittees TDC 10 : 1, TDC 10 : 2 and TDC 10 : 3.

Ropes and Cordages

The Ropes and Cordages Sectional Committee, TDC 14, approved for wide circulation the draft Indian Standard Specifications covering the following 6 items at its fourth meeting held on 27 and 28 May 195[illegible] at Calcutta:

1) Hawser-Laid Sisal Rope,
2) Shroud-Laid Sisal Rope,
3) Cable-Laid Sisal Rope,
4) Hawser-Laid Coir Rope,
5) Shroud-Laid Coir Rope, and
6) Cable-Laid Coir Rope.

The Committee also decided to introduce metric units in the following three Indian Standards at the time of their revision:

IS : 1084-1957 Hawser-Laid Manila Rope,
IS : 1085-1957 Shroud-Laid Manila Rope, and
IS : 1086-1957 Cable-Laid Manila Rope.

On considering its composition the Committee decided to co-opt a representative of the Jay Shree Textiles, Rishra, as its member.

CHEMICAL DIVISION

Lubricants

The work disposed of by the Lubricants Sectional Committee, CEDC 1, at its eleventh meeting covered many aspects, namely finalization of draft standards for publication, approval of draft standards and draft revisions for wide circulation, acceptance of new proposals for formulation of Indian Standards and the review of the composition of its subcommittees.

The draft specifications relating to the following items were finalized for publication after making a number of modifications:

1) Gear Lubricants, Regular,
2) Grease S. No. 2,
3) Temporary Corrosion Preventive, Grease, Soft Film Cold Application, and
4) Steam Turbine Lubricants Oils.

One important change made in the case of item No. 2, was to amend its scope to read as:

"This standard prescribes the requirements for Grease S. No. 2 used for lubrication of anti-friction bearings where they are not likely to come in contact with water and where the temperature involved precludes the use of calcium base greases."

The draft Indian Standard Specification for Oil, Cylinder, Unfiltered, Grade 3 was approved for wide circulation for eliciting comments.

Four draft Revisions for the following items were also considered and approved for wide circulation. The Indian Standards covered by these draft Revisions are given against each within brackets:

1) Oil, Cylinder, Unfiltered, Grade I (Revision of IS: 311-1951 Oil, Cylinder, Pure Mineral, Ordinary, and IS: 312-1957 Oil, Cylinder, Compounded, Ordinary),
2) Oil, Cylinder, Unfiltered, Grade 2 (Revision of IS: 313-1951 Oil, Cylinder, Pure Mineral, Super Heat and IS: 314-1951 Oil, Cylinder, Compounded, Super Heat),
3) Oil, Cylinder, Filtered, Grade I (Revision of IS: 315-1951 Oil, Cylinder, Pure Mineral, Filtered and IS: 316-1951 Oil, Cylinder, Compounded, Filtered), and
4) Automotive Hydraulic Brake Fluid (Revision of IS : 317-1951 Automotive Hydraulic Brake Fluid).

The only change made in the 6 Indian Standards given under items 1 to 3 was in respect of viscosity.

The revision of IS : 310 (Part I and Part II)-1951 Methods of Sampling and Test for Lubricants was also decided upon in view of the Government of India's decision for adoption of metric system and the work regarding the general revision of the test methods was entrusted to the convener of the subcommittee concerned.

Considering the new proposals the Committee approved the following new subjects for formulation of Indian Standards, and allotted them to the Subcommittees noted against each:

1) Jute Catching Oil — Engine, Machinery and Spindle Oils Subcommittee, CEDC 1 : 10,
2) Axle Oils — Gear, Transmission and Axle Oils Subcommittee CEDC 1 : 4, and
3) Open Gear and Wire Rope lubricants — Gear, Transmission and Axle Oils Subcommittee, CEDC 1 : 4.

It was brought to the notice of the Committee that there was necessity for a new Sectional Committee to deal with the Methods of Test for Petroleum — Petroleum Products and Lubricants. The Committee recommended its formation to the Chemical Division Council.

These decisions were taken at the eleventh meeting of the Sectional Committee which was held on 23, 24 and 25 April 1958 at Kanpur.

Water

The four draft Indian Standards for the following items were discussed in detail and approved for wide circulation with a view to getting comments from various interests by the Water Sectional Committee, CDC 26, at its second meeting which was held on 28 and 29 April 1958 at Manak Bhavan:

1) Methods of Test for Water, Physical and Chemical,
2) Methods of Test for Water, Microbiological,
3) Code of Practice for Boiler Feed Water and its Treatment Part I for Land Boilers, and
4) Code of Practice for Boiler Feed Water and its Treatment Part II for Marine Boilers.

The Committee also considered the comments received on the published Indian Standard Specification for Distilled Water (IS : 1070-1957) and decided to revise it as follows:

1) The title of the Indian Standard be modified to read as, 'Indian Standard Specification for Distilled Quality Water,'
2) The scope be enlarged to include water purified by any suitable means such as Ion Exchange in addition to distillation,
3) Non-volatile matters be expressed as parts per million instead of as g per 100 ml, and
4) In test for ammonia, a foot-note be given permitting the use of standard colour discs.

Considering a proposal for formulating Indian Standards on cleanliness of river water and reduction of polluting effect of the trade wastes and effluents of factories, the Committee set up a Panel with the representative of the Indian Council of Medical Research as its convener to study the problem on an all-India basis. The Panel was directed to submit its findings at the next meeting.

A proposal for formulation of Indian Standards on water suitable for building purposes was also accepted by the Committee and Shri M. R. Verma was entrusted to prepare a detailed working document on the subject.

Inks and Allied Products

The Inks and Allied Products Sectional Committee, CDC 13, considered the comments received on the two draft Indian Standard Specifications for Ink Stencil, Oil Base for Marking Non-Porous Surfaces, Colour as Required, and for Ink, Duplicating, All Weather Black and Drum Type Machine, and finalized them for publication at its eighth meeting held on 8 May 1958 at Calcutta.

The Committee also approved the draft specifications for the following items for wide circulation with a view to receiving comments and reviews:

1) Carbon Paper for Typewriters,
2) Ink, Metal Stamp, and
3) Ink, Finger Printing.

The draft Revision of IS : 220-1950 Specification for Fountain Pen Inks, Blue-Black and Red, with the title amended to read as 'Indian Standard Specification for Ferro-Gallo Tannate Fountain Pen Ink (0·1 percent Iron Content) was also approved for wide circulation.

It was pointed out in the comments received on the following published Indian Standards that the composition of standard inks prescribed in them for comparison purposes was not in conformity with the other requirements prescribed

for the materials covered by the specification:

1) IS : 219-1950 Ink Powders and Tablets, Blue-Black and red,
2) IS : 220-1950 Fountain Pen Inks, Blue-Black and Red,
3) IS : 221-1950 Fluid Ink for Registration and for Cheques and Records, and
4) IS : 222-1950 Blue-Black Superior Fluid Ink for Writing.

The Committee requested Shri N. G. Maitra to suggest suitable amendments to these standards, and also decided to revise the sampling procedure in all these standards at the time of their revision.

The revision of IS : 395-1952 Ink, Cloth Marking, Black was also decided upon by the Committee, and Shri P. K. Adhikari was requested to take up the work.

Alkalis and Chlorine

The Chairman Shri Madhav B. Bhagvat of Tata Chemical Ltd., Bombay, presided over the **first meeting** of the Alkalis and Chlorine Sectional Committee, CDC 25, which was held on 21 and 22 May 1958 at Bombay.

This sectional committee is one of the 3 sectional committees which were formed as a result of the reorganization of the Heavy Chemicals (Inorganic) Sectional Committee, CDC 3. The Chemicals (Miscellaneous) Sectional Committee, CDC 3, and the Acids and Fertilizers Sectional Committee, CDC 24, are the other two sectional committees.

The following 9 draft specifications were on the agenda for finalization in the light of comments received on them as a result of wide circulation:

1) Calcium Chloride, Technical,
2) Calcium Chloride, Anhydrous,
3) Cattle Licks, Plain and Mineralized,
4) Methods of Sampling and Test for Quick Lime and Hydrated Lime,
5) Quick Lime and Hydrated Lime for Chemical Industries,
6) Quick Lime for Calcium Carbide,
7) Hydrated Lime for Grease Manufacture,
8) Hydrated Lime for Bleaching Powder, and
9) Quick Lime and Hydrated Lime for Glass Industry.

The Committee dropped the two items at 6 and 8 and finalized the remaining 7 draft specifications for publication after making a number of modifications, including the amending of title of item 2 to read as ' Indian Standard Specification for Anhydrous Calcium Chloride, Technical.'

While considering the proposed draft Indian Standard Specification for Stannic Chloride, Technical, the Committee authorized the ISI Directorate to issue the draft specification into wide circulation with the approval of the Chairman. The Committee could not have certain clarification it desired in the absence of the Convener who had drafted the specification as it was felt that the requirements for free hydrochloric acid, combined hydrochloric acid and basic hydrochloric acid were not compatible with one another.

The Committee took up the work of formulation of Indian Standards on the following 2 items, subject to the approval of Chemical Division Council:

1) Dairy Salt, and
2) Ammonium Bicarbonate for Biscuit Factory.

The draft Amendment No. 2 to IS : 252-1950 Specification for Caustic Soda, Technical, was also finalized for publication.

With a view to facilitating the proper handling of work, the Committee set up the following 3 panels with their conveners as noted against each:

1) Panel for Alkalis and Allied Products, CDC 25/P1 — Shri K. M. Sheth.
2) Panel for Chlorine and Its Inorganic Products CDC 25/P2 — Shri S. Ramaswamy.
3) Panel for Salt and Marine Products, CDC 25/P3 — Dr. M. M. Chudgar.

Chemicals, Miscellaneous

The Chemicals (Miscellaneous) Sectional Committee, CDC 3, finalized for publication the draft standards for the following 3 items at its fourteenth meeting held on 4 and 5 June 1958 at Manak Bhavan:

1) Methods of Test for Gypsum,
2) Specification for Gypsum, and
3) Specification for Light Magnesium Carbonate for Rubber Industry.

Two draft specifications covering Talc and Kaolin, both for Cosmetic Industry, were approved for wide circulation.

But in the case of the two draft specifications for compressed nitrogen gas and for basic magnesium carbonate for insulation purposes, the Committee made a number of modifications and authorized the ISI Directorate to issue the specifications in wide circulation with the approval of the Chairman.

Comments received on some printed Indian Standards were also considered by the Committee and draft amendments to the following were approved for wide circulation:

1) IS : 261-1950 Copper Sulphate, Technical,
2) IS : 301-1951 Potassium Nitrate, Technical,
3) IS : 380-1952 French Chalk, Technical,
4) IS : 877-1956 Method of Sampling and Test for Activated Carbon Used for Decolourizing Vegetable Oils and Sugar Solutions,
5) IS : 1040-1957 Calcium Carbide, Technical, and
6) IS : 1109-1957 Borax, Technical.

Reviewing its own composition the Committee co-opted a representative of the DCM Chemical Works as a member.

AGRICULTURAL AND FOOD PRODUCTS DIVISION

Edible Starches, Confectionery and Cereal Products

The Edible Starches, Confectionery and Cereal Products Sectional Committee, AFDC 10, finalized the three draft specifications for the following subjects, at its sixth meeting held on 7 and 8 April 1958 at Manak Bhavan:

1) Covering Chocolate,
2) Cocoa-Powder, and
3) Cocoa-Butter.

The four draft specifications which were approved for wide circulation by the Committee, cover the following items:

1) Tapioca Starch,
2) Edible Tapioca Chips,
3) Edible Tapioca Flour, and
4) Baker's Yeast.

The Committee decided to take up the work of formulation of an Indian Standard for groundnut cake flour subject to the approval of the Agricultural and Food Products Division Council, and set up the Groundnut Cake Flour Subcommittee, AFDC 10 : 6, with Dr. D. S. Bhatia as its Convener to prepare the preliminary draft on it.

STRUCTURAL AND METALS DIVISION

Cast Iron and Malleable Cast Iron

Shri Pran Lal Patel, Technical Director of the Malleable Iron & Steel Castings Co., Private Ltd., Bombay, presided over the **first meeting** of the Cast Iron and Malleable Cast Iron Sectional Committee, SMDC 9, held on 13 and 14 June 1958 at Calcutta.

The work entrusted to the present Sectional Committee was previously

(*Continued on p.* 234)

NEW INDIAN STANDARDS

Indian Standards recently published are briefly described here.

rushes, Artists

The Indian Standard Specification or Brushes, Artists (IS: 1103-1957) , one of a series of Indian Standard pecifications on paint brushes. 'thers in the series, published so far, re:

IS: 384-1954 Brushes, Paints and Varnishes, Flat
IS: 486-1954 Brushes, Paints and Varnishes, Sash Tool
IS: 487-1954 Brushes, Paints and Varnishes (i) Oval, Ferrule Bound, and (ii) Round, Copper Wire Bound

The new standard prescribes the equirements and the methods of test or brushes, artists, filled with sable air set in a suitable cement. It overs twelve sizes of brushes, and ecifies them as well as their shape id design, dimensions, manufac- ire, workmanship and finish, arking, performance test, preser- ation and packing. The standard cludes two appendices; the first escribes the method of determina- on of weight of hair and the second ves a list of approved species of mber suitable for the manufacture handles.

The life and serviceability of rushes is often reduced by neglect some simple but important istructions which a user should now and observe. The standard rings this fact to the notice of the anufacturers, and it is hoped that ey would realize the need for such idance, and meet it by issuing istruction pamphlets along with the rushes, which they manufacture.

row-Bars and Claw-Bars

Crow-bar is generally used for igging purposes, while the claw-bar meant for levering up dog-spikes nd similar items driven into wood. he former is usually wedge shaped t the working end whereas a claw-bar as one end split up into two claws.

The Indian Standard Specification or Crow-Bars and Claw-Bars (IS: 04-1957) is one of a series of Indian tandard Specifications for hand ools. The series at present com- rises the following:

IS: 273-1951 Picks and Beaters (*Tentative*)
IS: 274-1951 Shovels (*Tentative*)
IS: 402-1952 Chisels
IS: 413-1953 Punches, Round
IS: 510-1953 Blacksmith's Anvil (Cast Steel)
IS: 619-1955 Pruning Knives, Hooked and Curved
IS: 620-1954 General Requirements for Tool Handles
IS: 621-1957 Forks for Plantations and Estates
IS: 663-1955 Adzes
IS: 703-1957 Axes
IS: 704-1957 Crow-Bars and Claw-Bars
IS: 841-1957 Hand Hammers
IS: 842-1956 Smith's Swages
IS: 843-1956 Smith's Flatters
IS: 847-1956 Smith's Fullers

The first two standards of the series are under revision.

In the Indian Standard Specification for Crow-Bar and Claw-Bar, an attempt has been made to rationalize their types and sizes. The standard specifies material, shapes and dimensions, weight, manufacture and finish, hardness, etc. Several mechanical tests, such as drop test, static load test and falling weight test have also been prescribed.

Forks for Plantations and Estates

The Indian Standard Specification for Forks for Plantations and Estates (IS: 621-1957), included in the series of Indian Standards for hand tools, listed above, covers nine types of forks, and specifies the chemical composition of the steel to be used in the manufacture of the forks. Other specifications are in respect of the shape, the more important dimensions, weight and the desired hardness requirements for the working end. A simple practical test for the forks has also been included in the standard.

Timber Panelled and Glazed Doors and Windows

Timber doors and windows are generally made at the construction site to suit individual sizes and requirements. But this usually delays construction of the building and is sometimes responsible for the poor quality of timber and unsatisfactory workmanship. If doors and windows were to be manufactured under controlled conditions in factories, suitable timber could be selected for a particular job, joinery could be inspected and thus suitable finish and workmanship assured. Considering that considerable advantage would be derived by promoting manufacture of standard sizes of doors and windows, the Indian Standard Specification for Timber Panelled and Glazed Doors and Windows (IS : 1003-1957) has been published.

Standard sizes of doors and windows, based upon a module of 10 cm, have been recommended. The overall dimensions of doors and windows specified in the standard have been evolved to suit modular openings. In order to provide for fitting and fixing, a clearance of 1·25 cm (*nom* 0·5 in.) has been assumed on all the four sides of the frames of both doors and windows. In fixing the height of the door shutter, a floor finishing of 4 cm (*nom* 1·5 in.) thick over the structural floor level has been assumed. After fixing the frame and laying the floor, it would be necessary to trim the bottom of door shutters to suit the actual finished floor level.

Since there is an acute shortage of timber like teak, the standard groups various other types of timbers into two classes for the manufacture of doors and windows, depending on their suitability for permanent and temporary structure. It is hoped that unless there is a specific reason requiring the use of teak, doors and windows made from other timbers would be found freely acceptable.

The standard lays down requirements for material, construction, workmanship and sizes of panelled and glazed doors and windows, generally used in domestic buildings and offices. The standard does not cover doors and windows for industrial and other special buildings, such as garages, workshops, etc.

Natural Building Stones

Building stones, being natural in origin, present a difficult problem for standardization. However, a series of seven Indian Standards, covering important characteristics of natural building stones and providing guidance regarding their use, has been published with a view to rationalizing building industry as a whole.

Two Indian Standards, IS : 1121-1957 Methods for Determination of Compressive, Transverse and Shear Strengths of Natural Building Stones, and IS : 1123-1957 Method for Petrographical Examination of Natural Building Stones had been published previously. To these two, the following five Indian Standards have now been added:

IS: 1122-1957 Methods for Determination of Specific Gravity and Porosity of Natural Building Stones

IS: 1124-1957 Method of Test for Water Absorption of Natural Building Stones

IS: 1125-1957 Method of Test for Weathering of Natural Building Stones

IS: 1126-1957 Method of Test for Durability of Natural Building Stones

IS: 1127-1957 Specification for Dimensions and Workmanship of Natural Building Stones

Among these, the dimensions recommended in the last named standard (IS : 1127-1957), are based on 10 cm module in accordance with the principles of modular co-ordination for dimensional standardization in building industry.

Two more Indian Standards — Specification for Dressing of Natural Building Stones, and Classification and Distribution of Natural Building Stones — are under preparation.

Leather Picking Bands for Looms

Expecting that a standard specification for leather picking bands for looms would be of use to the consumers in obtaining dependable supplies and to the manufacturers in producing bands of acceptable quality, an Indian Standard Specification for Leather Picking Bands for Looms (*Tentative*) (IS : 1225-1958) has been published.

The standard covers 8 types of ox-hide and buffalo-hide picking bands. Bands of types 1A and 1B are intended for use in jute industry; those of types 2A, 2B and 2C for use in non-automatic cotton looms, and those of types 3A, 3B and 3C for use in automatic cotton looms.

The standard prescribes specific requirements, such as dimensions, tensile strength, elongation and quality index values of the picking bands. An informative appendix giving, in brief, the method of manufacture of the bands has also been given in the standard.

Colour Fastness of Textile Materials

Colour fastness of textile materials is of considerable importance to the consumer. The fastness depends not only upon the nature and depth of shade of the dyestuff used, but also upon the nature of the fibre and the method of dyeing or printing employed; the same colouring matter, when used in dyeing or printing different fibres, or when applied by different methods upon the same fibre, may give vastly different results. Formulation of standard methods of test for determining colour fastness of textile materials to different agencies and processes likely to affect the change in colour is, therefore, necessary.

The Indian Standard Method for Determination of Colour Fastness of Textile Materials to Daylight (IS: 686-1957) prescribes two methods of procedure for mounting and testing test pieces for light fastness. Method 1 is considered ideal and should be used in cases of dispute. It requires one set of standard patterns for each test piece, and is, therefore, impracticable when a large number of test pieces has to be tested concurrently. In such cases, Method 2 should be used. This method enables a number of test pieces of differing light fastness ratings to be rated against a single set of standard patterns.

The methods of test prescribed in this standard are intended for evaluating colour fastness of textile materials to the action of daylight. They cannot be used when quick results are required.

Since it is equally important to evaluate colour fastness of textile materials to the action of other agencies and processes, which affect colour, such as washing, dry cleaning, hot pressing, rubbing, sea water, etc, separate Indian Standards dealing with methods of test for evaluating colour fastness in respect of these agencies and processes are also being issued.

Temporary Corrosion Preventive

The Indian Standard Specification for Temporary Corrosion Preventive, Fluid, Hard Film, Solvent Deposited (IS : 1153-1957) has been published with a view to facilitating supply to large and small-scale consumers of a material of quality, suitable for use under Indian climatic conditions. The other standard in the series is Indian Standard Specification for Temporary Corrosion Preventive, Fluid, Soft Film, Water Displacing (IS : 1154-1957), which will be reviewed in the next issue.

The new standard specifies requirements in respect of flash point, drying time, low temperature flexibility, adhesion and stickiness, stability, protection against corrosion at high temperature and humidity, drainage test and scratch test. Methods of test for determining these characteristics are also included in the standard.

Borax

Borax is an important inorganic raw material for a number of industries, such as textile, cosmetic, ceramic, glass, photographic, leather etc; it is also required for the manufacture of flux for welding, explosives and fire proofing textile fabrics. The annual requirement of the country is about four thousand metric tons, and it is largely met by import. The demand is likely to increase with the rapid development of chemical industries in the country.

It is hoped that the recently published Indian Standard Specification for Borax, Technical (IS: 1109-1957) will help the above mentioned industries in getting the material of approved quality. The standard prescribes the requirements and methods of test for borax technical. The specifications are in respect of sodium tetraborate content, iron, arsenic, heavy metals and matter insoluble in water. It has been laid down that the total content of chlorides, carbonates, phosphates and sulphates shall be not more than 0·5 percent.

Pearl Barley and Barley Powder

Pearl barley and barley powder have been covered by two standards: Indian Standard Specification for Pearl Barley (IS : 1156-1957), and Indian Standard Specification for Barely Powder (IS : 1157-1957).

Pearl barley is manufactured by a process of gradual abrasion, first of the husk and then of the outer portion of the barley kernel, till the grains become rounded or pearl and get polished so that the endosperm is as white as possible. Barley powder is manufactured by gradual reduction of barley grains, pearl barley or barley grits by roller milling process similar to that employed in milling wheat to *maida*. It is also obtained as a by-product during the manufacture of pearl barley.

In both the standards, requirements for moisture, total ash, acid insoluble ash, protein, crude fibre and

-lcoholic acidity have been laid own. Besides, methods of test, ɔ check conformity to these require- ıents, have also been specified. In rder to ensure that the sample taken ɔr test is truly representative of the onsignment, a method of sampling as been given. The laying down of he mode of packing and marking nsures that the material shall reach -he consumer in good condition.

-pecification for Wheat *Atta*

Practically the great bulk of *atta* onsumed in the rural areas in the ountry is produced by grinding ;heat in stone mills, worked either y hand or by animals. In the rban areas, it is produced largely ı mechanically operated stone mills nd in roller flour mills. The Indian tandard Specification for Wheat *Atta* (IS : 1155-1957) covers all -hese types of wheat *atta*.

In order to improve the nutritional alue of *atta*, its fortification with ıinerals, namely calcium and iron, nd vitamins, such as thiamine, iboflavin and niacin, is envisaged ı the standard. Requirements have ɔeen specified for moisture, total ash, cid insoluble ash, gluten, crude bre, acidity, etc. Besides, the ɔarticle size has been specified. Iethods of test to check conformity o these requirements have also been ɔrescribed.

While the results of chemical .nalysis would enable the analyst o determine purity of the material, ;isual detection of adulteration has ɔeen made possible by the inclusion ɔf microscopic examination. A ɔhotomicrograph of pure wheat tarch has been given in the standard o help the analyst in comparison vork under the microscope.

Methods of packing have been ;iven to ensure that the material eaches the consumer in good condi- ion. In order that the sample taken or test may be truly representative ɔf the consignment, a method of ampling has also been laid down.

.adiographic Examination of usion Welded Joints

Non-destructive tests for materials .nd components are being increas- ngly used in all fields of engineering .nd technology. In testing welds, 'Radiographic Examination' is be- ɔoming popular. The increased use ɔf X-rays and *gamma*-rays for such ɔxaminations has rendered it desir- ıble to formulate general recom- nendations on the application of hese methods for guidance. Pro- .ection of personnel from exposure to X-rays or *gamma*-rays is also very essential. Internationally agreed standards have been adopted for rendering protection to personnel engaged on the radiographic examination of fusion welded joints.

The Indian Standard General Recommendations for Radiographic Examination of Fusion Welded Joints (IS: 1182-1957) sets out recommendations for the radiographic examination of fusion welded butt joints in steel of thickness up to 50 mm. The recommendations contained in the standard are based primarily on a radiographic technique, which has been and is still being used successfully in industry for the examination of butt welds in mild and low alloy steels. In addition, a somewhat more sensitive technique has been given; it is intended for special application, for example, in those welded constructions involving austenitic steels, where micro-fissuring of the weld metal is of greater frequency. Further, a technique for *gamma*-radiography is given for examinations in which, because of dimensional, portability or other limitations, X-ray equipment would present certain problems outweighing the inherent superiority of X-ray as against *gamma*-ray examination of steel up to 50 mm thickness.

The recommendations contained in the standard are expected to unify the practices and eliminate or avoid the variation in the interpretation of results. The recommendations, however, do not lay down radiographic standards of acceptance for the joints.

High Tensile Structural Steel

The Indian Standard Specification for High Tensile Structural Steel (IS: 961-1957) is one of a series of Indian Standards being published for implementation of the ISI Steel Economy Programme. High tensile steels are a specific class of steels in which enhanced mechanical properties, and in most cases increased resistance to atmospheric corrosion, are obtained by the incorporation of low proportions of one or more alloying elements besides carbon. These steels are generally intended for application where saving in weight can be affected because of their greater strength and atmospheric corrosion resistance.

The standard prescribes the requirements for high tensile steel bars, plates and sections, used in bridges and general building construction. The material specified in the standard has higher ultimate tensile stress and yield stress than ordinary structural steel.

For use in structural work, two categories of the material have been specified. The HT designated steel is intended for structures where fabrication is carried out by methods other than fusion welding. The HTW steel is intended for structures where fusion welding is involved.

Lead-Acid Storage Batteries

The Indian Standard Specification for Lead-Acid Storage Batteries for Motor Cycles (IS: 1145-1957) prescribes capacities, and dimensional and performance requirements of lead-acid storage batteries of 3-unit-cells and 5 or 7 plate assemblies with single or dual separation used for motor cycles, including 3-wheel side-car assemblies and auto-rickshas. In this standard, dimensions, capacities, performance requirements as also the tests have been based on average climatic conditions normally prevailing in India. The atmospheric conditions specified in IS : 196-1950 Atmospheric Conditions for Testing, have been taken to be standard for purposes of this specification.

Two sets of maximum overall dimensions of motor cycle batteries have been recommended in this standard. Batteries complying with either type are expected to give the same performance. The need for recognizing two types arose out of the existing difference in demand by the civilian and military consumers in India.

AMENDMENT SLIPS

Amendment slips have been issued to the following Indian Standards:

No. & Date of the Amendment	No. & Title of the Indian Standard
No. 2 March 1958	IS : 303-1951 Specification for Commercial (Common) and Moisture-Proof Plywood (*Tentative*)
No. 1 April 1958	IS : 496-1955 Specification for Internal Combustion Engine Lubricating Oils

DRAFT INDIAN STANDARDS

Brief reviews are given here of draft Indian Standards issued recently for wide circulation to elicit comments from interested parties in India and abroad. Comments are considered by the Sectional Committee concerned at the stage of finalization of the drafts.

Raw Wool

Raw wool, which is wool as shorn from the sheep, usually contains varying amounts of impurities like sand, grease, suint, vegetable matter, tags, dung, etc. Since raw wool is purchased on the basis of its yield of clean wool, formulation of a standard method for determining the latter is necessary.

Another undesirable matter found in raw wool is kemp. This is a particular type of hair which is specially coarse, brittle and highly medullated; it can be easily spotted out in the finished fabric because of its being opaque and incapable of absorbing dyes. Most of the sheep, except the merino and other highly developed breeds, carry two coats; the outer coat of long, coarse and wavy hair is usually called kemp and the coat below, wool, which has fine crimpy fibres. Kemp content of wool varies from breed to breed; badly bred sheep have a higher content of kemp in their wool. Consequently, formulation of a standard method of test for determining kemp content of raw wool is necessary.

Two draft Indian Standards have, therefore, been prepared, one covering clean wool yield and the other kemp content of raw wool.

The first draft prescribes, among other things, method of sampling and determination of alcohol extractable matter, ash, and vegetable matter content in raw wool.

The second prescribes the method of sampling and the procedure for determination of kemp content of raw wool with a view to eliminating, as far as practicable, variations in testing procedure.

Mean Fibre Length of Wool

Wool fibre has crimps and curls that complicate measurement of its length, which is one of the factors on which the spinning quality of wool depends. Generally speaking, longer wools are combed and spun into comparatively fine, worsted yarn, and short wools not suitable for combing are spun into coarse woollen yarn. Consequently, mean fibre length of wool has to be determined by a standard method. The draft Indian Standard Method for Determination of Mean Fibre Length of Wool gives such a method.

The draft standard prescribes the method of sampling, apparatus and procedure together with the method of calculation.

Wool Fabrics

With a view to eliminating unnecessary and undesirable variations in testing procedures of wool fabrics, the following two draft Indian Standards have been prepared:

i) Method for Determination of Weight Per Square Metre and Weight Per Linear Metre of Wool Fabrics; and

ii) Method for Determination of Ends and Picks Per Centimetre in Woven Wool Fabrics.

The first draft specifies a generally applicable method giving results of an accuracy considered adequate for the purpose of a standard specification, but it is not applicable to narrow fabrics. Two methods have been prescribed in the second draft; the first method is generally applicable to unmilled fabrics and the second generally to milled fabrics.

Each draft lays down the method of sampling, conditioning of sample, apparatus and procedure of testing.

Count of Cotton Yarn in tex Units

The Indian Standard Method for Determination of Cotton Yarn Count (or Yarn Melidity in tex), published in 1951, prescribed a method for determination of cotton yarn count, using weights and measures of the foot pound system. The draft Revision of this standard (IS : 237-1951) under a new title, namely Method for Determination of Linear Density or Count of Yarn in tex Units, prescribes a method of determination of linear density (count) of cotton yarn in tex units. The method is equally applicable where linear density of plied or cabled yarn is to be determined.

In the draft Revision, a table has been added which gives equivalents for yarn count up to 120 in both the inch-pound and the tex systems of yarn numbering. It is hoped that this table would be useful, for obvious convenience, during the transitional period of changeover t– metric system.

Method of Test for Coal and Coke

Although India is a producer an a consumer of coal and coke on fairly extensive scale, yet no nation standards could be issued on th methods to be used for testing then This was due to the fact that ti recent years, systematic data c analysis of Indian coal and coke b uniform and standard methods on sufficiently extensive scale was nc available. With the starting of th Central Fuel Research Institute i India and the Coal Survey, howeve centres of investigation and researc were created. These, along with th larger consumers of coal and cok such as the Railways, Ministry c Production, Iron and Steel concern and the more progressive producer have built up the required data, o the basis of which the following si draft Indian Standards have bee prepared:

1) *Draft Indian Standard Metho of Test for Coal and Coke — Proxima Analysis, Sulphur and Calorif Value* — This draft prescribes the m thods of test for coal and coke relatir to proximate analysis, including d termination of moisture under diff rent conditions, and determination sulphur and calorific value.

2) *Draft Indian Standard Metho of Test for Coal and Coke — Ultima Analysis* — This draft standar prescribes the methods of test fc coal and coke relating to the ultimat analysis of coal comprising the dete mination of carbon, hydrogen, nitr gen, sulphur and oxygen (b difference).

3) *Draft Indian Standard Metho of Test for Coal and Coke — Speci Impurities* — This draft standar prescribes the methods of test fc coal and coke for the determinatio of special impurities in coal, namel carbon present as carbonate, forms c sulphur and their determinatior chlorine, phosphorus and arsenic.

4) *Draft Indian Standard Metho of Test for Coal Carbonization* – This draft prescribes the methods c test for coal carbonization, namel agglutinating or caking index, swel ling properties and Gray-King lo temperature (LT) assay-coke type

5) *Draft Indian Standard Methods f Test of Coke — Special Tests* — his draft standard prescribes the ıethods of test of coke, namely the etermination of shatter index, ıicum index, haven index, bulk ensity, true specific gravity, appa- nt specific gravity and porosity.

6) *Draft Indian Standard Methods f Test of Ash of Coal and Coke* — his draft standard prescribes the ıethods of test for the analysis of sh of coal and coke and the deter- ıination of fusion range of ash. The aft standard contains definitions of rms and methods of preparation of sh.

It has been laid down that should ıy inconsistencies exist between the quirements as laid down in this andard and in the standards for dividual materials, if any, issued parately, the latter shall prevail.

The need for these standard ethods of test was urgent not only r the contracts between buyers and llers, but also for the various sting laboratories in the country. owever, these draft standards, hen finalized, will be kept tentative r some time, during which period rther investigations will be con- ıcted. It may also be noted that ıe Technical Committee of the ISO r Solid Mineral Fuels (ISO/TC 27) making an attempt to reach inter- ıtional agreement on these methods test.

In the series to which these six aft standards belong, the ISI has ready published the following andards:

IS: 436-1953 Methods of Sampling of Coal and Coke (*Tentative*)
IS: 437-1956 Specification for Size Grading of Coal and Coke for Marketing (*Revised*)
IS: 439-1953 Specification for Hard Coke (*Tentative*)
IS: 770-1955 General Classification of Coal (*Tentative*)

ortar for Laying Silica Bricks

The draft Indian Standard Specification for Mortar for Laying Silica Bricks specifies the requirements for two grades of silica mortar. While Grade 1 is suitable for use in convertors, gas works, glass works and cupolas, Grade 2 is suited for use in steel furnaces and coke ovens. The draft standard lays down that the silica content of Grade 1 mortar shall be not less than 85 percent, and of Grade 2 not less than 90 percent. It also specifies the method of sampling, chemical analysis, physical tests and facilities for inspection and testing.

Code of Practice for Oxy-Acetylene Welding

Due to non-availability of a national code for the design of welded structures, the use of welding in India, particularly in the field of building construction, has lagged far behind other countries. The draft Indian Standard Code of Practice for Oxy-Acetylene Welding for Structural Work in Mild Steel is intended to help the sound development of welding industry by ensuring uniformity and greater efficiency in design practice.

The draft standard lays down a code of good practice covering the use of oxy-acetylene welding in mild steel; it does not apply to structures comprising tubular members.

The draft code has taken into consideration safety as well as economy and has, at the same time, not restricted the ingenuity of the design and construction engineers. It is hoped that the use of welded construction and the adoption of modern methods of design analysis will, in many cases, reduce the total amount of steel required for a structure.

Electric Toasters and Soldering Irons

The ISI has already issued the following series of standards with a view to ensuring safety of domestic electrical appliances:

IS: 302-1951 General Requirements for Electrical Appliances for Domestic Use
IS: 365-1951 Electric Hot Plates
IS: 366-1955 Electric Irons
IS: 367-1955 Electric Kettles for Domestic Use
IS: 368-1952 Electric Portable Immersion Heaters for Domestic Use
IS: 369-1952 Electric Radiators for Domestic Use

The draft Indian Standard Specifications for Electric Roasters and for Electric Soldering Irons make the series more comprehensive.

In these two drafts, as in other specifications of this series, particular attention has been paid to the safety aspect of the equipment. Besides giving details about materials, construction and workmanship, the two draft standards incorporate several methods of tests to determine satisfactory performance of the equipment.

Enamelled Copper Wire

Several synthetic enamels are used in USA and in the continental countries of Europe for the insulation of instrument wires and machine winding wires. In India, however, only vinyl acetate based synthetic enamelled wires have been commonly used for sometime. Other synthetic enamels, such as polyvinyl acetate base can also be used.

The draft Indian Standard Specification for Enamelled High Conductivity Annealed Round Copper Wire (Synthetic Enamel) has been prepared with a view to standardizing the requirements of wires covered with synthetic enamel. Only one grade of material has been included in this standard, but the scope of the present draft standard has been kept flexible enough to cover an enamel of any synthetic base, provided it passes all the test requirements.

The draft standard lays down standard diameters and insulation thicknesses for a large number of wire sizes used for different purposes. A number of tests for determining the durability and insulating properties of the enamel are also included.

ROMOTING BUILDING STANDARDS — *Continued from p. 212*

or Steel Doors, Windows, and entilators (IS : 1038-1957) and ther standards which the ISI has een preparing to assist in this task hould be of great help to industry. would suggest that the industry hould implement these standards in ull measures, so that they can reap he benefits of work in this field ".

Elections

Besides taking decisions on a number of items, such as rules and regulations, financial matters, publicity programme, etc, the Association also elected the following office bearers at the inaugural meeting:

President — Shri K. M. Rungta, Man Industrial Corporation
Vice-President Shri A. J. E. Daruwalla, Godrej & Boyce Manufacturing Co. Ltd.
Hony. Secretary — Mr. I. D. Collin, Indian Galvanizing Co. Ltd.
Hony. Member — Shri C. S. Chandrasekhara, Deputy Director (Building), ISI

STANDARDS ADDED TO ISI LIBRARY

The list includes full titles of only such standards as, besides being accessioned in the Library, are also stocked by the ISI for sale. Numbers of all other standards are listed under their respective general classification headings. Readers, who are interested in obtaining their titles, or any other information concerning them, are requested to address the Librarian.

The standards are in the official language(s) of the country of origin.

001.4 Scientific Nomenclature. Terminology

Netherlands: HCNN NEN 3029, 37
UK: BS 2951:1958 Glossary of Terms Used in High Vacuum Technology
BS 2955: 1958 Glossary of Terms Relating to Powders
Ministry of Supply: SDM(L) 32/1

003 Writing. Scripts. Notations. Symbols

Canada: 23-GP-5A
Finland: SFS A.L. 15
Germany: DIN 1332 Bl.1
Netherlands: HCNN NEN 3069
Spain: UNE 52002
UK: BS M24: 1955 Graphic Symbols for Aircraft Hydraulic and Pneumatic Systems
USA: ASA Y10.4: 1957 Letter Symbols for Heat and Thermodynamics
ASA Y32.7: 1957 Graphical Symbols for Use on Railroad Maps and Profiles

05 Periodicals. Reviews

Spain: UNE 1007

38 Trade

Austria: ONORM A 2050

51 Mathematics

Austria: ONORM A 6420
Germany: DIN 254
Japan: JIS Z 9003

53 Physics and Mechanics

Germany: DIN 1332 Bl.1, 42; 43713; 58383; 75578
Hungary: MNOSZ 5536
India-Ministry of Defence: IND/SL/MED/5874
Japan: JIS Z 8701
UK: BS 692: 1958 Meteorological Thermometers
BS 2742: 1958 Use of the Ringelmann Chart
Ministry of Supply: SSM(L) 9-42/1
USA: ASA Y10.4: 1957 Letter Symbols for Heat and Thermodynamics

54 Chemistry

Germany: DIN 12906; 51765
Hungary: MNOSZ 5963, 64
India-Ministry of Defence: IND/SL 0030; IND/SL/MED/5851
Poland: PN C-84034
Portugal: NP 140
Spain: UNE 43302; 53046; 55017
UK: BS 1428:Pt. A1:1958 Carbon & Hydrogen Combustion Train (Pregl Type)
BS 1428:Pt. k1:1958 Vaporimetric Molecular Weight Determination Apparatus

614.8 Prevention of Accidents. Safety Measures

Belgium: NBN 469
Denmark: DS 760
Finland: SFS Z.V.1
Germany: DIN 3176, 84; 13164; 14010
India-Ministry of Defence: IND/GS/902; DRG 2123
Japan: JIS T 8302, 03
Poland: PN Z-86005, 101, 105
UK: BS 2095:1958 Industrial Safety Helmets (Light Duty)
BS 2957:1958 Fireman's Axe with Ash Handle
USA: ASA Z12.2:1957 Prevention of Dust Explosions in Starch Factories
National Bureau of Standards: BMS R150

615 Pharmacy. Therapeutics

Denmark: DS 901; 907
India-Ministry of Defence: IND/SL/MED/5866; MED/IGS/282; 284; 294; 305; 307 to 09
UK: BS 2967:1958 Bridle & Centre Bar Buckles for Use with Orthopaedic Appliances
Spain: UNE 3005

620.1 Testing Materials. Faults in Materials

Canada: CSA C22.2 No. 55; 31-GP-Oa, -900
Germany: DIN 50128, 151; 51224, 225, 758, 806; 52320 to 322, 912; 53359; 54112
Hungary: MNOSZ 5702, 03
Italy: UNI 3964
Japan: JIS A 9301 to 05; G 0555; K 3361; Z 3141, 42
Portugal: NP 141
Spain: UNE 53036, 047, 049, 061, 062, 081, 082; 55017
Sweden: SIS 11 01 20; 23 51
Switzerland: VSM 23703, 704, 707, 709, 710
UK: BS 903:Pt. D6:1958 Methods of Testing Vulcanized Rubber: Determination of Indentation & Recovery Number of Ebonite
USA: ASA A37.28:1957 Tentative Method of Test for Clay Lumps in Natural Aggregates
ASA A109.10:1957 Tentative Methods of Sampling and Testing Felted and Woven Fabrics Saturated with Bituminous Substances for Use in Waterproofing and Roofing
ASA A111.35:1957 Method of Test for Disintegration of Refractories in an Atmosphere of Carbon Monoxide
National Bureau of Standards: BMS R150

621.1 Steam Power. Engines. Boilers

Germany: DIN 31211, 212; 33100; 35301, 319, 338; 36144
UK: BS 752:1958 Test Code for Accep tance Test for Steam Turbines

621.3 Electrical Engineering

Australia: SAA C.314:1957 Fixed Do mestic Electric Wash Boilers
SAA C.316:1957 Automatic Electri Storage Water Heaters (15 to 150 Ga lons Capacity)
Canada: CSA C22.2 No. 55
Canadian Electrical Manufacturers' Asso ciation: 1B-1; 2B-1; 3B-1; 4B-1; 5B-1 1C-1; C1; C12; 2E; J2-1
Finland: SFS C.V.32 to 34, 46 to 56
France: NF C32-700; C51-100; C67-200
Germany: DIN 7712; 40011 Bl.1 & 012 Bl. 1 & 2, 014 Bl. 1 & 2, 620 Bl. 621 Bl.2; 717, 719, 759; 41230, 30 Bl. 1 & 2, 498, 584, 853; 42520, 53 680, 693, 962; 43620, 701, 713, 72 808, 830; 45311, 602; 46257 Bl.1 48004, 061, 104 Bl.3, 322, 325, 801 812, 819; 49449
Hungary: MNOSZ 10747
India-Department of Posts & Telegraphs I.T.D. No. S/qh-103A
International Electrotechnical Commission IEC Pub. 71: 1958 Recommendation fo Insulation Co-ordination
Japan: JIS C 2321; 3203; 3901; 4201, 03 4901; 5505; 6411, 40; 6604 to 06 7011; 7507, 14; 8320; 8503; 9205 H4541; T8303; W 8302
Netherlands: HCNN NEN 437 to 439 1276; 2130; 3029, 37
Portugal: NP 159
Spain: UNE 10029; 21007, 008, 024 t 026; 25049 to 051; 53082
Sweden: SEN 24 02; 24 06 01 to 11, 19 t 21, 40 to 42, 50 to 55, 59, 60, 65 to 67 70, 77, 78, 85; 24 10 01, 11, 13, 15; 2 04; 30 20 02, 04, 07, 08, 12 to 15, 19, 2 24, 25, 50, 51, 90, 91; 33 02 01 to 04
Switzerland: VSM 23708, 709, 711, 71 751 to 755
UK: BS 37: Pt. 7: 1958 Electricity Meter
BS 77:1958 Voltages for A.C. Trans mission and Distribution Systems
BS 97:1958 Waterproof Electric Ligh Fittings
BS 440:1958 Stationary Batterie (Lead-acid Planté Positive Type)
BS 562:1958 Reversible Connectors fo Portable Electrical Appliances
BS 646:1958 Cartridge Fuse-Link (Rated up to 5 Amperes) for A.C. an D.C. Service
BS 1259:1958 Intrinsically Safe Elec trical Apparatus and Circuits
BS 1732:Pt. 2:1958 Domestic Electri Steam Irons
BS 2050:1958 Electrical Resistance o Conductive and Anti-Static Rubbe Products
BS 2909:1957 Cabinets for the Elec trical Euthanasia of Dogs
BS 2948:1958 Slides and Opaques fo Television

BS 2949:1958 Marine Motors & Generators
BS 2950:1958 Cartridge Fuse-Links for Telecommunication and Light Electrical Apparatus
BS 2960:1958 Dimensions of 3-Phase Electric Motors with Ventilated Enclosures
BS 2966:1958 Phenolic Resin-Bonded Cotton Fabric Sheets for Electrical Purposes
BS CP 1005:Pt. 4:1958 Use of Electronic Valves
Ministry of Supply: 4d-1/2; 9-11/5; 9-40/2; 10-16/1; 10-17/1; 176/1
Electrical Research Association: ERA L/T 355; 356; 361; T/T 53
USA: ASA C7.4: 1957 Tinned Soft or Annealed Copper Wire for Electrical Purposes
ASA C7.8: 1957 Concentric-lay-stranded Copper Conductors, Hard, Medium-hard, or Soft
ASA C7.15: 1957 Lead-coated and Lead-alloy-coated Soft Copper Wire for Electrical Purposes
ASA C7.16: 1957 Cored, Annular, Concentric-lay-stranded Copper Conductors
ASA C7.18: 1957 Concentric-lay-stranded Copper Covered Steel Conductors
ASA C7.19: 1957 Concentric-lay-stranded Copper and Copper Covered Steel Composite Conductors
ASA C7.29: 1957 Determination of Cross-sectional Area of Stranded Conductors
ASA C7.35: 1957 Three-quarter Hard Aluminium Wire for Electrical Purposes
ASA C8.35: 1957 Weather-resistant Wire and Cable
ASA C37.6: 1957 Schedules of Preferred Ratings for Power Circuit Breakers
ASA C42.10: 1957 Definitions of Electrical Terms: Rotating Machinery
ASA C42.20: 1957 Definitions of Electrical Terms: Switchgear
ASA C42.25: 1957 Definitions of Electrical Terms: Industrial Control Equipment
ASA C42.30: 1957 Definitions of Electrical Terms: Instruments, Meters and Meter Testing
ASA C42.35: 1957 Definitions of Electrical Terms: Generation, Transmission and Distribution
ASA C42.60: 1957 Definitions of Electrical Terms: Electrochemistry and Electrometallurgy
ASA C42.70: 1957 Definitions of Electrical Terms: Electro Devices
ASA C42.80: 1957 Definitions of Electrical Terms: Electrobiology Including Electrotherapeutics
ASA C42.85: 1957 Definitions of Electrical Terms: Mining
ASA C57.12: 1956 Requirements, Terminology, and Test Code for Distribution, Power, and Regulating Transformers, and Reactors
ASA C57.12c: 1957 Requirements for Overhead-type Distribution Transformers: 67 000 Volts and Below, 500 Kva and Smaller
ASA C57.16: 1956 Requirements, Terminology and Test Code for Current-limiting Reactors
ASA C59.27: 1957 Natural Muscovite Mica Based on Visual Quality
ASA C78.105: 1957 Spotlight and Floodlight Service Incandescent Lamps. 115, 120 and 125 Volts
ASA C78.805: 1957 Dimensional and Electrical Characteristics of 72-inch T-8 Instant-start Single-pin Hot-cathode Fluorescent Lamp
ASA C78.1104: 1957 Dimensional and Electrical Characteristics of 25-millimeter 93-inch Cold-cathode Fluorescent Lamp
ASA C78.1106: 1957 Dimensional and Electrical Characteristics of 25-millimeter 69-inch Cold-cathode Fluorescent Lamp
ASA C78.1107: 1957 Dimensional and Electrical Characteristics of 25-millimeter 45-inch Cold-cathode Fluorescent Lamp

621.4 Internal Combustion Engines

Japan: JIS D 3601, 02
UK: BS 649: 1958 Diesel Engines for General Purposes
BS 2952: 1958 Rubber Hose for I.C. Engine Cooling Systems
BS 2953: 1958 Diesel Engines for Rail Traction

621.5 Pneumatic Machines. Refrigeration Technology

Germany: DIN 8917, 75
Japan: JIS B 2290
UK: BS 2951: 1958 Glossary of Terms Used in High Vacuum Technology

621.6 Apparatus for Conveyance and Storage of Gases and Liquids. Conduits and Pumps

France: NF A48-501 to -515; -601 to -613; E 29-430
Germany: DIN 2439 to 41; 3483; 8917; DIN 86255 Bl.1 & 2
Hungary: MSZ 5680
International Standards Organization: ISO R 50: 1957E Steel Sockets Screwed in Accordance with ISO Recommendation R7. Minimum Lengths
Japan: JIS B 2290; 7351 to 54, 71, 72, 81, 82; L 0501 to 06
Netherlands: HCNN NEN 2128; 3045; 3120
Spain: 19062
Sweden: 429
UK: BS 746: 1958 Gas Meter Unions and Adaptors
BS 1211: 1958 Centrifugally Cast (Spun) Iron Pressure Pipes for Water, Gas & Sewage
BS 1832: 1958 Oil Resistant Compressed Asbestos Fibre Jointing
BS 2968: 1958 Hydraulic Spray Nozzles for Insect, Fungus and Weed Control
BS C10: 1958 Coupling Dimensions for Aircraft Ground Air-Conditioning Connections
BS C11: 1958 Coupling Dimensions for Aircraft Pressure Cabin Ground Test Connections
USA: ASA B16.10: 1957 Face-to-face and End-to-end Dimensions of Ferrous Valves
ASA B57.1: 1957 Compressed Gas Cylinder Valve Outlet and Inlet Connections
American Water Works Association: AWWA C206-50
Yugoslavia: JUS C.B5.222, .225, .226
Russia: GOST 6975

621.7 Workshop Practice

Austria: ONORM A 6066
Hungary: MNOSZ 10693
Japan: JIS C 7011; 0701, 5501
UK: BS 2946: 1958 Diamond Dies for Wire Drawing
USA: ASA Y14.1: 1957 Drafting Standards Manual: Size and Format (Section 1)
ASA Y14.2: 1957 Line Conventions, Sectioning and Lettering (Section 2)
ASA Y14.3: 1957 Drafting Standards Manual: Projections (Section 3)
ASA Y14.4: 1957 Drafting Standards Manual: Pictorial Drawing (Section 4)
ASA Y14.5: 1957 Drafting Standards Manual: Dimensioning and Notes (Section 5)
ASA Y14.6: 1957 Drafting Standards Manual: Screw Threads (Section 6)

621.791 Soldering. Welding. Cutting

Germany: DIN 50128
Japan: JIS Z 3141, 42; 3201
Spain: UNE 14010
USA-American Society for Testing Materials: ASTM A398

621.798 Packing and Dispatch Equipment

Canada: 43-GP-23
India-Ministry of Defence: IND/GS 889; MED/IGS/331; 384(d); 405

621.86 Mechanical Handling and Hoisting Equipment

Austria: ONORM B 2450
Germany: DIN 15136
Netherlands: HCNN NEN 1984, 85
UK: BS 357: 1958 Power-driven Travelling Jib Cranes. (Rail-Mounted Low Carriage Type)
BS 461: 1958 Bordeaux Connections
BS 464: 1958 Thimbles for Wire Ropes
BS 1290: 1958 Wire Rope Slings and Sling Legs
USA-Electric Overhead Crane Institute: EOCI 49

621.88 Means of Attachment. Fastenings

Belgium: NBN 402; 410
Germany: DIN 262 Bl.1; 7971, 76, 82, 83; 31211, 212; 35338; 48108 Bl.1 & 2; 70852
India-Ministry of Defence: MED/IGS/262
Japan: JIS B 4430 to 32; 8101 to 03
Sweden: SMS 1665 to 73; SEN 24 06 19
UK: BS 21: 1957 Pipe Threads
BS 463: 1958 Drop-forged Sockets for Wire Ropes for General Engineering Purposes
BS 716: 1958 Rigging Screws & Stretching Screws for General Engineering Purposes
BS A 204 to A 209: 1957 Machine Screws (Unified Threads) for Aeronautical Purposes
BS SP 41-46: 1951 Tab Washers for Aircraft
BS SP 73 to 75: 1958 Ferrules and Assembly Wires for Braided Rubber Cord Assemblies for Aircraft
BS SP 76: 1958 Snap Head Steel Rivets for Aircraft
BS SP 118: 1958 Tie Rods (Unified Threads) for Aircraft
BS SP 121: 1958 Collars for Shear Pins for Aircraft

621.89 Lubrication

India-Ministry of Defence: IND/GS/2036
Germany: DIN 51500, 503, 804, 806, 824
Spain: UNE 51510 to 512
Poland: PN C-96138
UK-Ministry of Supply: SDM(L) 8/3

621.9 Tools. Machine Tools. Machining

Belgium: NBN 135; 141; 404; 484; 486
Finland: SFS 0.1.50, 51

Germany: DIN 2087; 6360 to 62
Hungary: MNOSZ 8574 to 75; 10442; 18872, 76 to 78, 881; 19001, 006, 098
Ireland: I.S.72, I.S.77 to 86
Italy: UNI 3903 to 16, 63
Japan: JIS B 4106 to 12; 4430 to 32
UK: BS 2945: 1958 Axes and Hatchets
BS 2957: 1958 Fireman's Axe with Ash Handle
USA: ASA B5.35: 1957 Machine Mounting Specifications for Abrasive Discs and Plate Mounted Wheels
ASA B5.36: 1957 Carbide Blanks and Cutting Tools

622 Mining

Japan: JIS M 1001, 03
Spain: UNE 22022 to 025, 051
UK: BS 2969: 1958 High-Tensile Steel Chain (Round Link) for Chain Conveyors and Coal Ploughs
USA: ASA M6.1: 1955 Recommended Practice for Drainage of Coal Mines
ASA M30.1: 1957 Roof Bolting Materials in Coal Mines
Department of the Interior-Bureau of Mines: Bull 570 Recommended Practice for Drainage of Coal Mines

624 Civil Engineering

Finland: SFS G.IV.I
Japan: JIS A 5312; 8951
USA-National Bureau of Standards: NBS C579

625.1/.6 Railway Engineering

Germany: DIN 40759
India-Ministry of Defence: IND/GS/896
Italy: UNI 3953 to 59, 61, 62, 66
Spain: UNE 25049 to 051, 091, 105
Sweden: SMS 742 to 45, 47
USA: ASA Y32.7: 1957 Graphical Symbols for Use on Railroad Maps and Profiles

625.7/.8 Highway. Road Engineering

Poland: PN C-96170
UK: BS 594: 1958 Rolled Asphalt. Asphaltic Bitumen and Fluxed Lake Asphalt. (Hot Process)
BS 802: 1958 Tarmacadam with Crushed Rock or Slag Aggregate

628 Public Health Engineering

Australia: SAA A.35: 1957 Precast Concrete Drainage Pipes
Denmark: DS 700; 715.1 to .5
Germany: DIN 72613
Hungary: MNOSZ 19001, 006; MSZ 5680
Italy: UNI 3953, 54
Netherlands: HCNN NEN 2128, 3028; 3120
UK: BS 97: 1958 Waterproof Electric Light Fittings
Ministry of Supply: SSM(L) 10-12/4

629.11 Land and Road Vehicles

Germany: DIN 7761 to 67, 71 to 76, 79; 7811, 12, 16; 72613; 74263 Bl.1 & 2, 371 Bl.1 & 2
Hungary: MNOSZ 10849
Japan: JIS D 4207 to 12; 4611, 12; 7215, 16
Sweden: SMS 366; 368; 369; 1320; 1378 to 80; 1404 to 06; SIS 35 23 01, 04, 06, 10
UK-Ministry of Supply: SSM(L) 10-2/2

629.12 Ships and Shipbuilding

France: NF J 24-010, -020, -100, -105, -109, -114, -116, -120, -124, -126, -130, -132, -135, -137, -140, -142, -145, -150, -160
Japan: JIS F 2401, 02, 13, 14; 7351 to 54, 71, 72, 81, 82
Sweden: SEN 30 02 02, 07, 08, 12 to 15, 19, 20, 24, 25, 50, 51, 90, 91
UK: BS 2949: 1958 Marine Motors & Generators

629.13 Aeronautics. Aircraft Engineering

International Standards Organization: ISO R 45: 1957 Aircraft Pressure Refuelling Connections
Japan: JIS W 6319; 6404; 8302
UK: BS C10: 1958 Coupling Dimensions for Aircraft Ground Air-conditioning Connections
BS C11: 1958 Coupling Dimensions for Aircraft Pressure Cabin Ground Test Connections
BS 4L 37: 1958 Aircraft Material: Aluminium-copper-magnesium-silicon-manganese Alloy Wires and Tubes for Rivets
BS M24: 1955 Graphic Symbols for Aircraft Pressure Refuelling Connections
BS M27: 1958 Non-fluorescent Magnetic Flaw Detection Inks for Finished Machined Aircraft Parts
BS S123: 1958 Aircraft Material: 55 Ton, 3 Percent Chromium-molybdenum Steel
BS SP 73 to 75: 1958 Ferrules and Assembly Wires for Braided Rubber Cord Assemblies for Aircraft

63 Agriculture. Forestry. Stock Breeding. Animal Produce. Hunting. Fisheries

Hungary: MNOSZ 5860; 10730, 742; 19078, 084 to 088, 094, 096, 098, 100
Netherlands: HCNN NEN 958; 1358; 1616
Sweden: SIS 35 23 10, 50 01; SMS 429
UK: BS 1495: 1958 Agricultural Tractor Details
BS 2968: 1958 Hydraulic Spray Nozzles for Insect, Fungus and Weed Control

64 Domestic Science. House Keeping

Australia: SAA C.314: 1957 Fixed Domestic Electric Wash-boilers
Canada: 25-GP-12A, -13A
Denmark: DS 67; 68; 369
India-Ministry of Defence: IND/GS/881, 895; MED/IGS/297, 300
Hungary: MNOSZ 10700, 728, 729
Netherlands: HCNN NEN 937; 1731 to 34; 3037
UK: BS 1732: 1958 Domestic Electric Steam Irons
BS 2977: Pt. 1: 1958 Domestic Lighting Appliances for Use with Butane/Propane Gases
BS Handbook No. 17: Group III: 1958 Furniture and Ancillary Equipment
USA: ASA Z21.1.1a: 1957 Approval Requirements for Domestic Gas Ranges
ASA Z21.1.2a: 1957 Built-in Domestic Cooking Units
ASA Z21.3a: 1957 Approval Requirements for Hotel and Restaurant Gas Ranges and Unit Boilers
ASA Z21.5a: 1957 Requirements for Domestic Gas Clothes Dryers
ASA Z21.27b: 1957 Requirements for Hotel and Restaurant Deep Fat Fryers
ASA Z21.8a: 1957 Requirements for Portable Gas Baking and Roasting Ovens

65 Commercial, Office, Business Techniques. Management. Organization. Communication. Transport

Germany: DIN 41096 Bl.1 & 2
Japan: JIS E 3304 to 08; Z 8303; 9003
Spain: UNE 1012, 15, 22; 52002
Sweden: SEN 55 02
UK: BS 2961: 1958 Type Face Nomenclature

661 Chemicals (Fine, Heavy, etc)

Canada: 25-GP-13A
Hungary: MNOSZ 10413, 442, 443
India-Ministry of Defence: IND/SL/0030, 0552
Japan: JIS K 3362
Poland: PN C-80045; -83000; -84019, 020 021, 029, 032, 037, 040, 042, 043, 046, 050, 058, 059
Spain: UNE 30003, 063, 064, 068; 48039-041, 042, 044

662.6/.9 Fuel Industry. Industrial Heating

Belgium: NBN 435
Germany: DIN 51758, 792
Netherlands: HCNN NEN 3010
Poland: PN C-04301, 305
Spain: UNE 31607; 51501, 502, 504, 506
USA: ASA Z12.1: 1957 Installation and Operation of Pulverized-fuel Systems
ASA Z21.31a: 1957 Requirements for Gas Counter Appliances
ASA Z21.34b: 1957 Requirements for Gas-fired Duct Furnaces

663 Beverages. Stimulants

Canada: 32-GP-110B; -111B
Hungary: MNOSZ 19074
Japan: JIS K 0101; 7001
Poland: PN C-96120

664 Preparation and Preservation of Solid Foodstuffs

Portugal: NP 149

665 Oils. Fats. Waxes

Germany: DIN 55930 to 33
Poland: PN C-04020, 039, 064, 093 -96022, 025, 048, 071, 072, 130, 170 -97007
Spain: UNE 41086; 51515
USA: ASA Z11.43: 1957 Method of Test for Distillation of Plant Spray Oils

666 Glass. Ceramic Industries

Australia: SAA CA.26: 1957 Glazing and Fixing of Glass
Germany: DIN 12585; 52303, 320 to 322
India-Ministry of Defence: IND/SL/MED/5868
Japan: JIS A 5312; 5905 to 08; 5201 to 03, 10 to 12
Spain: UNE 43302
UK: BS 12: 1958 Portland Cement (Ordinary and Rapid-hardening)
BS 146: 1958 Portland-Blastfurnace Cement
BS 1308: 1957 Concrete Street Lighting Columns
BS 1370: 1958 Low Heat Portland Cement
BS 2649: Pt. 3: 1958 Methods for the Analysis of Glass
BS 2975: 1958 Sand for Making Colourless Glasses
USA: ASA A111.35: 1957 Method of Test for Disintegration of Refractories in an Atmosphere of Carbon Monoxide

667.6/.8 Paints. Varnishes. Lacquer. Polishing Materials

Austria: ONORM C-2351
Canada: 1-GP-35A, -122; 58-GP-2
Hungary: MNOSZ 2387, 89

India-Ministry of Defence: IND/SL/3152, 91
Japan: JIS K 5650 to 53
Netherlands: HCNN NEN 1213
Poland: PN C-04201
Spain: UNE 48040 to 042, 044, 046, 047, 102
USA: ASA K15.1: 1957 Tentative Methods of Chemical Analysis of White Pigments

68.5 Essential Oils

UK: BS 2999/1 to 15: 1958 Essential Oils

69.1 Ferrous Metallurgy

France: NF A 48-551 to -561, -566; E 29-050, -051
Italy: UNI 3960 to 62, 64 to 66
Japan: JIS G 0302; 2301 to 16; 3301, 07, 10; 3505, 06; 4102 to 05; 4202; 5501
Spain: UNE 36024, 025
Sweden: MNC 1; 705; 840; 880; 900; SIS 11 01 20; 23 51; 14 01 35, 12 25, 12 26, 18 80, 19 12, 19 22, 19 40, 19 57, 19 73, 20 92, 21 08, 21 40, 22 60, 23 10, 23 12, 23 46, 25 50, 27 10, 27 22, 27 30, 27 50
UK: BS 309: 1958 Whiteheart Malleable Iron Castings
BS 1121: Pt. 38: 1958 Methods for the Analysis of Iron and Steel
BS 2920: 1957 Cold-reduced Tin Plate and Cold-reduced Black Plate
BS 4L.37: 1958 Aircraft Material: Aluminium-copper-magnesium-silicon-manganese Alloy Wires and Tubes for Rivets
BS S.102: 1951 Aircraft Material: Carbon-molybdenum Steel
BS S.103: 1951 Aircraft Material: Low Nickel-chromium Steel
BS S. 105: 1952 Aircraft Material: Carbon Steel
BS S.123: 1958 Aircraft Material: 5 5 Ton, 3 Percent Chromium-molybdenum Steel
Ministry of Supply: SDM(L) 132/1
USA: ASA G45.1: 1957 Welded Steel Wire Fabric for Concrete Reinforcement
Yugoslavia: JUS C.B9.020

69.2/.8 Non-Ferrous Metallurgy

Canada: CSA HP2; 43-GP-148
Italy: UNI 3950, 52
Japan: JIS H 0501; 3106; 3801 to 03
Spain: UNE 37108, 109, 202; 38001, 041, 042, 111
UK: BS 1615: 1958 Anodized Aluminium
BS 3L. 16: 1951 Aircraft Material: 99 Percent Aluminium Sheets (Half Hard)
BS 3L.17: 1951 Aircraft Material: 99 Percent Aluminium Sheets (Soft)
BS 5L.25: 1951 Aircraft Material: Aluminium-copper-nickel-magnesium Alloy Forgings
BS 4L.31: 1950 Aircraft Material: 99·0 Percent Primary (Virgin) Aluminium Notched Bars and Ingots for Re-melting
BS 3L.33: 1950 Aircraft Material: Aluminium-silicon Alloy Ingots and Castings
BS 2L.35: 1950 Aircraft Material: 'Y' Aluminium Alloy Ingots and Castings (Heat Treated) — (Suitable for Pistons)
BS 4L.37: 1958 Aircraft Material: Aluminium-copper-magnesium-silicon-manganese Alloy Wires and Tubes for Rivets
BS 3L.42: 1951 Aircraft Material: Aluminium-copper-magnesium-iron-nickel Alloy Forgings
BS 2L.44: 1951 Aircraft Material: Aluminium — 2 Percent Magnesium Alloy Bars and Extruded Sections
BS L.69: 1951 Aircraft Material: Aluminium-copper-magnesium Alloy Wires for Rivets

672 Iron and Steel Goods Generally

Canadian Government Specification Board: 53-GP-43
France: NF E 26-101
Hungary: MNOSZ 10700, 728, 729, 730, 747
UK-Ministry of Supply: SSM(L) 7-18/1

674 Timber and Woodwork Industry

Hungary: MSZ 44 to 46; 6795; 9757, 59, 65, 66; 13309
Spain: UNE 41044 to 050

675 Leather Industry

Hungary: MNOSZ 5479

676 Paper and Cardboard Industry

Canada: 6-GP-20; 43-GP-21, -22; 53-GP -33, -36, -44, -45
France: NF Q 03-004
UK: BS 2922: 1958 Testing the Strength of Wet Paper
BS 2923: 1958 Printing Opacity of Paper
BS 2925: 1958 Air Permeability and Air Resistance of Paper

677 Textile and Cordage Industries

France: NF G 37-001
Denmark: DS 71; 73; 74; 75
Germany: DIN 53811; 60412; 61514; 62150, 151; 64160 to 63, 675, 680
Hungary: MNOSZ 5562
Spain: UNE 40016, 017
UK: BS 1836: 1958 Dimensions of Flyer Bobbins and Skewers
BS 2933: 1958 Measurement of Carrotting of Hatters' Fur
BS 2963: 1958 Tests for the Flammability of Fabrics
BS 2958: 1958 Flax, Jute and Hemp Webbings
BS 2959: 1958 Test for Dimensional Stability of Warp-knitted Nylon Fabrics
USA: ASA L14.14: 1957 Methods of Testing and Tolerances for Cotton Sewing Threads
ASA L14.91: 1957 Method of Test for Length and Length Distribution of Cotton Fibres by the Array Method
ASA L14.94: 1957 Method of Test for Maturity of Cotton Fibres (Random Sample-sodium Hydroxide Swelling Method)

678 Macromolecular Materials. Rubbers and Plastics

Germany: DIN 7712; 16700
Hungary: MNOSZ 5562; 18811, 812
International Standards Organization: ISO/R 48: 1957E Determination of Hardness of Vulcanized Natural and Synthetic Rubbers
Japan: JIS K 5650 to 53; 6715, 32, 41
Netherlands: HCNN NEN 1455, 1514, 15; 2173
Portugal: NP 159
Spain: UNE 53036, 043, 045 to 049, 061, 062, 071, 075, 081
UK: BS 903: Pt.A5: 1958 Methods of Testing Vulcanized Rubber: Determination of Tension Set
BS 903: Pt.A15: 1958 Methods of Testing Vulcanized Rubber: Determination of Creep and Stress Relaxation
BS 903: Pt. D6: 1958 Methods of Testing Vulcanized Rubber: Determination of Indenation & Recovery Number of Ebonite
BS 903: Pt. B6 to B10: 1958 Methods of Testing Vulcanized Rubber: Determination of Sulphur
BS 2050: 1958 Electrical Resistance of Conductive and Anti-static Rubber Products
BS PL.1: 1951 Synthetic Resin (Phenolic) Mouldings for Aircraft

685 Saddlery. Footwear. Gloves. Travel, Sport, Games and Other Equipment

Germany: DIN 7901 to 05
India-Ministry of Defence: IND/GS/894; Drg/2124; TC/3818(b), 21(a)
Netherlands: HCNN NEN 1300; 3065, 66
South Africa: SABS 321
UK: BS 2956: 1958 Physical Training Equipment

687 Clothing. Readymade Clothing. Sewing Machines. Toilet Articles. Brushes

Germany: DIN 61514
India-Ministry of Defence: IND/GS/895; TC/1611(c), 4493(c), 4593(f)
UK: BS 2939: 1958 Wire Brushes

69 Building Industry. Materials. Trades. Construction

Belgium: NBN 269; 455
France: NF P 18-310; -311
Germany: DIN 105
Hungary: MNOSZ 14905
Ireland: I.S.71
Italy: UNI 3952
Japan: JIS A 4701, 02; 5905 to 08; 6003, 04
Norway: NS 831
Spain: UNE 41049, 050, 086
UK: BS 12: 1958 Portland Cement (Ordinary and Rapid-Hardening)
BS 1097: 1958 Mastic Asphalt for Tanking and Damp-proof Courses (Limestone Aggregate)
BS CP 338: 1957 Domestic Propane-Gas-Burning Installations in Permanent Dwelling
USA: ASA A89.1: 1957 Building Code Requirements for Reinforced Concrete
ASA A109.2: 1956 Asphalt-saturated Roofing Felt for Use in Waterproofing and in Constructing Built-up Roofs
ASA A109.10: 1957 Tentative Methods of Sampling and Testing Felted and Woven Fabrics Saturated with Bituminous Substances for Use in Waterproofing and Roofing
ASA A109.3: 1956 Coal-tar Saturated Roofing Felt for Use in Waterproofing and in Constructing Built-up Roofs
ASA A109.10: 1956 Tentative Methods of Sampling and Testing Felted and Woven Fabrics Saturated with Bituminous Substances for Use in Waterproofing and Roofing
ASA Z21.13.2a: 1957 Gravity and Forced Air Central Furnaces
ASA Z21.13.3a: 1957 Gravity and Fan Type Floor Furnaces
ASA Z21.13.4b: 1957 Requirements for Central Heating Gas Appliances-volume IV-Gravity and Fan Type Vented Recessed Heaters

74 Drawing and Minor Arts

Italy: UNI 3967 to 69
UK: BS 1265-68: 1958 Drawing Boards and Tee Squares

77 Photography and Cinematography

Germany: DIN 19006; 54112
Japan: JIS B 7120: 1957 Photographic Exposure Meter
Spain: UNE 1059, 60, 67

Sweden: SIS 74 32 11, 12
UK: BS 1592: 1958 Camera Shutters
BS 2940: 1958 Dimensions of Film Spools for Airborne Cameras
BS 2948: 1958 Slides and Opaques for Television
BS 2954: 1958 Recommendations for Screen Luminance for the Projection of 16 mm Film
BS 2962: 1958 Picture Areas of Motion Picture Films for Television
BS 2964: 1958 Screen Luminance in Cinematograph Laboratory and Studio Review Rooms

USA: ASA PH1.21: 1956 Dimensions for Amateur Roll Film, Backing Paper, and Film Spools
ASA PH2.10: 1956 Method for Evaluating Films for Monitoring X-rays and *gamma*-Rays
ASA PH3.18: 1957 Criteria for Classifying and Testing the Internal Synchronization of Front Shutters
ASA PH3.21: 1957 Dimensions for Medical X-ray Film Cassettes. (Inch and Centimeter Sizes)
ASA PH4.16: 1957 Specification for Chromium-plated Surfaces for Ferrotyping

ASA PH5.2: 1957 Dimensions of Pape Sheets for Photo-reproduction of Dc cuments
ASA PH5.4: 1957 Storage of Micrc film
ASA PH22.40: 1957 Photographi Sound Record on 35 mm Prints
ASA PH22.106: 1957 Projector Aper ture for 35 mm, Anamorphic, 2.35: Prints with Squeeze Ratio of 2: 1
ASA PH4.201: 1957 Photographi Grade: Potassium Iodide. KI
ASA PH4.277: 1957 Photographi Grade: Potassium Metabisulfite K_2S_2C

ISI ACTIVITIES — *Continued from p. 224*

handled by the Steel Castings Subcommittee, EDC 3 : 7, of Engineering Division.

The Committee discussed for finalization the draft specifications covering the following 3 items in the light of comments received on them as a result of wide circulation:

1) Centrifugally Cast (Spun) Iron Pipes for Pressure Main Lines,
2) Cast Iron Fittings for Pressure Main Lines, and
3) Vertically Cast Iron Pipes for Pressure Main Lines.

The Committee modified these drafts and decided to send them again on a restricted circulation to certain manufacturers for a period of six weeks. It also set up a Cast Iron Pipes and Fittings Subcommittee, SMDC 9 : 1, with Mr. J. A. Platts as its Convener to go into the comments received after circulation and to finalize the draft for publication.

The Committee further agreed to the revision of the following two Indian Standards and made Shri K. C. Choudhuri and Shri Pran Lal Patel responsible for drafting the revisions for items 1 and 2, respectively:

1) IS : 210-1950 Grey Iron Castings, and
2) IS : 227-1954 Malleable Iro Castings.

The Committee decided upon th formulation of an Indian Standar Specification for Iron Castin with Spheroidal or Nodular Graphit It set up the Graphite Iron Castin Subcommittee, SMDC 9 : 2, to tak up the work with Dr. S. N. Anar Narayan as its Convener.

The Committee reviewed its ow composition and offered represent tions to the following:

1) Structural Engineering Work Ltd., Bombay, and
2) The Mond Nickel Compan Ltd., Bombay.

OBITUARY

We express our deep sorrow at the sudden and untimely passing away on 6th June last of Shri C. P. Gupta, the Managing Director of M/s Raj Traders, Jaipur, and a member of our Chemical Division Council on which he represented the All-India Manufacturers' Organization.

Born on 7 October 1913, Shri Gupta started his career as a sugar technologist in 1935 after graduating from the Banaras Hindu University and qualifying in sugar technology from Glasgow. After that he held various positions as sugar technologist.

He was appointed as Technical Adviser to Delhi Cloth & General Mills and Barhmi Sugar Mills. Later, he became the General Manager of DCM Chemical Works, Delhi. In 1948, he started his own concern at Jaipur known as Raj Traders, having bone crushing and fertilizer factories at Jaipur and Kotah.

Shri Gupta was a member of the Central Committee of the All-India Manufacturers' Organization (AIMO) and the Hon Secretary of its Rajasthan State Board. He was also a member of a number of other organizations, such as the Indian Council for World Affairs, Advisory Committee for Rajasthan Employment Exchange, the Rotary Club, Rajasthan Flying Club, etc.

Introduction of

METRIC SYSTEM

Poses Problems For

Constructors **Designers** **Shopkeepers**

IN FACT FOR ALL CITIZENS OF INDIA

Indian Standards Help Solve These Problems

FACTORS FOR CONVERTING VALUES

IS : 786-1956 Conversion Factors and Conversion Tables Rs 5·00

This standard is a must for trade and industry, Government departments, engineers, technologists, scientists, students and others interested in quick and accurate inter-conversion of quantities.

IS : 1020-1957 Conversion Tables for Ordinary Use Re 0·50

This standard gives basic conversion factors for units generally recognized in the country and conversion tables for ordinary day to day use.

HOW TO CONVERT VALUES

IS : 787-1956 Guide for Inter-Conversion of Values From One System of Units to Another Rs 3·00

This guide lays down basic rules to be followed whenever original accuracy or significance of a given value is required to be preserved in the converted value.

IS : 1105-1957 Method for Precise Conversion of Inch and Metric Dimensions to Ensure Interchangeability Rs 3·00

This method consists of simple set of rules for the precise conversion of dimensions on engineering drawings with which engineers, designers and shop-workers are concerned.

METRIC WEIGHTS AND MEASURES

IS : 1056-1957 Commercial Metric Weights Rs 2·00

Prescribes shapes, sizes, denominations, accuracy and materials for metric solid and sheet metal weights intended for use in normal commercial transactions.

IS : 1057-1958 Commercial Metric Carat Weights (*Under print*)

Prescribes the requirements for commercial carat weights intended for use in weighing precious stones and pearls.

IS : 1058-1957 Commercial Metric Capacity Measures Rs 1·50

Covers detailed specifications for metric capacity measures of denominations from 20 millilitres up to and including 20 litres.

IS : 1059-1958 Commercial Metric Length Measures (Non-flexible) Re 1·00

Prescribes the requirements for non-flexible metallic and wooden metric commercial length measures.

IS : 1160-1957 Metric Dispensing Measures Rs 1·50

Prescribes the requirements for metric dispensing measures made of glass or transparent plastic materials.

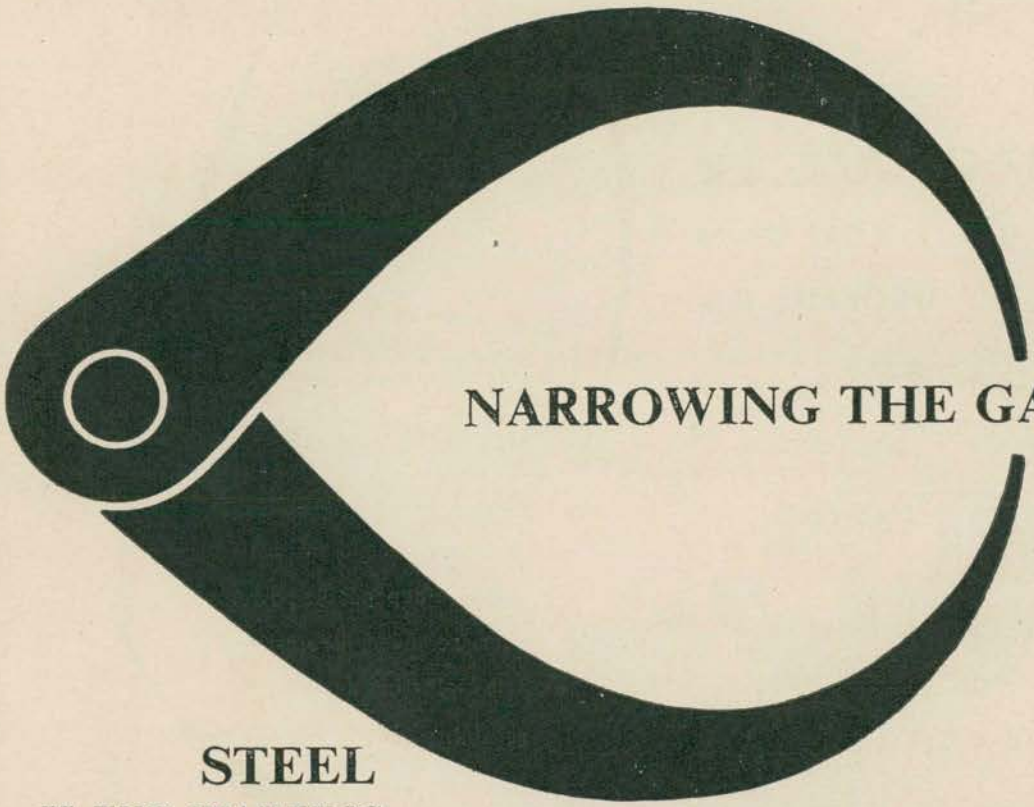
IS : 1269-1958 Metric Woven Metallic Tape Measures Rs 1·50

Prescribes the requirements for metric woven metallic tape measures intended for use where it is not possible to employ rigid measures of length.

Steel is the starting point in a country's progress towards economic self-sufficiency. In India today there exists a wide gap between requirements and production of steel. While the present annual production is only 1,430,000 tons, by the end of the Second Five Year Plan the country will need at least 6,000,000 tons a year.

The public and private sectors have joined hands to narrow this gap by the establishment of three new steel plants at Rourkela, Bhilai and Durgapur and by expanding the existing works.

The Indian Iron & Steel Company Limited plan to expand their ingot output to 1,000,000 tons by 1961, as their contribution towards the needs of the nation's ever growing economy.



STEEL
IS THE STARTING POINT

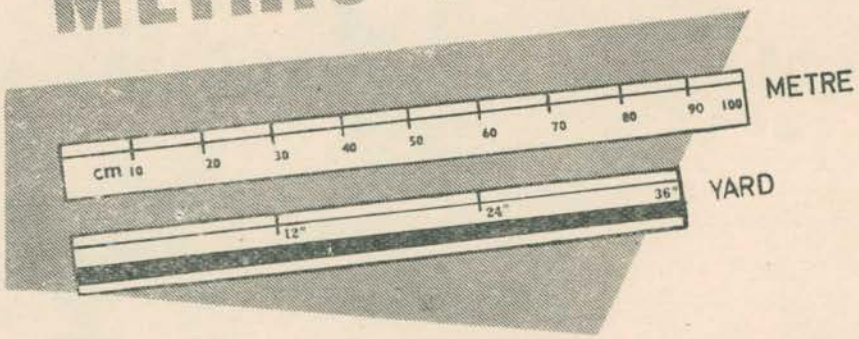
Use steel only when you must today, there will be more tomorrow.

INDIAN IISCO STEEL

THE INDIAN IRON & STEEL CO. LTD.
Works: Burnpur and Kulti
Head Office : 12 Mission Row, Calcutta.

IIC-6

WHAT IS THE METRIC SYSTEM ?



The Metric System derives its name from the Metre, which is the primary unit for measuring length. In this system, as in all decimal systems, the basis of calculation is 10. We multiply or divide any unit of length, weight or volume by the same number i.e. 10.

In the Metric System, the multiples of a unit have the prefix *Deca* (10 times), *Hecto* ($10 \times 10 = 100$ times) and *Kilo* ($10 \times 10 \times 10 = 1{,}000$ times). The sub-units have the prefix *Deci* (1/10) *Centi* (1/100) and *Milli* (1/1,000).

THE CHANGE-OVER TO THE METRIC SYSTEM OF WEIGHTS AND MEASURES BEGINS FROM OCTOBER, 1958

KNOW THE METRIC LENGTHS

The primary unit of length is

THE METRE

= 40 inches approx.
1 kilometre = 5 furlongs

SUB-UNITS

10 millimetres = 1 centimetre
10 centimetres = 1 decimetre
10 decimetres = 1 metre

MULTIPLES

10 metres = 1 decametre
10 decametres = 1 hectometre
10 hectometres = 1 kilometre

DA 58/109

ISSUED BY THE GOVERNMENT OF INDIA

INDIA and ICI

From Rs. 18 crores of ICI research spring new products, new techniques, improved methods and materials.

Scientific research and investigation never cease in the ICI Laboratories in Britain. Specialists are constantly at work—studying, probing and experimenting. In 1957, for example, ICI spent more than £ 13½ million, approximately Rs. 18 crores, in employing leading specialists in every field of research

Basically, that is 'good business'—to keep ahead of competition and abreast of the latest developments.

The outcome of this research is, of course, universally applicable. Here, these new products, processes, discoveries and techniques are speedily made available through the medium of ICI (India) and its associated companies. In India's fields, in her factories, her hospitals, her homes, the standards of living, of health, of technical production—all are being raised by the application of ever-changing, ever-improving methods and materials.

With the establishment of new Industries, ICI gives a pledge of faith in the future.

ICI has given solid proof of its faith in the future of India. Numerous projects have been investigated and capital has been invested in schemes where local conditions promised sound development. These are mentioned below.

In addition to production, I.C.I. (India) furnishes free technical advice and service on the use of the products it sells. Specialists are available to assist customers in every way. This free service ranges from training their staff to answering technical problems and even to trying to assist in marketing.

THE ALKALI & CHEMICAL CORPORATION OF INDIA LIMITED, RISHRA, WEST BENGAL: Produces Caustic Soda, Chlorine, Hydrochloric Acid; 'Gammexane' brand B. H. C. Insecticides; 'Duco', 'Dulux,' 'Necol' and Stoving Enamels; 'Deoxidine', 'Granodine' and 'Alocrom' pretreatment products.

A Rs. 3 crore project is under construction for the manufacture of 'Alkathene' brand of Polythene.

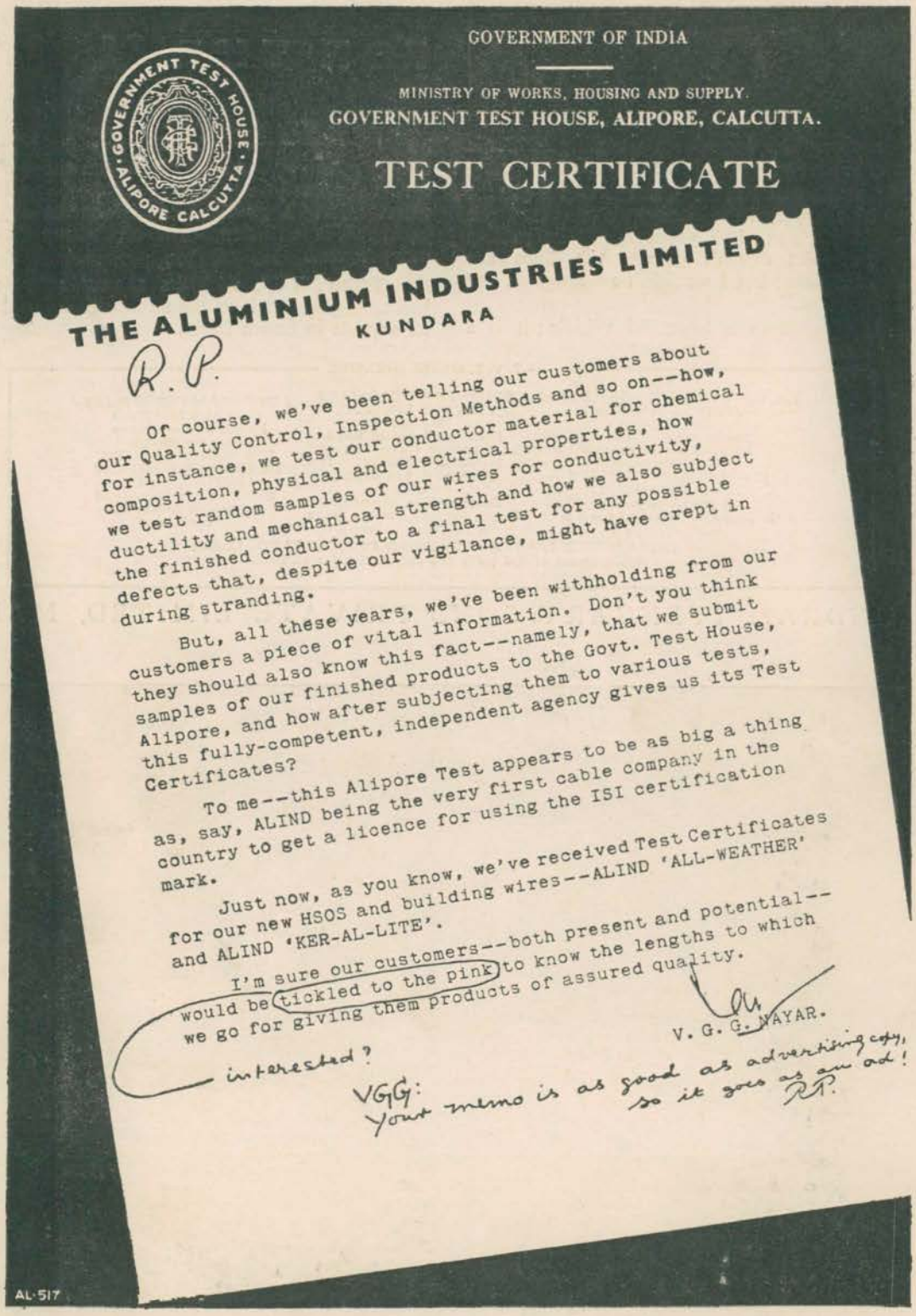
ATIC INDUSTRIES PRIVATE LTD., BULSAR: Manufactures Vat Dyes for the Indian Textile Industry. Atic is a partnership between Atul Products Ltd., and ICI

INDIAN EXPLOSIVES LTD., GOMIA, BIHAR is a joint venture of ICI and the Government of India. The factory is now under construction at Gomia, close to the Bihar coal fields; it will make industrial blasting explosives

I.C.I. (INDIA) PRIVATE LTD.: Makes in Calcutta, 'Alkathene' Film and 'Alkathene' Pipe for cold water and irrigation systems, at Sewri, Bombay, dyestuffs are processed and packed to the exact requirements of the Indian market, and a comprehensive range of auxiliary products is manufactured for the bleaching, dyeing, printing and finishing of textile fibres.

IMPERIAL CHEMICAL INDUSTRIES (INDIA) PRIVATE LIMITED

ICG 725D



GOVERNMENT OF INDIA

MINISTRY OF WORKS, HOUSING AND SUPPLY.

GOVERNMENT TEST HOUSE, ALIPORE, CALCUTTA.

TEST CERTIFICATE

THE ALUMINIUM INDUSTRIES LIMITED

KUNDARA

R. P.

Of course, we've been telling our customers about our Quality Control, Inspection Methods and so on--how, for instance, we test our conductor material for chemical composition, physical and electrical properties, how we test random samples of our wires for conductivity, ductility and mechanical strength and how we also subject the finished conductor to a final test for any possible defects that, despite our vigilance, might have crept in during stranding.

But, all these years, we've been withholding from our customers a piece of vital information. Don't you think they should also know this fact--namely, that we submit samples of our finished products to the Govt. Test House, Alipore, and how after subjecting them to various tests, this fully-competent, independent agency gives us its Test Certificates?

To me--this Alipore Test appears to be as big a thing as, say, ALIND being the very first cable company in the country to get a licence for using the ISI certification mark.

Just now, as you know, we've received Test Certificates for our new HSOS and building wires--ALIND 'ALL-WEATHER' and ALIND 'KER-AL-LITE'.

I'm sure our customers--both present and potential--would be tickled to the pink to know the lengths to which we go for giving them products of assured quality.

interested?

V. G. G. NAYAR.

VGG:
Your memo is as good as advertising copy, so it goes as an ad!
RP.

AL-517

Printed by H. JACQUEMOTTE, S.J., at the Catholic Press, Ranchi, India
Published by JAINATH KAUL, M.Sc., Indian Standards Institution, New Delhi, India

ISI BULLETIN

V. 10 No. 6 NOVEMBER 1958

IW-E IEC/1958

IN THIS ISSUE

INDIAN STANDARDS INSTITUTION

MANAK BHAVAN, 9 MATHURA ROAD
NEW DELHI 1

ISI Bull., V. 10, No. 6, Pp. 235-286 , New Delhi. November 1958

INDIAN STANDARDS INSTITUTION

FOUNDED 1947

The ISI BULLETIN is published every two months and supplied free of charge to all classes of ISI members.

For non-members:

Annual subscription Rs 6·00 (9s or $ 2·25)

Single copy Rs 2·00 (3s or $ 0·75)

All communications should be addressed to

The Chief Editor
Indian Standards Institution
Manak Bhavan, 9 Mathura Road
New Delhi 1, INDIA

Grams 'Manaksanstha' New Delhi — *Phones*: 45915-9, 43063-4

ISI BULLETIN

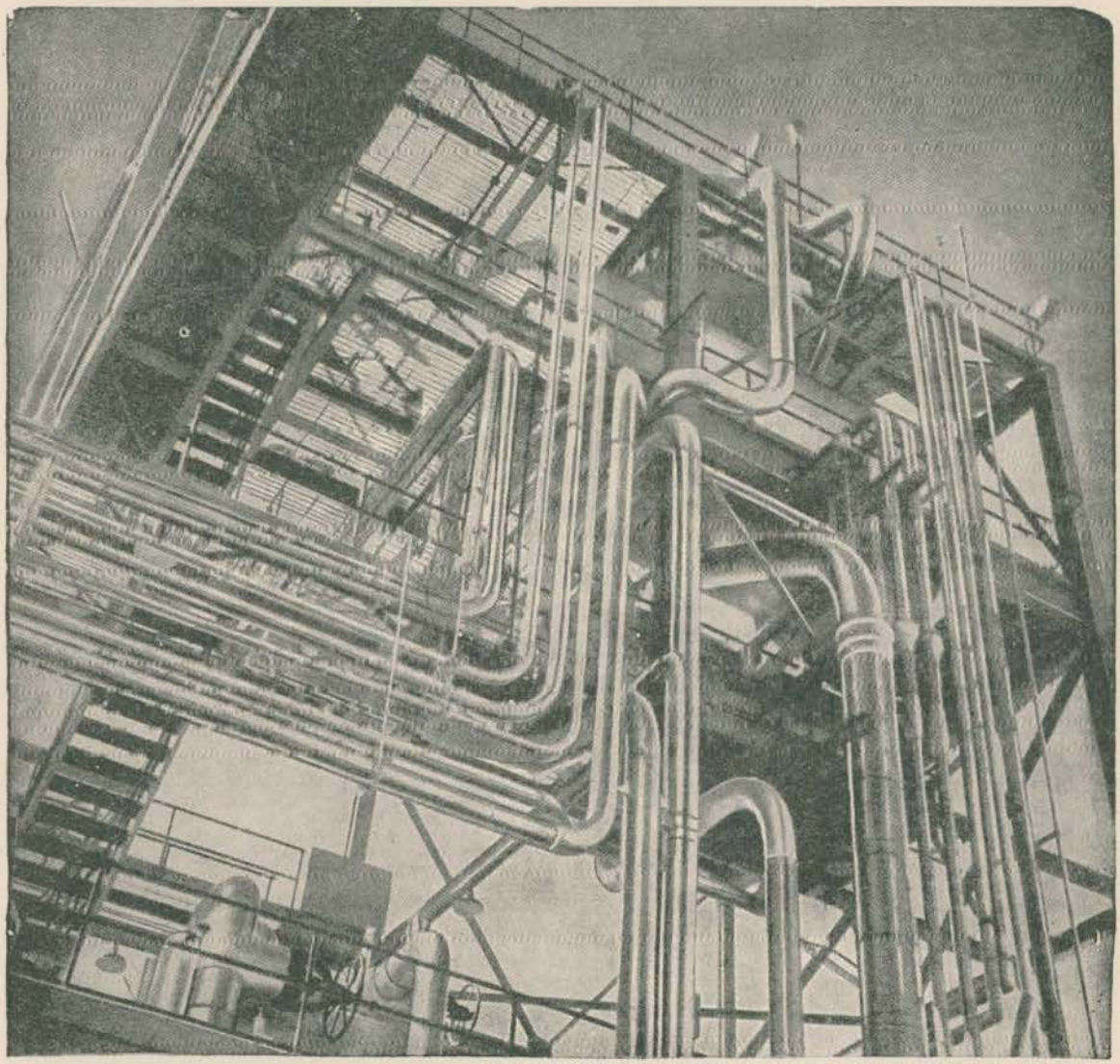
FOUNDED 1949

V. 10 NOVEMBER 1958 No. 6

CONTENTS

Picture on Cover — A view of the gathering of distinguished delegates at the inaugural session of the annual grouped meetings of IEC held at Stockholm last July. The meetings were attended by some 900 delegates (with about 300 accompanying family members) from more than 30 countries including India. An interesting review of these meetings, which lasted over a fortnight, appears on page 235 of this issue — *Ed.*

This periodical is produced in accordance with IS: 4-1949 *Practice for Make-up of Periodicals*



General view of pipework outside the turbine room at Trombay Thermal Power station

Fabrication and Erection of complete

Pipework installations

for Steam, Gas, Compressed Air, Fuel Oil etc.

SLF-2.57

S&L

STEWARTS AND LLOYDS OF INDIA PRIVATE LTD.

HEAD OFFICE: 41, Chowringhee Road P.O. Box 270 Calcutta
Telephone: 44-5224 (7 lines) & 44-1461

WORKS: 39, Hide Road, Kidderpore, Calcutta
Telephone: 45-3515 (3 lines)

Hercules is more than a cycle...
it's a lifetime companion

A HERCULES belongs to the family even though not everyone may ride it. "Shall I bring the medicine for granny?" "Daddy must be tired, shall I bring vegetables from the market?" There are always volunteers ready to run errands where there's a HERCULES. Few things in life are so useful for so long as a HERCULES.

Backed by the experience of people who have made top-quality cycles for nearly 50 years the sturdy HERCULES is precision-built in T. I. Cycles' ultra-modern factory. Its streamlined beauty, smooth effortless drive make it the finest cycle you can buy today.

Your cycle is an investment

Hercules

Is the best value for your money

Made by: T. I. Cycles of India Limited. Madras

TIC. 311,

INDEX TO ADVERTISERS

OVERHEAD BUSBAR EQUIPMENT

THIS IS AN

'ENGLISH ELECTRIC'

PRODUCT

NOW MANUFACTURED

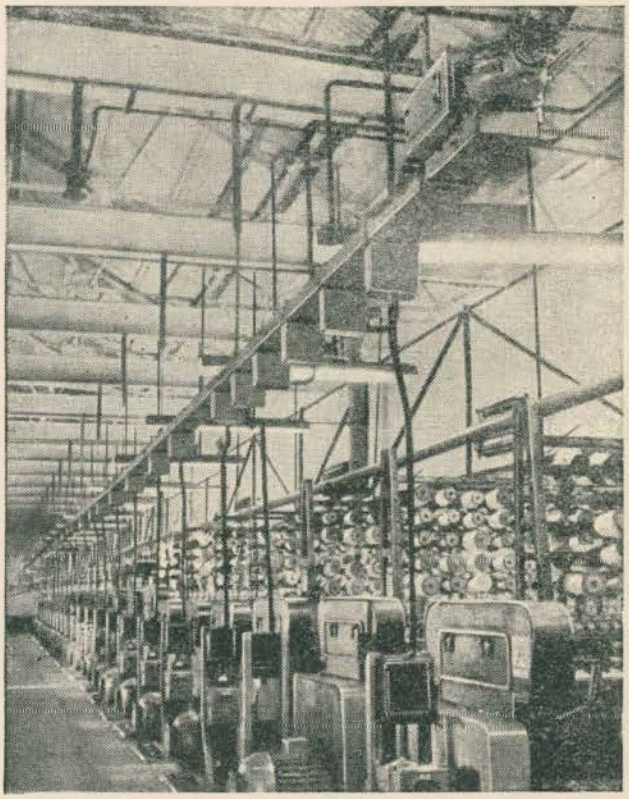
IN INDIA BY

THE

ENGLISH ELECTRIC COMPANY

OF INDIA

(PRIVATE) LIMITED.



The 'English Electric' Overhead Busbar System of electrical distribution is based on planned runs of fully insulated busbar chambers at or near roof truss level. The system distributes power to individual machines via fused plug-in points at 2 ft. intervals. The system makes it possible to clear the air of line shafting and belting and to avoid expensive underfloor cabling. In the majority of plants, it proves to be the cheapest method of distribution on the basis of installed cost and maintenance, the saving being directly proportional to the number of machines in a given area. The illustration shows 'English Electric' Busbar Equipment distributing power to the Frames in the Spinning room of a Textile Mill in Bombay.

In addition to the Overhead Busbar Equipment, 'English Electric' high rupturing capacity type 'CH' Combination Fuse-Switches, Combination Fuse-Switchboards and 'SM' & 'NS' type Distribution Fuse-boards are also being manufactured at our Works in Madras.

'ENGLISH ELECTRIC'

Send your enquiries to

THE ENGLISH ELECTRIC COMPANY LIMITED

Incorporated in England. Liability of members Limited

New Delhi Calcutta Bombay Lucknow

Agents for South India

BINNY & COMPANY (MADRAS) LTD. MADRAS

EEC-51A

SI BULLETIN

V. 10 NOVEMBER 1958 No. 6

IEC Meetings in Scandinavia

S. SRINIVASAN

The International Electrotechnical Commission (IEC) held the 1958 series of its annual meetings in Sweden and Denmark from 30 June to 18 July 1958. A review of its various aspects which we publish here contains interesting impressions of a member of the ISI staff who was one of the 8-man Indian delegation to these important international meetings — *Ed.*

THE Royal Institute of Technology, near Ostra Railway Station in Stockholm, the picturesque capital of Sweden, was the centre of intense activity for well over a fortnight in July this year. The normally quiet city of Stockholm was so to say, 'electrified' by the presence of nearly 900 delegates (with about 300 accompanying family members) from more than 30 countries of the world. The occasion was the annual grouped meetings of the International Electrotechnical Commission (IEC). In all, 54 meetings of technical committees, subcommittees and working groups took place on this occasion, and this is believed to have been the largest session of IEC held so far. In spite of the best efforts on the part of the Swedish National Committee, it was found impossible to hold all the meetings at Stockholm, and, therefore, a few of the meetings were arranged to be held at Copenhagen (Denmark) and Ludvika and Vasteras (Sweden).

The delegates — mostly high ranking experts in the different fields of electrical and communication engineering — were representative of a wide cross-section of interests and nationalities. The Conference had attracted delegates even from far off Japan, the People's Republic of China and Argentina, besides of course the USA, Canada, most of the European and West Asian countries and the USSR. The largest overseas delegation was from the United Kingdom, and the USSR had sent nearly forty of its highly qualified experts who took keen interest in the meetings and contributed considerably to the free exchange of technical information and experience. It was a very welcome and inspiring sight to see standards engineers from all over the world cordially discuss minute details of electrical and communication engineering subjects and invariably arrive at unanimous decisions in the interest of international accord and world trade.

The Indian delegation consisted of 8 members, including the author, the others being drawn from the electrical and electronics industries, both private and public, and closely connected with ISI work.

INAUGURAL SESSION

The businesslike programme of this session, which opened on 9 July at the Royal Institute of Technology, began with a brief welcome for the delegates by Dr. Herlitz, Director ASEA Works, Vasteras (Sweden) and President of the host National Committee. This was followed by a short speech by Dr. Percy Dunsheath, President IEC, in which he threw light on the purpose for which IEC had worked in the past 54 years and for which the Committees were meeting once again in Sweden. The shortness of duration in which the formal function was completed without delaying the more serious technical committee meetings, was symbolic of the purposefulness and practical approach of the IEC which has to deal with groups of electrical and electronic industries in which the pace of technological progress is so rapid that protracted procedures can hardly help in keeping abreast of it.

MEETINGS IN COPENHAGEN

As mentioned earlier, some of the meetings had to be held in Copenhagen, the beautiful capital of Denmark. Though it was no doubt somewhat difficult for some of the delegates who had to travel again to Stockholm, the meetings in Copenhagen gave them an opportunity to see the New York of Europe. And, the inconvenience was more than made up by the

Dr. Percy Dunsheath

traditional Danish hospitality to which the delegates were treated on a lavish scale.

The three committees which met in the Danish capital were TC 20 Electric Cables, TC 35 Primary Cells and Batteries and SC 12-2 Safety (Radio Communication). Of these, the last mentioned, though only a subcommittee, was the most lively, and had the largest attendance. This particular committee, besides discussing a draft recommendation on safety requirements of television receivers, also considered proposals for revision of the IEC Publication on Safety Requirements of Radio Receiving and Associated Apparatus. India had considerable interest in this committee as testing under tropical conditions was discussed, and more about this will be found later in this report.

The Cables Committee made further progress with draft recommendations for tests on gas pressure cables upto 275 kV. The Primary Cells and Batteries Committee, TC 35 approved of additional types of Radio HT batteries to be included in IEC Publication 86 and considered discharge conditions for Hearing Aid Batteries. The delegates to TC 35 visited the 'Hellesons' Dry Battery factory and the delegates to the Subcommittee 12-2 saw at the Danish Government Electrical Testing Laboratory (DEMKO) a demonstration of all the tests for safety requirements of Radio and Television Receivers as described in the IEC Publication on the subject and its latest draft revision. In the demonstration some of the manufacturers also participated, and the visit was very useful in assisting the delegates to understand the problems under discussion thoroughly.

MEETINGS IN SWEDEN

Besides the bulk of meetings of technical committees, which were held in Stockholm, the following committees met at Vasteras and Ludvika in the north of Stockholm.

Vasteras

As is well known, the discovery of newer and still newer synthetic insulating materials results in unexpected developments in the design of electrical gear, and the importance of specifying requirements of characteristics of such insulating materials and laying down standardized testing methods to evaluate them cannot be over emphasized. The Technical Committee for Insulating Materials (TC 15), along with its Experts Committee and seven Working Groups dealing with highly specialized aspects, met at Vasteras for nearly a whole week and approved for circulation six documents relating to electric strength at power frequencies, insulation resistance of solid insulating materials and thermal evaluation of insulating materials. The Committee also approved publication of an IEC Recommendation for methods of determining comparative tracking index of solid insulating materials.

Ludvika

At Ludvika, TC 22 (Power Converters) and its Subcommittee SC 22-2 (Semi-Conductor Rectifiers) met and re-defined the scope of the Technical Committee to include all types of static power converters. Arrangements were also made for close co-ordination between this committee and TC 39 (Electronic Tubes and Valves).

STOCKHOLM MEETINGS

As mentioned earlier, most meetings took place in Stockholm, the principal among them being the meetings of the Committee of Action and the Council. In the following account, brief references are made to the more important committee meetings and their principal achievements.

Committee of Action

The Committee of Action, which is the Executive Committee of the Commission, takes complete responsibility for its administration and for technical documents at final stages. This Committee meets every year when the grouped meetings take place. Besides attending to administrative matters, it approves the recommendations of the technical committees which may have met during the year and takes other steps to ensure co-ordination of work of the different committees. The Committee has 9 members elected by the Council, the election of members being for a period of nine years in rotation. India, which is a member of this Committee, was elected in 1952.

The Stockholm meeting was held in two sessions, one on 10 July and the other on 17 July. The first session, presided over by Dr. Dunsheath, President IEC, dealt mainly with problems of administration, an important one of which was the increasing cost of running the IEC. While approving the budget for the new year, the Treasurer spoke of the possibility of having to increase the subscription rates from member countries from 1960 onwards. After prolonged discussion, the Committee recommended that the Council should meet in 1959 specially for considering this question. The Committee accepted the invitation from Spain for holding the 1959 series of grouped meetings at Madrid in June-July of that year.

The second session of the Committee of Action, at which Dr. Herlitz, the new IEC President, took the chair, received reports from the various technical committees which met during the year, and particularly those which met in Scandinavia. Some 40 draft IEC recommendations were passed for circulation for comments under the Six Months' Rule and

IW-IEC/1458

The Author with Dr. Harold Osborne, a Former President (Centre) and Dr. I. Herlitz, President-elect of IEC

a dozen recommendations for final publication.

The other important decisions of the Committee of Action were as follows:

1) Technical Committee TC 34 (Lamps and Lamp Accessories) was authorized to undertake the administration of a designation code for photographic projection lamps on the lines of the ASA scheme already in operation in the United States.
2) Considering a suggestion from the ECAFE, the Committee agreed to send one free copy of each published IEC recommendation to such of the countries in the ECAFE region as are not members of the IEC, but the Committee could not agree to let them have copies of draft recommendations.
3) Technical Committee 11 (Rules and Regulations for Overhead Lines) was disbanded as similar work was being already done by another international organization, viz CIGRE.
4) The creation of a new technical committee (TC 45) to deal with electrical measuring instruments used in the application of Radio Isotopes and Personal Protection, was approved.

The meetings of the Committee of Action were attended by 20 delegates from the 9 member countries and about 30 observers from other countries. The ISO was represented by its President, Sir Roger Duncalfe.

IEC Council

The IEC Council, on which all the 33 member countries are represented, and which meets normally once in three years, held a formal session to approve the recommendations of the Committee of Action and to elect a new President for the next term of 3 years. The honour went this time to Dr. I. Herlitz, President of the Swedish National Committee. The present treasurer, Dr. Roth, was re-elected for another term. By secret ballot, the Council elected USA, USSR and Spain as the three new members to the Committee of Action for the next 9 years in the place of UK, Belgium and Italy who retired by rotation. The ISO President addressed the Council briefly and conveyed the greetings and good wishes of ISO for the continued success of the IEC in the field of electrical standardization.

NEW IEC PRESIDENT

DR. IVAR HERLITZ

We congratulate Dr. Ivar Herlitz, RVO (Royal Order of Wasa) on his recent election as President of the International Electrotechnical Commission. Dr. Herlitz, who has succeeded Dr. Percy Dunsheath on the expiry of his three-year term of office, is the Director of *Allmanna Svenska Elektriska Aktiebolaget*, ASEA, Vasteras (Sweden), and was for the last eight years, President of the Swedish National Committee of IEC.

Born in 1894, Dr. Herlitz graduated from the Royal Institute of Technology, Stockholm, in 1917, and after a period of studies and research (1920-22) joined ASEA, with which he has now been connected for the last 35 years. In 1929, he was awarded Doctorate in Technology. In 1945, Dr. Herlitz was appointed Chief Assistant in the Construction Department of ASEA, and six years later he became its Vice-President, in charge of the same department.

At present, Dr. Herlitz is also Vice-Chairman of the Swedish Bureau for Testing Electrical Equipment, SEMKO, a fellow of the American Institute of Electrical Engineers and a member of the Swedish Standards Association and the Royal Swedish Academy of Engineering Services.

The important publications of Dr. Herlitz are 'Investigations on High Tension Electric Transmission Lines' and 'The Dynamic Stability of Electrical Transmissions'.

Technical Committee Meetings

TC 1 (*Nomenclature*) — Good progress was reported from this Committee dealing with the fundamental matter of standardized nomenclature. Meeting in four sessions, the Committee approved the publication of two documents, viz, second list of graphical symbols, and symbols for transformers and machines. It also approved for six months' circulation, six drafts under different groups of subjects.

TC 7 (*Aluminium*) — This Technical Committee, meeting after its Subcommittee SC 7-1 (Aluminium Alloys), agreed to expand its scope to cover Aluminium Conductors for Overhead Transmission Lines. It also approved of two documents dealing with aluminium alloys of the Al-Mg-Si type for busbars and annealed aluminium electrical conductors for circulation under the Six Months' Rule.

TC 8 (*Standard Voltages, Current Ratings & Frequencies*) — While discussing standardization of high voltages for DC systems, this Committee ran into difficulty in the region above 420 kV, and the question was later referred to the Committee of Action which decided that the matter fell within the scope of TC 30 (Extra High Voltages).

TC 13 (*Measuring Instruments*) — The three Subcommittees SC 13-A (Integrating Meters), 13-B (Indicating Instruments) and 13-C (Electronic Measuring Instruments), and the main Technical Committee held 15 half-day sessions and approved a number of amendments to the finalized draft recommendation for watt-hour meters for A.C. electrical energy, besides processing further preliminary drafts on indicating instruments. Of particular interest was the first meeting of Subcommittee 13-C (Electronic Measuring Instruments), in the work of which added interest was shown due to the fact that this is the only IEC Committee for which USSR has taken up secretariat responsibility. The task of this Subcommittee was far from easy as it took up for consideration a very large number of subjects, most of which were just on the border of the scope of TC 13 and touched on the subject of electronics.

A preliminary draft on signal generators was discussed by this Subcommittee in a general manner and passed on to a working group for further study in consultation with a representative of TC 12 (Radio Communication). As a result of taking up this new work, TC 13 asked for expansion of its scope to include electronic measuring and associated instruments, and this extension of scope was approved by the Committee of Action.

TC 14 (*Power Transformer*) — Meeting for two and a half days, this Committee processed further work on the revision of the first edition of IEC Pub No. 76 Power Transformers. It also extended its scope of work to include on load tap change, and set up a new

A Combined Group Photograph of Members of the Council and Committee of Action of IEC. Seated (from l to r) are Prof. G. de Zoeten of Netherlands; S. Srinivasan of India; Dr. H. S. Osborne, Past President, IEC; P. D. Poppe of Norway; R. C. Sogge of USA; Col. B. H. Leeson of UK; Dr. R. Vieweg of Germany; Dr. A. Roth, Treasurer, IEC; Dr. P. Dunsheath, Immediate Past President, IEC; Dr. I. Herlitz, Newly Elected President IEC; L. Ruppert, Secretary, IEC; Sir Roger Duncalfe, President, ISO; Dr. J. A. de Artigas of Spain; A Nekrassov of USSR; Gen. E. E. Wiener of Belgium; A. Lange, of France; N. E. Holmblad of Denmark and J. Lai of People's Republic of China

Subcommittee (14-B) to take care of this subject.

TC 17 (*Switchgear and Controlgear*) — This Technical Committee and its two Subcommittees, 17-A (Low Voltage Switchgear and Controlgear), which met at Ludvika, and 17-B (High Voltage Switchgear and Controlgear) met in 15 half-day sessions. A document containing rules for isolators and earthing switches was approved for circulation to national committees under the Six Months' Rule.

TC 23 (*Electrical Accessories*) — After a four-day meeting, this Committee approved for six months' circulation two documents dealing with domestic fuses and links for miniature fuses.

TC 24 (*Electric and Magnetic Magnitudes & Units*) — An important decision of this Committee was to establish closer collaboration with the ISO in this fundamental field. For this purpose, the formation of a Steering Committee consisting of representatives of ISO/TC 12 (Quantities, Units & Symbols) and of IEC/TC 24 was recommended and later approved by the Committee of Action. The Central Office of the IEC will take further steps in this direction.

TC 25 (*Letter Symbols and Signs*) — To accelerate work on the fourth edition of IEC Pub. No. 27 International Letter Symbols used in Connection with Electricity Quantity Symbols — Alphabets and Letter Type, an Experts Committee was set up and two working groups were formed to deal with symbols and signs relating to electronics and communication (including semiconductors), and power converting equipment respectively. Permanent liaison was established with ISO/TC 12, and the present meeting was also attended by observers from the International Union of Pure and Applied Physics and the International Organization for Legal Metrology.

TC 28 (*Co-ordination of Insulation*) — After a two-day meeting, this Committee approved for circulation to national committees under the Six Months' Rule, a document containing amendments to the 2nd edition of Pub 71 Recommendations for Insulation Co-ordination.

TC 29 (*Electro-Acoustics*) — This very active Technical Committee and six of its eight working groups held 30 half-day sessions in all, several of the meetings taking place simultaneously. The work of the six working groups was related to sound systems, sound recording, hearing aids, loudspeakers, ultrasonics, and sound level meters. The two plenary sessions of the Committee were attended by nearly 80 delegates from more than 20 countries and covered a variety of very complicated documents on specialized subjects, all falling within the broad scope of electro-acoustics. This Committee also keeps close liaison with ISO/TC 43 (Acoustics), which held a meeting in Stockholm immediately following the IEC meetings, so that experts in the field who had interest in both Committees could conveniently attend the two meetings. The plenary meeting of TC 29 approved for circulation, under the Six Months' Rule, six documents, three of which pertained to magnetic recording systems, and the others to recommendations on loudspeakers (leading dimensions and impedances), Coupler for hearing aid calibration and specification for sound level meters respectively. The two documents finalized for publication were an amendment to IEC Pub 94 Recommendations for Magnetic Tape Recording and Reproducing Systems — Dimensions and Characteristics, and Methods of Measurement of Electro-Acoustic Characteristics of Hearing Aids. Among the Working Groups, the meeting of Working Group 5 (Loudspeakers) was of special interest to India as the agenda carried an item for discussion of four published Indian Standards on loudspeakers and loudspeaker systems, in connection with the preliminary work of the IEC on the subject of Measurement of Loudspeaker Characteristics. India was co-opted on the Working Group, and the Indian Committee was asked to take up the responsibility of preparing the preliminary IEC document on the subject, based on the Indian Standard and on the discussions at the meeting.

TC 38 (*Instrument Transformers*) — Further progress was made in the revision of Pub No. 44 Instrument Transformers, and agreement was

reached between the Chairman of this Committee and that of TC 33 (Power Capacitors) that work on capacitor voltage transformers should be carried out in TC 38, keeping the other committee informed of the progress from time to time.

TC 39 (Electronic Tubes and Valves and Similar Semi-Conducting Devices) — Meeting after a 3-day session of its Subcommittee SC 39-1 (Electronic Tubes and Valves) and a 2-day session of the joint Subcommittee SC 39/40 (Sockets and Accessories for Electronic Tubes and Valves), this Technical Committee approved for six months' circulation, four documents, including an amendment to Pub 67, Part II Dimensions of Electronic Tubes and Valves, and specifications for sockets for electronic tubes and valves.

TC 40 (Electronic Components) — Two plenary sessions of this Technical Committee and thirty half-day sessions of five of its subcommittees, namely SC 40-1 (Capacitors and Resistors), SC 40-2 (RF Transmission Lines and their Accessories), SC 40-4 (Connectors and Switches), SC 40-5 (Basic Testing Procedures) and SC 40-6 (Parts made of Ferro Magnetic Oxides) were held. After very detailed consideration by the subcommittees, the plenary meeting of TC 40 approved for 6 months circulation eleven documents, and recommended for final publication four documents, including a part revision of Pub 68 Basic Climatic and Mechanical Durability Testing Procedures for Components. Besides these, the Committee also considered a proposal from Poland to prepare a document similar to Pub 68 but relating to low-voltage electrical equipment and rotating machinery. The Committee, however, did not find this subject to be within its scope and referred the matter to the Committee of Action. Another proposal to start work on a complementary range of cables, wires and wave guides peculiar to electronic equipment was considered and the Committee recommended to the Committee of Action, the setting up of a separate technical committee to deal with the subject in close liaison with the International Telecommunication Union (ITU).

Acting on the recommendation of its Subcommittee SC 40-5, the Technical Committee commended to the Committee of Action a revised basic document dealing with standard temperatures and conditions for testing.

Of special interest was the meeting of SC 40-5 (Basic Testing Procedures), which incidentally was very well attended, as it dealt with the fundamentally important problem of climatic and durability tests for electronic components, on which the recommendations of this subcommittee are acted upon not only by the other subcommittees of TC 40 but to a large extent by many other technical committees also. India had a keen interest in this meeting, being the only country from the tropical region. The Indian delegation had very many comments to make on some of the basic methods in the revision of Pub 68, particularly those relating to damp heat (long term) tests and storage tests. Many explanations were obtained from the Committee to be considered further by the corresponding Indian Committee.

The Basic Testing Procedures Subcommittee of the Electronic Components Committee in Session. Seated (l to r) in Second Row are Indian Delegates, Sarvashri S. Srinivasan, R. R. Joneja and H. N. Doshi (Observer)

IW-IEC/TC 40

It is no exaggeration to say that the work of TC 40 (and its subcommittees) is considered to be the most progressive and attracts greatest attention in IEC deliberations. The reason for this is not far to seek. Along with other committees dealing with electronic subjects, this Technical Committee covers a field which in modern times pervades every other field of engineering. Also to keep pace with advances in electronics and allied subjects, which are far too rapid these days, it necessitates fast work by standardization committees. While on this subject, it may not be out of place to draw attention to the fact that in recent years, the work of the IEC technical committees dealing with electronics and communication engineering has increased so much in volume and importance that nearly 40 percent of the total work of IEC now lies in this field, and it is not unlikely that in the years to come, this percentage may become still higher.

TC 42 (High Voltage Testing Techniques) — In a five-day meeting of this Committee, further progress was made on the preparation of an international code of high voltage testing techniques. A document on voltage measurement by means of sphere gaps (with one sphere earthed) was approved for circulation to all national committees for comments under the Six Months' Rule.

Other Meetings

Besides the technical committees and their subcommittees mentioned above, the following committees also met in Sweden during this period, and made progress in their respective fields:

1) SC 2C (Classification of Insulating Materials) — Informal Meeting,
2) SC 2F (Dimensions of Carbon Brushes),
3) 37 Exp (Experts Committee on Lightning Arrestors),
4) Steering Committee of CISPR (International Special Committee on Radio Interference Suppression), and
5) ISO/TC 43 (Acoustics).

TECHNICAL VISITS

Because of the highly developed state of the Swedish electrical industry and their power generation and distribution systems, the technical visits arranged by the Swedish National Committee during the course of the meetings proved very

interesting. The range of interests covered in these visits was so wide that every delegate had something or other to interest him, whether his specialized subject was transistors and other semi-conductor devices, or high voltage insulators and lightning arrestors. Of the fifteen such organized visits to places of technical interest, the following eight deserve special mention:

1) Three Research Atomic Reactors,
2) SEMKO Laboratories, Stockholm, where testing of a variety of electrical and electronic equipment is done in a very well organized manner. (Safety testing of electrical appliances is compulsory in Sweden),
3) ASEA works at Vasteras — The largest group of factories in Sweden, making a big range of heavy electrical machinery,
4) 380 kV underground substation at Hemra near Upsala,
5) Automatic Telephone Exchange in Stockholm,
6) L. M. Ericsson's Telephone equipment factory,
7) Underground Railway of Stockholm, and
8) Lightning Research Station.

SOCIAL EVENTS

True to Swedish traditions of hospitality, the host Committee had arranged tastefully selected social events to entertain the hardworking delegates and the ladies accompanying them. The events ranged from an Italian Opera at the Drottingäm Theatre, the only running theatre built more than three centuries ago and still in excellent condition, to the Swedish folk dances at the open air theatre in the picturesque surroundings of ' Skansew ', the exclusive restaurant on an elevation commanding a bird's eye-view of the city. Besides the official reception given by the Mayor of Stockholm to all the visiting delegates in the Golden Hall of the Municipal building, the delegates were taken out in groups on holidays, on coach trips and boat trips to see the beautiful countryside and the archipelago. The outings, which were very enjoyable, revealed the broad based prosperity of the Swedes.

FOURTH CHARLES LE MAISTRE LECTURE

For the past four years, it has been the practice with the IEC to invite an eminent person connected with its work to deliver a lecture in commemoration of Charles Le Maistre, who was intimately associated with the work of the IEC for more than half a century till 1954, when he passed away. This year the honour of delivering such a lecture fell on Dr. Richard Vieweg, President of the Physikalisch-Technische Bundesanstalt, Braunschweig, Germany. Besides holding an eminent position in the electrical field, being Chairman of the German National Committee of the IEC and of the IEC Technical Committee on Insulating Materials, Dr. Vieweg is also a recognized authority on metrology, and represents the IEC on the International Organization for Legal Metrology. Dr. Vieweg chose for his address the subject of ' Measuring, Standardizing and Producing '. In his characteristically delightful and impressive way, he brought home to the packed audience gathered at the Technical Museum, the importance of measuring techniques and the part played by standardization in industrial advancement and human relationship.

IW-IEC/1958

An Informal Group of Some of the Indian Delegates with Shri S. P. Khemani, the Second Secretary to Indian Embassy in Stockholm (Second from Right), his Daughter, and a Friend Shri Gopala Rao (Second from Left) at the Mayor's Reception at Stockholm. The Delegates (from l to r) are Dr. G. R. Toshniwal, the Author, Shri R. R. Joneja, and Shri B. K. Mitter

INDIA AND IEC

Indian Participation

In view of the large number of simultaneous meetings and our limited interest in particular subjects, the Indian delegates covered meetings of only the following committees:

1) SC 12-2 (Safety-Radio Communication),
2) TC 8 (Standard Voltages & Current Ratings),
3) TC 13 (Measuring Instruments),
   SC 13-A (Integrating Meters),
   SC 13-B (Indicating Instruments),
   SC 13-C (Electronic Measuring Instruments),
4) TC 14 (Power Transformers),
5) TC 17 (Switchgear and Controlgear),
   SC 17-A (High Voltage Switchgear and Controlgear),
   SC 17-B (Low Voltage Switchgear),
6) TC 22 (Power Converters),
7) TC 23 (Electrical Accessories),
8) TC 29 (Electro-Acoustics),
   WG 29-5 (Loudspeakers),
9) TC 35 (Primary Cells and Batteries),
10) TC 40 (Electronic Components),
   SC 40-1 (Capacitors & Resistors),
   SC 40-5 (Basic Testing Procedures),
11) Committee of Action, and
12) The Council.

The Indian delegation consisted of the following gentlemen, who represent a good cross-section of the electrical and electronics industry in this country, and who are closely connected with ISI's work through the Committees indicated against their names:

1) Shri N. G. Ayyangar, Member, Electrical Plant and Switchgear Sectional Committee
2) Mr. C. L. Blanche, Member, Electric Fans Sectional Committee
3) Shri H. N. Doshi, Member, Primary Cells and Batteries Sectional Committee
4) Shri R. R. Joneja, Member, Radio Equipment Sectional

Committee and Convener, Audio Equipment Subcommittee

5) Shri B. K. Mitter, Member, Electrotechnical Division Council
6) Dr. G. R. Toshniwal, Member, Electrical Instruments and Meters Sectional Committee
7) Mr. F. Wade-Cooper, Chairman, Electrical Plant and Switchgear Sectional Committee
8) Shri S. Srinivasan — ISI Staff.

In the unavoidable absence of Dr. Lal C. Verman, Director ISI, who could not attend this year's meetings of the IEC, the author represented the ISI and the Indian National Committee at the meetings of the Committee of Action and the IEC Council, besides attending some of the Technical Committee meetings held at Copenhagen and Stockholm.

Importance of the IEC Meetings to India

Though it may not be possible to assess the achievements of these meetings for their significance to Indian industry, it can be said without hesitation that the 1958 series of IEC meetings contributed substantially to the progressive recognition that India is receiving in international standardization, particularly in the electrical field. This is of real importance to our country, and specially to the fast developing electrical and electronics industry here, for the reason, that India is clearly emerging from a purchasing nation to a producing nation having definite export interest in some of the fields and increasing possibilities in other fields. Being practically the sole representative of the tropical region at the meetings of the IEC, India has also a special role to play in bringing out the peculiar needs of this region so that, by covering the requirements of tropical conditions, IEC recommendations become truly international.

At the Copenhagen meeting of SC 12-2 (Safety) the Indian delegation had the opportunity to explain at length its proposals for testing radio receiving equipment under tropical conditions. In the detailed discussion on the two important points of contention, namely the permissible maximum leakage current to define a live point to be protected, and the maximum permissible temperatures which component parts may attain in radio receivers, India put forward proposals based on experimental investigations conducted at the National Physical Laboratory of India. These proposals created lively interest and will be further examined by the Committee.

Again, at the meetings of SC 40-5 and TC 40, the Indian delegation took the opportunity to press home its objections to some of the basic climatic tests which did not suit tropical conditions, and which, in its opinion, did not align with actual findings in India. The effectively constructive criticism brought forth explanations on several points by many delegations, and a good amount of additional information was gathered. Another meeting at which India occupied a helpful position was that of WG 5 (Loudspeakers) of TC 29 (Electro-Acoustics). At this meeting, while discussing proposals for methods of measurements on loudspeakers and loudspeaker systems, the four Indian Standards on the subject (IS: 1031 to IS : 1034) came in for appreciative references. At the end of the discussion, the Working Group came to the conclusion that the Indian Standards represented the nearest approach to what they had in mind as an international recommendation. In the circumstances, India was co-opted on the Working Group, and the Indian delegation was requested to undertake the responsibility of preparing the preliminary IEC draft on methods of testing Direct Radiator Cone Type Loudspeakers. The responsibility was accepted and the corresponding committee of the ISI will no doubt rise to the occasion and prepare the international document. This is the second occasion in recent years when such an offer has been made to India, the first one being about three years back, when, on a proposal from India to arrive at a unitary series of leading dimensions of foot-mounted Electric Motors based on the metric system, India was asked to contribute the preliminary document, which had the good chance of being accepted almost in its entirety by the IEC. Incidentally it may be mentioned here, that the author was gratified to hear from an authoritative personality of the IEC Organization that the achievement of unanimity based on the Indian proposal for dimensions of motor was considered as a ' Major Miracle ' in the history of the IEC.

IEC Meetings in India

The most significant decision taken at Stockholm, so far as India is concerned, was, of course, the acceptance of the Indian invitation to hold the 1960 meetings in New Delhi. It is very likely that the meetings, which may be held in October-November that year, will bring 400 to 500 delegates from member countries for the 20 to 25 IEC committees which are expected to meet in New Delhi. With the co-operation of the Government and the electrical industry in India, ISI hopes that the New Delhi meetings of IEC will be a success, from the point of view of our capacity to meet the expectation of the high standard both of organizational efficiency required for international meetings and of the traditions of friendliness and hospitality.

CONCLUSION

This review would be incomplete without recording a hearty appreciation of the really creditable manner in which the Swedish National Committee of the IEC, backed by the active representatives of the electrical industry of that country, and the student volunteers from the Royal Institute of Technology, Stockholm, had arranged for the excellent working conditions and enjoyment and comfort of all the delegates. The pressure of meeting work was great on most of the delegates, but all their personal needs and troubles were taken care of by the hosts in a typically unassuming and efficient manner, and every delegate left the land of the midnight sun with a heart full of gratitude and admiration.

ISO–Harrogate–1958

LEADING representatives of industry, science and engineering, as well as specialists in other connected fields, from 40 countries including India attended a number of meetings of the International Organization for Standardization at Harrogate (United Kingdom) last June. For two weeks from 9 to 21 June, the specialists discussed in 15 technical committees, problems ranging from mica, steel, screw threads and machine tools to certification mark and nuclear energy. During the same interval were also held at Harrogate annual sessions of the ISO Council and the triennial meeting of the General Assembly.

INAUGURAL ADDRESS

The opening session, attended by some one thousand delegates and presided over by Mr. H. A. R. Binney, Director, BSI, was addressed by Sir Roger Duncalfe, President ISO. Welcoming the delegates, Sir Roger said, " Our background is technical, and politics do not enter into our work. In that we are fortunate, because we are able to take advantage of a valuable and almost universal human characteristic, namely, that when men are set the task, with sufficient time at their disposal and without compulsion, of solving a technical problem, the job seems to take charge and men's minds tend to move from the circumference to the centre, where agreement is found.

For World Peace

" It is our experience in ISO that this applies to nations working together as well as to individuals, and this is one of the reasons why ISO may become increasingly an organization of profound significance to the world in which we live. In my view, it is by, and through, organizations such as ours that the nations will eventually develop the world in which all may dwell at peace.

" The interest shown in the conference ", went on Sir Roger, " reflected the growing importance of standards in the national economies of all countries, and their recognition of the benefits to be derived from international standards. Probably all would agree that a peaceful future

Sir Roger Duncalfe

for civilization and a greater measure of happiness for all mankind depended more upon a steady rate of economic growth and a continuing expansion of world trade than upon any other factor."

Removing Barriers

" So we must break down the barriers to that expansion. Misunderstanding is one of the barriers. Quarrels between men and wars between nations are generally due to misunderstanding. We set out to remove it and to ensure by international standardization that as trade spreads about the world — the buyer ever looking for new sources of supply and the seller for new markets — both buyers and sellers, even though they speak in different tongues work to a standard or specification which they both understand. This tends to promote happy business relationships and to facilitate trade development."

" It was that purpose which animated the delegates to the conference ", he said, " whether from the older industrial countries or from the newly-developed. Indeed, it was noticeable that the latter, when forming their standards policy were showing a particular interest in the adoption of standards internationally agreed. They appreciate that it would assist them to buy economically the equipment and goods they imported, as well as enable them to satisfy their customers abroad who bought the products they exported. Thus, through international standardization, much mutual help was gained, and indeed no country today could afford the luxury of not being a member of ISO."

Representatives of Member Countries of the International Organization for Standardization who Attended the Opening Session at Harrogate Last June. Seated (from r to l) in the Fourth Row are Indian Delegates Sarvashri S. Srinivasan, C. M. Rajgarhia, P. Kota Reddy and M. V. Patankar

ISO COUNCIL AND GENERAL ASSEMBLY

The twelfth annual meeting of the ISO Council, the governing body of ISO, held from June 14 to 17, was followed by the triennial meeting of the General Assembly on June 19 and 20 with Sir Roger Duncalfe, President ISO, in the chair.

Consequent upon the impending expiry of the presidential term of Sir Roger, the General Assembly elected Professor Wegelius of Finland as the new President of ISO for three years from January 1959. The Council elected Vice-Admiral G. F. Hussey Jr., Managing Director, American Standards Association, as Vice-President, also for a term of three years in succession to Dr. Carlo Rossi, the retiring Vice-President.

ISO Council

The Council noted that during the year 1957, 26 draft recommendations had been accepted as ISO Recommendations, and that a total of over 180 draft ISO Recommendations from technical committees were being processed.

Noting with concern the apparent lack of progress in certain cases, the Council decided on measures for accelerating the processing of recommendations. These measures included the review of the status of the concerned technical committees by the Planning Committee (PLACO) of ISO and to advise the Council on the matter. It will be recalled that the PLACO was set up in 1953 under the chairmanship of Dr. Lal C. Verman, Director ISI, and was entrusted with the task of ensuring co-ordination in the work of the various ISO technical committees.

On the recommendations of PLACO, the Council accepted the new proposal on apparatus for testing milk and milk products, and set up a separate technical committee allocating its secretariat to the German Member Body. The Council approved another recommendation of the PLACO concerning the establishment of a co-ordinating committee on mechanical testing of metals (TESTCO) consisting of representatives of the secretariats of each ISO technical committee connected with the field of study. The UK Member Body was entrusted with the secretariat of this co-ordinating committee.

The third important item which the PLACO had considered earlier for submission of an agreed proposal to the Council, related to the adoption of inch-millimetre series in ISO Recommendations. Endorsing the views of PLACO, the Council resolved that it appreciated the efforts of the technical committees in seeking agreement on the common ISO policy of a single series of linear measurements in ISO Recommendations, but recognized that as exceptions, it would be necessary in some cases to provide for two series.

Among other things, the Council considered the reports submitted by the Editing Committee concerning layout of ISO Recommendations, and approved a number of recommendations made therein relating to the place and method of numbering, dating and presentation of ISO Recommendations, their subsequent editions, amendments, etc.

The Council also examined the reports on the co-operation of ISO with IEC and with other international organizations. New arrangements were approved for liaison between the ISO and organizations of the United Nations in which problems regarding international co-ordination and standardization are assuming increasing importance.

The ISO Council, of which India continues to be an elected member since the formation of ISO, consists of 11 elected members, the other 10 at present are Belgium, France, Germany, Italy, Japan, Spain, Sweden, UK, USA and USSR.. The ISO technical committees, through which the standardization work of ISO is carried out, now number eighty-eight. The working of these committees lies in the hands of individual member countries, India holding the secretariat of three such committees and one subcommittee, namely ISO/TC 50 — Lac, ISO/TC 56 — Mica, ISO/TC 88 — Pictorial Marking of Handling Instructions for Goods, and ISO/TC 30/SC 1 — Measurement of Liquid Flow in Open Channels.

PRESIDENT-ELECT, ISO

PROF. E. A. WEGELIUS

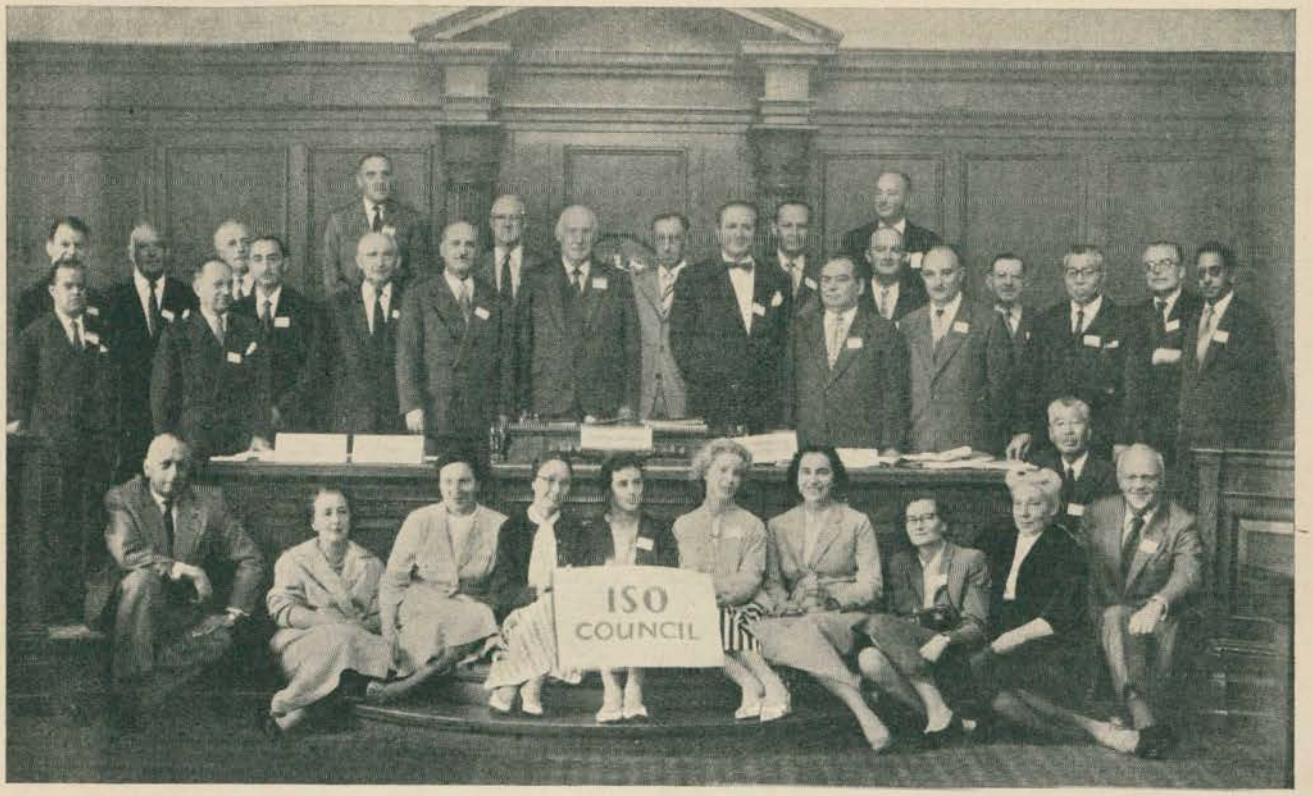
We extend our greetings and best wishes to Prof. Albert Wegelius, the President-elect of the International Organization for Standardization. He will succeed Sir Roger Duncalfe, the present President, on the expiry of the three-year term of office at the end of this year. Prof. Wegelius is at present the Director General of the State Institute for Technical Research, Finland, and President of the Finnish Standards Association.

Prof. Wegelius, who was born in 1903, and educated at Helsinki and Paris, began his professional career in 1929 as an Aeronautical Engineer with the State Aircraft Factory in Finland. He worked in that factory in various capacities till 1945. In that year, he was awarded the degree of Doctor of Technology from Finland's Institute of Technology, Helsinki, and appointed Professor at the State Institute for Technical Research and Special Teacher at Finland's Institute of Technology, Helsinki. In 1948, he became Director General of the former.

Prof. Wegelius's association with international standardization activity dates back to 1946, when as President of the Finnish Standards Association, he participated in the founding of ISO at London. Since then, he has represented his country in the General Assemblies of ISO and also in the ISO Council.

Besides other responsibilities, Prof. Wegelius is the President of the Finnish Association for Documentation, of Finnish Aeronautics Society and of Finland-France Society.

Vice-Admiral G. F. Hussey Jr.



Delegates Who Attended the 1958 ISO Council Meeting at Harrogate Last June, and Some Other Members of ISO General Secretariat. Standing (l to r) are: M. V. Patankar (India); O. Sturen and K. A. Sahlin (Sweden); R. Tavernier (France); P. Sohie (Belgium); A. G. de Guzman (Spain); Gen. P. Soloman and J. Birle (France); Willy Ruggaber, Treasurer, ISO; Vice-Admiral G. F. Hussey, Jr., Vice-President, and Sir Roger Duncalfe, President, ISO; Dr. C. Rossi (Italy); Henry St. Leger, General Secretary, ISO; K. D. Nikonov and A. E. Viatkine (USSR); W. Rambal and R. Marechal (ISO General Secretariat); V. V. Tkatchenko (USSR); G. Weston (UK); Dr. M. Kurokawa (Japan); H. A. R. Binney (UK); and S. Srinivasan (India). Seated on Extreme Left is Dr. A. Zinzen (Germany) and on Right, in Front of Dr. Kurokawa, M. Nagaoka (Japan)

ISO General Assembly

At the 1958 triennial session of the General Assembly, 35 out of 40 member countries were represented. Symbolic of the continued co-operation existing between ISO and IEC, the IEC was represented at this meeting by its President, Dr. Dunsheath.

The Assembly received report from the ISO General Secretary on the activities of ISO during the preceding three years as also on the results of the meetings of the various technical committees and ISO Council. A special mention in this connection may be made of an appraisal given by Dr. Törnebohm, Past President of ISO, about the significance of agreements reached by technical committees on screw threads which had met earlier in Harrogate, and which had been seized for a long time with the problem of bringing out international recommendations on screw threads.

At these meetings of the ISO Council and General Assembly, the Indian Standards Institution was represented by Shri M. V. Patankar, Assistant Director (Engineering) and Shri S. Srinivasan, Extra Assistant Director (Electrical Engineering).

TECHNICAL COMMITTEES

ISO/TC 1—Screw Threads

This important technical committee held its meeting on 17, 18 and 19 June, under the chairmanship of Dr. H. Törnebohm, the Past President of ISO. The meeting was attended by 75 delegates from 27 countries, India being represented by the following:

1) Mr. A. J. Lund (the Leader of the Delegation),
2) Lt-Col R. B. Ghose;
3) Shri G. K. Ruikar,
4) Shri T. V. Mansukhani, and
5) Shri M. V. Patankar.

At this meeting a proposal was put up by America, Britain and Canada for a parallel series of screw threads (from $\frac{1}{16}$ in. up to 6 in.) to draft ISO Recommendation 84 Dimensions for Screw Threads (Below 6 mm), which after a long discussion was accepted by the Committee as parallel series for 6 mm and below as well as for 6 mm and above. This acceptance is sure to have far reaching effects on engineering industry.

The two draft ISO Proposals on general plan for metric screw threads and on metric screw threads for commercial bolts and nuts diameter ranging from 6 to 39 mm were approved as draft ISO Recommendations. In these drafts, the 0·9 mm diameter will be shown in the second column as second preference.

ISO/TC 17—Steel

The sixth meeting of this Committee, held from 9 to 12 June, was attended by 60 delegates from 23 countries, India being represented by Mr. T. Atkinson of India Stores Department, London, and Shri S. Srinivasan of ISI.

Draft ISO Proposals for the following items were considered, and it was agreed that after incorporating the modifications as reached in the discussions, the drafts should be sent to member countries

for approval as draft ISO Recommendations:

1) Drift Expanding Test on Steel Tubes,
2) Bend Tests on Steel Tubes,
3) Flattening Tests on Steel Tubes,
4) Interrupted Creep Testing of Steel at Elevated Temperatures,
5) Non-Interrupted Creep Testing of Steel at Elevated Temperatures, and
6) Stress Rupture Testing of Steel at Elevated Temperatures.

The attention of the Committee was drawn to the need for widening its scope to include the work on material specifications also. The members unanimously agreed to it and submitted to ISO Council to amend the scope to read as under:

"For the purpose of facilitating international trade, to co-ordinate international standards for steel, and in order to assist in achieving this, to co-ordinate terms, definitions, specifications and methods of tests."

ISO/TC 25 — Cast Iron

The second meeting of the Cast Iron Technical Committee which was held from 16 to 18 June 1958, was attended by some 60 delegates from 14 countries. Mr. T. Atkinson of India Stores Department, London, was the Indian delegate.

The Committee discussed the draft ISO Recommendation for Grey Cast Iron, and subject to some modifications agreed to forward it to all members for approval.

The draft ISO Proposal for Brinell Hardness Test for grey cast iron was also decided to be circulated to the members for approval as draft ISO Recommendation.

The Committee agreed to include impact testing in its programme of work.

The scope of work of the Committee, which could not be confirmed in the first meeting was discussed and agreed to as to comprise the standardization of pig iron and various types of cast iron with a view to facilitating the international trade. To this end, the relative national standards will be reviewed, co-ordinating in particular the nomenclature, definitions, and methods of test.

ISO/TC 39 — Machine Tools

The Technical Committee ISO/TC 39 — Machine Tools held its fifth meeting under the chairmanship of M. Pierre Soloman, Ingenieur General of the Commissariat a la Normalization, Paris, on 12 and 13 June. Mr. Soloman was also the Chairman of meetings of this committee in Paris in 1950 and 1951, in New York in 1952 and in London in 1955.

About 45 delegates from 16 countries attended the meeting in which India was represented by Shri G. K. Ruikar (the leader of the Delegation) and Shri M. V. Patankar of ISI.

The adoption of the draft ISO Proposal for Test Code for Machine Tools as draft ISO Recommendation was the very important result obtained during the meeting. This document, it was stressed, will serve as a basic document, and will assist in evolving further recommendations of machine tools.

The draft proposals on the following items were also accepted as draft ISO Recommendations:

1) Tapers for Tool Shanks
2) Tools Centres
3) Tool Posts
4) Speeds and Feeds for Machine Tools

In case of all the above proposals, the aim was to achieve as much interchangeability as possible between the inch and metric dimensions.

The draft proposals on T-slots, lathe checks and direction of rotation of controls and indicator plates were referred back to the concerning Working Group for further modifications before they could be accepted as draft proposals.

ISO/TC 56 — Mica

A change in the draft ISO Recommendation, consideration of four draft ISO Proposals, discussion on master samples, appointment of an Editorial Committee and drawing up of programme of future work were the main features of the fourth meeting of ISO/TC 56 — Mica, the secretariat for which is held by India. The meeting in which, besides the Indian delegation, seventeen delegates representing Australia, France, UK, USA, USSR and the IEC participated, took place from 9 to 11 June 1958, and was presided over by Shri Chandmull Rajgarhia, the Chairman of the ISI Mica Sectional Committee, and the President of the Federation of Mica Association of Bihar. Shri S. Srinivasan of ISI acted as the Secretary. The Indian delegation consisted of Shri P. Kota Reddy of Madras Mica Association and

A Full View of the Meeting of ISO/TC 56 — Mica, the Secretariat for Which is Held by India

The Head Table at the Meeting of ISO/TC 56 — Mica. Seated from l to r are Mr. Henry St. Leger, General Secretary, ISO; Shri S. Srinivasan, Secretary; Shri C. M. Rajgarhia, Chairman; and Miss Saxe, Interpreter

Shri K. K. Saha, Mica Exporters' representative.

As a result of a suggestion from the UK, arising from the Brussels Convention, Nomenclature for the Classification of Goods in Customs Tariffs, the Committee passed the following resolution regarding the draft ISO Recommendation No. 115 Methods of Grading Muscovite Mica Blocks, Thins and Condenser Films:

"That the word 'condenser' should be removed from the title and from the text, wherever it occurs, of draft ISO Recommendation No. 115 and that item 13 of clause 2 (Terminology) should be replaced by:

Films — Knife dressed mica split to any specified range of thicknesses."

Draft proposals on the following four subjects were considered at the meeting:

i) Visual Classification of Muscovite Mica;
ii) Methods for Grading Muscovite Mica Splittings;
iii) Methods for Grading Phlogopite Mica Blocks, Thins and Splittings; and
iv) Thermal Classification of Phlogopite Mica Splittings.

It was decided that the first draft proposal be modified in the light of agreements reached by the Committee and then circulated by the secretariat as a new draft. Further action on the second draft was deferred pending receipt from the US of a full report of their investigation on muscovite mica splittings and the resulting new American specification. The third draft was approved at the meeting, and it was resolved that it should be circulated by the secretariat for postal ballot by members of ISO/TC 56 for approval as a draft ISO Recommendation, subject to confirmation by France on some of the clauses.

Great interest was aroused in the details, given by the US delegate, of the preparation of a series of master standard samples of mica and their use in illustrating the written quality specifications. This subject is to be studied further with a view to the establishment of a working group which will prepare a full report for the next meeting of the Committee.

Consequent upon the receipt of a letter from the ISO General Secretary urging each technical committee to entrust the final drafting and checking of draft ISO Recommendations in English and French to an Editorial Committee, including one representative each from the English-speaking and French-speaking countries, it was agreed that Mr. W. H. Devenish of UK and a representative of AFNOR would assist the secretariat in editorial work.

It was agreed that the secretariat should investigate the effect of India's adoption of the metric system on the size grading of mica and its use in other countries.

In addition to these items, the future programme of the Committee will include electrical classification of mica and sampling methods.

ISO/TC 73 — Marks Indicating Conformity to Standards

Mr. J. Birlè, Director-General of the French Standards Association, presided over the fourth meeting of this Committee, which was held on 13 June. The meeting was attended by about 30 delegates from Belgium, Burma, France, Germany, India, Ireland, Israel, New Zealand, Spain, South Africa, Sweden, UK and USA. India was represented by Shri S. Srinivasan from ISI.

This Committee was set up to investigate the practice prevalent in different countries in respect of operation of certification marks to indicate that a product conforms with national standards, with the object of achieving some degree of uniformity in the principles involved. This difficult matter had been under the consideration of the Committee since its first meeting and it was at this meeting that the Committee approved with some modifications draft ISO Recommendation 159 Principles of Operation of Standard Mark, which will be published in the near future.

This Recommendation covers the broad outlines of the principles that should govern the application of standard marks but leaves room for the adoption by the national standard body of the more detailed methods to suit local conditions.

Besides standards marking, the question of informative labelling with the aim of supplying the consumer with the useful technical information on the products purchased was also examined. A general agreement on the broad principles on which informative labelling should be based was reached.

A Belgian proposal regarding the grant of a certification mark in one country to products made in other countries was also considered. The matter being complicated, it was agreed that a detailed questionnaire, to be prepared in consultation with the Belgian Member Body, be circulated to all members of the Committee for further study.

ISO/TC 85 — Nuclear Energy

The second meeting of ISO Technical Committee 85 — Nuclear Energy, brought together 68 delegates from 17 countries, observers from 2 other countries and representatives from 6 international organizations concerned with the field. India is an observer member, but was not represented at the meeting.

The Committee met on 9 and 20 June under the chairmanship of Mr. Morehead Patterson, Chairman of the Board of the American Machine and Foundry Company, USA. The three subcommittees which met subsequently a number of times, accomplished the following results:

Subcommittee 1 — Terminology, Definitions, Units and Symbols agreed in principle on the basic design of a symbol to denote the actual or potential presence of ionizing radiation.

It also agreed on a tentative first list of 223 concepts which will later be defined in a glossary of nuclear terms.

Subcommittee 2 — Radiation Protection organized its work and its relationship with other competent international organizations.

It adopted as a basis for work three outline drafts concerned with the indirect contamination of individuals, and radiation detectors.

Subcommittee 3 — Reactor Safety defined the extent of its interest in radiation measurements, health records and effluent discharge in relation to the interest in the same topics of AIEA, ICRP, ICRU and World Health Organization. It also considered that work on potentially critical accumulations of material connected with processes other than reactor operation should be undertaken at the appropriate time.

The Subcommittee defined its general method of developing documentation through the stages of collation of information, and formulation of probable lines of development, leading ultimately to ISO Recommendations.

The Subcommittee also agreed on future procedure in regard to eleven different items connected with reactor safety.

At its final plenary session, ISO/TC 85 established a fourth Subcommittee on Radio-Isotopes with Poland as Secretariat.

METRIC SYSTEM IN UK

Under the caption ' England May Adopt the Metric System if United States Does the Same ' the April 1958 issue of Bulletin Belge De Metrologie from Brussels reports the following news :

" Speaking before the British Industries Association on the 15 November 1957, the President of the Board of Trade, Sir David Eceles declared that Great Britain would adopt the Metric System only if the USA did the same.

Sir David added that he had asked for the opinion of experts on the possibility of adopting the Metric System, especially in view of the proposal to establish the zone of free exchange in Europe.

We think that the fear of losing the Canadian Market would prove almost groundless, if the countries of Europe impose standardization of the conditioned products in round metric units.

This obligation would be in conformity with the interest of the buyer, and with the spirit of the existing law concerning weights and measures."

OBITUARY

We regret to announce the sad and premature demise of Mr. Hans Egede Glahn, Director of the Dansk Standardiseringsraad on 16 August 1958 after many months of severe illness.

Mr. Glahn had been the Director of the Dansk Standardiseringsraad since its establishment in 1926 and one of the pioneers of the international standardization movement. He served as a representative of Denmark on the ISO Council, was a member of the Supervisory Committee and a most helpful and active member of the Editing Committee until the very last.

The work that Mr. Glahn did for the Dansk Standardiseringsraad and the International Organization for Standardization would be remembered by all his friends and colleagues.

His passing away is a great loss to all concerned with international standards activity.

Engine Testing of Lubricating Oils

MOHAN LAL KHANNA & JOGINDER SINGH AHLUWALIA

NATIONAL PHYSICAL LABORATORY OF INDIA
NEW DELHI

Not many countries in the world have testing facilities for engine performance of heavy duty lubricating oils. For her requirements of such oils, India depends upon imports, but she has no facilities for testing them in the country. The acceptance of imported oils is largely on the basis of a test certificate from countries like USA and UK.

The ISI Lubricants Sectional Committee, at its second meeting held in Delhi in 1950, gave careful thought to the problem of engine testing of heavy duty oils in India, and recommended that the creation of such facilities should form a part of the scientific development programme of organizations like CSIR, the (then) Ministry of Industry & Supply, the Ministry of Defence and the Oil Companies of India. As a result of this, the NPL undertook to provide the necessary facilities.

In the present article, the authors review the up-to-date development of different engine tests for evaluating the performance of heavy duty oils in different countries of the world.

They have worked for sometime on the problems of installation of a single cylinder Caterpillar engine and its working under Indian conditions, and expect to submit their findings soon in the form of a paper which, when ready, may also be published in a subsequent issue of this Bulletin — *Ed.*

0. INTRODUCTION

0.1 The testing of a motor oil is intended to give a clear indication of its performance in an internal combustion engine. The physical, chemical and mechanical rig tests devised so far are useful only for the purposes of identification and control, and for finding some intrinsic lubricating properties of the oil. They do not correlate adequately with actual engine performance, and cannot, therefore, be relied upon to predict the aptitude of the oil in service. The most satisfactory means of ascertaining this would be to test the oil in engines under actual service conditions. But such tests are laborious and onerous, and are unsuitable for comparative work as it is extremely difficult to duplicate the actual running conditions in various engines. It has, therefore, become an agreed practice to submit the motor oils for heavy duty service conditions to bench tests in engines specially built for the purpose, under specified accelerated or 'extrapolated' conditions. Such tests have also their own limitations but they ensure to a large extent the rating uniformity of the differently constituted crank-case oils.

0.2 In the present paper it is intended to review and discuss the up-to-date development of different engine tests for evaluating the performance of heavy duty engine oils.

0.3 In a subsequent paper the setting up of the single cylinder Catterpillar engine at the National Physical Laboratory of India, used for conducting L-1 test, will be discussed together with an account of the difficulties encountered and how they were overcome in setting it up.

1. HISTORICAL

1.1 Prior to 1930, straight mineral oils were in general use for the lubrication of both spark-ignition and compression-ignition engines. The running conditions were easy and such oils gave quite a satisfactory performance. Their selection was made on the basis of conventional standard laboratory tests.

1.2 With the advent of heavier duty petrol engines and particularly the high speed diesel engines running under severe conditions of load and temperature, the conventional oils were found to be unsuitable. In short service periods, these oils gave rise to increased corrosion of the hard alloy crankshaft bearings; increased engine deposits, especially crank-case sludge; excessive lacquering and gum formation leading ultimately to ring sticking, hard carbon deposition in the ring grooves and on the piston lands, port clogging in the two cycle diesel engine, etc.

1.3 In about the year 1934, solvent refined lubricating oils became available. Such oils possessed improved stability and higher viscosity index as compared to the earlier oils, which had received sulphuric acid treatment followed by caustic washing and clay filtration. Although their use helped in decreasing engine deposits and corrosion to some extent, it soon became obvious that none of the existing refining processes could produce an oil completely satisfying conditions imposed by design changes and ever increasing severe operating conditions. The result was the development of chemical additives, which on incorporation in a carefully refined oil could enable it to cope with the newly imposed conditions. This development was made possible due to a close co-operation between the automobile and the petroleum industries. With every new advance in the design of the engine, higher standards of performance from lubricants were expected and met by the petroleum interests either by anticipating the demand or by conducting research on the problem. There has been a progressive development in the use of chemical addition agents so that today there are hardly any petroleum lubricants which do not contain one or more of these materials.

1.4 In 1935, corrosion inhibitors or antioxidants were introduced to cope with the failure of the hard alloy crankshaft bearings due to corrosion caused by the attack of acidic products of oil oxidation.

1.5 Later on, the introduction of Caterpillar diesel engine led to the development of new doped oils. The operations of this engine with conventional oils under heavy duty service conditions gave serious trouble in the form of hard carbon piston deposits, gumming up of the rings, etc. The whole situation was further aggravated when the fuel used was of poor quality. To overcome these difficulties, 'detergent-dispersent' additives were introduced in 1938. Their action was mainly to keep the harmful substances produced due to high temperature, oxidation of oil and incomplete combustion of fuel in

fine and stable suspension in the oil. These carbonaceous colloidal particles could otherwise aggregate and get deposited on the various engine parts and cause channeling and blocking of the oil ports. The drainage of the oil at regular intervals thus prevented the concentration of these particles to reach a harmful limit. These additives were found to be equally effective in the case of heavy duty gasoline engines.

1.6 In order to assess the newly desired properties brought about by incorporating the additives, engine bench tests were developed by the engine manufacturers faced with the problem of trouble-free operation of their engines. In 1937, Caterpillar Tractor Co. was using a specially designed single cylinder vertical engine for the approval of oils to be used in the engines of their own manufacture. The oil was approved on the basis of ring sticking, piston deposits and cylinder wear. In the case of gasoline engines, the General Motors Corporation was conducting approval tests on a commercial six-cylinder Chevrolet engine, for the assessment of oxidation resistance, bearing corrosion and lacquering of the proprietory brands of additive oils.

1.7 By the end of 1941, there were six major US oil companies offering additive oils, which could meet the standards of performance required of almost all automotive type diesels and all types of gasoline engines.

2. QUALIFYING SPECIFICATIONS

2.1 The work of developing and standardizing a series of engine bench tests was being systematically carried out under the auspices of Co-ordinating Research Council (CRC) formed jointly by the American Petroleum Institute (API) and the Society of Automotive Engineers (SAE). A series of engine tests was finalized and ultimately adopted by the US Army Ordnance Department in their specification 2-104 for heavy duty oils (3 Sept 1941). It was later changed to 2-104A (9 Apr 1942), and subsequently to 2-104B (6 May 1943). This was to simplify the supply problem of engine oils, which would be suitable for all types of engines under all types of service conditions.

2.2 In the qualifying specification 2-104B for heavy duty oils, there were originally five tests[1] which are listed below:

GRC-L-1-545 (AXS-1551) — 480 hours test in Caterpillar single cylinder vertical test engine for determining the effect of an engine oil on ring sticking, wear, general deposits and conditions.

CRC-L-2-545 (AXS-1552) — 3 hours and 20 minutes test in Caterpillar test engine with accelerated run-in and full load for determining piston ring and/or liner scoring.

CRC-L-3-545 (AXS-1553) — 120 hours test in a 4 cylinder diesel engine for oil stability at high temperatures and corrosion of copper-lead bearings.

CRC-L-4-545 (AXS-1554) — 36 hours test in a 6 cylinder gasoline engine for determining oxidation characteristics of heavy duty crank-case oils.

CRC-L-5-545 (AXS-1555) — 500 hours test in a 3 or 4 cylinder G.M. diesel engine for determining oxidation, ring sticking, detergency and bearing corrosion characteristics of heavy duty crank-case oils.

Experience showed that the desired information could be obtained by carrying out only two engine tests, namely L-1 and L-4, instead of five, and as a result, the new US Army specification MIL-O-2104 (4 Aug 1950), replacing the earlier 2-104B, was introduced. Another significant change brought about was that in the L-1 test, a fuel containing *not less than* 0·35 percent sulphur was prescribed instead of *not more than* 0·4 percent as in the old 2-104B specification.

2.3 The API heavy duty motor oils became available in the United Kingdom for the first time during the war, at least from 1942 onwards, and a British specification was introduced under Army Council Instructions 591/43 and Admiralty Fleet Order 5320/44. These specifications were largely based on the American 2-104B specification and the corresponding oils were described as OE-10-HD, OE-30-HD and OE-50-IID and with Navy Symbol 9250. However, the first specification issued by the UK's Ministry of Defence was DEF-2101, which was published on 27 August 1951.

2.4 When in 1952 the British Standards Institution introduced its specification B.S. 1905: 1952[2], there was no test method developed using a British engine, which had been sufficiently widely examined under controlled conditions to permit its adoption as a British Standard, and, therefore, this standard was based on US Army Ordnance Department specification MIL-O-2104.

2.5 The US Army specification MIL-O-2104 was revised and issued as MIL-O-2104A in February 1954, involving only some minor changes in the physical properties of the oil. The British Army specification DEF-2101A was introduced on 25 July 1953 replacing the earlier specification DEF-2101. These revised specifications are still in force in the two countries.

2.6 The latest Specification DEF-2101B was issued on 30 Sep 1957. The differences[3] between DEF-2101A and DEF-2101B are that under the latter all qualifications more than four years old automatically become obsolete. Additives and oils used in qualification tests must have been manufactured within the previous twelve months. The V.I. improvers are excluded but pour-point depressants may be used up to 1·5 percent by weight, maximum. If the pour-point depressant is also a V.I. improver, no objection will be taken.

2.7 In Europe, countries like France, Belgium and Germany have also based their specifications for heavy duty engine oils on the latest US Army specifications. The Indian Standard Specification for Internal Combustion Engine Lubricating Oils (IS: 496-1955), pertaining to the heavy duty class of oils, is also based on this specification.

3. SUPPLEMENT 1 OILS

3.1 In order to comply with the needs of diesel engines operating on cheap fuels of one percent or more of sulphur content marketed by the various oil companies, it became necessary to develop oils of detergency level higher than that of MIL-O-2104 specification. Thus the improved oils called the 'Supplement 1' oils were introduced. To qualify such an oil, the testing procedure adopted is the same as that for L-1 test in the MIL-L-2104A specification except that a fuel of one percent sulphur content is used.

4. SERIES 2 OILS

4.1 Supercharged diesel engines[4] operating on high sulphur content fuel need a still higher level of detergency than that of a ' Supplement 1 ' oil. In typical supercharged diesel engine operation, speeds, oil temperature, coolant temperature, fuel consumption and power output are all substantially higher than those in the conventional engine operation. The detergency requirements inherent in such service are so high that oils of

the MIL-L-2104A and 'Supplement 1' levels generally fail to maintain a satisfactory state of engine cleanliness. A category of detergent oils known as ' Series 2 ' oils is created, to provide lubricants, which would give acceptable performance under these very severe conditions. To qualify under the ' Series 2 ' specification promulgated by the Caterpillar Tractor Co., an oil shall give satisfactory performance in a supercharged single cylinder diesel engine test, called ' 1-D Test[5] ' of 480 hours duration and using fuel containing a minimum of one percent sulphur.

5. IMPROVED SERIES 2 OILS

5.1 In 1955, the Caterpillar Tractor Co.[4] found it necessary to raise the already exacting performance standards for ' Series 2 ' oils. Laboratory and field experience with a new small bore six cylinder highly supercharged diesel engine of advanced design indicated that the existing ' Series 2 ' oils failed in many instances to maintain a satisfactory degree of engine cleanliness. Working in close collaboration with the petroleum and additive industries, the Caterpillar Tractor Co. established very high but attainable performance standards which called for a 480 hours test in a new engine using fuel of high sulphur content.

5.2 In order to obtain a satisfactory state of engine cleanliness in this test, it was found that the amount of detergent additive had to be raised as much as two-fold[4] over the previous ' Series 2 ' levels. Some idea of severity of the new test can be gained by the knowledge that lubricants giving acceptable performance contain a total of 15 to 25 percent additives, substantially all as detergent additives[4].

6. SERIES 3 OILS

6.1 In 1956, these ' Improved Series 2 ' oils were found to be unsuitable for certain engines and the Caterpillar Tractor Co. decided to introduce a new range of superior lubricants, for which an even more rigid specification was necessary. These lubricants are now available on the market under the name ' Superior Lubricant — Series 3 '. They have to be approved by the Caterpillar Tractor Co. after having met the requirements of their new standard tests including both the 1-D and 1-G methods[5]. The 'Series 3' oils are required for the higher output supercharged engines and particularly in other engines operating at low jacket temperature or on low quality fuels.

6.2 In Table I are listed the main operating conditions of different engines used for evaluating the performance of heavy duty oils.

7. DEVELOPMENT OF NEW LABORATORY TEST ENGINES

7.1 The L-1 and L-4 tests as adopted in the US Army specification MIL-L-2104A are now the accepted official tests for heavy duty engine oils in almost all countries. Both these tests are expensive and the Caterpillar L-1 test, in particular, is time consuming. Keeping this in view, in the early forties many laboratories in the United States started seeking for some simple engine and test procedure, which could be used for preliminary screening of oils for the bearing corrosion, oxidation and detergency characteristics. This need was more acutely felt in the United Kingdom, France, Germany, Belgium and other European countries because of the difficulty and expense involved in obtaining these American test engines and spare parts. Secondly, it was important that such engines as alternates to L-1 and L-4 test engines should represent more faithfully the British or Continental service conditions and engine design practice. For additive development research work, this development became all the more necessary.

TABLE I OPERATING CONDITIONS OF DIFFERENT ENGINES USED FOR EVALUATING THE PERFORMANCE OF HEAVY DUTY OILS

Test/Particulars	Caterpillar 1-A[1,5] CRC-L-1 AXS-1551	Caterpillar 1-D[5]	Caterpillar 1-G[5]	AXS-1554[1] CRC-L-4
Engine description	Caterpillar single cylinder, diesel	Caterpillar single cylinder, diesel with a supercharger	Caterpillar single cylinder, diesel, with high speed change-over group	Chevrolet six cylinder, gasoline
Bore × stroke	5¾ in. × 8 in.	5¾ in. × 8 in.	5½ in. × 6½ in.	3½ in. × 3¾ in.
Speed, rpm	1 000	1 200	1 800	3 150
Test duration, hours	480	480	480	36
Oil temp., °F	150	175	205	280
Coolant outlet temp, °F	180	200	190	200
Inlet air temp., °F	Less than 100	200	255	80 (*Min*)
Inlet air pressure	Atmospheric	45 in. Hg abs	53 in. Hg abs	Atmospheric
Load, bhp (approx)	20	42-45	42-45	30
Fuel	S=0·35% *Min* (1% for Supplement 1 oils)	S=0·95–1·05%	S=0·35% *Min*	Octane No. (M)=80 *Min* S=0·1% TEL, ml/gal=3·0 –3·6
Scope	Ring sticking, wear and accumulation of deposits	Ring sticking, wear and accumulation of deposits	Ring sticking, wear and accumulation of deposits	Oxidation and bearing corrosion
Approval test for	MIL-L-2104A (USA) DEF-2101B (UK) IS: 496-1955 B.S. 1905: 1952 Supplement 1	Superior lubricant (Series 2); for superior lubricant, Series 3 also	Superior lubricant (Series 3)	MIL-L-2104A DEF-2101B IS: 496-1955 B.S. 1905: 1952

8. AMERICAN ENGINES

8.1 In the United States, many small prototype engines were developed and used for oil testing purposes. In 1944, the Co-ordinating Lubricant and Equipment Research Committee[6] of the CRC conducted a survey to find out what each testing laboratory, on the basis of its experience, required from an ideal engine and what features an engine should have to accomplish this need. No concrete proposals were put forward after examining this survey report. In 1946, exploratory tests using a new model H-2 of Lauson engine[7,8], developed by the Lauson Co. in collaboration with the CRC, were carried out by different laboratories and three provisional research procedures were recommended. Since then a considerable amount of co-operative research has been conducted both in USA and UK and different modifications have been made both on the engine and test procedure. Experience has shown that tests with the Lauson engine do not correlate or agree exactly with the full-scale L-I and L-4 tests but are only used for ' Screening ' purposes.

8.2 Buda IBD-38 single cylinder diesel engine[9,10] has also been employed by some American laboratories as a screening tool for Caterpillar L-1 and 1-D test engines. It has proved its usefulness in developing oils to meet the US Ordnance specification, Supplement 1 and Series 2, where the high sulphur content of the diesel fuel has destroyed the value of the Lauson test engine in screening for Caterpillar engine test.

8.3 Later on, in 1949, the Co-ordinating Lubricant and Equipment Research Committee[6] again reviewed the need for an oil test engine, which could be used as a research tool for the evaluation of engine lubricants. A symposium on Laboratory Test Engines[11] was held, wherein papers describing the COT engine[12], the Gulf twin-cylinder engine[12], the Lauson engine[6,8,12], 12·2 engine[12] and the Sunbury engine[13] were presented. Since none of these engines fulfilled the desired requirements, the CLR Test Engine Group was organized in 1950 for the purpose of developing such an engine.

8.4 In 1952, the Chevrolet Motor Division of the General Motors Corporation[14] decided to freeze its 1952 engine for L-4 use for a five-year period with the understanding that it would be relieved of its obligation to supply engines to the industry after that time. This proposal was accepted by this group of CRC with the stipulation that a satisfactory substitute be developed in the CLR in the specified time limit.

8.5 The CLR Oil Test Engine Group[14] was urged to expedite its work to:

1) determine the design requirements of a ' Universal ' laboratory oil test engine,
2) develop a preliminary design of a suitable engine which included as many of the specified requirements as possible, and
3) arrange for the final design and construction of this engine.

9. CLR OIL TEST ENGINE

9.1 As a result of this work, the single cylinder CLR Oil Test Engine was developed by the Laboratory Equipment Corporation, Mooresville, Indiana[14]. The first model of this engine was delivered by this company for test in late 1954.

9.2 The CLR Oil Test Engine[14] is a single cylinder spark-ignition engine of 3·8 in. bore, 3·75 in. stroke and 42·5 cu in. displacement. Test bearings are those of copper-lead used in the L-4 Chevrolet engine. The major operating conditions are:

Test duration	40 hours
Speed	3 150 rpm
Load	5 bhp
Air fuel ratio	$14{\cdot}0 \pm 0{\cdot}5$
Gallery oil temp	280°F
Jacket oil temp	200°F

A paper by Ainsley and Cleveland[15,16] describes this engine in detail. In Fig 1 is shown a general view and Fig 2 shows this engine installed on a test bed.

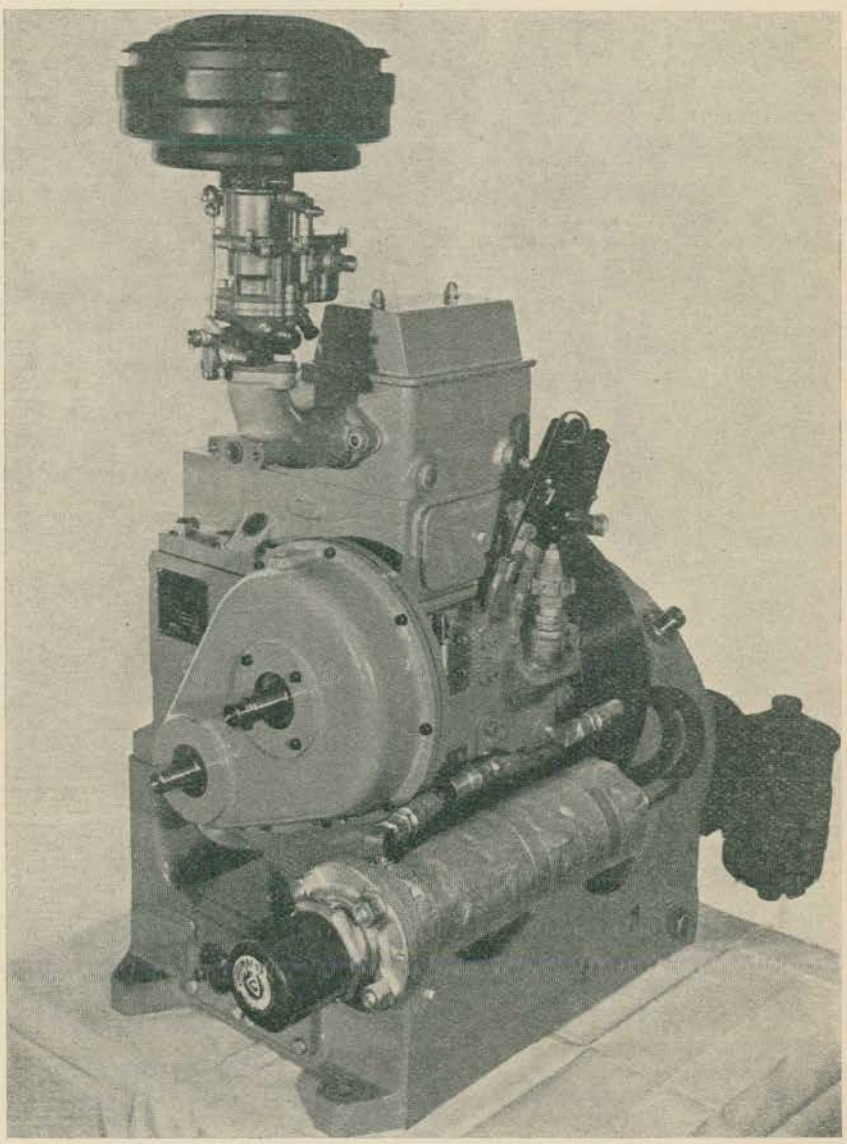


Fig 1 A General View of CLR Oil Test Engine
(Reproduced by the kind courtesy of Co-ordinating Research Council, New York)

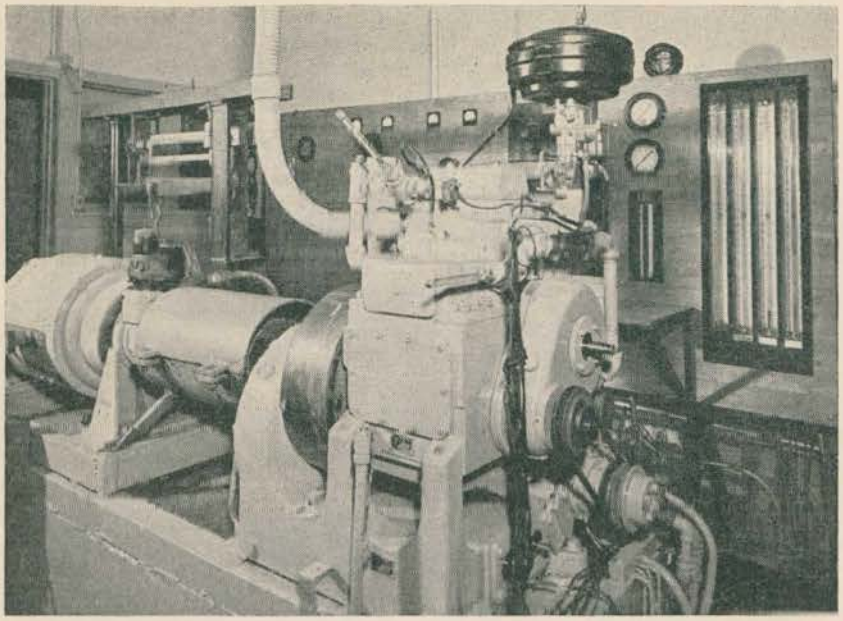


Fig 2 CLR Oil Test Engine Installed on the Test Bed and Coupled to a Dynamometer
(Reproduced by the kind courtesy of the Southwest Research Institute, San Antonio, USA)

9.3 As it appeared desirable to consider the CLR Oil Test Engine[14] as a replacement for the Chevrolet engine, in 1955, the CLR Engine Lubricants Division organized a group to develop a test technique to replace the L-4 technique, to guide and carry out the work involved in adapting the CLR Oil Test Engine and developing an operation technique for the purpose.

9.4 As soon as the CLR Oil Test Engine was considered to operate satisfactorily and the desired range of operating conditions could be attained, a reference oil programme and a commercial oil programme were carried out using both the 26 Jan 1956 tentative draft of the Research Technique for Study of the Oxidation Characteristics of Crankcase Oils in the CLR Oil Test Engine (CRC Designation L-38)[14] and the L-4 technique to establish the correlation of results and to develop information relative to the acceptability of the L-38 technique.

9.5 On the basis of the test data made available by nearly twenty-five laboratories working in co-operation, certain changes were recommended to be made in the L-38 technique and a new technique[14], now designated as L-38-357, was adopted.

The work according to this technique is still in progress. Recent data[17] have indicated that the CLR engine rates oils of varying oxidation stability in the same order as the L-4 test but the numerical values obtained for bearing weight loss vary from one laboratory to the other. It is, however, expected that it will eventually be possible to replace the Chevrolet engine in the L-4 test after additional work has been done to improve the test uniformity among the various laboratories.

9.6 In January 1957, the US Ordnance Department[17] had requested that all oils presented for MIL-L-2104A approval be run under L-38 as well as L-4 so as to collect further comparative data as a step towards adoption of L-38 as a part of the Ordnance specification.

10. BRITISH ENGINES

10.1 Since its inception in 1944, the Engine Tests of Lubricants Panel of the Institute of Petroleum, London, has been very active. It adopted, in the first instance, the CRC L-1 and L-4 test methods and then sponsored the development of two new engines. One of them, the spark-ignition Sunbury engine[13] produced by the Anglo-Iranian Co. (now British Petroleum Co.) was originally conceived for the purpose of testing ring sticking and bearing corrosion in aviation oils, but with suitable fuels could show correlation with L-1 test in respect of lacquering and piston carbon deposit. The other[18] was developed by Ricardo & Co. in collaboration with the Shell Petroleum Co. as a diesel unit for heavy duty oils. Both these engines are of single cylinder construction and have not been adopted as test engines on account of their very high cost.

10.2 In April 1953, the Institute of Petroleum, London, organized a symposium on Engine Testing of Lubricating Oils to discuss the test methods prevailing at that time. Papers dealing with the Petter AV 1[19], BLOGRO[20], Lauson[7], Petter W-1[21] engines and a typical multi cylinder compression-ignition engine[22] widely used in British vehicles, were presented. As a result of this[16], the following three test methods were selected:

1) Petter AV 1 engine piston lacquering test,
2) Petter W-1 engine bearing corrosion test, and
3) Gardner 1-L2 engine detergency test.

In 1955, a special meeting of the IP Panel on Engine Tests of Lubricants[16] reviewed the progress made up to that time by the two working groups handling these test engines.

11. ENGINE PISTON LACQUERING TEST PETTER AV-1

11.1 Considerable co-operative work has already been and is still being carried out by many British and Continental laboratories on the AV-1 unit in order to develop it as a useful sorting out test for oils.

Recently Tourret and Bale[23] of the Admiralty Oil Laboratory have concluded that in none of the several ways examined by them could results of tests of oils on the Petter AV-1 engine be used to predict the performance of the oils on the Caterpillar engine even when considering factors shown to give significant differences on the Petter engine. However, they have stated that it may be possible for a particular laboratory handling only one or two base stocks or additives to use this engine for Caterpillar prediction since that laboratory may be able to develop its own correlation.

At the initiative of the French Institute of Petroleum, a meeting of the Standardization Committee for Petter AV-1 test method[24] was held in September 1957 in order to examine different operating conditions of this test and to present the statistical results obtained at the French Institute when running the engine in accordance with the 'Anglomol' test procedure. As a result, a European Commission was set up with Germany, England, Belgium, Spain, Italy, Switzerland

and France as its member countries. Its principal object is to improve the reproducibility of the test method.

12. ENGINE BEARING CORROSION TEST PETTER W-1

12.1 The Petter W-1 lubricating oil oxidation test[25] was developed by Monsanto Chemicals Ltd., London, in 1951, to meet the need of a simple and inexpensive method of screening lubricating oils containing additives using a production engine of British make. The test as developed was originally intended to give information on the bearing corrosion aspects and to correlate, if possible, with the Chevrolet L-4 test on this criterion. This test was found, in general, to be useful when used in conjunction with the Petter AV-1 diesel detergency test in order to provide complete coverage at the screen testing stage of all the essential criteria applicable to the full scale Caterpillar L-1 and Chevrolet L-4 tests.

However, experience has shown that by using a high jacket temperature it is possible to obtain information on detergency as well as on oxidation stability and bearing corrosion. This together with the relatively short test duration of 36 hours makes the final test a useful one especially for those organizations, which are involved in the development of new additives or finished oil formulations as its low operating cost permits a large number of tests to be carried out on each project. It is now possible to do away with Petter AV-1[3] test as the information obtained from Petter W-1 is sufficient to provide complete coverage at the screen testing stage. Oils giving a favourable rating with Petter W-1 have good chances of qualifying the MIL-L-2104A or DEF 2101A specifications.

13. DETERGENCY TEST GARDNER 1-L2 ENGINE

13.1 Very little information is available regarding Gardner 1-L2 detergency test[16]. It appears that work on this engine has not been so actively pursued as in the case of the Petter AV-1 and Petter W-1 engines.

In Table II are given the major operating conditions of the CLR, Petter W-1 and Petter AV-1 engines.

14. IMITATIONS OF L-1 AND L-4 TESTS

14.1 The L-1 and L-4 tests have been universally adopted as the official tests by most of the countries and smaller engines are generally employed for screening purposes. As stated earlier, the different laboratory engines are operated under conditions of high load, high speed and high temperature without any stop, start, idling or acceleration. These operating conditions seldom correspond to those prevailing under normal service. Secondly, these engines in service are seldom in the perfect mechanical condition as that maintained in the laboratory test. Another important factor is the variety of oil which is dependent upon the crude source, the extent of refining and the additive treatment. All these factors have made it necessary to lay down more severe conditions of test operation so that the oils, which qualify with satisfactory ratings, may be considered as having a large factor of safety in the specific properties evaluated. But this procedure would eliminate some of the products, which give satisfactory service under normal working conditions.

In L-4 test, the weight loss of copper-lead bearings is used as a criterion for judging the oxidation and corrosive properties of the oil. However, such bearings are seldom used in the gasoline engines. It is a matter of considerable criticism[26] as this extrapolation to field service may not be justifiable.

15. BENCH AND FIELD TESTS

15.1 At present the aim is to achieve a correlation between the bench tests and the field trials. For different service conditions of operation, a separate correlation has to be established. The French Institute of Petroleum[27] has been working in this direction. They have already established a correlation of the test results on Petter AV-1 engine with the field performance of French Railways diesel engines. Further co-operative work with other organizations, such as the Post and Telegraph Department, is under way.

TABLE II OPERATING CONDITIONS OF CLR, PETTER W-1 AND PETTER AV-1 ENGINES

Test/Particulars	CLR-38-357[14]	Petter W-1[25]	Petter AV-1[23] IP Modified AT/4 Procedure
Engine description	Single cylinder, spark-ignition, CLR-Oil Test Engine	Single cylinder, spark-ignition, Petter W-1 Engine	Single cylinder, diesel, Petter AV-1 Engine
Test duration	40 hours	36 hours	120 hours
Bore × stroke	3·8 in. × 3·75 in.	8·5 in. × 8·25 in.	3·15 in. × 4·33 in.
Speed, rpm	3 150	1 500	1 500
Coolant	Water	Water-ethylene glycol	Kerosine, reverse flow
Coolant outlet temperature	200°F	150°C	186°F
Oil temperature	280°F	137·5°C	55°-75°C
Load, bhp	5	3·3 approx	5
Fuel	Octane No. 80 *Min* TEL, ml/gal = 2·5-3	PE/IP L-4 ref gasoline	As in L-1 for MIL-L-2104A
Scope	Oxidation and bearing	Oxidation, bearing corrosion, detergency	Carbon, lacquer and sludge deposits, ring sticking
Purpose	Being developed to replace L-4 test	Screening test for L-4 and possibly L-1	Screening test for L-1 and presently being developed as its alternate

The shortcoming of this method is that the laboratory engine does not produce deposits in the same manner as in the service engine on account of the time factor, which cannot be considered negligible[26]. Inspite of this drawback, this procedure is less dangerous than the method of ' full extrapolation '.

16. A NEW APPROACH

16.1 A more rational approach to the assessment of a particular property needs to be found out. For example, engine wear due to oil, which is perhaps the most difficult to assess, has been evaluated by using radio active piston rings[28]. Another recent attempt in this direction has been made by Sechrist and Hammen[29] by conducting radiotracer studies of engine deposit formation. This method gives more information in a much shorter time by using C-14 tagged fuel components in a CFR motor engine. It was possible to distinguish between the contribution of the fuel and lubricant in the formation of deposits, to determine the deposit-forming tendencies of specific fuel components and to locate the deposits in the combustion chamber formed from either the fuel and/or lubricant. The same technique could also be used to know the contribution of gasoline and lubricant additives towards deposit formation.

17. UNIVERSAL ENGINE

17.1 Question arises whether it is possible to evaluate the performance of a heavy duty oil by testing in only one engine instead of two different engines as at present. Although it is most desirable, so far the development of such a laboratory test engine has not been made possible. It is, however, of significance to note that the CLR Oil Test Engine is eventually to be developed as a universal engine. By a change of the cylinder head, it would be possible to convert it into a diesel engine for detergency test. This is included in the future programme of work of the CRC Panel but the work of designing a suitable cylinder head has not been taken up so far.

17.2 As stated earlier, the recent experience gained with the Petter W-1 engine[3] indicates a trend in the same direction. But it is only the future co-operative development work on laboratory engine testing that will show how far it is possible to achieve the aim of using a single engine for evaluating the performance of a heavy duty oil.

18. LIGHT AND LOW TEMPERATURE SERVICE OPERATION

18.1 Engines working under light intermittent duty present a quite different lubrication problem particularly when the ambient temperature is low. Excessive sludge deposits in the cooler parts of the engine, choked oil drain holes and cold corrosion are the troubles generally encountered. The deposits formed are largely influenced by the characteristics of the fuel used. Both premium and heavy duty grades of oil for use under these service conditions are usually subjected to CRC-FL-2 test[12], which is carried out in the Chevrolet engine. Laboratory test procedures in three different engines, namely a modified CFR engine, a Lauson LF engine and a multi-cylinder car engine have proved to be superior[30] to the FL-2 procedure for predicting the behaviour of lubricating oil under light duty service conditions.

19. PREMIUM GRADE OILS

19.1 There is no standard high temperature test for evaluating the detergency level of premium grade of oils intended primarily for spark-ignition engines. Single cylinder engines, some of which have been discussed earlier in this review, have often been employed for this purpose.

As regards the corrosion characteristics of the premium grade oils, it is required that they give a favourable rating when tested according to the modified L-4 technique.

20. ACKNOWLEDGEMENT

20.1 Our thanks are due to Mr. M. K. McLeod, Manager, CRC and Mr. W. P. Teich of the Southwest Research Institute, San Antonio, USA for making available glossy prints of the photographs and for permission to reproduce them as Fig 1 and 2. The authors are also grateful to many other friends in USA, UK and France, who made available the latest unpublished information on the subject, and to the Director, National Physical Laboratory of India for permission to publish this article.

21. REFERENCES

1. CRC Handbook p. 345-438 (1946).
2. B.S. 1905: 1952 Engine Lubricating Oils (H.D. Type). British Standards Institution (p. 5).
3. Private Discussion with E.R. Palmer of Messrs Monsanto Chemicals Ltd., London.
4. Smalheer, C. V. & Mastin, T. W., *J. Inst. Petrol;* Vol 42, p. 337 (1956).
5. Diesel Lubricant Test Manual, 1951. Research Department of the Caterpillar Tractor Co.
6. Ainsley, W. G., Cleveland, A. E. & McLeod, M. K. The CLR Oil Test Engine, *Proc. Fourth World Petrol. Cong., Rome.* 1955. Section VI.
7. Simmons, G. H. J. *J. Inst. Petrol.* Vol 39, p. 623 (1953).
8. Georgi, C. W. Motor Oils & Engine Lubrication. New York. Reinhold Publishing Corporation, 1950 (p. 83).
9. Clapp, M. R. & Palmer, J. L. SAE Preprint No. 392, Nov 1949. Society of Automatic Engineers Inc., New York.
10. Report of the 1949 SAE National Fuels & Lubricants Meeting, S.A.E. Journal, Dec 1949 (p. 60).
11. CRC Report of Symposium on Laboratory Test Engines, 3 Nov 1949. (Quoted from Ref 6.)
12. Withers, J. G. Science of Petroleum: Refinery Products London, Oxford University Press. [Vol V, Part III (1955), p. 218].
13. Crowther, J. R., Pitkethly, T. E. & Stanfield, R. *J. Inst. Petrol.*, Vol 35, p. 245 (1949).
14. CRC Report No. 306: Development of Research Technique for Study of the Oxidation Characteristics of Crankcase Oils in the CLR-Oil Test Engine. New York. *Revised* March 1957.
15. Ainsley, W. G. & Cleveland, A. E. A paper presented at the SAE Golden Anniversary Fuels & Lubricants Meeting, Philadelphia, Pa., 9-10 Nov 1955. *S.A.E. Journal,* 1955
16. Special Meeting of the I.P. Panel on Engine Tests of Lubricants. *J. Inst. Petrol.* Vol. 41, p. 383 (1955).
17. Private Communications from W. G. Ainsley, H. R. Barton & W. P. Teich. August 1957.
18. Downs, D. *J. Inst. Petrol.* Vol 35, p. 784 (1949).
19. Towle, A. & Vaile, P. E. B. *Ibid.* Vol 39, p. 581 (1953).
20. Perry, R. J. S. *Ibid.* Vol 39, p. 632 (1953).
21. Bell, C. O. R. *Ibid.* Vol 39, p. 638 (1953).
22. Fogg, A. & Oliver, G. R. *Ibid.* Vol 39, p. 559 (1953).
23. Tourret, R. & Bale, R. W. *Ibid.* Vol 43, p. 272 (1957).
24. Private Communication from the French Petroleum Institute, Rueil-Malmaison, France.
25. The Petter W-I Test for the Evaluation of Lubricating Oils. Monsanto Chemicals Ltd., London.
26. Sibenaler, E. *J. Inst. Petrol.* Vol 42, p. 155 (1956).
27. Brun, R. B., Courtel, R., Colle, A. & Schilling, A. *Rev. Inst. Franc. Petrole.* Vol 9, p. 144 (1954).
28. Putman, J. L. *J. Inst. Petrol.* Vol 43, p. 215 (1957).
29. Sechrist, C. N. & Hammen, H. H. *Ind. Eng. Chem.* Vol 50, p. 341 (1958).
30. Test, L. J. & Hall, C. A. SAE Preprint No. 396 (1949). Society of Automotive Engineers Inc., New York.

Loading Tests for Building Foundations

DINESH MOHAN

CENTRAL BUILDING RESEARCH INSTITUTE, ROORKEE

0. INTRODUCTION

0.1 Data regarding the safe bearing capacity of the soil are essential for the design of foundations. To determine its value, the most common method is to dig one or two trial pits at the site and to estimate the bearing capacity by visual identification of the soil and reference to a table in a standard text book or code of practice. This method is simple and expedient, and if the soil is of a normal type, it may not make material difference in the cost of construction of a single or a double storey building. If, however, the soil is of a softer type, it is difficult to place it in its correct category. The tendency then is to err on the side of safety and this may make a considerable difference in the cost of heavier structures as in multi-storey flats and office buildings.

0.2 Another method, used in the design of foundations for heavier and more important buildings, is the loading test. The test involves subjecting a bearing plate of steel, or a block of concrete, one foot square, to a gradual increment of load and noting the corresponding settlement. The ultimate bearing capacity is taken as the load at which the plate starts sinking or the settlement increases rapidly. This loading test forms the subject matter of this paper.

1. DESCRIPTION OF THE LOADING TEST

1.1 A sketch of the set up commonly used is shown in Fig 1. A pit five feet square is dug to the bottom level of the footing. A one foot square hole is made at the bottom in the centre of the pit, its depth bearing the same ratio to the width as for the actual footing. The bearing plate rests at the bottom of this hole. The load is transferred to the plate by a column carrying a loading platform and is applied with the help of sand bags, rails, pig iron or other heavy material. Settlement of the bearing plate is recorded by resting a levelling staff on a bracket attached to the column towards the top and reading it with the help of a levelling instrument. Load is applied in increments of one fifth the design load up to a maximum of one and a half times the ultimate load and a load settlement curve is plotted. Settlement is observed for each increment at one hour interval during a period of 6 hours and then at 12 hours interval until no measurable settlement is observed. The next increment is then applied and observations repeated. The load corresponding to a point on the curve where settlement increases rapidly is taken as the ultimate load causing failure, and the safe bearing capacity is then calculated by applying a factor of safety of 2 to 3. If the settlement increase is gradual and there is no marked break-away, the load corresponding to one half of an inch settlement is arbitrarily taken as the ultimate load, and a factor of safety of 2 is applied. According to the British Civil Engineering Code of Practice for Site Investigations the settlement should be 20 percent of the width of the plate.

1.2 The Commonwealth Experimental Building Station of Australia recommends a different procedure both for performing the test and for interpreting the results. According to it loading is stopped when it causes a progressive settlement beyond a period of 48 hours. The settlement value for 24 hours is noted. The loading is increased by about 25 percent and the settlement for a further period of 24 hours noted. The load settlement curve is plotted and the straight line connecting the two settlements is projected back to cut the ordinate at a point which gives the ultimate bearing capacity.

Foundations of large or multi-storeyed buildings, or of buildings intended for special loadings should, in particular, be designed scientifically to avoid differential settlement and plastic failure and to achieve maximum economy. Since foundation design depends upon the load bearing capacity of the soil concerned, it is necessary, for scientific designing, to determine the latter by appropriate test methods, instead of assuming a figure in an empirical way, as is done in the case of ordinary buildings. This paper, which covers soil testing for load bearing capacity, should be of value to those engaged in designing foundations and interested in conducting loading tests by simplified practice.

The design of foundation and the determination of load bearing capacity are being covered by ISI in a Code of Structural Safety of Buildings: Foundations and Super-structures, which the ISI Committee on Functional Requirements of Buildings is preparing. While the Code of Building Bye-laws (IS : 1256-1958), which is now under print, incorporates the load bearing capacities of different groups of soils in a general manner, the subject of identification of soils has been included in the draft Indian Standard on Classification of Soils for General Engineering Purposes, now under circulation for comments — *Ed.*

2. LIMITATIONS OF LOADING TEST

2.1 There are other methods of performing load tests and various rules for interpreting the test results, yet whatever the method, the test results reflect the character of the soil located only within a depth of less than twice the width of the bearing plate (2 feet for a plate one foot square). The actual footing being wider, the settlement will depend on the properties of much thicker stratum, and if the character of the soil changes below a depth of about twice the width of the bearing plate, which it often does, the test results will be misleading.

2.2 Another limitation is the effect of footing width. In sandy soils the bearing capacity increases with the width of the footing, with the result that tests on smaller size bearing plates are likely to give conservative values. In clayey soils the width has no appreciable effect, but owing to the impermeability of the soil settlement may take a considerable time to develop, and this may not be brought out in a short term loading test.

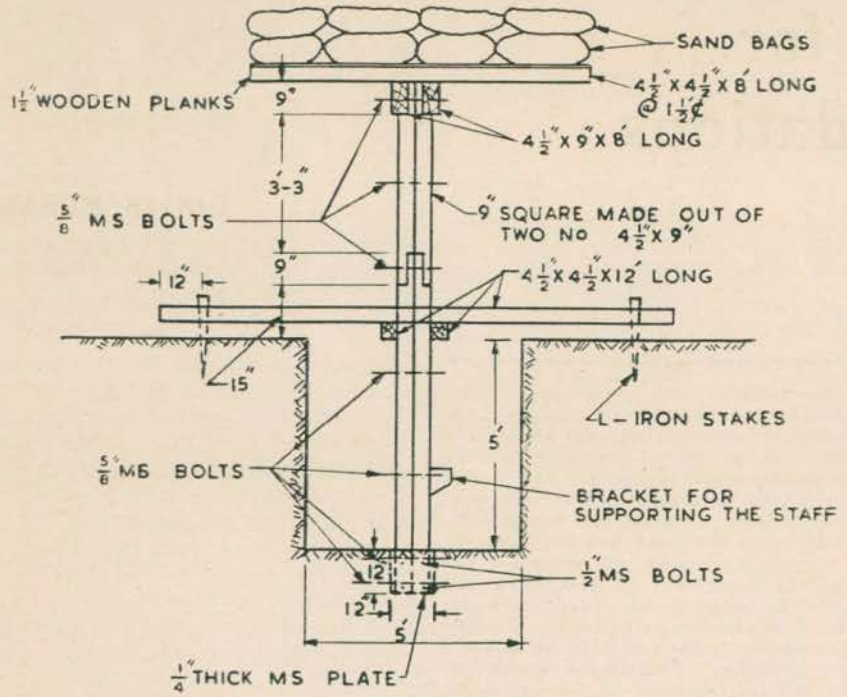


Fig 1 Loading Platform

2.2.1 The ideal test would involve using a bearing plate of the same size as the footing itself but this would require the application of very high loads and practical considerations rule out testing on this scale. A satisfactory loading test must, therefore, include adequate soil exploration and due attention must be paid to any weaker strata below the surface of loading.

2.3 Another factor, which a loading test ignores, is the shape of the footing. The bearing capacity of a square or circular footing is approximately 30 percent greater than a continuous footing of width equal to the side of the square or diameter of the circle. Yet the value given by the loading test is adopted irrespective of the shape of the footing.

3. SETTLEMENT FAILURE

3.1 The safe loading intensities given in various text books and codes of practice safeguard against shear or plastic failure only. A factor that has been neglected so far in the design of foundations is the likelihood of failure by excessive settlement. It may be of interest to note that for footings over three feet wide on sandy or gravelly soils the settlement considerations exclusively govern the design of the footing. If the settlement is uniform over the whole structure, damage may only occur to the water and other service installations but normally the settlement is differential and this, if excessive, leads to cracking of the structure. The permissible load should, therefore, be so determined that failures in both shear and settlement, can be excluded with a reasonable factor of safety. To avoid confusion the resistance to shear failure is indicated by the term 'bearing capacity' and resistance to either types of failure by 'safe bearing pressure' of the soil.

3.2 Common structures in concrete such as office buildings, residential flats and factory buildings can withstand a differential settlement between adjacent columns up to three-fourths of an inch. Steel structures can withstand somewhat greater amount and brick masonry structures three to four times the settlement allowed in concrete structures without serious damage. Differential settlement will not be excessive if the soil pressure selected is such that the largest footing will settle to the maximum permissible degree (i.e., one inch for concrete structures which experience normally a differential settlement of three-fourths of an inch) even when they rest on the most compressible part of the soil. For raft foundations, the maximum permissible settlement is twice the value for small footings (2 in. for concrete structures).

3.3 Loading test is the only reliable method available for measuring the likely settlement under a footing over sandy or gravelly soil. The size of the footing effects the settlement and Terzaghi has developed an expression co-relating the settlement of a loading plate to that of actual footings on sandy soils:

$$\frac{S_p}{S_f} = \left(\frac{B+1}{2B}\right)^2$$

where

S_f = the settlement of the footing;
S_p = the corresponding settlement of the bearing plate one foot square; and
B = the width of the footing.

If a maximum settlement of one inch is allowed in the footing, the permissible settlement of the loading plate is given by:

$$S_p = \left(\frac{B+1}{2B}\right)^2 \quad \ldots \quad \ldots \quad \ldots \quad \ldots (1)$$

where, S_p is in inches; and B is in feet.

The load corresponding to this settlement is the safe soil pressure from settlement considerations.

3.4 In case of clayey soils the settlement is directly proportional to the width of the footing. A larger bearing plate, two feet square, is used as it covers the cracks which are common in clayey soils. The settlement of the 2 feet square bearing plate, corresponding to a maximum settlement of one inch of the footing, is given by:

$$S_p = \frac{2}{B} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots (2)$$

3.5 Although expressions (1) and (2) give an approximate idea of the variation in settlement with the size of the footing, yet more reliable results would be obtained by repeating the loading test with plates of two or three different sizes, namely 12, 18 and 24 in. square, and the result of the settlement is extrapolated to the full width of the footing.

3.6 As the ultimate settlement in clays takes considerable time to develop the plate loading test is often not used for measuring settlements in clays. An alternative and quicker method is the Consolidation Test. A fair estimate of the settlement of all clays except the very soft and sensitive type can be obtained by the following expression:

$$S = H\frac{C_c}{1+e_o} \log \frac{p_o+\Delta_p}{p_o}$$

where

C_c = the compression index;
H = the thickness of the clay layer;

e_o = the initial void ratio which, in case of saturated clay, is equal to moisture content multiplied by the specific gravity of the soil particles;

p_o — the initial soil overburden at the mid clay layer; and

Δ_p = the increase of pressure at the mid clay layer due to addition of the building load.

3.6.1 Compression index can be found by laboratory consolidation tests. Skempton has related it to the liquid limit by the following expression:

$C_c = 0{\cdot}009\ (LL - 10)$, where LL is the liquid limit.

4. EFFECT OF WATER TABLE

4.1 The water table has a marked influence on the bearing capacity of sandy soils. If it rises above a depth equal to the width of the footing, the bearing capacity or resistance to shear failure is likely to be reduced by about half. Similarly the settlements are also doubled and the safe soil pressure from settlement considerations is also halved.

4.1.1 If water table is already above the level of the footing it should be lowered by pumping and the bearing plate seated after the water table has been lowered just below the footing level. Even if the water table is located 3 or 4 ft below the base level of the footing, the load test should be made at the water table, otherwise apparent cohesion imparted to the sand by the soil moisture may introduce an error on the unsafe side.

4.2 The loading test is a fairly cumbersome test and the way it is usually carried out in the field often leads to a number of errors. An attempt has, therefore, been made at the Central Building Research Institute to simplify the equipment and the technique. The loading platform has been replaced by a loading truss fabricated out of light structural steel (Fig. 2), and designed to carry an upward thrust of 15 tons. The truss can be split in two halves and can be bolted in position within a few minutes which makes it portable. At the two ends it is anchored to the ground by soil anchors which are also easily fabricated out of steel plate one eighth of an inch thick. Extensions are made of three fourths of an inch GI pipes (*see* Fig 3).

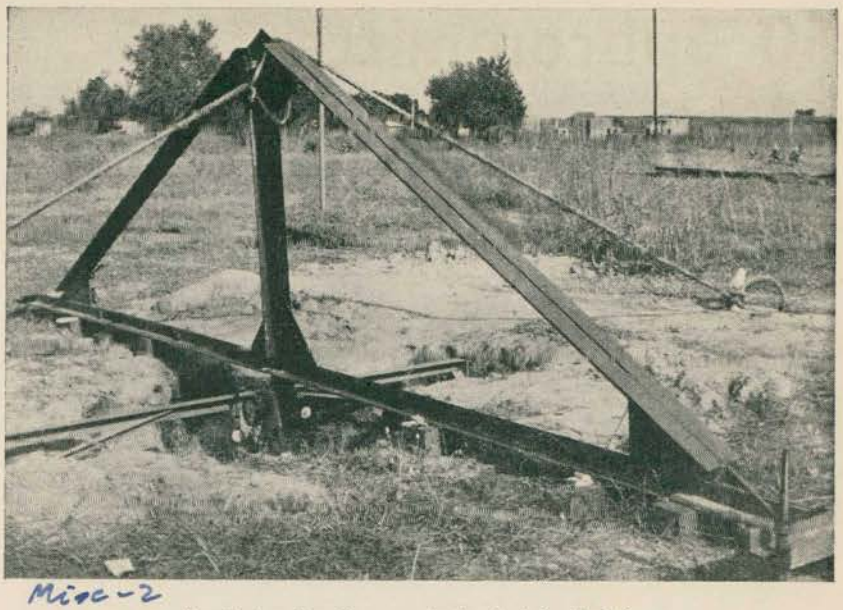


Fig 2 Loading Truss and the Jack in Position

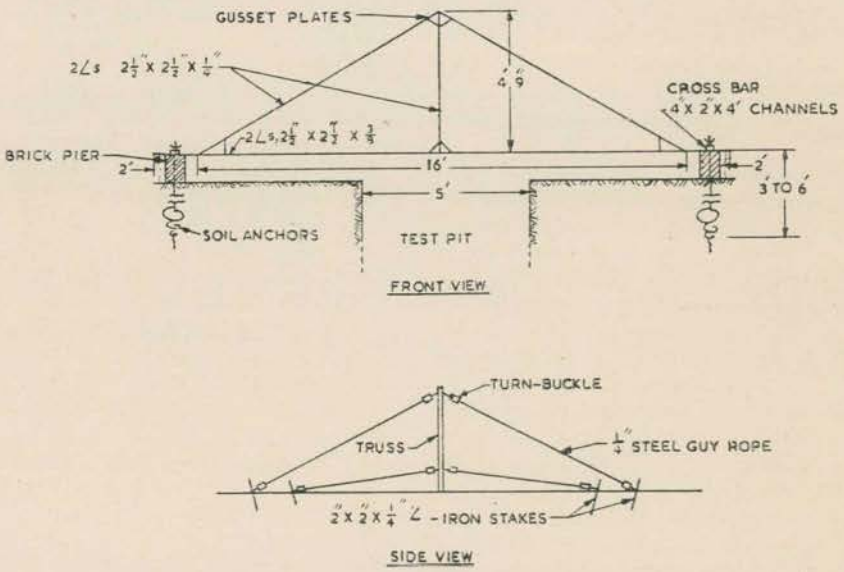


Fig 3 Loading Truss and Soil Anchors

4.2.1 Loading is accomplished by a 30-ton hydraulic jack with a pressure gauge. The jack rests on the loading column and by reacting against the tie of the truss it transfers the load to the bearing plate at the bottom of the pit. Settlements are measured by two dial gauges reading to a minimum of 0·001 inch. The gauges are clamped to a horizontal bar whose two ends rest at a minimum distance of 4 feet from the centre of the pit. The bearing plate rests on a horizontal bed of plaster of paris or cement concrete. Any eccentric loading on the column is easily detected by movement of the tips of the dial gauges and guy ropes connected to the top and bottom of the truss bring it back to the correct position.

5. CONCLUSIONS

5.1 The plate loading test is a useful test, specially in case of sandy soils if the soil strata do not change appreciably in the vertical direction It would, however, be well to bear its various limitations in mind and make use of the soil bearing values found out from it with due discrimination.

5.2 Terzaghi and Peck have co-related the results of plate loading tests to simple dynamic penetration tests where the number of blows (N), required per foot of penetration of a two-inch OD steel tube, under the impact of a 140-lb hammer falling freely from a height of 30 inches, are measured. Curves have been plotted

(*Continued on p.* 284)

ISO Subcommittee for Weaving Machinery

Working Groups Meet at Manchester

THE fourth meeting of Group B —Winding Machinery and Group C—Weaving Machinery of ISO/TC/72/SC 3 Weaving Machinery was held on 24, 25 and 26 June 1958 at the Manchester Office of British Standards Institution. The Secretariat of the Subcommittee is held by UK and India is a participating member.

The meeting was attended by 23 delegates from 5 countries. Indian delegation consisted of Shri B. B. Joshi, Hon. Director/Secretary of Textile and Allied Industries Research Organization, Baroda, who was the leader of the delegation and Mr. J. W. Scott of Pickers Ltd., Ahmedabad.

The meeting was held in six sessions; the subjects covered and the chairman for each session were as under:

1) *Healds* — Dr. H. M. Glass, of BSI, London.
2) *Reeds* — Mr. E. Howcroft, M.B.E., Director, Textile Machinery Manufacturers Association, Manchester.
3) *Shuttles & Cop Basis* — Mr. Derreth Smith, Director Linen Industries Research Association.
4) *Pickers* — Prof. J. J. Vincent, Head, Textile Department, College of Technology, Manchester.
5) *Beams* — Mr. F. Butterworth, Director, Butterworth & Dickinson Ltd., Burnley.
6) *Metal Cones and Wood Cones* — Mr. E. Brierley, Director, Thomas Holt Limited, Rochdale.

Documents prepared by the secretariat on the above subjects on the basis of deliberations at previous meetings, were considered at great length and dimensional standards in millimetres were fixed after examining standards and proposals of participating countries. Where necessary, inch dimensions were kept in brackets.

Indian Standards on 4B Pickers and on Twin Wire Healds for Cotton and Silk Weaving (IS: 250-1950 and IS : 1190-1957) were useful while arriving at dimensional standards of twin wire healds. So far as 4B pickers were concerned, no country except UK was interested. The Indian delegation actively participated in the discussions and helped to resolve minor differences on dimensions and conversions to metric system from the inch system.

As a result of deliberations at this meeting much headway was made in the technical work and it was possible to request the secretariat to prepare new proposals on the following subjects for consideration at the next meeting:

1) Twin Wire Healds, based on draft ISO Proposal for Dimensions for Inch Wire Healds [ISO/TC/72/WG C(Sec-7) 7] as amended by discussions.
2) Inset Wire Healds based on draft ISO Proposal for Dimensions for Inch Wire Healds [ISO/TC/72/WG C(Sec-7) 7].
3) Single Box Pickers for Automatic Underpick Looms based on draft ISO Proposal for Single Box Pickers for Automatic Underpick Looms [ISO/TC/72/WG C(Sec-11) 11] and draft ISO Proposal for Pickers for Single Box Automatic Underpick Looms [ISO/TC/72/SC 3/WG C(Swiss 6) 6].

The draft ISO Proposal for Dimensions for Inset Wire Harness for Jacquards [ISO/TC/72/WG C(Sec-8) 4] was withdrawn as it was, and a revised document tabulating 'all types to be dealt with, will be prepared and circulated for comments.

Considering the following draft proposals, it was decided that they should be redrafted in the light of suggestions made in the meeting:

1) Draft ISO Proposal for Flat Steel Healds [ISO/TC/72 (German-Swiss 1)60];
2) Draft ISO Proposal for Dimensions for Pitch-bound Reeds, [ISO/TC/72/WG C(Sec-9) 9]; and
3) Draft ISO Proposal for Dimensions for Shuttles for Pirn-Changing Automatic Looms [ISO/TC/72/WG C(Sec-4) 4].

Decision on draft ISO Proposal for Cop Basis for Rewound Solid Corps [ISO/TC/72/SC 3 (Sec-49) 59] was postponed. The secretariat would also prepare fresh document on metal and wood cones in the light of discussions.

A new subject, warpers' beams was included in the programme of work and the secretariat was requested to prepare the draft.

The Delegates Who Attended the Meeting of the Winding and Weaving Machinery Working Groups. Seated Second from Left is Shri B. B. Joshi, the Leader of Indian Delegation and Standing Sixth from Left is Mr. J. W. Scott, the Other Indian Delegate

Metric System in the American Army

THE Chief of Staff of the American Army, General Maxwell Taylor has said that it has been decided to introduce the Metric System in the American Army as soon as possible, in any case not later than the 1st January 1966. Maxwell Taylor pointed out that the western countries should have armaments in the same system, and for this the metric system is obviously the best.

The metric system will be used for all Army Weapons, for sighting instruments, control mechanism, military maps and radar. On the other hand, the meteorological data, like wind speed, air pressure, etc, will be continued to be given in miles per hour millibars and inches of mercury.

We Europeans can greet this decision to introduce the metric system in the American Army with pleasure. But this decision need not come as a surprise to us. Even for us there was a struggle between the inch and the metric systems. The scientific development in the machine age preferred, for a short time the inch system. This was a consequence of the earlier industrial production. Logic and practice have, however, always given first place to the metric system. It is needless to touch upon the immense superiority which the metric system has over the inch system for calculation and measurement.

In this connection, let us consider an incident in the first world war:

The battle of Jütland between the British and the German fleets. The German fleet inflicted a far greater loss on the British fleet than the British on the Germans. One of the reasons for this was, that though the British had super modern ships and guns, their firing mechanism, and the controlling systems were in

We reproduce the translation of an article from the June 1958 issue of VSM/SNV NORMEN BULLETIN which announces that metric system is to be introduced in the American Army. While the article takes note of the switching over to decimal coinage in India, it does not report on the Government's decision on the changeover to metric weights and measures, the first phase of which began on 1 October last — *Ed.*

the inch system and, therefore, took a *longer time* to operate. The defects of this obsolete inch system, which had been pursued by the British since the reign of Henry I (12th Century), were only too well realized by them after the battle of Jutland. Soon after the battle, there was a proposal in Britain to introduce the metric system in the British armed forces but nothing came out of it.

It was in the Latin portion of Europe, that the metric system had its inception. The " Assemblée Constituante " of the Revolutionary French Government worked out the metric system in 1795.

Even in the USA, everything is not worked in inch and pound. The Decimal classification, which was worked out by the liberarian, Dewey of New York, has now attained a world wide fame. Also, the American coin system is decimally divided. And likewise the minute for calculating working time. In the scientific and technical literature of America, the decimal system is predominating. In the tool and gauge catalogues, tables in metric values are given. The electrical measuring units were universally decimalized by the Congress of Chicago of 1893.

The American Trade Unions, for their own purposes, have always preferred the metric system.

In 1923, when the question was raised in the USSR, for adopting a measuring system to replace the old obsolete Czar's system, the metric system was chosen. Today, the metric system has been adopted by 42 nations, who form 97 percent of the world population.

It must be mentioned, that there are regions influenced by the one system or the other. In England, the machine age began over a century ago. She exported her manufactured products the whole world over. Then the USA followed her. The countries which imported the goods, therefore, imbibed the inch system. And consequently there are now some countries, which, though they have adopted the metric system officially, still continue to retain the inch system. Such countries are found in Latin America, and parts of Africa and Asia.

In the International Standards Organization, great efforts have been made to reconcile the differences between the two systems. But one effort after another has failed. The difference between the two systems is unbridgeable. The question of formulating a third system has also been considered. But it has been realized that no third compromise-system can equal the metric system.

The decision of the US Army Command to introduce the metric system is, therefore, important. USA is a big country, and is one of the biggest military powers. The adoption of the metric system may, therefore, serve as an example.

It is with pleasure that we have heard, that the Indian Government has decided to introduce the decimal coinage. For its practical adoption, a transitory period of three years is provided for. During this period, the old and the new systems will remain side by side.

ISI in INDIA 1958

INDIA 1958, the industrial show-window of India, which was inaugurated by the Prime Minister, Shri Jawaharlal Nehru, on 8 October last, has been organized as a national exhibition for the first time by the Government of India. In the words of its Director, 'its object is multiple, with emphasis on the projection of a national economic barograph with a view to showing to our people the natural and economic resources of the country, the resources harnessed, various developmental plans, the stages of development achieved, direction, tendencies and tempo of the process of development in different spheres — economic, industrial, scientific, technological and commercial.'

Naturally, the ISI has participated in the exhibition to publicize the indispensable role of standards in the industrial development of the country. While the industrialization programme is directed towards greater production and utilization of the country's economic resources and manpower, it is vitally important that our industrial products maintain a uniformly high quality, giving consumer satisfaction both in home markets and abroad.

The Front of the ISI Stall with the Exit Gate on the Right

A General View of the Exhibits Displayed at the ISI Stall

A Part of the Stall as Seen from the Entrance

At the stall have, therefore, been displayed exhibits of materials, components, finished products, etc, for which Indian Standards have been, or are being, prescribed. The role of ISI in the economic life of the country has been forcefully portrayed with the help of posters, cartoons, charts and other material displayed on the walls of the stall, with special reference to the change over to metric system, steel economy, modular co-ordination, and other spheres. And, finally, the utility of the ISI Certification Mark as a guarantee of quality to the consumer has been prominently publicized.

The co-operative effort of the industrialist, consumer, manufacturer, worker, distributor, technologist, scientific institutions and government bodies in the working of ISI has been hailed by many as a most useful new line of thinking.

STANDARDS NEWS

Leather Industry Seminar and ISI

The three-day Seminar on Leather Footwear and Leather Goods Industry held at Hyderabad from 31 July to 2 August 1958, recommended to the Government that samples and specifications in respect of leather footwear and leather goods should be made available at the various centres for easy reference by fabricators.

This first Seminar on the leather industry was organized by the Small Scale Industries Organization of the Government of India, to discuss the various technical and other problems of the industry. At the Seminar, it was made clear that the National Small Industries Corporation — a body which looks after the marketing of the small industries products — could promote only quality goods, and was anxious to encourage industrial co-operatives by purchasing footwear from them subject to quality and price.

The Seminar Chairman, Shri Ashfaque Hussain, Development Commissioner for Small Scale Industries, Ministry of Commerce & Industry, Government of India, stressed on the great need for quality production and standardization. He pointed out that some State Governments and the National Small Industries Corporation had already taken steps to standardize production. The standard specifications for three grades of footwear for men, ladies and children were also recently drawn up by the Small Scale Industries Organization with the help of experts from outside. These standards, he said, would soon be made available to all who might desire to see them. At present, they are under the consideration of the relevant Sectional Committee of ISI as basis for Indian Standards.

A strong reference to the Indian Standards Institution and the use of Indian Standards was made by Shri A. Bhagavantha Rao, the Minister for Endowments & Industries, Andhra State, who inaugurated the Seminar. He said that ' research and quality are the magic keys that open up the flood gates of industry and create confidence in the various markets', and agreed that though rigid standards could not be achieved overnight, a growing economy called for laying definite standards. He reminded the industry that ISI had already set up more than a thousand standards for various industries, including those of the leather footwear and other leather goods, and pointed out that a quality control scheme designed to discipline the leather industry and trade for the purpose of eliminating the element of uncertainty and speculation as to the specification of goods exported would be an incentive to the development of leather industry.

The ISI has been alive to the need for laying down standards for leather and leather products from its very beginning, and the 18 Indian Standards, published so far in this field, cover shoe uppers, sole leather, glazed kid, kips and sides for shoe uppers, harness leather, chaplis, ammunition boots, tanned leathers, sports goods, etc. Work is also in hand, or is proposed to be taken up in near future on other types of tanned leathers, vegetable tans and tan extracts, clothing and lining leather, bags for railways and postmen, shoes for nurses and infants, mining boots, protective and occupational footwear, chrome leather beltings and soles, etc.

Indian Pencil Manufacturers Association and the Draft Standard on Pencils

' The recent formulation of Indian Standard Specification for Black-Lead Pencils has been a landmark in the history of the pencil industry of the country. Not only shall the pencil manufacturers be henceforth relieved of the vagaries of diverse individual standards guiding purchases of different organizations but the standard specification shall also be highly useful to the manufacturers in maintaining control over quality and ensuring satisfactory performance of the products. The testing devices incorporated in the specification are highly ingenious and at the same time quite simple and inexpensive. This fits in very well with the existing structure and organization of the country.'

These views were expressed by Shri V. E. Chetty, the President of the Indian Pencil Manufacturers Association on the draft Indian Standard Specification for Black-Lead Pencils which has recently been finalized by the Pencils Sectional Committee of the ISI and which will be made available to the industry after it is printed in due course. Shri Chetty stated these views in his presidential address at the Fourth Annual General Meeting of the Association held at Madras last July.

In his speech, the President made a plea to the Government and to the consumers to avail more and more of the services of the Association in locating as well as in arranging supplies according to specifications and in adequate quantity. He further added that the industry was awaiting with great interest the formulation of specifications for coloured and copying pencils which, though not as important as black-lead pencils, were quite significant in respect of volume of production and diversity of use.

In this connection, it may be recalled that the ISI Committee concerned has the following subjects on its programme of work:

1) Indelible pencils (copying and coloured),
2) Coloured pencils for official use,
3) Glass marking pencils,
4) Heat resisting pencils,
5) Leads for propeller pencils, and
6) Crayon and tailors' chalks.

The work of preparing drafts on ' indelible pencils ' and ' leads for propeller pencils ' has been started.

Optical Glass Produced in India

A major recent development in the field of scientific and industrial research in India is the going into production of an optical glass plant at the Central Glass & Ceramic Research Institute in Calcutta. According to information published in CSIR News, samples of optical glass produced by CG & CRI have been found to conform to Grade 'A' of the Draft Indian Standard Specification for Optical Glass, now under wide circulation.

This event marks a crowning achievement for the Institute, as it is for the first time that optical glass is being produced in India. The only country in Asia producing it so far was Japan, and in all the optical glass manufacturing countries of the world the process of its production has been a closely guarded secret.

The importance of optical glass in scientific research and defence is too well known. It is optical glass which

extended human vision from the macroscopic to the microscopic, and it is difficult to imagine what progress medical science would have made without the microscope. Besides, most of the fire control and locating instruments used in defence are equipped with optical devices.

India's own annual requirement of optical glass is five to seven tons. It may now be possible to meet this requirement from internal production.

Development Council for Food Processing Industries

The Development Council for Food Processing Industries, the fourteenth set up under the Industries Act, held its first meeting in New Delhi on 15 July 1958. The meeting, which was inaugurated by Shri Manubhai Shah, Union Minister for Industries, discussed the problems of food processing industries and set up four subcommittees, including one for export promotion. The other three, which will cover the following items, will draft recommendations according to the assignments to the Council in respect of the industries falling within the purview of each subcommittee:

1) Preserved foods, vegetable and aerated water
2) Confectionery, biscuits, chocolate, products of roller flour milling industry, glucose, etc.
3) Dairy products

The Indian Standards Institution, which is a member of this Council, was requested to be a member of the Export Promotion Subcommittee and the two subcommittees for Confectionery, Biscuits, etc., and Dairy Products.

Functions — The functions assigned to this Development Council in respect of the industries to be covered by the subcommittees are as under:

1) Recommending targets for production, co-ordinating production programmes and reviewing progress from time to time;
2) Suggesting norms of efficiency with a view to eliminating waste, obtaining maximum production, improving quality and reducing costs;
3) Recommending measures for securing fuller utilization of the installed capacity and for improving the working of the industry, particularly of the less efficient units;
4) Promoting arrangements for better marketing, and helping in the devising of a system of distribution and sale of produce of the said scheduled industries which would be satisfactory to the consumer;
5) Promoting standardization of products;
6) Promoting or undertaking the collection and formulation of standards; and
7) Promoting the adoption of measures for increasing the productivity of labour, including measures for securing safer and better working conditions and the provision and improvement of amenities and incentives for workers.

Composition — The Council is composed of 16 members representing industrialists, workers, technologists and consumer interests related to the industries falling within its purview. The Chairman of the Council is Shri A. C. Khanna, President, Federation of Biscuit Manufacturers of India, and the Secretary, Shri V. A. Mehta, Deputy Development Officer, Development Wing, Union Ministry of Commerce & Industry. The Indian Standards Institution is represented by the Deputy Director (Agriculture & Food).

Inaugural Address — Inaugurating the first meeting, Shri Manubhai Shah dealt, *inter alia*, with the various items relating to the growth and development of the different food industries and the Central Government's role in this connection. Shri Shah urged upon the industries to help the country by increasing their production and thereby exporting goods from India. He also laid stress upon the need for goods to conform to standards, whether the goods are made for consumption at home or abroad. Regarding the use of certification marks on goods conforming to standards, the Minister remarked that such marks not only created confidence among consumers but also earned premium for the industry.

Way Clear For ISI Certified Goods

Copper base alloys bearing the ISI Certification Mark now pass for shipment without further tests by the customs. An announcement in this regard was made sometime back by the Chief Controller of Imports and Exports of the Ministry of Commerce & Industry, Government of India. The consignment for export has to be against valid licence.

A manufacturer is authorized to put ISI Certification Mark on his product after obtaining a licence from the ISI. Licences to manufacturers to use the Certification Mark on products conforming to the relevant existing Indian Standard, are granted by the ISI under its Certification Marks Scheme which is regulated under the Indian Standards Institution (Certification Marks) Act, 1952 and the Rules and Regulations framed thereunder.

Of the large number of copper base alloys, some of the important ones have so far been covered by the following 11 Indian Standard Specifications:

1) IS: 28-1950 Phosphor Bronze Ingots and Castings
2) IS: 191-1958 Copper (*Revised*)
3) IS: 291-1951 Naval Brass Rods, Bars and Sections
4) IS: 292-1951 Brass Ingots and Castings
5) IS: 304-1952 High Tensile Brass Ingots and Castings
6) IS: 305-1952 Aluminium Bronze Ingots and Castings
7) IS: 318-1952 Leaded Tin Bronze Ingots and Castings
8) IS: 407-1953 Brass Tubes for General Purposes
9) IS: 410-1953 Rolled Brass Plate, Sheet, Strip and Foil
10) IS: 613-1954 Copper Bars and Rods for Electrical Purposes
11) IS: 1028-1956 Silicon Bronze Ingots and Castings

The Indian Standard Specification for Brass Ingots for Gravity Die Castings and Brass Gravity Die Castings (IS: 1264-1958) is now under print.

Work is also underway for the preparation of Indian Standards on the following subjects:

1) Phosphor bronze rods and bars, sheet and strip, and wire,
2) Brass sheet for the manufacture of utensils,
3) Leaded brass strips for use in the manufacture of parts for instruments, and
4) Bronze for railways.

ISI Certified Goods in the Directorate of Technical Development

The Directorate of Technical Development of the Ministry of Defence now treat the samples bearing the ISI Certification Mark as registered samples after testing only once. This obviates the necessity of calling for tender samples for that particular product.

The Directorate of Technical Development call for tender samples at a regular interval and test them with a view to ensuring the quality of the product they consume. The ISI Certification Mark thus serves both: the manufacturer or the seller is

saved from continuously supplying the product or goods for testing, and the Directorate does not have to go in for testing sample after sample received from the same party in respect of the same material.

Roman Transliteration System Standardized

The Board of Scientific Terminology, set up by the Union Ministry of Education to evolve a standard and uniform scientific and technical terminology for Hindi and other Indian languages, has recently standardized a system of Roman transliteration. The need for a simple but accurate system of transliteration by which names and words of Indian languages can be written in Roman alphabet without creating ambiguities of spelling and pronunciation, had long been felt in the country.

In the standardized system, an attempt has been made to provide for faithful and unambiguous transliteration of letters of all major Indian languages into Roman script with the help of only four diacritical marks, viz, the dash, the colon, and the single and inverted commas. These signs are quite simple, well-known even to persons with a very moderate knowledge of English and also available on all standard English typewriters and teleprinters. In printing also, this system is expected to offer no difficulty.

At present, for this purpose two systems are prevalent in the country: the international phonetic alphabets, extensively used in this country for transliterating Sanskrit, Prakrit, Arabic and Persian words, and the other known as the Huntarian system. Of the two, the former is impracticable because, it requires the use of a confounding number of diacritical marks, and the latter, though simple, because it does not make use of any diacritical marks, has given rise to a number of mispronunciations which persist even today.

With the help of the standardized system, it is claimed that almost all Indian sounds can be reproduced faithfully without any ambiguity. The adoption of this system may, in the beginning, entail some inconvenience to the users, but the simplicity and the precision of differentiation in the various sounds claimed, should more than overcome the initial inconvenience.

A 10-page pamphlet, issued by the Union Ministry of Education, entitled ' A Standard System of Roman Transliteration ', priced at 12 naye paise per copy, describes the system in detail.

Standards Act for Burma

The Union of Burma has issued a draft Standards Act 1958. The Act is intended to facilitate commerce and trade by establishing a Department of Standards under the Union of Burma Research Board and by adopting the international system of weights and measures as the basis of reference for units to be used in Burma.

The Act authorizes the Burma Research Board to undertake the following functions:

a) The custody, maintenance, and development of the national standards of measurement, and the provision of means and methods for making measurements consistent with those standards, including the comparison of standards used in scientific investigations, engineering, manufacturing, commerce, and educational institutions with the standards adopted or recognized by the Government.

b) The determination of physical constants and properties of materials when such data are of great importance to scientific or manufacturing interests, and are not to be obtained with sufficient accuracy elsewhere.

c) The development of methods for testing materials, mechanisms and structures, and the testing of materials, supplies, and equipment, including items purchased for use of Government departments and independent establishments.

d) Co-operation with other government agencies and with private individuals and organizations in the establishment of commodity standards, standards of commodity grading, standard practices, standard specifications, and codes.

In carrying out the functions enumerated above, the Board will be authorized under the Act to undertake certain specified activities and other tasks for which need may arise in the operations of government agencies, scientific institutions, and commercial and industrial enterprises. One activity among the nine specified in the Act is the ' development and encouragement of standards and standardization of commercial, industrial, building, and other products and processes of all kinds where such standardization would be advantageous and in the public interest '.

Purchase Tax Off Kite-Marked Helmets

The British House of Commons has exempted the motor cyclists' helmets and other protective headgear from the purchase tax. Most types are, of course, made to requirements of British Standards, the most important being B.S. 2001 and B.S. 1869 for motor cyclists' helmets, and B.S. 2095 and B.S. 2826 for industrial safety helmets. These standards prescribe tests to prove the effectiveness of the complete helmets.

Under Government Regulations, it is at present an offence to sell a motor cyclist's protective helmet which does not comply with B.S. 1869 or B.S. 2001. All manufacturers of this head gear have, therefore, qualified for a licence to use the Kite-mark, as also have some of those who produce heavy industrial helmets.

NZ Standards Bulletin

We congratulate the New Zealand Standards Institute on bringing out an interesting and informative number of the New Zealand Standards Bulletin to commemorate the Silver Jubilee of standardization activity in New Zealand. This 40-page special number which was issued last April and received here in July is essentially an acknowledgement and an appreciation of the work of the 153 standards committees, and of some 2 000 committee members of NZSI.

Among the items covered in the Bulletin, is a chronological record of outstanding events during the 25 years from 1932-33 to 1957-58. Of these, the following are of particular interest:

1932-33	Formation of New Zealand Standards Institution
1936	Dissolution of the Institution because of inadequate financial support and establishment of New Zealand Standards Institute within the orbit of Government
1938	Issue of first New Zealand Standard N.Z.S.S. 143 Galvanized (Zinc Coated) Steel Fencing Wire
1941	Standards Act placed on Statute Book

1942 First standard mark registered under the Patents, Designs, and Trade Marks Act 1921-22

1944 1) First standard mark licence issued

2) NZSI became a member of the United Nations Standards Co-ordinating Committee (forerunner of the International Organization for Standardization)

1955 First issue of the quarterly New Zealand Standards Bulletin, which has since attained a request circulation of over 4 000.

Among the seventeen anniversary messages published on six pages of this Silver Jubilee Number, appears the following from the Director, ISI.

'On behalf of the Indian Standards Institution, I have great pleasure in sending our hearty congratulations and best wishes on the occasion of the Jubilee celebrations of the New Zealand Standards Institute. Being just twenty-five years old, the New Zealand Institute may be somewhat younger than certain sister standards organizations in other countries; nevertheless, to newcomers in the field like the ISI, it represents a mature and youthful member of the international family. We are, therefore, proud to have the privilege of being associated with it both in the international sphere and the Commonwealth of Nations.

The valuable contributions that the New Zealand Standards Institute has made to the national sphere of standardization, particularly in the field of national certification marks, have served to guide the formulations of policies in India, and I dare say in other countries, where standardization movements have started in recent years. Its fellow members in the International Standards Organization look forward to much closer collaboration from the New Zealand Standards Institute than has so far been possible, and it is hoped that, in these days of air travel, physical difficulties involved due to long distances will no longer stand in its way to make this possible. As a member of the Commonwealth Standards Conferences, the New Zealand Standards Institute has made valuable contributions in the past to Commonwealth co-ordination of standards, and we have every hope that these contributions will continue to be made in future in ever increasing volume.

At this happy occasion, ISI has great pleasure in extending its felicitations to its sister organization for a most successful future.'

Quality Standards for Central American Industrial Products

A provision for establishing quality standards has been made in an agreement on Central American Integration Industries, proposed by the Central American Economic Co-operation Committee. This agreement is a part of the programme of economic integration in the countries of Central America, namely the Republics of Guatemala, El Salvador, Honduras, Nicaragua and Costa Rica. The agreement applies to industries comprising one or more plants which, in order to manufacture a commodity or commodities on a reasonably economic and competitive scale, given the conditions obtaining in Central America, require to use individually a group of installations of machinery and equipment, the minimum capacity of which significantly exceeds the demand for their commodities on the domestic market of the Central American country where the plants are installed. These industries have been termed as the Central American Integration Industries, and the industrial plants which belong to them as the 'industrial integration plants.' Under the agreement, the commodities manufactured by such plants have to comply with quality standards.

It has also been provided in the agreement that the Central American Research Institute for Industry shall co-operate with the contracting states in establishing these standards and review them from time to time. The Institute shall also co-operate in the technical control of these standards. The Institute, it may be added, is a newly established organization which has not, up to the present, developed any industrial standards.

FOURTH COMMONWEALTH STANDARDS CONFERENCE TO MEET IN CANADA

The Fourth Commonwealth Standards Conference will be held in Ottawa (Canada) from 26 August to 3 September 1959. The venue of the Conference will be the National Research Council Building, about five miles from the centre of the city. The agenda for the Conference, when finalized, will be announced in this Bulletin.

It will be recalled that the First and Second Conference were held in London in 1946 and 1951 respectively, and the third in New Delhi in January 1957.

Implementation of Indian Standards

The following Government purchasing or consuming departments have adopted the Indian Standards listed under them during the period 1 July to 31 August 1958. In all, 9 standards were adopted during the period. Up to 31 August 1958 — 1 019 Indian Standards were in force, of which 895 had been adopted by various Government departments.

Research, Design and Standardization Organization, Ministry of Railways (Previously known as Central Standards Office)

IS: 226-1955 Structural Steel (*Revised*)
IS: 990-1957 Spoons, Stainless Steel
IS: 992-1957 Forks (Table, Fish and Serving) Stainless Steel
IS: 993-1957 Forks (Table, Fish and Serving) Brass and Nickel Silver
IS: 995-1957 Table Knives, Dessert Knives and Fruit Knives
IS: 1061-1957 Coal Tar Disinfectant Fluids, Black and White

Engineer-in-Chief's Branch, Ministry of Defence

IS: 73-1950 Asphaltic Bitumen and Fluxed Native Asphalt for Road Making Purposes
IS: 459-1955 Unreinforced Corrugated Asbestos Cement Sheets
IS: 731-1956 General Requirements and Methods of Test for Porcelain Insulators for Overhead Lines with a Nominal Voltage of 1 000 Volts and Above (*Tentative*)

Other Organizations

The following parties have stated that their future purchases will be made to Indian Standards:

a) M/s Heavy Electricals Private Ltd., Bhopal
b) The Bombay Electric Supply and Transport Undertaking, Bombay

---

New ISI Members

Enrolled during the period 1.7.58 *to* 31.8.58

Sustaining Members

Addison & Co. (Private) Ltd., Madras
AFCO Private Ltd., Bombay
Allen Richards & Co., Calcutta
Bombay Company (Private) Ltd., Bombay
Crossley & Towers Private Ltd., Calcutta
Dalmia Iron & Steel Ltd., Calcutta
Eagle Lithographing Co. Private Ltd., Calcutta
Eastern Machinery & Trading Co., Bombay
Gopal Metal Works, Lucknow
Hindustan Transmission Products (Private) Ltd., Bombay
Jaipur Udyog Limited, Sawaimadhopur
Jayems Engineering Company, Bombay
Keymer, Bagshawe & Co. (India) Private Ltd., Calcutta
Martin & Harris (Private) Ltd., Calcutta
Nagrath Paints Private Ltd., Kanpur
National Productivity Council, New Delhi
Shellac Export Promotion Council, Calcutta
Sudhir Chemical Co., Bombay

Sustaining Members (Associates)

Agromore Company, Bangalore
Bhatia Safe Works, Kanpur
Curzon Leather Works, Agra
Everest Tapes, Bombay
Gautam Electric Motors (Private) Ltd., New Delhi
General Merchandise Dealers Ltd., Calcutta
G. G. Industries (Chocolate Section), Agra
Hanuman Engineering Works, Lucknow
Metal Industries Limited, Shoranur (Kerala State)
Miniature Bulb Industries of India, Dehradun
Mooken's Mills Engineering Department, Trichur (Kerala)
Northern India Iron Press Works, Lucknow
Prakash Engineering Co., Lucknow
U.P. National Industrial Corporation Ltd., Agra

Ordinary Members

Haja Shareef, K.S.G., Madras
Joshi, Ishwar Chandra, Gwalior
Malhotra, Ram Lal, Kanpur
Oliver, Gerald Langford, Madras
Patel, Devsi R., Calcutta
Ranade, K. S., Bombay
Rao, K. V. P., Madras
Srinivasan, V. R., Madras

ISI ACTIVITIES

EXECUTIVE COMMITTEE

The fiftyfifth meeting of EC was held in joint session with the fortythird meeting of the Finance Committee in the Committee Room of the Ministry of Commerce & Industry, New Delhi, on 12 August 1958.

The collaboration programme organized between the ISI and the Statistical Quality Control Units of Indian Statistical Institute was noted by the Committee.

Particulars of the ISI publicity programme were brought to the notice of the Committee. These included the display of posters on ISI Certification Marks at vantage points at about 25 big railway stations, willingness of five State Governments to include a brief chapter entitled 'The Story of Standards' in their text books, the decision of twelve universities to print tables containing basic units of metric conversion factors on the exercise books of their students. These measures are aimed at popularizing the cause of standardization and of changing over to metric system among the student community.

The Committee was also informed about the documentary film 'Standards for Industry' under production at the Films Division of the Ministry of Information & Broadcasting. Another documentary film on quality control and export promotion, featuring the role of ISI Certification Marks in export promotion and quality control along with the roles of other organizations and departments like Export Promotion Councils, is also being made for the Ministry of Commerce & Industry.

The Committee noted the membership position as on 11 August 1958: it consists of 1 195 Sustaining Members, 205 Sustaining Members (Associates) and 123 Ordinary Members. The Committee also noted the membership subscription collected; it amounted to Rs 3.68 lakhs against last year's figure of Rs 3.31 lakhs.

The Committee accorded its approval of the nomination of Dr. Lal C. Verman, Director, ISI, on the Advisory Committee for the Department of Physics and Meteorology of the Indian Institute of Technology, Kharagpur.

The Committee agreed to the co-option of Prof. C. H. Khadilkar as the representative of Maharaja Sayaji Rao University of Baroda on the Building Limes Sectional Committee (BDC 4).

ENGINEERING DIVISION

Pencils

The draft Indian Standard Specification for Black-Lead Pencils was discussed in detail at the third meeting of the Pencils (Lead) Sectional Committee, EDC 33, which was held in joint session with the second meeting of the Pencils Subcommittee, EDC 33:1 on 4 and 5 August 1958 at Manak Bhavan, New Delhi. The draft specification deals with pencils of grades 6B, 4B, 2B, HB, 2H, 4H and 6H for general writing, drawing, carpenters and stenographers. The Committee made a number of modifications in it and decided to circulate the revised draft to members of the Sectional Committee again, before sending it for publication.

The Committee also considered the priority to be allotted to its future programme of work, and decided to take up work on the following subjects in the order given below:

1) Copying pencils, and
2) Leads for propeller pencils.

TEXTILE DIVISION

Cotton, Yarn and Cloth

The Cotton, Yarn and Cloth Sectional Committee, TDC 2, approved the following draft Indian Standards at its tenth meeting held on 14 August 1958 at Bombay:

1) Specification for Cotton, Duck, Scoured, Dyed or Waterproofed;
2) Specification for Cotton Gaberdine, Bleached;
3) Specification for Cotton Mosquito Netting, Round Mesh, Dyed;
4) Specification for Cotton Canvas, Scoured, Dyed or Waterproofed; and
5) Code for Inland Packaging on Cotton Textiles.

The draft Revision of IS: 293-1951 Code for Seaworthy Packaging of Cotton Textiles was approved for wide circulation for three months with a view to inviting comments on it.

The Committee also finalized for publication the draft amendments to the following two Indian Standard Specifications after making necessary modifications on the basis of comments received on them:

1) IS: 174-1951 Flannelettes (Plain) (*Tentative*), and
2) IS: 175-1951 Cotton Bed Sheets (*Tentative*).

A draft Amendment No. 1 to IS: 179-1951 Specification for Dosuti (*Tentative*) was approved for wide circulation for securing views and suggestions on it.

In the absence of the Committee Chairman Shri Bharat Ram, the meeting was presided over for the first half by Shri Madanmohan Ramnarain Ruia and in the latter half by Dr. R. L. N. Iyenger.

Textile Chemistry

The Textile Chemistry Sectional Committee, TDC 5, held its twenty-first and twentysecond meetings in joint sessions with the eighth meeting of the Subcommittee for Colour Fastness, TDC 5:3, and with the seventh meeting of the Subcommittee for Determination of Shrinkage, TDC 5:5, at Bombay on 25 and 26 August, respectively.

Of the 9 draft Indian Standard Methods for finalization considered by the Committee in its two meetings, draft methods for the following 8 items were finalized for publication subject to a number of modifications:

1) Determination of Colour Fastness of Textile Materials to Carbonizing with Aluminium Chloride;
2) Determination of Colour Fastness to Textile Materials to Alkaline Milling;
3) Determination of Colour Fastness of Textile Materials to Decatizing;
4) Determination of Colour Fastness of Textile Materials to Bleaching with Sodium Chloride;
5) Determination of Colour Fastness of Textile Materials to Bleaching with Sodium Chlorite;
6) Determining Shrinkage of Knitted Goods Containing Wool;

7) Determination of Shrinkage on Washing of Fabrics Woven from Rayon and Synthetic Fibres not Liable to Felting; and
8) Detection and Estimation of Damage in Cotton Fabrics Due to Micro Organisms.

The finalization of the draft Indian Standard Method for Determination of Colour Fastness of Textile Materials to Washing at the Boil was withheld for the present, and was referred back to the Subcommittee concerned for the purpose of reviewing the document in the light of other Indian Standards on colour fastness to washing already issued by the ISI.

The name of the Subcommittee for Treated Fabrics, TDC 5 : 10, was changed to ' Subcommittee for Biological Test Methods ', and it was assigned to prepare separate draft standards dealing with detection and estimation of damage due to micro-organisms in the following materials:

1) Cotton yarn and cordages,
2) Cotton,
3) Jute fabrics,
4) Jute yarn and cordages, and
5) Jute.

CHEMICAL DIVISION

Acids and Fertilizers

The **first meeting** of the Acids and Fertilizers Sectional Committee, CDC 24, was held under the presidentship of the Chairman, Shri C. R. Ranganathan, the Executive Director of the Fertilizer Association of India, New Delhi, on 23 June 1958 at Manak Bhavan, New Delhi. The Chairman, in his opening address, explained that the present Sectional Committee was formed by splitting the old Heavy Chemicals (Inorganic) Sectional Committee, CDC 3, with a view to disposing of the work expeditiously. He also expressed his confidence that the step would help in producing more standards to meet the demand of expanding industries.

The Committee, then, considered the draft Indian Standard Glossary of Terms Used in Fertilizer Trade and Industry in the light of comments received during the wide circulation and finalized it for publication subject to a number of modifications.

The draft Indian Standard Specification for Urea, Pure and Technical, was amended and approved for wide circulation for three months.

Having agreed that the method for the determination of phosphates as suggested by Dr. G. S. Kasbekar be included as an alternate method in IS : 1022-1956 Specification for Kotka Phosphate, the Committee decided to issue the amendment to the Indian Standard in wide circulation for three months.

It was also agreed that an alternate method based on the use of NPL mixed screened indicator be prescribed in IS : 798-1955 Specification for Orthophosphoric Acid, Technical, for the determination of end-point regarding orthophosphoric acid content. The Committee laid down the composition of the indicator, and authorized the ISI Directorate to draft the amendment to the above Indian Standard in consultation with Shri M. R. Verma of the NPL and to issue it into wide circulation for comments for a period of three months.

Considering the requests made by certain parties for membership, the Committee decided to find out their specific interests in its work and authorized the Chairman to take a decision on the basis of the information received. Besides, the Committee also co-opted a representative each of the following organizations with a view to making the Committee fully representative of the interests concerned:

1) M/s Shaw Wallace & Co. Ltd., and
2) M/s Nangal Fertilizers & Chemicals (Private) Ltd.

Metal Containers

The Chairman, Mr. R. Lawford, Chief Engineer of the Metal Box Company of India Ltd., presided over the third meeting of the Metal Containers Sectional Committee, CDC 28, held on 23 and 24 July 1958 at Calcutta. In his opening address, the Chairman pointed out that at the previous meetings there had been considerable discussion on the use of preferred numbers, and the conveners of the subcommittees when preparing the draft standards had made every endeavour to follow the preferred number theory. However, he said, it was not entirely practical in the case of metal containers, for it would be highly coincidental if the raw material sizes, the container dimensions and the quantity packed could all be selected as preferred numbers. In his opinion, over-riding preference should be given to the capacity of a container so that it was a preferred number, and the other dimensions should be fitted in as preferred numbers, wherever possible.

The Secretary Dr. Sadgopal, Deputy Director (Chemicals), ISI, also expressed the opinion that in the new draft standards the Committee should adopt wherever possible, increasing use of the preferred sizes numbers. But he also shared the doubt expressed by the Chairman that in view of the serious limitations under which the Indian industry had to develop, it might not be immediately possible to adopt this policy uniformly in all cases. He suggested for the consideration of the Committee that in all such cases the ultimate dimensional and other requirements be also given in preferred sizes and numbers so as to assist the industry to switch over to them in the near future.

Then the Committee discussed the draft Indian Standard on Eighteen Litre Tins in the light of Comments received and modifying the draft as required, finalized it for publication.

The following 6 draft Indian Standards for approval were also considered in detail:

1) Specification for Tin Plate Containers, Regular;
2) Specification for Tin Plate Containers, Round;
3) Specification for Mild Steel Barrels (Light Duty — Fixed Ends);
4) Specification for Mild Steel Barrels (Heavy Duty — Fixed Ends);
5) Drums and Kegs; and
6) Glossary of Terms Relating to Metal Containers Trade.

While approving these draft standards for wide circulation, the Committee agreed upon a number of changes in them. In the case of draft specifications for both regular and round tinplate containers, it was decided that they should be brought in line with the draft specification on eighteen-litre tins already finalized for publication. The Hydraulic Pressure Test in the second draft was deleted. The titles of items 3 and 4 were changed to ' Mild Steel Drums, Large (Light Duty — Fixed Ends) ' and to ' Mild Steel Drums, Large (Heavy Duty — Fixed Ends)', respectively. The title of the item 5 was also amended to read as ' Steel Drums and Kegs '.

The Committee considered the new proposals for formulation of Indian standards, and recommended the following subjects to the Chemical Division Council for its approval:

1) Crown Corks,
2) Roll seal closures,
3) Prescrewed caps, and
4) Goldie seals.

Subject to the approval of these subjects by the CDC, the Committee agreed to set up a Subcommittee on Metal Closures, CDC 28 : 4 with Mr. R. Lawford, as its Convener.

At this meeting, which was held on 23 and 24 July 1958 at Calcutta in joint session with the meetings of the Barrels Subcommittee CDC 28 : 1, the Drums and Kegs Subcommittee, CDC 28 : 2, and the Tinplate Containers Subcommittee, CDC 28 : 3, the Committee changed the name of the Barrels Subcommittee to Drums Large Subcommittee consequent upon the modification of the titles of the draft specification on barrels as reported above.

On reviewing the composition of the Subcommittee, the Committee offered representation to the Indian Paint Manufacturers Association on the Drums and Kegs Subcommittee and on the Tinplate Containers Subcommittee.

STRUCTURAL AND METALS DIVISION

Pig Iron and Ferro Alloys

The Pig Iron and Ferro Alloys Sectional Committee, SMDC 8, discussed and finalized for publication the draft Revision of IS : 224-1950 Specification for Pig Iron (Coke) at its second meeting which was held on 8 July 1958 at Calcutta.

The Committee also approved for wide circulation the 8 draft Indian Standards on the following five subjects:

1) Ferro Titanium,
2) Ferro Vanadium,
3) Ferro Tungsten,
4) Ferro Molybdenum, and
5) Silico Manganese.

The Committee also considered the comments received on the published Indian Standards. It was agreed that Table 1A of IS : 225-1950 Specification for Pig Iron (Charcoal) which specifies phosphorus content of 0·15 percent maximum, be deleted. The fines upto a maximum of 20 percent in the case of Grade FeSi 55(55-60) were permitted in both Indian Standards, namely IS : 1110-1957 Specification for Ferro Silicon and IS : 1111-1957 Specification for Spiegeleisen. The amendments in respect of these changes in the 3 Indian Standards mentioned above were decided to be issued. In case of the last two, i.e., IS : 1110-1957 and IS : 1111-1957 respectively, the Committee also decided to take note of the comments about the inclusion of the additional details for the end uses of ferro silicon and spiegeleisen at the time of their revision.

Considering the following ferro alloys as new subjects for formulation of Indian Standards, the Committee agreed that although they were not being manufactured at the moment in India, it was necessary to have Indian Standards on these subjects as these would have to be manufactured in due course:

1) Electrolytic Manganese,
2) Metallic manganese,
3) Metallic Chromium,
4) Metallic Silicon,
5) Calcium Silicide,
6) Silico Chromium,
7) Ferronickel, and
8) Foundry Nickel.

The Committee also set up a Ferro Alloys Subcommittee, SMDC 8 : 1, with Dr. B. R. Nijhawan as its convener, to prepare draft standards on these subjects. The Subcommittee was authorized to issue these drafts into wide circulation. But it was decided that while preparing drafts, the Subcommittee would keep in view the different grades of ferro manganese and ferro chromium already included in IS : 1170-1957 Specification for Ferro Chromium and IS : 1171-1957 Specification for Ferro Manganese.

Metal Standards

The draft dimensional standards covering the following four items, which were finalized for publication at the first meeting of the Metal Standards Sectional Committee, SMDC 1, were again considered in the light of some more comments received later, at the third meeting held on 25 July 1958 at Manak Bhavan, New Delhi:

1) Preferred Sizes for Metal Products,
2) Thicknesses of Sheet and Diameters of Wire,
3) Diameters and Thicknesses of Metal Bars, Flats and Plate, and
4) Sizes of Metal Strip, Sheet, Flats and Plate

The first item was finalized for publication with some modifications and item 2 was deferred till the comments of the other Divisions of ISI were received. In case of items 3 and 4, it was decided that the two drafts should be combined under the title ' Indian Standard Sizes of Metal Strip, Bars, Flats and Plate for Structural and General Engineering Purposes.' The draft standard combined in this way was then finalized for publication.

The Committee also reviewed the present position of the research schemes sponsored by the ISI, the work on which was being carried out by various testing laboratories and centres, and decided to approach the National Metallurgical Laboratory to take up some of the research problems. The National Metallurgical Laboratory has recently received specialized equipment.

ELECTROTECHNICAL DIVISION

Electrical Instruments and Meters

The draft Indian Standard Specification for AC Electricity Meters (Part III of IS : 722) Poly-Phase Whole-Current and Transformer — Operated Meters, and Single-Phase Two-Wire Transformer-Operated Meters was finalized for publication at the fourth meeting of the Electrical Instruments and Meters Sectional Committee, ETDC 6, which was held on 6 August 1958 at Bombay.

The draft specifications for Laboratory Type Electrical Apparatus, Mainly Comprising Resistances, and for Thermocouple Pyrometers with Indicators, were also approved for wide circulation for a period of three months subject to a number of changes.

The Committee, further, approved the following new subjects for formulation of Indian Standards for its future programme of work:

1) Maximum demand indicators,
2) Time switches,
3) Potentiometers, and
4) Galvanometers.

Prof. C. S. Ghosh, Head of Electrical Engineering Department of Roorkee University, was co-opted as the member of the Committee in his personal capacity and was nominated as the member of the Energy Meters Subcommittee, ETDC 6 : 1 and Instruments Subcommittee, ETDC 6 : 2.

MADRAS BRANCH OFFICE

Executive Committee

The Executive Committee of the Advisory Committee for ISI Madras Branch Office held its **first meeting** on 23 July 1958 at the Branch Office, Madras. In his opening address, the Chairman Shri D. C. Kolhari, recalled the second meeting of the Advisory Committee held in March last, in joint session with the Southern India Millowners' Association in which the Association had expressed the desire that there should be a separate standard for grey yarn for handloom industry. The Chairman stated that the ISI had taken up the subject, and a draft on it had been brought out. He also

(*Continued on p.* 284)

NEW INDIAN STANDARDS

Indian Standards recently published are briefly described here.

Badminton Racket Frames

No national or other standards for badminton racket frames are known to exist in any country. The Indian Standard Specification for Badminton Racket Frames (IS: 831-1957), prepared on the recommendation of the Export Promotion Committee of the Government of India, covers the requirements for three grades of badminton racket frames for shuttlecocks and wool balls, designated as Super, Special and Popular, the grading being based on certain constructional details.

The more important characteristics in a racket frame are its balance, resilience and grip, all of which should be such as to offer the maximum comfort to the player. However, it has not been possible to stipulate specific requirements and methods of test for these characteristics. It is very essential that timbers with high strength/weight ratio are used for the bend of the badminton racket frame, and the standard recognizes, for this purpose, certain well-established species of timber. The ranges of weight specified for the racket frames are those for the adult size, and though ladies usually prefer a slightly smaller grip, the range of weight remains the same.

This Indian Standard is one of a series of Indian Standard specifications for sport goods which at present comprises, besides the present one, the following:

IS: 414-1953 Guts for Tennis, Badminton and Squash Rackets (*Tentative*),
IS: 415-1953 Shuttlecocks (*Tentative*),
IS: 416-1953 Cricket and Hockey Balls (*Tentative*),
IS: 417-1953 Footballs, Volley-Balls, Basket-Balls and Water Polo Balls (*Tentative*),
IS: 827-1956 Sinew Guts (*Tentative*),
IS: 828-1956 Cricket Bats (*Tentative*),
IS: 829-1956 Hockey Sticks (*Tentative*), and
IS: 830-1957 Tennis Racket Frames.

Hand Hammers

A large variety of hand hammers is being manufactured in the country. The Indian Standard Specification for Hand Hammers (IS : 841-1957) is intended to regulate the manufacture of the most popular types of hammers.

Thirteen types of hammer heads for different applications have been covered in this standard. The standard also covers requirements relating to handles for fitting hammer heads and various other requirements such as shapes and dimensions, weight, hardening, chemical analysis, manufacture, workmanship, finish, mechanical tests, preservative treatment, etc.

Gunmetal Gate, Globe and Check Valves

The purpose of the Indian Standard Specification for Gunmetal Gate, Globe and Check Valves for Water, Steam and Oil Only (IS: 778-1957) is to establish a range of service ratings to govern the design of valves covered by it, and to specify minimum requirements with regard to materials, construction, workmanship and performance.

The standard covers gunmetal gate, globe and check valves from $\frac{1}{4}$ to 4 in. nominal sizes both inclusive, for water, oil and steam. The valves covered by this standard are not intended for use in the petroleum industry.

Dimensions which are concerned chiefly with the general design of valves have not been dealt with, but all essential dimensions have been standardized to ensure production of a sound article with a reasonably long life. The intention underlying the inclusion of detailed requirements has been to secure an adequate standard of quality for the ordinary gate, globe and check valves used under different service conditions. It is not intended to preclude the production and use of valves embodying special features other than those specified.

Cold Setting Casein Glue

Adhesives form one of the most important raw materials used in the plywood industry and also in the wood work and joinery industry. The selection of the adhesive and its correct use are important factors controlling the quality of the plywood or the joinery work produced. The raw materials for adhesives are not all found in this country. A large quantity of raw materials for adhesive and synthetic resin adhesives are imported. In the context of this background of the industry, it has been found necessary to lay down specifications governing the quality of raw materials and the performance expected from the prepared glues.

The Indian Standard Specification for Cold Setting Casein Glue for Wood (IS : 849-1957) prescribes the general quality of the material, requirements and methods of tests for adhesive strength, chloride content, sulphate content, etc. Detailed instructions for the use of the material are also included in the standard.

Basic Requirements for Water Supply, Drainage and Sanitation

The practices now followed in the country in regard to water supply, drainage and sanitation were instituted early in this century on the basis of codes prevalent in the United Kingdom, and there has been hardly any critical examination as to whether these practices are adequate and efficient under the conditions obtaining in this country. Valuable experience has since been gained by several municipal bodies, such as the Bombay Municipal Corporation, who have improved upon and introduced new regulations found necessary against the background of Indian habits and customs.

The Indian Standard Code of Basic Requirements for Water Supply, Drainage and Sanitation (IS : 1172-1957) makes available the valuable experience so obtained, to other municipalities and general public. It lays down general requirements and also separate detailed requirements for all buildings in regard to water supply, drainage and sanitation for residences and for buildings other than residences such as offices, factories, cinemas, art galleries, hospitals, schools, hostels, restaurants, etc.

Cast Iron Rain-Water Pipes and Fittings

The Indian Standard Specification for Cast Iron Rain-Water Pipes and Fittings (IS : 1230-1957) covers

the requirements for rain-water pipes of 50, 75, 100, 125 and 150 mm, nominal bore, together with their fittings and accessories. The standard also covers the requirements for quality of material, dimensions, weights, ears if required, hammer test, marking, finish, inspection, etc.

Steel Tubes in General Building Construction

The Indian Standard Code of Practice for Use of Steel Tubes in General Building Construction (IS: 806-1957) includes provisions which are of special application to construction using steel tubes. The use of tubular steel in structural work would result in considerable savings, particularly in the case of roof trusses, latticed girders and compression members in general. It is, therefore, recognized that large scale use of tubular steel in structural work is of considerable importance in the interest of steel economy.

The code prescribes requirements in respect of materials used, permissible stresses, wind pressure, design for structures using steel tubes, fabrication, etc.

This code is complementary to IS: 800-1956 Code of Practice for Use of Structural Steel in General Building Construction.

Petrographical Examination of Natural Building Stones

The Indian Standard Method for Petrographical Examination of Natural Building Stones (IS: 1123-1957) lays down method of sampling, procedure for test and for reporting the results after the examination. It also includes the petrographical classification of common types of natural building stones in a tabular form describing their colour, structure, texture and constituents.

This standard is one of a series of Indian Standards on testing of building stones. Other standards published so far in the series are:

IS: 1121-1957 Methods for Determination of Compressive, Transverse and Shear Strengths of Natural Building Stones,

IS: 1122-1957 Methods For Determination of Specific Gravity and Porosity of Natural Building Stones,

IS: 1124-1957 Method of Test For Water Absorption of Natural Building Stones,

IS: 1125-1957 Method of Test for Weathering of Natural Building Stones, and

IS: 1126-1957 Method of Test for Durability of Natural Building Stones.

Lime Stone Slabs

Lime stone slabs are used in the construction of building floors. Lime stone is found more or less in every part of India, with slight variations in the quality of raw materials. Considerable variation, however, exists in size, process of manufacture and quality of finished products. Rapid building activity envisaged during the Second Five Year Plan, needs a certain degree of uniformity to be ensured in construction materials. Standardization of lime stone slabs with regard to properties and sizes would substantially help in raising the quality and speed of construction.

The Indian Standard Specification for Lime Stone Slab (IS: 1128-1957) lays down requirements for dimensions and physical properties, and the minimum requirements of workmanship for lime stone slab for use in flooring and facing work.

Rubber Flooring Materials for General Purposes

Rubber coverings are commonly used for railway coaches, buses and ships, and in public and industrial buildings, because of their good wearing qualities, resiliency, and reduction in noise.

The Indian Standard Specification for Rubber Flooring Materials for General Purposes (IS: 809-1957) deals with the following 4 types of rubber floorings:

1) Type A — Plain or Marbled,
2) Type B — Ribbed or Fluted,
3) Type C — With fabric backing or fabric insert, and
4) Type D — With sponge rubber backing.

The specification lays down requirements in respect of the composition of material, workmanship, colour, dimensions, water absorption, hardness and compression set. It also includes methods of sampling, packing and marking.

Manila Ropes

Manila ropes covered by the following 3 Indian Standard Specifications are generally used in lifting tackle:

1) IS: 1084-1957 Hawser-Laid Manila Rope
2) IS: 1085-1957 Shroud-Laid Manila Rope
3) IS: 1086-1957 Cable-Laid Manila Rope

The three specifications cover 3 grades of the material each. The first two specifications cover sizes from 1 to 18 in. and the third from 5 to 18 in.

The specifications lay down terminology, grading, atmospheric conditions for testing, conditioning of samples and general, specific and other requirements for the relevant types and grades of ropes.

Shuttles for Sacking Looms

Shuttles used in jute industry are made mostly of wood, but have some metal parts and a porcelain ' eye '. The wooden body is long, narrow, pointed at the end, and hollowed out to take the cop. The metal parts consist of movable cover, shaped tip (to withstand the shock of impact at each end of the shuttle's traverse) and in the case of shuttles used in weaving hessians, also a ' drag ' to regulate the flow of the yarn as it leaves the shuttle.

The Indian Standard Specification for Shuttles for Sacking Looms (IS: 1187-1957) deals with four dimensional patterns of shuttles used in weaving sacking. Shuttles of patterns 1 and 2 are suitable for use with cops 279 to 318 mm in length and 41 to 48 mm in diameter. Shuttles of patterns 3 and 4 are suitable for use with cops 241 to 254 mm in length and 41 to 44 in diameter.

The standard defines terms, describes method of sampling and atmospheric conditions for testing. It also prescribes general requirements for general design, type of timber used and smoothness of surface, and specific requirements for materials, and dimensions.

Wetting Agents

Uniform, thorough and speedy impregnation of textile materials in processes like desizing, scouring, bleaching, dyeing, mercerizing, finishing, etc, is much to be desired. To facilitate impregnation, wetting agents are extensively used. From among a large variety of commercial wetting agents, the textile processer has to choose the one most suitable for his requirements. Formulation of standard methods of test for evaluating the relative wetting power of wetting agents is, therefore, necessary.

The Indian Standard Method for Determining the Relative Wetting Power of Wetting Agents (IS: 1185-1957) prescribes two methods used in the wet processing of textile materials.

Of these the first method is intended for assessing the wetting speed of the agents, whereas the second is primarily intended for assessing the absorption-aiding capacity of the agents.

The first method is based on the commonly used ' sinking time ' test. This method gives quick and fairly reliable results. It does not require elaborate apparatus and is suitable for comparing the relative wetting power of two (or more) wetting agents.

The second method involves the use of a special apparatus. The principle of the method is to determine the Herbig number by soaking a definite weight of specified yarn in an aqueous solution of a wetting agent, and centrifuging the yarn under specified conditions. This method is simple in technique and gives consistent results.

Twin Wire Healds For Use in Cotton and Silk Weaving

Healds are the means whereby the warp threads are raised or lowered in order to form a shed for the insertion of weft threads in weaving. Cotton healds which are very widely used in textile industry are being gradually replaced by wire healds, since it was found that wire healds had several advantages over cotton healds.

There are several types of wire healds in use, such as twin, twisted, flat steel, etc. In the twin wire healds, twin wire, formed by tinning together two wires, is split at the centre to form an eye.

The Indian Standard Specification for Twin Wire Healds for Use in Cotton and Silk Weaving (Excluding Jacquard and Weaving) (IS: 1190-1957) prescribes general requirements in respect of shape, plating, soldering, finish, etc, and specific requirements for length, end loops, thread eye, gauge of wire, etc. Other requirements covering designation, sampling and making are also included.

Ready Mixed Paint

Indian Standard Specification for Ready Mixed Paint, Brushing, Oil Gloss, Genuine Zinc Oxide, for General Purposes (IS: 1188-1957) deals with the material used for protection and decoration of building in which both steel and wood have been employed as materials of construction. The material is normally applied as a painting system over the appropriate priming paint.

The standard specification defines terminology, lays down composition of the material and prescribes requirements and methods of test in respect of consistency, drying time, finish, covering power, spreading rate, whiteness, residue on sieve, flash point, keeping properties, etc.

Turkey Red Oil

Turkey red oil is used in the textile industry for dyeing, bleaching and sizing operations, and also for tanning in leather industry. At present its production in India is about 6 000 tons. Efforts are being made to step up production as there is scope for export of the material, but it is appreciated by the progressive section of the nascent industry and consumers that the material should be produced to acceptable standards.

The Indian Standard Specification for Turkey Red Oil (IS: 1044-1957) covers two grades of the material, namely Grade 1 and Grade 2. It prescribes general requirements and also essential requirements in respect of miscibility with water, degree of sulphation, total alkali, total fatty matter, *p*H value, etc. Necessary methods for determining the various characteristics are included in appendices with the specification.

Oil Paste for Paints, Yellow Ochre

The oil paste for paints, yellow ochre is used for making ready mixed paints.

The Indian Standard Specification for Oil Paste for Paints, Yellow Ochre (IS: 1189-1957) prescribes composition, form and condition. It also covers requirements and methods of test for finish, colour, water content, keeping properties, etc.

The Indian Standard Methods of Test for Oil Paste for Paints (IS: 85-1950) is a necessary adjunct to this standard.

Baking Powder

Baking powder finds widespread use as ' chemical leavener ' of dough for bakery products. The constituents of baking powder are (i) Sodium bicarbonate, (ii) edible starch, and (iii) acid reacting component. On wetting, baking powder produces carbon dioxide by the action of acid reacting component on sodium bicarbonate.

In India, specifications for baking powder have been laid down by a number of organizations including the Ministry of Health, Defence organizations, and various units of bakery-products industry, but there is considerable diversity among these specifications. The Indian Standard Specification for Baking Powder (IS: 1159-1957) prepared at the instance of the organized sector of consumers of Baking powder, is intended to provide an agreed comprehensive specification for the materials.

The Indian Standard, besides describing the ingredients, lays down requirements and methods of test in respect of available carbon dioxide, arsenic, lead, copper, zinc, etc. Details of sampling and marking are also included.

Milk Powder (Whole and Skim)

The ease of carriage and preservation of an otherwise perishable article are the obvious advantages of converting milk into milk powder. The bulk of milk powder at present available in the market is prepared by two well known commercially established processes, respectively known as the " Roller Drying Process " and the " Spray Drying Process ".

The method of drying has a fundamental influence upon the solubility of the milk powder. Due to the severe heat treatment to which the milk is subjected in the roller drying process, the solubility of the material prepared by this process is reduced by the greater denaturation of proteins.

The Indian Standard Specification for Milk Powder (whole and skim) (IS: 1165-1956) prescribes requirements and methods of test in respect of flavour, odour, moisture, fat, titrable acidity, total ash, etc. Details of sampling, packing and marking are also included. The limit for solubility index has been fixed at 85 for the material manufactured by roller drying and at 98·5 for the material by spray drying.

Condensed Milk

Condensed milk, sweetened and unsweetened, is produced by evaporation *in vacuo* of milk, either whole or skim, with or without the addition of sucrose in the form of refined sugar. The removal of water in this way leads to the possibility of the storage of the resulting product unchanged for an appreciable length of time, thereby helping to ease the difficulties of co-ordinating supply and demand. Condensed milk (sweetened) is preserved by

its high sucrose content, but the unsweetened material is preserved by sterilization.

The Indian Standard Specification for Condensed Milk (IS : 1166-1957) deals with the following four types of condensed milk:

1) Condensed milk, full-cream, sweetened;
2) Condensed milk, full-cream, unsweetened; commonly known as ' Evaporated Milk ';
3) Condensed milk, skim, sweetened; and
4) Condensed milk, skim, unsweetened.

The standard prescribes requirements and methods of test for total milk solids, fat, sucrose, bacterial count, titrable acidity, residue on sieve, etc, and also tests for coliform organisms and protein. Details of quality of reagents, sampling of the condensed milk, its packing and marking are also included.

Safety and Protection During Welding

Welding is becoming increasingly popular for fabrications and is one of the main channels through which economy of steel can be achieved by propagating its use in all steel fabrications. The use of welding calls for certain safety and health requirements as well as for protective equipment for eye and face during the operations.

The following two Indian Standards covering the subject generally are intended to serve the need and help promote the rapid development of welding industry in India:

1) IS: 818-1957 Code of Practice for Safety and Health Requirements in Electric and Gas Welding and Cutting Operations, and
2) IS: 1179-1957 Specification for Equipment for Eye and Face Protection during Welding.

The Code of Practice lays down requirements for the protection of:

1) persons from injury and illness, and
2) Properties (including equipment) from damage by fire and other causes, arising from electric and gas welding and cutting equipment, its installation, operation and maintenance.

The general provisions of the Code are applicable to welding and cutting of metals and other allied processes. But the Code does not cover particular hazards which may be inherent when welding and cutting equipment is used in special types of industries. The code prescribes requirements for the installation and operation of gas welding and cutting equipment, arc-welding and cutting equipment, and resistance welding equipment, and lays down precautions for the prevention and protection of fire, protection of personnel, ventilation and health protection, etc.

The standard for eye and face protection equipment covers the following:

1) Spectacles,
2) Helmets,
3) Face masks,
4) Goggles,
5) Hand-shields, and
6) Fixed shields.

Special spectacles fitted with protective filters are included because they are sometimes used by supervisory staff and others who are not actually engaged in welding.

The specification is divided in two parts. Part I deals with general requirements defining terms and prescribing tests for compliance; Part II prescribes specific requirements in respect of design, manufacture, materials, inflammability of the material for equipments, etc. A recommended grouping of operations in welding and the use of protective equipment is also given in an appendix.

Tests for Metal Arc Welders

Sometimes back, the ISI had issued an Indian Standard Code of Practice for Training and Testing of Metal Arc Welders (IS : 817-1957) which entailed the need of certain qualifying tests for metal arc welders for assessing or testing the capabilities of a welder for specific application.

The Indian Standard Qualifying Test for Metal Arc Welders (Engaged in Welding Structure Other Than Pipes (IS : 1181-1957) has been prepared to make available a series of standard tests, one or more of which may be selected for assessing or testing capabilities of a welder. The 24 tests included in this Indian Standard comprise butt and fillet welds made by manual metal arc welding in steel sheets and plates of different positions. The Standard prescribes a scheme of approval tests giving particulars of plate or sheet thickness, type of joint and its position in respect of various tests individually. The approval tests specified in the standard include details regarding parent metal, position, assembly for welding, electrodes, deposition of test weld, etc. The methods for preparing etched specimens and the method for preparing and testing bend test specimen on plate are also included.

Definitions of Mica Terms

The quality of mica is judged by the degree of freedom from imperfections which are found in natural mica. These imperfections arise from various causes; some appear as structural defects, while others appear as stains resulting from inclusions of various foreign materials, the principal among which are the inclusions of air and mineral matter. Any system of grading and classification of mica has to be based on a clear understanding of the terms which are used in mica industry and trade to describe these imperfections.

Definitions of mica terms have for these reasons featured very prominently in the programme of work of the ISO Technical Committee (ISO/TC 56 — Mica), the Secretariat of which is held by India.

India had submitted to the ISO, proposals for grading methods for muscovite mica and definitions of terms relating to muscovite mica, based on normal usage in international trade. These definitions were discussed by ISO/TC 56 — Mica, as a result of which a large measure of agreement has been achieved towards international standardization of mica terms. Definitions which have been completely agreed upon by the Committee have been incorporated in the draft ISO Recommendation which has now been adopted as ISO Recommendation No. 67 by the ISO Council.

Realizing the need for international co-ordination, the Indian Standard Definitions of Mica Terms (IS: 1174-1957) based on the draft ISO Recommendation has been prepared. The Indian Standard lays down definitions of mica terms relating to grading according to size and classification according to visual qualities and structural imperfections.

Glossary of Terms for Secondary Cells and Batteries

The Indian Standard Glossary of Terms for Secondary Cells and Batteries (IS : 1147-1957) covers the definitions of terms used in Indian Standards relating to secondary cells and batteries. In the preparation of this standard, definitions recommended by the International Electrotechnical Commission (IEC) have also been taken into consideration. This standard

reviews and brings under one cover the definitions of terms used in different published Indian Standards on secondary cells and batteries.

Pedestal Type Electric Fans

The use of pedestal type fans has increased in recent years, both for indoor and outdoor purposes. The Indian Standard Specification for Pedestal Type Electric Fans (IS: 1169-1957) is intended to rationalize the sizes and types of such fans. It recognizes only two sizes to suit the convenience of manufacture and use. Besides the oscillating and non-oscillating types, the fans are classified as fixed height type and adjustable height type with corresponding figures for height laid down.

In this standard, reference is made to two types of enclosures to motors and regulators, namely totally enclosed and ventilated. The question of retention of the ventilated type of enclosure or its replacement by any other suitable type is under review and comments are invited from all concerned.

This standard applies to pedestal type fans, oscillating and non-oscillating, and to their associated speed regulators suitable for normal domestic and similar uses under tropical conditions. It does not cover air-circulators which have relatively higher air velocities in the axial direction.

The requirements prescribed by the specification are in respect of preferred voltage, frequency, phases, design, general construction, class of insulating material, speed regulation, starting, oscillating mechanism, performance, etc.

This Standard is one of a series of Indian Standard Specifications on electric fans. The other two specifications published so far are:

1) IS: 374-1951 Electric Ceiling Fans, and
2) IS: 555-1955 Table Type Electric Fans (*Tentative*)

AMENDMENT SLIPS

Amendment slips have been issued during the period 1-7-58 to 31-8-58 to the following Indian Standard Specifications:

No. and Date of Amendment	No. and Title of the Indian Standard Specification
No. 2 June 1958	IS: 220-1950 Fountain Pen Inks, Blue-Black and Red
No. 1 October 1958	IS: 350-1952 Insulating Oil Varnish, Clear, Baking
No. 1 October 1958	IS: 351-1952 Insulating Varnish, Baking, Bitumen Type
No. 1 October 1958	IS: 352-1952 Insulating Spirit Varnish, Clear, Air-Drying
No. 1 October 1958	IS: 353-1952 Insulating Varnish, Non-Alcoholic Clear, Air-Drying
No. 1 June 1958	IS: 493-1954 Machinery and Spindle Oils
No. 1 June 1958	IS: 588-1954 Mosquito Larvicidal Oil
No. 1 June 1958	IS: 677-1955 Cloth, Drab Mixture, Woollen (Water Resistant), No. 1
No. 1 June 1958	IS: 678-1955 Cloth, Drab Mixture, Woollen (Water Resistant), No. 2
No. 1 July 1958	IS: 722 (Parts I & II)-1955 AC Whole-Current Electricity Meters.

DRAFT INDIAN STANDARDS

Brief reviews are given here of Draft Indian Standards issued recently for wide circulation to elicit comments from interested parties in India and abroad. Comments are considered by the Sectional Committee concerned at the stage of finalization of the drafts.

Weighing Instruments

The draft Indian Standard Specification for Commercial Weighing Instruments deals with the following categories of weighing instruments:

1) Beam Scales;
2) Platform Weighing Machines;
3) Counter Machines;
4) Steel Yards;
5) Dormant Platform Machines and Weighbridges;
6) Automatic Weighing Machines;
7) Crane Weighing Machines; and
8) Spring Balances.

The draft standard is divided in nine parts. Part I prescribes the general requirements with a view to ensuring maintenance of accuracy, continued satisfactory functioning of operating parts, adjustments remaining reasonably permanent, and prevention of development of undue stresses. It also gives details of marking, sealing and testing.

Each of the parts from II to IX deals with one of the above mentioned categories of weighing instruments respectively, giving necessary definitions and details of design, construction, capacities, tests, etc.

Another important category, namely that of person weighing machines, has not been covered in this draft. It is expected that a separate specification will be prepared for it.

Screw Threads

The Government of India, in 1956, decided to introduce the metric system of weights and measures in the country. To assist the manufacturing industry in the changeover, the ISI has formulated a number of standards for weights and measures, and has been engaged on the work of preparing standards for screw threads for some time. An Indian Standard Dimensions for Screw Threads below 6 mm (IS : 886-1957) has already been published

on the basis of a draft ISO Recommendation on the same subject.

The following two draft Indian Standards are also based on the draft ISO Recommendations on the respective subjects:

1) General Plan for Screw Threads with ISO Triangular Profile (Diameter Range 0·25 to 300 mm), and
2) Screw Threads for Commercial Bolts and Nuts (Diameter Range 6-39 mm).

The first draft standard is intended to provide an overall plan for selection of pitch diameter series in a convenient manner for various applications. It prescribes requirements in respect of profile and designation, and lays down directives for choosing the pitch diameter combination from a table giving the general plan and diameters of pitches.

The second draft deals with the selection of screw threads 6 to 39 mm representing the largest pattern of demand for commercial bolts and nuts, and is based on the standard general plan. The draft standard covers two series of threads — coarse and fine. It is also in line with the draft ISO proposal on the subject, namely ISO/TC 1 (Sect-52)144 Metric Screw Threads for Commercial Bolts and Nuts (Diameter Range 6-39 mm).

Fire Safety of Buildings

Reliable and adequate guidance on fire prevention, fire fighting and fire grading of building is intended to be provided by the seven draft Codes of Practice for Fire Safety of Buildings, covering the following seven items:

Chimneys, Flues, Flue Pipes and Hearths — defines terms; divides chimneys, flues, flue pipes and hearths for the purpose of fire safety of buildings into two types; and prescribes designs, materials and functional requirements. Requirements for the protection of combustible material are also included.

Electrical Installations — covers rules and regulations relating to electrical equipment of buildings required from the viewpoint of fire safety and deals with requirements for power equipment; switch boards; power distribution and motor control gear; transformer sub-station, excluding bell and drawing frame transformers and transformers of small capacity; earth connections for low and medium tension and high and extra high tension; wiring such as conduit wiring, wood casing wiring, lead alloy sheathed cables, tough rubber sheathed cables, flexible conductors, bare conductors, overhead lines and protection from lightning, etc; lighting including fittings and accessories; electrical equipment and appliances, etc. Systems of wiring for circuits below 250 volts are also recommended in an appendix with the standard.

Fire Fighting Equipment and its Maintenance including Construction and Installation of Fireproof Doors— deals with the following types of fire fighting equipment and their maintenance:

1) Automatic sprinkler installations;
2) Hydrant services;
3) Hand appliances; and
4) Fireproof doors.

This item is divided into two parts: Part I deals with general description, operation and other requirements in respect of the types of fire fighting equipment mentioned above and Part II deals with construction and installation of fireproof doors. The latter classifies fireproof doors and prescribes requirements in respect of wall opening, construction of doors, rolling steel shutters, etc.

General Principles and Fire Grading — covers general principles of fire safety of buildings, fire grading of buildings, and general fire safety requirements of structural elements in buildings. It is a common experience, that most fires are caused by carelessness. Common instances of carelessness are: discarding of lighted ends of cigarettes, cigars, matches, and tobacco; smoking in unauthorized places; indifferent maintenance of machinery, including over-loading and under/or over lubricating of bearings; general indifference to cleanliness; incorrect storage of materials, etc. This code of practice aims at providing guidance with regard to fire prevention.

Personal Hazard—grades buildings into three different groups, depending upon the density of the population: theatres, offices, and residential buildings. With the object of allowing ample time facilities for the occupants of buildings to make a safe escape, the code lays down the requirements in building in respect of escape routes, internal staircases, external stairs or fire escapes, construction, layout, constructional features for multi-storeyed buildings and limitation of size and occupancy on single staircase buildings. The determination of staircase width is also included in an appendix.

Exposure Hazard — expresses the danger or risk of fire spreading through open air from a building on fire to another building or buildings in the vicinity, or from any materials outside the building, or from one section, compartment and floor of a building to another of the same building by external means only. The construction and spacing of buildings with due regard to their occupancies are the major factors to be considered in this regard.

The draft code deals with causes of such fires, main factors which influence severity, and the protective methods. It also recommends protection for existing buildings.

Materials and Details of Construction — lays down essential requirements of materials used and the details of construction with regard to various structural components of the buildings, e.g., walls, columns, beams, floors, roofs, ceilings, stairs, staircase, doors, windows, surface finishes and drainage.

Surkhi for Use in Mortar and Concrete

Surkhi has been finding extensive application in mortar in buildings and irrigation works of our country. It is a good pozzolana when ground sufficiently fine, and hence, it can find use either with lime to form a cementitious mixture or with portland cement to improve certain of its properties. In current practice, Surkhi is a by-product of the brick industry and is generally obtained by powdering rejected or broken bricks. This process is not always good, and some light has been thrown by recent research work on the type of raw material, the degree of burning and the fineness of grinding for obtaining good surkhi.

The draft Indian Standard Specification for Surkhi for Use in Mortar and Concrete prescribes requirements for raw materials for surkhi, its manufacture, fineness, lime reactivity, compressive strength, etc. It also includes methods of sampling, storage and delivery. The appendices with the draft describe, besides tests for various characteristics, the structure, properties and identification of clay minerals and their influence on pozzolanic reactivity of surkhi.

Waterproofing of Roofs with Bitumen Felts

Among the many types of waterproofing treatments for roofs, treatment with bitumen felts is being increasingly adopted with the growing manufacture of bitumen felt in the country and with the expanding

knowledge about its application. Waterproofing treatment with bitumen felt is done not only in the case of buildings and structures but also in the case of railway coaches, bus bodies, etc. Waterproofing treatment, to be efficient and lasting, has to be carefully carried out from the time the surface is prepared to receive the felt to the finishing of the treated surface. Special attention has to be paid to proper overlapping of joints and treatment of the parapet walls. The sticking of felt to the roof by means of hot bitumen also requires skill, if it is to be done economically and to give good results.

The draft Indian Standard Code of Practice for Waterproofing of Roofs With Bitumen Felts defines terminology and describes the materials, namely felts, nails and bonding materials. It also prescribes requirements with regard to the preparation of roof surface, type of waterproofing treatment for various types of roofs and method of laying roofing treatment.

Tiles

Roofing tiles constitute a common building material. The two types of tiles covered by the following draft specifications were originally manufactured in Mangalore, but are now being produced on a large scale in Malabar, Cochin, Madras, Calicut and other places:

1) Clay Flooring Tiles, and
2) Ridge and Ceiling Tiles.

These drafts cover machine pressed square clay flooring tiles as well as clay ridge and ceiling tiles respectively. They define terms, classify the tiles and prescribe requirements and tests for manufacture, shape, dimensions, tolerances, moisture absorption, break load, etc. Other details regarding sampling, marking, etc, are also included.

All other requirements, except the dimensional and shape requirements given in these draft specifications also apply to flooring tiles of irregular sizes and shapes, and those made to meet special requirements.

Rayon and Rayon Products

In India, rayon fabrics are mostly woven in small establishments, which are very large in number. Unlike larger establishments, they do not finish the goods, which they manufacture. Thus, besides the trade in finished rayon fabrics, there is an extensive trade in rayon fabrics in the loom state.

The series of draft specifications for the following 13 items of rayon takes into account only those constructions which have gained considerable popularity and have secured almost the status of staple goods:

1) Tafetta;
2) Crepe;
3) Satin and Sateen;
4) Half Crepe and Sari Cloth;
5) Georgette;
6) Voils, Ninons and Chiffons;
7) Linen;
8) Sari Cloth;
9) Half Crepe;
10) Crinkle Georgette;
11) Jacquard Fabrics;
12) Baby Sharkskin; and
13) Sharkskin.

Each of the above draft specifications covers finished and unfinished; undyed, dyed and printed material produced with a varying number of loom-settings.

All these drafts specify requirements in respect of yarn, weave, construction details, dying, printing, colour fastness, dimensional stability, weaving flaws, etc. The method for determination of linear density in tex or dernier units of yarns removed from fabric is included in appendices of each draft respectively.

Ropes

The draft specifications for the following six items of ropes cover the sizes and grades, if any, of the material given against each:

1) Hawser-Laid Sisal Rope — 25 to 457 mm (or 1 to 18 in.) in size.
2) Shroud-Laid Sisal Rope — 25 to 457 mm (or 1 to 18 in.) in size.
3) Cable-Laid Sisal Rope — 127 to 457 mm (or 1 to 18 in.) in size.
4) Hawser-Laid Coir Rope — two grades of hawser-laid coir rope, Grade 1 ropes of 38 to 559 mm (or 1½ to 22 in.) in size, and Grade 2 ropes of 127 to 559 mm (or 5 to 22 in.) in size.
5) Shroud-Laid Coir Rope — Grade 1 ropes of 76 to 559 mm (or 3 to 33 in.) in size, and Grade 2 ropes of 152 to 559 mm (or 6 to 22 in.) in size.
6) Cable-Laid Coir Rope — Grade 1 ropes of 152 to 559 mm (or 6 to 22 in.) in size, and Grade 2 ropes of 229 to 559 mm (or 9 to 22 in.) in size.

The draft specifications cover terminology and atmospheric conditions for testing and conditioning of samples. They also prescribe general requirements for fibre, yarn, strand, coil, lubricating and preservative materials and specific requirements for gross weight, linear density, breaking load, pitch, etc. Methods of test for various characteristics are included in the respective appendices.

Definitions of Textile Terms

The two draft standards covering definitions of textile terms in respect of the following subjects are intended to eliminate ambiguity or confusion arising from local interpretations of the terms:

1) Terms Relating to Various Types of Fabrics Made from Man-Made Fibres or Filaments, and
2) Terms Relating to Man-Made Fibres.

The terms are alphabetically arranged.

A-Twill Jute Bags for Packing Sugar

The question of packing sugar suitably has been under the consideration of manufacturers for some time past. Of late, it has assumed greater importance, since India has started exporting a sizeable quantity of sugar. Bags filled with sugar are subjected to rough handling during transit and storage. It is, therefore, necessary to have a packing which would satisfactorily withstand such handling and normal hazards.

The draft Indian Standard Specification for A-Twill Jute Bags for Packing Sugar defines terms and prescribes general and also specific requirements in respect of construction details for ends, shots, weight and tensile strength. The methods of determining the various qualities are given in appendices.

Braided Spray Hose, High Pressure, for Agricultural Purposes

The draft Indian Standard Specification for Braided Hose, High Pressure, for Agricultural Purposes covers spray hose, high pressure, with a recommended maximum working pressure of 240 kg/sq cm (or 600 lb/sq in.) and with cotton or rayon braided reinforcement. The braided spray hose is used in orchards, parks, forestry, tea and coffee estates and other agricultural spraying conditions for spraying mild insecticides, not containing oils or tarry matter.

The draft specification prescribes requirements in respect of

construction of inner rubber tube, outer rubber cover and reinforcement of plies; dimensions and tolerances; tensile strength and elongation at break of lining and cover; adhesion; etc.

Inks

The metal stamp ink and the finger printing ink have been covered in two separate drafts. The former is used for stamping letters or figures with the help of metal stamps on porous surfaces such as paper, card board cartons and postal stationery; the latter is used for taking impressions of fingers, thumbs and palms for the purpose of identification of persons.

The draft specifications lay down requirements and methods of tests in respect of pigment content, specific gravity, viscosity, fastness and applicability. Other details on sampling, packing and keeping quality are also included.

Classification of Dangerous Goods

The Kerala Madras Food Poisoning Cases Enquiry Commission has suggested among other things, that manufacturers and producers should provide adequate labelling on food packages in conformity with international recommendations to guard the persons likely to use, carry and store hazarduous goods. The category of goods which are dangerous to carry has substantially widened in recent years owing partly to the enormously increased use of these goods, and partly to a steady flow of new products to the market made available through progress in chemical research. Such dangerous goods are now of very great and increasing importance in economic activity, as well as to national and international traffic. It is very necessary to regulate the transport of these goods in order to prevent them, as far as possible from causing accidents to persons and damage to means of transport employed or to other property.

The draft Indian Standard Classification of Dangerous Goods recommends seven classes of dangerous goods as involving danger of explosion, ignition, poisoning, radiation, of oxidizing substances, and compressed gases; and seven distinct symbols each for labelling them. The draft standard is intended to serve as a guide to the parties interested in handling, transportation and inspection of such goods.

In the preparation of this draft, collaboration has been sought from many international organizations, such as UNESCO, International Labour Organization, and International Air Transport Association, which have been issuing from time to time distinctive symbols for labelling dangerous goods. In India, various organizations, such as the Railways and Civil Aviation, have slightly different sets of symbols for labelling goods involving different types of hazards.

Carbon Paper For Typewriters

With rapid industrialization in the country, the tempo of clerical and office work has also been increasing, and the indigenous industry manufacturing inks, carbon paper, typewriter ribon, etc, has been making rapid strides.

The draft Indian Standard Specification for Carbon for Typewriters deals with 3 types of carbon papers, namely, light weight, medium weight and heavy weight. It also prescribes requirements for basic paper, sizes, curling, coating, serviceability, manifolding, etc.

Glossary of Terms for Hides, Skins and Leather

The draft Indian Standard Glossary of Terms Relating to Hides, Skins and Leather defines terms as are widely used in the Indian leather trade and industry. The glossary is alphabetically arranged and runs into 116 pages. It is expected to provide a common language both to consumers and to producers of Indian leather, hides and skins.

Cellulose Nitrate Coated Fabrics

Cellulose nitrate coated fabrics are being used in India for lining the luggage compartments of motor vehicles, for book-binding, and also as a substitute for leather in upholstery, where good appearance rather than durability is the main consideration.

The draft specification for cellulose nitrate coated fabrics prescribes requirements for basic fabrics in respect of weight, weave, picks, ends, coating, and finished material. It also includes test for colour fastness to dry and wet rubbing, accelerated fading test and methods of determination of shrinkage, weight and adhesion of coating, volatility of plasticizer, width between selvedges and breaking strength in its various appendices.

Pest Control Products

In an agricultural country like India, the control of crop pests is very necessary and the following five draft specifications covering various insecticides are an addition to the already published 19 Indian Standards on the subject.

1) Aldrin, Technical,
2) Aldrin Emulsifiable Concentrates,
3) Aldrin Dusting Powders,
4) Endrin, Technical, and
5) Endrin Emulsifiable Concentrates.

The common name 'aldrin' has been assigned to the insecticidal product containing not less than 95 percent of *endo-exo* HHDN. Aldrin, technical, is, however, a manufactured product containing not less than 87·0 percent by weight of aldrin, the rest being allied organic chlorinated compounds. The aldrin emulsifiable concentrates and aldrin dusting powders also contain varying percentage of aldrin.

The popularly known 'endrin' is the insecticidal compound shortly represented as *endo-endo* HEOD. Endrin, technical, is a manufactured product containing not less than 90·0 percent by weight of endrin, the rest being allied organic chlorinated compounds. The endrin emulsifiable concentrates is also an insecticidal compound containing varying percentages of endrin.

These draft specifications describe the material and prescribe requirements and methods of test for moisture content, acidity and other chemical characteristics. Details of sampling, quality of reagents, packing and marking are also included.

Ethylene Dibromide and Methyl Bromide

Both of these compounds are used as fumigants. Ethylene dibromide is extensively used under tropical conditions for control of pests of agricultural and animal husbandry products such as fresh fruits, vegetables, foodgrains, stored timber products, etc. It is also used as a soil fumigant and for fumigation of textiles. Methyl bromide is being increasingly used for fumigating agricultural and food products in India.

The two draft specifications prescribe specific gravity, distillation range, residue on evaporation, acidity, etc. The tests for various characteristics prescribed, such as quality of reagents used, packing and marking of the material, are also included.

Edible Tapioca Products

The edible tapioca products, namely starch, chips and flour have been covered by three separate draft specifications, each for a specific item.

Tapioca Starch, also known as cassava starch and manioc starch, is obtained from the tubers of tapioca, and is used for edible purposes — chiefly in the manufacture of sago (saboodana) and to a small extent in making of puddings and some Indian sweets. It is also used for a variety of industrial purposes like sizing of textiles, paper making, manufacture of adhesives, etc.

Edible tapioca chips are prepared from the fresh tubers of tapioca. They are generally of two types, namely white and par-boiled. The white chips are obtained by removing the outer skin and inner rind of the tubers, slicing and drying in the sun or any drier. The par-boiled chips are prepared much in the same way as the white chips, except that the slices are boiled in water before drying.

The tapioca flour is prepared by powdering dried tapioca chips either in a disintegrator or any other grinding mill.

These three draft specifications define terms and lay down requirements and tests in respect of size, moisture, total ash, acid insoluble ash, *p*H of aqueous extract, etc. Other details regarding method of sampling, packing and marking are also included.

Baker's Yeast

The baker's yeast is used for the leavening of baked goods. Usually it consists of ' top yeasts '— so called because they ferment at the top of the substrate. It consists of *Saccharomyces cerevisiae* and related species. In the trade, it is available either in compressed or dried form.

The usefulness of baker's yeast depends entirely on its ability to raise the dough. To determine this, normally two tests are adopted, namely the ' dough-raising ' test and the ' fermenting power ' test. However, while the reliability of the former depends on the availability of flour with identical content of gluten with same hydration power, etc, the latter is based on pure chemical reagents.

The draft Indian Standard Specification for Baker's Yeast covers two types of the material:

1) Baker's Yeast, Compressed (BYC); and
2) Baker's Yeast, Dried (BYD).

The draft prescribes requirements and methods of test for dispersibility, moisture, fermenting power, yeast cell count, and microflora other than yeast.

Tinned Mild Steel Milk Cans

An ideal milk can has to be designed in such a way that it should transport its contents safely without spillage and with minimum of churning. It should also withstand rough handling, occupy minimum space on trucks or lorries, allow a high degree of sterilization and should also facilitate cleaning. Further, it should be light and durable.

The draft Indian Standard Specification for Tinned Mild Steel Milk Cans covers milk cans of 10, 20, 30, 40 and 50 litre capacity, used for collection and distribution of fluid milk. It specifies requirements for materials, manufacture of different parts, dimensions, workmanship and finish.

In preparing this draft, consideration has also been given to the fact that, in India, a large number of dairymen carry milk cans on bicycles. To facilitate this, handles have been provided in case of milk cans of 10 and 20 litre capacity.

Cane Molasses

Cane molasses form the principal by-product in the manufacture of cane sugar. The material is used for the preparation of *Hukka* tobacco and in the fermentation industries for production of ethyl alcohol, rum, yeast, acetone, butanol, certain organic acids, etc. But its largest use in India at present is in the alcohol industry.

Much of the cane molasses has to be stored in factories for an appreciable length of time as its entire production does not find use in the country, nor is it feasible to export it due to paucity of tank wagons, storage facilities at the ports and other economic factors. The storage conditions at many factories are also not as good as they should be, which results in the reduction of percentage of its sugar content.

While specifying three grades of molasses with varying requirements, in the draft specification for cane molasses, due consideration was given to these factors as well as to the existing rules laid down by the states of Uttar Pradesh, Bihar and Bombay for controlling its sale.

Requirements and methods of test prescribed in the draft are in respect of density, sulphated ash, total reducing sugars, etc. Details of sampling, marking and packing are also included.

In view of the ease of determination of total reducing sugars when compared to that of fermentable sugars, and because of the fact that about 95 percent of the total sugars in molasses are fermentable, requirements for total reducing sugars, as against fermentable sugars, have also been prescribed.

Sugar Used in Fruit Processing Industries

Large quantities of sugar are being used in the fruit processing and canning industry in the country. Spoilage in canned fruits is due to microbial contamination, involving thermophilic bacteria and other non-thermophiles such as yeasts and mesophilic, facultative, anaerobic and acid-loving bacteria. Sugar of almost all types has been found to carry the spores of these micro-organisms.

Fruit processing involves heat treatment of the material, during which, most of the non-thermophilic organisms are destroyed, whereas thermophiles, are not completely eradicated, since this would result in the overcooking of the material.

As the processed fruits are exposed to high tropical temperatures, the presence of thermophilic spores constitutes a positive spoilage danger. Sugar used in the fruit processing industry, furnishes a potential source of these spores and it, therefore, becomes essential that the sugar for use in fruit processing and canning be ' microbiologically clean '.

The draft Indian Standard Specification for Sugar Used in Fruit Processing Industries prescribes the microbiological limits and other requirements and methods of test in respect of colouring matter, moisture, reducing sugar, specific conductivity, sulphur dioxide, arsenic, lead, yeast, moulds, flat sour spores, etc.

Cylindrical Glass Milk Bottles

In India, the existing cylindrical glass milk bottles can be classified into two series, namely seer series and the pound series. The former is being used mostly in Bombay and the latter in other parts of the country; the Army Dairy Farms prefer to use the pound series. However, with the decision of the Government of India to introduce metric system in the country, it was

considered essential that henceforth milk bottles should have their capacities expressed only in terms of litres. In view of the fact that the use of glass milk bottles in India is at present limited only to the organized sector of the dairy industry, and also because bottles need replacement quite frequently, being susceptible to breakage, it has been felt that the changeover to the metric system would not have any adverse effect on the bottles manufacturing industry or the dairy industry. In fact, it is hoped that milk bottles having litre capacities would be an impetus to the changeover to the metric system in the entire dairy industry, for the development of which there is a huge programme in the Second Five Year Plan.

The draft Indian Standard Specification for Cylindrical Glass Milk Bottles, prepared with this consideration, covers 1 litre, $\frac{1}{2}$ litre and $\frac{1}{4}$ litre sizes of cylindrical glass bottles for liquid milk other than sterilized milk. The draft standard also includes thermal shock test for ensuring that the cylindrical glass milk bottles would withstand shocks of sudden changes of temperature.

While prescribing the various dimensions for these bottles, consideration was also given to the fact that these bottles are filled with automatic machines. The main variations in the bottle for different sizes are, therefore, expected to be only in the height and diameter of the body; diameter of the neck should be equal in all cases.

Other requirements prescribed in the draft specification are with regard to shape, marking and tests for various characteristics.

Chemical Analysis of Iron Ore

Large quantities of iron ore are regularly exported from various Indian ports; these are expected to mount up with the canalization of exports through the State Trading Corporation of India (Private) Ltd. With the setting up of more steel plants in the public sector, India's consumption of iron ore will also increase considerably. The prices paid to the mineowners for iron ore are directly linked with the contents of iron, phosphorus, etc.

The methods of analysis prescribed in the draft Indian Standard Methods of Chemical Analysis of Iron Ore have been prepared with a view to developing reference methods and co-ordinating the methods followed by public analysts engaged in analysing export consignments and laboratories attached to steel plants. Due consideration has been given in the preparation of this standard to the facilities available in the country for such analysis.

The draft standard specifies the methods for the determination of moisture, silica, iron, alumina, phosphorus, sulphur, titanium, manganese, calcium oxide, magnesium oxide, ferrous oxide, vanadium and combined water. For export purposes, the determinations of lead, copper, arsenic and zinc are sometimes required; methods for these have also been prescribed.

Modifications of the procedures for the determination of various constituents have been prescribed taking into account the variations in the chemical composition as commonly found. No account has been taken of the unusual presence of a constituent like chromium which may be rarely found in iron ore.

White Metals

The draft Indian Standard Methods of Chemical Analysis of White Metals deals with the analysis of white metal-bearing alloys having for their chemical compositions, lead, tin, antimony, copper, arsenic, bismuth and iron within the specified limits.

The draft lays down methods for determination of these constituents and also prescribes method for sampling and the quality of reagents to be used.

Chemical Analysis of Solders

Solders are required for making joints. The chemical analysis of soft and brazing solders has been covered in two draft Indian Standard Methods.

The draft Indian Standard Methods of Chemical Analysis of Soft Solder covers lead and tin-base solder metal having a range of chemical composition with lead 35-70 percent, tin 29-65, antimony 0·1-0·3, copper 0·01-0·22, arsenic and iron maximum of 0·05 and 0·02, respectively and trace of zinc, aluminium and cadmium.

The draft Methods of Chemical Analysis of Brazing Solder covers test procedures for the determination of copper, lead, cadmium, iron, zinc, tin, arsenic, antimony and bismuth.

The details of sampling and quality of reagents used are included in both drafts.

Mild Steel Wire for Manufacturing Wood Screws

Originally, it was felt that IS: 280-1951 Specification for Mild Steel Wire (*Tentative*) will also cover the requirements for the mild steel wire suitable for the manufacture of wood screws. Now it has been decided that for this subject a separate Indian Standard will be required.

The draft Indian Standard Specification for Mild Steel Wire Suitable for the Manufacture of Wood Screws is divided in two parts. Part I defines terms and lays down other general requirements for supply of material, and its physical and chemical tests. Part II prescribes details of manufacture, chemical composition, tolerances and selection of test samples.

Graphite for Use as Foundry Facing Material

In foundries, facing materials are used to prevent fusion of liquid metal with the sand at the mould or core face. They are applied as a thin coating by spraying or painting in the form of a suspension or by dusting or rubbing as dry powders. Different materials are used for this purpose.

The draft Indian Standard Specification for Graphite for Use as Foundry Facing Material covers 2 grades of the material. The draft in its first part gives definitions of terms and details of supply and test of graphite, and in its second part prescribes requirements and methods of test for volatile matter, moisture, fixed carbon, etc.

Protective Coating

Protection against corrosion for ferrous and non-ferrous metals is being given increased importance to increase the life of structural components as also to effect economy in the use of metals.

The following two draft Indian Standards are intended to provide guidance in the matter of protection against corrosion:

1) Code of Practice for Protective Coating of Zinc Base Alloys, and
2) Method of Testing Tin Coating on Tin Plate.

The draft Code lays down the procedure for protective coating of zinc base alloys intended primarily to prevent or reduce corrosion of zinc base alloys under humid conditions. Requirements for preparation of surface for coating, chromate treatment, etc, are also prescribed.

The method of protective coating included in the draft is a passivation treatment utilizing inhibitive action of chromate film.

The second draft standard is a necessary adjunct to IS : 597-1955 Specification for Black Plate for Tinning Plate (*Tentative*). It is divided into two parts. First part gives the iodimetric method for the determination of the weight of coating while the second part gives the ferricyanide paper test for determining the porosity of coating.

Covered Electrodes for Metal Arc Welding

The type and quality of an electrode play a very important part in getting welds of required characteristics. The performance qualities of an electrode should be such that satisfactory weld deposits can be made by a welder of average skill and experience, working under normal conditions existing at the site of work.

The draft specifications for the following two items cover two types of covered electrodes used in metal arc welding:

1) Molybdenum steel covered electrodes for metal arc welding, and
2) Covered electrodes for metal arc welding of high tensile structural steel.

The first draft standard deals with covered molybdenum steel electrodes of 2·5 mm (or 12 SWG) and over for metal arc welding (by hand operation), of mild steel of welding quality (conforming to IS : 226-1955), and of chromium-molybdenum and molybdenum creep-resisting steels of welding quality. The requirements are similar to those for normal penetration electrodes as specified in IS : 814-1957 Specification for Covered Electrodes for Metal Arc Welding of Mild Steel, with the exception of a specified molybdenum content. The idea of issuing a separate Indian Standard on the subject is to make it easy to differentiate and identify the molybdenum steel electrodes from other electrodes conforming to IS : 814-1957.

The second draft standard lays down requirements of covered electrodes used in metal arc welding of high tensile structural steel and specific methods for evaluating them. In the past, the absence of specification for electrodes which deposit metal having tensile properties in excess of those of mild steel, has meant that the stresses in welded joints in higher tensile steels have been limited to those which were permissible in mild steel. The use of this specification will ensure that the electrodes are capable of depositing metal having tensile properties comparable with those of high tensile structural steel, thus enabling such steels to be used more economically.

Each of the two drafts prescribes sizes, classification, general and performance requirements, and various tests for electrodes. Other details include packing, storage, marking, etc.

Lead Cable Alloy

Lead cable alloy is used for the manufacture of armoured and unarmoured cables for power, lighting and other similar purposes. It is also recommended for dry core, air spaced unarmoured telephone overhead cables, that is, suspended from catenary wire and other telephone cables operating under normal vibrations.

The draft Indian Standard Specification for Lead Cable Alloy covers lead cable alloy ingots suitable for remelting and manufacture of lead alloys sheathing to be used under most severe vibration stresses.

The draft standard is divided in two parts. Part I deals with the requirements for supply of the material, terminology and facilities of inspection, while Part II prescribes requirements for manufacture, the chemical composition of the alloy, sizes, weight and other details for sampling, marking, etc.

Zinc Sheet and Strip

Zinc sheets and strips are used for water tanks, lining of tanks, drawn and soldered battery cans, boiler and ship plates, address plates, eyelets and gromets, photogravers' plates, weather strips, roofing, and varieties of drawn and spun articles.

The draft Indian Standard Specification for Zinc sheet and Strip covers five grades of zinc designated as Zn 99·99, Zn 99·9, Zn 99·5, Zn 99·0 and Zn 98·5. There are two parts in the draft. The first part deals with the general requirements, and the second part prescribes specific requirements for manufacture, chemical composition, physical properties, sizes, tolerances and method of sampling.

Printing Metal

The draft Indian Standard Specification for Printing Metal deals with the following 4 grades of the material:

1) Lino type/Intertype metal,
2) Monotype metal,
3) Stereo metal, and
4) Electro backing metal.

The general part of the draft standard describes supply of the material while the other part prescribes specific requirements for chemical composition of various grades and details of sampling and marking.

Arsenic

The draft Indian Standard Methods for Determination of Arsenic prescribes methods for its determination in metals and alloys such as iron, steel, copper, bronze, lead and white metal. Besides these methods, the draft also prescribes general requirements for precipitants, quality of reagents, etc.

Phosphor-Bronze

Of the two drafts on phosphor bronze, one is a draft specification for Phosphor Bronze Rods and Bars, Sheet and Strip, and Wire, and the other is the draft Revision of IS: 28-1950 Phosphor Bronze Ingots and Castings.

The first draft specification deals with the material for general engineering and structural purposes such as manufacture of pumps, bolts, gears, parts of electrical gear, perforated sheet, chemical hardware, springs, etc; this material requires high tensile properties in combination with a high resistance to fatigue and chemical attack. The draft covers grades of phosphor-bronze for rods and bars, sheet and strip and wire designated as PBZ 3, PBZ 6, and PBZ 3 Pb.

The draft Revision deals with the chemical composition and physical properties in respect of copper, tin, phosphorus, zinc and other elements, and the mechanical properties of ingots and castings.

Both drafts are divided in 2 parts. Part I defines terms, prescribes details of certificate of compliance, supply, inspection and facilities for testing. Part II lays down specific requirements in respect of chemical composition, physical properties, sizes, and details of sampling and marking.

Aluminium and Aluminium Alloys

The draft Revisions of the following two Indian Standards deal with the material primarily concerned

with the aircraft industry but may be found useful for other industries as well:

1) IS : 23-1950 Specification for 99 percent Aluminium Notched Bars and Ingots for Remelting for Aircraft Purposes, and
2) IS : 202-1950 Specification for Aluminium-Alloy Ingots and Castings for Aircraft Purposes.

In the draft Revision of IS : 23-1950, the title has been modified to read as '99 Percent Primary Aluminium Ingots for Remelting for Aircraft Purposes', leaving notched bars from the scope of the draft standard.

The draft Revision of IS : 202-1950 modifies the chemical composition of the material. In case of alloy No. 1B, the maximum percentage of silicon has been raised from 2·7 to 3·0, of zinc reduced from 0·3 to 0·1 and the total percentage of other elements increased from 0·15 to 0·25. In case of alloy No. 3, the maximum percentage of magnesium has been introduced as 0·10 and that of tin reduced from 0·1 to 0·05.

With the inclusion of a separate part prescribing general requirements in respect of supply, inspection and testing facilities of the material, and other requirements for sampling, marking, etc, the two draft standards have been made comprehensive.

Brass Sheets, Strip and Plates

The following three draft specifications cover brass sheets, strips and plates used for various purposes:

1) Brass Sheet and Strip for the Manufacture of Utensils,
2) Rolled Brass Plate, Sheet, Strip and Foil, and
3) Leaded Brass Strip for Use in the Manufacture of Parts for Instruments.

The first draft standard dealing with brass sheet and strip is different from IS : 410-1953 Specification for Rolled Brass Plate, Sheet, Strip and Foil. It was considered desirable to have a separate specification for brass sheet suitable for the manufacture of household utensils and the other general holloware, since the requirements of material for pressing or deep drawing are quite different to those used for general engineering purposes. The draft deals with two grades of the material: Grade Bs 60 I for deep drawing and Grade Bs 60 II for shallow pressing or hand worked articles.

The second draft is the draft Revision of IS : 410-1953 Specification for Rolled Brass Plate, Sheet, Strip and Foil. The main modifications made in this revision relate to the redesignation of the different grades and prescription of maximum limit for lead in grade Bs 69 and grade Bs 65 (previously designated as grade 1 and grade 2, respectively). The draft covers four grades of the material, as grades Bs 69, Bs 65, Bs 62 and Bs 60.

The third draft specification covers leaded brass strip over 0·152 mm (or 0·006 in.) and up to and including 6·400 mm (or 0·252 in.) thick and up to and including 305 mm (or 12 in.) wide made from the three alloys, namely alloy Bs 59 Pb 2, alloy Bs 62 Pb 2 and alloy Bs 64 Pb 1, for use in the manufacture of parts for instruments. Each alloy shall be in the four grades, namely Superfine, Fine, Normal and Coarse, in respect of tolerances.

The first and second draft specifications lay down general requirements for supply of the material, inspection and testing facilities and specific requirements for manufacture, chemical composition, physical properties, sampling, etc.

The third draft is divided in 4 parts. Part I deals with general requirements in respect of supply, its inspection, sizes, tolerances, mechanical test, microscopic examination, etc; Parts II, III and IV prescribe specific requirements for grades Bs 59 Pb 2, Bs 62 Pb 2 and Bs 64 Pb 1 of leaded brass strip respectively in respect of chemical composition, condition, microstructure, mechanical properties, etc.

Oxy-Copper Finishes

The draft Indian Standard Specification for Oxy-Copper Finishes covers the following three grades of the material:

Grade I — for zinc base alloys with thickness of the oxy-copper finish being 0·0125 mm
Grade II — for steel base alloys with the thickness of the oxy-copper finish being 0·010 mm, and
Grade III — for copper and copper base alloys with thickness of the oxy-copper finish being 0·005 mm.

As the process of rendering an oxy-copper finish to an article involves three distinct steps, the draft standard has been prepared in three parts. Part I deals with the requirements covering the initial process of copper plating, Part II deals with requirements relating to the process of oxidizing, and finally, Part III deals with the final stage, namely the process of lacquering.

The first Part of the standard has been drafted keeping in view the oxidizing process which requires the nature and thickness of the copper plating to be sufficient to withstand the chemical reactions involved. Consequently, Part I on copper plating applies only to those cases in which it is desired to impart an oxy-copper finish to the electroplated article; it does not apply to all copper plating in general.

Similarly, Parts II and III are to be regarded as applicable only to articles intended to be oxy-copper finished.

Electro-Tin Plating

The draft Indian Standard Specification for Electro-Tin Plating covers electroplated tin coatings on iron, steel, copper and brass articles that are required to withstand corrosion; for protecting iron and steel against corrosion; for masking during nitriding process; for protecting bolts and other threaded parts less than 6 mm (or $\frac{1}{4}$ in.) diameter; and for facilitating soft soldering of electrical contracts and terminals.

The draft standard covers four classes of tin plating of varying thickness of coating. Requirements and methods of test prescribed are in respect of material, workmanship, thickness of plating, etc. Appendices with the draft include methods of determination of local and average thickness of tin coating and porosity test.

Porcelain Insulators

Porcelain insulators with voltage below 1 000 volts and otherwise are used for overhead lines. Of the following two draft standards on the subject, the first is the draft Revision of IS: 283-1951:

1) Specification for Porcelain Insulators for Telegraph and Telephone lines, and
2) General Requirements and Methods of Test for Porcelain Insulators for Overhead Lines with a Nominal Voltage Below 1 000 volts.

The Specification for Porcelain Insulators for Telegraph and Telephone Lines (IS : 283-1951) was issued in 1951. With the present manufacturing technique in the country, it has been found difficult to produce single shed pot head insulators conforming to the Indian

Standard, in respect of the minimum insulation resistance value. Consequently, it has become necessary for the Indian Posts & Telegraphs Department to revert to the practice of using double shed pot head insulators and to discontinue the use of the former. Accordingly, insulators and also oil cup insulators have been excluded from the scope of the draft Revision.

The insulators covered in this draft should also be suitable for telegraph and telephone lines of Railways and other users. The draft specification does not, however, cover insulators required for communication circuits run solely for the operation and maintenance of electric transmission systems and in close proximity to such lines which are covered by another standard.

The draft specification prescribes requirements for shape, dimensions, and general requirements in respect of material, glaze, colour, threading, etc. The draft includes insulation resistance tests, thermal shock test, mechanical test, porosity test, and gauge test.

The second draft standard covers both pin and shackle type insulators for over head electric lines with a nominal voltage below 1 000 volts. It does not apply to insulators forming part of electrical apparatus or to porcelain parts used in their construction.

The draft standard defines terms and prescribes general requirements for material and mechanical design and tests, namely power frequency tests, type tests, sample test, routine test, etc. Appendices with the draft standard include rules for the measurement of test voltage by sphere gaps in dielectrical tests, method of producing artificial rain and of verifying its characteristics, humidity correction factors for flash over voltages, etc.

Insulator Stalks

The draft Indian Standard Specification for Insulator Stalks for Telegraph and Telephone Lines covers the following six types of insulator stalks or spindles:

1) Stalk 16·83 cm (6⅝ in.) For Telegraph Bracket;
2) Stalk 13·34 cm (5¼ in.) For Telephone Bracket;
3) Stalk 15·88 cm (6¼ in) Transposition;
4) Stalk, Swan Neck, Long;
5) Stalk, Swan Neck, Short; and
6) J Stalk Single.

The draft specification covers terminology, information pertaining to their shapes and dimensions, materials to be used in manufacture, requirements for the manufacture, workmanship and finish of stalks, and prescribes tests, packing and sampling requirements.

Hard Chromium Plating on Steel

The Draft Indian Standard Specification for Hard Chromium Plating on Steel is intended for articles electrodeposited with hard chromium for industrial and engineering purposes, primarily for wear resistance and for salvaging worn out and/or accidently machined parts.

The draft specification deals with chromium plating applied directly on steel for use for engineering and industrial purposes and covers requirements regarding thickness of plating, chromium deposit, basis metal, sampling, inspection, and test, practice for granting of hard chromium deposit, etc.

Leclanché Type Dry Batteries and Inert Cells

The two draft standards on Leclanché type dry batteries and inert cells are the draft Revisions of the corresponding following Indian Standards, which were first issued in 1950 and 1951:

1) IS: 203-1950 Specification for Leclanché Type Dry Cells and Batteries for Flash Lamps, and
2) IS: 267-1951 Specification for Leclanché Type Inert Cells.

After the publication of these standards, the International Electrotechnical Commission (IEC) have progressed considerably in the work of primary batteries. With a view to aligning Indian Standards more or less with the IEC publications, the ISI has brought out draft revisions of these standards. The manner of designation of cells and batteries in the new draft revisions has been changed so as to follow the IEC practice. The dimensions have also been nearly aligned to IEC recommendations, taking into consideration the requirements of the battery industry in this country. Another important change introduced is the deletion of all reference to internal construction details of the unit cell.

Definitions of terms, originally included as parts of those Indian Standards have been deleted, as these have been included in a separate Indian Standard, namely Glossary of Terms for Primary Cells and Batteries (IS: 1025-1957).

Draft Revision of IS: 203-1950 lays down requirements for designation, dimensions, material, terminals, workmanship and tests.

Under life tests, both initial and delayed, a 5 ohm discharge resistance has been specified in the draft. However, a proposal is under consideration to introduce a 4 ohm discharge test, either as an additional test or in place of the 5 ohm test. Comments are particularly invited on this proposal.

The second draft Revision prescribes requirements for dimensions, material, workmanship, construction and tests for various characteristics. The draft Revision now deals only with the dimensional and performance requirements of the complete cell.

A revised sampling procedure for performance tests is still under examination, in consultation with the manufacturers and large scale purchasers. This will be included at the time of finalization of this draft.

Electrical Equipment of Machine Tools

Following the necessities of mass production methods, machine tools have been designed for a number of special purposes. In the process, though the design of the actual machine has been simplified, it has resulted in the electrical control equipment becoming more complex particularly as electronic devices have been extensively adopted. Such conditions have naturally tended for the designs to be developed on almost as many lines as there were controlgear of manufacturers, with the result that there is considerable overlapping and maintenance difficulties, because of lack of any standardization so far as positioning and installation are concerned. Furthermore, electrical control equipment to be installed has often been on an existing design, more or less adopted for the machine tool concerned rather than of a form specially designed for the control of that particular machine.

The draft Indian Standard General Requirements for Electrical Equipment of Machine Tools makes provision for the application of electrical components such as control apparatus, motors, wiring and accessories to machine tools, for connection to circuits which operate from a supply voltage not greater than 650 volts. It applies to all electrical equipment and wiring furnished as part of a machine tool and originating at the machine tool isolating

switch; and aims at ensuring the safety of personnel and equipment, uninterrupted production, and adequate length of service from the equipment.

The draft standard brings together in one document various existing requirements which directly affect machine tools, and obviates the necessity for the multitude of specifications prepared by individual users or purchasers of machine tools, and also intends to give a lead on design so that servicing of machine tools may be greatly improved.

LOADING TESTS FOR BUILDING FOUNDATIONS — *Continued from p. 257*

giving the value of safe bearing pressure for various widths of footings on sandy soils from settlement considerations.

5.3 A project is in hand at the Central Building Research Institute to see if a similar co-relation exists for Indian soils. There is little doubt that if a relationship could be established, it would provide a very handy tool for the field engineer when he is called upon to put his foundation on sandy or gravelly soils.

ISI ACTIVITIES — *Continued from p. 270*

requested the members to take more interest in furthering the cause of standardization in industries in South India.

The Committee, then, examined the programme of work for popularizing the standards movement in the southern region as laid down by the Advisory Committee. It was felt that better results could be achieved by appointing small subcommittees for different trades such as leather, non-ferrous metals and similar other important industries of south. Taking up the case of leather industry, a suggestion was made that in the first instance a subcommittee comprising representatives from the Southern India Skin & Hides Merchants Association and the Leather Export Promotion Council be formed to look after the implementation of leather standards, and its working watched before some other committees are formed. It was decided to address the chairmen of these two bodies and call a joint meeting of the Executive Committee with the representatives of these two organizations.

The Secretary of the Committee was also directed to contact various other technical and trade associations, like the steel fabricators, flour mills' associations, non-ferrous metals manufacturers, etc, and explore the possibilities of having joint meetings with their committees.

There was a feeling among the members that more publicity should be given to the work of the ISI. On this occasion, the plans of future publicity to be carried out by the Publicity Section of the Headquarters were explained and considered. A suggestion was made that the Subscribing Members of the ISI should be requested to use the wording 'Member, Indian Standards Institution' in their letter-heads which would not only be an attraction but also give due publicity. It was also felt that certified goods should invariably be given wider publicity. The members of the Committee were also directed to help in propagating the work of standardization and certification marking in various meetings of chambers of Associations they attended.

On reviewing its composition, the Committee decided to enlarge its membership by giving representations to more non-official organizations. The following three organizations were co-opted:

1) The Small Scale Industries Association, Madras,
2) Hindustan Chamber of Commerce, and
3) Tamil Chamber of Commerce, Madras.

STANDARDS ADDED TO ISI LIBRARY

The list includes full titles of only such standards as, besides being accessioned in the Library, are also stocked by the ISI for sale. Numbers of all other standards are listed under their respective general classification headings. Readers, who are interested in obtaining their titles or any other information concerning them, are requested to address the Librarian.

The standards are in the official language(s) of the country of origin.

001.4 Scientific Nomenclature. Terminology

Czechoslovakia: CSN 014001
Germany: DIN 25007; 55946
Italy: UNI 2853, 54; 3917
Norway: NS 888
Poland: PN C-89100

003 Writing. Scripts. Notations. Symbols

Germany: DIN 25007; 40710
Portugal: NP 154
Spain: UNE 5033

33 Political Economy. Economics

France: NF K 11-05, -70 to -81

389.6 Standardization

DS 1000

53 Physics and Mechanics

Spain: UNE 5033
USA: ASA Z 11.2: 1956 Standard Method of Test for Saybolt Viscosity
USSR: GOST 1807; 4381; 8284, 90; 8307, 09, 35

54 Chemistry

France: NF T 51-007; 90-013, -015
Germany: DIN 51763, 807
India-Ministry of Defence: IND/SL/5875
Israel: S.I. 249
Poland: PN C-13054; -80552; Z-04040, 042
USSR: GOST 2706; 8321; 8448

55 Geology and Collateral Sciences. Meteorology

USSR: GOST 7478

614.8 Prevention of Accidents. Safety Measures

Canada: CSA B89.6
Germany: DIN 13163; 23322
Yugoslavia: JUS F.C1.001, .005 to .008; G.B1.045; .B2.004 to .010; Z.B0.001; .B1.001 to .005; .G1.00
USSR: GOST 8460

620.1 Testing Materials. Faults in Materials

Canada: 43-GP-0
Germany: DIN 51763, 949, 950; 53382
Italy: UNI 3918
Poland: PN B-04102
Portugal: NP 105; 106
USSR: GOST 6105, 14; 8424, 95
Yugoslavia: JUS UMI.010, .011

621-1/-9 Machinery Details

Germany: DIN 36015; 38238
Poland: PN S-61062
Yugoslavia: JUS K.Z2.013

621.1 Steam Power. Engines. Boilers

Germany: DIN 31215; 36015; 38238
Israel: S.I. 257
Poland: PN K-74110
Yugoslavia: JUS P.J1.901, .902

621.22 Water Power. Utilization of Hydraulic Energy

USSR: GOST 8445

621.3 Electrical Engineering

Belgium: NBN 7
Canada: CSA C13
France: NF P-82
Germany: DIN 7713; 34021 to 023; 40001, 710; 43620; 48108
Israel: S.I. 25; 108; 245; 247
Poland: PN E-02200; -90016, 021; -92950
Roumania: STAS 1999
UK-British Electrical and Allied Industries Research Association: ERA D/T 101; 107; 108; L/T351; U/T 137; Y/T14.
USA-Association of Iron and Steel Engineers: AISE Std 6
Edison Electric Institute: EEI 57-7
National Electrical Manufacturers Association: NEMA TR4; Pub. No. VF1, F2
USSR: GOST 2081; 2585; 8303, 06, 43; 8490, 91

621.4 Internal Combustion Engines

Germany: DIN 1941
Italy: UNI 3885
Spain: UNE 10049

621.6 Apparatus for Conveyance and Storage of Gas and Liquids, Conduits

Germany: DIN 2999
Israel: S.I. 255
Poland: PN S-61062
Switzerland: VSM 18380, 381
USA-Petroleum Institute: API STD 12B; 12C; 12D; 12F
USSR: GOST 6444; 8436, 44

621.7 Workshop Practice

Germany: DIN 7849; 24201
Italy: UNI 3879
USSR: GOST 3212; 8291
Yugoslavia: JUS K.B1.080 to .082

621.791 Welding and Allied Techniques

Switzerland: VSM 14061
USA-Department of Defence: MIL-STD-123A

621.798 Packing and Dispatch Equipment

Canada: 43-GP-0
Germany: DIN 55450, 451
Poland: PN P-92400

621.8 Means of Attachment. Fastenings

Czechoslovakia: CSN 014001, 004, 009, 014, 016 to 018; 021101, 103, 131, 133, 143, 146, 153, 160, 161, 174, 181, 187
France: NF L 22-040A
Germany: DIN 998; 2999
Norway: NS 70A
Poland: PN B-75400
Switzerland: VSM 12200 to 203, 360 to 367, 782
USSR: GOST 8238, 81
Yugoslavia: JUS K.M4.050; .500; M9.010; Z2.010 to .012

621.82/.85 Transmission Parts

Italy: UNI 3884
Poland: PN M-84101; -86181, 182, 190 to 192, 199, 200, 201
Switzerland: VSM 15337 to 339
UK: BS 2980: 1958 Pure-Tone Audiometers
USSR: GOST 8328, 38

621.86 Mechanical Handling and Hoisting Equipment

France: NF P 82-204
Germany: DIN 11573; 15144; 22241
USA-Association of Iron and Steel Engineers: AISE Std 6
Yugoslavia: JUS K.J1.031

621.89 Lubrication

Germany: DIN 51807, 822

621.9 Tools. Machine Tools. Machining

Canadian Government Specification Board: 39-GP-46
Czechoslovakia: CSN 223010 to 012, 210 to 212; 241520
Germany: DIN Handbook No. 6; 9866
Italy: UNI 3898, 99; 3901
Roumania: STAS 1003
USSR: GOST 375; 8237; 8308
Yugoslavia: JUS K.B1.011, .050, .051, .055, .062, .076, .090 to .093, .110 to .121, .150, .155, .160, .165 to 168, .180 to .182, .190, .191 to .196, .220, .221, .223, .224, .230, .231; .B4.100; .C2.200, .201, .210, .211, .250, .251, .260, .261, .500, .501, .600, .601, .650 to .654, .700 to 706; .C3.025, .115, .116; .D0.101, .103 to .105, .111; .M4.020, .100, .101; .Z2.214

622 Mining

Germany: DIN 20536 to 538; 22524 to 527; 23322; 34021 to 023
USSR: GOST 644
Yugoslavia: JUS K.B1.145; .C5.151, .152

624 Civil Engineering

Germany: DIN 998; 7848
Israel: S.I. 252

Poland: PN B-04101, 487 to 489, 491
USSR: GOST 8478

625.1/.6 Railway Engineering

Germany: DIN 22524 to 527; 25007; 34021 to 023
India-Ministry of Railways: IRS TI: 1957 Fish Plates
Poland: PN E-92909, -910; K-74110
Yugoslavia: JUS K.N2.100; .Z2.014 to .021, .210 to .213, .290; P.G3.025, .030, .031, .035, .036, .040, .045, .050, .055, .060, .065, .070, .075, .080, .085, .090; .M3.010

625.7/.8 Highway, Road Engineering

UK: BS 598: 1958 Sampling and Examination of Bituminous Mixtures for Road and Buildings
USSR: GOST 8424

628 Public Health Engineering

Israel: S.I. 254
Japan: JIS K 0101

629.11 Land and Road Vehicles

France: PN R.124; 321
Germany: DIN 7800, 48, 49; 13163
USSR: GOST 5503
Yugoslavia: JUS G.E3.005; M.B0.095

629.12 Ships and Shipbuilding

Italy: UNI 3920 to 47
Spain: UNE 27184
USSR: GOST 8404 to 06

629.13 Aeronautics. Aircraft Engineering

Italy: UNI 3884, 85

63 Agriculture. Forestry. Stockbreeding. Animal Produce. Hunting. Fisheries

Germany: DIN 11300, 573
Israel: S.I. 58; 244; 253
Italy: UNI 3919
Yugoslavia: JUS E.B2.061; .B4.415, .417 to .420; .L1.001; .C3.115

64 Domestic Science. House Keeping

Germany: DIN 18022
Poland: PN M-77024
Yugoslavia: JUS F.CO.002

65 Commercial, Office, Business Techniques. Management. Organization. Communication. Transport

Canadian Government Specification Board: 6-GP-14A
Germany: DIN 164544
Switzerland: VSM 14061
USA-Department of Defence: MIL-STD-129B
Yugoslavia: JUS Z.A0.500

66.0 Chemical Technology, Engineering. Operations, Processes and Plant

Poland: PN C-01353, 55

661 Chemical (Fine, Heavy, Etc.)

India-Ministry of Defence: IND/SL/1519
Poland: PN C-84021; Z-04040, 042
USSR: GOST 123; 857; 8382; 8422, 29, 64, 65; 8504

662.6/.9 Fuel Industry. Industrial Heating

France: NF M 07-014
Germany: DIN 51763
UK: BS 2978: Pt. I: 1958 Measurement of Smoke Emission from Industrial Boilers
USSR: GOST 1501; 6105, 14; 8287

663 Beverages. Stimulants

USSR: GOST 8473

664 Preparation and Preservation of Solid Foodstuffs

USSR: GOST 21, 23
Israel: S.I. 58; 256

665 Oils, Fats, Waxes

France: NF M07-003; -015; PN M87-164, -183
Germany: DIN 55946
Poland: PN C-04075, 092; -96024
UK: BS 598: 1958 Sampling and Examination of Bituminous Mixtures for Road and Buildings
USA-American Petroleum Institute: API STD 12C; 12B; 12D; 12F

666 Glass. Ceramic Industries. Etc.

India-Ministry of Defence: IND/SL/5875; IND/SL/MED/0540
Japan: JIS R 2601 to 04
Poland: PN C-13054
Yugoslavia: JUS U.M1.010 to .012; .M9.010

667.6/8 Paints, Varnishes. Lacquer. Polishing Materials

Germany: DIN 53358, 382; 55934
India-Ministry of Defence: IND/TC/0602(C)
Israel: S.I. 188; 243; 248
USSR: GOST 8466

669.1 Ferrous Metallurgy

Czechoslovakia: CSN 420138
France: NF A48-513 to -515, -567
Germany: DIN 998
Israel: S.I. 31
Italy: UNI 3918
Switzerland: VSM 14061
USSR: GOST 1585; 2771; 5681; 8319, 20; 8479; 8510
Yugoslavia: JUS C.B9.021; .K6.021

669.2/.8 Non-Ferrous Metallurgy

Canada: CSA H.1. SERIES
Israel: S.I. 258
Italy: UNI 3919
USSR: GOST 1049; 8395, 96, 98, 99; 8400, 01
Yugoslavia: JUS C.D2.300 to .307; E1.002; K.B1.160

672 Iron and Steel Goods

Poland: PN M-65501; 024; -80565
Yugoslavia: JUS K.C3.050, .055, .060, .065, .070, .075, .080, .085, .086, .090, .100, .110; .J2.011

674 Timber and Woodwork Industry

India-Ministry of Defence: IND/GS/Drg 2120
Italy: UNI 2853, 54; 3917
Yugoslavia: JUS D.A1.020, 021, .040 to .042, .044, .046 to .048, .060 to .067

675 Leather Industry

Roumania: STAS 1284

676 Paper and Cardboard Industry

Canadian Government Specification Board: 6-GP-14A
Poland: PN P-92400
USSR: GOST 8273; 8434
Yugoslavia: JUS D.A1.080 to .086; .C5.022

677 Textile and Cordage Industries

Germany: DIN 61515, 610
Poland: PN M-65501; P-04772, 792, 797; -20005; -80100; -82270
Roumania: STAS 1284
USSR: GOST 8495
Yugoslavia: JUS F.B2.021 to .025; .B3.021; .C0.021; .C2.101 to .111; .130 to .132

678 Macromolecular Materials. Rubbers and Plastics

France: NF T 51-007
Germany: DIN 7713; 53358, 382
Israel: S.I. 245
Poland: PN C-89100
Switzerland: VSM 18380
USSR: GOST 426

679.8 Stone Industry and Technology

Yugoslavia: JUS K.B1.190 to .194

68 Specialized Trades. Crafts and Industries for Finished Articles and Goods

Germany: DIN 31215; 61515
India-Ministry of Defence: IND/GS/Drg 2120
Israel: S.I.42
Norway: NS 888
UK: BS 2981: 1958 Dimensional Features of Magnetic Sound Recording on Perforated Film
USSR: GOST 8303, 09
Yugoslavia: JUS F.C0.001; G. 1.050 to .052; K.B1.111, .121

69 Building Industry, Materials, Trade, Construction

Denmark: DS 1000, 10
France: FD(NF) X 40-501; NF P15-353
Germany: DIN 18022; 51949, 950; VDE 0675/9; 016519
Israel: S.I. 6; 12; 13; 14; 31; 42
Norway: NS 772A to 774; 828; 830
Poland: PN B-02351; -04101, 102, 250, 488, 491; -14000; -74410; -75400
Portugal: NP 15
USSR: GOST 5578
Yugoslavia: JUS K.B1.165 to .0168; U.A9.001

74 Drawing and Minor Arts

UK: BS 1709: 1958 Drawing Instruments for Drawing Office Use

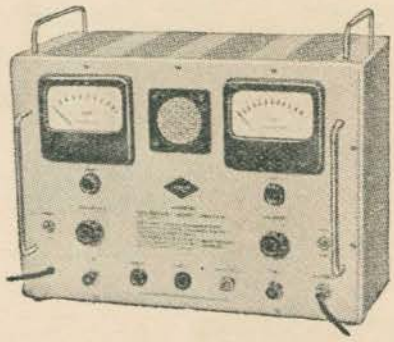
77 Photography and Cinematography

Germany: DIN 15541; 16544; 19005
Norway: NS 818A
UK: BS 2981: 1958 Dimensional Features of Magnetic Sound Recording on Perforated Film

Electrical Instrumentation

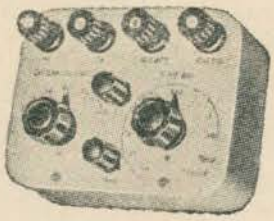
for RESEARCH WORK
for EDUCATIONAL PURPOSES
for PRODUCTION CONTROL
for SERVICE

12 kV Non-destructive Insulation Tester Type JP1



This instrument tests insulation by indicating the voltage at which ionisation sets on, thus providing an indication of the maximum safe working voltage without destructing the test object. A high gain amplifier amplifies the ionisation current to give an audible indication on a built-in loudspeaker. Operation of the instrument is absolutely safe when correctly installed and used.

Test voltage: in two ranges from 400 volts to 6 kV and 400 volts to 12 kV d.c.
Max. current: 0·5 mA.

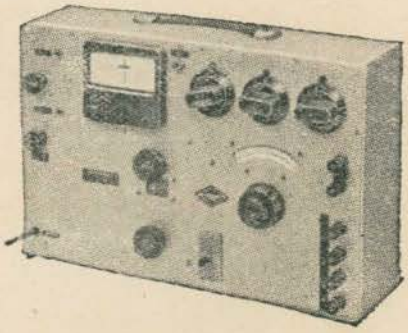


Calibrating Oscillator Type CO1

A transistorised portable oscillator with innumerable uses in the laboratory. Supplies square-wave or sine-wave signals at 1 kc or 10 kc. Accurate amplitude and frequency. Built-in step attenuator may be used separately. Power output for bridge supply, etc.

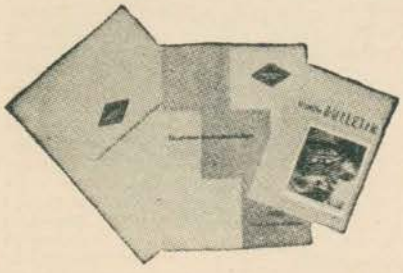
Frequencies: 1 kc and 10 kc ± 2%.
Range: Square-wave 1 mV to 3 V ± 2%.
Sine-wave 1 mV to 10 V ± 5%.
Max. output: 10 V into 5 kohm.

Universal Bridge Type UB3



A self-contained bridge for the measurement of d.c. resistance, capacitance, inductance and dissipation factor. The bridge is complete with standards, 1000 c/s oscillator, d.c. supply from the power pack, amplifier and meter. Mains operated.

Range: R: 1 milliohm - 3 megohms.
C: 1 pF - 300 μF.
L: 1 μH - 300 H.
Dissipation factor: 0·001 - 10.
Accuracy: R: ½%.
L and C: 1%.
Dissipation factor: 15%.
Dimensions: 45 × 30 × 15 cm.



DANBRIDGE LITERATURE AVAILABLE

Complete Catalogue
This catalogue contains detailed up-to-date specifications on the complete range of Danbridge standard production and is a valuable source of information to all users of electrical and electronic instruments.

Technical Bulletin
This bulletin is published regularly by Danbridge in order to keep scientists and engineers all over the world informed of the latest news from Danbridge. If you do not already receive this interesting bulletin, we shall be pleased to include your name and address in our mailing list.

1958 Shortform Catalogue
Contains brief specifications on all instruments manufactured by Danbridge and also gives a comprehensive list of important users of Danbridge instruments throughout the world.

SOLE AGENTS IN INDIA

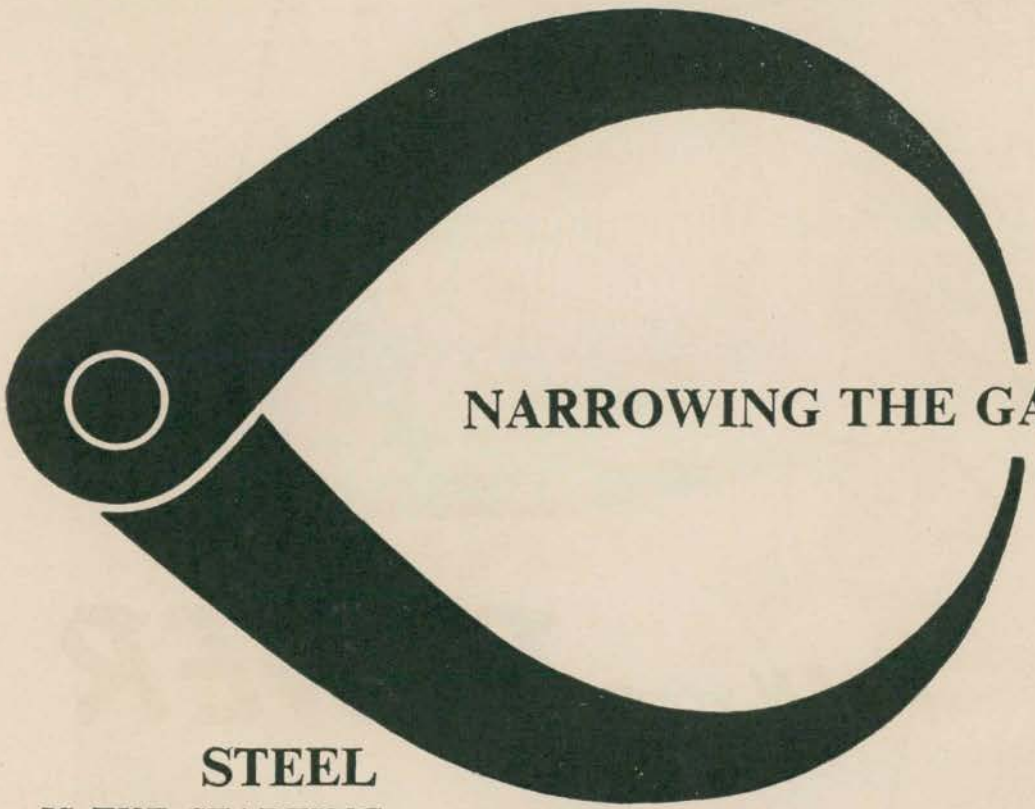
W. J. ALCOCK & CO. (PRIVATE) LTD.

Phone: 23-3019 **7 HASTINGS STREET, CALCUTTA 1** **Grams: DECIBEL**

Steel is the starting point in a country's progress towards economic self-sufficiency. In India today there exists a wide gap between requirements and production of steel. While the present annual production is only 1,430,000 tons, by the end of the Second Five Year Plan the country will need at least 6,000,000 tons a year.

The public and private sectors have joined hands to narrow this gap by the establishment of three new steel plants at Rourkela, Bhilai and Durgapur and by expanding the existing works.

The Indian Iron & Steel Company Limited plan to expand their ingot output to 1,000,000 tons by 1961, as their contribution towards the needs of the nation's ever growing economy.



STEEL
IS THE STARTING POINT

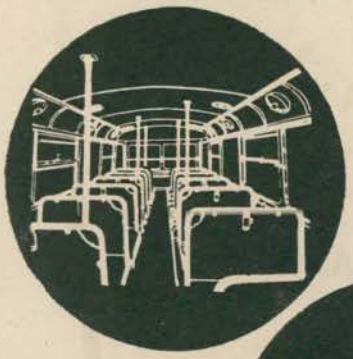
Use steel only when you must today, there will be more tomorrow.

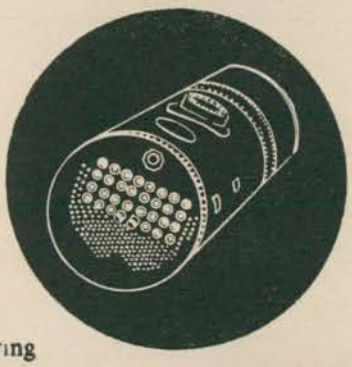
INDIAN IISCO STEEL

THE INDIAN IRON & STEEL CO. LTD.
Works: Burnpur and Kulti
Head Office : 12 Mission Row, Calcutta.

IIC-6

TRU-WEL -a versatile tube





TRU-WEL tubes enter almost every phase of our modern life... from the popular bicycle that takes people to work to the transformers that help bring light into your home.

TRU-WEL tubes are exceptionally strong, yet light. Their uniform finish, precision of concentricity, and wall strength bring them new uses everyday, everywhere.

Pioneered by Tube Products Ltd.. Oldbury, England, TRU-WEL tubes have been sold in India for nearly 30 years These world famous TRU-WEL tubes are now made in Avadi in association with them. We shall be glad to help you in all your plans involving the use of TRU-WEL tubes.

tested... tried...trusted

TRU-WEL
Electric Resistance Welded
STEEL TUBES

TUBE PRODUCTS OF INDIA LIMITED

AVADI

TP-387a

symbolises a free service to Indian Industry which is unique in this country. Our Sales Technical Service offers you :-

* **ADVICE**—on all your welding and cutting problems.
* **DEMONSTRATION**—at any time of the most up-to-date welding and cutting processes.
* **TUITION**—to welding operators in a modern well equipped school.

INDIAN OXYGEN
LIMITED

OXYGEN
Master of Metals

10AX 408

INDIA and ICI

From Rs. 18 crores of ICI research spring new products, new techniques, improved methods and materials.

Scientific research and investigation never cease in the ICI Laboratories in Britain. Specialists are constantly at work—studying, probing and experimenting. In 1957, for example, ICI spent more than £ 13½ million, approximately Rs. 18 crores, in employing leading specialists in every field of research.

Basically, that is 'good business'—to keep ahead of competition and abreast of the latest developments.

The outcome of this research is, of course, universally applicable. Here, these new products, processes, discoveries and techniques are speedily made available through the medium of ICI (India) and its associated companies. In India's fields, in her factories, her hospitals, her homes, the standards of living, of health, of technical production—all are being raised by the application of ever-changing, ever-improving methods and materials.

With the establishment of new Industries, ICI gives a pledge of faith in the future.

ICI has given solid proof of its faith in the future of India. Numerous projects have been investigated and capital has been invested in schemes where local conditions promised sound development. These are mentioned below.

In addition to production, I.C.I. (India) furnishes free technical advice and service on the use of the products it sells. Specialists are available to assist customers in every way. This free service ranges from training their staff to answering technical problems and even to trying to assist in marketing.

THE ALKALI & CHEMICAL CORPORATION OF INDIA LIMITED, RISHRA, WEST BENGAL: Produces Caustic Soda, Chlorine, Hydrochloric Acid; 'Gammexane' brand B. H. C. Insecticides; 'Duco', 'Dulux,' 'Necol' and Stoving Enamels; 'Deoxidine', 'Granodine' and 'Alocrom' pretreatment products.

A plant for the manufacture of 'Alkathene' brand of Polythene is nearing completion. It involves an investment of nearly Rs. 4 crores.

ATIC INDUSTRIES PRIVATE LTD., BULSAR: Manufactures Vat Dyes for the Indian Textile Industry. Atic is a partnership between Atul Products Ltd., and ICI.

INDIAN EXPLOSIVES LTD. is a joint venture of I.C.I. and the Government of India. The factory at Gomia, Bihar, has cost over Rs. 4 crores.

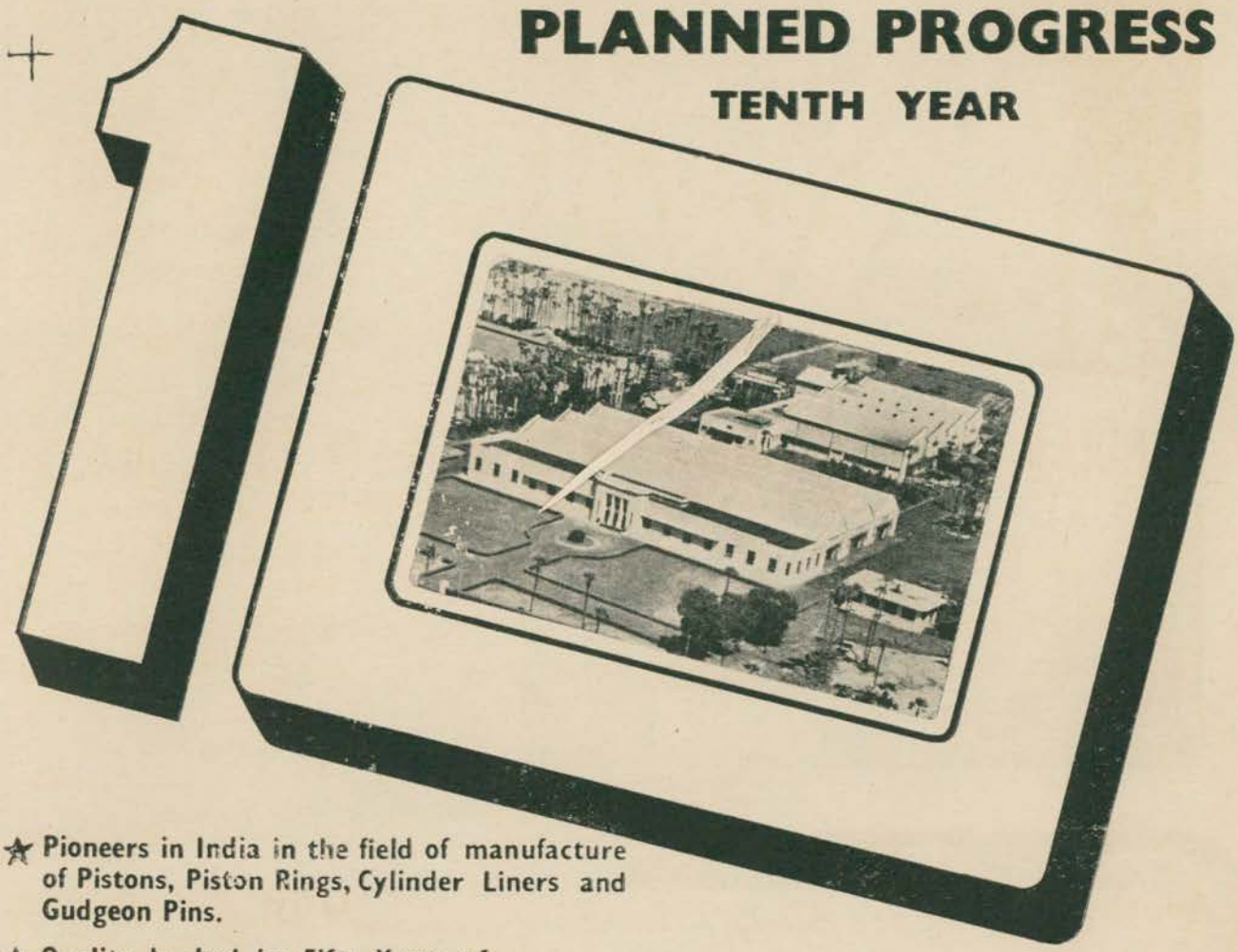
I.C.I. (INDIA) PRIVATE LTD.: Makes in Calcutta, 'Alkathene' Film and 'Alkathene' Pipe for cold water and irrigation systems; at Sewri, Bombay, dyestuffs are processed and packed to the exact requirements of the Indian market, and a comprehensive range of auxiliary products is manufactured for the bleaching, dyeing, printing and finishing of textile fibres.

IMPERIAL CHEMICAL INDUSTRIES (INDIA) PRIVATE LIMITED

ICG 827A

PLANNED PROGRESS

TENTH YEAR



★ Pioneers in India in the field of manufacture of Pistons, Piston Rings, Cylinder Liners and Gudgeon Pins.

★ Quality backed by Fifty Years of our Associates' experience

Progress at a glance


1949 ERECTION OF FACTORY


1950 PISTON RINGS


1951 CAST IRON FOUNDRY


1952 PISTONS


1953 CYLINDER LINERS


1954 GUDGEON PINS


1955 DUAFLEX EXPANDER TYPE STEEL RINGS


1957 ALUMINIUM FOUNDRY

INDIA PISTONS PRIVATE LIMITED,

SEMBIAM, MADRAS - 11.

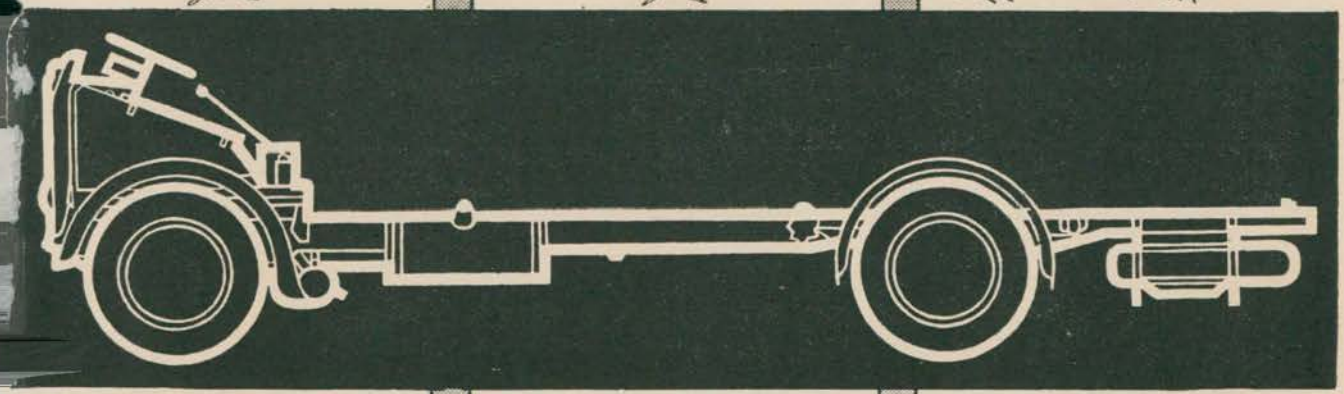
An Associate Company of:

Messrs. Hepworth & Grandage Ltd., Bradford, England — Wellworthy Ltd., Lymington, Hants, England — Bricovmo Ltd., Coventry, England.

A light jeep, a medium type Fargo or a heavy duty Leyland chassis—I get them all at TVS

TVS builds bodies both for buses and lorries

My motor vehicle is insured through TVS—so I have peace of mind



TVS retreads cut down tyre bills

TVS servicing ensures long life for my trucks - saves costly replacements

TVS hire purchase system helps me finance my business with easy payments

I buy chassis from TVS because I get all I need under one roof

TODAY, the rising tempo of production demands speedy transport of men and materials. Road transport, therefore, offers excellent opportunities for expansion and progress.

TVS, with its several units, meets the increasing demands of the automotive industry in all its aspects in South India.

TVS Units include

T. V. SUNDRAM IYENGAR & SONS PRIVATE LIMITED, Madurai, *Motor Vehicle Dealers, Automobile Engineers & Body Builders.* MADRAS AUTO SERVICE PRIVATE LIMITED, Madras—Bangalore, *Distributors of Motor Parts & Accessories.* SOUTHERN ROADWAYS PRIVATE LIMITED, Madurai, *Passenger & Parcel Road Transport Undertaking.* SUNDARAM MOTORS PRIVATE LIMITED, Madras, *Dealers: Fiat, Plymouth, Fargo, Leyland, Willys Jeeps & Ferguson Tractors* SUNDARAM INDUSTRIES PRIVATE LIMITED, Pudukkottai—Madras, *Tyre Retreaders.* THE MADRAS MOTOR INSURANCE COMPANY LIMITED, Madras. SUNDARAM FINANCE PRIVATE LIMITED, Madras. INDIA MOTOR PARTS & ACCESSORIES PRIVATE LTD., Madras, *Distributors of GM parts and accessories for all India.* SUNDARAMS PRIVATE LTD., Madurai.

TVS 286 **T. V. SUNDRAM IYENGAR & SONS PRIVATE LIMITED, Madurai**

Printed by H. JACQUEMOTTE, S.J., at the Catholic Press, Ranchi, India
Published by JAINATH KAUL, M.Sc., Indian Standards Institution, New Delhi, India