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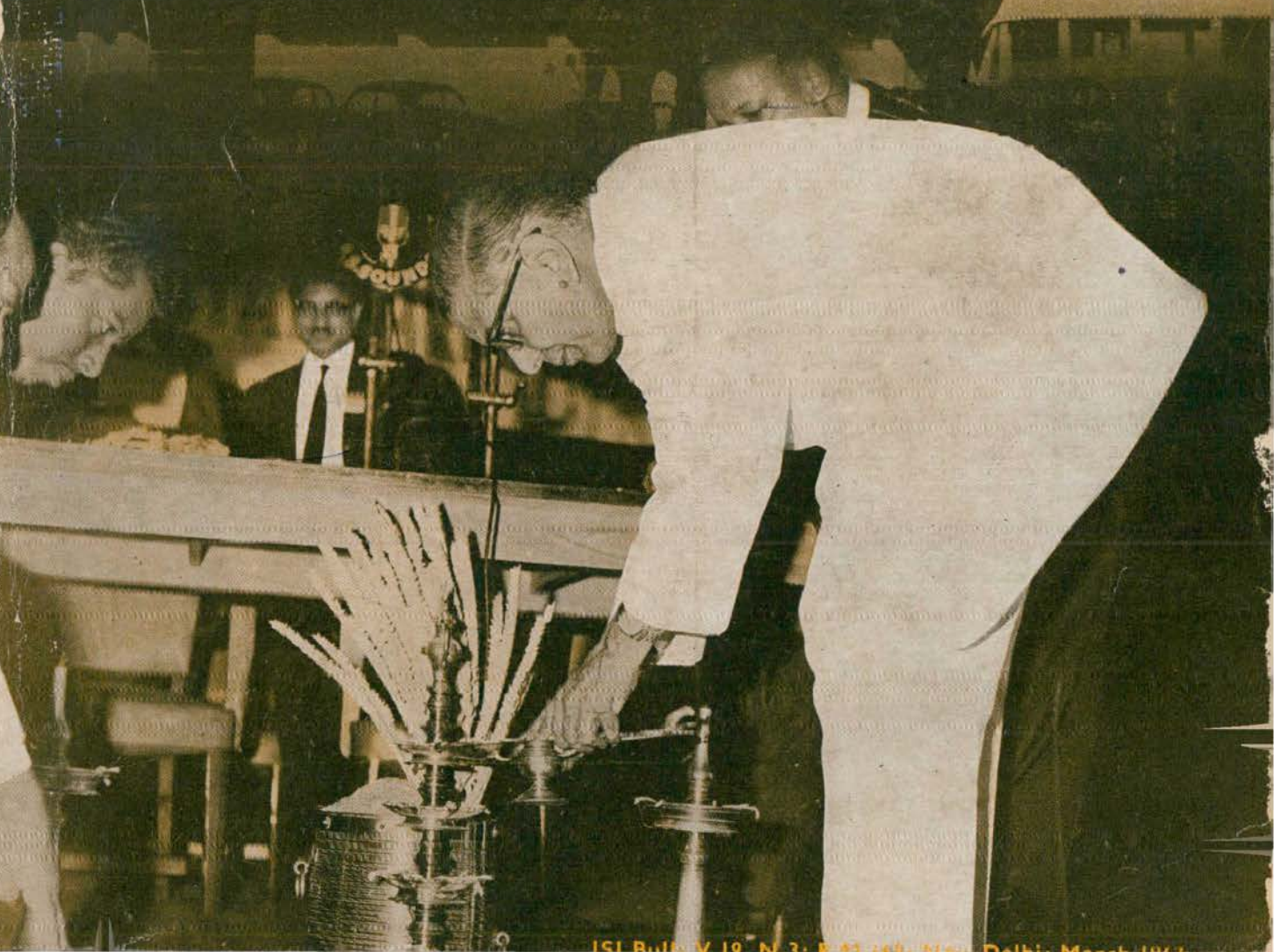
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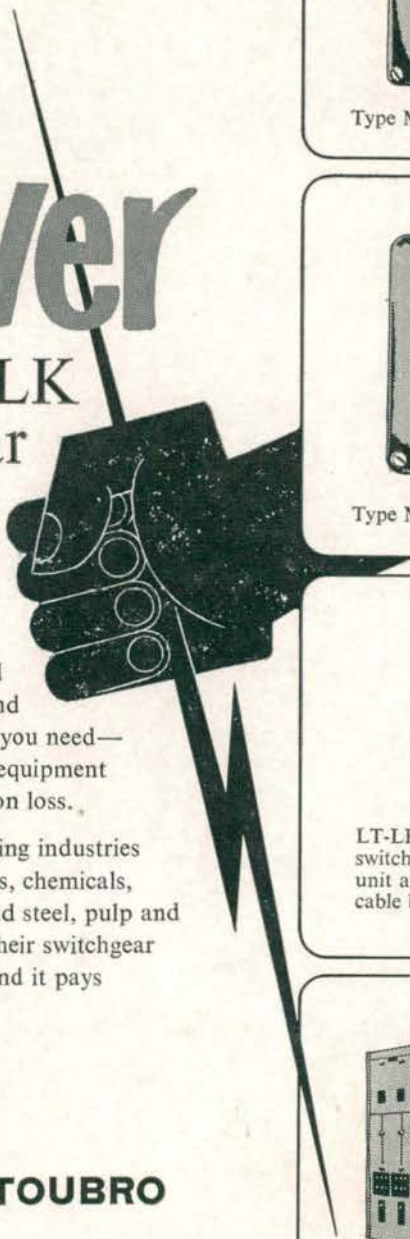
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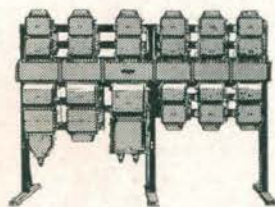
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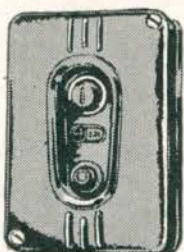
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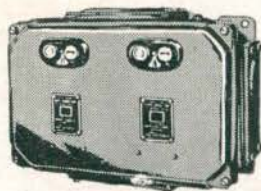
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Iron clad LT-LK switchboard



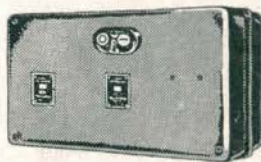
Type MF1 starter, 15 amps



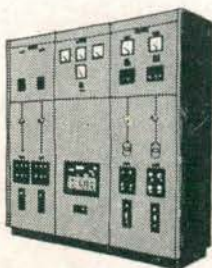
Reversing starter



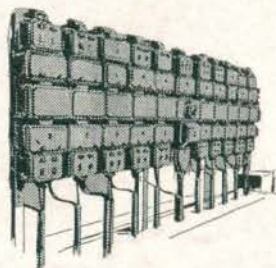
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switchfuse
unit and
cable box



Automatic Star Delta starter



Relay and control panel



Iron clad motor control centre

SWT 017 A

ISI BULLETIN

■ VOLUME 19

■ MARCH 1967

■ NUMBER 3

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■ **The Cover** — Flashback on Ernakulam. Shri Bhagwan Sahay, Governor of Kerala, lights the traditional jyoti to mark the inauguration of the Tenth Indian Standards Convention. Top: Glimpses of some of the events against the backdrop of the P. M. Paily Pillai Multi-Storey Building, the venue of the technical sessions. Detailed proceedings of the Convention appear on pages 93-139.

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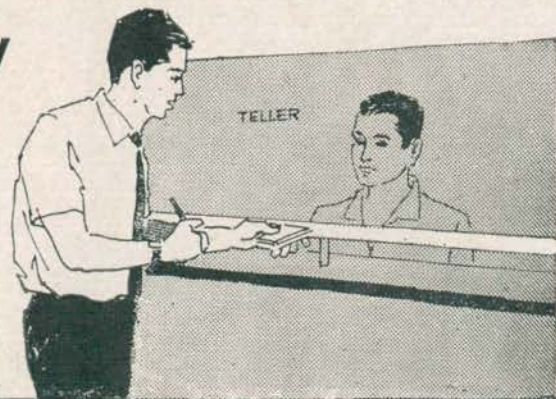
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**ELEVENTH
INDIAN
STANDARDS
CONVENTION
CHANDIGARH**

■ The Eleventh Indian Standards Convention will be held at Chandigarh from 25 to 30 September 1967.

The letter of Invitation, the Nomination Form and information on subjects for Technical Sessions appear on pages A3 to A9.

You are requested to send in your acceptance along with the necessary information as early as possible to the Organizing Secretary, Eleventh Indian Standards Convention, Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi I.



INDIAN STANDARDS INSTITUTION

Eleventh Indian Standards Convention Chandigarh (25-30 September 1967)

All ISI Members and Others Concerned

Dear Sir,

The Eleventh Indian Standards Convention will be held at Chandigarh from 25 to 30 September 1967.

On behalf of the Indian Standards Institution, I invite you and your organization to participate in the Convention. I hope it would be possible for you to nominate delegates for participating in the various technical sessions, details of which are given in the following pages, together with a tear-off Nomination Form for your use.

I also hope that it would be possible for you to share your valuable experience and knowledge by contributing original papers for discussion. Papers (not exceeding 2 500 words) should be thought-provoking and have direct bearing on some related aspect of standardization work.

In case you or your nominees decide to contribute papers, the titles of the papers may be indicated on the accompanying Nomination Form or otherwise intimated at an early date. The synopses of the papers should reach us by 6 May 1967 to enable us to finalize the programme of various sessions.

On receipt of information in the Nomination Form, we would correspond with the intending authors and send them suggestions for the preparation of papers. We also intend circulating full texts of papers to all delegates for prior study. It would, therefore, be appreciated if these texts reach us by 6 June 1967.

To ensure uniformity in presentation, layout and treatment of the subject matter and to facilitate referencing, the Institution will edit the papers before circulating them. The Institution will not, however, accept any paper for discussion at the sessions, if it is felt that the paper does not contribute anything original or is not related to the subject under discussion. All quantities and dimensions should be given in metric units. Papers received late cannot be assured of a place in the Convention programme.

The Convention would include, besides technical sessions, a number of visits to industrial plants and places of historical and tourist interest, as also some cultural and social functions. If a sufficient number of delegates show interest, excursion(s) may be organized to Bhakra-Nangal, Amritsar, Kufri (Simla) and Kulu at the delegates' expense.

Names of your nominees may kindly be intimated to us in the accompanying Nomination Form, by 30 April 1967. In case it is not possible for you to finalize the list of delegates by that date, please send an interim reply indicating the number of delegates we may expect from your organization; names and addresses may follow when they are finalized.

For making further arrangements, I hope you will have no objection to our corresponding with your nominees direct.

I trust you will accept this invitation and send us the necessary information early.

Should you so desire, we shall be glad to send you spare copies of this letter and its enclosures for internal circulation within your organization.

Yours faithfully,

(A. N. Ghosh)
Director General

GENERAL INFORMATION (Chandigarh Convention)

I. TECHNICAL SESSIONS

S-1 Standardization of Chemical Products of Plant Origin

The vegetable kingdom provides a natural and extensive storehouse of raw materials for a variety of chemical products. This source, wide in coverage and abundant in supply to feed the Indian industry as well as the export markets, is varied in quality dependent on ecological factors, regional practices in handling, storage and treatment, and processing techniques adopted.

In the process of standardization of chemical products of diverse plant origin, such aspects as procurement of the plant material, handling and storage, problems of safe packaging, grading for rational utilization, processing and quality control, economic use and disposal of by-products, competition from synthetic substitutes and development of indigenous alternates, etc, could be effectively highlighted with particular reference to conservation of national resources and export promotion.

Below is given a list of broad groups of chemical products of plant origin, along with typical problems, which could form useful subjects of discussion at the Session:

- a) *Resins, Gums and Waxes* — Procurement of high-pinene oil of turpentine from *Chir* resin, its processing for de-pinened oil, distinction of the de-pinened oil from the whole oil and economic disposal of its high sesquiterpene fractions; assessment of the quality of plant gums and resins; shellac in competition with its synthetics.
- b) *Oleaginous Materials* — Procurement and grading of lesser known oilseeds and their specifications; rational utilization of vegetable oils for specific industrial uses.
- c) *Rubber* — Technical classification of natural rubber; economic production of synthetic rubber; productivity of rubber plantations.
- d) *Kattha and Tans* — Quality specifications and tests for *Kattha*; grading of tannin-bearing plant materials; standardization of indigenous tans as alternate to imported wattle.
- e) *Perfumery, Flavouring, Cosmetic and Detergent Materials* — Chemo-taxonomical problems in the development of high-yielding hybrids and varieties of aromatic plants, and their processing for better yield and quality of natural perfumery and flavouring materials, their grading and quality standards; evaluation of cosmetic and detergent products and their freedom from dermatological hazards; specifications and methods of test for henna leaf, henna powder, lamp black and vegetable carbons.
- f) *Cellulosic Products* — Quality specifications for paper against the shortage of conventional raw materials; rational utilization of paper and paper products; exploitation of the large potential of cotton linters as industrial raw material.
- g) *Medicinal Products* — Problems of botanical identification of medicinal plants; development of high-yielding hybrids and varieties, their grading and quality standards; competition against synthetics.
- h) *Food Colours* — Colour assessment and stability during storage.

S-2 Quality Control in Small Scale Industry

The small scale sector of the Indian industry has a vital role to play in the development of national economy through increased production, expansion of export and growth of ancillary and feeder industries. However, in the present era of increasing competition, both at home and abroad, it is essential for the small scale industries to produce *Quality* goods at an *Economic Level* and thus create a new image of Indian small industries as *High-Quality* industrial producers. Modern techniques of quality control would be immensely useful in successfully meeting the twin problems of better quality and lower costs as also in achieving higher productivity and efficiency.

The following topics indicate the scope of the Session:

- a) Review of QC facilities (like training, consultation, testing and certification) currently available and their utilization in the small scale industries.

- b) Process control — control charts and their modifications for applicability to short-run production, economies resulting from actual operation of the control charts in plants.
- c) Product control — lot inspection, sampling plans, economics of sampling.
- d) Concept of total quality control.
- e) Organization of formal or informal groups of small scale units for professional consultation and exchange of intra-group and inter-group experiences in QC.

S-3 Elimination of Wastage in Industry

Shortage of raw materials, technical manpower, etc. are frequently referred to as affecting the productive capacity of Indian industry. The extent of wastage and loss in productive capacity because of several factors often related to lack of effective standardization is generally overlooked. The manufacture and supply of a large variety of materials and products is undoubtedly one of the major causes of industrial wastage. The proliferation of variety has sometimes resulted from technical collaboration with industrial units from overseas countries. Wastage in industry can hardly be dealt with effectively without adequate emphasis on standardization to regulate various spheres of industrial activity.

The following topics indicate some of the areas for discussion at the Session:

- a) Adoption of Indian Standards by industry, government departments, local bodies and others to regulate demands to fewer sizes, etc. so as to lead to longer production runs.
- b) Classification and coding of materials, equipment and parts to reduce inventory and streamline after-sale service.
- c) Standardization of materials, parts and components within company operations to promote the repetitive use of common items.
- d) Standardization of manufacturing methods, inspection and maintenance schedules, for conservation and utilization of available resources.
- e) Administrative standards to improve communication of company policy and procedure for better understanding and performance.

S-4 Standardization as a Tool for Light Mechanical Engineering Industry

There is no doubt that the light mechanical engineering industry stands to benefit greatly by the introduction of standardization techniques and procedures in all phases of the industry. Particularly the small sector of the industry has all along been beset with problems, many of which could be attributed to lack of standardization in (a) selection of raw materials, (b) establishment of quality control during production, and (c) testing and inspection procedures for ensuring quality.

The purpose of the Session is to stimulate practical ideas for promoting the application of standardization as a tool in light mechanical engineering industry. Case studies of actual in-plant operation will be specially useful with reference to the following aspects of the subject:

- a) Role of standardization in product design and production and inspection procedure.
- b) Implementation of Indian Standards for raw materials, semi-finished products, components, spares and equipment designed to metric system.
- c) Organization of design and drafting facilities.
- d) Organization of testing and inspection facilities.

S-5 Standards in Aid of Agriculture

Agricultural production is required to be increased in the country not only urgently but also with a certain amount of surety. For this purpose, it is necessary to base agricultural development on the consolidated experience of research and field work. The problems of communicating the results of research and field work to the farmer and their utilization are complicated by factors many of which are beyond the scope of standardization. It is certain, however, that unless

the results of research are available in the form of standardized practices and codes easily comprehensible to the farmer, much of the possible gains will be lost. It is in this context that the maximum use of Indian Standards which incorporate practical guidance of proved utility may help to bring forward a break-through in agricultural production.

The object of this Session would be to highlight the standards already formulated in fields allied to agriculture and examine further needs with reference to national plans. The discussions should be specific and may be related to any one of the following subjects:

- a) Standardization of agricultural inputs, namely, pesticides, farm implements, seeds, fertilizers and organic manures.
- b) Standardization of storage structures and lay-outs for market yards.
- c) Standardization in the field of dairying covering dairy products, equipment for dairies, animal feeds and animal housing.
- d) Standards for poultry development.
- e) Co-ordination of the work of Central and State agencies in the development and implementation of standards.

S-6 Development of Small Scale Textile Industry

Small scale textile units producing carpets; handloom products; hosiery; ready-made garments; components, accessories and testing equipment make substantial contribution to the economy of the country. Lack of adequate technical personnel, testing facilities and other quality control measures pose problems to these small scale units in the production of quality goods. This Session would help in finding ways and means of developing this sector of the industry on co-ordinated scientific lines.

The following topics indicate the scope of the Session:

- a) Standardization in hosiery and ready-made garment industry, anthropometric measurements, size labelling.
- b) Packing and care labelling of garments.
- c) Standardized raw materials for production of quality goods.
- d) Processing and finishing codes.
- e) Standardization of machinery components, accessories and testing equipment.
- f) Scope for ISI Certification Mark in small scale textile units.

S-7 Informative Labelling of Consumer Goods

The principal beneficiary of industrial production conforming to the accepted standards in the field of consumer goods is the housewife. But it is she who gets little or no help in choosing her daily necessities from a number of brands or from alternative materials available. More often than not, adequate information regarding the article especially its quality and performance are hard to get. She has, therefore, to depend upon her own guess or go in for things of which she or her friends have previous experience.

As in the case of the developed countries, the Indian housewife needs informative labelling of the following types:

- a) Electrical appliances for home to contain instructions for safe and efficient use and precautions to be taken in installing them.
- b) Refrigerators, washing machines and other allied items to have accompanying literature explaining their operation, efficient use, etc.
- c) Other domestic appliances, such as pressure cookers, pressure stoves and gas appliances, to have safety instructions.

- d) Textiles to have labels giving information regarding fibre content, colour fastness, washing and ironing instructions, keeping qualities of woollens.
- e) Canned food items to give contents of ingredients, preservatives used, amount of artificial colouring contained, etc.

This Session, which has been planned primarily for the lady delegates attending the Convention, will review the position regarding informative labelling in the country and suggest ways and means of promoting their use.

2. GENERAL SESSION

A General Session on the subject 'Safety in the Home' will be held at the Convention. Eminent authorities from different fields will give talks on various aspects of the subject. A general discussion will then follow and delegates interested in the subject will be welcome to participate.

No papers will be invited for the General Session.

3. PROGRAMME OF TECHNICAL AND GENERAL SESSIONS

The programme of Technical and General Sessions and social and cultural functions is being worked out. It will be circulated to all delegates well in time to help them in deciding their participation in the programme.

4. VISITS AND EXCURSIONS

To enable the delegates to spend their spare time usefully, visits to selected industrial units and places of historical and tourist interest will be included in the programme.

Depending upon the interest shown, excursions to one or more of the following places may also be organized at the expense of the delegates. Details are being worked out and will be intimated to the delegates in due course:

	<i>Approx distance from Chandigarh</i>
a) Bhakra-Nangal	105 km
b) Amritsar	215 km
c) Kufri (Simla)	110 km
d) Kulu	260 km

5. ACCOMMODATION

Arrangements are under way for reserving accommodation in hotels, Government hostels, rest houses, etc. Details will be forwarded to the delegates in due course.

6. RAILWAY CONCESSION

As in the past, Railway Board (Ministry of Railways) has been approached for granting railway concession facilities to delegates attending the Convention. If such a concession is desired, the necessary information may please be given in the Nomination Form.

It may please be noted that this concession, if available, would be for delegates travelling from places which are beyond 400 km from Chandigarh. It would not be admissible to those delegates whose travelling expenses are borne by the Central or State Governments or by the local authorities or by statutory bodies. The concession would be admissible to ladies accompanying delegates, only if they register themselves as delegates, but not to children.

7. REGISTRATION

All delegates (including those representing Government departments) will be required to register their names by paying a registration fee of Rs 15.00 per head with similar additional sum for each accompanying lady.

ELEVENTH INDIAN STANDARDS CONVENTION

(25 - 30 September 1967)

NOMINATION FORM

(To be completed and returned to the Organizing Secretary)

(Please write in block letters or type)

The Organizing Secretary
 Eleventh Indian Standards Convention
 Manak Bhavan, 9 Bahadur Shah Zafar Marg
 NEW DELHI-1

Reference: _____

Date: _____

Dear Sir,

*I/We shall be participating in individual capacity/as representative(s) of (Name of Organization) _____

(Address) _____

*I/We nominate the following to attend the Convention as delegate(s)/observer(s) to represent (Name of the Office) _____

(Address) _____

Relevant information is given below:

Serial No.	Name(s) & Address(es) of Delegate(s)	Participation in Session†	Technical Session for which Papers‡ are Being Contributed	Railway Concession		
				Desired or not	Name of	
					Starting Station	Railway
1				YES NO		
2				YES NO		
3				YES NO		
4				YES NO		
5				YES NO		

Date _____ 1967

Signature _____

*Please delete inapplicable words.

†Please indicate using abbreviations S-1, S-2, S-3, etc, for technical sessions and GS for General Session.

‡Please state titles of the papers also if possible on reverse.

Name and Address _____

For _____

For More Nomination Forms

and

Any Additional Information

Please Contact

The Organizing Secretary

ELEVENTH INDIAN STANDARDS CONVENTION

Manak Bhavan, 9 Bahadur Shah Zafar Marg

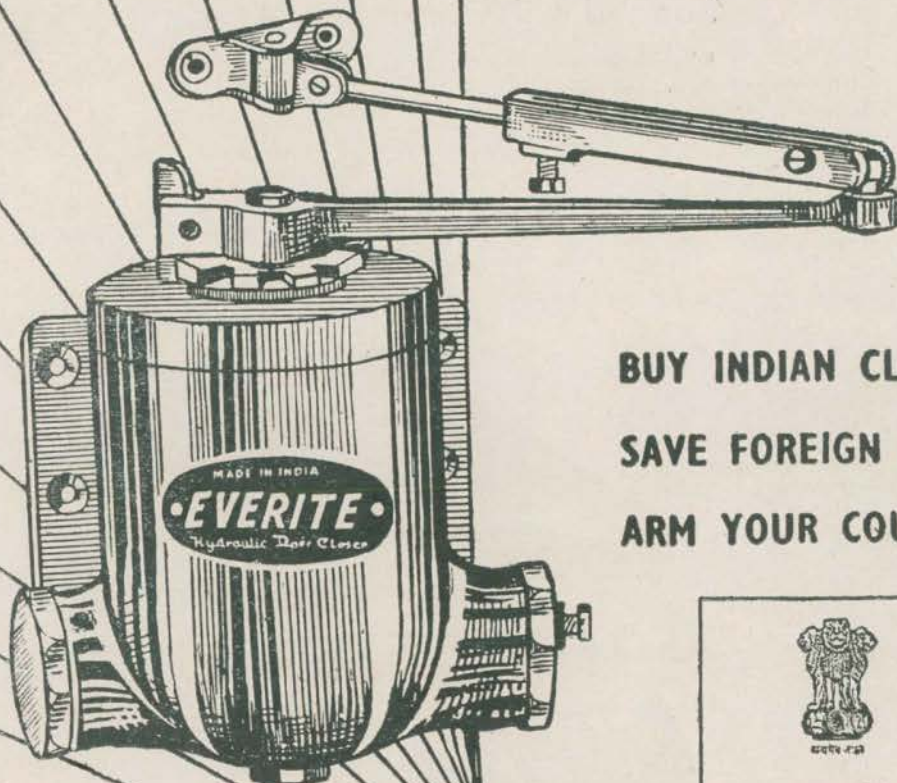
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8. REMITTANCES

All remittances in connection with the Convention may be made through Cheques/Demand Drafts/Postal Orders drawn in favour of Indian Standards Institution and sent to the Organizing Secretary.

9. WEATHER

Weather in September in Chandigarh is pleasant; the temperature varying between 22°C and 33°C. Light tropical and cotton clothing and bedding will be adequate.

10. CORRESPONDENCE

All letters and other correspondence in connection with the Convention may please be marked 'ELEVENTH INDIAN STANDARDS CONVENTION' on the envelope and addressed to:

The Organizing Secretary
Eleventh Indian Standards Convention
Manak Bhavan, 9 Bahadur Shah Zafar Marg
NEW DELHI-1

Telephones 27 36 11/219 and
27 21 29

Telegrams 'MANAKSANSTHA'
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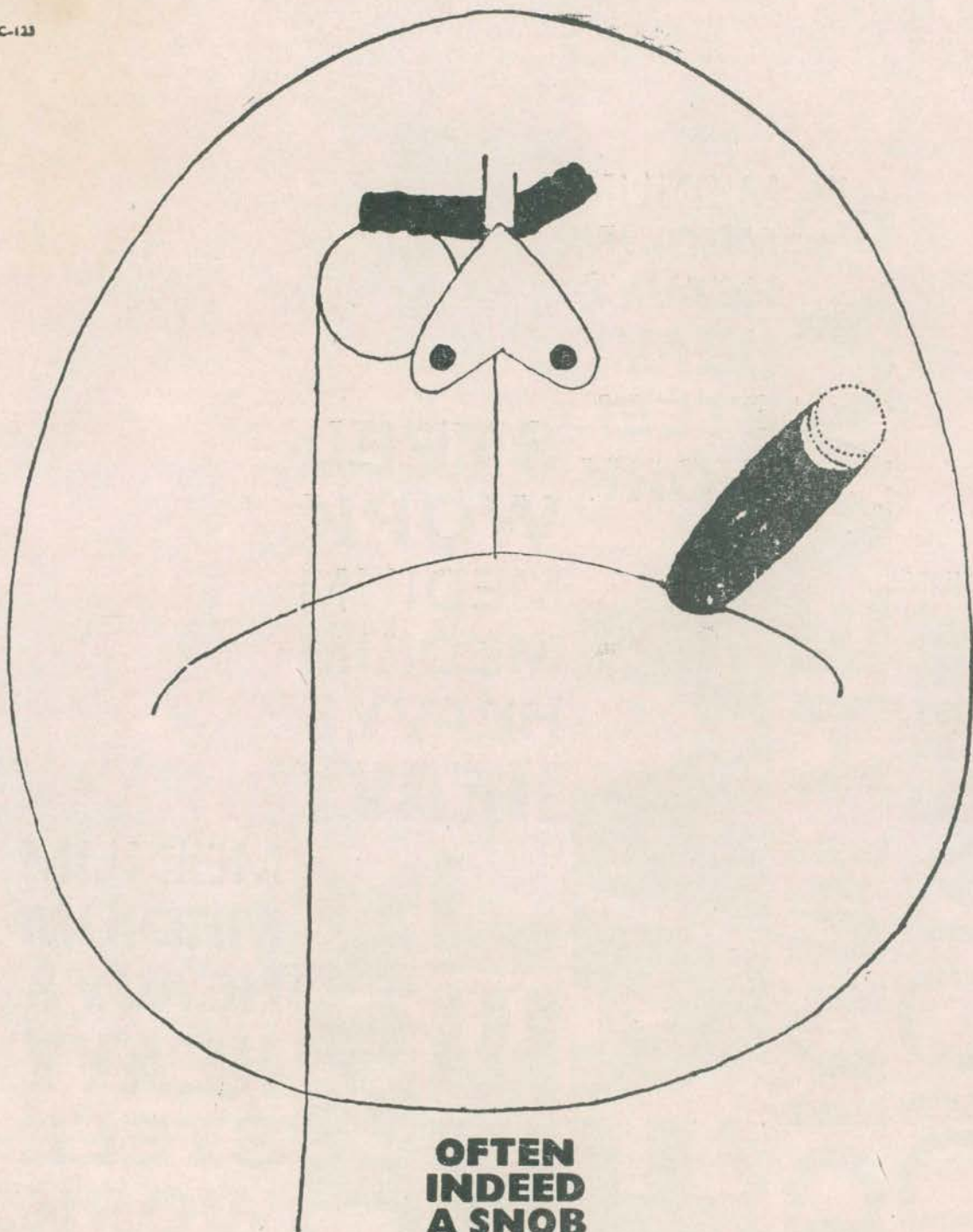
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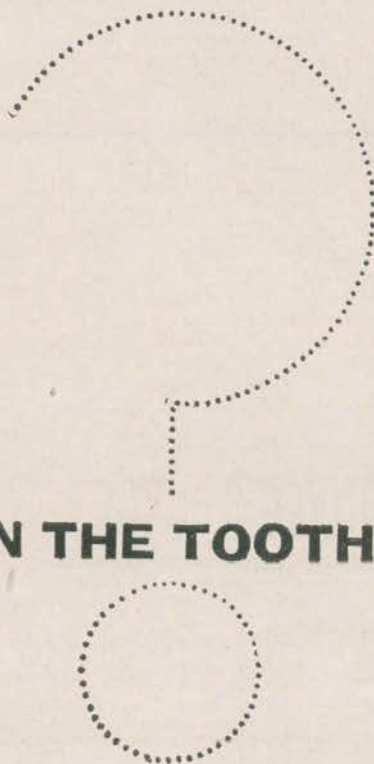
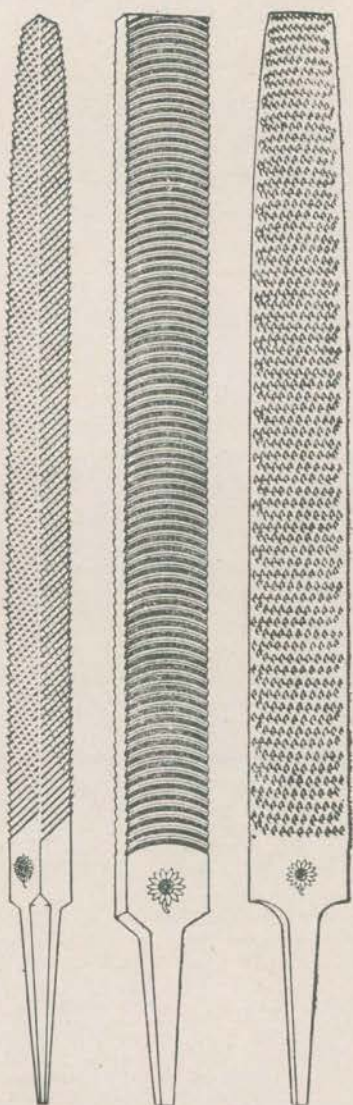
But that is only when we must insist on a specified raw material rather than compromise with a non-standard substitute.

Or when we must reject what our own factories have produced, which do not conform to specifications.

Or when we must recommend to industry new methods of using our products and processes rather than preserve the old ways, which obstruct standardisation.

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Garnish Traders, New Delhi	A11	PVC Wires & Cables Pvt Ltd, Calcutta ...	A36
Hind Commercial Agency, Calcutta	A37	Scientific Equipment Works, Delhi ...	A30
Hindustan Steel Ltd, Calcutta	A42	Siemens Engineering & Manufacturing Co of India Ltd, Bombay ...	A27
Hyderabad Asbestos Cement Products Ltd, Hyderabad	A24	Structural Waterproofing Co Pvt Ltd, Calcutta ...	A38
Indian Cable Co Ltd, Calcutta	A17	Tempo Industrial Corpn, Bombay ...	A41
Indian Iron & Steel Co Ltd, Calcutta	A28	Toshniwal Bros Pvt Ltd, Bombay ...	A20
Indian Oxygen Ltd, Calcutta	A14	Tube Investments of India Ltd, Madras ...	A19

BUYER'S GUIDE



For the benefit of our readers we list below the products, carrying ISI Certification Mark, advertised in this issue.

PRODUCT	LICENSEE	PAGE
Biscuits (excluding wafer biscuits) (IS : 1011-1957)	J. B. Mangharam & Co, Gwalior	A37
Integral cement waterproofing compounds (IS : 2645-1964)	Structural Waterproofing Co Pvt Ltd, Calcutta	A38
PVC insulated cables, single core (unsheathed), 250/440 and 650/1100 volts grade with copper or aluminium conductors and twin flat with or without earth continuity conductor (PVC sheathed) 250/440 volts with copper conductors only [IS : 694 (Parts I and II)-1964]	PVC Wires & Cables Pvt Ltd, Calcutta	A36
Flashlights (IS : 2083-1962)	Modi Torch Works, Modinagar (U.P.)	A40

Cables are always a long-term investment. Don't speculate—specify INCAB.

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The insulation on ordinary paper insulated power cables is saturated with impregnating compound which is fluid at cable working temperatures. Free compound in the insulation tends to migrate—can bleed into the cable boxes or distribution boards resulting in heavy leakage.

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For vertical runs and steep gradients such as mineshaft and roadway feeders, rising mains and internal works feeders, depend on the range of paper insulated power cables, now up to 33 kV, manufactured by INCAB—The Indian Cable Company Limited.

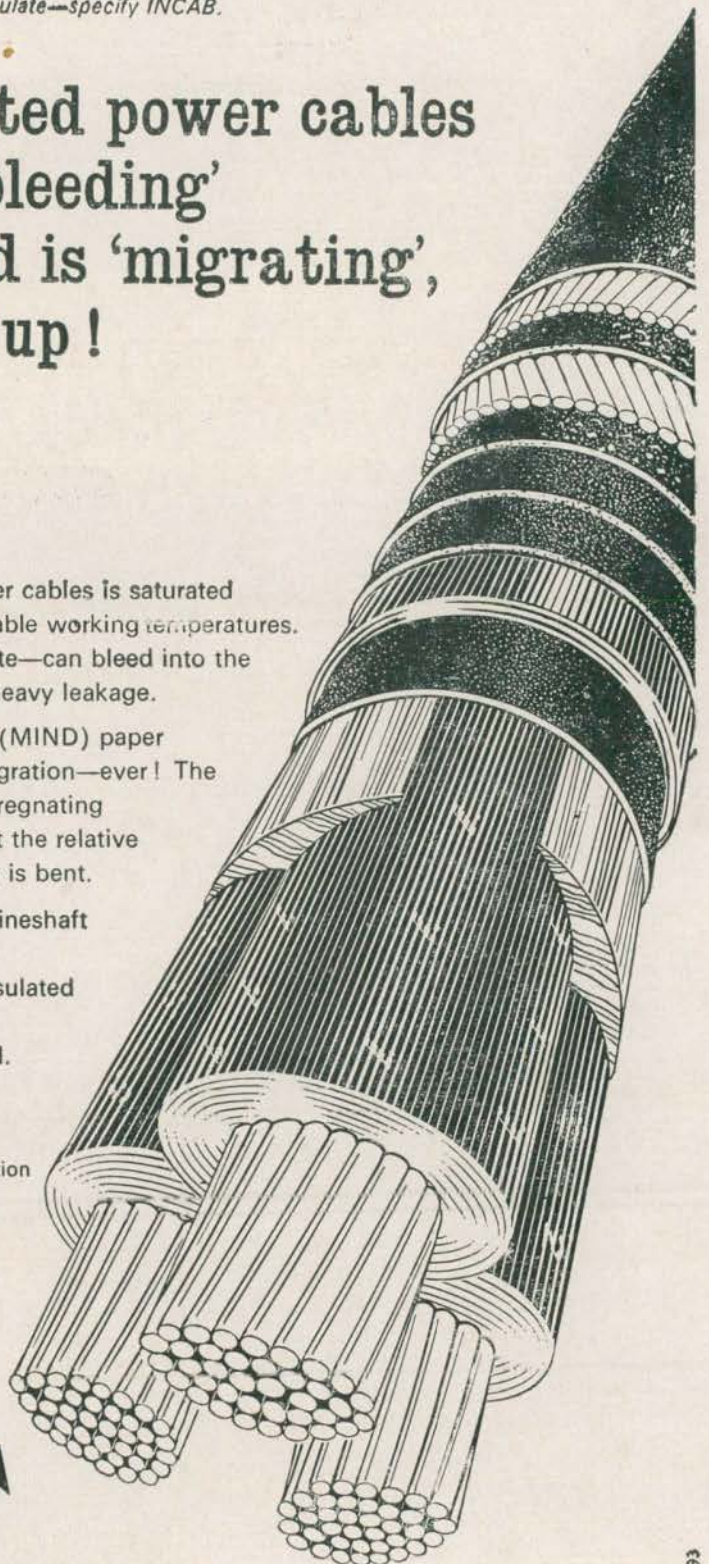
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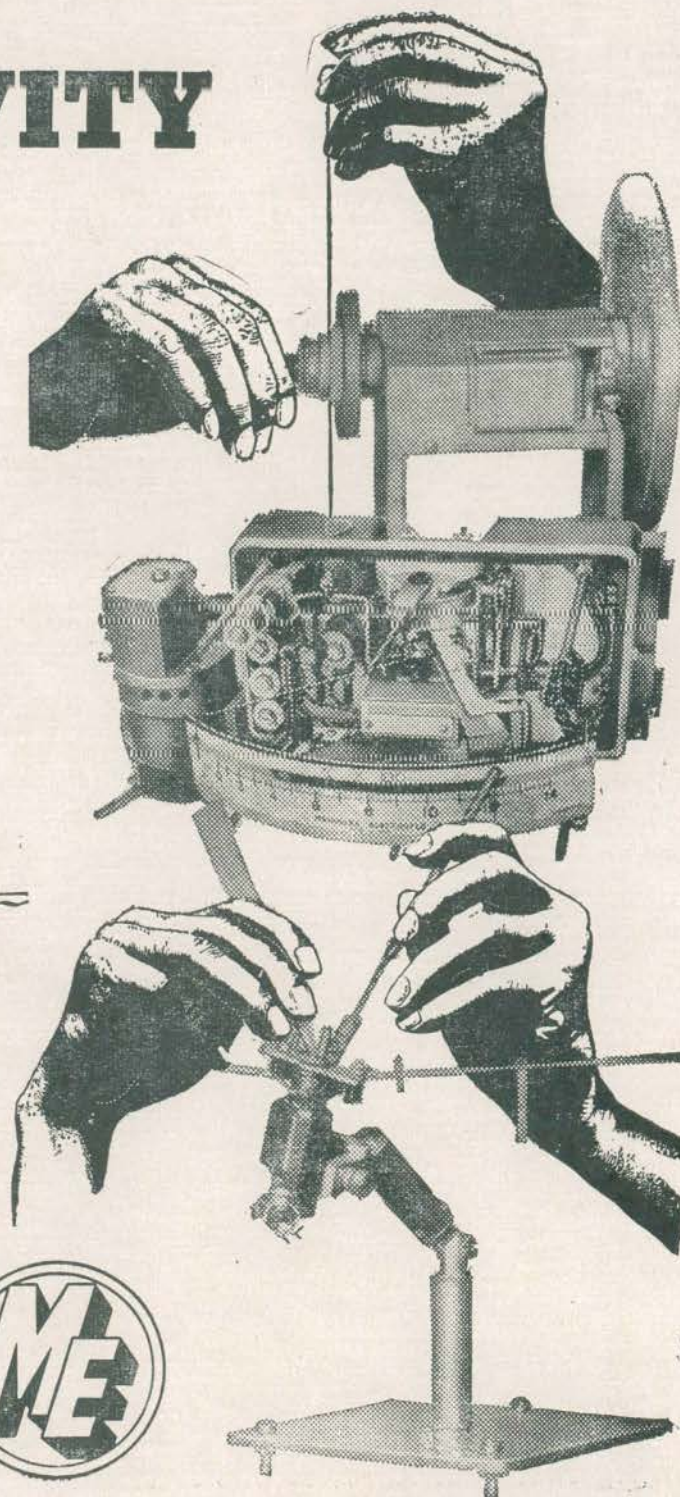
SENSITIVITY

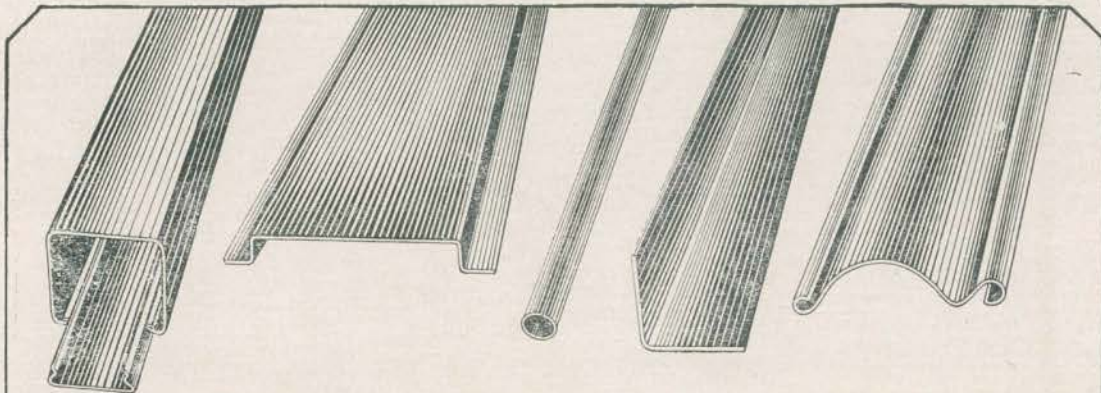
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A19

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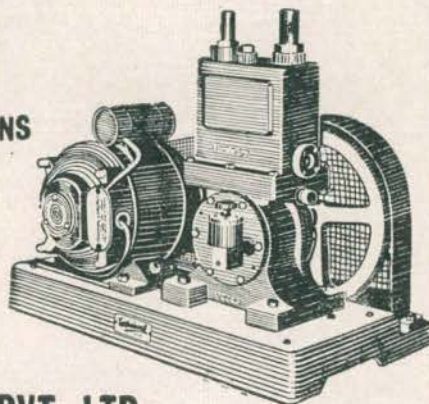
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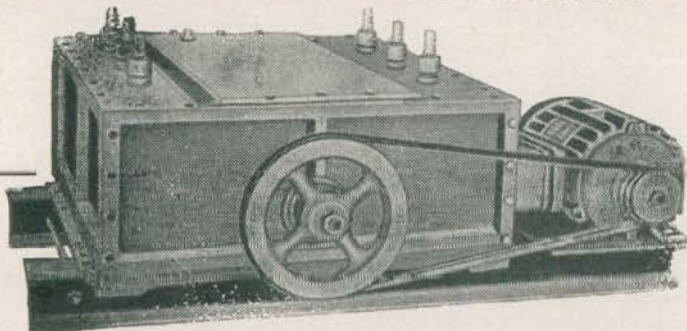
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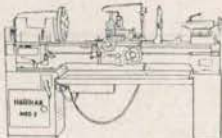
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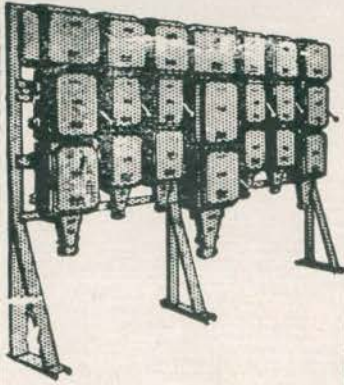
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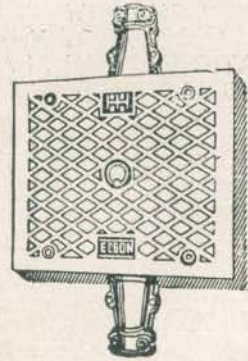
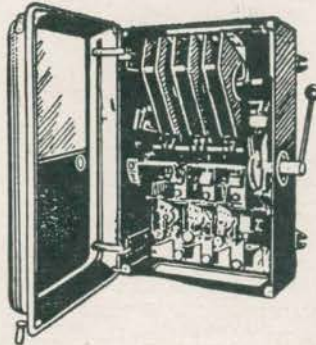
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SWITCHFUSES & DISTRIBUTION BOARDS UPTO 1000 AMPS - 500V

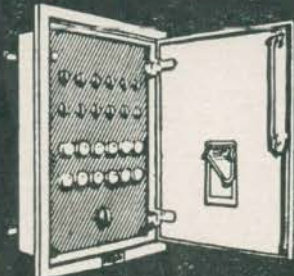
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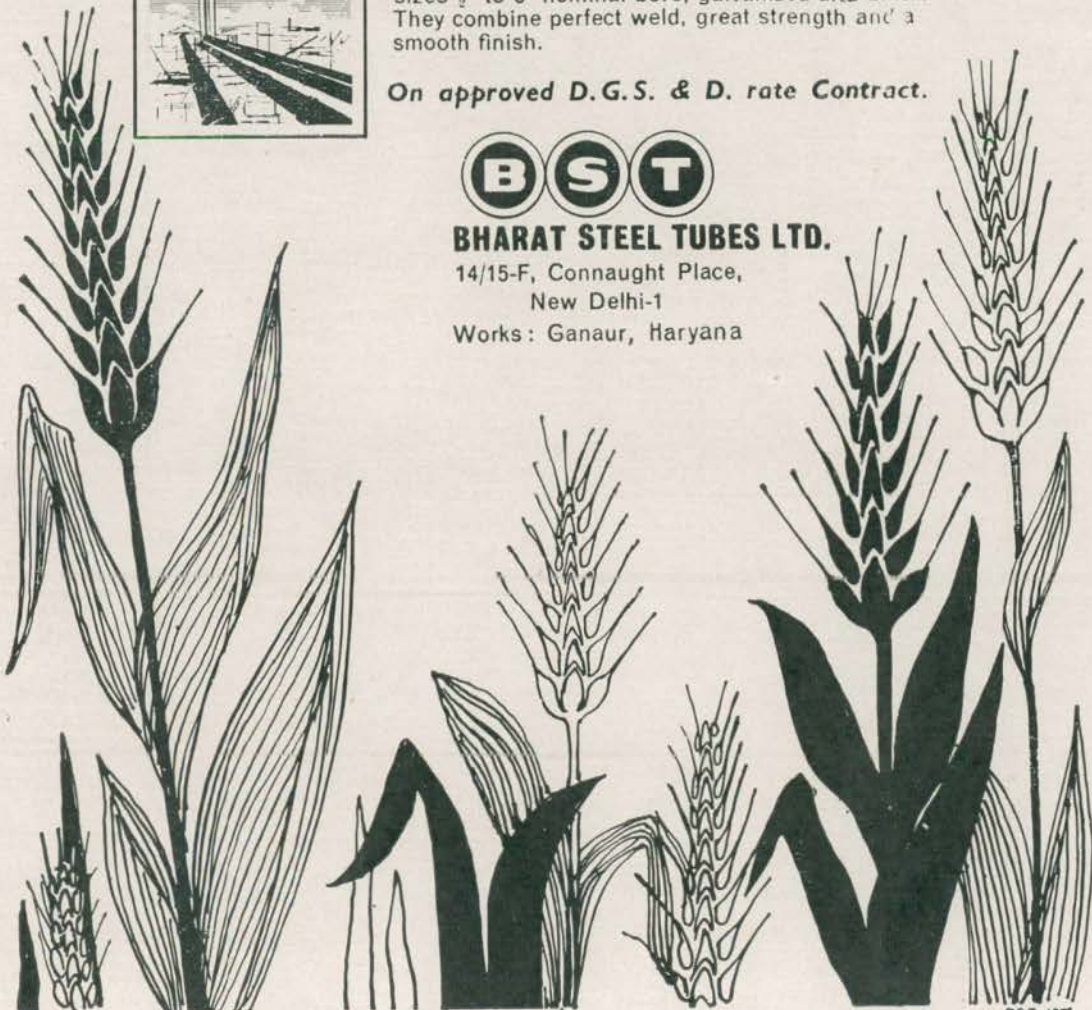
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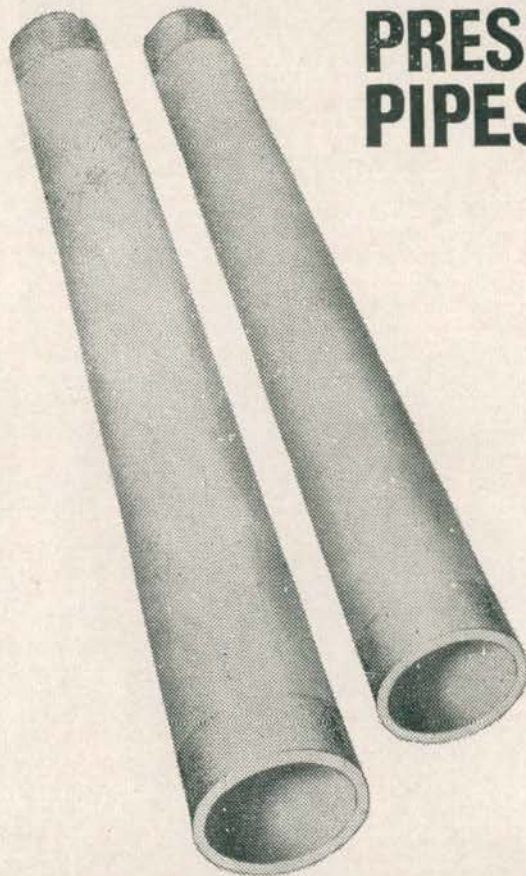
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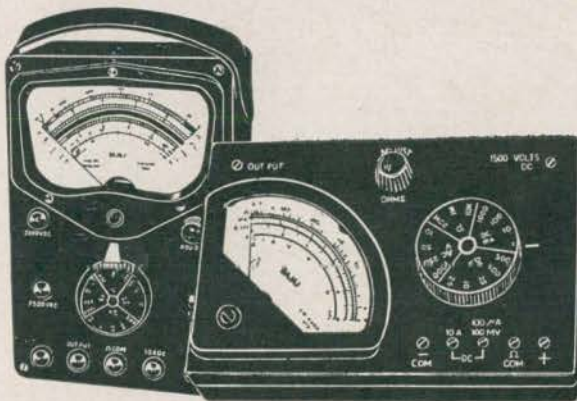
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Factories at Sanatnagar, Hyderabad A.P. and Ballabgarh, Punjab.

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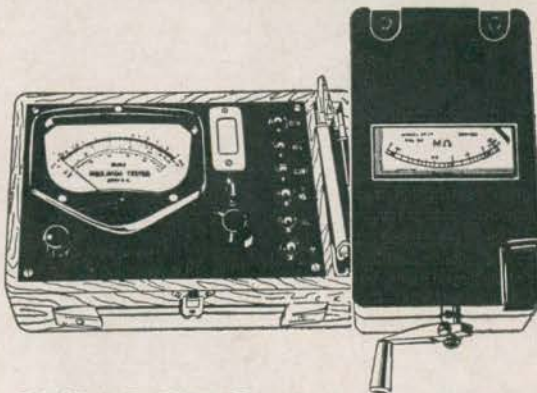
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A25

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ULKA-012

Ernakulam Convention Marks Guidelines for Future Progress

Wider Use of Standards Urged for Industrial Growth and Productivity

■ The Indian Standards Convention was started on a modest scale in 1954 as a forum for interchange of views on standards programmes and policies among scientists, engineers, producers, traders and consumers. Over the years, the Convention has snowballed into a national event, and in times of economic stress, such as the present one, the deliberations of the

conference, which attracts many eminent people from diverse fields of activity, assume added significance because of their purposive and fruitful character. The Tenth Convention at Ernakulam attracted over 600 delegates from all over India (in addition to those from Ceylon, Lebanon, Liberia and UAR). The participants represented scientific and technological institutions, industry

The imposing P. M. Paily Pillai Building which was the venue of the technical sessions





At the registration counter, Dr A. N. Ghosh greets Shri Erach A. Nadirshah, former Vice-President of ISI

and trade, and departments of the Central and State Governments. They had before them an intensive programme of business centering around discussions of as many as 107 selected technical papers dealing with such

diverse subjects as import substitution, metricization problems, industrial productivity, small-scale industries, training of standards engineers, technical editing and publishing, etc. The lady delegates had a session specially

A view of the dais at inauguration. From l Shri Joseph Chakola, Chairman of the Reception Committee; Shri D. Sanjivayya, Union Minister of Industry; Shri Bhagwan Sahay, Governor of Kerala; Dr A. N. Ghosh, Director General, ISI; Shri P. Govinda Menon, Union Minister of State, Ministry of Food and Agriculture; and Shri P. Kesavan, Secretary of the Reception Committee (standing on extreme right)



scheduled for them on standards for the home. It was the first time that such a session was held and the lively and fruitful discussions showed that it had proved immensely popular.

A feature of the Ernakulam convention was the award for the first time of ISI Fellowships to 179 eminent scientists and technologists in recognition of their meritorious contributions to the development and promotion of national standards. The founding of the Institute of Standards Engineers, a professional body with the object of promoting understanding and appreciation of the principles, techniques and practices of standardization among professional engineers and technologists was another highlight.

INAUGURAL FUNCTION

Shri Bhagwan Sahay, Governor of Kerala, inaugurated the Convention on 26 December 1966 in the Town Hall of Ernakulam in the presence of a distinguished audience of over 900. Shri D. Sanjivayya, Union Minister of Industry and President, ISI presided over the inaugural function.

Messages wishing success to the Convention were received from Dr S. Radhakrishnan, President of India; Dr Zakir Husain, Vice-President of India; Smt Indira Gandhi, the Prime Minister; Shri S. K. Patil, Union



Shri D. Sanjivayya, Union Minister of Industry and President ISI, arrives for the inaugural function

Minister of Railways; Shri Manubhai Shah, Union Minister of Commerce and Shri J. R. D. Tata.

The welcome address was given by Shri Joseph Chakola, the Chairman of the Kerala State Board of the All India Manufacturers' Organization and of the Convention Reception Committee. Among others who spoke at the inaugural function were Shri Prabhu V. Mehta, Vice-President, ISI; Shri B. D. Somani, President, All India Manufacturers' Organization and Dr A. N. Ghosh, Director General, ISI.

GOVERNOR'S ADDRESS

In his inaugural address, Shri Bhagwan Sahay, Governor of Kerala tracing the history of the standards movement said that though as an organized movement, standardization was a modern concept which had arisen to satisfy the compulsive needs of the industrial revolution, it had its roots in the distant past. Some elementary form of standardization must have existed in all human societies from the earliest times. The archaeological excavations at Harappa,

Mohenjo-daro and other sites of the Indus Valley Civilization, which flourished some 5 000 years ago, showed evidence of standard measures, standard methods of construction, standard methods of storage of food materials, standard sizes of bricks and standard ways of dealing with a number of other necessities of life. The standard sizes and shapes of bricks, the basic masonry unit, common to a large number of sites spread over a wide area, testified to the existence of established commercial codes and standardized techniques of production under guild or government control some 5 000 years ago in India. In the literature pertaining to early historical times and the middle ages there was ample evidence of the use of standards and standardization in commercial practice in a variety of economic and religious activities. This was so because the standards were the very fabric of sophistication of human

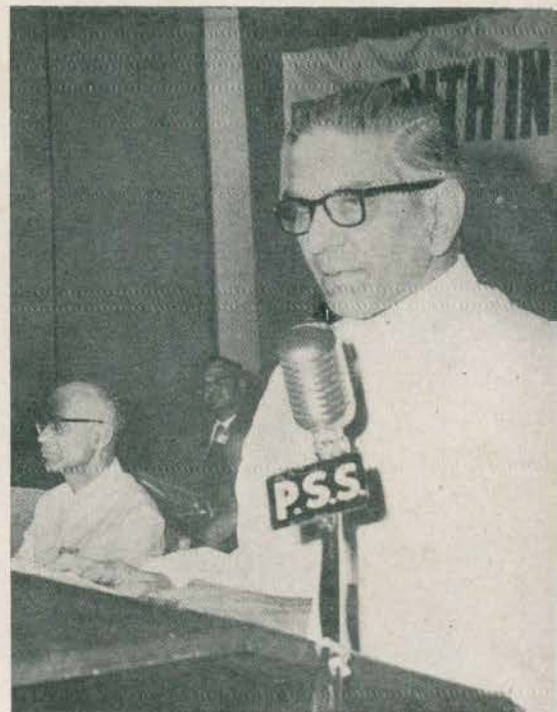
Inaugurating the Convention, Shri Bhagwan Sahay, Governor of Kerala commended the role of standards in the forward movement of industry in Independent India

activity. The more sophisticated a society the greater was the need for production and exchange of goods and services, which, in turn, emphasized the need for standards to regulate production and exchange of goods.

Shri Bhagwan Sahay referred to the forward movement of industry in Independent India and commended the achievements of ISI in enlisting voluntary co-operation from eminent experts all over the country to establish national standards in different fields of economic endeavour, such as agriculture and food products, chemicals, civil engineering, consumer products, mechanical engineering, electro-technical, metals, textiles, etc. Extending a warm welcome to the delegates on behalf of the Government of Kerala, Shri Sahay particularly congratulated the Fellows of the Indian Standards Institution who by their devoted work, as Chairmen of the ISI Committees, had made important contributions to the standards movement.

PRESIDENT'S KEYNOTE

Presiding over the inaugural function, Shri D. Sanjivayya, Union Minister of Industry and President ISI, underlined the need to gear up





A section of the distinguished gathering at the Inaugural Function

the country's economy on a more productive footing to achieve self-sufficiency and self-reliance in matters of industrial development, food requirements and defence preparedness. With self-reliance was linked the capacity for self-sustaining growth which called for the generation of economic capacities that would enable the country to have a steady and satisfactory rate of growth in industrial as well as agricultural fields without dependence on external aid.

Shri Sanjivayya emphasized the vital role which Indian Standards could play in the drive for import substitution and optimum utilization of indigenous industrial capacities and resources. As standardization led to over-all economy, waste reduction and increased productivity, it was imperative to formulate and implement more and more standards at all levels.

The Minister pointed out that agriculture would soon emerge as a large-scale modern industrial undertaking in which standards would play a very important role. ISI had developed a large number of standards for agricultural implements, seeds, fertilizers, pesticides and storage and handling practices, a proper implementation of which would help in raising of the

agricultural output and cutting down of the food imports substantially.

Shri Sanjivayya reviewed the contributions which standards could make in the field of consumer protection, quality assurance and export promotion. The world of export was severely competitive. One could sell only if prices were lower, the goods were up to the desired quality and specifications, and the purchasers had confidence in the seller's capacity to fulfil contracts. Standards made it possible to meet effectively the challenges of price and quality. Shri Sanjivayya commended the efforts of Kerala State to earn a handsome proportion of the country's foreign exchange through the export of food and cash crops, coir and coir products, handlooms, handicrafts, etc. He hoped that the small-scale industrialists of Kerala, who were responsible for the bulk of the production, would make increasing use of Indian Standards and ISI Certification Marks Scheme to capture more foreign markets.

The full text of the Presidential Address appears on pages 103-05.

Absorbing moments — Shri D. Sanjivayya, Union Minister of Industry and Dr A. N. Ghosh, Director General, ISI



GREETINGS FROM ISO PRESIDENT

In a message, read out by Shri Prabhu V. Mehta, Shri Jehangir J. Ghandy, President, International Organization for Standardization and Vice-President, ISI, who could not participate in the Convention, because of indisposition, extended his warmest greetings to the delegates. Shri Ghandy emphasized the importance of standardization, particularly of international standards, to developing countries and quoted the experience of India to derive valuable assistance from the ISO Recommendations in her efforts to promote exports of both raw-materials and manufactured goods.

Many of the countries in Africa, Middle-East and Far-East, Shri Ghandy said, were in a state of continuous evolution from purely agricultural economy to a state of mixed agricultural and industrial society. While the rate of industrial production in most of the countries could be considered satisfactory, with a few exceptions, the quality of industrial production was of a lower standard than normally acceptable. Shri Ghandy referred to the facility available to the developing countries to participate in and benefit from the international work of standards through enrolling themselves as 'Corresponding Members' of ISO which involved payment of only a nominal fee. ISO in collaboration with the United Nations would also be holding a special seminar on 'Standardization in the Developing Countries' on the occasion of its next General Assembly in Moscow during June 1967.

Shri Ghandy commended the pioneering efforts of ISI to provide organized training to standards engineers. He was glad that the facility of comprehensive training in standardization technology available with ISI was being availed by the neighbouring countries, such as Malaysia, Thailand, the Philippines and UAR.

WELCOME ADDRESS

Earlier in his welcome address, Shri Joseph Chakola, Chairman of the Reception Committee and Chairman of the Kerala State Board of the All India Manufacturers' Organization, spoke of the pivotal role of standards in the mass production of goods and services. In this machine age, hundreds of thousands



An inspiring message from Shri Jehangir J. Ghandy, President of the International Organization for Standardization (who could not attend the function due to his indisposition) is read by Shri Prabhu V. Mehta, Vice-President, ISI

of articles of the same size, shape, colour, weight and performance had to be produced in large quantities and sold in widespread areas at all times at uniform prices. This necessarily involved the adoption of certain minimum norms and specifications at various stages of production—selection of raw materials, instrumentation, various stages of processing and all that goes to ensure the quality of finished goods. Being an important factor in the efficient utilization of the available resources, standardization had a particular significance for India to ensure increased productivity.

Shri Chakola made a reference to the agriculture-based economy of Kerala which was gradually turning into an industrial economy. Many large, medium and small-scale industries, both in public and private sectors, such as the Cochin Oil Refinery, the Hindustan Machine Tools Factory and the Cominco Benani Zinc Ltd, had come up. Cash crops like cashew, spices, tea, coir, rubber, etc, had developed considerably. A new industry, fishing, had made giant strides and held considerable hopes to become the biggest foreign exchange earner in a short time. Shri Chakola drew attention

to the importance of standards for establishing a network of flourishing and efficient industries and for maintaining and improving upon the quality of output on a continuous basis.

Shri B. D. Somani, President, All India Manufacturers' Organization (AIMO), joined Shri Chakola in welcoming the participants and spoke of the emphasis laid by AIMO on the need for the industry to maintain standards and high quality. Commending the unique service rendered by ISI to provide standards which would improve the image of India's products in the world markets, Shri Somani recalled the close association of AIMO with the activities of ISI.

K. L. MOUDGILL PRIZE

The 1966 K. L. Moudgill Prize was awarded to Shri G. C. L. Joneja, Commissioner, Civil Supplies, Union Ministry of Commerce, for his enduring contribution in consolidating India's position in the international trade in jute, the country's biggest foreign exchange earner. Announcing the award, Shri S. K. Sen, Deputy Director General, ISI, recalled how the prize was instituted in 1958 to



Shri G. C. L. Joneja receives the 1966 K. L. Moudgill Prize from Shri Bhagwan Sahay, Governor of Kerala

commemorate the distinguished services rendered by Dr Moudgill to ISI and the country. Dr Moudgill had made invaluable contribution to the development and strengthening of the standardization movement during the early years through his mature judgement, sound technical knowledge, and skill at diplomacy and human relations. Shri Sen pointed out that Dr Moudgill was widely remembered and respected in this part of the country. As Ex-Pro-Vice-Chancellor of the Travancore University and Director of Research of the erstwhile Travancore State, Dr Moudgill spent his youth in shaping the industrial and educational policies of the Travancore State.

The K. L. Moudgill Prize which carries a cash award of Rs 1 000 is given yearly to any citizen of India who may be selected as having rendered most conspicuous service to the cause of standardization in the country. Earlier recipients of the Award are: Dr Lal C. Verma (1958), Late Lala Shri Ram (1959), Shri G. D. Joglekar (1960), Shri T. V. Ramamurti (1961), Shri B. S. Krishnamachar (1962), Shri Prabhu V. Mehta (1963), Dr G. S. Hattiangdi (1964), and Dr N. N. Dastur (1965).

The Citation accompanying the 1966 award, which was given away by Shri Bhagwan Sahay, said:

"Capable administrator, imaginative organizer and distinguished civil servant, Shri Gurcharan Lal Joneja, Commissioner, Civil Supplies, Union Ministry of Commerce, has made an

enduring contribution in consolidating India's position in international trade in the country's biggest foreign exchange earner, namely, jute and jute products through standardization, quality control and certification marking.

"As Chairman of the Sectional Committee for Jute and Jute Products of the Indian Standards Institution, Shri Joneja achieved the very difficult task of reconciling conflicting interests of producers, manufacturers, traders, consumers and technologists and effectively mobilizing their co-operation to establish as many as 14 standards covering different types of jute bags, hessian and sacking, all in a brief span of 3 years. In this task Shri Joneja's qualities of dynamism and



Shri G. C. L. Joneja

leadership, his specialized technical knowledge and deep understanding of the problems of producers and consumers gained in his capacity as Jute Commissioner and leader of numerous delegations abroad have played a decisive role.

"It was under his Chairmanship three years ago that the study group on Quality Control and Preshipment Inspection of Jute Goods unanimously recommended the introduction of compulsory quality control in jute mills right from the initial stage of production to the point of shipment of finished goods under the ISI Certification Marks Scheme. Today, the presence of ISI Certification Mark is a necessary pre-requisite for the export of a number of jute products. The good relations forged between the producer and the consumer through the operation of 134 ISI Certification Marks licences in 70 jute mills in the country bear testimony to the vision, initiative, tenacity and pragmatic approach of Shri Joneja and inspire confidence that the industry would continue to gain in competitive strength and reap a bigger share in the world.

"Shri Joneja's standardization activities have not been confined to the sphere of jute alone. As Chairman of the Sectional Committee for Lac and Lac Products, he has played a notable role in promoting the cause of this important export commodity through improvements in the methods of test and rationalization of inspection procedures.

"For these and other notable contributions to the cause of standardization, the Indian Standards Institution presents the 1966 'K. L. Moudgill Prize' to: Shri Gurcharan Lal Joneja."

ISI FELLOWSHIPS

The award of the ISI Fellowships to 179 scientists, engineers and others for their distinguished services as past chairmen of the Sectional Committees, Division Councils and Advisory Committees of ISI was announced for the first time at the Ernakulam Convention. Thirty of the recipients or their representatives were present to receive the awards from Shri Bhagwan Sahay, Governor of Kerala.

Introducing the recipients, Shri B. S. Krishnamachar, Deputy Director General, ISI, stated that the Fellowship was instituted to accord due recognition to the outstanding contributions made by a person to the development and promotion of



Dr A. N. Ghosh felicitates Dr K. L. Moudgill as he receives the ISI Fellowship from Shri Bhagwan Sahay

standardization activity in different spheres of industry. The full list of the awardees appears on pages 137-9.

VOTE OF THANKS

Dr A. N. Ghosh, Director General, ISI, said that he was grateful to all individuals and organizations who had put in tireless efforts for the success of the function. Expressing his gratitude to Shri Bhagwan Sahay and Shri D. Sanjivayya for their inspiring lead, Dr Ghosh referred to the increasing awareness of the need for promoting standards particularly in the developing regions of the world. At the meeting of the Directors of Standards Institutions in the ECAFE region, which Dr Ghosh attended recently at Bangkok, it was decided to set up an Asian Standards Committee with the object of establishing more standards bodies in the countries of the region. The ECAFE countries were alive to the need for active participation in the work of formulating international standards by ISO and IEC to ensure that these standards took note of the particular requirements of the region. Action to provide specialized training to the standards engineers on regional basis was also expected to be taken in the near future.

Dr Ghosh paid his tribute to Dr Lal C. Verman, the founder Director General of ISI, who could not be

present at the Convention, being out of the country. During the past 20 years, Dr Verman had made pioneering contributions in the field of standardization which had won recognition both at home and abroad.

Dr Ghosh specially thanked Shri Joseph Chakola and his band of dedicated colleagues and associates for

making excellent arrangements for holding the Convention.

Thanking delegates for travelling over long distances to participate in the function, Dr Ghosh said that ISI owed its success to the willing co-operation received from all sectors of the national economy. He hoped that this co-operation will continue to grow and prosper.

TECHNICAL SESSIONS

The technical sessions held in the P. M. Paily Pillai Multi-Storey Building, discussed wide-ranging problems faced by various sectors of economy and the contributions which standards could make towards their solution. The subjects covered were 'Standardization for Import Substitution', 'Metric Changeover—Remaining Tasks', 'Company Standardization and Productivity', 'Standardization and Small-Scale Industries', 'Training in Standardization Technology', 'Standardization for Technical Editors and Publishers', and 'Standards for the Home'. As many as 107 selected papers were presented for discussion. Highlights of the deliberations of the various sessions are briefly mentioned below; detailed proceedings appear on pages 106-36.



The Governor, Shri Bhagwan Sahay, is profusely thanked



At the flag hoisting ceremony — The flag of the Indian Standards Institution was hoisted by the Director General, Dr A. N. Ghosh amidst deafening crackers and fireworks

IMPORT SUBSTITUTION

The session emphasized that the tasks of import substitution should be tackled on a war footing and suitable machinery must be devised to achieve concrete results. The country had a tremendous capacity to develop her own know-how, which should be made available to all concerned through a suitable machinery. It was suggested that the Government should take steps to set up a Central Cell to watch the progress of the work in this field.

While appreciating the work done by ISI in the field of import substitution, delegates emphasized that ISI should formulate suitable codes of practice to facilitate recovery of scarce materials from industrial wastes and workshops scrap. The formulation of a scheme to be worked out jointly by the Directorate General of Technical Development and ISI was suggested to give impetus to the task of import substitution throughout the country.

METRIC CHANGEOVER

Although considerable progress had been made in the field of trade and commerce in the adoption of the

metric system of weights and measures, much still remained to be done in the field of industrial production. A large

proportion of the Indian industry still worked on inch dimensions and a systematic approach was called for to make them to changeover to the production of materials and products in metric system. The delegates felt that the task would be greatly facilitated if the industries started using materials conforming to standards and changed their designs in the light of relevant Indian Standard specifications.

The session also considered a survey carried out by the Directorate of Weights and Measures in the Union Ministry of Commerce for assessing the progress in metric changeover in the engineering industries. It was found that in the matter of drawings and products, the progress had generally been satisfactory. A number of manufacturers in these two fields had changed over to the use of metric system. In the North, the minimum percentage of those who had changed over was 50 while in the other three regions, it stood around 25 percent only. Quite a good number of manufacturers had already planned for complete switch-over. The period by which the fps units could be given a good-bye varied from industry to industry as well as from place to place; June 1966 was stated to be the earliest while the latest went beyond December 1968.



Shri and Shrimati Joseph Chakola with Dr K. L. Moudgill — Consultations continue even outside the conference rooms

Attention was also drawn to the difficulties of metric changeover posed by industrial collaboration with overseas countries. It was suggested that a closer scrutiny should be made of all future collaboration agreements to ensure that as far as possible the design of the products was based on metric units and accepted Indian and International standards.

COMPANY STANDARDIZATION

The discussions emphasized the importance of in-plant standardization or standardization at the company level as a management tool for increased industrial productivity through better co-ordination, quality control, streamlining of administrative procedures and variety reduction. It was felt that the management should give all possible encouragement to this movement and help set up standards cells in their companies to rationalize and co-ordinate various functions. The role of ISI in making available training facilities to industrial personnel for organizing company standards operation was commended.

It was felt that lack of attention to standardization at plant level was responsible for high inventory levels and unnecessary locking up of a lot of precious capital, which had to be avoided especially under the present-day conditions in the country when materials and components were so scarce.

STANDARDIZATION IN SMALL-SCALE INDUSTRIES

It was generally agreed that small-scale industries should form their own associations and pool their knowledge and resources with a view to deriving maximum benefits from quality marking schemes such as the one operated by ISI.

The delegates emphasized that there was need for Small Industries Service Institutes (SISI) to enlarge their testing facilities so as to serve an increasing number of small entrepreneurs. The small industries on their part should take greater advantage of the technical know-how offered by SISI as also of the facilities provided by the State Departments of Industries through quality marking schemes. Standard specifications should be widely adopted in order to create a better home market and to develop competitive strength in foreign markets.

While noting that ISI had published a number of standards which could profitably be employed to orient the



Decision Making — The Organizing Secretary Shri Kavaljit Singh and Dr A. N. Ghosh with Shri Joseph Chakola (from l to r)

production at small industry level on right lines, it was felt that the Institution should run specialized courses for giving training to the small industrialists in in-plant standardization. The large-scale sector could also extend a helping hand to the small industrialists by making available to them technical know-how and thereby enabling them to produce goods according to established standards.

TRAINING IN STANDARDIZATION TECHNOLOGY

Since the promotion of standardization greatly depended upon the appre-

ciation of its value by management, it was suggested that suitable programmes directed to developing management appreciation should be organized along with the training of the specialist engineers. The general consensus was that training of standards engineers should be objective and ensure the appreciation of theory as well as practical applications. The view was also expressed that labour union workers should be given opportunity to develop at least an elementary understanding of the basic tenets of standardization so that workers could be induced to cooperate in the standardization movement. Productivity Councils and management institutions should pool



An informal group. Seated l to r are Shrimati A. N. Ghosh (who was responsible for Ladies' Programmes), Shri S. K. Sen and Dr K. L. Moudgill



Over a hundred ladies registered as delegates. A special session on Standards for the Home was scheduled for them

their resources with the universities and technical institutions to provide suitable training facilities in the field of standardization technology.

STANDARDS FOR THE HOME

The session, specially arranged for the housewives, considered measures for protecting the consumer against substandard, injurious and adulterated products with particular reference to the steps that women should take in this direction. Various aspects of consumer protection including price structure, variety and quality of products, safety of electrical and other household appliances, adulteration of food products, consumer organizations and certification marking as an assurance of quality were discussed.

It was pointed out that, as consumers, housewives had to be much more active and take greater interest for their own well being by organizing consumer associations and facilities for testing consumer products. With the socio-economic changes that were taking place in the country, women had less and less time to attend to household chores and it was important that steps should be taken to facilitate the job of house-keeping by ensuring that the food products, electrical appliances and other articles marketed for use in the home were free from adulteration and hazards to health and life. If more and more manufacturers took to certifying their products, ordinary shoppers, it was felt, would be greatly benefited and shoddy products would be driven off the market in due course.

STANDARDS FOR TECHNICAL EDITORS AND PUBLISHERS

The problems of improving publication standards with a view to meeting the challenge of expanding needs of education, research and industry for text books, technical and popular science periodicals, monographs, instruction manuals, etc, were discussed by technical writers, editors and publishers.

Delegates pointed out that the demand for technical publications for disseminating the results of scientific research and for carrying out programmes of industrial development was rapidly growing. Such publications had to be properly planned, written and produced at a low cost so that they could meet the

specific needs of the readers to whom they were directed. Suggestions advanced included the formulation of a code of practice for the guidance of authors, editors and referees; development of a national manual style to achieve uniformity in verbal and non-verbal elements of publications; and establishment of standards for scientific and technical publication in Indian languages. It was also felt that an integrated programme of training publication specialists conversant with various phases of publication mechanics was urgently needed. Such programmes should be organized at various levels, such as full time university courses on technical writing at graduate and post-graduate level, on the job training, refresher courses, summer schools and technical workshops.

RECEPTION COMMITTEE

A large measure of the credit for the success of the Convention must go to the excellent management of the conference affairs by the energetic Reception Committee headed by the very amiable and winsome Shri Joseph Chakola. In keeping with spirit of the time, the usual dinners, banquets, etc, associated with such functions were cut out and the money thus saved was contributed to the National Drought Relief Fund. Special mention may also be made of the valuable co-operation extended by the All India Radio and the press, particularly the local press, to generate a lively interest in the proceedings of the Convention through their extensive coverage, first hand reports, and well-informed comments.



Dr A. N. Ghosh thanks the press for co-operation and lively interest in the deliberations of the Convention

Standards for Self-Reliance*

■ It is a matter of great pleasure for me to be with you today at this Inaugural Function of the Tenth Indian Standards Convention. As the President of ISI, I take this opportunity to extend a warm welcome to all the delegates who have come to participate in this Convention. We have amongst us the delegates from Ceylon, USSR, Liberia and Lebanon. I am happy to note that ISI Conventions are attracting the attention of our friends in the neighbouring countries. During the last few Conventions delegates from many countries have joined us. It is my hope that many more countries will send delegations to future Conventions and exchange experience with us. To our friends from overseas I extend a very special welcome.

SELF-RELIANCE

The country is now in the first year of its Fourth Five-Year Plan. A major objective of our economic planning is the achievement of self-reliance. Self-reliance not only means freedom from dependence on foreign aid, but also involves the establishment of acceptable minimum standard of living for the masses and a continuing rise in the standard. With self-reliance is linked the capacity for self-sustaining growth. What is needed is to generate economic capacities that will enable the country to have a steady and satisfactory rate of growth both in industrial and agricultural fields without dependence on external aid. We have, therefore, to gear up our economy on

a more productive footing so as to achieve self-sufficiency and self-reliance in the matter of our development and general economic growth as also our requirement for food and our defence. It is in this context that standardization activity in general and the Indian Standards Institution in particular can make significant contribution.

In the field of industry, many steps have already been taken towards self-reliance. The industrial programme for the Third Plan was intended to lay the foundation of rapid industrialization over the next plan periods on a sustained basis and with increasing independence of outside aid. In view of this, the establishment of basic capital and producer goods industries with emphasis on machine-building programmes and the acquisition of related skills, technical know-how and designing capacity were accorded a prominent place in the Third Plan. The industrial programme was expected to strengthen the industrial base and make significant advance towards the creation of a modern self-reliant industrial structure. These expectations have been largely fulfilled. Still I must say that in the past we have been relying too much on foreign collaboration and have been over-anxious to avail ourselves of foreign aid just because it was somehow readily forthcoming and appeared to be the easier way to establish thriving industries. A change in this outlook is now called for. Concerted efforts will have to be made to make the fullest possible use of our industrial capacity and to draw on our indigenous capabilities and technological skill. New industries have to be set up and new techniques evolved, which would result in avoidance of import or



Shri D. Sanjivayya, Union Minister of Industry delivering the presidential address

substitution of hitherto imported components by those produced indigenously.

SUBSTITUTION IN ENGINEERING INDUSTRY

While there is a limit to what we can do in regard to substitution so far as basic raw materials are concerned, there is vast scope for Indian technicians and engineers in regard to spares and components. At present, we are dependant on external supplies for a variety of spares, components and equipment for continuing the production up to the capacities we have built over the years. Continued production in these fields can only be facilitated by organizing an intensive programme of interchangeability of spares and components. And here standardization can be of great help. Standards furnish authoritative information and data of vital interest to industry, such as specifications for materials, dimensions, performances, finish, etc. Standards of size, shape and type which provide for

*Text of the 'Presidential Address' by Shri D. Sanjivayya, Union Minister of Industry, on 26 December 1966 at the Inaugural Function of the Tenth Indian Standards Convention held at Ernakulam.

ready interchangeability, enable assembly methods to be successfully adopted for mass production, minimize stock-piling and conserve transport resources. Besides, standardization results in overall economy and avoidance of wastage, which, in its turn leads to maximum productivity. I have no doubt that in the context of our urgent need for import substitution and optimum utilization of our indigenous industrial capacities, ISI, which has been engaged in the task of preparing national standards for the past about two decades, will definitely play a very vital role. I am glad to learn that one of the sessions of the present Convention is devoted to 'Standardization for Import Substitution'. No less than 34 papers have been contributed on the subject, which indicates recognition of the importance of standardization to this very vital task before the nation.

AGRICULTURAL SELF-SUFFICIENCY

In the field of agriculture, need for self-reliance is even more pronounced. Adverse weather conditions for successive years and consequent droughts and shortages have brought into sharp focus the necessity of giving the highest priority to our programmes for increasing agricultural production. We have to do away with our food imports, increase our exports of agricultural and agriculture-based commodities, raise living standards by increasing domestic availabilities and supply the raw material requirements of the country's growing industrial activity. In the achievement of these objectives also, standardization can make significant contributions. Standardization of agricultural implements and inputs like fertilizers, seeds, pesticides goes a long way in increasing the yield per acre. It is gratifying to note that ISI has formulated a number of Indian Standards for agricultural implements, seeds, fertilizers, pesticides, storage structures and preservation processes. Widespread implementation of these standards can help in raising our agricultural output and thereby cutting down our food imports substantially. Modern methods of agricultural production have to be adopted in place of ancient systems of tilling the soil. Agriculture will soon emerge as a large-scale modern industrial undertaking in which standards will play very important role.

EXPORT PROMOTION

Closely linked with import substitution and avoidance of imports is our need for export promotion. Export is a matter of survival for us. Like any other country—developed or developing—India cannot do without import of some types of materials and machines. However, the import can only be sustained by a corresponding effort to export steadily increasing quantity of goods. Let me, however, mention in this context that the world of exports is severely competitive. It is no respecter of nations. Our friendly relations with any country will not necessarily assure us trade with that nation. You can sell only if your prices are lower than those of the competitors and your goods are of the desired quality and specification and the purchaser has confidence in your ability to continuously deliver the goods as contracted. Consumer confidence can only be won through vigorous application of quality standards. Standardization makes it possible to meet the challenges of price and quality effectively, in that it helps to reduce the cost of production and also offers consumers' satisfaction through maintenance of quality standards. ISI's activity in establishing standards for various goods, therefore, represents an important step in the direction of promoting our exports.

There is no doubt that implementation of Indian Standards and the use of ISI Certification Marks Scheme for products and processes will improve the quality of goods whether meant for export or for home consumption. However, to step up our export trade, there is the necessity of getting the exports inspected before shipment. It is gratifying to note that a large number of export goods have been brought under pre-shipment inspection and quality control under the Export (Quality Control) Inspection Act. In a number of cases like jute and jute products, steel, cables, etc, Government of India has made ISI Certification a compulsory pre-requisite for export. These are vital steps. Much more, however, remains to be done in the field of implementation of standards if we have to improve the country's image in foreign markets.

While talking of exports and export promotion, I must make a reference to the important role played by Kerala in this field. As is well known, Kerala earns a handsome proportion of foreign exchange for the country

through its exports of fish and frog-legs, food and cash crops, coir and coir products, handlooms and handicrafts, etc. Production of these export items is undertaken in the State mostly on a small scale. Standardization being an effective instrument of promoting small-scale industries as well, I hope the small industrialists in Kerala as elsewhere, would derive maximum benefits from ISI Standards and ISI Certification Marks Scheme. This will bring about maximum possible cost economies and improvement in the quality of their products which, in its turn, would enable them to capture more foreign markets. Small scale entrepreneurs face special problems of raw material quality, laboratory facilities, which are obstacles in their way to quality production in a sustained manner as required by ISI Certification Marking. The technical session of the Convention on 'Standardization and Small-Scale Industries' would be of special interest to small industrialists in Kerala as it would discuss primarily the small-scale industries in the Southern region of the country with particular emphasis on exports. This session will, no doubt, find satisfactory answers to some of the problems of small-scale industries.

QUALITY ASSURANCE TO CONSUMER

While standardization plays an important role in the fields of higher productivity, import substitution and export promotion, it comes to the rescue of the common consumer by bringing about improvement in the quality of products. There is no denying the fact that the common consumer in the country today is rather bewildered because of a large variety of complex products which are being thrown into the market and are being boosted up through high-pressure publicity. The lay consumer has no means to assess their quality or to judge their suitability. What he needs, therefore, is authentic information about the intrinsic value of the products. And he can have it only if the products are manufactured in accordance with known standard specifications laid down by a national body like ISI enjoying public confidence and having no commercial interest in the manufacture or sale of products. It is heartening to note that ISI provides assurance of quality to the consumers

by issuing licences to apply ISI Certification Mark on products produced according to Indian Standards.

This aspect of ISI's activity is of special importance to housewives, who, I think, are the principal beneficiaries of industrial standardization in the field of consumer goods. There is no doubt that certification marking of goods helps housewives in making proper assessment of quality of products. However, the extent of protection that they derive from such marking would depend on the support they lend to make this service effective. I am afraid this aspect of the question is not always realized by beneficiaries of the protection afforded by the quality marking scheme. Housewives in Kerala are enlightened and progressive in their outlook. I would, therefore, expect them to give a lead to housewives elsewhere in the country in the matter of creating wide-spread demand for ISI certified goods and ensuring feed-back of consumer experience to standards making committees of ISI and certification marking authorities. In this context, the session of the Convention dealing with 'Standards for the Home', which has been specially organized for ladies, has an important role to play and I am confident that the women of India will evince greater interest in the work of ISI. I would, therefore, advise ISI to organize in every Convention a session of interest to the housewife.

COMPANY STANDARDIZATION

While ISI has been doing commendable work in the field of formulating and promoting the use of national standards, I would like to point out that standardization effort of the country cannot be limited to ISI alone. Our country is vast. Our resources are not that large. Our needs are urgent. What is called for, therefore, is a much greater proliferation of standardization activity in levels other than national, namely, association and company. The need of the hour is to maximize production through improvisation, adaptation, substitution and conservation. Optimum use has to be made of the large untapped reservoir of ability and technical knowledge obtaining in this great country of ours. Confidence has to be built in our own scientists,

technologists and other specialists. And I think company standardization provides an excellent means for the achievement of these objectives. A well-organized company standards department would continuously address itself to the peculiar problems of the enterprise, concerned with substitution of imported materials and components, evolution of new designs selecting special sizes and varieties of nationally standardized items for the industrial use of the enterprise, limiting varieties of components and materials going into production and products coming out of the factory and so on. It is imperative, therefore, that consciousness of the potential of company standardization is created among the various industrial units in the country. It is really heartening that ISI has been helping Indian industries to produce their own standards by sponsoring various programmes for promoting the establishment of company standardization. Starting in 1963, these programmes have aroused considerable interest and more than hundred prominent industrial units in the country have already availed themselves of ISI's services in organizing their in-plant standards activity. This is quite a good beginning. However, much more has yet to be accomplished. I am looking forward to a time in the foreseeable future when all prominent industrial units in the country established or to be established, whether large or small, whether primary or ancillary, would have organized their own company standardization activity. I am happy to find that one of the sessions of the Convention will discuss the vital subject, 'Company Standardization and Productivity'.

SAFETY OF ELECTRICAL APPLIANCES

I would now like to touch upon the aspect of implementing Indian Standards. As President of the Indian Standards Institution, I am aware that the electrical manufacturers have been participating in the formulation of Indian Standards by way of attending the meetings and joining in the discussions of the ISI Committees. It is, however, not sufficient that their participation is limited only to assistance in the formulation of Indian Standards. Their responsibilities go further in implementing these standards

in their production programmes. There are many electrical goods, namely, domestic electrical appliances, which the people of this country are using in large numbers. Unfortunately, the people are not in a position to judge the quality and by unwillingly buying substandard and unsafe equipment they endanger life and property. It is here that the Indian Electrical Manufacturers' Association (IEMA) can play an important role by promoting the use of the Certification Marks Scheme of ISI. I understand that IEMA has been pursuing this question with ISI and I do not know what has prevented adoption of the ISI Certification Marks Scheme on a large scale by the IEMA members. I would suggest that the members of IEMA should endeavour to have as many of their products as possible covered under the ISI Certification Mark. This will definitely provide an incentive to others outside your Association to similarly take to ISI Certification Mark.

In conclusion, may I remind you once again that the nation has set before herself the goal of self-reliance and self-sufficiency in every field. There is no going back. This, in itself, emphasizes the urgent need for expeditious formulation and widespread implementation of more and more standards at every level. I am confident that standardization activity in the country will be so stimulated as to play a progressively significant role in the achievement of our national objective of self-reliance.

I earnestly hope that this Annual Standards Convention will make important contribution to the future well-being of the nation by arousing standards and quality consciousness in the country.

Let me take this opportunity to express, in my capacity as President of ISI, the gratitude of the Institution to the State Government of Kerala and to you, Sir, its Governor, for having given your full co-operation to us and to the Kerala State Board of the All India Manufacturers' Organization, Ernakulam, who invited this Convention to Ernakulam. My sincerest thanks are also due to AIMO itself, to the Reception Committee and its Chairman, Shri Joseph Chakola for excellent arrangements they have made for the Convention in this picturesque city of Ernakulam.

Proceedings of Technical Sessions

■ In all, 107 papers were received for discussion at the seven technical sessions. The papers presented and discussed at each of the sessions are listed in the beginning of the session proceedings, which are reported in the following pages. The seven Technical Sessions were:

- a) Standardization for Import Substitution (S-1)
- b) Metric Changeover — Remaining Tasks (S-2)
- c) Company Standardization and Productivity (S-3)
- d) Standardization and Small-Scale Industries (S-4)
- e) Training in Standardization Technology (S-5)
- f) Standards for the Home (S-6)
- g) Standards for Technical Editors and Publishers (S-7)



Shri F. A. Jasdanwalla initiates the discussions in the session on 'Standardization for Import Substitution'. The session was presided over by Dr A. N. Ghosh, Director General, ISI (centre); Shri B. S. Krishnamachar, Deputy Director General, ISI, acted as the Secretary

S-1 Standardization for Import Substitution

Chairman	Dr A. N. Ghosh, Director General, Indian Standards Institution, New Delhi
Discussion Leader	Shri F. A. Jasdanwalla, Indian Standard Metal Co Ltd, Bombay
Secretary	Shri B. S. Krishnamachar, Deputy Director General, Indian Standards Institution, New Delhi
Date	27 December 1966

PAPERS PRESENTED

S-1/1	Indian Standards and import substitution	Indian Standards Institution, New Delhi
S-1/2	Contribution of standardization to the substitution of scarce materials	Hans E. Riebensahm, UNDP Expert, Indian Standards Institution, New Delhi

OPENING REMARKS

■ Welcoming the delegates, Dr A. N. Ghosh, Director General, ISI, said that he was obliged to take the chair in the absence of Shri T. Swaminathan who was to preside over the Session but had recently gone to Brussels as India's Ambassador to Belgium.

Dr Ghosh referred to the 34 papers received for discussion from authors from all branches of engineering and technology which indicated the importance that import substitution had assumed in the context of emergency and the urgent need to conserve scarce and imported materials. Although in some fields imports might have to continue to some extent,

S-1/3	Integrated standards programme for accelerating import substitution	A. P. Banerji, Indian Standards Institution, Calcutta
S-1/4	Role of standardization for import substitution	S. Krishnamurthy, Indian Telephone Industries Ltd, Bangalore
S-1/5	Quality assurance for import substitution with particular reference to heavy duty commercial vehicle Industry	T. V. N. Kidao, Ashok Leyland Ltd, Madras
S-1/6	Role of standardization in indigenisation of imported spares for defence vehicles	A. K. Chatterjee & S. R. Moorthy, Ministry of Defence (DGI), Ahmednagar
S-1/7	Import substitution in Hindustan Machine Tools Limited	V. A. S. Setty, M. K. Handa & K. Nagesha Rao, Hindustan Machine Tools Ltd, Bangalore
S-1/8	Standardization for import substitution in the field of water supply fittings and builders' hardware	C. R. Rama Rao, Indian Standards Institution, New Delhi
S-1/9	Suggestions for substitution of imported asbestos in asbestos-cement products	K. L. Arora & Y. C. Gokhale, Regional Research Laboratory, Jorhat, Assam
S-1/10	Standardization for import substitution with particular reference to river-valley projects and agricultural development	Jatindra Singh, Irrigation Works, Punjab, Chandigarh
S-1/11	Standardization for import substitution with aluminium	R. K. Chari, Indian Aluminium Co Ltd, Calcutta
S-1/12	Metal arc welding industry and import substitution	V. R. Subramanian, Indian Oxygen Ltd, Calcutta
S-1/13	Studies on recovery of zinc from viscose rayon waste	R. N. Chakraborty, K. L. Saxena & S. N. Chattopadhyaya, Central Public Health Engineering Research Institute, Field Centre, Kanpur
S-1/14	Some aspects of rationalization of boiler steels	A. S. N. Rao, Bharat Heavy Electricals Ltd, Tiruchirapalli
S-1/15	Review of progress made by the mints on import substitution	D. C. Mukherjee, India Government Mint, Hyderabad
S-1/16	ISI's role in import substitution	P. S. Shah, Cable Corporation of India Ltd, Bombay
S-1/17	Import substitution of raw materials used in wire and cable industry	P. K. Sen Gupta, Indian Cable Co Ltd, Golmuri, Jamshedpur
S-1/18	Import substitution in the field of overhead transmission lines	EMC Projects Pvt Ltd, Calcutta
S-1/19	Amendment of existing specifications leading to greater use of aluminium and steel in manufacture of ACSR and AAC	N. M. Bhatt, Indian Metal Traders, Udhna (Surat)
S-1/20	Role of standardization for import substitution	M. B. Ajwani & V. Subramanian, Heavy Electricals (India) Ltd, Bhopal
S-1/21	A new series of economic electric motors with aluminium windings	C. E. B. Rao, Bharat Bijlee Ltd, Bombay
S-1/22	Hot dip aluminizing of transmission line hardware	L. Venkatasubbu & A. Krishnaswami, Seshasayee Industries Ltd, Vadalur
S-1/23	Indigenous vegetable transtuffs <i>vis-a-vis</i> import substitution	C. Koteswara Rao & Y. Nayudamma, Central Leather Research Institute, Madras
S-1/24	Role of talc in import substitution	Dalpat R. Lodha, Udaipur Mineral Development Syndicate (P) Ltd, Jaipur
S-1/25	Progress in the substitution of minerals in the world and their possibilities in India	R. K. Sinha & N. R. Gupta, Indian Bureau of Mines, Nagpur

there were other fields where they could be dispensed with altogether.

PRESENTATION OF PAPERS

To facilitate discussion, the papers were divided into the following five groups:

Group I—Indian Standards and Import Substitution. Papers S-1/1 to S-1/4

Group II—Import Substitution in Engineering Industries—this was further divided into the following subgroups:

a) Ferrous—Papers S-1/5, 6, 7, 12 and 14

b) Non-ferrous—Papers S-1/11, 13 and 15

c) Civil Engineering—Papers S-1/8, 9 and 10

Group III—Electrical Industries—Papers S-1/16 to S-1/22

Group IV—Chemicals and Minerals—Papers S-1/23 to S-1/30

Group V—Research for Import Substitution—Papers S-1/31 to S-1/34

INDIAN STANDARDS AND IMPORT SUBSTITUTION

Presenting the paper 'Indian Standards and Import Substitution' Shri B. S. Krishnamachar (ISI) drew attention to the efforts made by ISI to specify indigenous materials in preference to imported materials in various Indian Standards dealing with metals, electrical industry, textiles, paints, metal containers, agriculture and food products, and general engineering.

The paper 'Contribution of Standardization to the Substitution of Scarce Materials', by Mr Hans E. Riebensahm outlined the measures adopted in Germany with regard to substitution of scarce materials and suggested the type of standards that could be developed and the ways these could be implemented to meet the challenge during emergency. As Mr Riebensahm had returned to Germany after completing his assignment at ISI, the paper was presented by Shri B. S. Krishnamachar.

The paper by Shri A. P. Banerji (ISI) briefly reviewed the import requirement of Indian industry and the role that industrial research and standardization could play in import substitution. Depicting the entire field of import substitution by a three-dimensional diagram, Shri Banerji

S-1/26	Research leading to import substitution in petroleum industry	A. G. Menon, Defence Research Laboratory (Materials), Kanpur
S-1/27	Indigenous substitution for imported lecithin, lanolin and palm oil (tinning oil)	S. D. Thirumala Rao, B. A. R. Somayojulu, G. Azeemuddin, K. Venkateswara Rao, K. Viswanathan, B. R. Reddy, B. Panduranga Rao, S. Dhanvantari & G. Siva Rami Reddy, Oil Technological Research Institute, Anantapur, Andhra Pradesh
S-1/28	Mineral based industries and import substitution	V. K. Rao & B. N. Bhattacharyya, Geological Survey of India, Exploratory Wing, Nagpur
S-1/29	Role of research in import substitution with particular reference to plastics and other synthetic high polymers	S. R. Nair & R. T. Thampy, Sri Ram Institute for Industrial Research, Delhi
S-1/30	Investigations leading to import substitution of some metals and minerals	A. S. Gopalachari, Indian Bureau of Mines, Nagpur
S-1/31	Role of metallurgical research for import substitution	B. N. Das, National Metallurgical Laboratory, Jamshedpur
S-1/32	Possible avenues of research leading to import substitution	N. R. Pillai, The Fertilizers and Chemicals Travancore Ltd, Alwaye
S-1/33	Research leading to import substitution	K. S. Thomas, The Fertilizers and Chemicals Travancore Ltd, Udyogamandal
S-1/34	Indigenous drugs for import substitution	Bhagwan Dash, Health Division, Planning Commission, New Delhi; & Ramesh Bedi, Ministry of Health, New Delhi

proposed the setting up of 'substitution establishment cells' for each industry with a 'central cell' for the purpose of co-ordination, and for creation of a 'consultancy consortium' to guide the industry to progressively use indigenous know-how and materials.

Dr S. Krishnamurthy (Indian Telephone Industries Ltd, Bangalore), while presenting his paper, brought out the importance of cost reduction for promoting exports and increasing the foreign exchange earnings. The cost of finished products could be brought down by standardizing methods of production, increasing the interchangeability and developing indigenous substitutes without affecting the quality of end product.

DISCUSSION

During discussions, Shri R. S. Mani (Standard Batteries, Bombay) pointed out that the acceptance of some of the emergency standards brought out by ISI had been more than encouraging.

Advocating a dynamic outlook with regard to lead, Shri Mani said that the attempt should be to find ways and means to produce more lead than to reduce the consumption of the metal. Referring to refractories, the import of which had been stopped, Shri K. C. Choudhuri (Research, Designs and Standards Organization, Chittaranjan) expressed doubts about the quality of indigenously available refractories which according to his information was affecting the quality of steel. Some of these refractories were not quite satisfactory for certain specialized uses. Shri Choudhuri also said that it was not possible to substitute galvanizing completely by aluminizing in the case of large structures.

Lt-Col M. C. Bhatnagar (Army Headquarters) underlined the need to promote designs which would ultimately result in import substitution of materials. Shri M. M. Shenoy (Hindustan Steel Ltd) laid stress on the proper utilization of the arisings resulting during the manufacture of

special steels. Shri Nagesha Rao (HMT, Bangalore) said that they had set up an import substitution cell which was showing commendable results.

Shri S. S. Gill (Department of Industries, Punjab) desired that the purchasing agencies of the Government, such as Posts & Telegraphs, Railways and Defence should use more and more indigenous materials and thus set example for the private sector to follow suit.

Referring to paper S-1/1, Shri P. B. Jayakumar (Guest, Keen, Williams, Ltd) wanted that ISI should persuade users to specify steels included in IS : 1570-1961, production of many of which had already started. Further, the import of mild steel bars, medium carbon steels, etc, could also be drastically cut down or even stopped as these materials were being produced in the country.

Shri S. Raghaviah (Ministry of Industry) laid stress on the utilization of scrap after proper segregation, for example for making ingots for use in foundries. The stainless steel scrap found its use in the manufacture of pen and nibs and other consumer items. Shri Raghaviah desired that ISI should lay down standards for efficient utilization of scrap. Dr C. V. S. Ratnam brought out the need for keeping an eye over the cost while attempting import substitution.

The Discussion Leader, Shri Jasdhanwalla also touched upon the need for better utilization of scrap, bearing in mind, of course, the cost factor. He also emphasized the necessity to develop our own designs which would minimize the need for overseas collaborations. The Chairman, Dr Ghosh clarified several points brought up during the discussion.

IMPORT SUBSTITUTION IN ENGINEERING INDUSTRIES

Ferrous Metals

Introducing his paper, Shri T. V. N. Kidao (Ashok Leyland Ltd, Madras) stated that no compromise was possible with regard to standards for the products of the automobile industry, whether it was road transport, railways or ships, as it involved the safety of travelling public. Therefore, highest quality control must be observed for the manufacture of automotive spare parts. He emphasized that unless the suitability of the indigenous components had been



Shri Nagesha Rao of HMT, Bangalore, making a point for import substitution

fully proved after life tests under actual service conditions, substitution of imports of such items was bound to lead to serious consequences.

Dr A. K. Chatterjee* (DGI, Ahmednagar) presenting his paper, stated that a comparative study of the typical compositions of different armour steels indicated that extravagant use of nickel for production could be curtailed without adversely affecting the functional aspect of the fighting tanks. Based on detailed studies, he suggested alternative compositions for armour steels. A study of the German practice on armour welding had indicated considerable scope for reducing nickel in the armour welding electrodes. The paper also discussed the possibility of substitution and rationalization of nickel bearing low alloy steels in various components of vehicles. This would result in considerable reduction in the national requirement of nickel. A study of the German practice in engineering steels from 1925 to 1950 also revealed the possibility to meet the major functional requirements of the automobile industry by adopting

three types of case carburizing and a few numbers of through hardening steels. Dr Chatterjee also suggested development of suitable aluminium alloy bearings in place of babbit bearings, use of aluminium in place of copper for electrical wirings, dynamos and starter motors, and substitution of terne plate by aluminium for manufacture of fuel tanks. It was further suggested that automobile designers and manufacturers could use aluminium die-castings in place of zinc base castings for various automotive components.

Introducing the paper on 'Import Substitution in Hindustan Machine Tools', Shri V. A. S. Setty (HMT, Bangalore) stated how separate cells set up by HMT for designs, standards and import substitution, were evolving specifications on the basis of workability giving every consideration to import substitution. Similar cell should be set up by each factory to systematically scrutinize the various imported items and to find alternative as far as possible. The results achieved by individual industries could be made known to other production units so that the country, as a whole, could be benefited.

Presenting his paper, Shri V. R. Subramanian (Indian Oxygen Ltd, Calcutta) said that mild steel for electrode core wire which was hitherto being imported had now been fully substituted by indigenous steel conforming to the national specifications. This had resulted in an annual saving of Rs 25 million. From the number of imported stainless steel core wires each differing slightly in its specifications, three types had been rationalized for production by mutual agreement between major electrode manufacturers and the potential producers of these steels, particularly the Alloy Steel Project, Durgapur. Shri Subramanian observed that though India was very fortunately placed with regard to titanium bearing minerals, about 50 percent requirement of rutile, an important constituent in the flux covering for electrodes, was still being imported. He underlined the need for stepping up production and also for the formulation of an Indian Standard for rutile for electrode coating. Necessity for rationalization of specifications to reduce import of raw materials was also pointed out. Shri Subramanian warned that indiscriminate substitution could inflate the cost.

In his paper Shri A. S. N. Rao (Bharat Heavy Electricals Ltd, Tiruchirappalli) had proposed certain amendments supported by additional information to make the existing Indian Standards relating to boilers and pressure vessels more versatile. He described the attempts made by his organization to make use of the indigenous steels. Experiments were under way to replace the stainless steel stems by nitrided or chromium plated medium carbon steels. Results on the use of hard chromium plated stems were also encouraging.

DISCUSSION

Shri N. V. Meswani pointed out that Premier Automobiles Ltd had achieved 93 percent import substitution in the case of commercial vehicles and 95 percent as far as other vehicles were concerned. Shri Meswani advocated the need for protecting the consumer from the poor quality of spare parts available in the market and for establishing some means for independent quality checks.

Lt-Col Bhatnagar (Army Headquarters) underlined the need for setting up of a material research organization to undertake investiga-

*Presently with ISI.

tions on problems of specific nature to help development of import substitution oriented designs.

Shri U. C. Sharma (Bhilai Steel Plant) pointed out that through mutual consultations and necessary experiments Bhilai Steel Plant could produce special steels required by various industries. The plant was already supplying steels for the machine tools industry and defence organizations.

Shri M. M. Shenoy (Hindustan Steel Ltd, Rourkela) suggested that manufacturers of commercial vehicles should willingly accept the sizes of various steels as standardized by ISI. He added that HSL, Rourkela could meet 60 percent of the total requirement of steels of automobile manufacturers.

Shri R. Viswanathan of Bharat Heavy Electricals Ltd, requested ISI to formulate a separate standard for classification and coding of covered electrodes for mild steels and low alloy steels applicable for the fabrication of pressure vessels. Such standards existed in some of the overseas countries, namely, Germany, USSR, and Czechoslovakia.

Shri V. S. Bhatia of Siemens Engineering, Bombay, proposed that some kind of a guarantee should be available to the manufacturers about the availability of various materials, if they offered to change their designs.

Shri K. J. Rao of Tata Hydro-Electric Power Supply Company underlined the need for formulation of an Indian Standard specification for automobile components on an emergency basis. He also suggested substitution of some of the long term tests with alternate tests.

Shri Jayakumar wanted ISI to take up work on standardization of control system equipment.

Shri T. V. Subba Rao of Forest Department, Andhra Pradesh urged the need for substituting steel and cement by timber in the construction of industrial sheds and labour and staff quarters to effect economy.

Replying to some of the queries, Shri Kidao stated that Ashok Leyland Ltd, Madras did carry out the life tests and had been running the vehicles for about 32 000 km in order to check their dependability and safety. He also stressed the need for the establishment of a competent and independent body for certification of various automobile products to safeguard the interest of both the purchaser and the manufacturer.

Shri V. R. Subramanian stated that

coding of covered electrodes for metal arc welding of mild steel and low alloy high-tensile steels, already existed and it would not be possible to make a separate standard exclusively for the boiler industry. The various properties in such cases should be the subject of a mutual agreement between the purchaser and the manufacturer.

Non-Ferrous Metals

In the absence of Shri R. K. Chari, Shri R. M. Chaudhri presented the paper 'Standardization for Import Substitution with Aluminium'. To facilitate the users of electric busbars in obtaining the correct grade of aluminium, the formulation of an Indian Standard specification was recommended. Attention was also drawn to the existence of a British standard for aluminium bars and sections for electric purposes.

Introducing his paper Dr K. L. Saxena (CPHERI, Field Centre, Kanpur) drew attention to the highly acidic waste waters from viscose rayon industries producing staple fibres, yarn, tyre cord and cellophane. Among other things, the presence of zinc in appreciable concentration rendered the effluents highly toxic and hazardous for human beings. Dr Saxena added that about 86 percent of zinc, worth Rs 3.6 million of foreign exchange, could possibly be recovered from the waste water by chemical precipitation reducing at the same time the water toxicity also.

The paper by Shri D. C. Mukherjea gave an account of the efforts made by the India Government Mint, Hyderabad to employ indigenous raw materials for making coins and also to develop its own minting machines. Shri Mukherjea said that an automatic coining press designed in the mint was under fabrication.

DISCUSSION

Shri J. B. Bhavnani of J. B. Mangharam & Co recommended the production of special quality packing paper for delicate food products by industry with the help of the Government which would save a lot of foreign exchange being spent at present on importing the same.

Shri R. Balasubramanian of Central Institute of Fisheries, Madras disclosed that an aluminium magnesium alloy had been successfully tried in place of copper used for marine purposes. If the alloy was made available commercially, considerable

foreign exchange could be saved.

Commander L. D. Tewari of the Indian Navy underlined the need for a centralized research centre for import substitution to avoid duplication of efforts by various organizations.

Dr Krishnamurthy said that aluminium busbars which have been successfully tried at the Indian Telephone Industries, Bangalore, would replace brass busbars in about a year's time. Regarding the composition of aluminium magnesium alloys for coins, Shri Mukherjea stated that they were using 3.5-4.0 percent magnesium, the remaining being aluminium. This alloy was being used in several countries.

Civil Engineering

In the absence of the authors the papers S-1/8 and S-1/9, were taken as read. Introducing his paper (S-1/10), Shri Jatindra Singh (Irrigation Works, Chandigarh) laid emphasis on drawing up of firm specifications for machinery required for the river-valley projects and on steps to take up the manufacture of the machinery within the country in a regulated manner. Stressing the need for research in the field of metallurgy for the manufacture of different types of machinery, Shri Singh also insisted on the quality marking of the products so as to build up the confidence of the consumer in indigenous substitutes.

DISCUSSION

During discussion on these three papers, Shri M. B. Ajwani of the Heavy Electricals (India) Ltd, Bhopal, stated that they had set up full-fledged cells which were working exclusively to find out substitutes for imported items.

Shri T. V. Subba Rao of Andhra Pradesh Forest Department recalled his experience with regard to manufacture of sawing machinery and availability of spare parts for tractors as well as accessories to suit felling of trees in forests to reduce working costs.

Summing up the discussions of Groups 1 and 2, the Discussion Leader, Shri Jasdhanwalla, pointed out that there appeared to be an urgent need for preparation and wide-spread implementation of standards in some of the fields of engineering industries particularly in the context of the import substitution. Further, there was need for the establishment of import substitution cells in the various

industries on a co-ordinated basis. Shri Jasdanwalla also underlined the necessity to undertake research in spare parts for machinery used in the river-valley projects with a view to taking up their manufacture within the country. Better utilization of scrap also had its own role to play in import substitution. Shri Jasdanwalla also desired priority to be given by ISI to the formulation of standards relating to items of ancillary automotive industry.

ELECTRICAL INDUSTRIES

Introducing Group 3, Shri Jasdanwalla remarked that the electrical industry had achieved maximum import substitution. Most of the papers in the Group dealt with the substitution of copper by aluminium in different branches of the industry, such as winding wires, conductors, busbars, etc. Shri Jasdanwalla was, however, disappointed that no mention was made of the jointing material which was probably due to non-availability of jointing materials and lack of experienced people.

Presenting his paper, Shri P. S. Shah (Cable Corporation of India Ltd, Bombay) highlighted the role of ISI in India's efforts in import substitution, and the scope for expansion of its activities in the years to come. He proposed that producers of raw materials should be given representation on the relevant ISI committees and that standards should be formulated for intermediates, basic materials, testing procedures and instruments, machine elements and machines, etc, which would ultimately lead to import substitution.

Shri P. K. Sen Gupta (Indian Cable Co Ltd, Jamshedpur) said that his paper reviewed the present position, the difficulties as well as achievements of import substitution in the wire and cable industry. He emphasized that adequate technical assistance and advice should be made available to the common customer with regard to alternate designs of cables manufactured from indigenous materials.

Presenting the paper, 'Import Substitution in the Field of Overhead Transmission Lines', Shri Madan Gopal (EMC Projects Pvt Ltd, Calcutta) suggested that the possibility of exporting indigenous overhead transmission lines may be explored. In another paper dealing with ACC and ACSR for overhead power transmission, the author Shri N. M. Bhatt

recommended the use of 99.0 percent purity aluminium in place of 99.5 percent purity aluminium which was in short supply.

Introducing his paper, Shri M. B. Ajwani [Heavy Electricals (India) Ltd, Bhopal] stated that the drive for import substitution could broadly be divided into four main categories, namely, technical know-how, raw materials, components and machine tools. He emphasized the need to put into practice what had already been achieved. Regarding jointing problems, Shri Ajwani stated that his organization had done some developmental work on transformers and switchgears, and replacement of bronze bearings.

In the absence of the author, the paper, S-1/21 was taken as read. Shri L. Venkatasubbu, introducing his paper, said that experiments conducted at Seshasayee Industries Limited on hot-dip aluminizing as a substitute to galvanizing of transmission line hardware like yoke plates, disc insulator caps, socket and clevis ended components had yielded satisfactory results regarding finish, weight of coating and tensile strength.

Discussion

Initiating discussions, Dr A. N. Ghosh referred to the views of the delegates about shortage and inconsistency of raw materials. The raw material required by one industry was, in fact, the finished product of another. The non-availability of a material, therefore, reflected only a particular market situation. Most of the finished products had been standardized, and for others standards were being formulated as and when necessary. Dr Ghosh clarified that ASTM standards or standards of any other overseas country were not the international standards but were the national standards of that particular country and suited the conditions prevailing there. Turning to aluminium, Dr Ghosh said that the stepping up of production was dependent on the availability of more power. As for the transmission of power, more aluminium conductors were needed. All these things had to go together. Dr Ghosh felt that there should be no difficulty about structural steel for which a number of Indian Standards were already available.

Shri V. S. Bhatia drew attention to the possibility to substitute entire motor instead of the various small components only. Referring to the

different sets of regulations that exist in various states, Shri Bhatia underlined the need to unify the same through the State Electricity Boards. A proposal was also made to set up a committee consisting of ISI, State Electricity Boards and the Central Water and Power Commission to consider proper and full utilization of raw materials proposed.

Shri G. N. Pillai of Aluminium Industries Ltd, Kundara pointed out that the commercial grade aluminium having a purity of 99.0 percent was also not freely available in the country. He was doubtful whether the use of galvanized mild steel wire in the manufacture of ACSR, would avoid the possibilities of importing steel.

Dr K. R. Pandit of Tata Hydro-Electric Power Supply Co Ltd, Bombay, wanted attention to be paid to the inter-connected power systems. He underlined the need for co-ordination and uniformity of approach between the various State Electricity Boards right from the planning stage to ensure the desired results.

Shri N. M. Bhatt stated that aluminium busbars (flat bars) with copper face were being successfully used and research work on the production of this material could be undertaken by NML or any other laboratory.

On an enquiry from Shri A. P. Banerji, Shri L. Venkatasubbu elaborated that they had not conducted experiments on hot-dip aluminizing of mild steel sheets or wire and their work mainly related to malleable cast iron components. The protection of steel surface from oxidation during aluminizing, was a matter of selection of flux and also the quenching process which gave the required strength and elongation properties. Shri Ajwani observed that during the last two decades quite a number of factories for manufacturing electrical equipment, foundries and plants had been established and there was not much justification for continuing to take overseas help in these fields. Regarding jointing materials, he stated that some of the manufacturers had done quite a bit of work on the subject and that an Indian Standard for this was under print. Referring to a point made out by the Chairman, Shri Ajwani stated that though steel wire was the finished product of wire manufacturers, it was also an intermediate for the cable manufacture. He supported the need to give representation to some of the manufac-

turers of raw materials on the committee formulating specifications for finished products.

Shri Jose pointed out that 11 kV cable could replace paper insulating cables and that a draft Indian Standard specification in this regard was under preparation.

CHEMICALS AND MINERALS

Introducing his paper, Shri C. Koteswara Rao (CLRI, Madras) stated that vegetable tanstuffs were widely used in the production of a variety of leathers, such as sole, industrial and E. I. leathers. The most important tanstuffs were avaram bark, *babul* bark, myrobalan fruits and wattle extract. Wattle extract, which was imported to an extent of about 26 000 tonnes valued at Rs 27 million per year, formed one of the major tanstuffs used by the tanning industry. The total annual requirement of various types of tannin extracts was around 70 000 tonnes.

Referring to the very high electrical insulation properties of steatite talc under suitable circumstances, Shri Dalpat R. Lodh in his paper recommended its use for making lava objects, namely, radar plugs, aeroplane spark plug shields, gas burner tips and other high frequency electrical insulation items. These items would not only save a lot of foreign exchange but would also be very cheap. Because of its strong resistance to heat up to 1 100°C and chemically inactive nature, talc could also be used for making insulating bricks. In the paper industry, brilliant white talcum powder could profitably replace the imported china clays and titanium dioxide to a large extent.

The paper 'Indigenous Substitution for Imported Lecithin, Lanolin and Palm Oil (Tinning Oil)' summarized the work done at the Oil Technological Research Institute, Anantapur, Andhra Pradesh on the development and evaluation of groundnut and cottonseed lecithins, lanolin and rice bran oil and *mahua* fat, as substitutes for the imported soylecithin, lanolin and palm oil for tinning.

Introducing his paper, Shri B. N. Bhattacharyya (Geological Survey of India, Nagpur) observed that the import of ores and minerals during the Third Plan period registered an increase of nearly 84 percent; the items included, apatite, sulphur, asbestos, fluorspar, cryolite, clay, iron ores, etc. The first three items accounted

for about 75 percent of the imports. Substitutes for these raw materials from indigenous sources could be developed through:

a) proving of new reserves by detailed exploration,

b) improving indigenously available raw materials through research or processing, and

c) utilization of indigenous materials by formulation of new standards keeping in view the end use.

While presenting his paper, Shri S. R. Nair (Sri Ram Institute for Industrial Research, Delhi) stated that the projected growth of the polymer industries warranted extensive research and development work so that the industry in the near future could be dependent on indigenous talent and technology. For effective utilization of research, it was necessary to have close liaison between research and industry which would be possible only if:

a) the problems of direct interest to the industry were selected by mutual discussions between the production and the research personnels and periodic discussions were held between the two groups; and

b) targets were achieved in a reasonable period of time through proper planning and effective execution.

Shri Nair strongly felt the need for research and developmental work by competent groups within the factory premises in close collaboration with the laboratory research team. For better utilization of talent and resources, the author desired the attention to be concentrated on a smaller number of projects.

Discussion

Initiating the discussion, Dr M. S. Vaidya observed that the results brought out in papers S-1/25, 28 and 33 would save important chemicals in short supply, such as soda ash. Commenting on paper S-1/27, Dr S. Krishnamurthy stated that they had not met with success in the use of palm oil after tin plating, as this oil could not be used after a period of 10-12 days.

Summing up the discussion, Dr A. N. Ghosh said that ISI had formulated specifications for a number of electrical equipment and what was needed was their wider implementation both by the purchasers and the manufacturers.

RESEARCH FOR IMPORT SUBSTITUTION

Presenting his paper, Shri B. N. Das

(NML, Jamshedpur) pointed out a few of the potential fields involving production of secondary metallurgical components, wherein research might help in substitution or conservation of scarce or non-indigenous ferrous and non-ferrous metals. He also laid emphasis on research and development work to find out new clad and composite products and development of new fields of their application. Wider use of surface alloying which was an extension of composite product was also suggested. Shri Das pointed out the necessity of research aimed at reclamation of defective engineering components by weld, braze and solder repairing and development of suitable electrodes for such reclamation having less or no non-indigenous metals.

During the introduction of his paper Shri Bhagwan Dash (Health Division, Planning Commission) brought to light the fact that nearly 70-80 percent of the drugs used were being imported in a country which abounded in valuable medicinal plants and had inherited a rich medical knowledge. The long foreign rule came in the way of the development of the indigenous products and also engendering a sense of diffidence about the indigenous know-how. In the present strained economic situation, it was necessary to exploit these resources for import substitution and export promotion. *Ayurvedic* classics were replete with references to therapeutically useful single drugs and compound preparations. Folk-medicine in India also provided a rich source of knowledge of medicinal plants. The author mentioned that these drugs were widely used by *vaidyas*, *hakims* and even doctors of modern medicine for curing such of the conditions as were now treated with imported drugs. Shri Bhagwan Dash made the following specific suggestions for exploiting indigenous drugs in place of imported ones:

a) Extensive survey of medicinal plants,

b) Large-scale cultivation of useful plants,

c) Establishment of an agency for supplying fresh and well-processed/well-preserved raw and prepared drugs to the consumers/pharmacies, and

d) Standardization of pharmaceutical products and tests for genuine drugs.

Concluding, the author recommended that popular and non-toxic drugs and those on which some research had already been done should

be taken up directly by the medical officers in preference to imported drugs. Other single drugs and compound preparations could be clinically screened under scientifically controlled conditions for their therapeutic effects. Further the single drugs proving to be useful therapeutically should be taken up for pharmacognostic, chemical and pharmacological studies and their active-principles isolated.

Discussion

Initiating discussions, Shri K. C. Choudhuri suggested that the Directorate General of Technical Development, in consultation with ISI, should work out a scheme so that import substitution could be effectively carried out throughout the country. Shri Choudhuri pointed out that research with regard to cladding of metal had been carried out at the National Metallurgical Laboratory for several years but it was not possible to make use of this work as the material was not available in the country. Shri Choudhuri also did not favour the replacement of solder tin by cadmium as cadmium was a costlier and imported material. Shri B. N. Das added that after a certain amount of research, antimony could replace up to 7 percent of tin. However, some research was needed on the subject.

Shri S. R. Pandey of Fertilizer Corporation of India (FCI), Sindri stated that most of the items required for the construction of fertilizer factory, which were being imported till recently involving heavy foreign exchange, were now slowly being developed locally in collaboration with the Heavy Engineering Corporation, Ranchi. Stainless steel, another important raw material required by the fertilizer industry, was also expected to be made available by the Alloy Steel Project, Durgapur and the Mysore Iron & Steel Works, Bhadravati. Coming to other requirements of fertilizer industry, such as chemicals and raw materials, Shri Pandey stated that FCI had developed methods for making its own catalyst and as a result this material was not imported any more. In the realm of designs, FCI was not importing the medium pressure vessels but was only purchasing raw materials required for their construction.

SUMMING UP

Summing up the deliberations of the Session, the Discussion Leader,

Shri Jasdanwalla noted that there was a widespread awareness for import substitution. In this regard, it would be useful to take into account the various factors brought out in different papers. He appreciated that aluminium was finding more and more uses in the country thus replacing copper which was in short supply. He regretted, however, that the production of aluminium was not adequate to meet the demand. In this connection, Shri Jasdanwalla appreciated the suggestion of Shri N. M. Bhatt to use commercial grade 99.0 percent aluminium in place of EC Grade of 99.5 percent purity. He was, however, glad that the industry was alive to the situation and hoped that the entire requirements of aluminium would be produced in the country very soon. In order to substitute aluminium for copper and to make people conscious about the use of this metal, there was need to make aluminium available at a lower cost, with Government's help if necessary. He also suggested reduction in excise and other duties on aluminium to popularize its use.

Shri Jasdanwalla emphasized that considerable quantity of scarce material could be recovered from industrial wastes and workshop scrap. Similarly, in melting process and in galvanizing, lot of metal was used and some quantity of zinc could be recovered from it. The savings from these processes would run into quite a few millions of rupees. Shri Jasdanwalla was also of the view that small manufacturing units could attain some measure of self-sufficiency by preparing their own drawings of equipment required by them. Once a compact design was ready, the small manufacturers could find another manufacturer to make the equipment for them. This was all the more in their interest because procurement of an import licence was not an easy job for them. He then referred to the work being done by the Indian Engineering Association on welding electrodes and hoped that other industries would offer their co-operation to achieve good results as early as possible.

Shri Jasdanwalla referred to shortage of time for discussion at the Session and proposed that a seminar to discuss the subject in great detail should be organized. He also recommended that the imported raw materials should be released only to such of the industries where the use of these materials was inescapable.

CONCLUDING REMARKS BY CHAIRMAN

The Chairman, Dr A. N. Ghosh remarked that the problem of import substitution was not such that it was to be faced only under conditions of emergency though attention to it was drawn by the events in the recent past. Import substitution literally meant utilization of our own resources in preference to the resources available elsewhere. A nation howsoever rich it might be, could not totally dispense with imports. The real development of a country meant the utilization of its resources to the fullest possible extent in all fields, such as agriculture, engineering, technical know-how and design procedures. The emergency conditions existing in the country at present had made us to realize that we had to depend on ourselves and that we had to cut down imports to the barest minimum extent. Dr Ghosh stated that India had no dearth of talent and technical know-how. What was required was to exploit the available expertise to the best advantage of the country.

Dr Ghosh commended the efforts put in by the Hindustan Machine Tools Ltd (HMT), to achieve import substitution through the establishment of 'import substitution cells'. He was glad that HMT had cut down on the variety of steels which were being imported hitherto as a result of its collaboration with a number of overseas organizations.

Referring to Shri Kidao's paper, Dr Ghosh pointed out that company standardization in automotive industry was very important. He also assured the delegates that ISI would do whatever was possible in the field of standardization of spare parts for the machinery required for river valley projects.

Concluding, Dr Ghosh thanked all the authors for their contributions and particularly congratulated Shri Bhagwan Dash for his excellent paper about the indigenous drugs. By suitable research and exploitation of the medicinal plants available on a large scale within the country, it may be possible not only to reduce imports of allopathic drugs but also to establish an export market. Dr Ghosh thanked the Discussion Leader, the Secretary and the delegates for their co-operation in conducting the Session.

The Session concluded with a vote of thanks to the Chair.

S-2 Metric Changeover—Remaining Tasks

Chairman	Shri K. V. Venkatachalam, Officer on Special Duty, Ministry of Industry, New Delhi
Discussion Leader	Shri V. B. Mainkar, Director, Weights & Measures, Ministry of Commerce, New Delhi
Secretary	Shri S. M. Razvi, Deputy Director (Mech Engg), ISI, New Delhi
Date	28 December 1966

PAPERS PRESENTED

S-2/1	What retards the metric changeover	K. Venkataraman, P. S. G. College of Technology, Coimbatore
S-2/2	International standardization — its effect on our changeover	R. K. Mukherji & M. P. Kumaraswamy, Central Mechanical Engineering Research Institute, Durgapur
S-2/3	Problems of metric conversion of designs of inch products of overseas collaborators	A. K. Gangopadhyay, Hindustan Machine Tools Ltd, Bangalore
S-2/4	Implementation of the metric system by the instrument industry in India	Dr C. S. Rao, Andhra Scientific Co, Masulipatam
S-2/5	Adoption of metric fasteners in automobile industry	N. V. Meswani, Premier Automobiles Ltd, Bombay
S-2/6	Problems of metric changeover in light engineering industry	A. N. Mukerji, Indian Oxygen Ltd, Calcutta
S-2/7	Metric changeover in the textile industry	R. N. Rao & M. Radhakrishnan, Bombay Textile Research Association, Bombay
S-2/8	Changeover in metric system in aircraft industry	V. M. Ghatage, Hindustan Aeronautics Ltd, Bangalore
S-2/9	Metric changeover in Western Railway	C. Sundaram, Western Railway
S-2/10	Metric changeover in building industry	P. D. Chawla, Central Public Works Department, New Delhi
S-2/11	Metric changeover in Andhra Pradesh PWD	P. T. Malla Reddy, Public Works Department, Andhra Pradesh
S-2/12	Complete metric changeover — some suggestions	K. Satyanarayana, K. C. P. Ltd, Madras
S-2/13	Further steps to complete the changeover	H. Narayana Rao, India Government Mint, Hyderabad
S-2/14	Transactions in metric units — remaining tasks	S. N. Sihno, Weights & Measures Department, Madhya Pradesh

CHAIRMAN'S OPENING REMARKS

■ Welcoming the delegates, Shri K. V. Venkatachalam stated that, significantly enough, the session was being held on the day which marked the completion of the ten-year period prescribed in the *Standards of Weights and Measures Act, 1956*, for putting into effect its various provisions. The legal requirement had been com-

pleted with the issue of a notification recently by which the use of all metric units of weights and measures prescribed under the *Act* had been made compulsory to the exclusion of all other units from 1 December 1966 except in the case of temperature where the use of the °C and °F would continue side by side upto 1 December 1967.

Reviewing the progress of changeover during these ten years in various

spheres, Shri Venkatachalam mentioned that the adoption of metric system in commercial transactions in some cases was satisfactory while, in the case of others, steps were being taken to expedite the full change. The adoption of metric system in school education was more or less complete, though, its progress had been slow in the field of technical institutions. He observed that the changeover in the industrial sphere was a highly complicated aspect because of the interdependence of industries with regard to raw materials, finished product, etc. The changeover by one industry required that it should be effected in some other allied and ancillary industries as well. Industrial collaborations with overseas manufacturers also posed a great problem for the changeover. Whenever Indian industrialists entered into collaboration with an overseas manufacturer, one of the conditions should be that the design of the product was based on raw materials and components conforming either to international or Indian specifications. Where this was absolutely impossible, the attempt should be to switch over to the use of those specifications in the design as early as possible during or at the end of the collaboration period. This step, if accepted widely, would quickly make India self-reliant and also put it on the road to independent industrial development. Further, the existing industrial units should be encouraged to switch over to new designs based on Indian raw materials and specifications. This was a difficult task because it involved complete change of tooling, jigs, fixtures, calculations, etc, and would take some more time to get into gear and work smoothly. It would also require constant vigilance on the part of the Government particularly those concerned with the adoption and enforcement of the metric system in the country. In fact, this work was the very kingpin of the metric reform and was the primary reason which promoted the adoption of the metric system and should, therefore, be followed vigorously in the years to come.

Shri Venkatachalam stated that they could be termed as short-term aspects of the metric reform which would be completed in the course of the next few years. There were, however, certain long-term or permanent tasks which were imposed on the Government by the reform of weights and measures and the most important of those was to ensure that the weights

and measures used in trade, commerce, industry, industrial measurement, education, etc, did conform, within the prescribed tolerances, to the specifications laid down in the law for their performance. For this purpose, Weights and Measures Organizations set up in all the States, which had been verifying periodically various types of weights and measures, etc, used in a large variety of transactions, needed to extend the scope of their activities considerably to newer fields.

PRESENTATION OF PAPERS

For facility of discussion, the papers were grouped as under:

- Group I—Papers S-2/1 to S-2/3
- Group II—Papers S-2/4 to S-2/8
- Group III—Papers S-2/9 to S-2/14

Group I

Shri K. Venkataraman (P. S. G. College of Technology, Coimbatore) in his paper 'What retards the metric changeover', felt that, except for weights and measures in commercial transactions, much remained to be done in the engineering and manufacturing industries. He attributed the delay to the general apathy among the educated in industry and educational institutions. Lack of conviction by industrialists and the consumer about the advantages in the use of metric measurements, and inconsistency in nomenclature and adoption of standards were some of the other reasons mentioned for the slow progress.

In their paper 'International standardization—its effect on our changeover', Shri R. K. Mukherji and Shri M. P. Kumaraswamy (Central Mechanical Engineering Research Institute, Durgapur) briefly surveyed ISO's work in various fields. The fact that ISO had adopted parallel series of recommendations for inch and metric countries, both of which contributed to Indian industrial development, had caused peculiar problems not faced by many other countries. The result was a definite loss in productivity and a burden on economy. The authors felt that education at all levels in the industry and technical institution, extensive organization of rational schemes and parallel development of indigenous designs particularly of items requiring constant or periodical replacement mainly by imported spares would hasten the changeover.

Presenting his paper 'Problems of metric conversion of designs of inch products of overseas collaborators',

Shri A. K. Gangopadhyay (Hindustan Machine Tools Ltd, Bangalore) stated that technical collaboration helped a developing country to utilize its meagre resources for industrial reconstruction with speed and efficiency. After enumerating the problems of changeover to metric system in machine tool industry, he stated that if immediate metric conversion of an inch product was avoided it might create serious mix-up of components resulting in chain reaction affecting production. The work of metricization at a later date would be more difficult and expensive. Shri Gangopadhyay suggested that Government should take adequate steps to ensure that any industry to be newly set up followed metric system only.

DISCUSSION

Shri N. V. Meswani (Premier Automobiles Ltd, Bombay) thought that ISO recommendations did not create any confusion, because, if the Indian Standards on a subject, based on ISO recommendations, were available in metric units the Indian industry would follow those standards instead of the ISO recommendations drawn in inches.

Dr N. K. Gopalan (Ministry of Defence, New Delhi) observed that, to complete the changeover in the industrial sphere, it was very necessary to introduce it effectively at the technical institutions and training centres. Quoting from his own experience at Naval College of Engineering, he explained that it would not be difficult to introduce metric system at the technical colleges because text books of metric system on all subjects of engineering were available.

Referring to a suggestion made in Shri Venkataraman's paper that the Central Government should establish a separate machinery to enforce the metric changeover in each sphere, Shri C. P. Malik (CPWD) informed the delegates that so far as the building industry was concerned, the Government had set up a Central Metric Cell in the National Buildings Organization and similar cells had also been set up in the States and they had been doing quite useful work. The Central Cell had already compiled a handbook for the engineers and architects which was now under print. Besides that, the Central Cell had issued several Metric Bulletins on various subjects which had been circulated by the National Buildings Organization to the concerned departments of the

Central and State Governments, Railways, Municipal Corporations, public undertakings and private organizations.

Shri S. Raghaviah (Small-Scale Industries Organization, New Delhi) stated that effective changeover in the small-scale industries would be possible only when the difficulty of getting replacement of tools and gauges in metric sizes was resolved.

A suggestion was also made that, for effective implementation of metric system, the Directorate General of Supplies and Disposals should tender their requirements only in metric units.

Shri S. K. Sen (ISI) informed the delegates that, according to a recent press report, UK had also decided to introduce metric change in the currency to be followed after a year or two by a change in commerce, trade and education. The actual changeover in the industry would naturally be introduced after the existing British Standards had been converted into metric system.

Group II

Presenting his paper 'Implementation of the metric system by the instrument industry in India', Dr C. S. Rao (Andhra Scientific Co Ltd, Masulipatam) recounted the present position with regard to the adoption of the metric system by the instruments industry, the problems that came in the way of its effective implementation and the steps that might have to be taken to accelerate the pace of complete changeover. He mentioned that the availability and use of instruments in the metric system was not a serious problem although their manufacture in strict conformity to the system did present some problems.

In his paper 'Adoption of metric fasteners in automobile industry' Shri N. V. Meswani (Premier Automobiles Ltd, Bombay) stated that the import substitution of components had been rapidly accelerated due to paucity of foreign exchange, but that had not resulted in hastening the metric changeover because of the overseas designs of many components. He said that changing of the design of the inch components to metric sizes involved major problems. It was not just converting the inch dimensions to metric dimensions, as it involved the basic design of components in the metric system. He explained the problems involved in changeover in fasteners in automobiles and described the methodology and planning of change-

over to metric fasteners which could guide other groups of industries.

Introducing his paper 'Problems of metric changeover in light engineering industry', Shri A. N. Mukherji (Indian Oxygen Ltd, Calcutta) stated that light engineering industry manufactured a variety of industrial equipment and accessories for gas welding and cutting as well as medical equipment and accessories for administration of anaesthesia and analgesia. He said that the guiding factors for conversion of design from inch system to metric system were (a) availability of metric standards on functional aspects; (b) availability of standards in metric system for raw materials, semi-finished and bought-out components; and (c) availability of metric standards for tools, gauges, etc. He hoped that such an approach would provide the basis of planning for many similar industries.

Shri R. N. Rao (Bombay Textile Research Association, Bombay), in his 'Metric changeover in the textile industry', stated that the changeover to metric system in textile industry had lagged behind because the existing machinery, equipment and production practices could not be easily changed over to the new system. While recommending the adoption of the tex system for the textile industry, Shri Rao said that the indefinite policy of the Government in deciding about a suitable metric unit for yarn fineness was partly responsible for the slow progress in metricization.

In his paper 'Changeover to metric system in aircraft industry', Shri V. M. Ghatage (Hindustan Aeronautics Ltd, Bangalore) mentioned that the task of introducing and popularizing metric system was still unfinished because people did not accept changes so easily; it involved both psychological and mechanical readjustment. He enumerated the different problems of changeover to metric system in aircraft industry and suggested the steps to increase the pace.

DISCUSSION

Shri A. K. Gangopadhyay stated that under a collaboration agreement with an overseas firm, it was not necessary that products of original designs only be manufactured. He mentioned that, in many cases, the products had been redesigned in the metric system and prototypes made before commencing production.

Shri S. Raghaviah (Small-Scale Industries Organization, New Delhi)

explained that in the case of scientific and electrical instruments there was no problem for changeover to metric system. There was, however, difficulty in the case of engineering instruments because of the change in the basic unit, that is, from inch to centimetre or millimetre. He mentioned that in the case of fasteners also the difficulty of changeover was confined only to threads.

Shri K. J. Rao (Tata Hydro-Electric Power Supply Co) mentioned that the country's dependence on loans, grants and aids from overseas nations, and insufficiency in the field of technological research were the main reasons for the slow progress of changeover in the industrial sphere.

Shri S. K. Sen felt that lethargy was the main reason for the slow progress in the industrial sphere; if that attitude was changed, the progress could be much faster.

Shri V. B. Mainkar informed the delegates that in the case of fasteners, ISI had appointed a panel to hold discussion on various aspects of changeover in consultation with the manufacturers of machinery and tools as well as users. He felt that by bringing together manufacturers, suppliers and consumers, and others concerned, as in the case of fasteners, a system of changeover in a particular group of industries could be worked out. With regard to the supply of small tools and gauges in metric sizes, Shri Mainkar thought that it would be necessary to augment the indigenous production of such tools as delivery periods for any type of tools varied from 6 to 18 months.

In view of the paucity of tools in the country, the convention recommended that the ISI and other appropriate bodies should take up this matter with the Central Government.

Group III

The paper 'Metric changeover in Western Railway' by Shri C. Sundaram (Western Railway) dealt with the two aspects of changeover, that is, (a) where it could be effected straightaway, and (b) where it had to pass through a transit stage before it came to stay. The steps necessary for the former had already been completed by the Western Railway, and the latter, which involved the manufacturing activities, was in progress.

Introducing his paper 'Metric changeover in building industry' Shri P. D. Chawla (Central Public Works Department, New Delhi) explained the efforts

made by the Government for the changeover in the building industry, and the difficulties encountered in the procurement of modular bricks in Delhi. Mentioning CPWD's progress in the adoption of metric system in architecture, town planning and building industry, he observed that not much progress had been made so far with regard to the conversion of the laboratory equipment into metric units.

In his paper 'Metric changeover in Andhra Pradesh PWD', Shri P. T. Malla Reddy (Public Works Department, Andhra Pradesh) described the progress Andhra Pradesh PWD had achieved in metric changeover. Outlining the tasks that still loomed large, Shri Reddy thought that it might be necessary for the Central Government to extend the time limit for complete changeover.

Shri K. Satyanarayana (K. C. P. Ltd, Madras), in his paper 'Complete metric changeover—some suggestions', felt that it would be more advantageous to introduce metric system in the teaching curricula of the country at the primary stage itself. He also took note of the problems the engineering industry faced in changing over to metric system.

Presenting his paper 'Further steps to complete the changeover', Shri H. Narayana Rao (India Government Mint, Hyderabad) put forth a plea for better publicity in regional languages to drive home the advantages of metric system. With a view to helping the industries and small establishments in solving problems of changeover and also to look after their needs of periodic checking and inspection of gauges, tools and instruments to metric standards, Shri Rao suggested setting up of standard metrology laboratories and consultation bureaux at important industrial centres. Such centres could work in co-ordination with the local Weights and Measures Department so that problems common to commercial weights and measures and engineering establishments could be dealt with uniformly.

Introducing his paper 'Transactions in metric units—remaining tasks', Shri S. N. Sihno (Weights and Measures Department, Madhya Pradesh) explained the difficulties experienced by the public and the field staff of the Department of Weights and Measures in their daily work, and suggested that regulations regarding enforcement of *Weights and Measures Act* should be scrutinized and suitable corrective measures adopted.

DISCUSSION

Shri T. V. Subba Rao (Forest Department, Government of Andhra Pradesh) stated that he was glad to know of the steps already taken by the Central Public Works Department for the introduction of metric system in the building industry particularly about the schedule of rates. He explained how the Andhra Pradesh Government had been able to introduce metric units in the timber industry.

Shri S. K. Sen (ISI) said that Government should take early steps for effective introduction of metric system in the industrial sector. He feared that if the present pace continued, the UK, which had introduced metric system much later, might steal a march over India.

Shri Mainkar stated that there were several mechanized plants producing bricks to metric sizes and suggested that they could be utilized for meeting the requirements. Regarding the suggestion of setting up standard metrology laboratories, he observed that the industrial equipment in the USA was calibrated after a specific period by an authorized laboratory so as to ensure that its accuracy was directly traceable to the national prototype, but, in India, this work had not been taken up, and it deserved immediate consideration particularly in view of the country's developing industries. Disagreeing with the view that lethargy was responsible for the slow progress in the industrial sphere, Shri Mainkar stressed that one of the basic needs for the industrial production was standards, and unless standards were available in metric units, production could not be converted fully. Since the metric standards were now available, the industry should consider rapid change-over.

CONCLUSION

Summing up the discussion, the Chairman, Shri K. V. Venkatachalam stated that the changeover in commerce and trade had almost been completed. With regard to changeover in the industry, he mentioned that it had been well recognized even at the beginning that it was a far more complicated process than the changeover in commerce and trade and the ten-year period prescribed would apply only to commerce and not to the industry and to other technical aspects of the change-over. However, there seemed to be an impression now that the task of metric changeover had been completed and there was very little left to be done,

and as such a sense of complacency had set in. He felt that the changeover in industry was a more complex proposition, and it was necessary to proceed with it on a systematic and rationalized basis. The Chairman suggested that the industrial units should, if necessary, set up small cells to look into the difficulties and problems and review the progress every six months.

With regard to the introduction of metric system in the educational field, the Chairman mentioned that its

adoption in the school education was quite satisfactory, but that was not the case with the technical and scientific institutions. The main reason was non-availability of text books. He agreed that unless the changeover was effected in technical institutions, its implementation in the industrial field would remain incomplete.

The Session concluded with a vote of thanks to the Chairman, the Discussion Leader and the delegates proposed by Dr A. N. Ghosh.

S-3 Company Standardization and Productivity

Chairman	Shri M. K. K. Nayar, Managing Director, The Fertilizers and Chemicals Travancore Ltd, Alwaye
Secretary	Dr A. K. Gupta, Director (Implementation), Indian Standards Institution
Date	29 December 1966

PAPERS PRESENTED

S-3/1	Company standards unit as a centre for co-ordination of the various service functions within an organization	G. C. Bhattacharya & S. K. Bhatia, Heavy Electricals (I) Ltd, Bhopal
S-3/2	Company standardization and productivity	A. K. Mukerji, Indian Oxygen Limited, Calcutta
S-3/3	In-plant standardization — a management tool for better productivity	M. R. Lodh, Devidayal Cable Industries Ltd, Thana
S-3/4	Role of surface roughness comparison standards in higher productivity	V. Venkataraman, Central Mechanical Engineering Research Institute, Durgapur
S-3/5	Increased productivity in building industry	S. Rachkovsky & M. N. Venkatesan, Central Water & Power Commission, New Delhi
S-3/6	A case study of the improvement of material utilization in a forge plant	S. M. Sundara Raju & B. Banerjee, Indian Statistical Institute, Madras
S-3/7	Economy through company standardization	Dr M. L. Bhaumik, National Rubber Manufacturers Ltd, Calcutta
S-3/8	Product standardization at synthetic drugs project	Dr H. L. Bami & Dr G. Ramana Rao, Indian Drugs Pharmaceuticals Ltd, Hyderabad
S-3/9	Company standardization and productivity	H. M. David, The Fertilizer Corporation of India Ltd, Sindri
S-3/10	A case problem — operation of 'Standards' established in a factory	S. M. Sundara Raju & S. V. R. Rao, Indian Statistical Institute, Madras
S-3/11	In-plant standardization in equipment design, maintenance and process control with special reference to the pharmaceutical industry	N. Narasimhachari & S. R. Sen, Hindustan Antibiotics Ltd, Pimpri
S-3/12	Standardization as applied to blast furnace technology in Bhilai	N. C. Ramasubbu, Hindustan Steel Ltd, Bhilai
S-3/13	Standardization of tests and procedures in the briquetting and carbonization plant at Neyveli	Dr C. V. S. Ratnam, Neyveli Lignite Corporation Ltd, Neyveli
S-3/14	How to organize a company standards department	K. Satyanarayana, The K. C. P. Ltd, Madras
S-3/15	Standardization — a fundamental to quality control	A. N. Bhattacharyya, The Metal Box Co of India Ltd, Calcutta

OPENING REMARKS

■ Noting the large attendance at the Session, Shri M. K. K. Nayar, the Chairman, said that it indicated the importance of company standardization in increasing productivity of industrial units. Shortage of raw materials, scarcity of foreign exchange, lack of encouragement to indigenous manufacturers, etc, were some of the factors which were adversely affecting the growth of Indian industry. The need for import substitution to save foreign exchange, he said, was being stressed from various platforms, but systematic efforts to achieve the objective were still lacking. Company standardization provided a means by which the problem could be effectively dealt with. Referring to the work done at the Fertilizers & Chemicals Travancore Ltd to standardize the equipment at the plant level, he said that the work had helped in interchangeability of parts and reduction of inventories.

PRESENTATION OF PAPERS

Co-ordination of Functions

Shri G. C. Bhattacharya (Heavy Electricals, Bhopal), referring to the overseas units with whom they were having collaboration, said that those units had functioned for years and had grown to the present stature after a lot of experience. Even though two of the units might produce circuit breakers, transformers, turbo-generators, motors, etc, designed to meet similar functional requirements to customers' specifications, yet the basic design, raw material requirement, manufacturing process, procedures for stocking and storage and other functions generally followed different patterns. Company standards of those units represented their way of working to suit local conditions. Their documents required to be suitably modified to bring them in line with Indian conditions. Moreover, when an industrial unit was having collaboration agreement with two different firms, from one country or from two different countries, the need for aligning the documents of the collaborators was even more imperative for orderly working of the Indian units. For co-ordinating the various service functions within an organization, the standards department had an effective role and it would be useful if industry in the country paid adequate attention to the subject. Referring to Heavy Elec-

tricals (I) Ltd, he said that the major problem was to get experienced standards engineers and this often dampened management's enthusiasm for the activity. He said that ISI was doing yeoman service in this direction by organizing various seminars and conferences.

Better Productivity

Shri A. K. Mukerji (Indian Oxygen) said that in the field of physical operation, in-plant standards made the maximum contribution towards productivity; these standards or indices were of paramount importance to any industry. He cited some examples where Indian Oxygen Limited was able to increase productivity by restricting unnecessary varieties of products, components and materials within the company. In the case of manufacture of pressure gauges, regulators and cylinder valves, standardization effort was directed in the first instance towards product rationalization to cover different pressure ranges and types. For example, rationalization of pressure ranges for gauges and regulators limited their number to only five, which by and large met the requirements of the industry. In the case of cylinder valves, the number of types had been rationalized to a minimum of four, which covered all applications of 13 different types previously in use. Efforts were then directed towards ensuring maximum number of common parts for a number of products; the five types of regulators have 70 percent common parts, and the three types of cylinder valves about 40 percent common parts. Annual production of the items being high, multiple use of some parts had enabled the company to go in for automats, which resulted in higher productivity. This had also helped in maintaining the inventory at a low level. The materials used in the manufacture of parts had also been standardized, which again contributed towards reduction of inventory and the processing cost from imported virgin metals. Rationalization of bar stock sizes, from 20 different types to only 8, had assisted in the reduction of waste in the non-ferrous stamping operations in the manufacture of parts.

Economy Through Rationalization

Shri M. R. Lodh (Devidayal Cables) emphasized the role of company standardization for communicating policies and decisions of the management down the line. Properly docu-

mented employees' handbook, standing orders, personnel manual, accounts manual, etc, he said, had been very effective in his company; new-comers in the organization did not feel themselves as strangers and they were able to contribute their best in the shortest possible time. Standardization of forms to ensure that proper information was conveyed at different levels was also stressed. This activity had helped the company in eliminating a great deal of paper work and enabled the management to know day-to-day position of cost *versus* budget, plans *versus* achievements, and to take remedial action where necessary. Referring to the purchasing activity, Shri Lodh said that development of company standards (based on national standards) on purchase items had helped them in eliminating separate orders for many similar items under different names. The job of purchasing was made easy because the purchasing departments were not to refer to production departments for quality requirements every time the purchase was made; bulk purchase also made it possible to effect economy. Development of standards for packing wires and cables helped in the reduction of a number of varieties. A direct saving to the extent of 20 to 25 percent was possible through those efforts, which also resulted in more dependence on local vendors on the quality of supply and minimized the inventory carrying cost by increasing the frequency of supply.

Roughness Standards

Shri V. Venkataraman (Central Mechanical Engineering Research Institute) emphasized that the old practice of denoting surface quality by triangle or simply specifying as turned, ground, etc, often led to unnecessary restriction on the surface quality, thereby increasing the cost of production. He advocated development of roughness comparison standards to assist designers in specifying in the drawings the degree of surface roughness required for the component as well as in planning the manufacturing process. In engineering industry, very few surfaces required control of roughness within close limits and, therefore, it was possible to develop the comparison standards without much difficulty.

Industrialized Building

Shri M. N. Venkatesan (Central Water & Power Commission) said that with the increasing tempo of industrialization and consequent increase in the

construction of various heavy engineering enterprises for attaining self-sufficiency on various fronts, the investment in building industry was mounting up from plan to plan. This resulted in an appreciable demand of construction materials, for the achievement of the targets. He emphasized that increased production of building materials, like steel and concrete, on a unified basis would ensure better and more economic use of such building materials, resources of which were limited in our country. The enormous strides made by the building industry in USSR and East European countries during the last decade were mainly due to such standardization in the manufacture, rationalization in design and production of typical elements for use readily on the job. This had resulted in a much quicker design and construction time for not only the minor structures like residential and office buildings, but also for major civil engineering structures like thermal power stations and chemical plants.

Case Study

Shri S. M. Sundara Raju (Indian Statistical Institute, Madras) referred to a case study of improvement of material utilization in a forge plant through development of standards. The plant was engaged in the production of cranks and pins for bicycle and insulator industries; cranks accounted for the bulk of output. The steel rods were the basic material procured from outside, sheared, heated and forged into parts. During manufacture, the end pieces and fins accounted for 70 percent of the waste. The rods were received in various lengths from 3.70 to 6.34 m for one size and 4.50 to 5.66 m for the other. They were sheared to 1.50 m length for 7 cranks to be forged at a time. The study led to the development of economic standard rod lengths for forging 7 to 10 cranks at a time. To reduce the end pieces, standard instructions were developed for the shearing operations. Standards were also developed for replacements of dies and a proper procedure established for controlling the quality during production. As a result of these efforts, average material saving, compared to the base period, worked out to 5.2 percent—about Rs 240 000 per annum. The overall output went up by 12 percent.

Inventory Control

Shri H. M. David (Fertilizer Corporation of India, Sindri) said that a

general survey of the various private and public sector industrial undertakings indicated that the locked up capital in inventories ranged from 10 to 15 percent of the cost of equipment, which was a colossal figure if the total investment in industry was taken into account. The post-independence industrial build-up in the country, he said, had been executed with foreign collaboration, resulting in variety *ad infinitum*. Materials management and inventory control had, therefore, assumed great importance and standardization must be taken up to break through the Gordian knot of variety strangling economic productivity. In Fertilizer Corporation, he said, 17.02 percent of the capital cost of equipment was locked up in stores as spares. Some 10 784 items in the stores had been studied for simplification and standardization with the striking result of reduction to 7 167. In the process, 81 imported items were replaced by indigenous ones leading to a saving of Rs 530 000 during the last two years.

Shri K. P. A. Menon (Alkali and Chemical Corporation of India, Calcutta) supporting the views of Shri David, said that in his organization the spares in stores accounted for 9.18 percent of the capital cost in 1962, but through application of standardization and other management techniques the figure was brought down to 3.5 percent. Plant utilization during the period had also gone up from 85 to 95 percent.

Process Vessels and Equipment

Shri S. R. Sen (Hindustan Antibiotics Ltd) said that in-plant standardization would naturally begin at the plant design stage. Standardization of process equipment occupied an important place when flexibility had to be built in without loss of efficiency. Standardization of operating procedures and plant maintenance would follow as a corollary. The last but not the least in importance was the standardization of process control techniques. Referring to Hindustan Antibiotics, he said, standardization in process vessel design was adopted in the factory, yielding considerable benefits. The first production plant was started in 1953 when fabrication facilities available in the country were limited and necessary equipment had to be purchased from various countries. The manufacturing processes were not fully established due to the fact that antibiotics industry was still then relatively young. Over and above,

action had to be taken for expansion of capacity. Naturally, standardization activity could not be immediately started; the equipment fell into a number of varieties, for example, process vessels alone were of 45 different specifications, out of a total of 175 installed. After a few years when a plant for a new product had to be set up, standardization was adopted as a creed. The result was that in that plant out of 100 process vessels ranging from capacities of 200 litres to 10 000 litres, over 80 percent could be included within eight types and in all there were 15 types. In a similar manner, standardization in pumps, agitators, heat exchangers, and other process equipment and instrumentation made it possible to achieve a high level of productivity in the plant. Standardization of operating procedures facilitated training of operatives.

Blast Furnace Technology

Shri N. C. Ramasubu (Hindustan Steel Ltd, Bhilai) said that daily output of a blast furnace in the Bhilai Steel Plant varied from 1 000 to 2 000 tonnes. These furnaces had to produce a particular grade at least for a week, otherwise they would not be economical. Further, frequent changes from one grade to another would result in pig iron of intermediate grades being produced during the changeover period, which would not have a ready market. In USSR, a particular grade was produced for 15 days and sometimes even longer at a stretch. He suggested that it would be advantageous if market survey were made and a particular plant were allotted a few grades of pig iron to be manufactured. Referring to standardization as applied to blast furnace technology, he said that for producing low silicon pig iron to IS : 2842-1964, the plant had developed rigid specifications as regards physical and chemical properties of raw materials and as to the method of running the furnace itself. With ore having high alumina and high coal ash, it was found necessary to stick to the rigid specifications at various stages to be able to produce pig iron to ISI specification. Shri Ramasubu emphasized that another field where lot of scope for standardization existed was in the case of equipment. In Bhilai Steel Plant, there were three blast furnaces of one size and two other of larger size. The equipment were not interchangeable and they had to keep two sets of spares. With the heavy machinery plants coming up, it would

be desirable to standardize at a rational level the furnace sizes and their capacity to minimum number, so that the spares could also be produced economically. He referred to the work done at Bhilai Steel Plant to modify certain equipment so that they could be interchangeable within the plant.

Quality Control

Dr C. V. S. Ratnam (Neyveli Lignite Corporation) referred to the importance of standardizing the test methods and processes at the company level for manufacturing to consumer satisfaction. In the manufacture of 'LECO' in his company, the frequency of tests in the briquetting and carbonization plant had been standardized for effective process control. To ensure correct weight of 'LECO' bags with respect to compensating moisture content and fines, standard procedures, based on SQC principles, had been developed.

Shri A. N. Bhattacharyya of Metal Box Co of India Limited, Calcutta emphasized on standardization for achieving better relationship between supplier and customer. Referring to a case history of his organization supplying containers to a vanaspati manufacturer, he said that after proper agreement on the definition and classification of defects, methods of testing, batch and sample size and acceptable quality level, it was possible to eliminate a large number of disputes, reducing rejections by the customer from 52.2 percent to 0.74 percent of the consignment.

DISCUSSION

Shri M. M. Shenoy (Hindustan Steel Limited, Rourkela) emphasized that no company standardization programme would be successful without full-fledged support of the management. Without such support, standards developed by any department of an organization would not be effective. Shri M. S. Rajagopalan (English Electric Co of India Ltd, Madras) suggested that company standardization activity should be directly under the top management so that the standards received the necessary status for implementation.

Shri N. Narasimhachari (Hindustan Antibiotics Ltd) enquired as to what extent company standardization was in operation in Indian industries. For propagation of company standardization activity in Indian industries, he suggested publication of the results.

Shri M. R. Lodh referred to the role of a professional society of standards engineers for ensuring adequate recognition of the activity and invited all those interested to join the Institute of Standards Engineers, establishment of which was being considered at an open Session of the Convention.

Replying to some of the points raised during the discussion, Dr A. K. Gupta (ISI) said that since 1963 the Indian Standards Institution had conducted a series of management conferences, training programmes and seminars in various parts of the country to propagate the company standardization activity in Indian industries. The management conferences aimed at creating a general appreciation of the importance of company standardization practices; over 1 000 management representatives had so far attended the conferences. The training programmes and seminars, which aimed at creating a nucleus of company standards engineers capable of independently organizing the activity in a company, had been attended by 339 persons representing 264 organizations. Information available with ISI indicated that company standardization had been initiated to varying degrees in some 34 percent of those organizations. Though that did not appear to be a discouraging response to the training effort, he felt that with adequate awareness on the part of management, the results would be even more encouraging. Regarding publication of the results, attention was invited to the series of articles on the subject which were currently appearing

in *ISI Bulletin*. He requested all those present to send to ISI results of their efforts so that these could be brought to the notice of a larger group for propagation of company standardization movement.

CONCLUDING REMARKS

Concluding the Session, the Chairman said that the fact had come to be recognized that company standardization activity had a vital role to play in achieving higher productivity. One of the most important points was the need for making the top management of industry conscious of the benefits derived through company standardization. It was quite evident that the benefits of company standardization would be many times more than the money spent on running such an activity. He suggested that visits to organizations having standards departments would be of benefit to others and hoped that units which had such departments would provide necessary facilities for such visits. He suggested that big industrial units should make available their standards to small-scale industries so as to help them improve quality of their production.

For propagation of company standardization, Shri Nayar suggested that ISI might consider announcing 1967 or 1968 as 'Company Standardization Year' and augment its efforts by enlisting the support of various units in organizing lectures, training programmes, etc, in various parts of the country.

S-4 Standardization and Small-Scale Industries

Chairman	Dr S. T. Merani, Development Commissioner, Small-Scale Industries (Ministry of Commerce & Industry), Udyog Bhavan, New Delhi	
Secretary	Shri R. I. Midha, Indian Standards Institution	
Date	29 December 1966	
S-4/1	Standardization for small-scale industries	Dr S. Krishnamurthy, Indian Telephone Industries Ltd, Bangalore
S-4/2	Standardization and small-scale industries	B. K. Mukherjee, National Test House, Calcutta
S-4/3	Surveys of consumer preference for standardization in small-scale industry	Dr N. T. Mathew, Army Headquarters, New Delhi
S-4/4	Prospects and problems in the small-scale manufacture of building materials	Dr Mohan Rai, Central Building Research Institute, Roorkee
S-4/5	Prefabricated timber structures — a small-scale industry and its standardization	N. J. Masani, A. N. Bajaj & K. S. Pruthi, Forest Research Institute, Dehra Dun
S-4/6	Mode of standardization for small-scale industries	N. C. Sen Gupta, National Test House, Calcutta

S-4/7	Standards and requirements for processing and quality control of human hair	Dr S.K. Barat, Central Leather Research Institute, Madras
S-4/8	Small industries products and export with special reference to animal feeding stuffs industry	Dr H. C. Saxena, Hindustan Lever Ltd, Bombay
S-4/9	Standardization of century-old survey and drawing instruments industry at Roorkee	S. Gautam, Quality Marked Goods Manufacturers' Co-operative Association Ltd, Roorkee & J. L. Gaindhar, University of Roorkee, Roorkee
S-4/10	Pneumatic gauging in small-scale industries	M. P. Kumaraswamy, Central Mechanical Engineers Research Institute, Durgapur
S-4/11	An anatomy of standardization of small-scale industries	A. K. Bhattacharya, The Indian Humepipe Co Ltd, Cuttack
S-4/12	Small-scale industries — standardization and certification execution problems	N. T. C. Acharya, Ficides (India), Madras

CHAIRMAN'S OPENING REMARKS

■ Dr S. T. Merani observed that he himself had attached great significance to the development of small-scale industries and to the importance of this sector producing goods in conformity with Indian Standards. He was happy that ISI had recognized this sector by allocating a separate session for detailed discussion on the subject. The Chairman added that the number of small-scale units registered with the Directorate of Industries in the various States had now reached over 100 000 and out of this over 42 000 units were registered under the *Indian Factories Act*. About 91 percent of registered factories in India today were small-scale industries and the contribution of these industries to national production was as high as 33 percent.

Dr Merani observed that it was necessary for the small-scale sector to take full advantage of the work done at ISI and also to produce goods according to the quality marking schemes of the various States. He hoped that the session would be useful in pin-pointing the work that was yet to be done and the method by which it could be achieved. Dr Merani suggested that apart from discussion on the papers, a general discussion for an hour would be fruitful.

Welcoming the delegates, Dr A. N. Ghosh, Director General, ISI appreciated the idea brought out by

the Chairman for devoting some time to a general discussion so that any of the points which were either not reflected in the papers or remained untouched could be considered.

PRESENTATION OF PAPERS

At the suggestion of the Secretary, Shri R. I. Midha, the papers received for the Session were divided into the following four groups for discussion:

Group I—Role of feeder industries—Papers S-4/1 and 2

Group II—Standards for small-scale industries—Papers S-4/3, 4, 5 and 6

Group III—Small industries products and exports—Papers S-4/7 and 8

Group IV—Problems of small-scale industries in relation to standardization and certification marking—Papers S-4/9, 10, 11 and 12

Group I

Presenting his paper 'Standardization for small-scale industries', Dr S. Krishnamurthy, Indian Telephone Industries Ltd, Bangalore, stated that small-scale industries formed a sizable proportion of the industries in the country and played an important part in the development of ancillary industries. Having been in existence for more than a decade, small-scale industries should be channelized to produce goods conforming to standard specifications. The ideal way of achieving this was by adopting Indian Standards wherever available and accepting the ISI Certification Marks Scheme.

In the absence of the author, the paper 'Standardization and small-scale industries', which outlined the necessity for standardization in the small-scale sector, was taken as read.

DISCUSSION

Initiating the discussion, Shri B. M. S. Chopra (Directorate of Industries, Punjab) mentioned that out of 100 000 small-scale production units in the country, 43 000 existed in the Punjab alone. He wanted ISI to establish some kind of 'standardization cells' at such of the places or States where there was concentration of small-scale industries.

Shri Raghaviah (CSIO) stated that in view of the fact that jigs, tools, etc, as also the processes were made available to the small-scale industries by CSIO, he saw no reason why the production of the small-scale sector should not conform to the Indian Standards. Referring to the company standardization, he said that the products of small-scale units, which were purchased by the large units, were generally sold according to the specifications of the purchasing units. The production of the small-scale units belonged to large-scale units and accordingly the responsibility for making company standards did rest with the large units. It was, therefore, incumbent upon the large units to insist on conformity to standards prescribed by them. Shri Raghaviah classified the products of small-scale industries into two categories:

a) Products which came under the Quality Marking Scheme of the State Government (these might or might not conform to the Indian Standards, but these were acceptable to the State Government, because they were suitable for one or the other purpose).

b) Products for which no standards existed at present (there were some automobile components for which no standards existed at present, but these components were manufactured and consumed in the country).

The speaker stressed the need to make available raw materials as well as adequate testing facilities to the small-scale manufacturers.

Dr A. N. Ghosh (ISI) stated that Government of India had taken a decision to conform to Indian Standards wherever they existed, and in case the Defence Departments wanted some supplies according to their own specifications, there must be some valid reason behind it. Referring to the use of some of the raw materials in small-scale industry, Dr Ghosh added that some of these industries depended

only on scrap, and if scrap was not available, they would not be able to procure any raw material. It was, therefore, necessary to codify the scrap coming out of the three steel plants and utilize it as off-grade material for small-scale industries.

One of the delegates mentioned that standards were meant only to achieve an end, and he wanted to distinguish between the establishment of standards and problems which arose subsequently while implementing the standards. As far as establishment of standards was concerned, Indian Standards for raw materials and other parts going into the manufacture of various equipment were readily available. In addition, there were company standards, and it was here that large-scale manufacturers had to work in a co-operative spirit with the small-scale sector so as to minimize the problems of the smaller units.

Stressing the need to exercise some check by the Industries Departments in various States on the utilization of cheap materials which quite often went as wastes, Shri T. V. Subba Rao (Andhra Pradesh Forest Department) related his experience with regard to the establishment of saw mill and factory workshop wherein he had utilized the small pieces of timber in a profitable way. He also drew the attention of the delegates to the work done by the Forest Department in utilizing the waste material, and he wanted the delegates to take advantage of the same.

Shri A. B. Sarkar (M. C. Engineering Company, New Delhi) mentioned that considerable time was involved in getting the products tested as the testing facilities were not within reach of the small-scale industries. Further, it was also not possible for the small-scale industries to purchase their own testing equipment which was quite expensive. He emphasized that CSIO should provide more and more testing facilities.

Shri C. L. Sharma stated that many of the units in the small-scale sector did not know the existence of Indian Standards either for the raw materials required by them or for their finished products. He felt the need to educate the small-scale sector in this regard by the Small Industries Service Institutes.

Group II

In the absence of the author, the paper 'Surveys of consumer preference for standardization in small-scale industry', which dealt with different methods of determining consumer

preference for products of small-scale industries, was taken as read.

Introducing his paper 'Prospectus and problems in the small-scale manufacture of building materials', Dr Mohan Rai (Central Building Research Institute, Roorkee) stated that in the Fourth Plan, the investment in house building alone was expected to be Rs 20 000 million which formed one-tenth of the total Plan outlay. In fact, building materials, not only in housing but in all other construction activities accounted for 60-70 percent of the total expenditure. This gave an idea of the significant role the building materials industry had to play in our national economy as even one percent economy through improved design, research and standardization meant a net saving of about Rs 200 million.

Dr Mohan Rai said that the Central Building Research Institute, Roorkee had made efforts to develop certain processes for building materials suitable mostly for small- and medium-scale industries. Fifteen 'project proposals' outlining the processes, requirement of plant and machinery, details of cost estimates for an economic unit, etc, had been prepared and distributed.

In the absence of the authors, the papers 'Prefabricated timber structures—a small-scale industry and its standardization' and 'Mode of standardization for small-scale industries', were taken as read.

DISCUSSION

Referring to a point made out by the Chairman, Dr Mohan Rai stated that CBRI could give demonstration of the work done by them at Roorkee only.

Shri B. N. Bhattacharya (Geological Survey of India) wished to know whether ISI could arrange for some convenient testing facilities for the small-scale units free of cost.

Shri S. M. Shafi (Industries Department, Jammu & Kashmir) stated that ISI had not made any special impact in their State and the small-scale manufacturers were not even aware of the Indian Standards.

Shri A. B. Sarkar brought out the idea of preparing standards for loud-speakers. He was of the view that it would be ideal if a speaker made in India could be used in USA, UK and other overseas countries.

Intervening, Dr Ghosh clarified that ASTM standards or standards published by the national standards bodies of any other country could not

be classified as international standards, as they were only the national standards of that particular country.

Shri S. M. De (Department of Industries & Commerce, Government of West Bengal) referred to the work that the Central Leather Research Institute had been doing in improving the quality of leather goods. He wanted the small-scale units to take advantage of the work already done there and to avoid duplication of research on similar problems. Shri De added that CLRI was currently engaged on research for finding some substitute for leather.

Mentioning the incentive given for the goods bearing quality mark or those produced according to Indian Standards, Shri Jayaraman (Government of Madras) narrated the State's work in establishing centres to give assistance to small-scale units. He was of the view that auto spare parts, sports goods, etc, came under the purview of small-scale industries. They had tried two standard equipment for this and ISI was also doing some work on the subject.

Shri Chopra stated that there were about 200 units in Ludhiana which were manufacturing bicycle parts of satisfactory quality. Although ISI had prepared Indian Standards for some of the bicycle parts, there was need to formulate Indian Standards for the remaining parts also.

Shri S. S. Gill (Department of Industries, Punjab) stated that the small-scale industries had played an important role in the industrial development of the country and the problems of most of the industries were identical. What was needed was preparation of more standards, removal of ignorance on the part of small-scale units, imparting to them necessary modern technical know-how, availability of raw materials and testing equipment. Referring to one of the earlier speakers, Shri Gill stated that functional failure was not the monopoly of small-scale units and it could happen even in the case of larger units. Proper education was the best remedy to check failures.

Shri Gill also mentioned that they were bringing the various industries within the purview of quality marking scheme and then impressing upon them the necessity of producing their goods conforming to Indian Standards.

Group III

In the absence of the author, the paper, 'Standards and requirements

for processing and quality control of human hair', was taken as read.

Presenting his paper 'Small industries products and export with special reference to animal feeding-stuffs industry', Dr H. C. Saxena (Hindustan Lever Ltd, Bombay) stated that 'grain balancers' could be produced as a first step towards exporting compound animal feeds. He added that only when standardized raw materials were available, one could produce the proper type of compound feeds to enter into the highly competitive export markets. Dr Saxena requested ISI to formulate such standards which were practicable and suited to the conditions existing in the country with regard to raw materials so that they could find wider implementation.

DISCUSSION

Explaining the role of ISI in the formulation of standards Dr A. N. Ghosh stated that it was not ISI but experts drawn from industry who would formulate standards and they would take into account the workability and implementation of every standard before it was published. Further, ISI had all along been very eager to give every consideration to the user's interest. Manufacturers as well as users were given adequate representation on the technical committees of ISI, and before publishing an Indian Standard, concurrence was obtained from all quarters. On a point made out regarding goods bearing ISI Mark having turned out to be of sub-standard quality, Dr Ghosh made an earnest request to delegates to bring such instances to ISI's notice so that the Institution could examine those cases and take suitable preventive measures and also take action against the concerned manufacturers.

Group IV

Introducing his paper 'Standardization of century-old survey and drawing instruments industry at Roorkee', Shri S. K. Gautam stated that surveying and drawing instruments were the primary tools for planning projects and for running drawing offices. The Quality Marked Goods Manufacturers' Co-operatives Association Ltd, Roorkee, had, during recent years, improved the quality of their products. But, the Association had not attained interchangeability of parts. What was needed was to purchase the goods according to the national standards which had already been formulated by ISI. Shri Gautam stated that

there was urgent need to protect the survey and drawing instruments industry at Roorkee which was nearly 130-years old and was producing quality goods. He urged for the setting up of a testing centre at Roorkee and sought ISI's help in this regard.

Shri A. K. Bhattacharya (The Indian Humepipe Co Ltd, Cuttack), who discussed in his paper 'An anatomy of standardization of small-scale industries' the reasons as to why standardization of all the products from small-scale industries had not yet been made possible, suggested that ISI should publicize its work with a view to educating not only the small-scale manufacturers but also the consumers. He pleaded for the formulation of standards which were practicable.

DISCUSSION

Dr A. N. Ghosh observed that ISI, while formulating standards, had to adopt a common line so that the standards were acceptable to all concerned. Further, the Indian Standards were subject to change with the changing conditions in the country. Quite often, ISI received requests for relaxing standards after they were published, while not a single request had come for any standard to be made more rigid. Dr Ghosh added that the standards for animal feedstuffs could be relaxed if the relaxations were not hazardous to the well-being of the animals. It was for the large industries to supply necessary technical knowledge and the standards to the feeder industries so that the products from the feeder industries which go into the assembly of products were up to the expected mark of quality. Citing the instance of the automobile industry, Dr Ghosh said that 70 to 80 percent of the parts required came from feeder industries. He informed the delegates that the Government had taken a decision that wherever an Indian Standard existed, it was to be followed by all the Departments; he requested the delegates to let ISI know if there had been any departure from this so that the Institution could take appropriate action in the matter. Referring to a point made out earlier, Dr Ghosh stated that it was for the Government or for the research laboratories to demonstrate the work done by them, and it would not be possible for ISI to arrange for demonstrations. As far as bicycle industries were concerned, ISI had decided to

prepare standards for rapid moving parts without freezing the design and dimensions. Dr Ghosh assured Shri Gautam of all possible help to the survey and instruments industry at Roorkee in setting up collective testing centre for their products.

General Discussion

The Chairman invited delegates to bring out specific problems on which immediate action should be taken either by ISI or CSIO and also suggest solutions for the same.

Referring to Dr Ghosh's remarks, one of the delegates underlined the need to investigate the requests in favour of relaxing Indian Standards. He added that one of the reasons for this might be the difficult position about the availability of raw materials. Another bottleneck in the way of implementation of Indian Standards was the lack of testing facilities. The speaker requested ISI to recognize the colleges of engineering and other educational institutions equipped with necessary testing equipment for the purpose of certifying products.

In reply, Dr Ghosh stated that ISI had to take adequate precautions to see that safety and performance of the equipment or product did not suffer. He pointed out that testing facilities available at many of the colleges of engineering were education-oriented and the testing work could not be entrusted to students.

Clarifying Shri S. M. De's statement that standards formulated by ISI were, in general, on the higher side, Dr Ghosh said that, in a few cases, the stiff attitude of the technical committees preparing the standards might have given rise to such a situation. Referring to the difficulties faced by the designers, Dr Ghosh stated that it was for the designers to get together and find out ways and means of solving those difficulties and to come up to the standards.

Shri S. S. Gill advocated the idea of extending the company standardization courses arranged by ISI to the industrial centres. He also brought out the idea of opening developmental centres in the States and industrial towns.

The Chairman underlined the need for larger units to extend a helping hand to the small-scale sector particularly with regard to testing facilities, designs, raw materials, inspection and technical know-how. It was also incumbent upon the larger units to help the small-scale sector to orient

its production in accordance with the published Indian Standards. With regard to testing facilities, the Chairman added that two testing centres, one at Delhi and another at Bombay, were already functioning. Further, a collection of Rs 100 000 had been made and CSIO was prepared to give about Rs 400 000 more for establishing additional testing facilities. These testing centres were giving all help to the industries which came forward with an application for obtaining ISI Mark. Dr Mirani could not support the view that only such of the units who were prepared to manufacture their products in accordance with Indian Standards should be given import licence for importing the machinery. The Chairman advised the industrialists who were planning to set up a new industry, to take into consideration the standards existing in the country for the product they proposed to manufacture, position of the raw material and the availability of technical know-how.

One of the delegates suggested giving of awards to such of the industries that achieved higher standards. He also wanted reduction in the Certification Marking fee charged by ISI.

Summing up, Dr Ghosh stated that ISI would take note of the suggestions with regard to organizing company standardization courses at various industrial centres. He also accepted the idea of ISI taking up some testing work on payment of fee and also to send inspectors from ISI to industrial centres to explain what standardization and quality control meant. Dr Ghosh added that it was not always the lack of availability of proper materials but it was the lack of proper understanding and approach to the problem to produce quality goods that led to the fall in the quality of products. ISI could also recognize the co-operative centres set up for testing for the purpose of grant of ISI Mark but those centres would have to be up to the expected standards to maintain the prestige of ISI Mark.

Dr Mirani suggested that ISI could discuss the problems of small-scale industries with the Government, and on some other occasions outside the Convention. He also requested ISI to publish a brochure giving details of the places where testing facilities were available for various products along with the equipment and also the type of equipment needed for a particular test and its place of manufacture.

Concluding the Session, the Chairman thanked Dr Ghosh, the authors and the delegates for their

co-operation in conducting the Session. The Session ended with a vote of thanks to the Chair.

S-5 Training in Standardization Technology

Chairman Prof G. R. Damodran, Director, P. S. G. College of Technology, Coimbatore-4
 Secretary Shri S. K. Sen, Deputy Director General, Indian Standards Institution, New Delhi
 Date 30 December 1966

PAPERS PRESENTED

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| S-5/1 | Standard technologists — the need of the day | A. K. Mukerji, The Indian Iron & Steel Co Ltd, Burnpur |
| S-5/2 | Training in standardization technology | V. K. S. Menon, National Institute for Training in Industrial Engineering, Bombay |
| S-5/3 | Training of standards engineers | Indian Standards Institution, New Delhi |
| S-5/4 | Training of standards engineers — ASTEF course in France | M. Raghupathy, Indian Standards Institution, New Delhi |
| S-5/5 | The need for training in standardization technology | M. R. Lodh, Devidayal Cable Industries Ltd, Thana |
| S-5/6 | A national society of standardization technologists or a nation-wide specifications-minded society | Hamid Ahmed Khan, Hamdard 'Wakf' Laboratories, Delhi |
| S-5/7 | Training in standardization technology | S. Raghavachari, Neyveli Lignite Corporation Ltd, Neyveli |
| S-5/8 | Standards engineer — Jack of all trades and master of standardization | V. R. Subramanian, Indian Oxygen Ltd, Calcutta |

OPENING REMARKS

■ Opening the Session, Prof G. R. Damodran, Director, PSG College of Technology, Coimbatore welcomed the delegates and said that the subject for discussion was a very important one and hoped that its deliberations would serve a very useful purpose.

Dr A. N. Ghosh, Director General, ISI, welcomed the delegates and spoke on the need and importance of standardization. He said that ISI was already training standards engineers not only for its own work but also overseas trainees from Singapore, Thailand, UAR and the Philippines.

PRESENTATION AND DISCUSSION OF PAPERS

Presenting his paper, Shri A. K. Mukerji (Indian Iron & Steel Co) said that he had divided the paper into two parts. The first dealt with the need for a separate body of well-trained engineers and the second with the training course for standards engineers.

He said that in a developing country like India, there was urgent need of a

separate cadre of qualified and well-trained standards engineers whose sole endeavour should be to assist the Indian industry in every possible way to get the best out of our materials, equipment and skills.

In the context of devaluation and the consequent need of intensive efforts towards import substitution and corresponding export drive, a great task awaited the future standards engineers. It would also be their sacred responsibility to encourage greater usage of indigenous materials and to cut down cost in industries coming up with overseas collaborations.

It was, therefore, of utmost importance that such a distinct cadre should have an effective training programme. But it was necessary that the right type of men were selected — preferably personnel who had put in at least three years of training in industry.

Shri Mukerji suggested a tentative theoretical and practical course for the future standards engineers. Such training courses should be short term and should be supplemented by seminars, lectures, case studies, visits to factories and audio-visual programmes. In the present conditions

in the country, there was need for having a separate professional institution to conduct examinations and award certificates to qualified standards engineers. He expressed doubt about any unified training programme because standards engineers with a mechanical background could not effectively conduct a standardization programme in a chemical or an electrical manufacturing unit unless, of course, he had the expert knowledge and experience of the relevant components, tools, materials, equipments, processes and finished products of that particular industry.

It was obvious, therefore, that the task of chalking out a realistic training for future standards called for careful planning and ISI was the right organization to initiate such a programme.

Shri V. K. S. Menon (National Institute for Training in Industrial Engineering), while presenting his paper said that he came from a training institute where standardization was one of the subjects included in the normal scope of work and, therefore, in his paper he had tried to give the details of a programme which satisfied the need of having a well-trained group of standards engineers as well as an organized standards department in a factory. He said that the most important factor in organizing a standardization programme in a company was the attitude and expressed desire of top management

with respect to importance of standardization. The training programme outlined in his paper was based on two parts, namely, (a) an application programme for the technicians; and (b) an appreciation programme for the top management, middle management and union representatives. Shri Menon explained how a standards engineer should deal with top management, middle management and union leaders and convince them of the advantages of standardization. He thought that more stress should be placed on the tools and techniques of standardization. In many factories, standards activity had not yet taken deep roots due to misunderstanding and lack of appreciation of its benefits. The success of a standardization programme depended upon the skill of the people, co-operation of supervisors and union leaders, support of top management, case studies and training programmes.

Dr A. K. Gupta (ISI), presenting the paper 'Training of standards engineers', said that the main object of the training programmes conducted by ISI was to train standards engineers who should be able to implement national standards. It was his experience that standards were not fully implemented because of many reasons varying from factory to factory; hence the need of a training programme. The qualifications required of a standards engineer were a degree in engineering and knowledge of principles

of standardization, knowledge of design, materials, parts and process specifications, etc. He mentioned the different training programmes being arranged by ISI which were as follows:

a) Programmes for National Standardization

1) Intensive and extensive training for standards engineers to work at the national level as officers of the Indian Standards Institution;

2) Training programmes similar to and coupled with the above programme but considerably abbreviated for standards engineers invited from other developing countries;

b) Programmes for Company Standardization

3) Management programmes in the form of short-term promotional conferences of top-level policy makers;

4) Survey programmes for exploring with the assistance of training staff the existing status and further prospects of standardization within the participants' plants;

5) Training programmes for enabling the participants independently to establish company standardization activity within their plants;

c) Specialized and Ad Hoc Programmes

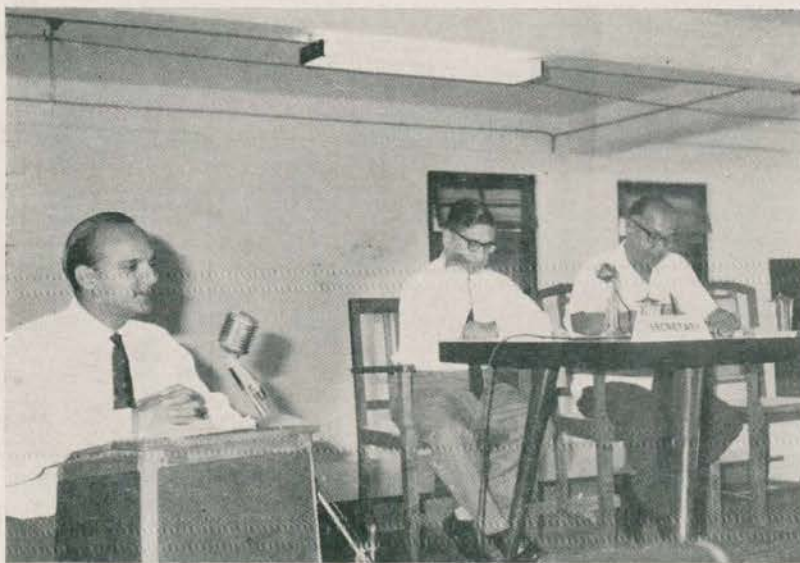
6) Statistical quality control training programme for assisting ISI Certification Marks licensees in establishing scientifically based control of quality in production;

7) *Ad hoc* training of specialized character requested by ISI members and others for training personnel for specialized needs;

8) Programmes for casual visitors from sister standards organizations from abroad.

Dr Gupta also gave details of the subjects covered under each training programme (as given in the paper) and also the duration of each training programme.

Giving his general impression about the response to these training programmes, Dr Gupta said that Indian industries had amply demonstrated that management acceptance of company standardization practice was growing rapidly. In the past three years (1963-66), sixteen programmes had been carried out. About 350 engineers had participated in these programmes from about 260 companies. Still there was persistent request for more courses. The need for trained personnel for the Institution itself was also growing at a rate faster than could conveniently be met, in spite of a planned attempt for



At the Session 'Training in Standardization Technology', with Prof G. R. Damodaran, Director, PSG College of Technology, Coimbatore (extreme right) in the chair. The Secretary of the Session was Shri S. K. Sen, Deputy Director General, ISI

recruitment and training. The Institution's best efforts had enabled it to meet about 60 percent of the annual requirement but then about 40 percent of the probationer officers left the Institution during or at the end of the training, which meant that only about 36 percent remained with ISI. This posed quite a challenge.

In the absence of Shri M. Raghupathy, his paper was presented by Shri S. K. Sen, who said that the paper provided an illustration of a training programme conducted outside India. The French programme was a combination of training in theory and practice and its facilities were extended to trainees from outside France; many of whom did not have sufficient knowledge of French language. Therefore, the first part of training consisted of imparting some instruction in speaking and reading the French language. The actual training started later. This training programme was conducted by an organization known as Association pour L'Organisation des Stages en France (ASTEFL). Participants in the training programme were from different countries and every year about 3 000 engineers, technologists and scientists from developing countries were trained in the different subjects. One of these programmes concerned standardization. ASTEFL had so far organized three such programmes — 1961, 1963 and 1966. The programme was very much similar to that of ISI. It consisted of theory and tools and techniques of standardization at different levels, ie, international, national and within the country. After the lectures on theory, which took about three months, the trainees were sent out to different parts of the country for visits to different manufacturing organizations.

Shri Sen said that France was much ahead in the field of standardization. There, in the educational institutions, training in company standardization formed a part of the curriculum. Shri Sen expressed concern that this subject had not yet been included in the curriculum of educational institutions in India.

Before going to next paper, Shri Sen requested Dr Amin Shariff to say a few words about his experience as he had attended one of the training courses of ASTEFL in France.

Giving his impression about this training programme, Dr Amin Shariff said that the important thing that this course induced was awareness of standardization activity because most

of the people who came for training were from developing countries.

Shri M. R. Lodh (Devidayal Cable Industries) presenting his paper 'The Need for Training in Standardization Technology' said that even today industrialists did not know what standardization was and who were the standards engineers. Conventions like this one helped in creating a better understanding of the need for standardization and standards engineers. He emphasized that basic training on aspects of standardization was very much essential and a training course of short duration spread over a week or two would fill the gap, but the basic knowledge of standardization like simplification, variety reduction, etc, should be introduced as a part of the engineering and technological education in the universities.

The training should cover standardization in regard to design, manufacture, procurement, personnel, production procedures and other organizational policies. For training of standards engineers he suggested three steps: (a) Those who were at the university or college should be taught the basic concepts of standardization, (b) Those who were engineering graduates should undergo a regular full-time course for the post-graduates, and (c) Those who were already in the industry and could not join full-time courses, should be provided with short-term courses. He suggested that there was need for a separate institute for standards engineers which along with the other functions could also take the responsibility of training standards engineers. A joint venture of ISI and Institute of Engineers could serve this purpose.

The paper S-5/6 was taken as read since the author was not present.

Presenting his paper, Shri S. Raghavachari (Neyveli Lignite Corporation) laid special emphasis on the need for certain companies to have their own training courses for training standards engineers. He referred to the outline of a training programme for standardization technology as given in Annexure I of his paper. He said that certain basic skill and scientific approach were needed in training standardization. Human relation and psychological aspects should also be included in the programme.

Training in standardization technology should be directed towards producing a band of competent men to serve the companies in implementing their standards programmes and to

prepare them for handling the programme of standardization at the national level also.

Presenting his paper, Shri V. R. Subramanian (Indian Oxygen) said that the standards engineer was a guarantor of speciality. He was a jack of all trades and master of standardization but he had to have formal training in the principles and practice of standardization in order to master the application of standards techniques. His personal qualities were extremely important for his satisfactory functioning.

He said that academic institutions could not, at least for the present, take on the responsibility of training standards engineers. In the absence of formal training, engineering and management institutions and agencies requiring standards services had to assume the burden of selecting and training personnel for these tasks. He made a number of suggestions, such as in-plant training, instructor training, interest in management institutes, publicity through audio-visual means and correspondence courses, for promoting education and training in standards technology. The most important suggestion was the urgent need for formation of a national society for standards engineers so that this body could make efforts, with the support of ISI in giving shape to some of the suggestions to promote standards consciousness among Indian industries.

CONCLUDING REMARKS

Summing up, the Chairman said that different authors had expressed their views about the need for and importance of standardization, and on the ways and means of applying the techniques and methods of standardization in all activities. He admitted that there was lack of interest about standardization in educational institutions and suggested that ISI should approach the official organizations like UGC, APTI, NPC, LPCs, Institute of Management, etc, which were running training courses, to get the subject of standardization included in their curricula. He emphasized that training of standards engineers should be objective and should ensure the appreciation of both theory as well as practical applications. Since the promotion of standardization depended much upon the appreciation of its value by management, it was suggested that suitable programmes directed to

developing management appreciation should be organized along with the training of the specialist engineer. He also suggested that labour union workers should be given opportunity

to develop at least an elementary understanding of the basic tenets of standardization so that workers could be induced to co-operate in the standardization movement.

S-6 Standards for the Home

Chairman	Smt Lakshmi N. Menon, Former Minister of State, Ministry of External Affairs, Government of India, New Delhi
Secretary	Shri A. B. Rao, Director (Consumer Products), Indian Standards Institution, New Delhi
Date	31 December 1966

PAPERS PRESENTED

S-6/1	Housewife and articles of daily use — the need for standardization	(Smt) Nilima Chakravarty, New Delhi
S-6/2	Standards in the service of the home	G. L. Malhotra, Marketing and Management Consultant and Lecturer, NPC, Former Director, National Consumer Service, New Delhi
S-6/3	Protection of consumer	(Smt) Jayavati A. Kaji, Bombay
S-6/4	Tested appliances for the home	'Housewife', New Delhi
S-6/5	Adulteration — a menace	G. L. Malhotra, Marketing and Management Consultant and Lecturer, NPC, Former Director, National Consumer Service, New Delhi
S-6/6	Standards work and housewife	(Smt) Sunila Singh, Secretary, Women's Advisory Committee of Indian Standards Institution, New Delhi
S-6/7	Certification for consumer products	A. S. Cheema, Director (Marks), Indian Standards Institution, New Delhi
S-6/8	Consumer	(Smt) Arati Sen, 5 Humayun Road, New Delhi
S-6/9	Consumer consciousness	St. Theresa's College, Ernakulam

OPENING REMARKS

■ Extending a hearty welcome to the delegates the Chairman, Smt Lakshmi N. Menon, observed that women played a large part in determining quality in the products they purchased and it was, therefore, quite appropriate that a session on 'Standards for the Home' had been organized. She expressed the hope that the discussion would serve to educate the common housewife who, these days, was generally unaware of the poor quality of materials, especially food items. In the good old days, housewives devoted sufficient time to prepare the mixtures of spices and condiments at home and

even wheat grain used to be washed and cleaned with meticulous care, in order to get a good quality flour. It was unfortunate that the housewives especially in the cities found too little time to attend to these important duties. More and more women took to buying the processed foods, canned and bottled fruits and juices, and ground and packed spices. Very few food items were available with well known certification marks like ISI Mark, Agmark, etc. It was, therefore, essential that more and more standards for consumer items, especially needed in the home, should be prepared and brought under Certification Marks Scheme of ISI. Besides,

consumer research as conducted in many parts of the world was also an essential need in the country. About 25 countries had consumer research associations, and carried out independent testing and gave comparative evaluation of quality, usefulness and performance of many consumer items. These reports had been extremely useful for the housewife in choosing her requirements. Citing the example of bed-sheets, the Chairman said that these were evaluated for their shrinkage, the bleaching factor, dimensions, strength of the fabric, etc. On electrical goods, the safety factors, such as earthing, insulation were highlighted, besides performance, temperature attainments, etc. The standards available as well as the consumer research conducted threw ample light on the safety aspect of many appliances. In America and certain other countries, the voltage of electricity available to the consumer was of 110 volts, which was less hazardous for the consumer, than the 220 volts supply. Even the kitchen and the hazards that normally occur in it had received the attention of the experts in many countries and ideal kitchens had been devised.

The Chairman emphasized the importance of women taking active interest in the work of establishing standards, especially in the fields in which they were vitally interested. She was happy to note from one of the papers that about 50 women were serving on different committees of ISI.

PRESENTATION OF PAPERS

The Secretary, Shri A. B. Rao, gave a brief summary of the contents of various papers and brought out the common points which most of the papers covered, such as the standards on consumer items, certified products already available and the need for more certification, the importance of consumer research, and adulteration and safety.

Presenting the paper 'Housewife and articles of daily use — the need for standardization', Smt Nilima Chakravarty brought out aspects like lack of quality; adulteration in food; absence of safety measures in electrical appliances; children's articles and toys; lack of information, such as inflammability or non-inflammability of clothing; etc. She emphasized that adequate attention should be paid to the articles used by children, such as school uniforms, sports goods and shoes. She cited the accidents that normally

occurred at home and suggested certain preventive measures. Adulteration should be fought at all levels and especially with a strong hand by the Central and State Governments. More and more products should come under ISI Certification Marks Scheme. Smt Chakravarty strongly urged the formation of a consumer organization for protecting the consumer from a number of malpractices as well as from inadequate legislation.

unadulterated foods and spices. He also suggested formation of associations of pure food manufacturers, colouring of certain items like vanaspati and strengthening of Government machinery at various levels.

In the absence of the author, the paper 'Protection of consumer' was presented by the Secretary. The author, Smt Kaji dealt with problems facing the consumer. As measures of consumer protection she suggested

Committees. By participation in standards work, the housewives themselves gained a lot by way of information regarding quality goods and also helped ISI with feedback on the need for standards and adoption of certain important requirements.

In his paper 'Certification for consumer products' which was presented by the Secretary, the author, Shri A. S. Cheema briefly described the process of certification, and the availability of the mark on some of the consumer items. The author stressed on consumers' own forums to augment the good results of certification.

Presenting her paper 'Consumer', Smt Arati Sen mentioned the futile attempts that consumers made to form an all India association. Recently, attempts were being made at Calcutta and Bombay to start work on consumer protection. She was of the opinion that India should have one consumer association which should work in close collaboration with ISI, Agricultural Marketing and Inspection Organizations, National Consumer Service, etc, and this body should undertake comparative testing and evaluation of surveys. The information available with some of the existing laboratories like the Forensic Research Laboratories could be published for the benefit of consumers.

In the paper 'Consumer consciousness', a member of St. Theresa's College, Ernakulam, stressed the great need of consumer research and protection. It was pointed out that due to the apathy of consumers themselves, consumer research had suffered. ISI should also encourage the formation of such associations. School and college curricula might also take steps to introduce consumer education.



Smt Lakshmi N. Menon, former Minister of State, Union Ministry of External Affairs addressing the session on 'Standards for the Home'. She is flanked by Dr A. N. Ghosh and Shri A. B. Rao, Director (Consumer Products), ISI, the Secretary of the session (left)

In the absence of the author, the papers 'Standards in the service of the home' and 'Adulteration—a menace' were presented by the Secretary. In his first paper, Shri Malhotra urged that as far as home was concerned, standards should be enforced by law and any certified material not conforming to the standard should be confiscated and destroyed. In the second paper the author, who made a special study of adulteration problem in the country, listed various adulterants used with different kinds of food items and discussed some of the hazards that resulted from using adulterated food. He advocated that steps should be taken to declare adulteration as a social evil. Testing laboratories should give publicity to the injurious effects of adulteration. Consumer cooperatives should produce

correct labelling, quality marks for larger number of items, consumer cooperatives, consumer associations and the need for women to play a greater role in this field.

Shri A. B. Rao introduced the paper 'Tested appliances for the home' which dealt with consumers' bodies and associations functioning in various countries of the world and the unfortunate lack of such activities in India. The National Consumer Service working under Bharat Sevak Samaj was conducting some market surveys regarding prices and adulteration, while the Indian Consumer Society, Bombay and the Consumer Association of Eastern India, Calcutta were having teething troubles.

The paper 'Standards work and housewife' by Smt Sunila Singh stressed women's participation in ISI

Discussion

Dr (Smt) Sumati Rajagopal (S. N. College for Women, Quilon) referred to some accidents due to fire that happened in congested kitchens. She supported the Chairman's idea of developing ideal kitchens to avoid such accidents. The municipal as well as public analytical laboratories should make known the results of analysis of many items of food and drugs so as to guard the public against adulteration and other malpractices. Touching on women's participation in ISI work, she felt that home science colleges and institutions in the country could provide useful participation on ISI committees.

Shri T. V. Subba Rao (Andhra Pradesh Forest Department) quoted examples of how a housewife had a controlling authority over the activities at home and felt that she should actively participate in all consumer protection measures. He also advocated that in order to enable delegates at the Conventions to publicize the certified goods as much as possible, lists of ISI marked goods should be made available at the conference.

Smt Janak Taneja (Delhi), while expressing her concern at the type of adulterants used, desired that drastic punishments and humiliation in public, as had been done in Punjab recently, appeared to be the only solution against this unsocial evil.

Shri M. M. Shenoy (Rourkela Steel Plant) commented on the Chairman's remarks about the desirability of changeover to 110 volt system for electrical distribution. He was of the opinion that a changeover from 220 to 110 volt would be very expensive and the safety aspect could very easily be implemented by following the requirements specified in Indian Standards.

Shri M. V. Meswani (Premier Automobiles Ltd) felt that the social evil of adulteration should be uprooted in order to save the present generation as well as its effects on the progeny.

Shri John P. John (Island Seafoods Private Ltd, Cochin) mentioned that the food processors were taking enormous precautions especially in canning food. However, he felt that the housewife and the general consumer should work for wide adoption of Indian Standards.

Smt Vanaja Lakshman, mentioned about a certified pressure cooker leaking steam and felt that though ISI had arranged for the replacement of the cooker, more precautions should be taken in testing the cookers both at the factory as well as by ISI.

Referring to the complaint made by Smt Vanaja Lakshman about the defective pressure cooker, Smt Arati Sen urged that the manufacturers should make necessary improvements rather than be content with replacing the defective pressure cooker.

Shri P. D. Chawla (CPWD) speaking about adulteration felt that the law should not leave any loopholes by which the culprits could escape punishment. As an instance he cited a case in which kulfi had been adulterated with blotting paper and the accused escaped unpunished.

Lt-Col M. C. Bhatnagar (Army Headquarters) felt that in order to be able to implement standards at the home level, home science course for

girls was very appropriate and suggested that this be made compulsory for all school-going girls.

Dr N. K. Gopalan (Ministry of Defence) felt that more and more attention should be paid to the safety aspects of home appliances including electrical goods. He also pointed out that the lay consumer did not know much about ISI mark and was not able to distinguish whether the mark was for the container or for the contents.

Shri V. K. S. Menon (National Institute for Training in Industrial Engineering) stated that the Institute had designed ideal kitchens for various income groups which should be acceptable to the home makers. He supported the suggestion of the Chairman for changing over of electrical supply from 220 to 110 volt. In order to avoid spurious goods, Shri Menon stressed the necessity of purchasing only certified products.

CONCLUDING REMARKS

Summing up the discussions, the Chairman felt that it was possible to avoid certain difficulties if the country had a strong consumer organization with a large membership. The testing activities of such an organization should keep out the manufacturer. She felt that there was also unanimity of thought in bringing to book the culprits who indulged in adulteration. Regarding safety, she felt that though there was no unanimity of opinion, in the interest of saving human life a switchover to 110 volt supply was desirable.

Dr A. N. Ghosh, Director General ISI, expressed warm appreciation of the discussions and the constructive suggestions put forward by men and women delegates. He promised that some of the suggestions would be taken due care of. With particular reference to publicity, Dr Ghosh stated that ISI did take and would be taking necessary steps in publicizing the standards work and the mark through cinema slides, radio talks, advertisements, etc. He made an earnest appeal to the delegates gathered at the Session to carry the message of standardization and the certification mark so that more consumers knew about it. Dr Ghosh declared that any consumer movement organized with the purpose of evaluating the quality would have the support of ISI. He paid his tribute to the Chairman for conducting the Session in such a lively and fruitful manner and proposed a very hearty vote of thanks.



The Technical Session on 'Standards for the Home' was a big draw

S-7 Standards for Technical Editors and Publishers

Chairman	Shri B. N. Sastri, former Chief Editor, CSIR, Central Food Technological Research Institute, Mysore
Discussion Leader	Dr R. L. Thakur, Central Glass & Ceramic Research Institute, Calcutta
Secretary	Shri Ram D. Taneja, Indian Standards Institution, New Delhi
Date	30 December 1966

PAPERS PRESENTED

Group A Preparation and Processing of Manuscripts

S-7/A : 1	Areas for standardization in the production of books and articles	S. R. Ranganathan, DRTC, Bangalore
S-7/A : 2	Choice of principle of helpful sequence	A. Neelameghan & G. Bhattacharyya, DRTC, Bangalore
S-7/A : 3	A standard manual for industrial publications programme: scope and contents	V. V. Parthasarathy, Semiconductors Ltd, Poona
S-7/A : 4	Preparation of technical manuscripts — need for guidance to engineers	S. Mukhopadhyay, Institution of Engineers (India), Calcutta
S-7/A : 5	The craft of the blue pencil	P. N. Malhan, Indian Institute of Mass Communication, New Delhi

Group B Matters of Style

S-7/B : 1	The style manual as a medium of communication	Ram D. Taneja & P. V. Gopalakrishnan, ISI, New Delhi
S-7/B : 2	Article in a periodical, prelims	A. Neelameghan & G. Bhattacharyya, DRTC, Bangalore
S-7/B : 3	Preparation of alphabetical index to books	M. A. Gopinath, DRTC, Bangalore
S-7/B : 4	Information to be given at the top and bottom of an open double page of an article	(Miss) Afroze Fathima, HMT Ltd, Bangalore, & (Miss) R. Sugra Begum, Polytechnic for Women, Bangalore
S-7/B : 5	Suggestions for standard practices of paragraphing, numbering and itemization in Indian languages	G. P. Srivastava, ISI, New Delhi

Group C Illustrations for Effective Reproduction

S-7/C : 1	Illustrations and their graphic reproduction — standard symbols and notations for simplifying checking and correction of proofs	I. M. L. Bhasin & Gurcharan Singh, ISI, New Delhi
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Group D Format, Layout, Typography

S-7/D : 1	Bridge between typescript and print	S. R. Ranganathan & M. A. Gopinath, DRTC, Bangalore
S-7/D : 2	Standardization of sizes of publications	Abdul Rahman, HMT Ltd, Bangalore

Group E Qualifications, Functions and Training of Technical Writers and Editors

S-7/E : 1	Professional qualifications for editors of research periodicals with special reference to their functions and training	A. Krishnamurthi, R. N. Sharma, S. S. Saksena, D. S. Sastry, K. Satyanarayana & K. S. Rangarajan, Publications & Information Directorate, Hillside Road, New Delhi
S-7/E : 2	Training of 'publication engineers'	S. B. Deshaprabhu, Publications & Information Directorate, Hillside Road, New Delhi

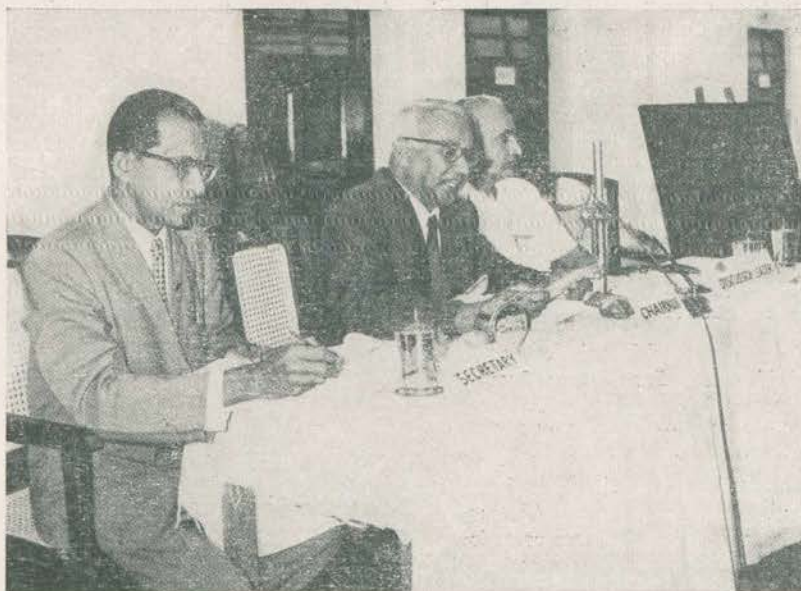
OPENING REMARKS

■ Shri B. N. Sastri welcomed the delegates and thanked the Indian Standards Institution for according him the honour to preside over the session. He observed that it was for the first time that technical writers, editors and publishers in India had been brought together to confer on matters pertaining to the improvement of scientific and technical publications. Paying his tributes to Dr Lal C. Verman, the Chairman said that Dr Verman had been a champion of high standards for publications as for many other things. The organization of the present session, Shri Sastri said, had been largely inspired by Dr Verman and Dr Ghosh, his worthy successor whose concern for sound editorial and publication standards was well known.

Shri Sastri described the technical publications as 'ambassadors of science', for the quality and stature of the scientific achievements of a country were reflected in its publications, and the world at large got to know the country's achievements through its periodicals, monographs and other scientific and technical publications. The maintenance of high standards of excellence in publications work was, therefore, a matter of the highest importance.

Referring to the attention devoted in recent years to document handling methods and the many refinements introduced in the techniques of information retrieval and storage, the Chairman felt that in the effort to cope with the prodigious problem of literature proliferation — 'Information Crisis' as it had come to be called — the work of documentation specialists must be matched by the efforts of publication specialists, whose responsibility it is to provide documents of real scientific merit, conforming at the same time, to the requirements of documentalists; both content and form were important.

Quoting Prof Bernal, Shri Sastri pointed out that the bulk of scientific publications was itself delusive. It was of very unequal value. A large proportion of it, probably as much as three-quarters, did not deserve to be published at all. This view had been reiterated by many others; and the experience of all those who were concerned with sifting, reviewing, and synthesising information, confirmed it. Whatever be the percentage of papers that lacked merit, or were devoid of merit, the central fact remained that scientific and technical literature was loaded



Addressing the technical session on 'Standards for Technical Editors and Publishers', Shri B. N. Sastri, former Chief Editor of CSIR described the technical publications as 'ambassadors of science'. Seen others in the picture are Shri Ram D. Taneja, Editor, ISI (Secretary of the Session) and Dr R. L. Thakur, Central Glass Research Institute, Calcutta (discussion leader)

with trivia. So long as the yardstick for measuring the work of a scientist for appointment, promotion or preference was based on the quantity of publications — number of papers, even number of pages — the law of 'produce or perish' prevailed, and papers lacking in quality or merit would continue to burden scientific literature and bedevil literature specialists.

The Chairman strongly felt that measures must be taken with a sense of urgency 'to tidy up our publication activities, and technical writers, editors and publishers must commit themselves deeply to this great task and formulate standards and codes of practice which would help them to produce documents of scientific merit and value'.

Continuing, the Chairman said, 'Publications should be looked upon as end products of the research enterprise. It is through them that users come to know of new ideas, concepts, methods, techniques and data revealed through research. These results are of value to research workers, industry, and the general public, and in order that publications embodying these results may meet the requirements of users, they must satisfy exacting standards with regard to both intrinsic worth and form of presentation. Research has become an industry in its own right and in the interest of

users, quality control measures should be imposed all along the production line, from the raw material to the finished product'.

Concluding his remarks, the Chairman said that the topic of standards for technical writing, editing, etc, was of particular interest to science. 'Science feeds on science' was a well-known adage, and the dynamism of the scientific community was sustained by the circulation of scientific information. The effectiveness of communication of this information was a matter of vital importance. Subject knowledge was an essential requirement for technical writers and editors, and they must be adequately trained for carrying out their work efficiently, effectively and responsibly. Much attention had been given to the training of communication specialists in other countries. The US Civil Service Commission had issued a formal 'position classification' for technical writers and editors. The FID/ICSU/IFLA/ISO/UNESCO Liaison Committee had published a 'code of good practice' for scientific publications. There were other publications also providing guidance to those engaged in the profession of writing and editing; and the American Association for the Advancement of Science has a section (Section T), under whose auspices writers, editors and publishers

meet annually to discuss matters germane to the improvement of the effectiveness of scientific communication. The British Association for the Advancement of Science had likewise organized a section on the subject.

Referring to the papers for discussion at the Session, Shri Sastri said that the coverage was fairly wide. One lacuna was the absence of papers on standards for publications in Indian languages. The importance of these publications was rising, and it will rise further. It will be useful to formulate standards even now so that their production may conform to high standards of excellence. There were also a few other lacunae, for instance, there was no paper on technical terminology. It would be too ambitious, however, the Chairman remarked, to expect that all aspects could be covered in one session. He had no doubt that ISI would provide opportunities for discussing the needs and requirements of publications at future sessions of its conventions.

The Chairman's remarks were endorsed by the Director General, Dr A. N. Ghosh, who emphasized the need for meticulous care in the presentation and publication of any material. Tonnes and tonnes of paper was being wasted on publications which were not worth reading at all. Besides wasting the time of the authors, such publications wasted the time of the reader. As such it was important that some standard approach was worked out for stopping the publication of such trivial material.

Dr Ghosh expressed the hope that under the able guidance of the Chairman and the Discussion Leader, the discussions at the session would be lively and fruitful. He added that ISI would be happy to take appropriate action on suggestions made as a result of the discussion at the Session.

PRESENTATION OF PAPERS

The Secretary, Shri Ram D. Taneja, while presenting the plan for discussion of papers, referred to the four allied technical sessions held in earlier conventions at Madras (1957), Hyderabad (1959), Kanpur (1961) and Bangalore (1965). All of these mainly concerned the fields of documentation, library housing, etc. The Ernakulam Session was to be devoted to consideration of the chain of operations from the author's manuscript to the finished book. It would examine some aspects of publication work where standardization

could help improve presentation and quality, and achieve economy through saving on materials as well as on mental and physical effort.

For facility of discussion, the papers were considered under the following five groups:

Group A — Preparation and Processing of Manuscripts: Papers A:1 to A:5

Group B — Matters of Style: Papers B:1 to B:5

Group C — Illustrations for Effective Reproduction: Paper C:1

Group D — Format, Layout, Typography: Papers D:1 and D:2

Group E — Qualifications, Functions and Training of Technical Writers and Editors: Papers E:1 and E:2

The presentation of a group of papers was followed by discussion of the areas covered by the group.

PREPARATION AND PROCESSING OF MANUSCRIPTS

Dr S. R. Ranganathan's paper 'Areas for Standardization in the Production of Books and Articles' which was presented by Shri G. L. Gulati (ISI), gave a schematic representation of the areas of work from the point of creation of thought to the point of its release in printed form. Areas which were amenable to standardization or guiding principles (including those which had already been covered by national standards) and those that remained to be taken up were indicated.

Presenting the paper 'Choice of Principle of Helpful Sequence' by Shri A. Neelameghan and Shri G. Bhattacharyya, Shri Abdul Rahman (HMT, Bangalore) enumerated the principles for helpful arrangement of the thought content in a document in relation to the majority-use in view. He pointed out that, in the choice of a principle from among the principles of helpful sequence, problems might arise in one or more of the following ways: (a) Two or more principles might give a sequence apparently equally helpful in the context; (b) the Law of Symmetry suggesting the possibility of the existence of a sequence of entities that was reverse of the sequence given by the Principle of Helpful Sequence used; (c) the need to decide the sequence of application of the principles, when two or more of them were applicable in arranging the chapters and the sub-sections of each chapter in a book, or a section and its sub-sections in an article; (d) the possibility of using a principle that will

give a comparatively more helpful sequence not being obvious; and (e) the more appropriate attribute of the entity concerned for the application of the principle of helpful sequence not being evident. The authors had suggested that a guiding principle for deciding the choice from among the principle of helpful sequence might be based on the subject context and the estimate of the author regarding the approach of his readers.

Shri V. V. Parthasarathy's paper 'A Standard Manual for Industrial Publications Programme: Scope and Contents' which was presented by Shri S. N. Roye (FCI, Sindri), brought out the scope and contents for a standard manual suitable for industrial publications programme. The requirements of effective communication in an industrial context, the communication vehicles used for this purpose and details of the publication programme of a progressive company were elaborated. After reporting that the publication mechanics of various forms of communication vehicles had a common pattern (with only slight variations for product specifications and catalogues), the paper emphasized the substantial economy and high operational ease possible of a co-ordinated publications programme. The operational structure of the programme with distinctive recognition of its functional units and role of the respective participants was worked out during a review of the programme. Freezing of operations at different stages as a means of facilitating the flow of publication work had also been dealt with. In drawing up the scope and contents of a standard manual, the author found the approach through five planes of work, namely, idea, structure, verbal, notation and physical, most helpful. It was suggested that a co-ordinated publications programme, on the lines detailed in the paper, might be recommended by ISI as a standard guideline for industrial publication activities.

Presenting his paper 'Preparation of Technical Manuscripts: Need for Guidance to Engineers', Shri S. Mukhopadhyay (Institution of Engineers, Calcutta) stressed that engineers needed to develop facility in writing. They had to acquire a multi-faced personality today: the managers of engines and men, the blueprint-designers and research workers, the masters of servo-machines like the computer and electronic brain, and the writers of reports, standards, text books, articles, etc, to mention only

a few diversities of the profession. He mentioned that the problem appeared to be the lack of right balance in education and of adequate emphasis on writing aspect of the profession. The author referred to the absence of well-laid house styles for technical publications of universities, research institutions, publishing houses, industries and commercial enterprises in India. He emphasized the need for providing guidance to engineers through a series of Indian Standards, each dealing with a specialized branch of technical literature.

Prof P. N. Malhan whose paper 'The Craft of the Blue Pencil' was presented by Shri V. B. Mainkar (Directorate of Weights and Measures, Union Ministry of Commerce, New Delhi), described the editor as a surgeon, whose task was to brighten up the written material by scrupulous and meticulous application of his blue pencil. This involved mending loose constructions, cutting off the fat, improving the presentation and weeding out grammatical solecisms. The author dealt at length with some editing techniques and matters connected with improving language, syntax, style, etc.

Discussion

Shri S. Mukhopadhyay stated that his experience about the engineers' enthusiasm for writing was very discouraging. He mentioned that for the *Journal of the Institution of Engineers*, only 300 papers per year were received, out of which about 50 per cent got screened out for lack of requisite quality and standard. He suggested that to avoid such wastage, some sort of guidelines should be given to the authors. To tackle the problem at the national level, he suggested that ISI should prepare a series of Indian Standards which would guide the authors in the preparation of publishable manuscripts suitably. Supporting this view, Shri A. Krishnamurthi (Publications and Information Directorate, CSIR) observed that it would be very useful to the authors if they had some specific and clear instructions from the organizations concerned by way of guidelines for writing their papers. This was further endorsed by Shri S. B. Deshaprabhu (Publications and Information Directorate, CSIR).

Shri R. S. Mani (Standards Batteries, Bombay) stated that though certain amount of standardization in the production of books and articles was

necessary, it would be stretching things too far if standardization was introduced even for the manner of approaching the subject.

Shri A. Krishnamurthi felt that the general quality of technical papers was really much below par. With a view to improving it, he suggested that it would be worthwhile if a course in technical writing was introduced in the technical colleges and the universities at the post-graduate level. He mentioned that in countries like USA there were separate courses for technical writing and it would be very useful if such courses were introduced in the Indian universities also. Endorsing the views of Shri Krishnamurthi, Shri Rajagopalan stated that clarity of thought and expression were the foremost things for a good writer and introduction of such a course would provide adequate training to the technical personnel in this regard.

With regard to the smaller number of papers received by the Institution of Engineers (India), Dr C.V.S. Ratnam (Neyveli Lignite Corporation) pointed out that one of the reasons might be the inordinate delay in the publication of the papers, with the result that the writers lost interest. He mentioned that in some cases it took about 1½ years or so to publish a paper. He also pleaded that some guidance to the authors about the method of preparation of manuscript, type of material that it should contain, etc, should be given.

To overcome the problem of delay in the publication of articles, it was suggested by one of the delegates that there should be proper co-ordination between different links in the chain of production of technical publications.

Referring to the paper 'Areas for Standardization in the Production of Books and Articles', Shri Deshaprabhu stated that standardization of structuring the technical exposition was not only desirable but essential. He also emphasized the need for a standard manual for technical writers, editors and printers.

Agreeing with the views expressed by the participants, the Chairman observed that there was definite need for prescribing guidelines for the authors, editors and publishers of technical papers. He mentioned that there was a draft Indian Standard 'Guiding principles for preparation of the text of a book and of an article in the learned periodical' and suggested that while finalizing this document,

ISI should take into consideration the suggestions made in the papers and the views expressed in the discussion.

Summing up the discussion, Dr R. L. Thakur observed that it would be very helpful if some guiding principles for them were formulated as they would facilitate preparation of the manuscripts. He felt that ISI could undertake this job. He agreed with Shri Deshaprabhu that standardization of structuring the exposition was very essential.

MATTERS OF STYLE

Presenting the paper 'The Style Manual as a Medium of Communication', by Shri Ram D. Taneja and Shri P.V. Gopalakrishnan, the Secretary mentioned that a reasonable amount of time and effort spent in putting the manuscript in good physical shape was always a worth-while investment. The script must be made self-consistent in all respects and also consistent with all other scripts for the particular journal, book or series of books. He explained that styling had nothing to do with an author's prose style. Two manuscripts that were styled by the same person according to the same standards might still be completely different from each other in prose style. He stated that a style manual laid down certain guidelines to assist writers, editors and printers in preparing documents which helped in promoting uniformity and expeditious printing. Shri Taneja described the various elements considered essential for editing technical materials which must be covered by a style manual. A brief review of the work done in laying down standard practices on some of these elements on the national as well as international level, was given.

Underlining the need for a comprehensive house manual of style, the author mentioned that ISI published its *Guide for Drafting Indian Standards* as early as 1949. This had been revised from time to time based on the experience gained; the second revision was published in 1964. As a result of the continued use of this Indian Standard Guide, it had been possible not only to maintain a fairly high editorial standard for the Institution's publications, but also to reduce significantly the time taken for printing an Indian Standard. Though no style book could answer every question, a style book did help overcome most of the hurdles and that indeed was its

precise function, namely, to cover those situations that came up most frequently in the publisher's day-to-day operations.

The paper 'Article in a Periodical, Prelims' by Prof A. Neelamaghan and Shri G. Bhattacharyya which was presented by Shri Abdul Rahman, discussed the possibility of adopting a uniform practice in regard to the statements in the preliminaries to the text of an article. The functions of the prelims were to facilitate (a) preliminary evaluation of an article to decide on its perusal by the reader; and (b) identification, location and evaluation of article, and making entries for it in documentation lists designed to help readers. A survey of the published articles in about 100 learned periodicals had revealed that a variation in the statements included in the prelims and the sequence in which the statements were given were not conducive to productivity in respect of the two functions mentioned above and for the preparations of the press copy of an article in a periodical. It had, therefore, been thought desirable to follow a uniform practice in respect of the prelims to an article in a learned periodical and a standard in regard to the statements and their sequence to be included in the prelims had been suggested. The importance of proper wording of the title of the article and its correlation with the abstract had been stressed. A method of deriving a helpful title for an article had been suggested with illustrations.

Shri M. A. Gopinath, whose paper 'Preparation of Alphabetical Index to Books' was presented by Shri M. S. Dandekar (INSDOC) described (a) organization of the index, (b) choice of index terms, (c) rendering of the index term, (d) arrangement of entries, and (e) layout of the factors involved in the preparation of an alphabetical index to a book; all of which except 'choice of index terms' had been found amenable to standardization. Even here, it was felt, the application of certain guiding principles given by Dr Ranganathan would prove helpful. It was pointed out that preparation of the index would be greatly speeded up and could be done concurrently with the preparation of the press copy if the author of the book adopted the Draft 'Indian Standard on guiding principles for the preparation of the text of a book and of an article for a learned periodical'. The author had further described a

standard procedure for the preparation of the index with illustrations.

Miss Afroze Fathima and Miss R. Sugra Begum, in their paper 'Information to be Given at Top and Bottom of an Open Double Page of an Article' (presented by Shri Abdul Rahman) listed the usual items of information given at the top and bottom recto and verso of an open double page of an article and the help that they render to the reader and the publisher in various ways. Positions of the items occupied at the top and bottom of the verso and recto pages were also mentioned. A survey of the top and bottom recto and verso of the open double page of articles in about 125 learned periodicals on various subjects revealed that there was considerable variation in the kind and number of items of information given in the top verso, bottom verso, top recto and bottom recto of an open double page of an article. There was also variation in the sequence, position and style in which these items of information were presented. This paper considered the utility of various items of information and suggested a code of practice for these items of information, their position and sequence in relation to the ISI Draft Standard 'Guiding principles for the preparation of the text of a book and of an article in a learned periodical'.

The paper 'Suggestions for Standard Practices of Paragraphing, Numbering, and Itemization in Indian Language' by Shri G. P. Srivastava which was presented by Shri V. B. Mainkar sought to introduce standardization in the field of technical writing and editing in Indian languages. Problems of standard practice for paragraphing, numbering and itemization were discussed and the practices and provisions obtaining in English for the purpose were examined with a view to their suitable adaptation in Indian languages. The author further analysed the factors associated with the areas requiring formulation of new standards in the light of limitations of the Indian languages. Suggestions were made for standard practices for paragraphing, numbering and itemization in the context of the available facilities.

Discussion

Referring to the paper 'Article in a Periodical, Prelims' Shri A. Krishnamurthi observed that the title of an article should be brief and should give the main concept only. He further mentioned that a suitable

method should be devised for giving the name and address of the author in the article to obviate the difficulty of getting the reprints of the articles later on. He stated that sometimes it so happened that at the time of writing the article the author would be with some organization but by the time the article was published he goes over to some other organization. He further observed that since the technical and scientific articles were not very lengthy and were confined to a few pages only, it would be preferable, if a running summary was given instead of the table of contents. The view was endorsed by some other delegates also.

Shri Abdul Rahman (Hindustan Machine Tools Ltd, Bangalore) stated that the method of indexing should be such that it was convenient for the reader to locate the information he wanted in the book. He mentioned that ISI had already formulated standards on the subject but they were not being followed by the publishers, not even by the Publications Division of the Government of India.

The Chairman, Shri B. N. Sastri, observed that there was need to have a style manual to assist writers, editors and printers in preparing documents, but it would be too early to make an attempt in that regard at the national level. He suggested that in the first instance house manuals should be drawn up by the premier technical and scientific organizations like CSIR, ICAR, ICMR, NIS and other publishers of technical publications for their own publications. Based on these house manuals, a style manual for scientific publications at the national level should be formulated by the Indian Standards Institution at a later date. He further suggested that an Indian Standard should be formulated by ISI on 'Article in a periodical—prelims' taking into consideration the suggestions made in the paper. He stated that there was already an Indian Standard on 'Rules for Making Alphabetical Indexes (IS : 1275-1958)' and suggested that at the time of its revision, ISI should take into account the suggestions made. The Chairman commended the suggestions made by Shri G. P. Srivastava (ISI) in his paper for standard practices of paragraphing, numbering and itemization in Indian languages. Since ISI had already worked out a number of standards for publications in English, the Chairman suggested that a sub-committee of the Documentation

Sectional Committee should be set up to work out adaptation of the existing standards for publications in Indian languages.

ILLUSTRATIONS FOR EFFECTIVE REPRODUCTION

Shri I. M. L. Bhasin and Shri Gurcharan Singh in their paper 'Illustrations and Their Graphic Reproduction—Standard Symbols and Notations for Simplifying Checking and Correction of Proofs', presented by Shri S. B. Deshaprabhu (Publications and Information Directorate, CSIR), emphasized that illustrations occupied an important position in publication mechanics because they helped to supplement text, to show details that were difficult to describe in words and brought out functional relationship between variables or made it possible to compare at a glance different sets of observations. In the development of illustrations, right from the stage of commissioning the art work to its final reproduction in the printed form, there were a number of stages involving communication of instructions from authors or editors to artist on the one hand and to the process engraver and the printer on the other. A large number of these instructions were repetitive in character. The authors suggested that it would save considerable time and energy if they could be indicated with the help of standard notations and symbols developed on lines similar to proof correction symbols for use in the text. The standard symbols would not only avoid the necessity of writing out lengthy notes or frequent personal consultations but would also preclude the possibility of ambiguity or misinterpretations. The authors had made an analysis of the different types of illustrations—designs in black and white, photographs, colour transparencies, etc—and the problems connected with their reproduction. A set of symbols had been proposed to facilitate marking of the common type of corrections in art works as well as on block pulls supplied by the engraver for the use of editors, artists, technical photographers, process engravers and printers.

Discussion

Shri Deshaprabhu stated that he had gone through the paper with interest and found that the symbols suggested therein for correcting illustrations and their graphic reproduction would be of great help in saving

a lot of time. He complimented the authors for these suggestions. However, he did not agree with some of the symbols such as use of thicker lines and thinner lines. He suggested that a committee be set up to look into these suggestions.

The Chairman observed that it was a good paper which the officers of ISI had attempted by suggesting symbols for corrections in illustrations and their graphic reproductions. He suggested that ISI should take up the work of formulating an Indian Standard on the subject, taking into consideration the suggestions made in the paper.

Dr Thakur, the discussion leader, observed that this was for the first time that some thought had been given to this subject. He endorsed the Chairman's suggestion that ISI should formulate an Indian Standard on the subject.

FORMAT, LAYOUT, TYPOGRAPHY

The paper 'Bridge Between Typescript and Print' by Dr S. R. Ranganathan and Shri M. A. Gopinath was presented by Shri G. L. Gulati (ISI). For minimizing the time lost in estimating the number of printed pages of a book or an article presented in typescript and for securing other advantages, it had been suggested that standards for printing and typing be worked out for different type sizes so that one printed line contained exactly the same number of words as the corresponding typed line. Dr Ranganathan further suggested that standardization of the number of lines in each typed as well as in each printed page should be such that the ratio of the number of the printed pages to the number of typed pages of a book or an article was a simple fraction.

Presenting his paper 'Standardization of the Sizes of Publications', Shri Abdul Rahman explained the need for standardizing the sizes of various kinds of publications and reduction of variety of sizes for the same type of publication, and suggested the use of sizes in the universal series according to 'IS : 1064-1961 Indian Standard specification for paper sizes'. He outlined the criteria for determining the suitable standard sizes for publications and based on these criteria recommended the standard sizes for different types of publications, such as text books, periodicals, standards, patents, atlases, working instructions and trade catalogues. The author

suggested that ISI should formulate an Indian Standard for sizes of publications and appealed to all concerned — publishers, printers, editors, librarians and manufacturers of papers to co-operate in implementing such a standard.

Discussion

Shri G. L. Gulati (ISI) emphasized the need for standardization of sizes of different publications not only at the national but also at the international level. He suggested that A-4 and A-5 sizes could be conveniently adopted for journals and text books respectively. In regard to Dr Ranganathan's suggestions that one typed line should contain exactly the number of words contained in a printed line, Shri Gulati thought the idea was not practical. A number of other participants including the Chairman also felt that the suggestion was of theoretical interest and its implementation would raise more difficulties than it will solve.

Shri Deshaprabhu agreed with the need for standardization of sizes of publications and further suggested that paper manufacturers should be asked to produce paper in the standard sizes in Universal 'A' Series.

Shri Mukhopadhyay felt that besides having standards for sizes of publications, standards for the thickness of different types of publications, as suggested by Shri Abdul Rahman, should also be worked out.

The Secretary informed the delegates that ISI had already decided to publish its standards in A-5 size except where it was necessary to use A-4 size to accommodate certain types of drawings, illustrations or tabular data. *ISI Bulletin*, the monthly Journal of the Institution, was being published in A-4 size.

Agreeing with the views expressed by the delegates, the Chairman observed that ISI should take up formulation of an Indian Standard for sizes of publications taking into consideration the suggestions made.

QUALIFICATIONS, FUNCTIONS AND TRAINING OF TECHNICAL WRITERS AND EDITORS

Presenting his paper 'Professional Qualifications for Editors of Research Periodicals with Special Reference to Their Functions and Training', Shri A. Krishnamurthi stated that because of an exponential increase in the rate of accumulation of new knowledge in various disciplines of

science and technology, the scientific publication work in the advanced countries had emerged as a specialized profession, but the situation was markedly different in India. He mentioned that in the absence of any clear-cut guidelines or codes of practice, no standard practices were followed in the execution of various operations involved in the publication of research papers from the time of their receipt in the editorial office to bringing them out in print. As a consequence compared to advanced countries, very few periodicals in India measured up to international standards. The author then explained the professional qualifications required for editors for their responsibilities and functions. He stated that in his key position as a central link between the authors on the one hand and the referees on the other, the editor has to possess both subject and professional competence of a high order. The editor's attainments and training should be interdisciplinary in character. He suggested that for putting the technical publications services on a sound footing, there was need for establishing training facilities for persons with basic subject qualifications desirous of adopting technical communication as a profession. The responsibility for providing training facilities could be taken up jointly by a university and a well-established technical publications unit, such as the Publications and Information Directorate of CSIR. To induce suitably qualified persons to adopt the profession of a technical editor, the author suggested the provision of substantial incentives in some form or other. He further emphasized the need for drawing up a standard manual for technical editors embracing all aspects of their work as well as a code of practice for them.

Presenting his paper 'Training of Publication Engineers', Shri S. B. Deshaprabhu stated that a good crew of workers had to be developed before standard publications might be forthcoming. In order to bring out well-planned scholarly publications of a high standard, special professional skill and thorough knowledge of the principles and practices of technical writing, editing and production was needed. He suggested the introduction of a course for technical writers, editors and production specialists at the university level. It was also desirable to organize facilities for on-the-job training, refresher courses, summer schools and technical workshops specially to

meet the needs of those already working in the profession. He made a mention of an on-the-job training scheme being worked out by the Publications and Information Directorate of CSIR.

Discussion

It was pointed out by Shri C. G. R. Kurup (ICAR) that technical editing was a specialized job and it was very essential for the editors to have some sort of fundamental basic background on the subject. He mentioned that a course for technical writing would not suffice for technical editing; the training of technical editors should be taken up seriously. There should be specific courses suited to basic qualifications of the editors at the universities and this could form a part of the course of journalism. Besides, premier scientific bodies like CSIR, ICMR, ICAR and ISI should also organize training courses for the editors.

Shri M. S. Dandekar (INSDOC) stated that technical writing and editing were two distinct professions. While the course for technical writing should be compulsory for every scientific worker, there should be separate specialized courses for technical editing.

Narrating his experiences in Hindustan Machine Tools Ltd, Shri Abdul Rahman stated that many of the ideas and processes developed there could not be published because the persons who developed them were generally not able to write about them. As such there was terrific amount of wastage of technical and scientific effort in the country. He, therefore, emphasized the need for training of technical workers in technical writing. He suggested that besides a course at the university level, there should be some short-term in-plant training or refresher courses for the engineers. To keep them active and their interest in writing live, organizations like CSIR and UGC should organize symposia and seminars at regular intervals.

Shri A. Krishnamurthi stated that an ideal choice for a technical editor's job would be one who combines knowledge of subject discipline with skill in expression. He felt that for technical editing, subject qualification was absolutely essential but once the manuscript had been edited as such, this qualification should not be an overriding factor.

The Chairman felt that in order to attract talented scientists and technologists for careers in the publications field, and to raise the standard of research and technical periodicals and other publications, it would be important that the profession of technical writers, editors and publishers was accorded due importance and status in regard to service conditions, and that only qualified persons were appointed as editors in technical and research organizations.

RECOMMENDATIONS

The following recommendations emerged from the discussion:

1) Standards on the following subjects be formulated:

- i) Article in a periodical — prelims
- ii) Sizes of publications
- iii) Symbols and notations for simplifying checking and correcting proofs of illustrations, etc

2) Existing standards on the following subject should be reviewed taking into consideration the suggestions put forward by the participants in the session:

- i) Guiding principles for the preparation of the text of a book and of an article in a learned periodical
- ii) Preparation of alphabetical index of books
- iii) Layout of periodicals

3) A subcommittee of the Documentation Sectional Committee of ISI should be constituted to adapt existing standards for publications in the Indian languages.

4) Style manuals for publications should be prepared by the Publications

Wings of CSIR, ICAR, ICMR, NIS and other publishers of scientific and technical publications. Based on these house manuals, a style manual for scientific publications at the national level might be prepared by ISI at a later date.

5) Standards for writing and editing positions should be formulated and a code of practice for scientific publications should be developed.

6) Technical writing and editing should be recognized as a distinct profession and measures should be taken to train writers and editors in order to improve the standard of publications. Research councils and learned societies may, in the first instance, be requested to provide on-the-job training facilities. Concurrently, UGC may be requested to organize post-graduate training courses for technical writing in the universities.

7) Writing and editing position standards should be circulated to research councils, UPSC, AEE and other organizations to ensure that only qualified persons were appointed to writing and editing positions. This would ensure a continuing improvement in the standards of publications issued in India. A manual for the guidance of editors of scientific publications might also be prepared for circulation and adoption.

CONCLUSION

Summing up, the Chairman observed that he was happy at the fruitful exchange of views and the constructive suggestions formulated at the session and expressed the hope that they would go a long way in improving the standard of technical papers and raising the status and improving service conditions of technical writers, editors and publishers.

The session ended with a vote of thanks proposed by the Secretary to the Chair, the Discussion Leader and the delegates.

'PADMA SHRI' FOR DR VERMAN

■ Figuring in the Republic Day Roll of Honours this year is Dr Lal C. Verma, former Director General, ISI (now in Tehran as Chief Adviser, Institute of Standards and Industrial Research of Iran), who has been conferred 'Padma Shri' in recognition of his leadership in and distinguished services to the growth of Indian industry through organized development of the standardization and quality control movement in the country.

We offer our hearty felicitations to Dr Verma on the honour conferred on him.



Fellows of the Indian Standards Institution

■ In recognition of their valuable contributions to the development and promotion of standardization in different spheres of trade and industry, the following have been awarded the Fellowship of ISI:

<i>Sl No.</i>	<i>Name</i>	<i>Council/Committee with Which Associated</i>	<i>Sl No.</i>	<i>Name</i>	<i>Council/Committee with Which Associated</i>
1	Shri N. Adhikari	i) Alcohols and Allied Products, and ii) Coal Carbonization Products	25	Shri K. K. Chatterjee	Jute Bags for Packing Coins
2	Shri M. B. Amin	Alcohols and Allied Products	26	Shri N. P. Chatterji	Fruits and Vegetables Timber
3	Dr N. Anjaneyulu	Basic Non-ferrous Metals	27	Shri M. D. Chaturvedi	Inorganic Chemicals (Miscellaneous)
4	Mr F. Ashmore	i) Foundry, and ii) Sanitary Appliances and Water Fittings	28	Shri B. B. Chaudhuri	i) Chemical Division Council, and ii) Textile Division Council
5	Dr Atma Ram	Glassware	29	Brig N. N. Chopra	Concrete, Plaster and Tiled Finishes
6	Shri J. J. Bagchi	i) Lubricants; and ii) Methods of Test for Petroleum, Petroleum Products & Lubricants	30	Shri R. A. Cole	Screw Threads and Fasteners
7	Shri B. V. Baliga	Radio Equipment	31	Shri R. G. Da Costa	Southern Regional Storage and Marketing Structures
8	Shri A. B. Banerjee	i) Cutlery, and ii) Hand Tools	32	Shri Chandulal C. Dangoria	Cast Iron and Malleable Cast Iron
9	Shri H. H. Banerjee	Structural Engineering	33	Dr A. A. Das	Cotton Healds and Reeds
10	Dr T. Banerjee	i) Electroplating, and ii) Methods of Chemical Analysis	34	Shri W. H. Date	Soaps and Other Surface Active Agents
11	Shri J. Banerji	Sports Goods	35	Shri J. B. Davies	Structural Engineering Abrasives
12	Shri R. P. Barman	Building Construction Practices	36	Shri A. V. D'Costa	Electrical Appliances and Accessories
13	Dr U. K. Benegal	Treated Fabrics	37	Shri S. N. De	Petroleum Measurements
14	Shri J. G. Berry	Copper and Copper Alloys	38	Shri P. N. Deobhakta	Doors, Windows and Shutters
15	Shri R. S. Bhalla	Construction Plant and Machinery	39	Dr A. M. Desai	Small Tools
16	Dr Bharat Ram	i) Textile Division Council; ii) Cotton, Yarn, and Cloth; and iii) National Flag of India	40	Shri S. F. Desai	Structural Steel
17	Shri K. R. Bhide	Sanitary Appliances and Water Fittings	41	Shri O. D. Friedmann	Oils and Oilseeds
18	Shri P. C. Basu	Pulleys and Belts	42	Shri J. J. Ghandy	Wool Hosiery and Knitted Garments
19	Shri A. K. Bose	Electroplating Chemicals	43	Shri S. C. Ghose	i) Oil & Gas Burning Appliances (Pressure Type), and ii) Utensils
20	Shri B. K. Bose	Precious Metals	44	Shri G. R. Ginns	Fish and Fisheries Products
21	Dr P. K. Bose	Lac and Lac Products	45	Dr N. K. Gopalan	Jute Bags for Packing Sugar
22	Shri R. G. Burt	Mechanical Engineering Division Council	46	Shri K. Gopinatha Pillai	Oil Burning Appliances (Non-pressure Type)
23	Shri N. G. Chakrabarti	Wire Ropes and Wire Products	47	Shri S. N. Gundu Rao	Switchgear and Control-gear
24	Shri P. C. Chanda	Paints and Allied Products	48	Shri T. R. Gupta	Jute Bags for Packing Cement
			49	Shri H. C. Hardy	
			50	Dr R. R. Hattiangadi	

<i>Sl No.</i>	<i>Name</i>	<i>Council/Committee with Which Associated</i>	<i>Sl No.</i>	<i>Name</i>	<i>Council/Committee with Which Associated</i>
51	Prof H. A. Havemann	Internal Combustion Engines	87	Dr K. L. Moudgill	Natural and Synthetic Perfumery Materials
52	Shri M. Hayath	i) Electrotechnical Division Council, and ii) Electrotechnical Standards	88	Shri A. I. Murison	Jute and Jute Products
53	Dr M. B. Ichaporia	Oils and Oilseeds	89	Shri Erach A. Nadirshaw	i) Civil Engineering Division Council, ii) Cement and Concrete, and iii) Building Bye-laws
54	Shri T. N. Idnani	Power Installation and Maintenance	90	Shri R. D. Nadirshaw	Non-cement Floors and Roof Coverings
55	Lt-Col Jaswant Singh	Pest Control	91	Dr P. V. Nair	Coir and Coir Products
56	Shri M. V. Joglekar	Stones	92	Shri K. K. Nambiar	Bitumen and Tar Products
57	Shri G. C. L. Joneja	Jute Bags	93	Shri S. C. Nundy	Cotton Spinning Machinery
58	Shri R. E. Jones	Coir and Coir Products	94	Dr C. Nanjundayya	Textile Standards
59	Dr H. K. Joshi	Petroleum Measurements	95	Dr D. Narayanamurti	Sports Goods
60	Shri N. R. Junnarkar	Drawings	96	Dr E. S. Narayanan	Apiary Industry
61	Dr S. M. Kaji	Water	97	Shri D. Narayanaswamy Chetty	Mechanical Engineering Division Council
62	Dr B. D. Kalelkar	i) Steel Castings, and ii) Cotton Spinning Machinery	98	Dr M. U. Pai	Inorganic Chemicals (Miscellaneous)
63	Shri Kanwar Sain	Fluid Flow Measurement	99	Shri B. N. Pal	Gas Cylinders
64	Dr S. N. Kapur	Timber	100	Dr N. K. Panikkar	Fish and Fisheries Products
65	Shri Kazi Abdur Rasheed	Druggets	101	Dr J. S. Patel	i) Lac and Lac Products, ii) Farm Implements and Machinery, and iii) Spices and Condiments
66	Dr A. N. Khosla	Civil Engineering Division Council	102	Dr M. S. Patel	Tobacco Products
67	Shri D. N. Khurody	Livestock Housing	103	Dr V. N. Patwardhan	Agricultural and Food Products Division Council
68	Shri S. L. Kirloskar	i) Mechanical Engineering Division Council, ii) Machine Tools, and iii) Abrasives	104	Dr O. G. F. Paulssen	Structural Shapes
69	Dr S. Krishna	Chemical Division Council	105	Dr S. V. Pingale	Agricultural & Food Storage Practices
70	Shri D. Krishnamurthy	Cotton Weaving Machinery Components	106	Dr S. V. Puntambekar	Lac and Lac Products (ACI)
71	Dr M. S. Krishnan	Manganese Ore	107	Shri N. E. S. Raghavachari	Electronic Components
72	Shri S. L. Kumar	i) Welding General, and ii) Vice-Chairman of Structural and Metals Division Council	108	Shri T. V. Ramamurti	Alkalis and Chlorine
73	Shri T. K. Lahiri	i) Industrial Gases, and ii) Gas Cylinders	109	Shri S. Ramaswamy	Cotton Mill Shuttles
74	Shri H. Lal	Cereals and Pulses	110	Shri M. Rangachari	Timber
75	Dr K. B. Lal	Pest Control	111	Shri C. R. Ranganathan	Organic Chemicals (Miscellaneous)
76	Prof P. C. Mahalanobis	Quality Control and Industrial Statistics	112	Dr V. Ranganathan	i) Chemical Division Council, and ii) Inorganic Chemicals (Miscellaneous)
77	Dr M. K. Maitra	Gas Cylinders	113	Dr A. Nagaraja Rao	Organic Chemicals (Miscellaneous)
78	Shri C. P. Malik	i) Gypsum Building Material, and ii) Civil Engineering Division Council	114	Dr K. A. N. Rao	Welding, General
79	Dr A. K. Mallik	i) Pig Iron and Ferro Alloys, and ii) Pig Iron	115	Shri K. K. Rao	Petroleum Measurement
80	Brig K. K. Mehta	Environmental Testing Procedures	116	Shri T. R. Rao	Electrical Instruments and Meters
81	Shri V. A. Mehta	Meat and Meat Products	117	Shri T. S. Rao	Timber
82	Shri A. K. Menon	Natural and Synthetic Perfumery Materials	118	Shri V. S. Rao	Organic Chemicals (Miscellaneous)
83	Col V. P. S. Menon	Automobile Electrical Equipment	119	Dr J. N. Ray	Textile Mill Accessories (Other Than Jute)
84	Shri L. C. Mirchandani	Fire Fighting	120	Shri M. A. Rehman	
85	Dr H. K. Mitra	Refractories			
86	Shri D. G. Morarji	Cotton Healds and Reeds			

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121	Shri J. M. Rijwani	Building Construction Practices	141	Shri K. C. Sood	Structural Engineering
122	Shri G. N. Roy	Pulleys and Belts	142	Shri C. A. Subrahmanyam	Organic Chemicals (Miscellaneous)
123	Shri S. K. Roy	Rubber Products	143	Dr V. Subrahmanyam	Soft Drinks
124	Dr P. N. Sahai	Inks and Allied Products	144	Brig P. V. Subramanyam	i) Internal Combustion Engines, and
125	Lt-Gen Sant Singh	Sports Goods			ii) Automotive Vehicles
126	Shri R. N. Sarma	i) Brushware, and ii) Abrasives	145	Dr T. S. Subramanian	i) Chemical Standards, ii) Treated Fabrics, iii) Textile Chemistry, and iv) Sampling Methods
127	Shri Sarup Singh	i) Gypsum Building Material, ii) Building Bye-laws, and iii) Planning and Organization at Site	146	Shri S. Swayambu	i) Switchgear and Controlgear, and ii) Insulating Materials
128	Dr M. B. Sarwate	Electrical Appliances and Accessories	147	Shri G. G. Takle	Timber
129	Shri B. N. Sastri	<i>Kattha</i> , Vegetable Tans and Allied Products	148	Lt-Col J. H. Taylor	Textile Standards
130	Shri S. K. Sen	Gas Cylinders	149	Shri J. C. Thaker	Wire Healds
131	Shri D. L. Sen	Textile Standards	150	Shri B. K. Thakoor	Cutlery
132	Shri D. M. Sen	Drawings	151	Shri T. R. Vachha	Structural Engineering
133	Shri D. N. Sen	Footwear	152	Shri J. S. Vatchagandhy	i) Basic Ferrous Metals, and ii) Wrought Steel Products
134	Shri S. N. Sen Gupta	Boilers	153	Dr K. Venkataraman	Textile Chemistry
135	Prof T. R. Seshadri	Chemical Division Council	154	Shri V. Venkataramayya	i) Bridges, and ii) Structural Engineering
136	Shri D. C. Sharma	Bitumen and Tar Products	155	Shri F. Wade-Cooper	Electrical Plant and Switchgears
137	Prof Nariman B. Shroff	Modular Co-ordination	156	Dr W. D. West	Manganese Ore
138	Shri Srinagabhushana	i) Textile Standards, and ii) Cotton Hosiery & Knitted Garments	157	Dr J. W. Whitaker	i) Solid Mineral Fuels, and ii) Flameproof Electrical Equipment
139	Shri V. P. Sondhi	Ores and Raw Materials			
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POSTHUMOUS AWARDS

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160	Shri B. M. Dass	Leather	171	Shri P. M. Nabar	Glucose
161	Shri S. A. Gadkary	Mechanical Engineering Division Council	172	Dr P. Neelakantan	Textile Materials for Aeronautical Purposes
162	Shri N. P. Gandhi	Basic Non-ferrous Metals	173	Shri E. P. Nicolaides	Functional Requirements in Buildings
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165	Shri P. R. Kodangekar	Pulleys and Belts	176	Shri K. B. Sen	Paper
166	Dr K. S. Krishnan	Engineering Standards	177	Shri S. K. Sen	Bicycles
167	Shri P. N. Kuckreja	Wicks for Oil Burning Domestic Appliances	178	Shri K. C. Sood	Steel Forgings
168	Shri Madhav B. Bhagvat	i) Inorganic Chemicals (Miscellaneous) and ii) Alkalis and Chlorine	179	Lala Sri Ram	Storage and Marketing Structures Co-ordinating Committee

STANDARDS NEWS

THREADED FASTENERS Standard Revised

The Screw Threads and Fasteners Sectional Committee (EDC 27) has revised the main Indian Standard for threaded fasteners, 'IS : 1367-1961 Technical supply conditions for threaded fasteners'.

In the present revision, the tolerances specified for the various categories of threaded fasteners, that is, hexagonal bolts, nuts both of black and precision grades, countersunk and round head screws, and socket head cap screws, have been generally liberalized and brought in line with those that are generally adopted at the international level.

The former version of the standard specified three grades, namely, black, turned and precision. The Committee felt that the use of the term 'turned grade' caused confusion to the consumers, in view of the term being associated with a particular method of manufacture. The committee has now specified three grades which will be designated as black, semi-precision and precision.

Other characteristics in regard to mechanical properties and methods of test have also been covered in the revised version. The earlier version specified 10 different classes of material for bolts, while, for nuts, only four classes had been specified. The revision has regrouped these classes taking into account the available materials in the country and also the standard being evolved at the international level in respect of materials for bolts and nuts. There will be only five property classes in the revised version for bolts and three property classes for nuts. The method of designating the property classes has also been revised eliminating the letter symbols which were previously used in the earlier version.

With the increasing pace of adoption of ISO metric fasteners in the Indian engineering industry, particularly by the railways, defence and automobile sectors, a system of identification marking to distinguish the bolts and nuts made to ISI specifications from those made to other specifications has been introduced. With the issue of revised

specification for IS : 1367, the production of fasteners to ISI specifications and their adoption by major engineering sectors such as automobiles, railways and defence, will receive added momentum.

COMPULSORY QUALITY CONTROL OF AUTO SPARES

With a view to reducing the work of agencies of the Export Inspection Council and limiting its work to an area where compulsory quality control and inspection are imperative, the All India Automobile and Ancillary Industries Association has suggested that a well-equipped manufacturing unit, which turned out quality products, should be given the status of the export inspection agency to determine the pre-shipment quality of automobile spares, components and ancillaries intended for export. The suggestion is contained in its comments on the draft rules for compulsory quality control and pre-shipment inspection of automobile spares for export. Implementation of its suggestion, the Association feels, would enable the genuine manufacturer to export his products unhindered by cumbersome inspection procedures.

The first task was to shut out spurious exports and minimize the possible adverse impact on genuine exports. In the opinion of the Association, elaborate quality control and inspection procedures by an outside agency may be superfluous in the case of well-equipped manufacturing units.

Addressing the seventh annual general meeting of the Association at Madras, Shri M. K. Raju, the President, observed that under no circumstances would the Association like to compromise on quality of the components manufactured by the ancillary industry. The President also emphasized that without all the facilities to test vehicles under different operating conditions for safety, performance, economy and efficiency, the country would not be able to claim an indigenous automobile industry.

Agreeing with these observations, Shri D. Sanjivayya, Union Minister of Industry, who inaugurated the meeting, urged that the existing facilities in the country in technical and research

institutions of the CSIR, and in major industries should be harnessed to the maximum extent. The Minister welcomed the vehicle manufacturers' proposal to set up a co-operative research organization for the industry as a whole but sounded a note of caution against multiplicity of un-co-ordinated attempts in that direction.

ENGINEERING SPARE PARTS EXHIBIT

Import Substitution Drive

An exhibition of some 1 500 items and photographs of essential mechanical and electrical spare parts required by the country's steel plants was held in New Delhi by the Hindustan Steel Limited last January. The exhibition, which lasted three weeks, was part of the Company's import substitution drive and had been arranged jointly by the Bhilai, Rourkela and Durgapur plants.

Inaugurating the exhibition, Shri M. S. Rao, Chairman of the Hindustan Steel Limited, said that the parts and components displayed were urgently needed by the steel industry and the manufacturers in the country would do well to take up their production.

According to an estimate, each steel plant requires, on an average, 50 000 to 80 000 tonnes of spare parts every year. Of these, 70 percent of the requirement is being met by the engineering shop of the plant, itself. Even so, imported parts account for about Rs 120 million in foreign exchange annually.

COLLIMATORS FOR RANGEFINDERS

A programme to rationalize and standardize the short-base rangefinders presently used by the services and to substitute the imported instruments by a single design evolved indigenously is underway at the Instruments, Research and Development Establishment, Dehra Dun. The rangefinder used in the accurate determination of the distance of a target, is an important factor for effective use of weapons in operational areas.

The Establishment has successfully developed prototypes of two collimators—end-on collimator and inspection collimator—required for test and adjustment of the new rangefinder. These collimators can also be adapted for use with the existing rangefinders. To achieve this, two sets of replaceable Y-brackets have been provided in the inspection collimator and an adjustable suspension device has been incorporated in the end-on collimator.

STANDARDS NEWS

The graticules in the collimators have the normal cross-lines, definition markings and magnification marks. A few more lines have been incorporated which will provide artificial range targets for some of the specific ranges. (*R & D Digest*; V 6, N 6; 1966; P 107).

IDENTIFICATION OF DYES IN INKS

For the identification of dyes in writing inks and fluids, the National Physical Laboratory of India has developed a method which makes use of the thin layer chromatography technique. The method consists of studying the behaviour of diluted ink solutions on a thin layer of silica gel coated on glass plate using different eluents. From the approximate R_f value thus obtained, tentative identification of dyes is accomplished. In the next step, spots of known dyes are run alongside the ink spots on the same plate. Parallel movement of the dye and the ink spot confirms the identity of the dye(s) used in the ink.

Out of the 23 samples of various inks available commercially, identity of dyes in 22 cases was established by this technique. The eluents used in the study were *n*-butanol, acetic acid (3 N) and ethanol. For red dyes, the eluents recommended are methylethyl ketone, pyridine, and water.

In the case of writing inks, the main criterion laid down in Indian and British specifications is performance. However, recommendations with respect to the constituents of the formulation have also been made. It is hoped that thin layer chromatography technique (which is much faster than paper chromatography), would greatly aid evaluation of dyes and dye solutions (*American Ink Maker*, October 1966).

PHOTOCHEMICALS: PRODUCTION BEGINS AT OOTY FACTORY

Two ancillary units, one for manufacturing silver nitrate and another for organic chemicals went into production last January at the Hindustan Photo Films Plant, Ootacamund, the country's first, when it was inaugurated by the Prime Minister, Shrimati Indira Gandhi.

The plant will produce 5.8 million square metres of sensitized material annually. The production is to be stepped up to 8.5 million square metres by the end of the Fourth Plan period. The factory has a promising future in that it is likely to launch an export drive in the next few years.

Considerable work has already been done by ISI in the direction of formulating standards for photographic chemicals and related materials. Standard specifications for 'Silver nitrate, photographic grade (IS : 2318-1963)'; 'Sodium sulphite, anhydrous (IS : 247-1964)'; 'Sodium thiosulphate, crystalline (IS : 246-1964)' etc have been formulated keeping in view the limitations of the indigenous industry, and simultaneously aligning these, to the extent possible, with international standards on the subject.

QUALITY CONTROL FOR COAL

The Union Government has set up a quality control group for coal consisting of representatives of Hindustan Steel Limited and the coal industry to ensure a regular supply of quality coal to steel plants and washeries. Experiments will be conducted on the sampling of coal from 10 to 15 collieries with a view to evolving a practical and rational approach to the sampling of coal. The samples taken from selected collieries will be analysed, both at the loading point and at the destination, for a period of 2-3 months and the results tabulated.

Initially, a large number of collieries resented joint sampling on the ground that the methods of sampling and analysis of coal employed by the producers were not in accordance with the procedure laid down by the Indian Standards method for sampling. The coal producers were agreeable for joint sampling at the producing end for the reason that standard sampling procedures could be ensured only there. However, the steel plants were not agreeable to this procedure.

The Government resolved this by setting up a joint group responsible for conducting experiments on sampling of coal from 10-15 collieries.

Mention may be made here that ISI has formulated a number of specifications and methods of test for coal and coke, prominent among them being 'Methods of sampling of coal and coke—IS : 436-1964 Part I Sampling of coal and IS : 436-1965 Part II Sampling of coke; Methods of test for coal and coke—proximate analysis, total sulphur and calorific value (IS : 1350-1959); and Methods of test for coal and coke—ultimate analysis (IS : 1351-1959)'.

SMALL SCALE CABLE INDUSTRY

Testing, quality control and certification marking, were among the subjects discussed at an Open House discussion organized in New Delhi

recently by the Small Industries Service Institute (SISI). The discussion was in relation to the development of cable industry (PVC/rubber insulated) specially in the small scale sector. Shri K. C. Grover, Additional Chief Engineer, CPWD was in the chair. Representatives from about 50 small and large industries participated in the discussions. ISI was represented by Shri Y. S. Venkateswaran, Director (Electrotechnical).

All the participants were of the view that quality control should be strictly adhered to by all the cable manufacturers, and that the products should conform to relevant Indian Standard specifications. The consensus was that the minimum testing equipment should be owned by each and every unit while the rest could be arranged by the cable manufacturers or their association on a co-operative basis, if individual units could not bear the cost of the entire equipment.

The discussion on substitution of copper by aluminium brought out that the cables with aluminium conductors could be manufactured and used in place of copper conductors without any difficulty.

WEIGHTS AND MEASURES ACT—Coverage Extended

On 1 December 1966, the *Standards of Weights and Measures Act, 1956* came into force, in relation to all classes of undertakings and all goods (except those in respect of which the provisions of the Act had already been brought into force), in the whole of India except the districts of Kohima and Mokokchung in the State of Nagaland. However, the use of any scale of temperature, which was in use immediately before 1 December 1966 in the area mentioned above, has been permitted by the Government for a period of one more year, that is, up to 1 December 1967, according to the notification in the *Gazette Extraordinary* of 29 November 1966.

QC TRAINING SLIDES

To acquaint field personnel with quality control theory and to enable them to orient traders and consumers on the quality of products produced by their companies, the Japan Productivity Centre has produced a reel of 82 auto-slides under the title 'An introduction to quality control'. The 22-minute reel constitutes the third of the four-part 'salesmanship series'. 'The new

role of sales persons', 'How to solicit orders', and 'Successful salesmanship' are the titles of the other three parts.

In Japan, quality control, which is practised mainly in factories, has come to be considered a useful tool for sales promotion.

SYMPOSIUM ON PROTEIN FOODS AND CONCENTRATES

An international symposium on 'Protein Foods and Concentrates' will be held at the Central Food Technological Research Institute (CFTRI), Mysore from 27 June to 4 July 1967. The symposium has been sponsored by the Council of Scientific and Industrial Research, New Delhi, in co-operation with the National Institutes of Health, USA and the Association of Food Technologists, India.

According to a CFTRI announcement, the last date for the receipt of abstracts of papers is 31 March; full papers will be received up to 1 May 1967.

INTERNATIONAL RUBBER CONFERENCE

Major technical advances in the use of rubber to replace human organs, new developments in tyre construction that could help eliminate skidding, and greatly increased productivity within the rubber industry are among the subjects to be discussed at the International Rubber Conference, to be held from 15-18 May 1967 at Brighton, England. Representatives from India are expected to participate in the Conference which is being organized by the Institution of the Rubber Industry, London.

Concurrently with the Conference, an exhibition devoted solely to rubber and its uses will be held in which more than 100 of the world's leading rubber companies are likely to display new products, materials and chemicals, alongside working exhibits of new processing machinery and equipment.

ANNOUNCEMENT

Dr A. N. Ghosh, Director General, ISI has been nominated a Member of the Central Boilers Board of the Ministry of Industry.

Dr Atma Ram, Director General, Council of Scientific and Industrial Research, New Delhi, has been elected General President of the Indian Science Congress Association for 1967-68.

Shri S. Ghosh, Deputy Director (Lab), ISI, has been awarded Ph.D. by the University of Strasbourg (France) for his theses 'Contribution in the study of depolarization mechanism of gamma manganese dioxide and alpha and beta lead dioxide', and 'Micro analysis of copper using chemical and electro-chemical techniques'.

OBITUARY

■ We regret to announce the death of Shri B. Balarama Swamy (29) Scientist, Electronics and Radar Development Establishment (LRDE) Bangalore, on 20 November 1966. Shri Swamy was closely associated with ISI as a member of Electrical Instruments and Meters Sectional Committee (ETDC 6), Electron Tubes and Valves Sectional Committee (ETDC 39), and Semi-conductor Devices Sectional Committee (ETDC 40).

After a brilliant academic career, first at Andhra University and later at the Madras Institute of Technology, Shri Swamy joined the research staff of the Atomic Energy Establishment, Trombay. He entered LRDE at Bangalore as a Senior Scientific Officer in 1962.



Shri Balarama Swamy was a specialist in electronic measurement, and established a modern reference standard laboratory creating special areas of modern measurement techniques. He achieved notable success in the field of radio frequency interference.

Author of a number of scientific papers, Shri Swamy had a great passion for indigenous development of specialized electronic components.

COMMITTEE MONTH

This month, we report the proceedings of 28 Committees which held their meetings during 21 November to 20 December 1966. Detailed notes regarding some of the committee meetings are given below. The Table of Meetings (see page 144) lists important items of the business transacted by other committees.

EXECUTIVE COMMITTEE

The Executive Committee of ISI accepted the invitation of the Northern Indian Chambers of Commerce and Industry, to hold the Eleventh Indian Standards Convention at Chandigarh during September 1967. This decision was taken at the 99th meeting of the Committee held in New Delhi on 2 December 1966.

The Committee noted the progress of work during 1 August to 31 October 1966 and approved the revised budget estimates for 1966-67 and budget estimates for 1967-68. The Committee noted the appointment of Dr Lal C. Verma as Chief Adviser to the Institute of Standards and Industrial Research of Iran. The proposal to create a Shrimati Kunti Verma Prize to be awarded every year to the best ISI worker was accepted.

EC accorded its approval to the admission of the following new subscribing members:

- a) Donors 2
- b) Sustaining Members 10
- c) Associate Members 40
- d) Individual Members 8

The total membership as on 25 November 1966 stood at 3 600. The membership subscription collected as on 25 November 1966 was Rs 1.474 million against the budget estimate of Rs 1.66 million.

In the absence of Shri Jehangir J. Ghandy, the meeting was presided over by Shri Prabhu V. Mehta.

CHEMICAL STANDARDS

Three new sectional committees to deal with (a) Raw Materials for Paints, (b) Explosives and Pyrotechnics, and

(c) Dental Materials were constituted by the Standing Working Committee of the Chemical Division Council (SWCC) at its 25th meeting held in New Delhi on 13 December 1966. The Committee will formulate specifications, codes of practice, methods of sampling and test, standard terminology, etc. on the following subjects:

Raw Materials for Paints—pigments and extenders, drying oils, resins, thinners and solvents, driers, etc.

Explosives and Pyrotechnics—commercial explosives, initiators, detonators, detonating fuse and safety fuse, pyrotechnics and fire-works preparations and their allied raw materials.

Dental Materials—moulding waxes impression materials, tracing sticks, base plates, dental alloys, ceramic and plastic dentures, etc.

The Standing Working Committee also reconstituted fourteen sectional committees dealing with Chemical Standards (CDC 1), Alcohols and Allied Products (CDC 2), Organic Chemicals (Miscellaneous) (CDC 4), Lac and Lac Products (CDC 9), Natural and Synthetic Perfumery Materials (CDC 11), Coal Carbonization Products (CDC 23), Water (CDC 26), Ceramic-ware (CDC 27), Metal Containers (CDC 28), Petroleum Measurements (CDC 32), Electroplating Chemicals (CDC 43), Photographic Chemicals and Related Materials (CDC 44), Paper Products and Packaging Materials (CDC 45), and Treated Fabrics (CETDC 3).

Reviewing the progress of work, the Committee noted that during 16 July-31 October 1967, 85 sectional committees and subcommittees had held their meetings as a result of which 36

draft standards were finalized for publication and 52 were approved for wide circulation.

The Committee considered in detail the difference between the methods of test for the detection of argemone oil in edible vegetable oils as prescribed in the Indian Standards and as lately being employed by some of the public analysts. In Maharashtra State, the public health authorities were understood to use a method based on paper chromatography which was said to be more accurate. It was decided to request the Sectional Committee on Oils and Oilseeds (CAFDC 5) to initiate a scheme of investigation to evaluate the

two methods with a view to adopting the more sensitive method in the Indian Standards. In this task, CAFDC 5 will work in close collaboration with the Central Committee for Food Standards (CCFS) and other concerned laboratories in the country. CCFS was also requested to initiate biological investigations regarding the toxic effects of argemone oil present in traces in edible vegetable oils. This would help in arriving at the permissible limits of argemone oil.

Dr J. S. Badami, the Vice-Chairman, who presided over the meeting in the absence of the Chairman, Dr G. P. Kane, highlighted the progress of the work

since the last meeting of the Committee. Dr Badami felicitated the Tata Chemicals Ltd for their winning the 1966 'ICMA Award'. The award was in recognition of the initiative and originality of the firm in developing a process for the manufacture of heavy soda ash without any foreign technical assistance.

The Committee approved 8 new subjects for formulation of Indian Standards, namely, ethyl chloride, glass globes for transport coaches, impregnated paper, scouring preparations, shaving soap, ammonium thiosulphate for photographic industry, picture coating varnish, and paints, varnishes and lacquers for automobile industry.

TABLE OF MEETINGS

AGRICULTURAL AND FOOD PRODUCTS

AFDC 17 LIVESTOCK HOUSING New Delhi
30 November 1966

Chairman Dr P. Bhattacharya
Animal Husbandry Development Commissioner
Ministry of Food, Agriculture, Community
Development & Co-operation
(Department of Agriculture)
New Delhi

Draft finalized for publication — Code of practice for pig housing.

AFDC 20 FARM IMPLEMENTS New Delhi
AND MACHINERY 9 December 1966

Chairman Shri D. N. Kherdekar
Director (Agricultural Implements)
Directorate of Extension
Ministry of Food, Agriculture, Community
Development & Co-operation
(Department of Agriculture)
New Delhi

Draft finalized for publication — Specification for hand maize sheller.

Draft approved for wide circulation — Specification for sickles.

Other activities — The Committee set up three subcommittees to deal with farm equipment and machinery testing code, farm processing equipment and farm power machinery.

AFDC 24 TRANSPORT OF LIVE Bombay
ANIMALS 25 November 1966

Chairman Dr P. J. Deoras
(for the meeting) Assistant Director
Haffkin Institute
Bombay

Draft finalized for publication — Code for the transport of laboratory animals: Part I Mice, rats, rabbits, guinea pigs and cotton rats.

Drafts approved for wide circulation — Codes for the transport of (a) Laboratory animals: Part II Snakes, (b) Laboratory animals: Part III Frogs, (c) Livestock: Part I Equine (horses and mules), and (d) Monkeys by land: Part II Transport from rail head to the nearest airport.

AFDC 34 DAIRY PRODUCTS & Calcutta
LABORATORY APPARATUS 23-26 November 1966

Chairman Dr K. C. Sen
403 Jodhpur Park
Calcutta

Drafts finalized for publication — Recommendation for a ghee refinery. Specifications for (a) Canned *rasgolla*, and (b) Slides for direct microscopic count of milk.

Drafts approved for wide circulation — Methods of tests for dairy industry: Part VI Determination of moisture. Specifications for (a) Milk powder (whole and skim) (*revision of IS: 1165*), and (b) Sterilized milk.

Other activities — The Committee set up five subcommittees to deal with milk products, method of test and laboratory apparatus, infant foods, packaging and the ISO work.

AFDC 35 DAIRY EQUIPMENT Calcutta
25-26 November 1966

Chairman Dr N. N. Dastur
Dairy Development Adviser to the Government
of India
Ministry of Food, Agriculture, Community
Development & Co-operation
New Delhi

Draft approved for wide circulation — Specification for aluminium farm milk cooling tanks.

Other activities — The Committee set up three subcommittees and one panel to deal with milk storage tanks and vessels, milk containers, dairy detergents and glass milk bottles.

CHEMICAL DEPARTMENT

CDC 16 LEATHER Kanpur
1 December 1966

Chairman Dr Y. Nayudamma
Director
Central Leather Research Institute
Madras

Drafts finalized for publication — Specifications for (a) Leather for cricket balls, (b) Leather for boxing gloves, and (c) Leather-boards.

Drafts approved for wide circulation — Specifications for (a) Pickled goatskins, (b) Buffalo butt knee bushings, (c) Chromed goatskin in wet blue condition, and (d) Diaphragm leather.

New subjects — Leather for high altitude gloves; leather safety belts—75 mm wide with 'D' rings at either side and 180 cm length of rope with solid hooks; and man-hoisting belt, wholly made of leather, 50 mm wide buckle, and 'D' ring suitable for fixing rope.

CDC 36 KATTHA, VEGETABLE TANS AND ALLIED PRODUCTS Dehra Dun
21-22 November 1966

Chairman Dr S. K. Barat
Scientist
Central Leather Research Institute
Madras

Drafts finalized for publication — Specifications for (a) Kattha, (b) Wattle bark, (c) Goran bark, and (d) Cutch.

Drafts approved for wide circulation — Specifications for (a) Avaram bark, and (b) Babul bark.

Other activities — Considering the importance of rational grading of myrobalan nuts for use in tanneries and for export, the Committee decided to prepare urgently standards for myrobalan nuts.

CIVIL ENGINEERING DEPARTMENT

BDC 17 FLUID FLOW MEASUREMENT New Delhi
2 December 1966

Chairman Shri N. D. Gulhati
(in personal 140 Sunder Nagar
capacity) New Delhi

Drafts finalized for publication — Code of practice for use of current meters (cup type) for water flow measurement. Specifications for (a) Suspended sediment load sampler, (b) Bed material sampler, (c) Surface floats, (d) Sounding rods, (e) Fish lead weights, and (f) Vertical staff gauges.

New subjects — Standing wave flumes, flume meter falls, quadrant edge orifice meters, venturi meters for high velocity flows, bed load sampler, analysis of sediment flow, radioactive isotope method, measurement of liquid flow in open channels by dilution methods using fluorescent and other

materials, measurement of flow of polluted waters by dilution methods, measurement of sediment flow (both suspended and moving in bed) by dilution method, measurement and estimation of littoral drift and sand harbour entrances, measurement and estimation of total sediment load in open channels, guide for selection of particular method to be used under different conditions of flow and measuring sites.

BDC 30 CLAY PRODUCTS FOR BUILDING New Delhi
2 December 1966

Chairman Shri Rabinder Singh
Joint Director (Materials)
National Buildings Organization
New Delhi

Drafts finalized for publication — Code of practice for manufacture of burnt clay Mangalore pattern roofing tiles. Specifications for (a) Burnt clay hollow blocks for walls and partitions, (b) Common burnt clay building bricks (revision of IS : 1077), and (c) Structural hollow clay floor tiles.

BDC 38 CRITERIA FOR DESIGN OF STRUCTURES New Delhi
1 December 1966

Chairman Prof G. S. Ramaswamy
Director
Structural Engineering Research Centre
Roorkee

Draft finalized for publication — Criteria for the design of reinforced concrete arches.

BDC 45 SAFETY IN CONSTRUCTION New Delhi
1 December 1966

Chairman Shri D. N. Chopra
General Manager
South Central Railway
Secunderabad

Draft finalized for publication — Safety code for working in compressed air.

Draft approved for wide circulation — Safety code for demolition work, buildings.

BDC 50 PROJECT REPORT, ESTIMATES AND SPECIFICATIONS New Delhi
24 November 1966

Chairman Shri B. Parthasarathy
Chief Engineer (Civil)
Damodar Valley Corporation
PO Maithon Dam
Distt. Dhanbad

Draft finalized for publication — Guide for presentation of project report for river-valley projects.

Draft approved for wide circulation — Guide for preparation of project report for river-valley projects.

New subjects — Guides for (a) Allocation of cost between different purposes of river-valley project, and (b) Preparation of estimate for river-valley projects.

COMMITTEE MONTH

IS : 1294), (b) Needle bars for sewing machines for household purposes (revision of IS : 1295), (c) Presser feet for sewing machines for household purposes (revision of IS : 1296), (d) Presser bars for sewing machines for household purposes (revision of IS : 1297), (e) Feed fork for sewing machines for household purposes, and (f) Oscillating shafts for sewing machines for household purposes.

Drafts approved for wide circulation—Specifications for (a) Shuttles for sewing machines for household purposes, (b) Needle bar link bolt for sewing machines for household purposes, (c) Needle bar links for sewing machines for household purposes, (d) Feed dog roller for sewing machines for household purposes, (e) Square slider for sewing machines for household purposes, and (f) Memorandum on screw threads for sewing machine components.

New subjects—Glossary of terms relating to sewing machines for household purposes, short needle bars, and square slider for stitch regulator.

EDC 41 COMMERCIAL WEIGHTS AND MEASURES New Delhi
23 November 1966

Chairman Dr A. R. Verma
Director
National Physical Laboratory
New Delhi

Drafts finalized for publication—Specifications for (a) Automatic weighing machines, (b) Totalizing weighing machines, (c) Wheel weighers, and (d) Spring balances (revision of IS : 1702).

Drafts approved for wide circulation—Specifications for (a) Jewellers scales for diamonds, pearls and other jewels; and (b) Railway weighbridges.

New subjects—Liquor glasses and medicine glasses.

EDC 57 CHEMICAL ENGINEERING Bombay
2 December 1966

Chairman Dr O. P. Kharbanda
(for the Divisional Manager
meeting) Heavy Plant Division
Larsen & Toubro Limited
Bombay

Drafts finalized for publication—Graphical symbols for process measurement and control functions. Sizes of process vessels and leading dimensions. Specifications for (a) Ball, pebble and tube mills; (b) Gyratory and cone crushers; (c) Jaw crushers; and (d) Shell and tube type heat exchangers.

Drafts approved for wide circulation—Code of practice for rubber lining of vessels and equipment for chemical processes. General requirements for shell flanges of chemical equipment. Specifications for (a) Flat gaskets for shell flanges of chemical equipment; (b) Plug valves and cocks and their parts; (c) Screw-down stop, check and gate valves and their parts; (d) Welded shell flanges for vessels and equipment not subject to pressure used in chemical industry; (e) Welded shell flanges for carbon steel pressure vessels and equipment used in chemical industry; (f) Welded shell flanges for stainless steel pressure vessels and equipment used in chemical industry; (g) Welded shell flanges with hub for stainless

steel pressure vessels and equipment used in chemical industry; and (h) Welding neck shell flanges for carbon steel pressure vessels and equipment used in chemical industry.

New subjects—Face-to-face and end-to-end dimensions of flanged and butt-welded end ferrous valves, grindability index of various materials, and lubricated valves.

EDC 65 MATERIAL HANDLING EQUIPMENT Calcutta
24 November 1966

Chairman Lt-Col G. D. Verma
Directorate of Inspection (Vehicles)
Ministry of Defence (DGI)
New Delhi

Draft finalized for publication—Glossary of terms on pallets.

Drafts approved for wide circulation—Dimensions for fork lift trucks. Glossary of terms on powered and non-powered trucks. Methods for stability testing of fork lift trucks. Specification for box pallets for through transit of goods.

New subjects—Flat timber pallets, industrial tractors, pallet trucks, and testing of pallets.

STRUCTURAL AND METALS

SMDC 9 CAST IRON AND MALLEABLE CAST IRON New Delhi
2 December 1966

Chairman Shri Pran Lal Patel
Technical Director
The Malleable Iron & Steel Castings Co Pvt Ltd
Bombay

Drafts finalized for publication—Comparison of Indian and overseas standards for iron castings. Specifications for (a) Centrifugally cast (spun) iron pressure pipes for water, gas and sewage (revision of IS : 1536); and (b) Centrifugally cast (spun) iron spigot and socket soil, waste and ventilating pipes.

Drafts approved for wide circulation—Specifications for (a) Cast iron fittings for pressure pipes for water, gas and sewage (revision of IS : 1538); and (b) Iron castings with spheroidal or nodular graphite (revision of IS : 1865).

New subject—Abrasion resistant iron castings.

SMDC 26 CRANES AND ALLIED APPLIANCES New Delhi
16-17 December 1966

Chairman Shri D. K. Nandi
Jessop & Co Ltd
Calcutta

Draft finalized for publication—Code of practice for heavy duty electric overhead travelling cranes including special service machine for use in steel works.



Drafts approved for wide circulation—Code of practice for (a) Mobile cranes, and (b) Design of portal and semiportal wharf cranes.

Other activities—A panel was set up to prepare draft 'Guides for selection of cranes'. The guides will be of help to users in ordering cranes most suitable for their purposes.

CERTIFICATION MARKS

During December 1966, the Institution specified standard marks and prescribed marking fee for two products. Besides, 22 new licences were granted and another 136 renewed. Particulars of all these and of licences cancelled/lapsed or renewal deferred are given in the tables which follow.

STANDARD MARKS AND MARKING FEES

DESIGN OF THE STANDARD MARK	PRODUCT/CLASS OF PRODUCT AND THE NUMBER OF THE RELEVANT INDIAN STANDARD	UNIT	MARKING FEE PER UNIT	GAZETTE OF INDIA, PART II, SECTION 3 (ii), NOTIFICATION REFERENCE	
				S.O. No. and Date	Gazette Issue Dated
	Basic carbonate of lead (white lead) for paints — IS : 34-1950	One tonne	Re 1-00 per unit for the first 1 000 units; Re 0-50 per unit for the 1 001st unit & above	4025, 4026 20-12-1966	31-12-1966
	Automotive brake lining — IS : 2742-1964	One kg	1 Paisa		

NEW LICENCES GRANTED

(Published in the Gazette of India, Part II, Section 3(ii) dated 21-1-1967 under Notification No. S.O. 243 dated 9-1-1967)

NO. OF LICENCE AND DATE OF ISSUE	PERIOD OF VALIDITY		NAME AND ADDRESS OF THE LICENSEE	ARTICLE/PROCESS COVERED BY THE LICENCE AND NUMBER OF THE RELEVANT INDIAN STANDARD
	From	To		
CM/L-1364 12-12-1966	16-12-1966	15-12-1967	M/s Bombay Cable Co Pvt Ltd, Agra Road, Bhandup, Bombay	PVC insulated cables, sheathed and un-sheathed, both with aluminium conductors only of the following types: i) Single core 250/440 volts Grade ii) Single core 650/1 100 volts Grade — IS : 694 (Part II)-1964 Flashlights — IS : 2083-1962
CM/L-1365 14-12-1966	16-12-1966	15-12-1967	M/s Modi Torch Works, Modinagar, Distt Meerut (UP)	
CM/L-1366 16-12-1966	16-12-1966	15-12-1967	M/s Bramec Suri Pvt Ltd, G.T. Road, Ghaziabad	Automatic brake lining, Type IA — IS : 2742-1964
CM/L-1367 16-12-1966	16-12-1966	15-12-1967	M/s Emco General Industries, 6/1 Nawab Dilwarjung Road, Cossipore, Calcutta	Low density polythene pipes for cold water services, 12 mm normal gauge, 10 and 40 mm heavy gauge — IS : 3076 (Part I)-1965
CM/L-1368 16-12-1966	16-12-1966	15-12-1967	M/s Metal Udyog Private Limited, Pratapnagar, Industrial Area, Udaipur (Rajasthan)	BHC dusting powders — IS : 561-1962
CM/L-1369 16-12-1966	16-12-1966	15-12-1967	M/s Western India Plywoods Ltd, P.O. Baliapatam, Cannanore Distt, Kerala State	i) Medium strength aircraft plywood, and ii) Marine plywood — IS : 709-1957
CM/L-1370 26-12-1966	1-1-1967	31-12-1967	Nahan Foundry Ltd, Nahan, Distt Sirmur, Himachal Pradesh	Horizontal centrifugal pumps for clear, cold, fresh water (radial flow, single stage, single suction volute casting) 76 x 64 mm only — IS : 1520-1960

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	From	To		
CM/L-1371 26-12-1966	1-1-1967	31-12-1967	M/s Hindustan Safety Glass Works Pvt Ltd, Makes Mukherjee Feeder Road, Ariadah, 24 Parganas	Laminated safety glass — IS : 2553-1964
CM/L-1372 26-12-1966	1-1-1967	31-12-1967	M/s Imperial Stores & Agency Co, Simla Road, Manicktola, Calcutta	Tea-chest metal fittings — IS : 10-1964
CM/L-1373 27-12-1966	1-1-1967	31-12-1967	M/s Azad Industries, Jepoo Mangalore	Biscuits (excluding wafer biscuits) — IS : 1011-1957
CM/L-1374 28-12-1966	16-1-1967	15-1-1968	M/s Annapurna Pulverising Mills, Industrial Estate, Eluru, West Godavari District (AP)	Parathion emulsifiable concentrates — IS : 2129-1962
CM/L-1375 28-12-1966	1-1-1967	31-12-1967	M/s Sandoz (I) Ltd, Kolshet Road, Thana	Parathion emulsifiable concentrates — IS : 2129-1962
CM/L-1376 29-12-1966	16-1-1967	15-1-1968	M/s Salem Magnesite Pvt Ltd; Kurumbapatti Reserve Forest Area, Panorama, Hasthampatti Extension, Salem	Calcined magnesite 'chemical requirements' — IS : 657-1962
CM/L-1377 30-12-1966	16-1-1967	15-1-1968	M/s Devidayal (Sales) Pvt Ltd, Gupta Mills Estate, Reay Road, Daukhana, Bombay	Endrin emulsifiable concentrates — IS : 1310-1958
CM/L-1378 30-12-1966	16-1-1967	15-1-1968	M/s Premier Cable Co Ltd, Karukutty, Ernakulam Distt (Kerala State)	PVC insulated (heavy duty), electric cables, unarmoured, with aluminium conductors for working voltages up to and including 1100 volts — IS : 1554 (Part I)-1964
CM/L-1379 30-12-1966	16-1-1967	15-1-1968	M/s Alembic Chemical Works Co Ltd, Alembic Road, Baroda	Parathion emulsifiable concentrates — IS : 2129-1962
CM/L-1380 30-12-1966	1-1-1967	31-12-1967	M/s Mahendra Electricals Ltd, Kamla Mission Road, Nadiad, Gujarat State	Polythene insulated & PVC sheathed cables, single core with aluminium conductors — IS : 1596-1962
CM/L-1381 30-12-1966	16-1-1967	15-1-1968	M/s J. B. Metal Industries, Sakinaka — Vihar Lake Road, Kurla, Bombay	Rolled brass plate, sheet & strip, Grade Bs 63 — IS : 410-1959
CM/L-1382 30-12-1966	1-1-1967	31-12-1967	M/s Camlin Pvt Ltd Kondivate, Near Marol Bazar, Andheri, Kurla Road, Bombay	Ink, duplicating, all weather, black for rotary type machines — IS : 1222-1957
CM/L-1383 30-12-1966	16-1-1967	15-1-1968	M/s Sandoz (I) Ltd, Kolshet Road, Thana	Endrin emulsifiable concentrates — IS : 1310-1958
CM/L-1384 30-12-1966	1-2-1967	31-1-1968	M/s Hoosini Metal Rolling Mills Pvt Ltd, Tambewala Properties, Reay Road, Bombay	Aluminium utensils, SIC Grade — IS : 21-1959
CM/L-1385 30-12-1966	1-2-1967	31-1-1968	M/s Eagle Vacuum Bottle Mfg Co Pvt Ltd, 144/46, Sheriff Devji Street, Bombay	Aluminium utensils, SIC Grade — IS : 21-1959

LICENCES RENEWED

[Published in the Gazette of India, Part II, Section 3(ii), dated 4-2-1967 Under Notification No. S.O. 419 dated 19-1-1967]

NO. OF LICENCE AND DATE OF ISSUE	PERIOD OF VALIDITY		NAME AND ADDRESS OF THE LICENSEE	ARTICLE/PROCESS COVERED BY THE LICENCE AND NUMBER OF THE RELEVANT INDIAN STANDARD
	From	To		
CM/L-24 19-12-1956	1-1-1967	31-12-1967	M/s Light Metal Works, New Sun Mill Compound, Delisle Road, Bombay	Wrought aluminium and aluminium alloy utensils — IS : 21-1959
CM/L-34 4-11-1957	16-11-1966	15-11-1967	The National Insulated Cable Co of India Ltd, Shamnagar (24 Parganas, W. Bengal)	Hard-drawn copper solid and stranded conductors — IS : 282-1963
CM/L-85 24-4-1958	1-1-1967	31-12-1967	M/s Hindustan Timber Industries, 41 Chaulpatty Road, Beliaghata, Calcutta	Tea-chest plywood panels — IS : 10-1953
CM/L-112 26-12-1958	1-1-1967	31-12-1967	The Kesar Sugar Works Ltd, 45-47 Apolo Street, Fort, Bombay	Hydroquinine, photographic grade — IS : 388-1963
CM/L-146 28-9-1959	1-1-1967	31-12-1967	M/s Bharat Pulverising Mills Pvt Ltd, 38-A Sayani Road, Bombay	BHC water dispersible powder concentrates — IS : 562-1962

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	From	To		
CM/L-157 23-12-1959	1-1-1967	31-12-1967	M/s Shamsher Sterling Cable Corporation Ltd, Vaswani Mansions, Dinsha Wacha Road, Bombay	a) VIR cables for fixed wiring with copper or aluminium conductors i) TRS (tough rubber sheathed) 250/440 volts ii) Braided and compounded 250/440 and 650/1100 volts iii) Weatherproof 250/440 and 650/1100 volts iv) Flame retarding 250/440 volts b) VIR flexible cords with copper conductor only v) Twisted and circular artificial silk or glass cotton braided 250/440 volts — IS : 434 (Parts I & II)-1964
CM/L-225 16-9-1960	1-1-1967	31-3-1967	M/s Veneer Mills Pvt Ltd, Tinsukia, Assam	Tea-chest plywood panels — IS : 10-1953
CM/L-244 28-11-1960	16-12-1966	15-12-1967	M/s Indian Plastics Ltd, Poisar Bridge, Kandivli, Bombay	Phenolic moulding materials, Grade 2 — IS : 1300-1963
CM/L-245 28-11-1960	16-12-1966	15-12-1967	M/s TIPCO, The Industrial Plastics Corporation Ltd, 14 Hamam Street, Fort, Bombay	Phenolic moulding materials, Grades 1, 2 and 3 — IS : 1300-1963
CM/L-252 26-12-1960	1-1-1967	31-12-1967	M/s Tata Fison Industries Ltd, Union Bank Building, Dalal Street, Bombay	Copper oxychloride water dispersible powder concentrates — IS : 1507-1959
CM/L-361 27-11-1961	16-12-1966	15-12-1967	M/s Modi Vanaspati Mfg Co, Modinagar, Distt Meerut (UP)	18-litre square tins — IS : 916-1958
CM/L-363 30-11-1961	16-12-1966	15-12-1967	M/s Nielcon Pvt Ltd, 37-F Parel Road, Cross Lane, Chinchpokli, Bombay	Three-phase induction motors up to 10 horse power — IS : 325-1961
CM/L-365 12-12-1961	1-1-1967	31-12-1967	M/s Ditz Electricals (India) Ltd, 29 Malkaganj, Delhi	Electric portable immersion heaters for domestic use (500 watts to 4 000 watts capacity) — IS : 368-1963
CM/L-366 15-12-1961	1-1-1967	31-12-1967	M/s Tungabhadra Industries Ltd, Kurnool (Andhra Pradesh)	18-litre square tins — IS : 916-1958
CM/L-367 15-12-1961	1-1-1967	31-12-1967	M/s Bharat Pulverising Mills Pvt Ltd, 589 Thiruvottiyur High Road, Madras	Endrin emulsifiable concentrates — IS : 1310-1958
CM/L-369 22-12-1961	1-1-1967	31-12-1967	M/s D.C.M. Container Works, Najafgarh Road, New Delhi	18-litre square tins — IS : 916-1958
CM/L-370 22-12-1961	1-1-1967	31-12-1967	M/s Excel Industries Pvt Ltd, 184-87 Ghodbunder Road, Jogeshwari, Bombay	Zinc phosphide, technical — IS : 1251-1958
CM/L-456 14-9-1962	16-12-1966	15-6-1967	M/s Grandlay Electricals (India), Military Parade Road, Radio Colony, Delhi	a) VIR cables for fixed wiring with copper or aluminium conductor only i) Braided and compounded 250/440 volts ii) Tough rubber sheathed 250/440 volts iii) Weatherproof 250/440 and 650/1100 volts With copper conductor only iv) Braided and compounded 650/1100 volts v) Tough rubber sheathed 650/1100 volts b) VIR flexible cords with copper conductor only vi) Tough rubber sheathed 250/440 volts vii) Twisted twin and braided 250/440 volts

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			viii) Workshop type unkinkable 250/440 volts
			ix) Circular twin and braided 250/440 volts
			— IS : 434 (Parts I & II)-1964
			BHC dusting powders — IS : 561-1962
CM/L-465 30-12-1962	1-12-1966 30-11-1967	M/s EAG Minerals Supply, B/1 Hide Road, Kidderpore, Calcutta	
CM/L-472 16-11-1962	1-12-1966 30-11-1967	M/s Bharat Sheet Metal Industries Ltd, 22 Beerpura Lane, Ghugudanga, Dum Dum, Calcutta	Steel drums of grade B2 only — IS : 2552-1963
CM/L-473 20-11-1962	1-12-1966 30-11-1967	M/s Chandra Electricals, S2/638 Club Road, Varanasi Cantt	ac and universal fractional horse power motors, single-phase, 1/36 to 1 hp and three-phase only — IS : 996-1959
CM/L-477 29-11-1962	16-12-1966 31-12-1967	M/s Shalimar Tar Products (1935) Ltd, P-46 Hide Road, Extension, Kidderpore, Calcutta	Bitumen (plastic) for waterproofing purposes — IS : 1580-1960
CM/L-479 29-11-1962	1-1-1967 31-12-1967	do	Preformed fillers for expansion joints in concrete, non-extruding and resilient type (bitumen-impregnated fibre) — IS : 1838-1961
CM/L-482 3-12-1962	16-12-1966 15-12-1967	M/s Kamani Metals & Alloys Ltd, Agra Road, Kurla, Bombay	Brass sheets, Grade Bs 63 only — IS : 410-1959
CM/L-483 5-12-1962	16-12-1966 15-12-1967	M/s Lakhi Trading Co, Village Road, Bhandup, Bombay	Wrought aluminium utensils, Grade SIC — IS : 21-1959
CM/L-486 20-12-1962	1-1-1967 31-12-1967	M/s Gautam Electric Motors Pvt Ltd, 42 Okhla Industrial Estate, New Delhi	Fractional horse power motors, single-phase 1 hp and three-phase 1/4 hp to 1 hp — IS : 996-1959
CM/L-597 31-10-1963	1-12-1966 30-11-1967	M/s Camlin Pvt Ltd, Kondivata, Near Marol Bazar, Andheri-Kurla Road, Bombay	Ink, drawing, waterproof, black — IS : 789-1955
CM/L-605 29-11-1963	1-1-1967 31-12-1967	M/s Skytone Electricals (India), 43 Industrial Area, Faridabad	a) VIR cables for fixed wiring with copper or aluminium conductor only i) Braided and compounded 250/440 and 650/1100 volts ii) Tough rubber sheathed 250/440 volts and 650/1100 volts iii) Weatherproof 250/440 and 650/1100 volts b) VIR flexible cords with copper conductor only iv) Twisted and circular artificial silk or glace cotton braided 250/440 volts — IS : 434 (Parts I & II)-1964
CM/L-606 29-11-1963	1-1-1967 31-12-1967	M/s Associated Pigments Ltd, 260 Barackpore Trunk Road, P.O. Sukchar, 24 Parganas, West Bengal	Zinc oxide for paints — IS : 35-1950
CM/L-608 11-12-1963	1-1-1967 31-12-1967	M/s Hindustan Steel Ltd, Bhilai Steel Plant, Bhilai, Distt Durg (MP)	Structural steel (ordinary quality) — IS : 1977-1962
CM/L-609 11-12-1963	1-1-1967 31-3-1969	The Tata Iron & Steel Co Ltd, Jamshedpur	do
CM/L-732 29-6-1964	1-8-1966 31-7-1967	M/s Sri Rama Machinery Corpn (P) Ltd, Catholic Centre, 5/6 Armenian Street, Madras	Structural steel (standard quality) — IS : 226-1962
CM/L-733 29-6-1964	1-8-1966 31-7-1967	do	Structural steel (ordinary quality) — IS : 1977-1962
CM/L-821 30-10-1964	16-12-1966 15-5-1967	M/s Sreedhar Sago Factory, 81 Omalur Road, Salem	Sago (<i>saboodana</i>) — IS : 899-1956
CM/L-835 10-11-1964	16-11-1966 15-11-1967	The Hindustan Iron & Steel Co, 8 Rajendra Deb Road, Calcutta	Structural steel (standard quality) of the following sections only: i) M.S. rounds up to 16 mm dia and over 28 mm dia

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CM/L-836 10-11-1964	16-11-1966	15-11-1967	do	ii) M.S. squares up to 14 mm square and over 28 mm sq iii) M.S. angles, flats, etc, where the cross-sectional area of the sample does not exceed 200 sq mm — IS : 226-1962 Structural steel (ordinary quality) of the following sections only: i) M.S. rounds up to 16 mm dia and over 28 mm dia ii) M.S. squares up to 14 mm square and over 28 mm square iii) M.S. angles, flats, etc, where the cross-sectional area of the sample does not exceed 200 sq mm — IS : 1977-1962
CM/L-837 23-11-1964	16-12-1966	15-12-1967	M/s Lucky Acid & Chemical Works, 32/2 Murari Pukur Road, Calcutta	Nitric acid, technical, pure and analytical reagent grades — IS : 264-1950
CM/L-841 25-11-1964	16-12-1966	15-12-1967	M/s New Chemi-Mineral Mills Pvt Ltd, Chakravarti Ashoka Road, Industrial Estate, Kandivli (East) Bombay	BHC water dispersible powder concentrates — IS : 562-1962
CM/L-844 28-11-1964	1-12-1966	30-11-1967	M/s Baranagore Jute Factory Co Ltd, 284 Maharaja Nandakumar Road, Alambazar, Calcutta	Jute hessian — IS : 2818-1964
CM/L-845 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-848 28-11-1964	1-12-1966	30-11-1967	M/s Kamarhatty Co Ltd, 907 Graham Road, Kamarhatty, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-849 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-852 28-11-1964	1-12-1966	30-11-1967	M/s Budge Budge Jute Mills Co Ltd, 57 Maulana Azad Road, Budge Budge, Calcutta	Jute hessian — IS : 2818-1964
CM/L-853 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-854 28-11-1964	1-12-1966	30-11-1967	M/s Delta Jute Mills Co Ltd, Manikpore, Sankrail, Howrah	Jute hessian — IS : 2818-1964
CM/L-855 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-856 28-11-1964	1-12-1966	30-11-1967	M/s Cheviot Jute Mills Co Ltd, Bedekalinagar, Budge Budge, Calcutta	Jute hessian — IS : 2818-1964
CM/L-857 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-860 28-11-1964	1-12-1966	30-11-1967	The Dalhousie Jute Co Ltd, Champdany, Distt Hooghly	Jute hessian — IS : 2818-1964
CM/L-861 28-11-1964	1-12-1966	30-11-1967	The Kinnison Jute Mills Co Ltd, Titaghur, 24 Parganas	do
CM/L-862 28-11-1964	1-12-1966	30-11-1967	do	Jute Sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-867 28-11-1964	1-12-1966	30-11-1967	The Standard Jute Co Ltd, Titaghur, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-868 28-11-1964	1-12-1966	30-11-1967	The Union Jute Co Ltd, 12 Convent Lane, Calcutta	do
CM/L-869 28-11-1964	1-12-1966	30-11-1967	The Gourepore Co Ltd, Garifa, 24 Parganas	do
CM/L-870 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-871 28-11-1964	1-12-1966	30-11-1967	The Nuddea Mills Co Ltd, Naihati, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-872 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964

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CM/L-873 28-11-1964	1-12-1966	30-11-1967	M/s National Co Ltd, Rajgung, Andul, Howrah	Jute hessian — IS : 2818-1964
CM/L-874 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-875 28-11-1964	1-12-1966	30-11-1967	M/s Angus Co Ltd, P.O. Angus, Hooghly	Jute hessian — IS : 2818-1964
CM/L-876 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-877 28-11-1964	1-12-1966	30-11-1967	M/s Samnuggur Jute Factory Co Ltd, Bhadreswar, Hooghly	Jute hessian — IS : 2818-1964
CM/L-878 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-879 28-11-1964	1-12-1966	30-11-1967	M/s Titaghur Jute Factory Co Ltd, P.O. Titaghur, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-880 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-881 28-11-1964	1-12-1966	30-11-1967	M/s Victoria Jute Co Ltd, P.O. Telinipara, Distt Hooghly	Jute hessian — IS : 2818-1964
CM/L-882 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-887 28-11-1964	1-12-1966	30-11-1967	M/s Khardah & Company Ltd, Titaghur, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-888 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-893 28-11-1964	1-12-1966	30-11-1967	M/s Hukumchand Jute Mills Ltd, 47 Ghoshpara Road, Halisahar	Jute hessian — IS : 2818-1964
CM/L-894 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-895 28-11-1964	1-12-1966	30-11-1967	M/s Anglo-India Jute Mills Co Ltd (Lower Mill), P.O. Jagatdal, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-896 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-897 28-11-1964	1-12-1966	30-11-1967	M/s Anglo-India Jute Mills Co Ltd, (Middle Mills), P.O. Jagatdal, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-898 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-899 28-11-1964	1-12-1966	30-11-1967	M/s Nakarpara Jute Co Ltd, 220/2 Shibogopal Banerjee Le, Ghosuri, Howrah	Jute hessian — IS : 2818-1964
CM/L-900 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-901 28-11-1964	1-12-1966	30-11-1967	M/s Shree Ambica Jute Mills Ltd, P.O. Belurmath, Howrah	Jute hessian — IS : 2818-1964
CM/L-902 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-909 28-11-1964	1-12-1966	30-11-1967	The India Jute Co Ltd, P.S. Serampore Hooghly	Jute hessian — IS : 2818-1964
CM/L-910 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-911 28-11-1964	1-12-1966	30-11-1967	M/s Shree Gourishankar Jute Mills (P) Ltd, Ghoshpara Road, P.O. Carulia, Summagat, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-912 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-921 28-11-1964	1-12-1966	30-11-1967	M/s Fort Gloster Indust Ltd (New Mill), P.O. Fort Gloster, Rly Station Bauria, Distt Howrah	Jute hessian — IS : 2818-1964
CM/L-922 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964

NO. OF LICENCE AND DATE OF ISSUE	PERIOD OF VALIDITY		NAME AND ADDRESS OF THE LICENSEE	ARTICLE/PROCESS COVERED BY THE LICENCE AND NUMBER OF THE RELEVANT INDIAN STANDARD
	From	To		
CM/L-923 28-11-1964	1-12-1966	30-11-1967	M/s Fort Gloster Indust Ltd (North Mill), P.O. Fort Gloster, Rly Station Bauria, Distt Howrah	Jute hessian — IS : 2818-1964
CM/L-924 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-925 28-11-1964	1-12-1966	30-11-1967	The Hooghly Mills Co Ltd, 9 Garden Reach Road, Kidderpore, Calcutta	Jute hessian — IS : 2818-1964
CM/L-926 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-929 28-11-1964	1-12-1966	30-11-1967	M/s Alexandra Jute Mills Ltd, Jagatdal, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-930 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-931 28-11-1964	1-12-1966	30-11-1967	M/s Eastern Manufacturing Co Ltd, Ali Hyder Road, Titaghur, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-932 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-933 28-11-1964	1-12-1966	30-11-1967	M/s Empire Jute Co Ltd, Titaghur, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-934 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-935 28-11-1964	1-12-1966	30-11-1967	M/s Kelvin Jute Co Ltd, Titaghur, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-936 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-937 28-11-1964	1-12-1966	30-11-1967	M/s Presidency Jute Mills Co Ltd, Rishra, Hooghly	Jute hessian — IS : 2818-1964
CM/L-938 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-939 28-11-1964	1-12-1966	30-11-1967	The General Industrial Society Ltd, Gondalpara, Hooghly	Jute hessian — IS : 2818-1964
CM/L-940 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-941 28-11-1964	1-12-1966	30-11-1967	M/s New Central Jute Mills Co Ltd (Albion Mills), Budge Budge, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-942 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-943 28-11-1964	1-12-1966	30-11-1967	M/s New Central Jute Mills Co Ltd (Lothian Mills), Budge Budge, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-944 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964, IS : 2875-1964
CM/L-949 28-11-1964	1-12-1966	30-11-1967	M/s Shree Hanuman Jute Mills, 76 Jogendra Nath Mukherjee Road, Ghosuri, Howrah	Jute hessian — IS : 2818-1964
CM/L-950 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964, IS : 2875-1964
CM/L-953 28-11-1964	1-12-1966	30-11-1967	M/s Shree Mahadeo Jute Mills Co, 226 G. T. Road, Bally, Howrah	Jute hessian — IS : 2818-1964
CM/L-954 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964, IS : 2875-1964
CM/L-955 28-11-1964	1-12-1966	30-11-1967	M/s Bharat Jute Mills Ltd, Dasnagore, Howrah	Jute hessian — IS : 2818-1964
CM/L-956 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-963 28-11-1964	1-12-1966	30-11-1967	M/s Naffar Chandra Jute Mills Ltd, Kankinarrah, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-964 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964

NO. OF LICENCE AND DATE OF ISSUE	PERIOD OF VALIDITY		NAME AND ADDRESS OF THE LICENSEE	ARTICLE/PROCESS COVERED BY THE LICENCE AND NUMBER OF THE RELEVANT INDIAN STANDARD
	From	To		
CM/L-965 28-11-1964	1-12-1966	30-11-1967	M/s Shree Luchminarain Jute Mfg Co Ltd, 107 G. S. Mukherjee Street, Konnagar, Hooghly	Jute hessian — IS : 2818-1964
CM/L-966 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-971 28-11-1964	1-12-1966	30-11-1967	M/s Chitavalsah Jute Mills Co Ltd, Chitavalsah, Visakhapatnam	Jute hessian — IS : 2818-1964
CM/L-972 28-11-1964	1-12-1966	30-11-1967	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-975 30-11-1964	16-12-1966	15-12-1967	M/s Hindustan Chains Pvt Ltd, G. T. Road, P.O. Pasaunda, Ghaziabad (UP)	Wrought aluminium utensils, Grade SIC — IS : 21-1959
CM/L-977 30-11-1964	16-12-1966	15-6-1967	M/s Industrial Research Corporation, 2/70 East Mada Street, Thiruvanniyur, Madras	Ferro-gallo-tannate fountain pen ink (0.1 percent iron content) — IS : 220-1959
CM/L-979 21-12-1964	1-1-1967	31-12-1967	M/s Periyar Metal Products, Industrial Estate, Ettumanoor, Kottayam (Kerala State)	Wrought aluminium utensils, Grade SIC — IS : 21-1959
CM/L-980 21-12-1964	1-1-1967	31-12-1967	The Indian Cable Co Ltd, Golmuri, Tatanagar	PVC insulated (heavy duty) electric cables for working voltages up to and including 100 volts (with aluminium and copper conductors) — IS : 1554 (Part I)-1964
CM/L-981 21-12-1964	1-1-1967	31-12-1967	M/s Industrial Chemicals Limited, Sankarnagar, Talaiyulliar R.S., Tirunelveli Distt	Calcium carbide, technical, Quality A — IS : 1040-1960
CM/L-1118 28-7-1965	16-8-1966	15-8-1967	M/s Malawa Ram Handa & Sons, G. T. Road, Phagwara, Distt Kapurthala (Punjab)	Structural steel (standard quality) tested steel sections of the following sizes only: Rods and Squares 6-40 mm ($\frac{1}{4}$ -1 $\frac{1}{8}$ inch) Flats — width 12.5-100 mm ($\frac{1}{2}$ -4 inch) Thickness 1.5 x 25 mm (1/16 x 1 inch) Angles — 25 x 25 x 3 mm (1 x 1 x 1/8 inch) to 50 x 50 x 6 mm (2 x 2 x $\frac{1}{4}$ inch) Gate channels hexagonal bars up to 25 mm (1 inch) — IS : 226-1962
CM/L-1119 28-7-1965	16-8-1966	15-8-1967	do	Structural steel (ordinary quality) tested steel sections of the following sizes only: Rods and squares 6-40 mm ($\frac{1}{4}$ -1 $\frac{1}{8}$ inch) Flats — width 12.5-100 mm ($\frac{1}{2}$ -4 inch) Thickness 1.5 x 25 mm (1/16 x 1 inch) Angles — 25 x 25 x 3 mm (1 x 1 x 1/8 inch) to 50 x 50 x 6 mm (2 x 2 x $\frac{1}{4}$ inch) Gate channels hexagonal bars up to 25 mm (1 inch) — IS : 1977-1962
CM/L-1162 4-11-1965	1-1-1967	31-12-1967	M/s Prem Cables Private Ltd, P.O. Pipalla-Kalan, Rajasthan	Hard-drawn stranded aluminium and steel-cored aluminium conductors for overhead power transmission purposes — IS : 398-1961
CM/L-1168 3-12-1965	1-1-1967	31-12-1967	M/s Prem Conductors Pvt Ltd, Station Road, Vatva (Gujarat)	Hard-drawn stranded aluminium and steel-cored aluminium conductors for overhead power transmission purposes — IS : 398-1961
CM/L-1170 6-12-1965	16-12-1966	15-12-1967	M/s Asmpol Engineering Company, C 16-17 Shri Ram Industrial Estate, Katrak Road, Wadala, Bombay	Small ac and universal electric motors with class A insulation, three-phase up to $\frac{1}{2}$ hp only — IS : 996-1959
CM/L-1171 6-12-1965	1-1-1967	31-12-1967	M/s Power Cables Pvt Ltd, Vithalwadi, Kalyan	Steel wire for the use of steel-cored aluminium conductors for overhead power transmission purposes — IS : 398-1961
CM/L-1172 6-12-1965	1-1-1967	30-6-1967	The Premier Lighting Industries (P) Ltd, Dr A. Nair Road, Bombay	Ballasts for Fluorescent lamps (for switch start circuits) — IS : 1534 (Part I)-1960

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CM/L-1173 7-12-1965	16-12-1966	15-6-1967	The Bharat Carbon & Ribbon Mfg Co Ltd, 543 Basantlal Saha Road, P.O. New Alipore, Calcutta	Carbon paper for typewriters, Types 1 and 3 — IS : 1551-1959
CM/L-1174 7-12-1965	16-12-1966	15-12-1967	M/s Krishna Silicate & Glass Works Ltd, Baraipur, P.O. Baraipur, Distt 24 Parganas	Glass milk bottles — IS : 1392-1959
CM/L-1176 9-12-1965	1-1-1967	31-12-1967	M/s Kesoram Spun Pipes & Foundries, (Prop M/s Kesoram Industries & Cotton Mills Ltd), Bansberia, Hooghly (W. Bengal)	Centrifugally cast (spun) iron pressure pipes (size 80-300 mm Class LA) — IS : 1536-1960
CM/L-1178 13-12-1965	1-1-1967	31-12-1967	M/s Madhya Pradesh Industries, 31 Industrial Estate, P.O. Birla Nagar, Gwalior	Hard-drawn stranded aluminium conductors for overhead power transmission purposes — IS : 398-1961
CM/L-1182 15-12-1965	16-12-1966	15-12-1967	M/s Fort Gloster Industries Ltd, Bauria, S.E. Rly.	PVC insulated (heavy duty) electric cables for working voltages up to and including 1100 volts — IS : 1554 (Part I)-1964
CM/L-1183 16-12-1965	16-12-1966	15-12-1967	M/s Pesticides India, Udaisagar Road, Udaipur	BHC emulsifiable concentrates — IS : 632-1958
CM/L-1186 23-12-1965	1-1-1967	31-12-1967	M/s Indo Engineering (Kota) Private Ltd, Industrial Estate, Kota (Rajasthan)	Hard-drawn stranded aluminium conductors for overhead power transmission purposes — IS : 398-1961

LICENCES CANCELLED/LAPSED OR RENEWAL DEFERRED

SL NO.	LICENCE NO. (CM/L-)	NAME AND ADDRESS OF THE LICENSEE	PRODUCT AND RELEVANT IS NO.	REMARKS	GAZETTE OF INDIA, PART II, SECTION 3 (ii), NOTIFICATION REFERENCE	
					S.O. No. and Date	Gazette Issue Dated
1	111	M/s Beliaghata Timber Works Pvt Ltd, 28-B Chaulpetty Road, Calcutta	Tea-chest plywood panels — IS : 10-1964	Deferred after 31-12-1966	468 30-1-1967	11-2-1967
2	478	M/s Shalimar Tar Products (1935) Ltd, P-46 Hide Road, Extension, Kidderpore, Calcutta	Hot applied sealing compounds for joints in concrete — IS : 1834-1961	Deferred after 31-12-1966		
3	485	M/s Glenfield & Kennedy Ltd, 4 Fairlie Place, Fairlie House, Calcutta-1	Sluice valves for water works purposes — IS : 780-1963	Cancelled after 31-12-1966	626 9-2-1967	25-2-1967
4	599	M/s Gadre Brothers, Raviwar Peth, Madhvnagar (S. Railway), Distt Sangli (Maharashtra)	Parallel keys (sizes 6 × 6 × 22 mm, 8 × 7 × 28 mm, 8 × 7 × 40 mm, 8 × 7 × 80 mm, 12 × 8 × 45 mm, 12 × 8 × 80 mm and 18 × 11 × 100 mm only) — IS : 2048-1962	Deferred after 15-12-1966	468 30-1-1967	11-2-1967
5	600	M/s Hind Cycles Ltd, 250 Worli, Bombay	Bicycle chains — IS : 627-1961	Deferred after 15-12-1966		
6	601	M/s Central Distributors Ltd, Poisar Bridge, Kandivli, Bombay-67	14 SWG bicycle spokes (plain) with nipples and washers — IS : 630-1961	Deferred after 31-12-1966		
7	607	The Production Centre for Electric Motors (Govt of India, Ministry of Industry) Tiruvalla (Kerala)	Small ac and universal electric motors with class 'A' insulation, single-phase capacitor start and three-phase squirrel cage induction motors — IS : 996-1959	Deferred after 31-12-1966		
8	817	M/s Sultania Rice & Sago Factory, Cuddalore Main Road, Talukanur, Attur (Madras State)	Sago (saboodana) — IS : 899-1956	Lapsed after 15-11-1966		

SL. NO.	LICENCE NO. (CM/L-)	NAME AND ADDRESS OF THE LICENSEE	PRODUCT AND RELEVANT IS NO.	REMARKS	GAZETTE OF INDIA, PART II, SECTION 3 (ii), NOTIFICATION REFERENCE	
					S.O. No. and Date	Gazette Issue Dated
9	863	The Lansdowne Jute Co Ltd, Champdany, Distt Hooghly (Dalhousie Jute Co Ltd)	Jute hessian — IS : 2818-1964	Lapsed after 30-11-1966	468 30-1-1967	11-2-1967
10	864	M/s Lawrence Jute Co Ltd, Chartered Bank Building, Calcutta	Jute hessian — IS : 2818-1964	Lapsed after 30-11-1966		
11	1177	M/s Power Cables Pvt Ltd, Vithalwadi, Kalyan (Maharashtra)	Armour wire for PVC insulated (heavy duty) electric cables — IS : 1554 (Part I)-1961	Lapsed after 15-12-1966		
12	1179	M/s Apeejay Steel Casting Co Pvt Ltd, Netaji Subhas Road, Jullundur (Pb)	Carbon steel bars, billets, blooms and slabs for forgings — IS : 1875-1961	Deferred after 31-12-1966		
13	1180	M/s Dhawan Mills Co, 123/400 Mill Area, Fazalganj, Kanpur	BHC dusting powders — IS : 561-1962	Deferred after 31-12-1966		
14	1181	do	Chlordane dusting powders — IS : 2864-1964	Deferred after 31-12-1966		
15	1221	M/s Jayshree Plywoods, Nanda Bose Road, Khardah (24 Parganas)	Blockboards — IS : 1659-1960	Cancelled after 30-11-1966		
16	1222	do	Wooden flush door shutters (solid core type) — IS : 2202-1962	Cancelled after 30-11-1966		

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I, Ram D. Taneja, hereby declare that the particulars given above are true to the best of my knowledge and belief.

Date 1 March 1967

Sd/- (Ram D. Taneja)
Signature of Publisher

CERTIFICATION MARKS

INDIAN STANDARDS

The standards listed below have been classified subject-wise and not according to the Departments in ISI responsible for formulating them.

■ NEW INDIAN STANDARDS

AGRICULTURAL AND FOOD PRODUCTS

IS : 3795-1966 Fenugreek, whole. Re 1-00

IS : 3796-1966 Fennel seeds, whole. Re 1-00

IS : 3797-1966 Celery seeds. Re 1-00

CIVIL ENGINEERING

IS : 1150-1966 Trade names and abbreviated symbols for timber species (first revision). Rs 2-50

IS : 1837-1966 Fanlight pivots (first revision). Rs 2-00. Covers mild steel, aluminium and brass types of fanlight pivots or ventilator hinges.

IS : 3630-1966 Code of practice for construction of non-load bearing gypsum block partitions. Rs 2-50

IS : 3696 (Part 1)-1966 Safety code for scaffolds and ladders: Part 1 Scaffolds. Rs 2-50. Lays down the safety requirements for the erection, use and dismantling of scaffolds for supporting workmen or materials for any construction work including maintenance and demolition.

IS : 3731-1966 Grading rules for teak squares. Rs 2-50

CONSUMER PRODUCTS

IS : 3735-1966 Canvas shoes, rubber sole. Rs 3-00

ELECTRICAL ENGINEERING

IS : 3671 (Part 1)-1966 Air dielectric variable capacitors: Part 1 Tests and general requirements. Rs 4-50. Covers single as well as multiple section (ganged) capacitors relating to air dielectric variable capacitors of the types normally used in radio receivers and allied electronic equipment.

IS : 3715-1966 Letter symbols for semiconductor devices. Rs 4-50

EQUIPMENT, TOOLS AND APPLIANCES

IS : 1441-1966 Insulator stalks for telegraph and telephone lines (first revision). Rs 4-50. Covers seven types of insulator stalks intended for use on telegraph and telephone lines. They are: (a) stalk, telegraph; (b) stalk, telephone; (c) stalk, swan neck, long; (d) stalk, swan neck, short; (e) stalk; (f) bracket attachment terminal, single; and (g) bracket attachment terminal, double.

MECHANICAL ENGINEERING

IS : 3621-1966 Domestic Refrigerators (absorption type). Rs 3-50. Covers general constructional requirements and methods of testing and rating of absorption type of domestic refrigerators having a net volume up to and including 350 litres.

IS : 3697-1966 Boundary dimensions for tapered roller bearings. Rs 2-50

IS : 3745-1966 Yoke type valve connections for medical gas cylinders. Rs 3-00. Covers gas cylinder valves with non-interchangeable flush type outlet connections or yoke type valve connections for medical gases and gas mixtures.

IS : 3755-1966 Emery fillets. Re 1-00. Prescribes requirements for grooved emery fillets in the form of rolls using woven tapes as backing, and emery or synthetic aluminium oxide as abrasive.

IS : 3793-1966 Live centres. Rs 1-50

PLASTICS

IS : 3730-1966 Polyethylene buckets. Rs 2-00

SAFETY EQUIPMENT

IS : 3737-1966 Leather safety boots for workers in heavy metal industries. Rs 3-50

IS : 3738-1966 Rubber knee boots. Rs 3-50. Covers boots made of rubber used for protection of foot and legs against rain slush and knee deep waters.

STRUCTURAL AND METALS

IS : 25-1966 Antifriction bearing alloys (second revision). Rs 2-00. Besides including a new grade of antifriction alloy, namely, Grade 6, this second revision has modified the chemical composition of Grades 90 and 86 and has redesignated Grade 86 as Grade 84.

IS : 193-1966 Soft solder (second revision). Rs 1-50

IS : 713-1966 Zinc base alloy ingots for die casting (first revision). Re 1-00. This revision prescribes the maximum limits for thallium and indium for zinc base alloys.

IS : 1875-1966 Carbon steel billets, blooms and slabs for forgings (revised). Rs 2-00. Prescribes requirements for six grades of carbon steel billets, blooms and slabs for forgings.

IS : 1918-1966 Methods of physical tests for foundry sands. Rs 5-50

IS : 3601-1966 Steel, tubes for mechanical and general engineering purposes. Rs 6-00. Covers the following six types of carbon steel welded and seamless tubes: (a) hot finished welded, (b) hot finished seamless, (c) cold drawn seamless, (d) electric resistance or induction butt-welded, (e) cold drawn electric resistance welded, and (f) oxy-acetylene welded.

This does not cover steel tubes for pressure purposes and for structural purposes.

INDIAN STANDARDS

IS : 3711-1966 Method for selection and preparation of samples and test pieces for mechanical tests for wrought steel. Re 1-00

IS : 3747-1966 Steel for flanging and pressing. Re 1-00

TEXTILES

IS : 744-1966 Method for determination of wool diameter — projection microscope method (first revision). Rs 3-00

IS : 3667-1966 B-twill cloth. Rs 2-00

IS : 3668-1966 Liverpool twill (L-twill) cloth. Re 1-00

IS : 3750-1966 Jute corn sack cloth. Re 1-00

IS : 3751-1966 Heavy cee cloth. Re 1-00

IS : 3770-1966 Dasuti, cotton khadi. Rs 2-00

IS : 3772-1966 Mazri, cotton khadi, scoured. Rs 1-50

IS : 3773-1966 Napkins, cotton khadi, bleached. Rs 2-00

IS : 3774-1966 Table cloth, cotton khadi, bleached. Rs 1-50

IS : 3784-1966 Cotton khadi, bleached, for general purposes. Rs 1-50

IS : 3789-1966 Bare cloth take-up rollers for plain cotton looms. Re 1-00

IS : 3794-1966 Liverpool twill (L-twill) bags. Re 1-00

■ DRAFT INDIAN STANDARDS

AGRICULTURAL AND FOOD PRODUCTS

Guar meal

Mandarins

Meat meal

CHEMICALS

Borax

Burettes

Colorimetric methods for the determination of iron

Ethylene glycol

Kerosines (revision of IS : 1459)

Light kaolin

Maleic anhydride

Metallic zinc powder

Methods of test for essential oils (revision of IS : 326)

paraformaldehyde (trioxymethylene)

Sodium sulphoxylate formaldehyde

CIVIL ENGINEERING

Mobile hot mix asphalt plant, light duty

Sluice valves for water works purposes (second revision of IS : 780)

CONSUMER PRODUCTS

Aluminium compartmental trays

Carrom-draughts

Carrom-strikers

Discs

Lockers, bedside, for hospital use

Tables, over-bed, for hospital use

Table tennis rackets

Wrought aluminium utensils (revision of IS : 1660)

ELECTROTECHNICAL

Clamping arrangements for bushings

Methods of measurement for direct reading pH meters

Methods of measurement for radiation from television receivers

Methods of measurements on cathode-ray oscilloscope (dc to 10 Mc/s)

Methods of measurement on receivers for monochrome television broadcast transmissions: Part I General

Porcelain transformer bushings:

Part I Up to 1-1 kV bushings: Sec 2 Metal parts

Porcelain transformer bushings: Part II 3-6 kV bushings: Sec 2 Metal parts

Porcelain transformer bushings: Part III 12 and 17-5 kV bushings: Sec 2 Metal parts

Porcelain transformer bushings: Part IV 24 kV bushings: Sec 2 Metal parts

Porcelain transformer bushings: Part V 36 kV bushings: Sec 2 Metal parts

Rectifier type arc welding plant

Switches and switch isolators above 1 000 volts but not exceeding 11 000 volts

MECHANICAL ENGINEERING

Glossary of terms relating to compressors and exhausters

Wire ropes used in oil wells and oil well drilling

STRUCTURAL AND METALS

Bright bars for machining

Mild steel for metal arc welding electrode core wire (revision of IS : 2879)

Steel wire for office staples

Steel wire for umbrella ribs

TEXTILES

Metal heald frames for flat steel healds

Method for evaluating strength of homogeneous vat dycestuffs

Method for determination of absorbency of absorbent textile materials (revision of IS : 2369)

Methods for determination of chloride content in textile materials

Method for determination of strength of fast bases

Methods for determination of sulphate content in textile materials

■ KEEP YOUR STANDARDS UP TO DATE

Given below are particulars of amendments to Indian Standards published during December 1966. Copies of the amendments issued from time to time are automatically mailed to those who possess Indian Standards and are registered with ISI for the purpose. Others may obtain them free of charge from the Sales Service, ISI.

These amendments were published in the Gazette of India, Part II, Section 3 (ii) dated 31-12-1966 under S.O. No. 4024, dated 20-12-1966

NO. AND DATE OF AMENDMENT	NO. AND TITLE OF INDIAN STANDARD	NO. AND DATE OF AMENDMENT	NO. AND TITLE OF INDIAN STANDARD
No. 1 October 1966	IS : 253-1964 Specification for edible common salt (revised)	No. 1 October 1966	IS : 1589-1960 Specification for oil cylinder
No. 1 October 1966	IS : 267-1963 Specification for inert cells (second revision)	No. 1 October 1966	IS : 1622-1964 Methods of sampling and test for microbiological examination of water used in industry
No. 3 September 1966	IS : 268-1959 Specification for leclanché type sack cells (revised)	No. 1 October 1966	IS : 1628-1960 Specification for oil, lubricating axle, regular and premium
No. 1 May 1966	IS : 277-1962 Specification for galvanized steel sheets (plain and corrugated) (revised)	No. 3 October 1966	IS : 1651-1960 Specification for stationary cells batteries, lead-acid type (with tubular positive plates)
No. 3 September 1966	IS : 317-1959 Specification for general service automotive hydraulic brake fluid (revised)	No. 2 October 1966	IS : 1652-1960 Specification for stationary cells and batteries lead-acid type (with plante positive plates)
No. 2 October 1966	IS : 362-1962 Methods of test for essential oils	No. 1 September 1966	IS : 1674-1960 Specification for temporary corrosion preventive, fluid, soft film, solvent deposited
No. 2 September 1966	IS : 408-1952 Specification for grease A No. 0, graphited	No. 2 November 1966	IS : 1714-1960 Methods of sampling and test for oilcakes as livestock feed
No. 4 November 1966	IS : 493-1958 Specification for machinery and spindle oils (amended)	No. 1 October 1966	IS : 1730-1961 Dimensions of steel plate, sheet and strip for structural and general engineering purposes
No. 2 October 1966	IS : 506-1953 Specification for grease, L/A No. 1	No. 1 September 1966	IS : 1781-1961 Specification for urea, technical and pure
No. 3 October 1966	IS : 589-1961 Basic climatic and mechanical durability tests for electronic components (revised)	No. 1 August 1966	IS : 1791-1961 Specification for batch type concrete mixers.
No. 2 November 1966	IS : 595-1954 Specification for blown rape (or mustard) oil for use in lubricants	No. 1 November 1966	IS : 1811-1961 Methods of sampling foundry sands
No. 1 November 1966	IS : 654-1962 Specification for clay roofing tiles, mangalore pattern (revised)	No. 1 October 1966	IS : 1846-1961 Specification for lead-acid storage batteries for aircraft (aerobic and non-aerobic)
No. 1 September 1966	IS : 900-1965 Code of practice for installation and maintenance of electrical motors (revised)	No. 2 October 1966	IS : 1879-1961 Specification for malleable cast iron pipe fittings
No. 3 September 1966	IS : 985-1962 Specification for lead-acid storage batteries (heavy duty) for motor vehicles (revised)	No. 1 November 1966	IS : 1914-1961 Specification for carbon steel boiler tubes and superheater tubes
No. 1 September 1966	IS : 1012-1958 Specification for steam turbine lubricating oils	No. 1 October 1966	IS : 1931-1962 Specification for engineer's files
No. 1 September 1966	IS : 1021-1964 Specification for caustic soda, pure (revised)	No. 1 September 1966	IS : 2134-1962 Specification for round tins for general purposes
No. 1 October 1966	IS : 1102-1957 Specification for hand-loom buckram cloth	No. 1 October 1966	IS : 2140-1962 Specification for stranded galvanized steel wire for fencing
No. 1 September 1966	IS : 1118-1957 Specification for gear lubricant, multipurpose (extreme pressure gear oil)	No. 2 November 1966	IS : 2393-1963 Specification for cylindrical and taper pins
No. 2 October 1966	IS : 1145-1962 Specification for lead-acid storage batteries for motor cycles, auto-rickshaws and similar vehicles (revised)	No. 2 September 1966	IS : 2486 (Part I)-1963 Specification for insulator fittings for overhead power lines of 3.3 kV and above: Part I General requirements and tests
No. 2 September 1966	IS : 1146-1960 Specification for hard rubber containers for lead-acid storage batteries	No. 1 October 1966	IS : 2510-1966 Specification for bottom rollers for cotton ring spinning frames (revised)
No. 1 October 1966	IS : 1230-1957 Specification for cast iron rain-water pipes and fittings	No. 1 September 1966	IS : 2512-1963 Specification for miner's cap lamp batteries (lead-acid type)
No. 1 October 1966	IS : 1406-1963 Specification for rectangular tins (revised)	No. 3 September 1966	IS : 2544-1963 Specification for porcelain post insulators (3.3 kV and above)
No. 2 October 1966	IS : 1413-1959 Specification for round vanaspati tins	No. 1 November 1966	IS : 2552-1963 Specification for steel drums (galvanized and ungalvanized)
No. 1 October 1966	IS : 1456-1959 Specification for rayon baby sharkskin	No. 1 November 1966	IS : 2553-1964 Specification for safety glass (revised)

NO. AND DATE OF AMENDMENT	NO. AND TITLE OF INDIAN STANDARD	NO. AND DATE OF AMENDMENT	NO. AND TITLE OF INDIAN STANDARD
No. 1	IS : 2652-1964 Schedule of terminals for leclanché type primary batteries	October 1966	automobile lighting and signalling devices
October 1966	IS : 2664-1964 Specification for quenching oil	No. 1	IS : 3154-1965 Specification for X-ray tubes, diagnostic type
No. 1	IS : 2762-1964 Specification for wire rope slings and sling legs	October 1966	IS : 3176-1965 Specification for top rollers for ring spinning frame
September 1966	IS : 2852-1964 Specification for carpenter's augers	No. 1	IS : 3231-1965 Specification for electrical relays for power system protection
October 1966	IS : 2876-1964 Specification for 3-jaw self-centering lathe chucks	October 1966	IS : 3289-1965 Tests and general requirements for audio frequency transformers and chokes
No. 1	IS : 2968-1964 Dimensions of slide rails for electric motors	No. 1	IS : 3359-1965 Specification for silk coating
September 1966	IS : 3021-1965 Specification for bentonite for use in foundries	September 1966	IS : 3367-1965 Specification for burnt clay tiles for use in lining irrigation and drainage works
No. 1	IS : 3070 (Part I)-1965 Specification for lightning arresters for alternating current systems: Part I Non-linear resistor type lightning arresters	No. 1	IS : 3481-1966 Specification for electric portable lamp stands and brackets
October 1966	IS : 3105-1966 General requirements for	October 1966	IS : 3482-1966 Specification for electric saucepans

SQC TRAINING PROGRAMME

Representatives of cables and conductor manufacturers attended a training programme in statistical quality control (SQC) held at Bombay in December 1966. This was the second in the series of ISI's training programmes (the first one was held in July 1965) started with a view to imparting working knowledge of simple SQC techniques to licensees under the ISI Certification Marks Scheme so as to help them control their processes and produce quality goods conforming to the relevant Indian Standard specifications.

The programme included formal lectures followed by discussions and working sessions on basic principles and techniques of SQC. The range of topics covered included summarization of data, various kinds of statistical measures for location and dispersion, specifications and tolerances, process control and its economic aspects, relation between process capability and specifications, determination of conformity of material to specified requirements, sampling inspection plans for both attributes and variables along with their economic considerations, correlation and regression. Consideration was also given to statistical significance of the schemes of testing and inspection, flow-diagrams of manufacturing processes, and strategic points and stages where different SQC techniques could be usefully applied were suggested.

It is proposed to hold similar training programmes for licensees in other sectors of industry also. The next programme is scheduled to be held at Calcutta in April 1967.



SQC training programme in progress at Bombay. Second from right is Shri S. K. Sen, Deputy Director General, ISI, who inaugurated the course

STANDARDS

ADOPTED

A list of Indian Standards adopted by various Government purchasing and consuming departments during December 1966 is given below. On 31 December 1966 3 626 Indian Standards were in force (excluding the standards under print) out of which 2 716 had been adopted by the Government.

Directorate General of Supplies and Disposals

- IS : 177-1965 Cotton drills (revised)
- IS : 181-1965 Leopard cloth (revised)

Posts and Telegraphs Department

- IS : 15-1956 Seedlac (revised)
- IS : 17-1956 Bleached lac (revised)
- IS : 23-1965 Primary (virgin) aluminium notched bars and ingots for remelting for aircraft purposes (second revision)
- IS : 51-1963 Zinc chrome for paints (revised)
- IS : 101-1964 Methods of test for ready mixed paints and enamels (second revision)
- IS : 104-1962 Ready mixed paint, brushing zinc chrome, priming for use on aluminium and light alloys (revised)
- IS : 117-1964 Ready mixed paint, brushing, finishing, exterior, semi-gloss, for general purposes, to Indian Standard colours
- IS : 157-1950 Ready mixed paint, brushing, acid and alkali resisting, lead-free, for general purposes, to Indian Standard colours
- IS : 162-1950 Ready mixed paint, brushing, fire resisting, silicate type, for use on wood, colour as required
- IS : 167-1950 Ready mixed paint, thick white, for lettering
- IS : 190-1960 Coniferous sawn timber intended for further conversion (second revision)
- IS : 204-1961 Tower bolts (revised)
- IS : 212-1961 Crude coal tar for general use (revised)
- IS : 226-1962 Structural steel (standard quality) (third revision)
- IS : 251-1962 Soda ash, technical (revised)
- IS : 252-1962 Caustic soda, technical (revised)
- IS : 274-1961 Shovels (revised)
- IS : 275-1961 Padlocks (second revision)

- IS : 277-1962 Galvanized steel sheets (plain and corrugated) (revised)
- IS : 280-1962 Mild steel wire for general engineering purposes (revised)
- IS : 281-1964 Mild steel sliding door bolts for use with padlocks (revised)
- IS : 282-1963 Hard-drawn copper conductors for overhead power transmission (revised)
- IS : 292-1961 Brass ingots and casting (revised)
- IS : 303-1960 Plywood for general purposes (revised)
- IS : 317-1959 General service automotive hydraulic brake fluid (revised)
- IS : 330-1951 Chromic acid
- IS : 331-1951 Chrome salt
- IS : 341-1952 Black japan
- IS : 348-1952 French polish
- IS : 349-1955 Lacquer, cellulose, clear
- IS : 350-1952 Insulating oil varnish, clear baking
- IS : 352-1952 Insulating spirit varnish, clear, air-drying
- IS : 363-1961 Hasps and staples (revised)
- IS : 365-1965 Electric hot-plates (revised)
- IS : 367-1955 Electric kettles (revised)
- IS : 368-1963 Electric immersion water heaters (revised)
- IS : 369-1965 Electric radiators (revised)
- IS : 380-1952 French chalk, technical
- IS : 384-1964 Brushes, paints and varnishes, flat (second revision)
- IS : 394-1963 Ink, cloth marking (revised)
- IS : 396-1953 Bare annealed high-conductivity copper wire for electrical machinery and apparatus
- IS : 397-1952 Method for statistical quality control during production by the use of control chart
- IS : 413-1965 Punches, round
- IS : 444-1964 Water hose of rubber, low pressure, with woven reinforcement (revised)
- IS : 445-1964 Water hose of rubber, high pressure, with woven reinforcement (revised)
- IS : 446-1964 Air hose of rubber, light duty, with woven reinforcement (revised)
- IS : 447-1964 Welding and cutting hose of rubber with woven reinforcement (revised)
- IS : 449-1962 Enamelled high-conductivity annealed round copper wire oleo-resinous enamel (revised)
- IS : 451-1961 Wood screws (revised)
- IS : 495-1954 Graphite, flake, for lubricants
- IS : 509-1953 Grease, L No. 4
- IS : 513-1963 Cold rolled carbon steel sheets (revised)

- IS : 529-1959 Solid-woven impregnated cotton belting for power transmission (revised)
- IS : 530-1959 Solid-woven impregnated hair belting for power transmission (revised)
- IS : 533-1954 Gum spirit of turpentine (oil of turpentine)
- IS : 548-1964 Methods of sampling and test for oils and fats (revised)
- IS : 549-1961 Split cotter pins (revised)
- IS : 583-1954 Ammunition boots for general purposes
- IS : 597-1962 Black plate for tinning, and tinplate (pack rolled) (revised)
- IS : 599-1960 Twist drills (revised)
- IS : 617-1959 Aluminium and aluminium alloy ingots and castings for general engineering purposes (revised)
- IS : 641-1964 Ready mixed paint, brushing, finishing, interior, semi-gloss, for general purposes, white (revised)
- IS : 648-1962 Steel sheets for magnetic circuits of power electrical apparatus (non-oriented steel) (revised)
- IS : 664-1963 Centre drills (revised)
- IS : 696-1960 Code of practice for general engineering drawings (revised)
- IS : 704-1957 Crow-bars and claw-bars
- IS : 707-1958 Glossary of terms applicable to timber, plywood and joinery
- IS : 715-1962 Coated abrasives, glue bond (revised)
- IS : 722 (Part I)-1962 AC electricity meters: Part I General requirements (revised)
- IS : 722 (Part II)-1962 AC electricity meters: Part II Single-phase 2-wire whole-current watt-hour meters (revised)
- IS : 722 (Part IV)-1961 AC electricity meters: Part IV Three-phase kilowatt-hour meters with maximum demand indicator
- IS : 723-1961 Mild steel wire nails (revised)
- IS : 729-1963 Drawer locks, cupboard locks and box locks (revised)
- IS : 733-1956 Wrought aluminium and aluminium alloys, bars, rods and sections for general engineering purposes
- IS : 734-1956 Wrought aluminium and aluminium alloys, forgings (for general engineering purposes)
- IS : 739-1956 Wrought aluminium and aluminium alloys, wire (for general engineering purposes)
- IS : 749-1955 Handloom cotton dungri cloth, grey
- IS : 755-1955 Handloom cotton malmal, bleached
- IS : 783-1959 Code of practice for laying of concrete pipes
- IS : 814-1963 Covered electrodes for metal arc welding of mild steel (revised)

IS : 818-1957 Code of practice for safety and health requirements in electric and gas welding and cutting operations

IS : 823-1964 Code of procedure for manual metal arc welding of mild steel

IS : 841-1957 Hand hammers

IS : 842-1956 Smith's swages

IS : 843-1956 Smith's tongs

IS : 844-1962 Screw drivers

IS : 845-1961 Swage blocks and stands

IS : 846-1956 Smith's flatters

IS : 847-1956 Smith's fullers

IS : 875-1964 Code of practice for structural safety of buildings: Loading standards (*revised*)

IS : 900-1965 Code of practice for installation and maintenance of induction motors (*revised*)

IS : 997-1957 Limestone for glass industry

IS : 1002-1956 Multipurpose grease, No. 1, No. 2, and No. 3

IS : 1015-1956 Leather pump buckets made from vegetable tanned leather

IS : 1021-1964 Caustic soda, pure (*revised*)

IS : 1064-1961 Paper sizes (*revised*)

IS : 1065-1957 Bleaching powder, stable

IS : 1079-1963 Hot rolled carbon steel sheet and strip (*revised*)

IS : 1088-1957 Oil, clock and watch

IS : 1104-1957 Brushes, lettering

IS : 1110-1964 Ferro silicon (*revised*)

IS : 1115-1957 Oil, cutting, soluble

IS : 1118-1957 Gear lubricant, multi-purpose (extreme pressure gear oil)

IS : 1169-1957 Pedestal type electric fans

IS : 1175-1957 Methods for grading and classification of muscovite mica blocks, thins and films

IS : 1179-1957 Equipment for eye and face protection during welding

IS : 1181-1957 Qualifying tests for metal arc welders (engaged in welding structures other than pipes)

IS : 1222-1957 Ink, duplicating, all weather, black for rotary type machines

IS : 1234-1957 Ink, stencil, oil base, for marking porous surfaces, colour as required

IS : 1249-1958 Recommendations for selection of grinding wheels

IS : 1260-1958 Code of symbols for labelling of dangerous goods

IS : 1273-1958 Leather pump buckets made from chrome tanned leather

IS : 1278-1958 Filler rods and wires for gas welding

IS : 1280-1958 Foundry moulding boxes

IS : 1326-1958 Non-coniferous sawn timber for further conversion

IS : 1328-1958 Veneered decorative

plywood

IS : 1333-1958 Ink, duplicating, all weather, black, for drum type machine

IS : 1350-1957 Methods of test for coal and coke—proximate analysis, total sulphur and calorific value

IS : 1378-1959 Oxidized copper finishes

IS : 1393-1961 Code of practice for training and testing of oxy-acetylene welders

IS : 1396-1960 Blotting paper

IS : 1398-1960 Packing paper, water-proof, bitumen laminated

IS : 1435-1960 Platform weighing machines

IS : 1436-1960 Weigh-bridges

IS : 1445-1959 Porcelain insulators for overhead lines with a nominal voltage below 1 000 volts

IS : 1446-1959 Classification of dangerous goods

IS : 1451-1959 Handloom cotton drills, bleached or dyed

IS : 1459-1959 Kerosines

IS : 1460-1959 Diesel fuels

IS : 1475-1959 Self-contained water coolers

IS : 1495-1959 Mild steel dust-bins

IS : 1526-1960 Sizes and shapes for firebricks

IS : 1551-1959 Carbon paper for typewriters

IS : 1568-1960 Wire gauge for general purposes

IS : 1570-1961 Schedules for wrought steels for general engineering purposes

IS : 1593-1960 Fuel oils

IS : 1595-1960 Enamelled high-conductivity annealed round copper wire (synthetic enamel)

IS : 1630-1960 Mason's tools for plaster work and pointing work

IS : 1644-1960 Code of practice for fire safety of buildings (general): Personal hazard

IS : 1645-1960 Code of practice for fire safety of buildings (general): Chimneys flues, flue pipes and hearths

IS : 1646-1960 Code of practice for fire safety of buildings (general): Electrical installations

IS : 1673-1960 Mild steel wire for the manufacture of machine screws (by cold heading process)

IS : 1703-1962 Ball valves (horizontal plunger type) including floats for water supply purposes

IS : 1707-1960 Wood wool for general packaging purposes

IS : 1711-1960 Self-closing taps

IS : 1719-1961 Felts, woollen, proofed and unproofed

IS : 1730-1961 Dimensions for steel plate, sheet and strip for structural and general engineering purposes

IS : 1742-1960 Code of practice for building drainage

IS : 1745-1961 Petroleum hydrocarbon solvents

IS : 1751-1961 Fireclay cupola refractories

IS : 1752-1961 Coal dust for use in cast iron foundry

IS : 1762-1961 Code for designation of steel

IS : 1766-1961 Time switches

IS : 1772-1961 Copper plating

IS : 1774-1961 Paper for permanent records

IS : 1777-1961 Industrial lighting fittings with metal reflectors

IS : 1809-1961 Nickel salts for electroplating

IS : 1822-1961 Motor starters of voltage up to 650 volts

IS : 1830-1961 General requirements for milling cutters

IS : 1831-1961 Dimensions for milling cutters

IS : 1836-1961 Reamers

IS : 1841-1961 Rolled aluminium rods (electrical conductor grade) for electrical purposes

IS : 1848-1961 Writing and printing papers

IS : 1855-1961 Steel wire ropes for winding purposes in mines

IS : 1859-1961 Thread cutting dies

IS : 1862-1961 Studs

IS : 1865-1961 Iron castings with spheroidal or nodular graphite

IS : 1867-1961 Rubber hot-water bottles

IS : 1886-1961 Code of practice for installation and maintenance of transformers

IS : 1891-1961 Rubber and canvas conveyor and elevator belting

IS : 1895-1961 Cotton tape *newar*, grey or dyed

IS : 1897-1962 Copper strip for electrical purposes with drawn or rolled edges

IS : 1901-1961 Visual indicator lamps

IS : 1911-1961 Schedule of unit weights of building materials

IS : 1913-1961 General and safety requirements for electric light fittings

IS : 1923-1963 Cotton selvage tape for electrical insulation purposes (*revised*)

IS : 1930-1961 Wood working chisels and gouges

IS : 1931-1962 Engineers' files

IS : 1944-1961 Code of practice for design of electrical street lighting installations

IS : 1947-1961 Flood-lights

IS : 1951-1961 Polyvinyl chloride sleeving for electrical purposes

IS : 1956-1962 Glossary of terms relating to iron and steel

IS : 1958-1961 Nickel anodes for electroplating

IS : 1959-1961 Silver anodes for electroplating

IS : 1977-1962 Structural steel (ordinary quality)

IS : 1980-1961 Ceramic dielectric capacitors, type I

IS : 1986-1962 Code of practice for hard chromium plating on steel

IS : 1987-1962 High silica sand for use in foundries

IS : 1988-1962 Screwing taps

IS : 1991-1962 Safety code for grinding wheels

IS : 2016-1962 Plain washers

IS : 2028-1962 Open jaw spanners

IS : 2030-1962 Box spanners

IS : 2032 (Part I)-1962 Graphical symbols used in electrotechnology: Part I Classification and definitions of diagrams and charts

IS : 2032 (Part II)-1962 Graphical symbols used in electrotechnology: Part II Kind of current distribution systems and methods of connection

IS : 2032 (Part III)-1962 Graphical symbols used in electrotechnology: Part III Circuit elements and variability

IS : 2036-1962 Paper base thermo-setting synthetic resin bonded laminated sheets

IS : 2049-1963 Colour code for the identification of wrought steels for general engineering purposes

IS : 2053-1962 Thermocouple pyrometers

IS : 2062-1962 Structural steel (fusion welding quality)

IS : 2066-1962 Coding and classification for non-ferrous scrap metals and residues

IS : 2067-1962 Wrought aluminium for electrical purposes, wire (other than that used for overhead conductors)

IS : 2074-1962 Ready mixed paint, red oxide-zinc chrome, priming

IS : 2086-1963 Carriers and bases used in rewirable type electric fuses up to 650 volts (revised)

IS : 2089-1962 Common proofed paulins (tarpaulins)

IS : 2092-1962 Dial gauges

IS : 2106 (Part I)-1962 Environmental tests for electronic equipment: Part I General

IS : 2106 (Part II)-1962 Environmental tests for electronic equipment: Part II Damp heat (cycling) test

IS : 2106 (Part III)-1963 Environmental tests for electronic equipment: Part III Cold test

IS : 2106 (Part IV)-1963 Environmental tests for electronic equipment: Part IV

Dry heat test

IS : 2106 (Part V)-1964 Environmental tests for electronic equipment: Part V Low air pressure test

IS : 2106 (Part VI)-1965 Environmental tests for electronic equipment: Part VI Rapid change of temperature

IS : 2106 (Part VII)-1964 Environmental tests for electronic equipment: Part VII Bump test

IS : 2106 (Part VIII)-1964 Environmental tests for electronic equipment: Part VIII Impact or shock test

IS : 2106 (Part IX)-1964 Environmental tests for electronic equipment: Part IX Drop test

IS : 2106 (Part X)-1965 Environmental tests for electronic equipment: Part X Water immersion test

IS : 2106 (Part XI)-1965 Environmental tests for electronic equipment: Part XI Water spray test

IS : 2106 (Part XII)-1965 Environmental tests for electronic equipment: Part XII Dust test

IS : 2120-1963 15-ampere tumbler switches (revised)

IS : 2155-1962 Rivets for general purposes (below 12 mm diameter)

IS : 2161-1962 Coolant pumps for machine tools

IS : 2163-1963 Carbide tipped single point turning tools

IS : 2169-1963 Milling arbors

IS : 2170-1963 Accessories for milling arbors

IS : 2208-1962 HRC cartridge use-links up to 650

IS : 2217-1963 Recommendations for providing first-aid fire fighting arrangements in public buildings

IS : 2240-1962 Vegetable tanned leather belting for power transmission

IS : 2241-1962 Round leather belting for small machines

IS : 2243-1962 Drill chucks

IS : 2255-1962 Mild steel wire rod for the manufacture of machine screws (by cold heading process)

IS : 2268-1963 Call bells and buzzers for indoor use

IS : 2279-1963 Fine silver bar, sheet, wire, granules and token (*lagdi* or *mohur*)

IS : 2283-1962 Nickel silver sheet and strip for general purposes

IS : 2285-1963 Cast iron surface plates

IS : 2290-1962 Zinc sulphate for electroplating

IS : 2292-1963 Taper keys and keyways

IS : 2339-1963 Aluminium paint for general purposes, in dual container

IS : 2412-1963 Link clips for electrical wiring

IS : 2413-1963 Cotton twine

IS : 2418-1964 Tubular fluorescent

lamps for general lighting service

IS : 2419-1963 Dimensions of electrical indicating instruments

IS : 2448 (Part I)-1963 Adhesive insulating tapes for electrical purposes: Part I Tapes with cotton textile substrates

IS : 2450-1963 Recommended practice for plating on aluminium and its alloys

IS : 2480-1964 General purpose glass thermometers

IS : 2494-1964 V-belts for industrial purposes

IS : 2507-1965 Cold rolled steel strip for springs

IS : 2509-1963 Rigid non-metallic conduits for electrical installations

IS : 2525-1963 Diameters of wrought aluminium and aluminium alloys, wire

IS : 2532-1965 Hard-drawn copper wire for telegraph and telephone purposes

IS : 2549-1963 Code for classification of processed ferrous scrap

IS : 2551-1963 Danger notice plates

IS : 2553-1964 Safety glass (revised)

IS : 2589-1964 Hard-drawn steel wire for upholstery springs

IS : 2594-1963 Hacksaw blades

IS : 2601-1964 Brass anodes for electroplating

IS : 2602-1964 Cadmium anodes for electroplating

IS : 2603-1964 Copper anodes for electroplating

IS : 2604-1964 Lead anodes for electroplating

IS : 2605-1964 Zinc anodes for electroplating

IS : 2606-1964 Alloy lead anodes for electroplating

IS : 2612-1965 Recommendation for type approval and sampling procedures for electronic components

IS : 2617-1964 Millboard, greyboard and strawboard

IS : 2633-1964 Methods of testing weight, thickness and uniformity of coating on hot dipped galvanized articles

IS : 2636-1964 Wing nuts

IS : 2637-1964 Steel roller chains and chain wheels for agricultural and similar machinery

IS : 2654-1964 Method for tensile testing of copper and copper alloys

IS : 2655-1964 Method for tensile testing of copper and copper alloy tube

IS : 2656-1964 Method for tensile testing of copper and copper alloy wire

IS : 2659-1964 Enamelled round copper wire for elevated temperatures

IS : 2660-1964 Oil, cylinder, grade

IS : 2664-1964 Quenching oil

IS : 2667-1964 Fittings for rigid steel conduits for electrical wiring

IS : 2673-1964 Dimensions for wrought aluminium and aluminium alloys, extruded tube (round)

IS : 2675-1964 Enclosed distribution fuseboards for low and medium voltages

IS : 2676-1964 Dimensions for wrought aluminium and aluminium alloys, sheet and strip

IS : 2677-1964 Dimensions for wrought aluminium and aluminium alloys, plate

IS : 2678-1963 Dimensions for wrought aluminium and aluminium alloys, drawn tube

IS : 2695-1964 Drawing filing equipment

IS : 2704-1964 Brass wire for cold-headed and machined parts

IS : 2745-1964 Fireman's helmets

IS : 2763-1964 Glossary of terms relating to foundry technology

IS : 2765-1964 Radiator hose

IS : 2789-1964 Special proofed paulins (tarpaulins)

IS : 2818-1964 Indian hessian

IS : 2876-1964 3-jaw self-centering lathe chucks

IS : 2880-1964 Pressure sensitive adhesive cellulose tape

IS : 2888-1964 Toilet soap

IS : 2891-1964 Wooden handles for felling axes and hand axes

IS : 2892-1964 Wooden handles for picks and beaters

IS : 2893-1964 Wooden handles for adzes

IS : 2894-1965 Wooden handles for wood working chisels and gauges

IS : 2897-1965 Wooden handles for shovels

IS : 2921-1964 Vernier height gauges

IS : 2922-1964 Wooden tent mallets

IS : 2925-1964 Industrial safety helmets

IS : 2927-1964 Brazing alloys

IS : 2931-1964 Ready mixed paint, brushing, aluminium-zinc oxide composite primer

IS : 2932-1964 Enamel, synthetic, exterior, type 1 (a) undercoating, (b) finishing colour as required

IS : 2933-1964 Enamel, exterior, type 2 (a) undercoating, (b) finishing colour as required

IS : 2949-1964 V-blocks

IS : 2964-1964 Methods for detection and estimation of damage in cotton fibres due to micro-organisms

IS : 2983-1964 Code of practice for hot tinning of brassware

IS : 2994-1965 Electric stoves

IS : 3005-1964 Grey cast iron ingot moulds; stools and slag ladles

IS : 3006-1965 Chemically resistant salt-glazed stoneware pipes and fittings

IS : 3015-1964 Brush, scrubbing

IS : 3020-1964 Leather for oil seals and washers

IS : 3024-1965 Electrical steel sheets (oriented)

IS : 3027-1964 Zinc cyanide for electroplating

IS : 3037-1965 Bitumen mastic for use in waterproofing of roofs

IS : 3052-1964 Dimensions for wrought copper and copper alloys, sheet, strip and foil

IS : 3053-1965 Cane baskets for general purposes

IS : 3055-1965 Clinical thermometers

IS : 3064-1964 Hand-made drawing paper

IS : 3065-1965 Cutting oil, sulphurized, for ferrous metals

IS : 3087-1965 Wood particle boards (medium density) for general purposes

IS : 3096-1965 Fine grade palladium

IS : 3098-1965 Oil, hydraulic, mineral oil type

IS : 3102-1965 Classification of bricks

IS : 3103-1965 Code of practice for industrial ventilation

IS : 3150-1965 Galvanized wire netting

IS : 3152-1965 Needle files

IS : 3164-1965 Oil pressure lamps, hanging type

IS : 3168-1965 Brass strip and foil for deep drawing

IS : 3177-1965 Code of practice for design of overhead travelling cranes and gantry cranes other than steel work cranes

IS : 3179-1965 Feeler gauges (0.03 to 1 mm)

IS : 3187-1965 Methods of chemical analysis of copper-nickel-zinc alloys

IS : 3194-1965 Code of recommended practice for cleaning of metals prior to electroplating

IS : 3203-1965 Methods of testing local thickness of electroplated

IS : 3239-1965 Die holder for circular thread cutting dies

IS : 3339-1965 Silica flour for use in foundries

IS : 3343-1965 Natural moulding sand for use in foundries

Research, Designs and Standards Organization

IS : 801-1958 Code of practice for use of cold formed light gauge steel structural members in general building construction

IS : 2313-1963 Phosphor copper ingot

IS : 2410-1963 Suction hose of rubber for fire services

IS : 2546-1963 Galvanized mild steel fire bucket

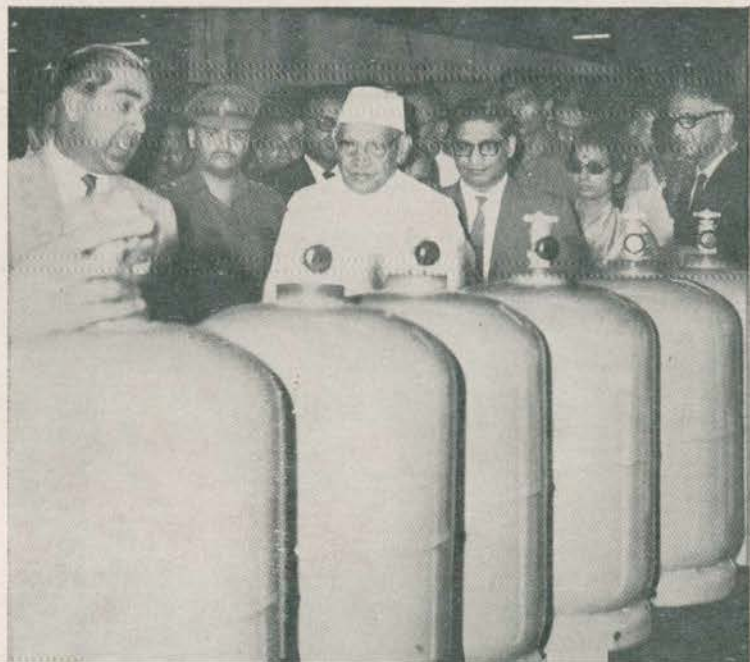
IS : 2676-1964 Dimensions for wrought aluminium and aluminium alloys, sheet and strip

IS : 2713-1964 Tubular steel poles for overhead power lines

IS : 2789-1964 Special proofed paulins (tarpaulins)

IS : 3015-1964 Brush, scrubbing

■ At a ceremony held recently at Sanatnagar, Hyderabad, the Hyderabad Allwyn Metal Works Ltd presented its first LPG Cylinder produced under ISI Certification Marks Scheme to the Indian Oil Corporation. The function was presided over by Shri Pattom Thanu Pillai, Governor of Andhra Pradesh.



NEW ISI MEMBERS

The following 56 organizations and individuals were enrolled as Subscribing Members of ISI for the year 1967 during December 1966. The net subscribing membership as on 1 January 1967 was 3727 with 2 Patrons, 8 Donor Members, 2077 Sustaining Members, 1231 Associate Members and 409 Individual Members.

■ SUSTAINING MEMBERS

Atta's Iron Foundry, Howrah
Bahco Taparia Tools Ltd, Bombay
D & H Secheron Electrodes Private Ltd, Indore
Director General of Inspection, Department of Defence Production, Ministry of Defence, New Delhi
Gujarat State Road Transport Corporation, Ahmedabad
Hutti Gold Mines Company Ltd, Hutti P.O., Raichur District (Mysore State)
K. C. A. Private Ltd, Jamnagar
Modern Rubber Manufacturers (Private) Ltd, Calcutta
National Starch Products Private Ltd, Calcutta
Padinjarekara Agencies Private Ltd, Kottayam
Photophone Equipments Ltd, Bombay
Pioneer Spring & Steel Concern Private Ltd, Calcutta

■ ASSOCIATE MEMBERS

Aphali Pharmaceuticals Ltd, Ahmednagar
Asian Art Industries, Bombay
Changla Industries, Jamnagar
C. P. Welding & Engineering Works, Nagpur
Dua Brothers, Ludhiana
Electrical & Mechanical Corporation (India), Jullundur
Gandhi & Raval, Surat
Golden Metal Industries, Jamnagar
Government Polytechnic, Guntur
Himco Industries, Amritsar
International Engineering Company, Nagpur
Jal P. Cassad & Son Private Ltd, Nagpur
Jupiter Industries, Jamnagar
Kanak Soap Factory, Jamnagar
Kathiawar Nails Manufacturing Works, Bhavnagar
K. L. Malhotra Bros, Jullundur City

Liberty Traders, Salem
Madras Chipboards Ltd, Rajapalayam
Metalfabriks (India), Ludhiana
M. G. Automobiles, Bellary
Nagpur Re-rolling Mills, Nagpur
Nayar Bros, Ludhiana
New Surgical Trading Company, Bombay
Northern India Switchgears Manufacturers Association, Jullundur
Paramount Meters Private Ltd, Jamnagar
Parmar Industries, Jamnagar
Pathick Engineering Works, New Delhi
Prabhat Industrial Works, Jalgaon (Maharashtra)
Prakash Tin Factory, Jamnagar
Prem Magnesium Industries, Bhavnagar
Reliance Fabrications (Private) Ltd, Calcutta
Saraf Bros Ltd, Calcutta
Shiv Steel Works, Falna
Shree Gajjar Engineering Works, Porbandar
Shree Nursing Sahay Mudungopal Electric Company Private Ltd, Nagpur
Siku Industries, Nagpur
Sree Narayana Polytechnic, Quilon
Standard Brick & Tile Company (Yelahanka) Private Ltd, Yelahanka (Bangalore North)
United Mineral & Chemical Industries (Private) Ltd, Bhavnagar
Victory Industries (Private) Ltd, Calcutta
W. S. Atkins Private Ltd, Calcutta

■ INDIVIDUAL MEMBERS

Samuel (Dr Ing.), R., Salem
Sehgal (Dr), S. B., Chandigarh
Shah, Shamji Rayshi, Jamnagar

NEW SUBJECTS

■ The following subjects were recommended for formulation of Indian Standards during December 1966:

CHEMICAL DEPARTMENT

Ethyl chloride
Paints, varnishes, lacquers, etc, for automobile industry
Impregnated paper
Scouring preparations
Shaving soap
Ammonium thiosulphate for photo-

graphic industry

Picture coating varnish
Glass globes for transport coaches

CIVIL ENGINEERING DEPARTMENT

Standing wave flumes
Flume meter falls
Quadrant edge orifice meters
Bed load sampler
Analysis of sediment flow for estimation of sediment load
Radio-active isotope method for

measurement of liquid flow

Measurement of sediment flow (both suspended and moving in bed) by dilution method as occurring in open channels

Measurement and estimation of littoral drift and sand by-passing of inlets and harbour entrances

Measurement of flow of polluted waters by dilution method

Guide for selection of particular method to be used under different conditions of flow and measuring sites

COMMONWEALTH STANDARDS

■ NEW STANDARDS

AUSTRALIA

AS A89: 1966 Methods of testing soils for engineering purposes

AS A157: 1966 Low and intermediate tensile strength carbon steel plates of structural quality

AS B217: 1966 Glossary of terms for toothed gearing

AS C178: 1966Ap. Silicon rubber insulated cables and flexible cords

AS E41: 1966 Flat pallots for materials handling

AS K97: 1966 Electroplated coatings of nickel and chromium

AS O98: 1966 Seasoned size-matched framing timber (including finger-jointed pieces) from South-eastern Australian hardwoods

AS O106: 1966 (Int.) Sawn douglas fir (oregon) and sawn Western hemlock (Canada pine)

AS P431: 1965 Stiffness of paper and paperboard

AS R13: 1966 Maximum, minimum and ordinary meteorological thermometers

AS T33: 1966 Clinical maximum thermometers

AS Z30: 1966 Interconversion of inch and metric dimensions

AS CA10: 1966 Code for fixed platforms, walkways, stairways and ladders

AS CA37: 1966 Laying of resilient sheet and tile flooring

AS CA45: 1966 Code for high strength bolting

AS CC7: 1966 Code for electrical installations in caravans and caravan parks

CANADA

CSA Z7.2.1.4: 1966 Dimensions of molded type cores for photographic film and paper rolls

CSA Z7.2.1.6: 1966 Dimensions for medical X-ray sheet film (inch and centimeter sizes)

CSA Z7.2.1.12: 1966 Dimensions for industrial X-ray sheet film (inch sizes)

CSA Z7.2.4.7: 1966 Picture sizes for roll film cameras

CSA Z7.2.4.9: 1966 Dimensions of front lens mounts for cameras

CSA Z7.2.4.11: 1966 Attachment threads for lens accessories

CSA Z7.2.7.8: 1966 Standard lantern slide projectors

CSA Z7.2.7.10: 1966 Dimensions for lantern slides

CSA Z7.2.8.2: 1966 Internal dimensions for radiographic film processing tanks

CSA Z7.2.8.4: 1966 Chromium-plated surfaces for ferrotyping

CSA Z7.2.8.205: 1966 Photographic grade 5-methylbenzotriazole $\text{CH}_3\text{C}_6\text{H}_3\text{NHN} : \text{N}$

CSA Z7.2.8.206: 1966 Photographic grade 5-nitrobenzimidazole nitrate $\text{NO}_2\text{C}_6\text{H}_3\text{NHCH} : \text{N.HNO}_3$

NEW ZEALAND

NZSS 2003: Part 1: 1965 Fish, and requirements for the handling, preparation, and distribution of fish: Part 1 Product requirements and permissible temperatures and times

UNITED KINGDOM

B.S. 419: 1966 Varnished fabrics and types for electrical purposes

B.S. 1121: Part 1: 1966 Methods for the analysis of iron and steel: Part 1 Sulphur in iron and steel: Gravimetric

B.S. 1314: 1966 Phenolic resin bonded paper round tubes for electrical purposes at power frequencies

B.S. 1804: Part 1: 1966 Steel dowel pins and parallel pins: Part 1 Inch series

B.S. 2992: 1966 Painters' and decorators' brushes for local authorities and public institutions

B.S. 3396: Part 1: 1966 Woven glass fibre fabrics for plastics reinforcement: Part 1 Loom-state fabrics

B.S. 3456: Section A1: 1966 Testing and approval of domestic electrical appliances: Part A Heating and cooking appliances: Section A1 General requirement

B.S. 3456: Section B1: 1966 Testing and approval of domestic electrical appliances: Part B Motor-operated appliances: Section B1 General requirements

B.S. 3727: Part 22: 1966 Methods for the analysis of nickel for use in electronic tubes and valves: Part 22 Determination of zinc (atomic absorption method)

B.S. 3933: 1966 Layout of remote control panels for 35 mm cinematograph projection

B.S. 3939: Section 5 & 6: 1966 Graphical symbols for electrical power telecommunications and electronics diagrams: Section 5 Capacitors: Section 6 Inductors, transformers and transducer

B.S. 4036 : 1966 Asbestos-cement fully compressed flat sheets

B.S. 4044 : 1966 Method for the determination of fibre length by comb sorter diagram

B.S. 4053 : Part 1 : 1966 Retainers for electronic tubes and valves: Part 1 General requirements and methods of test

B.S. 4055 : 1966 Hose clips (channelled ring type) for use below 20 lbf/in² pressure

B.S. 4056 : 1966 Method of test for ignition temperature of gases and vapours

B.S. 4057 : 1966 Spring cylinders for yarn dyeing

B.S. 4058 : Part 1 : 1966 Data processing problem definition and analysis: Part 1 Flow chart symbols

B.S. 7F.16 : 1966 Heavy duty braided rubber cord for aeronautical purposes

B.S. 5F.51 : 1966 Light duty braided rubber cord for aeronautical purposes

B.S. L.89 : 1966 Aluminium-coated aluminium-copper-magnesium-silicon-manganese alloy sheets and strips to close tolerances

B.S. L.90 : 1966 Aluminium-coated aluminium-copper-magnesium-silicon-manganese alloy sheets and strips to close tolerances

B.S. X.26 : 1966 Doping and finishing schemes for fabric covered aircraft

B.S. CP 152 : 1966 Code of practice glazing and fixing of glass for buildings

B.S. CP 211 : 1966 Code of practice internal plastering

■ DRAFT STANDARDS

AUSTRALIA

1099 Dial gauges for linear measurement

1103 Non-wire wound potentiometers, type II (proposed endorsement of IEC publication 190-1966)

1104 Method for expression of the power and intensity levels of sound or noise (proposed endorsement of ISO Recommendation R357-1963)

1105-1108 1105 Fixed capacitors for direct current using impregnated paper or paper/plastic film dielectric (proposed endorsement of IEC publication No. 80-1964)

1106 Fixed metallized paper dielectric capacitors for direct current

1107 Ceramic dielectric capacitors, type II (proposed endorsement of IEC publication No. 187-1965)

1108 Polyester film dielectric capacitors for direct current (proposed endorsement of IEC publication No. 202-1965)

NEW ZEALAND

D 8858 Manual fire alarm systems for

use in buildings (revision of NZSS 1299 : 1957)

D 8877 Fish liver oils (revision of NZSS 601 : 1948)

UNITED KINGDOM

66/18402 Haematocrit measurement apparatus

66/27732 Glossary of terms in electrical engineering: Group 16 Terminology for relays (revision of B.S. 205 : 1943)

66/28075 Methods of testing vitreous enamel finishes: Part 4 Resistance to abrasion (part of revision of B.S. 1344)

66/28088 Galvanized line-wire for telephone and telegraph purposes (revision of B.S. 182)

66/28089 Galvanized steel wire strand for electricity supply and communication lines (revision of B.S. 183)

66/28210 Cleanliness of clippings and crumb from cellular rubber and cellular plastics (to be an addendum to B.S. 1425)

66/28240 School furniture: Part 1 Materials, workmanship and finish (revision of B.S. 3030 Part 1: 1959)

66/28255 Monolithic linings for steel chimneys and flues

66/28358 Dimensional features of six-track magnetic sound recording on 70 mm release prints

66/28362 Method for the determination of width of woven or knitted fabrics when relaxed at zero tension (revision of B.S. 1930 : 1953)

66/28705 G5 and G13 B1-pin lamp caps and lampholders (revision of B.S. 1875)

66/28825 Dimensional features of single-track magnetic sound recording on 35 mm pitcher film with ISO type I perforations for television programme exchange

66/28864 Phenolic compreg (impregnated desized wood laminate) for electrical purposes

66/29030 Method for ballistic tear testing of woven fabrics

66/29031 Method for determination of length of woven or knitted fabrics when relaxed at zero tension (revision of B.S. 1931 : 1953)

66/29071 Code of practice for semi-rigid asbestos bitumen sheet roof coverings: Part 8 of CP 143-sheet roof and wall coverings

66/29143 Sills of clayware, cast concrete, slate and other natural stone (revision of B.S. 1236-8)

66/29167 Methods for the analysis of nickel for use in electronic tubes and valves: Part 12 Determination of sulphur (combustion method)

■ RECENT PUBLICATIONS OF ISO AND IEC

ISO RECOMMENDATIONS

ISO/R 54-1966 *Mudules and diametral pitches of cylindrical gears for general engineering and for heavy engineering.* P 3. Sw fr 3-00

ISO/R 496-1966 *Shaft heights for driving and driven machines.* P 7. Sw fr 9-00

ISO/R 498-1966 *Preparation of dry films from concentrated natural rubber latex.* P 4. Sw fr 3-00

ISO/R 499-1966 *Paper: Internal diameters of cores of reels.* P 3. Sw fr 3-00

ISO/R 503-1966 *Composition of wrought magnesium-aluminium-zinc alloys.* P 3. Sw fr 3-00

ISO/R 507-1966 *Procedure for describing aircraft noise around an airport.* P 19. Sw fr 24-00

IEC PUBLICATIONS

IEC Publication 68-2-6 *Basic environmental testing procedures for electronic components and electronic equipment: Part 2 Tests: Test F vibration.* 1966. P 26. Sw fr 15-00. The object of the test is to determine the ability of components and equipment to withstand specified severities of vibration.

IEC Publication 117-7 *Recommended graphical symbols: Part 7 Semiconductor devices, Capacitors.* 1966. P 21. Sw fr 15-00

IEC Publication 151-11 *Measurements of the electrical properties of electronic tubes and valves: Part II Methods of measurement of radio-frequency output power.* 1966. P 13. Sw fr 8-50

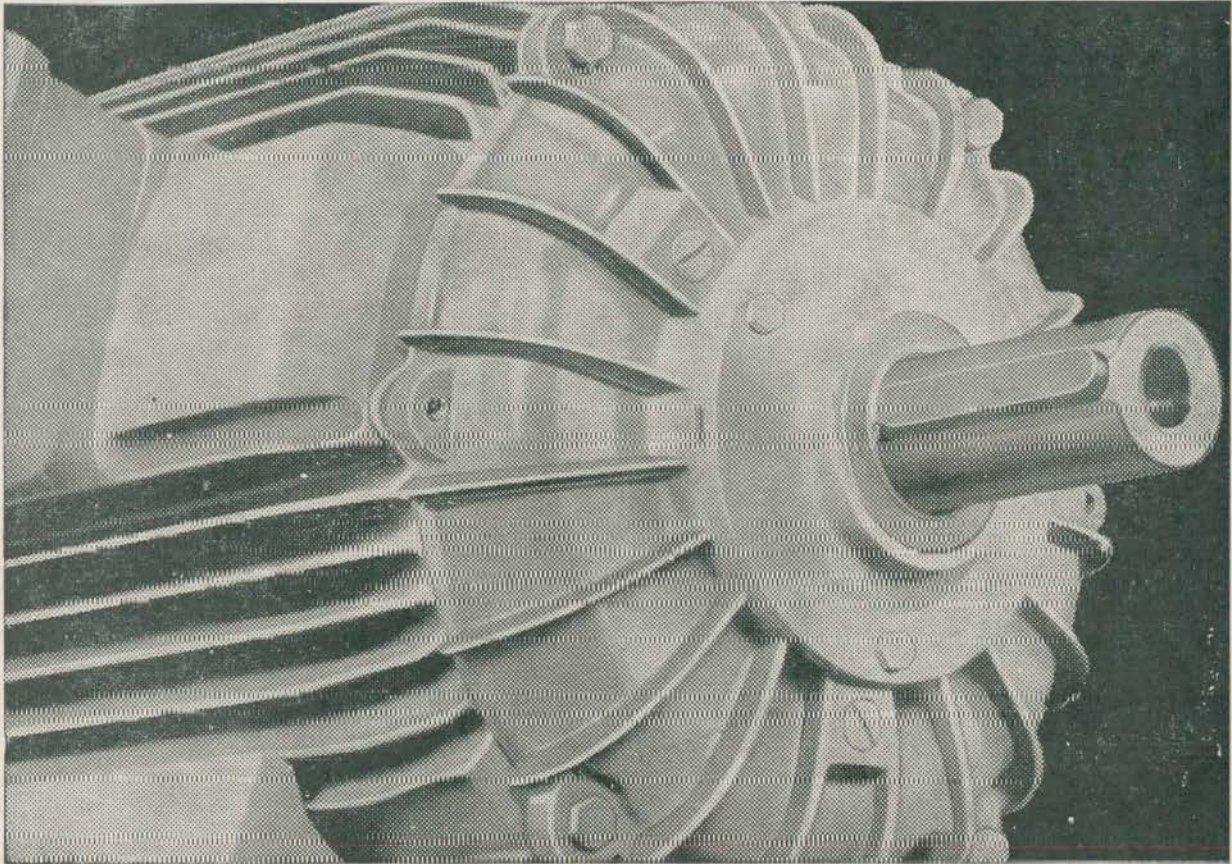
IEC Publication 218 *Guide for the drafting of performance specifications for cores of tuned transformers and inductors of ferromagnetic oxides for telecommunication.* 1966. P 25. Sw fr 15-00

IEC Publication 219 *Guide for the drafting of performance specifications for cores of broad-band transformers of ferromagnetic oxides for telecommunication.* 1966. P 25. Sw fr 15-00

These two guides mainly list essential characteristics and general rules for the associated measuring method. These rules will allow a qualified engineer to draft the complete measurement specification applicable to a given core in a given laboratory.



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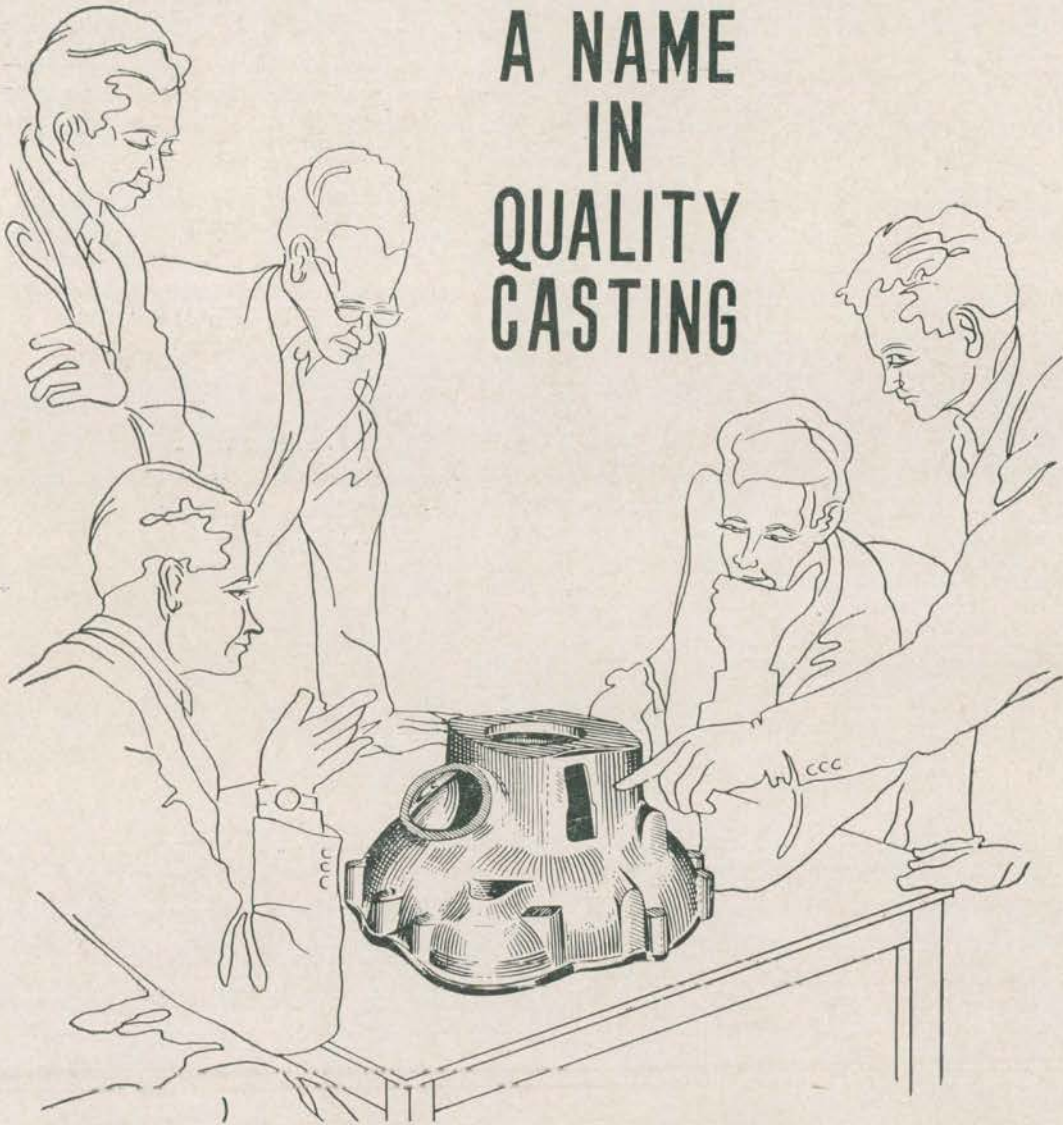
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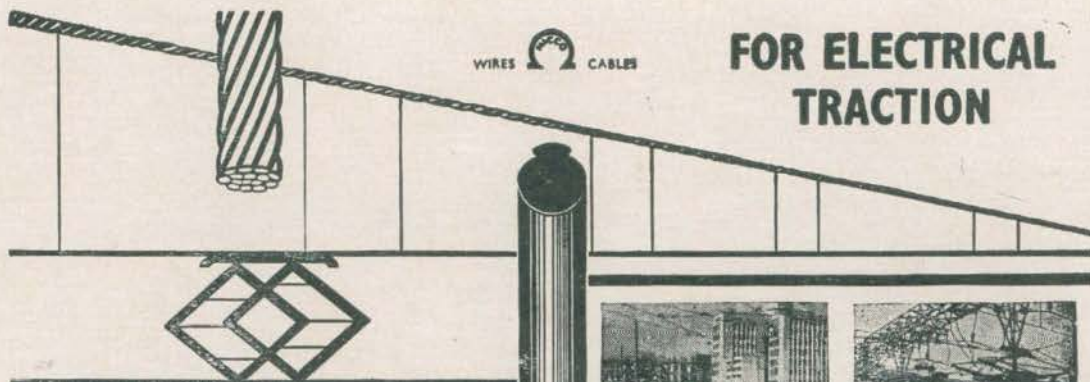
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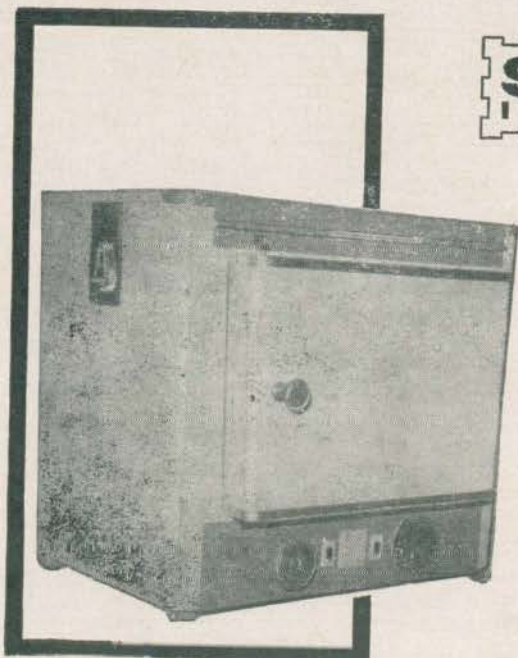
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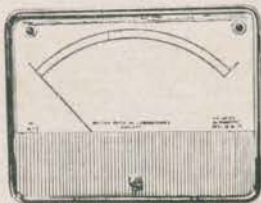
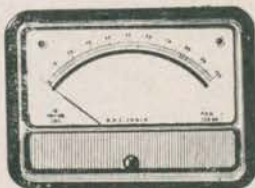
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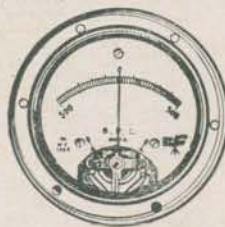
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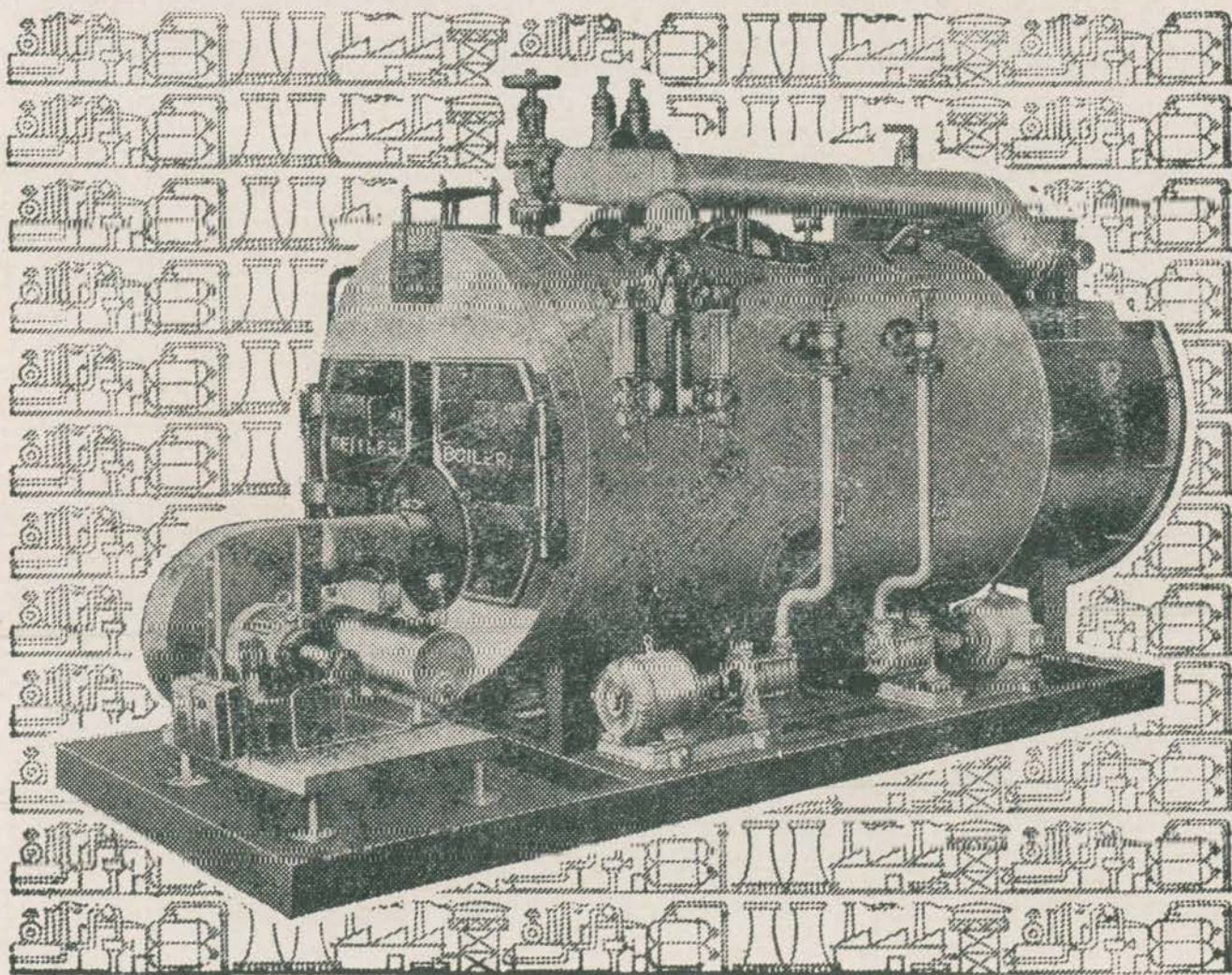
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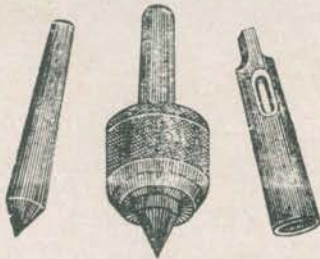
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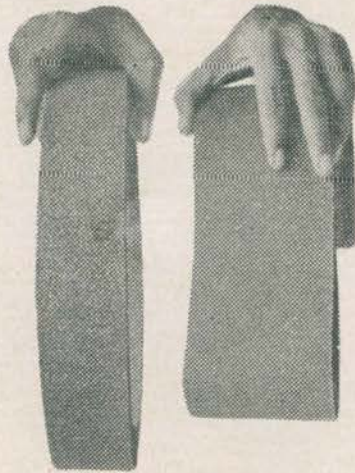
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(Journal Officiel de la Republique Francaise — Recommendations and Reports of the Economic Council — Meeting of July 25, 1956.)

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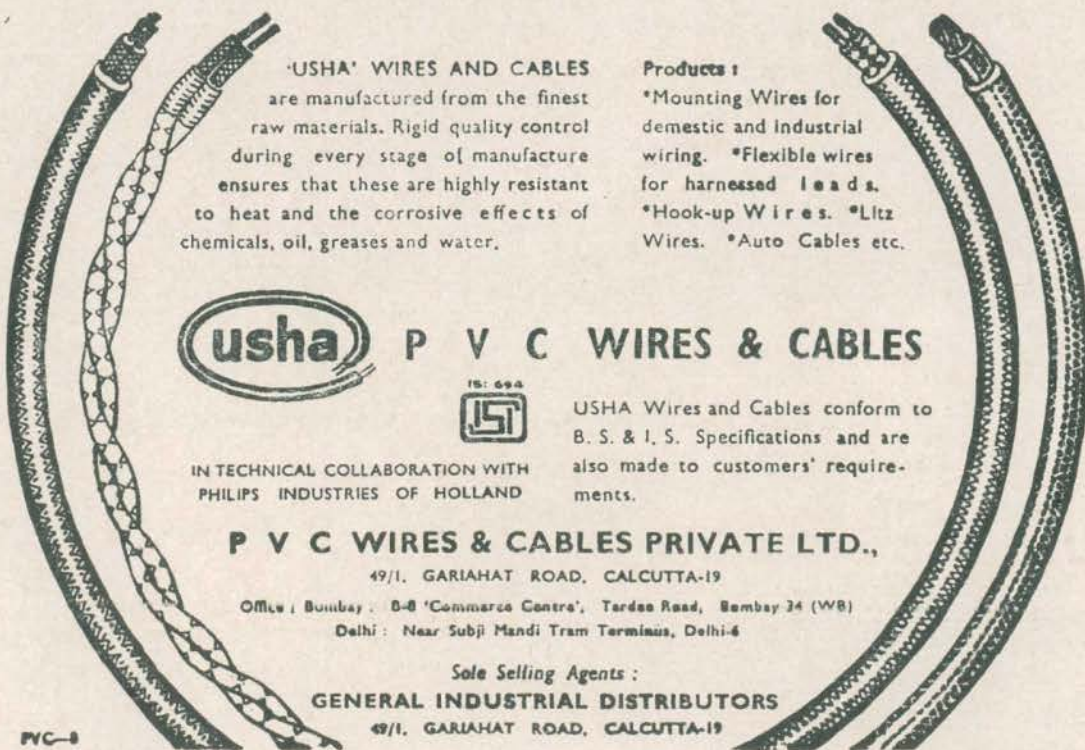
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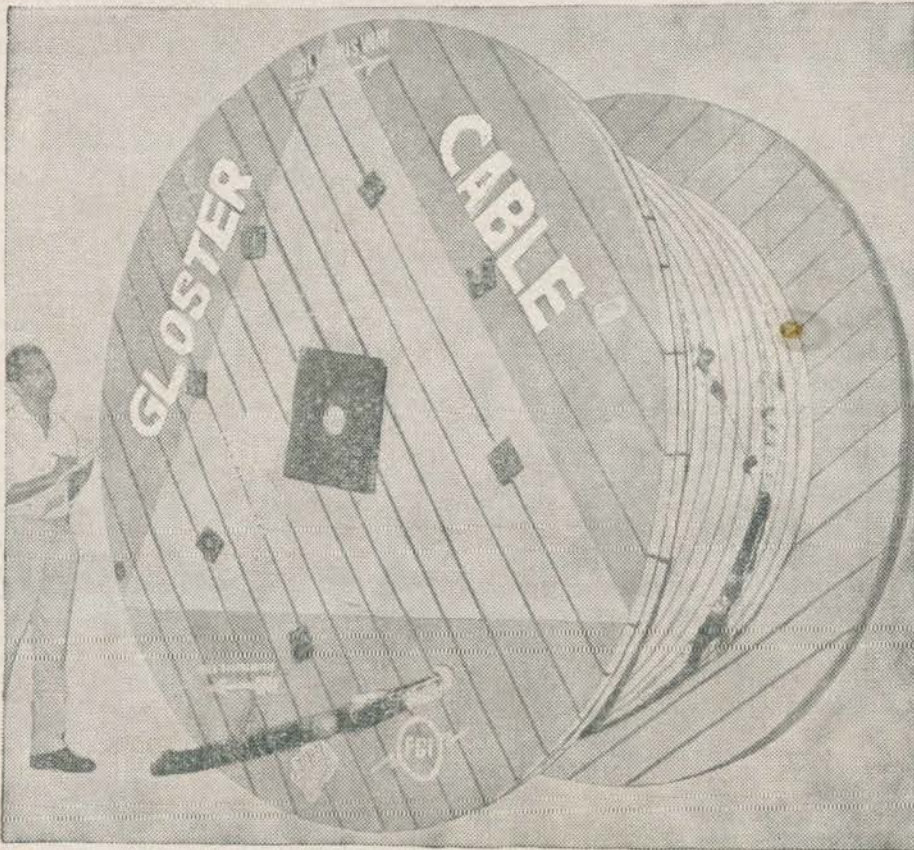
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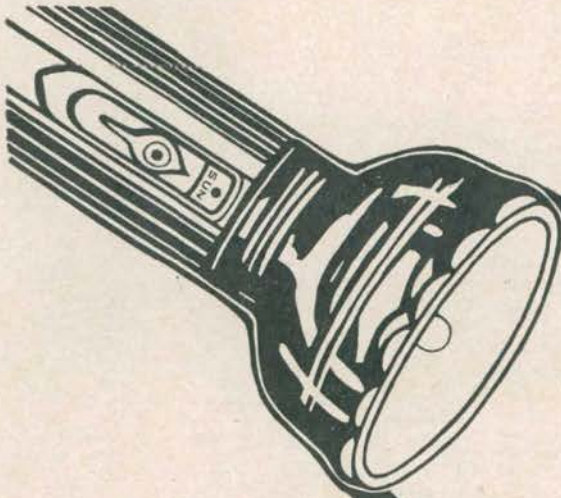


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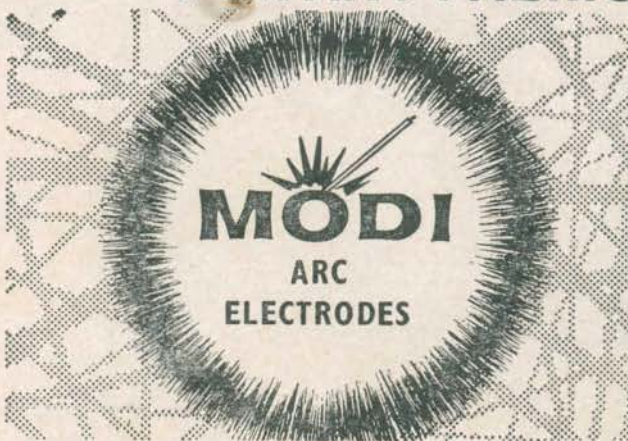
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