

# INDIAN STANDARDS INSTITUTION ( ISI )

## INDIAN STANDARDS INSTITUTION ( As on 31 March 1964 )

### General Council ( GC )

President

Vice-Presidents

### Executive Committee ( EC )

Chairman

### Finance Committee ( FC )

Chairman

Member-Secretary of General Council,  
Executive Committee, Finance Com-  
mittee, and Director, ISI

Joint Director, ISI

### Agricultural & Food Products Division Council ( AFDC )

Chairman

Vice-Chairman

Secretary

### Building Division Council ( BDC )

Chairman

Vice-Chairman

Secretary

### Chemical Division Council ( CDC )

Chairman

Vice-Chairman

Secretary

### Consumer Products Division Council ( CPDC )

Chairman

Vice-Chairman

Secretary

### Electrotechnical Division Council ( ETDC )

Chairman

Vice-Chairman

Secretary

### Engineering Division Council ( EDC )

Chairman

Vice-Chairman

Secretary

SHRI NITYANAND KANUNGO,  
Minister for Industry, Government of India

SHRI J. BHANGUR J. GHANDY  
SHRI ERACH A. NADIRSHAH

SHRI JEBANGUR J. GHANDY

SHRI ERACH A. NADIRSHAH

DR. LAL C. VERMAN

DR. A. N. GHOSH

DR. M. S. RANDHAWA

SHRI A. C. KHANNA

DR. D. V. KADAMBAR ( ISI )

SHRI ERACH A. NADIRSHAH

SHRI C. P. MALHE

DR. H. C. VISVESVARAYA ( ISI )

DR. G. P. KANE

DR. J. S. BADAMI

DR. SADDOPAL ( ISI )

COL. R. D. AYYAR

BRIG. N. N. CHOPRA

SHRI A. B. RAO ( ISI )

SHRI D. V. BALIGA

SHRI K. P. S. NAMR

SHRI Y. S. VENKATESWARAN ( ISI )

DR. B. D. KADLAKAR

SHRI M. V. PATANKAR ( ISI )

( Continued on cover page 3 )

## SEVENTEENTH ANNUAL REPORT

APRIL 1963 - MARCH 1964



THIS REPORT WILL BE PRESENTED BY THE EXECUTIVE COMMITTEE  
TO THE GENERAL COUNCIL OF ISI AT ITS NEXT ANNUAL MEETING

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SHRI BALYANTRAY G. MEHTA, CHIEF MINISTER OF GUJARAT, INAUGURATING THE EIGHTH INDIAN STANDARDS CONVENTION HELD AT AHMEDABAD IN DECEMBER 1963. SEATED FROM LEFT TO RIGHT: DR. K. L. MOUDGILL; SHRI PRABHU V. MEHTA, CHAIRMAN, ALL INDIA MANUFACTURE ORGANIZATION; SHRI ARVIND NAROTTAM LAHBHAI; SHRI NITYANAND KANUNGO THE THEN UNION MINISTER FOR INDUSTRY AND PRESIDENT, I AND SHRI JAYKRISHNA HARIVALARHIDAS, MAYOR OF AHMEDABAD (SEE PAGE 13)

## CONTENTS

	PAGE
PART I GENERAL REVIEW ... ..	5
PART II DIVISIONAL REPORTS ... ..	18
0. Introduction ... ..	18
1. Agricultural and Food Products Division ... ..	21
2. Building Division ... ..	21
3. Chemical Division ... ..	23
4. Consumer Products Division ... ..	24
5. Electrotechnical Division ... ..	25
6. Mechanical Engineering Division ... ..	25
7. Structural and Metals Division ... ..	27
8. Textile Division ... ..	28
9. Sectional Committees under the Executive Committee ... ..	29
10. Statistical Section ... ..	29
11. Research and Investigation ... ..	30
PART III INTERNATIONAL ACTIVITIES ... ..	34
1. International Organization for Standardization (ISO) ... ..	34
2. International Electrotechnical Commission (IEC) ... ..	53
3. Commonwealth Standards Conference ... ..	61
4. UK Standards Engineers Conference ... ..	62
5. National Conference on Standardization of American Standards Association ... ..	62
PART IV APPENDICES	
A Indian Standards Published and in Press During 1963-64 ... ..	63
B Audited Accounts for the Year 1963-64 ... ..	80
—————	
INDIAN STANDARDS INSTITUTION — General Information ... ..	86

SHRI BALVANTRAY G. MEHTA, CHIEF MINISTER OF GUJARAT, INAUGURATING THE EIGHTH INDIAN STANDARDS CONVENTION HELD AT AHMEDABAD IN DECEMBER 1963. SEATED FROM L TO R ARE: DR. K. L. MOUDGILL; SHRI PRAHLLAD V. MEHTA, CHAIRMAN, ALL INDIA MANUFACTURERS' ORGANIZATION; SHRI ARVIND NAROTTAM LALBHA; SHRI NIRYANAND KANUNGDO THE THEN UNION MINISTER FOR INDUSTRY AND PRESIDENT, ISI; AND SHRI JYKRISHNA HARIVALLABHIDAS, MAYOR OF AHMEDABAD ( see PAGE 13 )

## CONTENTS

	PAGE
PART I GENERAL REVIEW ... ..	5
PART II DIVISIONAL REPORTS ... ..	18
0. Introduction ... ..	18
1. Agricultural and Food Products Division ... ..	21
2. Building Division ... ..	21
3. Chemical Division ... ..	23
4. Consumer Products Division ... ..	24
5. Electrotechnical Division ... ..	25
6. Mechanical Engineering Division ... ..	25
7. Structural and Metals Division ... ..	27
8. Textile Division ... ..	28
9. Sectional Committees under the Executive Committee	29
10. Statistical Section ... ..	29
11. Research and Investigation ... ..	30
PART III INTERNATIONAL ACTIVITIES ... ..	34
1. International Organization for Standardization (ISO) ... ..	34
2. International Electrotechnical Commission (IEC) ...	53
3. Commonwealth Standards Conference ... ..	61
4. UK Standards Engineers Conference ... ..	62
5. National Conference on Standardization of American Standards Association ... ..	62
PART IV APPENDICES	
A Indian Standards Published and in Press During 1963-64 ... ..	63
B Audited Accounts for the Year 1963-64 ... ..	80
INDIAN STANDARDS INSTITUTION — General Information ...	86

## ACKNOWLEDGEMENT

The Indian Standards Institution records with pleasure its deep debt of gratitude to its members and others interested in its work, whose specialised technical assistance and financial help enabled the Institution to make its humble contribution to the economic and industrial development of the country.

The pattern of this growing co-operative activity is an index of the all-round realization that through standardization lies the road to industrial and trade efficiency, ultimately leading to economic advancement of the country.

Encouraged by the faith reposed in, and conscious of the expectations from it, the Institution looks forward, with confidence, to the future of its work in progressive partnership with different interests representing industry, trade, science, technology, Government and consumer, for the prosperity and well-being of the people.

# SEVENTEENTH ANNUAL REPORT OF THE INDIAN STANDARDS INSTITUTION ( APRIL 1963 - MARCH 1964 )

## PART I GENERAL REVIEW

During the year 1963-64, the Institution maintained its usual steady pace of progress. The targets laid down in its development plans for the establishment of Indian Standards in different fields in the year under review—the third year of the Third Five-Year Plan—were exceeded in many cases. Implementation of Indian Standards, issue of licences under ISI Certification Marks Scheme and creation of standards-consciousness registered marked progress.

The Institution participated actively in the work of standardization at international level for the economic development of the country and promotion of international trade.

The nineteenth annual meeting of the General Council was held on 18 March 1964 under the chairmanship of its President, Shri Nityanand Kanungo, Union Minister for Industry. Shri Jehangir J. Ghandy and Shri Erach A. Nadirshah were elected as Vice-Presidents for another term of one year ending 31 March 1965. The Executive and Finance Committees of ISI held six meetings each during the year.

**Standards Published**—The number of Indian Standards in force including those under print on 31 March 1963 was 2 214. During the year under report, 5 standards were withdrawn and 337 new standards (as against 304 during the previous year) were sent to press. The total number of Indian Standards in force, including those under print, on 31 March 1964 was, therefore, 2 546. Of these, 114 standards were revised during the year, 2 of which were split into two parts each while revising, thus making the number of revised standards as 116. One standard, namely, IS: 1020-1963 'Conversion tables for ordinary use (*revised*)' was translated into Hindi. Lists of new and revised standards, standards translated into Hindi and standards withdrawn are given in Appendix A (*see P 63*).

**Metric System**—During the period under review, 105 non-metric standards were revised or amended to conform to metric system. The number of non-metric standards, which was 212 or 10 percent of those published up to 31 March 1963, was reduced to 107 or 4 percent of those published up to 31 March 1964.

**ISI Certification Marks Scheme**—During the year under review, 124 new licences were granted, bringing the total licences granted under the Scheme since its inception to 650 up to 31 March 1964. New items

covered during the year included condensed milk, full-cream, sweetened; malt extract; plastic water-closet seats and covers; water delivery hose; air hose for pneumatic tools; crown corks; zinc oxide for paints; vinyl coated fabrics (leather cloth); electric ceiling fans with regulators; steel conduits for electrical wiring; light duty cables for vehicles; solid-woven impregnated hair belting for power transmission; bicycle rims; parallel keys; steel wire ropes for winding and haulage purposes in mines; rosin-core solder wire; silver solder; mild steel tubes and tubulars; nickel anodes for electroplating; drill chucks; and cotton drills, poplins, for colour fastness.

The annual value of the goods covered under the Scheme excepting steel, the marking of which is due to be started shortly, amounted approximately to Rs 700 million.

New applications for the grant of licences received during the year were 310 as against 275 during the preceding year. This brought the total to 1 365 as on 31 March 1964, out of which 450 were being processed.

Figure 1 gives graphical representation of the progress of the Scheme through the years.

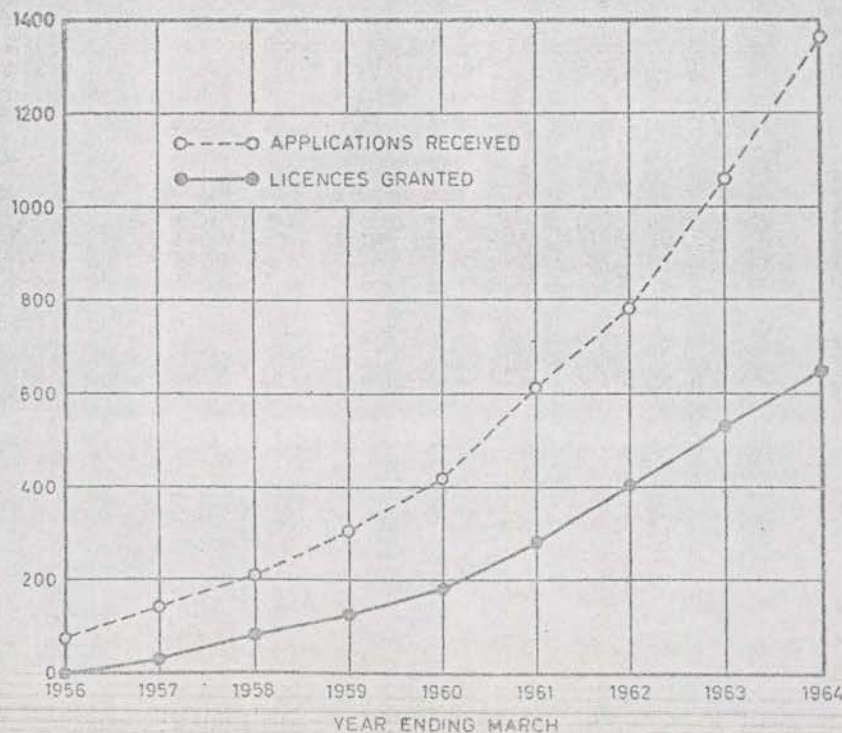


FIG. 1 PROGRESS OF ISI CERTIFICATION MARKS SCHEME

*Certification Marks Advisory Committee*—The Committee at its ninth meeting held on 22 December 1963 at Ahmedabad approved the gazetting of only the unit rate of marking fee, leaving minimum and maximum marking fees to be agreed upon between ISI and each licensee. It was further suggested that ISI Certification Marks Scheme should be extended to Goa.

*Amendment to ISI Certification Marks Regulations*—The Institution, with the prior approval of the Government of India, issued ISI Certification Marks Amendment Regulations, to come into force with effect from 1 April 1964. They provide, *inter alia*, for the modifications as may be necessary in the standards to be recognized as Indian Standards to expedite the use of the Certification Mark without, in any way, affecting the quality of the goods covered by the standard.

*Modification of the Provisions of Indian Standards and Recognition of Other Standards*—With a view to expediting the use of the Standard Mark, without in any way affecting the quality of the products covered by the standards, the Director, ISI, modified tentatively some of the provisions of IS: 398-1961 'Hard-drawn stranded aluminium and steel-cored aluminium conductors for overhead power transmission purposes (*revised*)', IS: 731-1956 'General requirements and methods of test for porcelain insulators for overhead lines with a nominal voltage of 1000 volts and above', IS: 1283-1958 'Bicycle free-wheels' and IS: 2086-1963 'Carriers and bases used in rewirable type electric fuses up to 650 volts (*revised*)'.

Under the provisions of ISI (Certification Marks) Regulations, ISI recognized two British Standards, namely, B.S. 857:1954 'Safety glass for land transport', and B.S. 861: Part I - 1955 'Switches and isolators for voltage not exceeding 660 volts and for currents not exceeding 200 amperes', as Indian Standards, and designated them as IS: 2553-1964 and IS: 2607-1964 respectively.

*Competent Authorities*—The Government of India appointed the Director-General, Supplies & Disposals and the Fisheries Development Advisor, New Delhi, as competent authorities in respect of paints and fisheries products respectively.

*Testing in ISI Laboratory*—During the year under report, 1 699 samples were received, out of which 1 557 were tested, covering 54 Indian Standards. The value of testing work done during the year was Rs ₹18 548.00.

*Recognition of Testing Laboratories*—The Institution approved the High and Low Tension Laboratory, Khurja; the Indian Jute Mills' Association Research Institute, Calcutta; and Inspection and Testing Co. (India), Calcutta; as testing laboratories for testing of samples under the ISI Certification Marks Scheme.

**Implementation of Indian Standards** — The third meeting of the Advisory Committee on Implementation of Indian Standards (ACI) was held at Ahmedabad on 22 December 1963 at which a number of recommendations relating to adoption of Indian Standards by various organizations, both in public and private sectors, and promotion of ISI Certification Marks Scheme was made.

*Adoption of Indian Standards* — The number of Indian Standards adopted by various Departments of the Government of India up to 31 March 1964 is given below:

DEPARTMENT	NO. OF INDIAN STANDARDS ADOPTED		AS ON 31 MAR 1964
	Up to 31 Mar 1963	From 1 Apr 1963 to 31 Mar 1964	
Directorate General of Supplies & Disposals	1 781	174	1 955
Defence Research & Development Organization	841	152	993
Research Designs & Standards Organization (Railways)	829	28	857
Posts & Telegraphs Department	155	46	201

As on 31 March 1964, the total number of Indian Standards adopted was 2 070 (representing 83 percent of the total published standards in force) as against 1 812 during the previous year, registering an increase of 258 in the year under report.

In addition, various electricity boards and public works departments of States, municipal corporations, associations, production units, etc. adopted Indian Standards of interest to them for the purpose of store purchase and guiding design and construction work.

To enable ISI to provide information about manufacturers operating to Indian Standards, 41 enquiries were issued covering 326 Indian Standards on different subjects. A list of such manufacturers is maintained in the ISI Directorate.

*Steps by State Governments and Others for Implementation of Indian Standards* — The Governments of Andhra Pradesh, Assam, Madras and Rajasthan are considering holding, in the near future, conferences on implementation of Indian Standards in these States. In the meanwhile, as a first step, the Government of Madras has advised the manufacturers of Madras State to (a) adopt all Indian Standards to govern their purchase requirements and to form the basis of the quality of manufacture, (b) cover their production under ISI Certification Mark, and (c) join ISI as subscribing members for active participation in the formulation of Indian Standards.

In accordance with the recommendation made at the Mysore State Conference on Implementation of Indian Standards held at Bangalore on 2 and 3 May 1961, a meeting of the representatives of the Mysore State Government Industrial Undertakings was convened on 18 February 1963 at Bangalore to consider their joining the ISI Certification Marks Scheme which would also mean implementation of Indian Standards in their purchase and manufacturing programmes.

The Director of Industries, Punjab, adopted in consultation with ISI, a number of measures for wider implementation of Indian Standards in the State.

In order to ascertain the extent of implementation of Indian Standards, State Governments having Central Stores Purchase Organizations were approached to furnish to ISI quarterly statements of purchases made by them. Kerala and Bihar Governments have agreed to this proposal while Mysore, Gujarat and Maharashtra Governments are actively considering it.

On the recommendation of the Agricultural and Food Products Division Council of ISI, a subcommittee was set up under the chairmanship of Dr. Y. K. Subrahmanyam of the Central Committee for Food Standards, Ministry of Health, to examine in detail the question of wider implementation of Indian Standards formulated by the Division Council.

A meeting of the representatives of various State Electricity Boards and Supply Undertakings was held on 22 November 1963 (along with the annual meeting of the Central Board of Irrigation and Power) to consider implementation of Indian Standards by the State Electricity Boards, Supply Undertakings, etc. It was recommended that all State Electricity Boards and major Electric Supply Undertakings should organize Standards Cells in their respective central technical offices for the purpose of studying various draft standards and other documents circulated by the Institution from time to time, and for providing a comprehensive 'standards service' to their respective departments.

*Reference to Indian Standards in Tender Enquiries* — Organizations issuing tender notices without reference to Indian Standards have been approached by ISI for suitable action. Over a hundred such enquiries were covered during the period under review, and the response received has usually been favourable.

The Directorate General of Supplies and Disposals has agreed to indicate in the tender enquiries, reference to Indian Standards under the description of material.

*Popularization of Indian Standards Abroad* — On the advice of the Ministry of Industry, Indian Standards on rubber and rubber products were brought to the notice of importers abroad by Indian Trade Missions

in the countries wherever our export trade exceeded Rs 20 000.00 per annum.

The State Trading Corporation has agreed to implement Indian Standards, wherever possible, in their import and export programmes, for which necessary instructions have been issued to the representatives responsible for negotiating the deals.

**Industrial Safety Advisory Committee (ISAC)**—The Subcommittee, set up earlier by ISAC, for formulation of a standard on computation of injury rates of accidents, prepared a 'Draft Indian Standard method for computation of frequency and severity rates for accidents in industry and classification of industrial accidents'. Computation of industrial accidents on a uniform basis is intended to equip managements, factory inspectors, industrial organizations and social security agencies with essential data in dealing with prevention of accidents. The classification of accidents in the draft is based on international practices.

**Company Standardization**—During the year under review, the Institution organized training and survey programmes under its project of promoting and developing standardization activities in Indian industries.

- a) *Training Programmes*—Two training programmes were organized, one each at Hyderabad (1 to 13 April 1963) and Mussoorie (15 to 28 May 1963), in which 38 representatives from 29 industrial organizations from all over the country took part. The programmes provided detailed training in standardization methods and techniques with a thorough indoctrination in basic principles and practices.

With a view to providing them a forum for exchange of views in their common effort for company standardization activities in their respective organizations and to give them further assistance in this endeavour, a group meeting of the participants in the training and survey programme was held at Ahmedabad on 27 and 28 December 1963.

The next training programme for establishment of company standardization has been scheduled to be held at Mussoorie from 6 to 19 May 1964.

- b) *Survey Programmes*—Three survey programmes were conducted at Bombay, Calcutta and Madras to evaluate the status of in-plant standardization activity. These programmes were organized in collaboration with the National Productivity Council of India, the Local Productivity Councils and the Bombay Productivity Centre in which 50 nominees from 42 organizations took part.

During the year 1964-65, two survey programmes have been scheduled to be organized, one each at Calcutta and Bombay.

- c) *Short-Term Training Course*—For developing purchase specifications for use by Air-India, five purchase officers of the organizations participated in a short-term training course at ISI Headquarters from 9 to 13 September 1963. At the end of the course, ISI was informed by Air-India that the officers *were unanimous in stating that they have considerably benefited from it (the training course) and it has opened new lines of approach to their work, which would be very useful to them as well as to Air-India.*

These programmes, which have proved very useful for the ultimate objective of implementation of Indian Standards in purchase and manufacturing programmes of different industrial and commercial bodies, have aroused considerable interest among all concerned and have led to the establishment of a number of Sections of the Standards Engineers Society in different parts of the country.

**Training of Standards Engineers**—With the object of overcoming the shortage of trained technical personnel, the Institution has, for the last six years, been operating its own Training Scheme. Under the Scheme, young graduates in different fields of science and technology are recruited on the basis of their performance in Universities and tests and interviews held by ISI, and given intensive and extensive training, for a period of two years, in the basic principles of industrial standardization through a course of lectures and practical training.

In order to assist other developing countries of Asia and Africa in the field of standardization, which have similar problems, the Institution offered to accommodate in its training programme a few trainees from the neighbouring countries. The Government of India, under the Technical Assistance Programme of Colombo Plan and the Special Commonwealth African Assistance Plan, agreed to sponsor the Scheme. Accordingly, a training programme was drawn up and sent to the Government for further processing.

**Library and Information Services**—During the year, 15 315 new publications were accessioned in the Standards Library at ISI Headquarters, bringing the total collection of standards and other technical publications in the Headquarters Library to more than 123 100. The number of technical, trade and scientific journals received was 439, including 10 new journals added during the year.

More than 50 000 publications were consulted or loaned out from the Headquarters Library and 144 bibliographies were prepared for the use of technical personnel and committee members. Arrangements were also made for translation into English of standards and other literature in foreign languages.

- S-3 Standardization of Materials Used in Textile Processing
- S-4 Standardization in the Field of Textile Machinery and Mill Accessories
- S-5 Progress of Changeover to Metric System in Industrial Production
- S-6 Role of Laboratory and Operational Research in Standards
- S-7 Standardization in the Dairy Industry
- S-8 Precious Metals Industry and Standardization

A Reception Committee consisting of leading citizens of Ahmedabad in particular and Gujarat in general was formed under the chairmanship of the well-known industrialist of Ahmedabad, Shri Arvind Narottam Lalbhai. The Reception Committee made necessary arrangements for accommodation, transport and local visits to places of technical and general interest for the delegates. Some social functions, entertainments and excursions were also arranged during the Convention.

The proceedings of the Convention evoked great interest in the columns of the press all over the country. Special supplements with contributions from leading experts in different fields on various aspects of standardization were brought out by 23 newspapers and journals. In addition, a 200-page Souvenir was published by the Reception Committee on the occasion of the Convention.

**K. L. Moudgill Prize**—The sixth K. L. Moudgill Prize for the year 1963 of the value of Rs 1000.00 was awarded by Shri Balvantray G. Mehta, Chief Minister of Gujarat State to Shri Prabhudas V. Mehta, Chairman of the All India Manufacturers' Organization and Chairman of the Certification Marks Advisory Committee of ISI on 22 December 1963 on the occasion of the Eighth Indian Standards Convention, at Ahmedabad, for the outstanding work he had done in promoting wide-spread use of standards as a basic requirement for the industrial and economic development of the country on sound lines. Shri Prabhu V. Mehta donated the amount of the Prize to the Welfare Fund for ISI employees.

**Finances**—A certified statement of accounts for the year under review appears in Appendix B (see P 80). Total income of ISI from various sources, such as contributions of the Government of India, membership subscription, sale of standards and certification marks fee, amounts to Rs 4 732 738.03 as against an expenditure of Rs 4 449 850.32. In addition, consideration may be given to the direct contribution made by way of expenses incurred by committee members from Government and private organizations to attend meetings of ISI within India and abroad, besides, several organizations, both Government and private, have undertaken testing work and also supplied samples. Such invisible contribution for the year under report is estimated at Rs 972 726.62.

**Branch Offices**—During the year under report, the four Branch Offices of the Institution located at Bombay, Calcutta, Kanpur and Madras continued to render useful service to industry, trade and commerce in their respective zones by disseminating information relating to standardization, effecting sale of Indian and foreign standards, enrolling subscribing members, doing inspection work under the ISI Certification Marks Scheme and maintaining liaison with industry and commerce.

In order to allow more space for its increased activities, the Madras Branch Office was provided with new and bigger accommodation.

**Welfare**—In response to a call by Voluntary Blood Transfusion Service of the Ministry of Health, 17 members of ISI donated blood on 7 October 1963, free of charge, to be used in hospitals for the sick, victims of accident, maternity cases, etc.

Forty-three employees utilized the facilities during 1963 of ISI Holiday Home at Mussoorie and spent a portion of their leave at the hill station.

**Second ISI Building**—To cope up with the ever-increasing demand for standardization, consequent on the fast developing industrial economy of the country, the Institution has been expanding its activities and services; for this, need had long been felt for additional accommodation for housing a comprehensive testing laboratory and additional staff. A plot of land measuring 0.5127 hectares (1.267 acres), adjacent to Manak Bhavan, had been allotted to ISI as reported in the Sixteenth Annual Report.

**Construction Work**—During the year 1963-64, building plans for the second ISI building were approved by municipal authorities and construction started.

**Interest-Free Deposit Funds**—A sum of Rs 3 million was estimated as the cost of the new building out of which the Government of India could spare only Rs 0.5 million owing to National Emergency. However, the Government agreed that the Institution may raise the balance of Rs 2.5 million from its members as interest-free deposit to be repaid in five years' time when the Government of India's grant would become available during the Fourth Five Year Plan. Accordingly, sustaining and associate members were approached to contribute a minimum of Rs 1000.00 towards the interest-free deposit fund.

Up to 31 March 1964, a sum of Rs 0.621 million had been received or promised from 315 members, consisting of Rs 0.502 million as interest-free deposit and Rs 1.19 lakhs as outright donation in cash and kind. In addition, the Bank of Baroda Ltd. agreed to allow an interest-free overdraft up to three lakhs of rupees in the current account of ISI.

**International Activities**—In pursuance of its policy of active collaboration for standardization at international level for the development



of national economy and promotion of international trade, the Institution participated actively in the work of 78 technical committees of the International Organization for Standardization (ISO), 55 technical committees of the International Electrotechnical Commission (IEC) and served as elected member of the Council of ISO.

ISI also held the secretariat of 14 international-committees, sub-committees, working groups dealing with subjects of interest to India, details of which are given below:

1. ISO/TC 50 Lac
2. ISO/TC 56 Mica
3. ISO/TC 88 Pictorial Markings for Handling of Goods
4. IEC/TC 43 Electric Fans
5. ISO/TC 12/SC 1 Procedure for Inter-Conversion of Values
6. ISO/TC 30/SC 1 Measurement of Liquid Flow in Open Channels
7. ISO/TC 34/SC 7 Spices and Condiments
8. ISO/TC 34/SC 8 Stimulant Foods
9. ISO/TC 17/WG 8 Dimensions of Hot-Rolled Steel Sections
10. ISO/TC 30/SC 1/WG 1 Liquid Flow Measurement in Open Channels by Velocity Area Method
11. ISO/TC 30/SC 1/WG 2 Liquid Flow Measurement in Open Channels by Notches, Weirs and Flumes
12. ISO/TC 30/SC 1/WG 3 Glossary of Terms Relating to Liquid Flow Measurement in Open Channels
13. ISO/TC 30/SC 1/WG 4 Liquid Flow Measurement in Open Channels by Dilution Method
14. ISO/TC 54/WG 7 Vetiver Oil

Meetings of some of the technical and administrative committees of international organizations dealing with standardization which were of great importance to India were attended by Indian representatives who played a notable part in putting forward the Indian point of view.

*ISO General Assembly and Group Meetings in New Delhi in November 1964—*  
As reported in the Sixteenth Annual Report, at the invitation of ISI, the International Organization for Standardization (ISO) will be holding its Sixth Triennial General Assembly and Group Meetings at Vigyan Bhavan, New Delhi from 9 to 21 November 1964. About 37 administrative bodies, such as ISO General Assembly, Council, and Planning Committee, and technical committees dealing with screw threads; bolts, nuts and accessories; procedure for inter-conversion of values; steel; solid mineral fuels; agricultural food products; rubber; vetiver oil; sheet and wire gauges; manganese ores; marks indicating conformity to standards; light metals and their

alloys; pictorial markings for handling of goods; and sampling of iron ore; will be holding their meetings. About 400 overseas delegates from 49 member countries besides 200 Indian delegates are expected to take part in the deliberations. These meetings, which are being held for the first time in the East, will afford a unique opportunity to our technologists, scientists and industrialists to establish useful contacts and benefit from the exchange of knowledge and experience with their overseas counterparts in different fields of standardization. Necessary arrangements are under way for holding the meetings and for visits and excursions to some places of technical, industrial, historical and cultural importance to which the delegates will be taken during and after the meetings, to give them an idea of the various phases of Indian life.

## PART II DIVISIONAL REPORTS

### 0. INTRODUCTION

0.1 This Part of the Report gives, in brief, the record of technical work done by different Divisions and Sections of the Institution during the year 1963-64.

0.2 **Progress of Standards** — During the period under review, 337 new Indian Standards were adopted and sent to press; and 114 were revised (see Appendix A); 321 new proposals for formulation of Indian Standards were received and 415 proposals (including some made during the previous year) were accepted and referred to various committees for further processing.

Fig. 3 gives graphical representation of the growth of standards (see P 19).

0.3 **ISI Committees and Their Membership** — As on 31 March 1964, 1292 committees of the Institution were at work for formulation of Indian Standards with a membership of 15 236 experts drawn from different interests — manufacturers, consumers, research and technical organizations, purchasers, and Government departments.

Fig. 4 and 5 show the rapid increase in the growth of Committee membership and of ISI Committees and their activities (see P 20).

0.4 Cumulative information about the work pertaining to different Divisions and Sections of the Institution is given in Table 1.

TABLE 1 RECORD OF ISI TECHNICAL DIVISIONS AND SECTIONS  
(FOR THE YEAR 1963-64)

(For details of standards published and under print during 1963-64, see Appendix A)

DIVISION OR SECTION	No. OF COMMITTEES	No. OF MEETINGS	NEW STANDARDS AND REVISED STANDARDS PUBLISHED AND UNDER PRINT	AMENDMENTS TO STANDARDS	DRAFT STANDARDS CIRCULATED	NEW SUBJECTS TAKEN UP
Agricultural & Food						
Products	110	80	58	49	65	31
Building	163	87	67	8	83	43
Chemical	313	198	89	22	122	51
*Consumer Products	35	7	Nil	Nil	Nil	99
Electrotechnical	104	78	45	17	62	32
Mechanical Engineering	207	120	72	10	87	83
Structural & Metals	228	57	64	20	57	50
Textile	111	72	53	8	53	25
Miscellaneous	21	38	3	0	—	1
<b>TOTAL</b>	<b>1292</b>	<b>737</b>	<b>451</b>	<b>134</b>	<b>529</b>	<b>415</b>

\* Inaugurated on 17 March 1964.

## DIVISIONAL REPORT

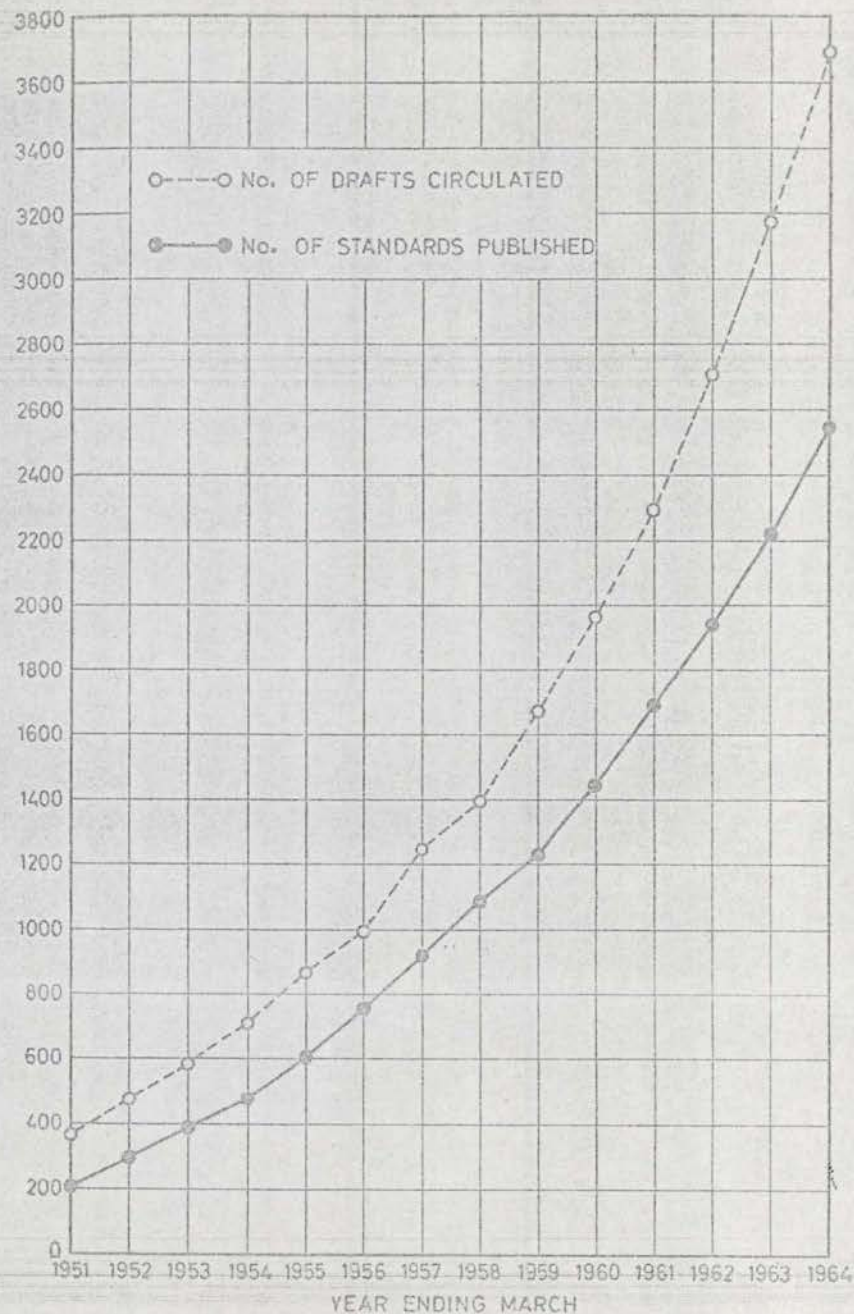


FIG. 3 GROWTH OF INDIAN STANDARDS

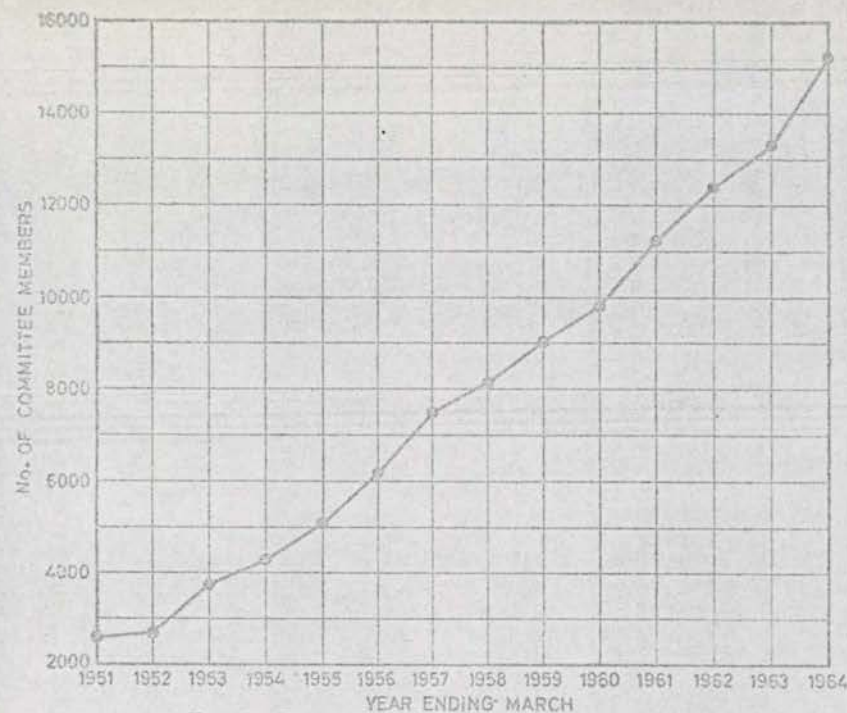


Fig. 4 GROWTH OF COMMITTEE MEMBERSHIP

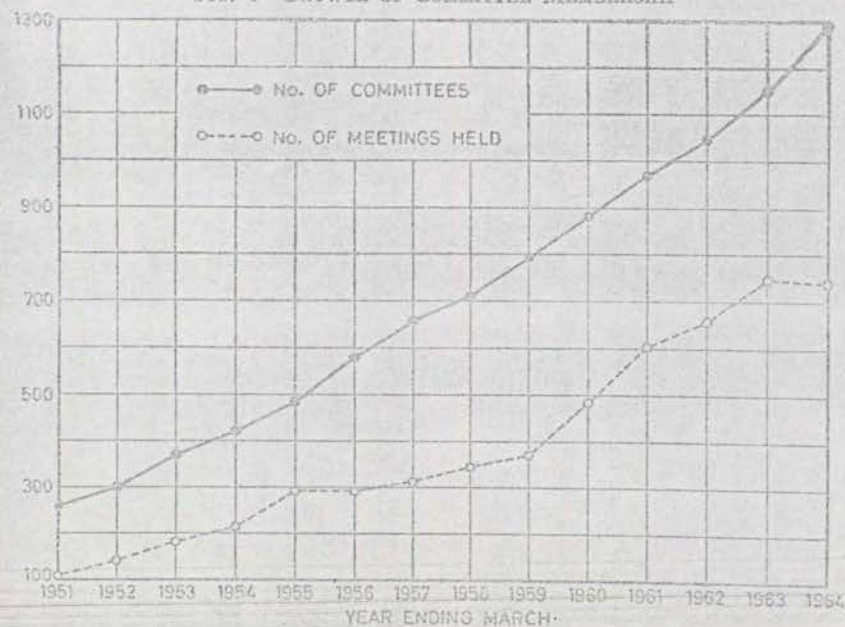


Fig. 5 GROWTH OF COMMITTEES AND THEIR ACTIVITIES

## 1. AGRICULTURAL AND FOOD PRODUCTS DIVISION

1.1 During the year under report, the Agricultural and Food Products Division paid special attention to the development of standards required for implementing the recommendations of the *Adhoc* Committee on Quality Control and Preshipment Inspection which had been set up under the chairmanship of Dr. Lal C. Verma, Director, ISI. Standards falling within this category covered spices and condiments, fish products, meat and meat products, tobacco products, and animal feeds. Besides these, the standards sent for publication covered carbonated beverages, wafer biscuits, cereal products like *PAPAD* and *BOMBAY HALWA*, dairy equipment and apparatus, pest control chemicals and equipment, and food colours. In order to help the development of agricultural machinery and farm implements industry in the country, the Division also published standards in respect of garden rake, blade harrow (*GUNTAKA* type), ridger (animal drawn), hedge shears of the straight edged type, etc.

1.2 The Standing Working Committee of the Agricultural and Food Products Division Council (SWCAF) and the Agricultural and Food Products Division Council (AFDC) held their meetings on 21 October 1963 and 18 March 1964, respectively. Both AFDC and SWCAF discussed at length the question of implementation of Indian Standards published by the Division. AFDC set up a subcommittee to suggest ways and means to achieve effective implementation and consequent wider application of these standards by the industry to market goods marked with ISI Certification Mark; established an *adhoc* committee to examine in detail the various difficulties expressed by the roller flour mills to manufacture *MAIDA* conforming to Indian Standards; and constituted a subcommittee to examine the existing standards published on storage structures with a view to making modifications and changes in them, if necessary, so as to facilitate their implementation, both at the Centre and State levels, as early as possible.

Besides reconstituting the Sectional Committees for Sugar Industry, Glucose, Apiary Industry, Animal Feeds, Propagation Materials, Fruits and Vegetables, Pest Control, Transport of Live Animals, Soft Drinks, and Cereals and Pulses, SWCAF set up a new Sectional Committee for Coffee and Cocoa Products, AFDC 29.

1.3 Fifty-eight Indian Standards formulated by the Agricultural and Food Products Division, which were sent to press during the year under review, are given in Appendix A.

## 2. BUILDING DIVISION

2.1 During the period under report, the standards published by the Building Division, covered a number of important subjects. Of these, mention may be made of the revision of the specification for coarse and fine aggregates from natural sources for concrete, which has taken into account the

latest experience available on the subject in this country and also the data which have become available from abroad; code of practice for bending and fixing of bars for concrete reinforcement, which fulfills the long-felt need of the concrete engineering profession in the country; code of practice for manufacture of hand-made common burnt clay building bricks, which is, perhaps, the first of its type and which has been prepared with the object of helping small-scale and village industries in the manufacture of quality bricks; specification for vitreous china sanitary appliances, which is expected to assist the Indian industry in export of goods of comparable quality; laying *in situ* cement concrete floor finish, which unifies the various practices adopted in different parts of the country and recommends the best methods that should be adopted under given conditions; code of practice for design and construction of septic tanks for domestic purposes, which would prove very useful in semi-urban and rural areas of the country; revision of the specification for test sieves; revision of the classification of commercial timbers and their zonal distribution; code of practice for daylighting of buildings; code of practice for acoustical design of auditoriums and conference halls; recommendations for providing first aid fire fighting arrangements in public buildings; code of practice for fire safety of non-industrial buildings; and code of practice for water supply in buildings. Among the standards on construction plant and machinery, special mention may be made of the specifications for concrete vibrators and concrete vibrating tables, as new ground has been broken in the formulation of these standards.

2.2 The work in hand, included revisions of the code of practice for plain and reinforced concrete and the loading standards, both of which are basic, important and widely adopted all over the country. The revised versions of these standards, which incorporate many important changes and bring various provisions abreast of recent technological advances and in line with modern thinking on the subject, have already reached advanced stages of processing and are expected to be published soon. The code of practice for pile foundations, the publication of which is being eagerly awaited by the profession, has already been finalized and will be published shortly.

2.3 The work of some committees was reorganized, resulting in the setting up of the following two new sectional committees:

- a) Foundation Engineering Sectional Committee, BDC 43; and
- b) Civil Works Measurement Sectional Committee, BDC 44.

In addition, the following two new committees were set up:

- a) Advisory Committee for Standardization in Multi-purpose River Valley Projects, and
- b) Safety in Construction Sectional Committee, BDC 45.

2.4 Sixty-seven Indian Standards formulated by the Building Division, which were sent to press during the year under review, are given in Appendix A.

### 3. CHEMICAL DIVISION

3.1 Quite a large number of Indian Standards published by the Chemical Division were noteworthy for their having broken new and important ground in different fields of technology and industry. Of these, special mention is needed in respect of the specifications for vegetable and aluminium tanned snakeskins, vegetable tanned lizardskins, and safety matches in boxes; standards relating to the methods of sampling and test for industrial water, inland surface water and industrial effluents; revisions of specifications for coal tar disinfectant fluids (black and white), coconut oil, groundnut oil, *MAHUA* oil, mustard oil and sesame oil; and revision of standards on rubber hoses which would go a long way not only to meet the indigenous needs but also in aid of export promotion. A separate mention may be made of the revision of the methods of sampling and test for vegetable oils and fats. An important achievement in this regard is the complete alignment brought about by an Expert Subcommittee appointed by the Central Committee for Food Standards (CCFS) in the Ministry of Health, between the methods of test adopted by Directorate of Marketing and Inspection (DMI), ISI and the CCFS.

3.1.1 Important collaborative data and studies had been made by various committees, particularly in respect of the adhesives, cosmetics and toilet goods, perfumery resinoids, thermometers, thermal insulation materials, *KATTHA*, revision of paint standards, dye intermediates, chemical hazards, paper products and packaging materials, rubber, photographic chemicals, etc.

3.2 The Standing Working Committee of the Chemical Division met twice on 19 August and 5 November 1963 and the Chemical Division Council held its annual meeting on 19 March 1964.

3.3 In view of the rapidly increasing demand for raw rubber in the wake of heavy expansion of rubber goods industry, a new Sectional Committee for Rubber, CDC 42, was established to formulate standards on natural, synthetic and reclaimed rubbers and the status of various subcommittees was raised, resulting in the setting up of the following sectional committees:

- a) Electroplating Chemicals, CDC 43;
- b) Photographic Chemicals & Related Materials, CDC 44;
- c) Paper Products & Packaging Materials, CDC 45; and
- d) Dye Intermediates, CDC 46.

3.4 Eighty-nine Indian Standards formulated by the Chemical Division, which were sent to press during the year under review, are given in Appendix A.

#### 4. CONSUMER PRODUCTS DIVISION

4.1 As reported in the Sixteenth Annual Report, the General Council had decided at its eighteenth meeting held on 25 March 1963 to create the Consumer Products Division Council. The new Division Council which is the eighth in the series, will deal with important items for household and outdoor use and for use in hospitals, schools and other institutions of public importance.

4.2 The Consumer Products Division Council was inaugurated on 17 March 1964 by Shri Nityanand Kanungo, Union Minister for Industry and President, ISI, and the inauguration was followed by the first meeting of the Division Council. Col R. D. Ayyar of the Ministry of Health was elected as the Chairman and Brig N. N. Chopra of the Ministry of Defence as Vice-Chairman. A Standing Working Committee of Consumer Products Division Council (SWGCP), consisting of 19 members including the Chairman and the Vice-Chairman, was formed.

4.3 The Division Council approved, for formulation of Indian Standards, 15 broad categories of consumer items, including surgical instruments, medical equipment and hospital appliances. For this purpose, the following fifteen sectional committees were set up:

- a) Coir and Coir Products, CPDC 1;
- b) Oil Burning Appliances ( Non-pressure Type ), CPDC 2;
- c) Oil Burning Appliances ( Pressure Type ), CPDC 3;
- d) Sports Goods, CPDC 4;
- e) Utensils, CPDC 5;
- f) Cutlery, CPDC 6;
- g) Umbrellas, CPDC 7;
- h) Pencils, CPDC 8;
- j) Safety Matches, CPDC 9;
- k) Classification and Nomenclature of Surgical Instruments and Medical Appliances, CPDC 10;
- m) Surgical Instruments, CPDC 11;
- n) Medical Glass Instruments and Appliances, CPDC 12;
- p) Anesthesia, Resuscitation and Allied Equipment, CPDC 13;
- q) Hospital Equipment, CPDC 14; and
- r) Dental Equipment, CPDC 15.

4.4 Ten Indian Standards on subjects transferred to the Division were sent to press during the year under report. Of these nine are reported

under Mechanical Engineering Division and one under Textile Division in Appendix A.

#### 5. ELECTROTECHNICAL DIVISION

5.1 The new standards and draft standards processed by the Division covered important subjects including graphical symbols, terminology, cables, porcelain insulators, insulator fittings, light electrical appliances and accessories, circuit breakers, propeller type ventilating fans, miners' cap lamp batteries, insulating materials, electric lamps and accessories, electronic equipment, electronic components and codes of practice for power installation and maintenance.

5.2 With a view to quickening the pace of standardization in the fields of instrument transformers and relays, the status of both the Instrument Transformers Subcommittee and the Relays Subcommittee was elevated to that of a sectional committee.

5.3 The Division, which also holds the Secretariat of the Indian National Committee of the International Electrotechnical Commission (IEC), continued to take active part in the deliberations of a large number of committees of that Organization, a detailed account of which is given under Part III of the Report.

5.4 Forty-five Indian Standards formulated by the Electrotechnical Division, which were sent to press during the year under review, are listed in Appendix A.

#### 6. MECHANICAL ENGINEERING DIVISION

6.1 Important subjects covered during this period by the Division included standards on machine tools and small tools (on which a number of standards were formulated including a number of test charts, specially prepared for determining limits of accuracy in a variety of machines manufactured in the country), hand tools, threaded fasteners, mathematical and optical instruments, wire ropes and wire products, roller bearings and engineering metrology.

6.1.1 Work for formulation of Indian Standards was undertaken on the important subject of steam tables in metric units, on the basis of Russian steam tables. These steam tables would contain the thermodynamic properties of water and steam up to 800°C and 300 atmospheres.

6.1.2 On the recommendation of the Ship Ancillary Committee of the Ministry of Transport and Communications, a new sectional committee was set up to deal with marine engineering and shipbuilding items. Standardization in this field is expected to save considerable foreign exchange which is at present being spent on getting materials from abroad. The committee has already made a beginning and substantial results are expected to be achieved by the end of the year.

6.1.3 Screw Threads Sectional Committee of the Division, EDC 27, was actively engaged in the implementation of ISO metric fasteners in various Indian industries. It was decided to approach this problem industry-wise and, in the first instance, the automobile industry and the bicycle industry were taken up. An *ad hoc* meeting of various interests in the automobile industry was convened at Calcutta to apprise them of the problems involved in the early adoption of ISO metric screw threads in the automobile industry. As a result, a panel was constituted which is now studying in detail the various aspects of the problem. Another panel was set up for the adoption of metric fasteners in the bicycle industry, and the results of the work of this panel are now being issued in the form of a memorandum.

6.2 As mentioned in the Sixteenth Report, the services of Mr. F. Danek a technical expert on machine tools, were made available to ISI for one year in the first instance and then extended by another year by the United Nations Technical Assistance Board (UNTAB), to assist in the formulation of standards on machine tools and small tools. Mr. Danek completed his assignment on 2 September 1963 and submitted his report to UNTAB. Valuable assistance and advice was received from him in the preparation of national standards on machine tools, small tools and other related fields in metric dimensions. The recommendations made by him in his report are under consideration.

6.3 Pursuant to the decision of the Executive Committee of ISI taken at its meeting held on 12 November 1963, the sectional committees dealing with the following items of consumer interest were transferred to the Consumer Products Division (CPD) of ISI, set up to deal with consumer items:

- a) Oil Burning Domestic Appliances ( Non-pressure Type ),
- b) Sports Goods,
- c) Cutlery,
- d) Pencils,
- e) Oil Burning Domestic Appliances ( Pressure Type ),
- f) Utensils, and
- g) Umbrellas.

6.4 Inaugural meetings of the following sectional committees were held during the year; at each meeting, the scope of work was discussed and subcommittees set up to deal with subjects allotted to them:

- a) Marine Engineering and Shipbuilding, EDC 56;
- b) Chemical Engineering, EDC 57;
- c) Packings and Gaskets, EDC 58; and
- d) Gears, EDC 59.

6.5 The Mechanical Engineering Division Council held its meeting on 16 January 1964 when a new sectional committee, namely, Industrial Instruments Sectional Committee, EDC 60, was set up.

6.6 Seventy-two Indian Standards formulated by the Mechanical Engineering Division, which were sent to the press during the period under review, are given in Appendix A. Of these, nine standards have since been transferred to the Consumer Products Division.

## 7. STRUCTURAL AND METALS DIVISION

7.1 Of the standards finalized for publication during the year, mention may be made of the glossary of terms relating to foundry technology; spectrographic and chemical analysis of high purity zinc and zinc base alloys; chemical analysis of calcium silicon; specifications for mild steel for metal arc welding electrode core wire, structural steel ( shipbuilding quality ), primary nickel, austenitic iron castings, cast iron pipe flanges and flanged fittings for petroleum industry, brass wire for cold headed and machined parts, gilding metal strip for bullet envelopes, gold thread (silver base), 1.5 percent manganese steel castings, and carbon steel castings for surface hardening; and dimensional standards for wrought aluminium and aluminium alloys.

7.2 Among the important draft standards and amendments processed during the period under report, mention may be made of drafts relating to tensile tests for aluminium and aluminium alloys, and copper and copper alloys; methods of determining austenitic grain size of steel; carbon steel billets for re-rolling into tie bars, gibs, cotters and keys for sleepers; amendment to IS : 808-1957 'Rolled steel beam, channel and angle sections', with a view to affording temporary relaxation to the steel mills in rolling Indian Standard sections; code of practice for use of steel in overhead transmission line towers, Part I load and permissible stresses; aluminium bronze ingots and castings for overhead fittings in electrical traction; method of assaying platinum and platinum alloys; brazing alloys; recommended equipment for manual tungsten inert gas arc welding of aluminium and stainless steels; code of practice for welding of pressure vessels; natural moulding sands for use in foundries; methods of test for foundry core oil; heat-resistant steel castings; steel castings for ship's structure; carbon and alloy steel castings for high temperature service; methods for determining weight, thickness and uniformity of coating on galvanized articles; low phosphorus pig iron for special purposes; and code of practice for hot-dip galvanizing of iron and steel. Of the standards compiled, mention may be made of accelerated life test for metallic materials for electrical heating; nickel silver sheet and strip for telecommunication purposes; general requirements for steel upset, drop and press forgings; forged steel rolls, alloyed and unalloyed; safety code for radiographic practice; code of practice for ultrasonic testing; hot-rolled mild steel strip for cold reduced tinplate; steel for the manufacture of volute, helical and laminated springs

for railway rolling stock and for automobiles; steel for marine boilers, pressure vessels and welded machinery structures; billets for re-rolling into structural steels and chequered plates; etc.

7.3 Some of the important new subjects taken up for standardization during the year included cold-rolled carbon steel strips; crane rail sections; structural steel pipes and fittings for marine purposes; copper for commutator bars; and hand-operated geared ladles for iron and steel foundries.

7.4 The Standing Working Committee of the Structural and Metals Division Council (SWGSM) held its third meeting on 16 December 1963 and the Structural and Metals Division Council (SMDG) held its eighth meeting on 19 March 1964. During the year, eleven sectional committees were reconstituted and twenty new subcommittees and panels were formed.

7.5 Sixty-four Indian Standards formulated by the Structural and Metals Division, which were sent to press during the year under review, are given in Appendix A.

### 8. TEXTILE DIVISION

8.1 The standards published during the year covered, among others, important export items, such as Indian hessian, heavy cec jute bags, jute corn sacks and B-twill jute bags (for packing foodgrains), which were taken up for laying down standards on the recommendation of the Study Group on Quality Control and Preshipment Inspection of Jute Goods for Export, set up by the Ministry of Commerce and Industry, Government of India. Other important subjects covered during the period included knitted worsted mufflers, worsted hose tops, bottom shaft and crank shaft for plain calico cotton looms, cotton twine, hawser-laid and cable-laid cotton rope, bottom fluted rollers for cotton ring spinning frames, flax webbing for aircraft safety belts and harnesses, cotton drill (non-water-proofed) for umbrellas, nylon georgette and taffeta and code for seaworthy packaging of man-made fibre fabrics. Indian Standards for wool fabrics were revised.

8.2 The Textile Division Council (TDC) held two meetings, one on 24 December 1963 at Ahmedabad and the other on 14 February 1964 at New Delhi. The latter was a special meeting held in pursuance of the decision taken by the Council in its meeting held at Ahmedabad to discuss introduction of 'tex' system in the textile industry in the country. During the year, 13 sectional committees were reconstituted and Cotton Mill Wooden Articles (Other Than Shuttles) Sectional Committee and Cotton Mill Shuttles Sectional Committee amalgamated into one. Four sectional committees and their subcommittees for different varieties of jute bags were dissolved to form one committee, namely, Jute Bags Sectional Committee (TDC 41) to deal with all kinds of jute bags.

8.3 Fifty-three Indian Standards formulated by the Textile Division, which were sent to press during the period under review, are given in Appendix A. Of these, one standard has since been transferred to the Consumer Products Division.

### 9. SECTIONAL COMMITTEES UNDER THE EXECUTIVE COMMITTEE

9.1 **Documentation (EC 2)**—During the year under report, two standards, namely, IS:4-1963 'Guide for layout of learned periodicals (revised)' and IS:2381-1963 'Recommendations for bibliographical references', were printed. One standard, namely, IS:2550-1963 'Glossary of classification terms' was under print. The proposed 'Draft Indian Standard abbreviations of titles of periodicals in Indian languages, Part I', which covers all Indian languages except Tamil, was completed; and work on Part II covering Tamil was started.

The composition of the Documentation Sectional Committee (EC 2) was revised by the Executive Committee at its 83rd meeting held on 12 November 1963.

9.2 **Quality Control and Industrial Statistics (EC 3)**—The Quality Control and Industrial Statistics Sectional Committee (EC 3), which had been dissolved in 1956, was re-appointed during the year under review to formulate basic standards on quality control and industrial statistics, with a view to propagating their knowledge in industry and promoting their application in the specifications and methods of test.

9.3 **ISI Directorate Standards (EC 5)**—'Draft Indian Standard guide for drafting Indian Standards (second revision) (IS:12)' was finalized in the light of the comments made by members of the ISI Directorate. The Sectional Committee decided to recommend to the Executive Committee that the circulation of this draft standard be dispensed with, as the matter contained therein was of non-controversial nature and the need for revision was urgent.

9.3.1 The 'Guide for the organization of ISI conventions', formulated in 1960, had originally been prepared in cyclostyied form. However, demand for the publication increased in view of its utility to other bodies for organizing conferences and conventions. It was, therefore, decided to print the document, incorporating the comments received from members of the ISI Directorate and others; and during the year under review the document was sent to press.

### 10. STATISTICAL SECTION

10.1 During the year under review, the Section scrutinized 618 draft Indian Standards with the object of introducing, wherever possible, statistical quality control concepts in them. In 326 cases, statistically sound sampling inspection plans were recommended, and in almost all the cases these recommendations were accepted by the concerned sectional

committees. In this connection, mention may be made of the India Standard specifications for malathion emulsifiable concentrates ( IS: 2567-1963 ), metal helmet for civil defence ( IS: E2299-1963 ); bicycle tyres ( IS: 2414-1963 ); blacksmith's vices ( IS: 2588-1964 ); dry batteries for transistor radio receivers ( IS: 2576-1963 ); brass strip for pen nibs ( IS: 2456-1963 ); and bunting, worsted ( IS: 676-1963 ).

10.2 The section scrutinized 80 routine sampling inspection schemes referred to it for issue of licences under the ISI Certification Marking Scheme. The routine inspection data collected from different licensees in accordance with the recommended schemes were also statistically analyzed to find out whether or not the certified products conformed to the relevant Indian Standards.

10.3 Investigations and statistical analysis of data were undertaken on an extensive scale for a variety of purposes, such as laying down of appropriate sampling procedures, judging the efficiency of the sampling procedures recommended and evaluation of specification requirements. Such investigations were found to be extremely helpful in evolving scientific and practicable sampling procedures for a number of materials, such as light metals and their alloy products, metal containers, coal and iron ore. In the case of iron ore, for example, the problems investigated pertained to the determination of optimum weight of the gross sample, optimum size of the increment, comparison of the efficacies of two methods of sample reduction ( the coning and quartering method and the increment reduction method ), and arriving at the most desirable size of iron ore sample at which moisture determination is to be carried out. Similarly, various problems connected with the sampling of pig iron ( coke ), acceptance criteria for asafetida for customs purposes, determination of the minimum number of samples of black tea, evaluation of the specification limits for acidity of ATTA, estimation of apparent citronellol content and ketone content in imported geranium oil, size grading of cauliflower from diameter and depth of the curd, etc, were suitably investigated and appropriate recommendations made.

10.4 Comments and suggestions for improvement were sent on 11 draft proposals of ISO and standards bodies of overseas countries pertaining to terminology, definitions and symbols, methods of test ( for twist in yarn ); and materials like iron ore, coal, seeds and fruits, cereals and refractory materials.

## 11. RESEARCH AND INVESTIGATION

11.1 As in the previous years, the Institution continued to undertake research and analytical studies in different fields with the object of collecting information for formulation of Indian Standards. For these purposes, close and active assistance was received from different national, State and private laboratories, testing organizations and research institutions. The

Institution records its profound appreciation for the valuable help received from these bodies.

11.2 During the year under review, research and investigation were carried out on a number of important subjects, details of which are given in the following paragraphs:

**Agricultural and Food Products Division** — Investigations related to the analysis of biscuits ( excluding wafer biscuits ), baker's yeast, BOMBAY HALWA, black tea, soluble coffee, DDT water dispersible powder concentrates, ethylene dichloride carbon tetrachloride mixture ( 3:1, v/v ), ethylene dibromide, BHC smoke generator, malathion ( technical ), malathion emulsifiable concentrates, methyl parathion emulsifiable concentrates, chlordane ( technical ) and methods of test for aromatic amines in coaltar food colours.

**Building Division** — Research and investigation related to the quantity of water to be used in the compressive strength test for cement; water-cement ratio and strength of cement mortar and concrete; variation in bulk density of aggregates measured with different sizes of containers; mortar-making properties of Ennore sand; permissible limit for magnesia content in building limes, and tests on samples of building limes available in the respective regions to ascertain their chemical composition, strength values and classification; strength characteristics ( compressive and transverse ) of lime concrete; SURKHI-lime mixture as masonry cement; testing of natural building stones; thermal efficiency of brick kilns; requirements for abrasion resistance of cement concrete tiles; field test for abrasion resistance of cement concrete tiles; soil for manufacture of Mangalore tiles; use of square and circular plates for load test on soils; effect of vibration on soils; testing and calibration of sieve shaker; load test of prototype Madras terrace; pressure test for bitumen felts for waterproofing and damp-proofing; verification of methods of tests for bitumen emulsions; performance of concrete vibrators; suitability of polythene pipes for potable water supply; effect of silt quantity on velocity distribution and hence on discharge; effect of silt quantity on rating of current meter; minimum number of verticles for discharge measurements in canals; testing of jointed wood poles; cupping and twisting of fibre hardboard; and preservative treatment for block boards.

**Chemical Division** — Investigations related to fusel oil; tables for alcoholometry ( Pycnometer method ); bleaching earths; hot-pressed naphthalene; PVC coated nylon and cotton fabrics for fuel pump diaphragm for vehicular engines; PVC ventilation ducting and tubing; linalool; and resinoid benzoin. Tests were carried out for developing appropriate methods for determination of bleachability of cottonseed oil with simplified apparatus; topane and brentamine fast red GG for hide curing salt; iron colorimetrically; calcium and magnesium with EDTA; phosphorus volumetrically; and bursting characteristics of collapsible tubes; and for



detection of copper, lead and tin in vegetable oils. Data were collected with regard to specific gravity of crotonaldehyde, industrial benzole and butyl acetate at 27°/27° C; stiffness of mill board, grey board and straw board deterioration in tensile strength and elongation on accelerated ageing for braided rubber hoses for petrol and diesel fuel; mode of preparation of samples for testing of leather; gasoline correlation test scheme; smoke point of kerosine; comparative properties of mineral colza and kerosine as fuel for flame safety lamps; oil of geranium; gum spirit of turpentine; specific gravity and refractive index for amyl cinnamic aldehyde; and crankcase lubricating oil test unit.

**Electrotechnical Division** — Investigations related to tensile strength and percentage elongation of steel conduits, suitability of rigid non-metallic conduits for use in concealed wiring, suitability of aluminium for manufacturing link clips, determination of minimum life duration for dry batteries for transistor radio receivers, determination of value of breakdown strength of insulating oil using test cell recommended by IEC, evolving of a method of test for determination of electric strength of mica tapes, effect of aluminium cap on brass holder of electric lamps, life test on road traffic signalling lamps and use of potassium persulphate for persulphate test specified in the 'Indian Standard specification for rubber-insulated cables'.

**Structural and Metals Division** — The most important work taken up during the period under review relates to the preparation of standard certified samples for metallurgical analysis, at the National Metallurgical Laboratory. Out of the items of work completed, mention may be made of the investigations conducted on 'What should be the variation in specified chemical analysis of steel products'.

Investigations were continued on assessment of economy in the use of steel through standardization; corrosion research relating to light gauge steel sections; preparation of nomograph showing the correlation between the elongation percentage on different gauge lengths; determination of antimony by the potassium bromate and the permanganate methods; preparation of reference blocks for checking of ultrasonic testing equipment; determining the optimum weight of the gross sample of iron ore and optimum size of the increment; establishing the relative merits of the two methods of iron ore sample reduction, namely, 'increment reduction method' and 'coning and quartering method'; determining the optimum size at which moisture determination of iron ore should be carried out; high temperature properties of steels for boiler materials; preparation of a graph indicating the variation of strength with cross-sectional thickness of grey iron castings; determining the effect of phosphorus on the mechanical properties of both whiteheart and blackheart malleable cast iron, effect of machining on tensile properties of chill castings (aluminium); determining permanent set stress values for the different grades of aluminium bronze

ingots and die castings; mechanical properties of copper foil and brass strip for use in the manufacture of radiator cores; tests on the composition of manganese bronze; production of reference radiographs for steel welds; standard design for cupola furnace; exploration of sources of high silica sands; standard sand for foundry sand control; tests with regard to liquid limit of bentonite and, if possible, to establish a correlation among liquid limit 'gel strength', dry and wet fineness swelling index and bonding strength; tests regarding green compression strength developed in sand mixtures using indigenous bentonite clays; determination of performance characteristics of indigenous graphite crucibles up to size 100; thermal conductivity of insulating bricks; determination of baked properties of standard sand core oil water mixture developed after using linseed oil; and sampling of steel castings for general engineering purposes.

**Textile Division** — Research was carried out on evaluation of certain characteristics of cotton yarn and cotton cloth used in cable industry; rayon mix lining cloth; continuous filament viscose rayon yarn and acetate yarn, bright and dull; cotton webbing staticute; tubular tape for equipment dropping parachute static lines; cotton tape, undyed; cotton tape, special; longcloth for supply dropping parachute; cotton fabric for target sleeves; breaking cord for cotton parachute; jute bags for packing (mint) coins; nylon ropes for mountaineering purposes, leather aprons used on ring frames; shirting Angola cloth; Baratheia, khaki; cotton selvedge tape; signal lamp wick; and determination of rigidity of twin wire. Investigations were carried out to determine (a) the specific volume of the cotton wool, gauze, etc, to be presented to the surface of water, and (b) correlation between the sinking time and the water absorbed by the material in the absorbency test for highly absorbent material prescribed in IS: 2369-1963 'Method for determination of absorbency of highly absorbent material, such as cotton gauze and cotton wool'.

Samples of cotton yarn were tested for finding out a regression equation for converting CSF (English) to CSP (French) and YSI of cotton yarn above Nf 68 (or 7.4 tex).

### 1. INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

1.1 As on 31 March 1964, there were 107 technical committees of ISO, out of which India was a participating member of 78 technical committees and an observer member of 28 technical committees. Besides, the Institution held secretariats of 3 technical committees, 4 subcommittees and 6 working groups.

1.2 **ISO Council**—The annual meeting of ISO Council was held at Geneva on 19-22 June 1963 under the chairmanship of its President, Mr. A. E. Viatikine (USSR) and was attended by the Director, ISI, and Shri Jehangir J. Ghandy from India.

The Council admitted the Korean Bureau of Standards, Seoul (S. Korea), and the Committee for Standardization of the Democratic People's Republic of Korea, Pyongyang (N. Korea), to ISO membership.

Another important decision taken was to have the immediate Past President take part in the work and attend sessions of the Council and the General Assembly in an advisory capacity for a period of three years following the termination of his presidential functions. It was also decided to invite the Past Presidents to group themselves as a 'Committee of Elder Statesmen' empowered to review matters of vital importance submitted to them by the President or the Council for study, evaluation and recommendation.

The new edition of the ISO Directives for technical work was adopted by the Council, the form and layout remaining as before but including the substance of various Council resolutions concerning the work of technical committees since the last edition of the Directives was issued.

The next Council meeting will be held in India in November 1964.

1.3 **ISO/STACO**—The eleventh meeting of the Standing Committee for the Study of Scientific Principles of Standardization (STACO) was held at Stratford-upon-Avon on 20-24 May 1963 under the chairmanship of Mr. A. Caquot (France) and attended by representatives from ten countries (including India) as well as the International Electrotechnical Commission. Mr. Caquot, who has been President of STACO ever since its creation in 1952, retired and Mr. T.R.B. Sanders (UK) was appointed as the new President by the ISO Council.

In its last meeting, STACO had defined the terms 'Standard' and 'Standardization'. This year STACO adopted the definitions for 'Specification', 'Simplification', 'Unification' and 'Specialization' with the preamble that these were intended only for use in the field of standardization, and in other contexts the words may have other meanings.

STACO also considered the draft of a document which summarized its achievements over the period of ten years since its creation and recommended the preparation of a revised brochure for consideration at its next meeting.

The next meeting of STACO will be held in New Delhi at the time of the General Assembly in November 1964.

1.4 **ISO/PLACO**—Planning Committee (PLACO) is one of the standing committees of the Council of which Dr. Lal C. Verma, Director, ISI, is the Chairman, with representatives of France, UK and USSR as members. The Committee held its meeting at Geneva on 17-18 June 1963 and covered several important items dealing with the assignment of secretariats of certain ISO technical committees and consideration of new proposals on mechanical shock and vibration, oil burners and associated equipment, power or hand-operated handling trucks, lifting chains and associated fittings and components, and ball pen refills, the last one having been proposed by India.

1.5 A brief report on the work of ISO technical committees, subcommittees and working groups of interest to India and other relevant information is given below:

**ISO/TC 4 Rolling Bearings**—(Sect: Sweden)—Ninth plenary meeting, 13-17 May 1963, London. India was represented at the meeting. Items dealt with at the meeting included among other things, introduction of two light ranges of tapered roller bearings, progress with unification of diametric clearance in cylindrical roller bearings, and tolerance of ball thrust bearings for applications calling for a higher than usual degree of precision. Boundary dimensions were finalized for metric instrument bearings and progress was made with the establishment of a code for the identification of airframe bearings. Two new working groups were appointed, one to study the general question of balls for bearings, and the other to prepare a proposal for acceptance inspection of railway rolling bearings.

Introduction of tolerances as small as  $2.5 \mu\text{m}$  ( $0.0001$  in) for bores and outside diameters, together with tolerances for running errors of only half this amount, raises serious doubts as to the adequacy of present concepts of such things as diameters of 'cylindrical' bodies. The Committee found it necessary for the Working Group dealing with tolerances to work out a precise definition of departure from true circular form which affects these apparently simple concepts.

**ISO/TC 5 Pipes and Fittings**—(Sect: Switzerland)—A draft ISO proposal for steel pipes for gas and water, and for sewage, welded or seamless, was received for comments.

**ISO/TC 6 Paper**—(Sect: France)—Third meeting, 25-26 April 1963, Paris. The Committee adopted the revised text for draft ISO Recommendation No. 397 regarding method of expression of dimensions

of processed writing paper and certain classes of printed matter, considered two draft Recommendations dealing with substances and with determination of the bulking thickness and bulk of paper; and agreed to circulate to member bodies as draft ISO Recommendations, draft ISO proposals on (a) dry matter in pulp, (b) alkali solubility, (c) thickness of single sheets, and (d) water absorption (Cobb test).

**ISO/TC 12/SC 1 Procedures for Interconversion of Values (India)**—At the international level a noteworthy feature of considerable significance was the establishment of a Subcommittee on the Procedures for Interconversion of Values with India as the Secretariat. It will be recalled that ISI had taken up this problem at the international level in 1956 after breaking new grounds by publishing an 'Indian Standard guide for interconversion of values from one system of units to another (IS: 787-1956)'.<sup>1</sup>

**ISO/TC 17 Steel**—( Sectt: UK )—India has agreed with some of the other countries that draft ISO Recommendation No. 517 relating to interrupted creep testing of steel at elevated temperatures ( temperature, not load, interrupted ) be withdrawn in view of the fact that this subject relates more to the field of research and is not in common use in industry.

India's approval was conveyed to ISO General Secretariat regarding the draft ISO Recommendations relating to ring expanding test on steel tubes; tensile testing of steel tubes; calibration of elastic proving devices; calibration of Rockwell B & C scale hardness testing machines; calibration of standardized blocks to be used for Rockwell B & C scale hardness testing machines; calibration of standardized block to be used for Vickers hardness testing machines; calibration of standardized blocks to be used for Brinell hardness machines; chemical analysis of steel, namely, determination of total carbon by gravimetric method and determination of total silicon by gravimetric method; general principles of fatigue testing; general technical delivery requirements of steel; and selection and preparation of samples and test pieces of steel. The last three drafts were approved subject to certain comments.

**ISO/TC 17/WG 1 Methods of Mechanical Testing**—( Sectt: UK )—Nineteenth meeting, 29 October to 1 November 1963, London. Draft revisions of the following ISO Recommendations were received for comments:

- a) Brinell hardness test for steel,
- b) Rockwell hardness test ( B and C scales ) for steel,
- c) Vickers hardness test for steel,
- d) Calibration of Vickers hardness testing machines,
- e) Calibration of Brinell hardness testing machines,
- f) Calibration of Rockwell B and C scale hardness testing machines,

- g) Calibration of standardized blocks to be used for Rockwell B and C scale hardness testing machines,
- h) Calibration of standardized blocks for Vickers hardness testing machines, and
- j) Calibration of standardized blocks for Brinell hardness testing machines.

**ISO/TC 17/WG 3 Structural Steel**—( Sectt: France )—Draft ISO proposal relating to structural steel was received for comments.

**ISO/TC 17/WG 4 Heat Treated and Alloyed Steels**—( Sectt: Germany )—Fourth meeting, 27-29 January 1964, Dusseldorf. Draft proposals relating to (a) quenched and tempered unalloyed steels, and (b) quenched and tempered steels with 1 percent Cr and 0.2 percent Mo were considered.

**ISO/TC 17/WG 7 Methods of Testing Steel ( Other than Mechanical Testing and Chemical Analysis )**—( Sectt: France )—Draft ISO proposals for (a) micrographic determination of austenitic grain size of steel, and (b) hardenability test by end quenching steel ( Jominy test ) were received for comments.

**ISO/TC 17/WG 8 Dimensions of Hot Rolled Steel Sections**—( Sectt: India )—Second meeting, 4-8 November 1963, Dusseldorf, Germany, under the chairmanship of Shri O. S. Murthy, General Manager, Western Railway. Twenty-eight delegates, representing Belgium, France, Germany, Hungary, India, Italy, Sweden, UK and USA participated in the meeting.

In this meeting it was agreed in principle to adopt the present IPE series as the basic metric series for I-beam sections, the dimensions and properties of profiles would be given in both metric and inch units. It was also agreed to study the possibility of improving the efficiency of IPE-beam sections having a depth over 300 mm and the possibility of extending the IPE-series in depth over 600 to 1000 mm. The work of preparing the draft ISO proposal was given to Belgium. Work on column sections was postponed for the present.

It was agreed to take up work on angle sections on priority basis in view of the fact that CECA countries are already working on this project.

**ISO/TC 17/WG 9 Tinplate**—( Sectt: UK )—Second meeting, 16-18 December 1963, Dusseldorf. Draft ISO proposal for cold reduced tinplate and cold reduced blackplate was discussed.

**ISO/TC 18 Zinc and Zinc Alloys**—( Sectt: Belgium )—The second compromise formula in respect to draft ISO Recommendation No. 437 'Zinc alloy ingots' received from Belgium was approved on behalf of India. In this compromise formula, the combined limit for lead and cadmium has been specified as 0.004 percent for Zn 99.995 although the individual limit for these impurities could be as much as 0.003 percent.

**ISO/TC 18/SC 1 Zinc and Zinc Alloys — Methods of Analysis** — ( Sectt: Belgium ) — First meeting, 23-25 April 1963, Brussels. At this meeting four draft ISO proposals relating to polarographic determination of lead and cadmium and photometric determination of iron and copper in zinc and zinc alloys were discussed:

**ISO/TC 24/SC 1 Test Sieves** — ( Sectt: Germany )

**ISO/TC 24/SC 1/WG 1 Wire Cloth in Test Sieves** — ( Sectt: Germany )

**ISO/TC 24/SC 1/WG 2 Perforated Plates in Test Sieves** — ( Sectt: Germany )

**ISO/TC 24/SC 2 Test Sieving** — ( Sectt: Germany )

Meetings of these four Subcommittees and Working Groups were held in Munster from 14 to 19 November 1963, and India's comments were sent for consideration by ISO/TC 24. Reports of tests carried out by National Physical Laboratory, New Delhi, in accordance with IS: 460-1962 'Specification for test sieves (revised)' and the German Standard (DIN 4188) in respect of two sample pieces of wire cloth were sent and India also sent its proposal for the subject 'materials to be sieved', for consideration by the Subcommittee, ISO/TC 24/SC 2.

*Documents Processed Under ISO/TC 24/SC 1:*

- 1) ISO/TC 24/SC 1 ( Secretariat-11 ) 28 Wire diameters for test sieves
- 2) ISO/TC 24/SC 1 ( Secretariat-12 ) 29 ISO aperture tolerances
- 3) ISO/TC 24/SC 1 ( Secretariat-13 ) 30 Permissible variations for openings of perforated plates

*Documents Processed Under ISO/TC 24/SC 2:*

- 1) ISO/TC 24/SC 2 ( India-1 ) 18 Material to be sieved
- 2) ISO/TC 24/SC 2 ( Secretariat-6 ) 20 Procedure of hand test sieving
- 3) ISO/TC 24/SC 2 ( Secretariat-8 ) 22 Comparison of methods for hand test sieving

**ISO/TC 25 Cast Iron** — ( Sectt: UK ) — India's approval regarding three draft ISO proposals relating to (a) whiteheart malleable iron, (b) blackheart malleable iron, and (c) pearlitic malleable iron was communicated to the secretariat.

India's comments on the second draft ISO proposal for spheroidal graphite or nodular graphite or ductile cast iron were conveyed to the Secretariat ( France ) of Working Group ISO/TC 25/WG 2 Spheroidal or Graphite Cast Iron.

Draft ISO proposals for (a) designation of micro-structure of graphite on cast iron, and (b) beam unnotched impact test for grey cast iron were received for comments.

**ISO/TC 26 Copper and Copper Alloys** — ( Sectt: Germany ) — India was enrolled as a participating (P) member of the Working Group ISO/TC 26/WG 4 Specification for Copper.

India's approval was conveyed to the ISO General Secretariat regarding classification of tin bronzes and special tin bronzes, classification of aluminium bronzes and special aluminium bronzes, classification of other special copper alloys ( copper-silicon and copper-beryllium ), classification of copper-nickel alloys, classification of copper-nickel zinc alloys, and densities of wrought copper alloys.

Draft ISO proposals on (a) principle of designation of copper and copper alloys, (b) principle of mechanical properties for wrought copper and copper alloys, (c) mechanical properties of wrought copper alloy products, and (d) temper designation for non-ferrous metals and their alloys, were approved on behalf of India, the first two being approved subject to certain editorial comments.

A draft ISO Recommendation relating to the principle of designation of copper and copper alloys was received for comments.

**ISO/TC 27 Solid Mineral Fuels** — ( Sectt: UK ) — No meeting held. The following ISO Recommendations were published:

ISO/R 331-1963 Determination of moisture in the analysis sample of coal by the direct gravimetric method

ISO/R 332-1963 Determination of nitrogen in coal by the Kjeldahl method

ISO/R 333-1963 Determination of nitrogen in coal by the semimicro Kjeldahl method

ISO/R 334-1963 Determination of total sulphur in coal by the Eschka method

ISO/R 335-1963 Determination of caking power of coal by the Roga method

ISO/R 348-1963 Determination of moisture in the analysis sample of coal by the direct volumetric method

ISO/R 349-1963 Audibert-Arnu dilatometer test for coal

ISO/R 350-1963 Determination of chlorine in coal by the Bomb-combustion method

ISO/R 351-1963 Determination of total sulphur in coal by the high temperature combustion method

ISO/R 352-1963 Determination of chlorine in coal by the high temperature combustion method

India's approval to draft ISO Recommendations on the following items was communicated to the ISO General Secretariat:

- a) Determination of the volatile matter of hard coal and of coke;
- b) Determination of gross calorific value of coal and coke by the calorimetric bomb method;
- c) Determination of the moisture-holding capacity of hard coals;
- d) Determination of the micum indices of coke;
- e) Determination of the shatter indices of coke;
- f) Determination of fusibility of the fuel ash;
- g) Determination of carbon and hydrogen in coal and coke by the Liebig method;
- h) Determination of carbon and hydrogen in coal and coke by the Sheffield high temperature method;
- j) Determination of phosphorus in ash from coal; and
- k) Graphical symbols for coal preparation plant.

**ISO/TC 30/SC 1 Measurement of Liquid Flow in Open Channels** — (Sectt: India) — The following Working Groups met in Zurich on the dates shown against each:

<i>Working Groups</i>	<i>Dates</i>
WG 1 Liquid Flow Measurement in Open Channels by Velocity Area Methods	1-3 April 1963
WG 2 Liquid Flow Measurement in Open Channels by Notches, Weirs and Flumes	25-27 March 1963
WG 3 Liquid Flow Measurement in Open Channels — Glossary of Terms	5 April 1963
WG 4 Liquid Flow Measurement in Open Channels — Dilution Methods	29-30 March 1963

Draft proposals on (a) liquid flow measurement in open channel by velocity area methods, and (b) glossary of terms and symbols used in connection with the measurement of liquid flow with a free surface, are at advanced stages of processing.

**ISO/TC 33 Refractories** — (Sectt: UK) — India disapproved draft ISO Recommendation No. 567 'Determination of pyrometric cone equivalent of refractory products' for certain technical reasons.

India's approval to draft ISO Recommendation No. 568 'Dimensions of rectangular refractory bricks' was conveyed to ISO General Secretariat, subject to certain editorial comments.

A document regarding technical classification for refractory products was received for comments.

**ISO/TC 34/SC 2 Oleaginous Seeds and Fruits** — (Sectt: Rumania) — Third meeting, 17-19 October 1963, Bucharest. The following documents were considered:

- a) Determination of impurities in oleaginous seeds;
- b) Determination of oil content of oleaginous seeds and fruits;
- c) Determination of the acidity of crude vegetable oils and fats;
- d) Determination of acidity of oils from oleaginous seeds and fruits;
- e) Preparation of contract sample of fruit, vegetable oils and seeds;
- f) Determination of water and entrainable substances in crude vegetable oils and fats; and
- g) Determination of impurities insoluble in light petroleum, in crude vegetable oils and fats.

**ISO/TC 34/SC 3 Fruits, Vegetables and Their Derived Products** — (Sectt: Poland) — Third meeting, 11 October 1963, Bucharest. India was not represented. The subcommittee approved the reports of four of its Working Groups (WG 1, WG 2, WG 3 and WG 8).

**ISO/TC 34/SC 3/WG 1 Terminology** — (Sectt: Poland) — First meeting, 10 October 1963, Bucharest. India was not represented. The subject discussed was the nomenclature of fruits and vegetables.

**ISO/TC 34/SC 3/WG 2 Methods of Sampling** — (Sectt: Hungary) — First meeting, 9 October 1963, Bucharest. India was not represented. The subject discussed was the draft proposal on sampling of fresh fruits and vegetables.

**ISO/TC 34/SC 3/WG 3 Testing Methods of Fresh Fruits and Vegetables of the Temperate Zone** — (Sectt: Poland) — Second meeting, 10 October 1963, Bucharest. India was not represented. The subjects discussed were:

- a) determination of titrable acidity,
- b) determination of mineral impurities, and
- c) determination of water insoluble matter.

**ISO/TC 34/SC 3/WG 8 Storage and Transport of Fruits and Vegetables** — (Sectt: Czechoslovakia) — Second meeting, 8-10 October 1963, Bucharest. India was not represented. The subject discussed was the storage of apples, pears, peaches, grapes, onions, cauliflowers, potatoes and cabbages.

**ISO/TC 34/SC 4 Cereals and Pulses** — (Sectt: Hungary) — Third meeting, 3-5 July 1963, London. India was not represented. The subjects discussed were (a) methods of test for pulses, (b) determination of the mass of 1000 grains of cereals and pulses, (c) practical reference

India's approval to draft ISO Recommendations on the following items was communicated to the ISO General Secretariat:

- a) Determination of the volatile matter of hard coal and of coke;
- b) Determination of gross calorific value of coal and coke by the calorimetric bomb method;
- c) Determination of the moisture-holding capacity of hard coals;
- d) Determination of the micum indices of coke;
- e) Determination of the shatter indices of coke;
- f) Determination of fusibility of the fuel ash;
- g) Determination of carbon and hydrogen in coal and coke by the Liebig method;
- h) Determination of carbon and hydrogen in coal and coke by the Sheffield high temperature method;
- j) Determination of phosphorus in ash from coal; and
- k) Graphical symbols for coal preparation plant.

**ISO/TC 30/SC 1 Measurement of Liquid Flow in Open Channels** — (Sectt: India) — The following Working Groups met in Zurich on the dates shown against each:

<i>Working Groups</i>	<i>Dates</i>
WG 1 Liquid Flow Measurement in Open Channels by Velocity Area Methods	1-3 April 1963
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WG 3 Liquid Flow Measurement in Open Channels — Glossary of Terms	5 April 1963
WG 4 Liquid Flow Measurement in Open Channels — Dilution Methods	29-30 March 1963

Draft proposals on (a) liquid flow measurement in open channel by velocity area methods, and (b) glossary of terms and symbols used in connection with the measurement of liquid flow with a free surface, are at advanced stages of processing.

**ISO/TC 33 Refractories** — (Sectt: UK) — India disapproved draft ISO Recommendation No. 567 'Determination of pyrometric cone equivalent of refractory products' for certain technical reasons.

India's approval to draft ISO Recommendation No. 568 'Dimensions of rectangular refractory bricks' was conveyed to ISO General Secretariat, subject to certain editorial comments.

A document regarding technical classification for refractory products was received for comments.

**ISO/TC 34/SC 2 Oleaginous Seeds and Fruits** — (Sectt: Rumania) — Third meeting, 17-19 October 1963, Bucharest. The following documents were considered:

- a) Determination of impurities in oleaginous seeds;
- b) Determination of oil content of oleaginous seeds and fruits;
- c) Determination of the acidity of crude vegetable oils and fats;
- d) Determination of acidity of oils from oleaginous seeds and fruits;
- e) Preparation of contract sample of fruit, vegetable oils and seeds;
- f) Determination of water and entrainable substances in crude vegetable oils and fats; and
- g) Determination of impurities insoluble in light petroleum, in crude vegetable oils and fats.

**ISO/TC 34/SC 3 Fruits, Vegetables and Their Derived Products** — (Sectt: Poland) — Third meeting, 11 October 1963, Bucharest. India was not represented. The subcommittee approved the reports of four of its Working Groups (WG 1, WG 2, WG 3 and WG 8).

**ISO/TC 34/SC 3/WG 1 Terminology** — (Sectt: Poland) — First meeting, 10 October 1963, Bucharest. India was not represented. The subject discussed was the nomenclature of fruits and vegetables.

**ISO/TC 34/SC 3/WG 2 Methods of Sampling** — (Sectt: Hungary) — First meeting, 9 October 1963, Bucharest. India was not represented. The subject discussed was the draft proposal on sampling of fresh fruits and vegetables.

**ISO/TC 34/SC 3/WG 3 Testing Methods of Fresh Fruits and Vegetables of the Temperate Zone** — (Sectt: Poland) — Second meeting, 10 October 1963, Bucharest. India was not represented. The subjects discussed were:

- a) determination of titrable acidity,
- b) determination of mineral impurities, and
- c) determination of water insoluble matter.

**ISO/TC 34/SC 3/WG 8 Storage and Transport of Fruits and Vegetables** — (Sectt: Czechoslovakia) — Second meeting, 8-10 October 1963, Bucharest. India was not represented. The subject discussed was the storage of apples, pears, peaches, grapes, onions, cauliflowers, potatoes and cabbages.

**ISO/TC 34/SC 4 Cereals and Pulses** — (Sectt: Hungary) — Third meeting, 3-5 July 1963, London. India was not represented. The subjects discussed were (a) methods of test for pulses, (b) determination of the mass of 1000 grains of cereals and pulses, (c) practical reference

method, (d) ash determination, (e) natural weight, and (f) terminology of sampling.

**ISO/TC 34/SC 4/WG 1 Sampling of Cereals and Pulses**—(Sectt: UK)—First meeting, 1 and 3 July 1963, London. India was not represented. The subject discussed was sampling of cereals (as grains).

**ISO/TC 34/SC 5 Milk and Milk Products**—(Sectt: Netherlands)—Second meeting, 13 July 1963, The Hague. No Indian delegation attended this meeting or any of the meetings of the working groups held on 11-12 July 1963. At this meeting, the committee considered the reports of the working groups and also the report of the Secretariat of SC 5 on the work on the liaison with International Dairy Federation (IDF) and FAO.

**ISO/TC 34/SC 5/WG 1 Fat Content of Milk**—(Sectt: UK)—Second meeting, 11 July 1963, The Hague. The following subjects were discussed:

- a) Determination of the fat content of milk—reference method, and
- b) Determination of the fat content of milk—Gerber method.

**ISO/TC 34/SC 5/WG 2 Analysis of Cheese**—(Sectt: Germany)—First meeting, 12 July 1963, The Hague. At this meeting, the second draft proposal for determination of dry matter in cheese and processed cheese was considered. It was also agreed that work on the following items be continued:

- a) Determination of dry matter in cheese;
- b) Determination of dry matter in processed cheese;
- c) Determination of fat content in cheese, Schmid-Bondzynski-Ratzlaff;
- d) Fat content of cheese-Van Gulik; and
- e) Salt content of cheese.

**ISO/TC 34/SC 5/WG 3 Sampling of Milk and Milk Products**—(Sectt: Hungary)—Second meeting, 12 July 1963, The Hague. At this meeting, draft proposal for standard methods on sampling milk and milk products was considered.

**ISO/TC 35 Raw Material for Paints, Varnishes and Similar Products**—(Sectt: Netherlands)—Third plenary meeting, 30-31 May 1963, The Hague. The subcommittee meetings, which preceded, discussed for circulation to ISO/TC 35, draft proposals on (a) sampling of raw materials for paints and varnishes, (b) general methods of tests for pigments, and (c) titanium dioxide. Additional items included in programme of work for raw materials were yellow and orange chrome pigments, iron blues, aluminium powder, lead chrome greens, extenders and liquid driers.

**ISO/TC 37 Terminology (Principles and Co-ordination)**—(Sectt: Austria)—Revised texts of the following two draft ISO Recommendations received during the year were accepted by India:

ISO/TC 37 (Sectt-81) 144 Symbols for languages, countries and authorities, and

ISO/TC 37 (Sectt-83) 146 Guide for preparation of systematic vocabularies.

**ISO/TC 38 Textiles**—(Sectt: UK)—The following three second draft ISO Recommendations were circulated by the ISO General Secretariat:

No. 194/I Method of test for linear density (mass per unit length) of yarn from packages, skein method;

No. 194/II Method of test for twist in yarns;

No. 194/III Method of test for breaking load and breaking elongation of single strands of yarn from packages (CRL, CRT and CRE testers).

Second draft ISO Recommendation No. 194/II was approved by India.

**ISO/TC 41 Pulleys and Belts (Including V-Belts)**—(Sectt: France)—Seventh meeting, 1-5 April 1963, Bournemouth. The meeting, which was also attended by a delegate from India, discussed the subjects relating to:

- a) lengths of classical V-belts (Sections A, B, C, D and E);
- b) narrow pulleys and V-belts;
- c) wide belts for variable speed drives; and
- d) conveyor belts.

**ISO/TC 44 Welding**—(Sectt: France)—India's approval was sent to the secretariat on the draft ISO proposals dealing with (a) rating of manual arc welding equipment, (b) rating of resistance welding equipment, (c) dimensions of straight spot welding electrodes, (d) dimensions of seam welding wheel blanks, (e) special method of mechanical testing for the code of symbols for deep penetration electrodes, (f) filler rods for gas welding—tests to determine the suitability of a steel filler rod for the parent metal in the welding of steels, and (g) definitions of welding process.

Two draft proposals relating to code of symbols for hard-surfacing electrodes, recommended joint preparation for fusion welding of steel and dimensions for reels and coils for wire for automatic welding were received for comments.

**ISO/TC 45 Rubber**—( Sectt: UK )—Eleventh meeting, 10-15 June 1963, Stockholm. The meeting was attended by three delegates from India. The meeting was preceded by meetings of various working groups. During this meeting, Doc: 45 N 582 'Evaluation of standard vulcanizates', as amended by the Working Group 'C', and Doc: 45 N 665 'Measurement of electrical resistance of conductive and antistatic rubber products', as modified by Working Group 'G' were approved, to be submitted to the General Secretariat as draft ISO Recommendations. A special task group under Working Group 'C' was set up for formulation of standards for natural rubber.

**ISO/TC 46 Documentation**—( Sectt: Netherlands )—The items dealt with during the year included conventional abbreviations for titles of periodicals, index, conversion of Yiddish, and title leaves of a book. The work on bibliographical references and transliteration of Greek is nearing completion and ISO Recommendations on the subject would be issued in due course.

The Subcommittee on Documentary Reproduction (ISO/TC 46/SC 1) was also very active and circulated a number of documents including those on preservation of microcopies, ISO conventional typographical characters for legibility test, description and use of ISO mire, 35 mm microfilms, 16 mm microfilms, apparatus, etc.

**ISO/TC 47 Chemistry**—( Sectt: Italy )—Sixth plenary meeting, 7-11 October 1963, Paris. Draft ISO Recommendations regarding sampling of and methods of test for acetic acid, acetic anhydride, *n*-butanol, isopropyl alcohol and acetone; and method for the determination of relative density  $d_{20}^{20}$  of liquids, distillation range, residue on evaporation, water in chemical products by Karl Fischer method and bromine index, were received during the year.

**ISO/TC 48 Laboratory Glassware and Related Apparatus**—( Sectt: UK )—No meeting held. However, the following draft ISO Recommendations circulated by the General Secretariat during the year were accepted by India:

- a) Density hydrometers for general purposes,
- b) 60°/60° F Relative density hydrometers for general purposes,
- c) One-mark volumetric flask,
- d) One mark pipettes,
- e) Interchangeable spherical ground glass joints,
- f) Procedure for testing the resistance of glass to attack by a boiling aqueous solution of mixed alkali,
- g) Procedure for testing the resistance of glass grains to attack by water at 100° C,

- h) Procedure for testing the resistance of glass grains to attack by water at 121°C,
- j) Graduated pipettes ( excluding blowout pipettes ),
- k) Thermal shock tests for laboratory glassware,
- m) Long solid-stem thermometers for precision use,
- n) Short solid-stem thermometers for precision use,
- p) Long enclosed scale thermometers for precision use,
- q) Short enclosed-scale thermometers for precision use,
- r) Solid-stem calorimeter thermometers of 6 deg C range, and
- s) Enclosed-scale calorimeter thermometers of 6 deg C range.

**ISO/TC 54 Essential Oils**—( Sectt: Portugal )—Seventh meeting, 22-27 April 1963, Lisbon. Two working groups, one for studying absorption of essential oils in the ultra violet and visible regions of the spectrum and the other for studying the determination of citral in essential oils, were set up.

The following draft proposals were considered and were finally approved:

- a) Estimation of alcohols by cold formylation,
- b) Expression of results in determination of carbonyl compound content,
- c) Determination of freezing point,
- d) Determination of ester value,
- e) Estimation of cineole content,
- f) Carbonyl compounds content of East Indian lemongrass oil, and
- g) Determination of residue on vacuum distillation.

In addition, material specifications for the following essential oils were also considered and approved for further processing:

- a) Bergamot, Italy;
- b) Cedarwood, East Africa;
- c) Cedarwood, Red;
- d) Cedarwood, Texas;
- e) Celery seed;
- f) Cubeb;
- g) Lavandin, Abrialis;
- h) Lemon, expressed, Italy;
- j) Lemon, Israel;
- k) Mandarin, Italy;



**ISO/TC 72/SC 2 Winding and Weaving — Preparatory Machinery** — (Sectt: Germany) — Fourth meeting, 2 October 1963, Berlin. No delegation from India attended the meeting. Report of the meeting is still awaited.

**ISO/TC 72/SC 3 Weaving Machinery** — (Sectt: UK) — Fifth meeting, 2 October 1963, Berlin. No delegation from India attended the meeting. Report of the meeting is still awaited.

**ISO/TC 72/SC 4 Dyeing and Finishing Machinery** — (Sectt: France) — First meeting, 8-10 January 1964, Paris. India was represented at this meeting. The subcommittee approved for further processing the proposal for draft ISO Recommendation on definition of side (left or right) of dyeing and finishing machinery; agreed to the principles to prepare a document on classification of dyeing and finishing machinery; and included the subject 'definition of working width of dyeing and finishing machinery' in the programme of work.

India approved the following draft and second draft ISO Recommendations circulated by the ISO General Secretariat:

a) *Draft ISO Recommendations:*

- No. 602 Perforated metal cheese centres for bast fibre yarns
- No. 603 Warper's beams, basic dimensions
- No. 631 Pirn winders, basic terms and definitions
- No. 632 Cone winders or cheese winders, basic terms and definitions

b) *Second Draft ISO Recommendations:*

- No. 127 Drop wires for mechanical warp stop motions
- No. 128 Drop wires for electrical warp stop motions

The second draft ISO Recommendations No. 335 'Twin wire healds for frame weaving', and No. 336 'Twin wire healds for jacquard weaving' disapproved earlier, were accepted by India.

**ISO/TC 77 Products in Asbestos Cement** — (Sectt: Switzerland) — Eighth plenary meeting, 6-10 May 1963, Rome. The committee adopted the following draft ISO Recommendations:

- a) Sampling and inspection of asbestos-cement products,
- b) Building and sanitary pipes in asbestos cement,
- c) Asbestos cement pipes and fittings for building and sanitary purposes,
- d) Asbestos cement corrugated sheets for roofing and cladding,
- e) Asymmetrical section corrugated sheets in asbestos cement for roofing and cladding,
- f) Asbestos cement slates for roofing and cladding, and
- g) Asbestos cement flat sheets.

The following draft proposals for ISO Recommendations were received from the Secretariat for final approval and India approved them subject to some minor modifications:

- a) Asbestos cement siding shingles, and
- b) Asbestos cement pipes, joints and fittings for sewerage and drainage.

The committee took up revision of ISO/R 160 'Asbestos cement pressure pipes'.

**ISO/TC 77/WG 10 Asbestos Cement Decking** — First meeting, 5 November 1963, Frankfurt.

**ISO/TC 77/WG 11 Revision of ISO/R 160** — First meeting, 14 and 15 November 1963, Paris.

**ISO/TC 79 Light Metals and Their Alloys** — (Sectt: France) — Draft ISO proposals relating to gravimetric determination of aluminium in magnesium alloys, photometric determination of iron and copper in magnesium and its alloys, electrolytic determination of copper and gravimetric determination of zinc in aluminium alloys, photometric determination of iron and copper, gravimetric determination of silicon in aluminium and its alloys, and compositions of wrought products of aluminium alloys were received.

**ISO/TC 79/WG 6 Methods of Mechanical Testing (Light Metals and Their Alloys)** — (Sectt: UK) — India's approval to draft ISO proposals relating to (a) flattening test on aluminium tubes; (b) tensile test for aluminium and aluminium alloys, wire; (c) simple torsion test for aluminium and aluminium wire; and (d) wrapping test for aluminium and aluminium alloy wire was sent to the Secretariat of the working group. Draft proposals on (a) drift expanding test on aluminium and aluminium alloy tubes, (b) simple bend test for aluminium and aluminium alloy sheet and strip of thickness between 0.5 mm and 6 mm, and (c) tensile test in full section for aluminium and aluminium alloy tubes were received for comments.

**ISO/TC 81 Common Names for Pesticides** — (Sectt: UK) — Fifth meeting, 24-27 September 1963, London. India was represented at the meeting. Items dealt with during the year were (a) principles for selection of common names for pesticides, (b) procedure for submission of common names to ISO/TC 81, (c) proposals for common names for pesticides, (d) means of promoting national adoption of ISO recommended names, and (e) preparation of a list of pesticides considered not to require common names.

India's approval to the following draft ISO Recommendations was communicated to the ISO General Secretariat:

- a) Common names for pesticides (fifth list), and
- b) Common names for pesticides (sixth list).

**ISO/TC 86/SC 3 Testing of Refrigerating Systems** — (Sectt: Belgium) — Third meeting, 17-19 June 1963, The Hague. The third draft proposal on testing of refrigerating systems was reviewed.

**ISO/TC 86/SC 4 Testing of Refrigerant Compressors** — (Sectt: UK) — Third meeting, 19-21 June 1963, The Hague. Second draft proposal on testing of refrigerant compressors was discussed.

**ISO/TC 86/SC 5 Construction and Testing of Household Refrigerators** — (Sectt: France) — No meeting held. Third draft proposal on refrigerators for household use (Part I Performance requirements) was circulated for comments.

**ISO/TC 86/SC 6 Testing of Factory-Assembled Air-Conditioning Units** — (Sectt: USA) — Third meeting, 5-7 September 1963, Munich. Second draft proposal on testing and rating room air conditioners was discussed.

**ISO/TC 87 Cork** — (Sectt: Portugal) — Third meeting, 14-17 May 1963, Paris. The committee considered a number of documents concerning cork and cork products.

**ISO/TC 89 Derived Timber Products** — (Sectt: Germany) — No meeting of the main committee was held, but meetings of the subcommittees were held as indicated below:

**ISO/TC 89/SC 2 Particle Boards** — (Sectt: Germany) — First meeting, 14-16 October 1963, Hamburg.

**ISO/TC 89/SC 3 Plywood** — (Sectt: Germany) — First meeting, 16-17 October 1963, Hamburg.

India approved as draft ISO Recommendations the following documents which were circulated to the member-countries for their approval:

- a) Definition and classification of fibre building boards,
- b) Determination of measuring dimensions of fibre building boards,
- c) Determination of moisture content of fibre building board,
- d) Determination of bending strength of fibre building boards, and
- e) Determination of water absorption and swelling in thickness, after total immersion in water.

**ISO/TC 90 Apparatus for Testing Milk and Milk Products** — (Sectt: Germany) — Third meeting, 10 July 1963, The Hague. India was not represented. At this meeting, besides considering the reports of its Working Groups 2, 3 and 4, the committee considered the third draft proposal on butyrometers for the determination of the percentage of fat in milk by the Gerber method.

**ISO/TC 90/WG 2 Apparatus for the Sampling of Milk and Milk Products** — (Sectt: Netherlands) — Third meeting, 8 July 1963, The Hague. At this meeting, draft proposals for cheese and butter triers were approved.

**ISO/TC 90/WG 3 Hydrometers for Use with Milk and with Liquid Milk Products** — (Sectt: UK) — Third meeting, 8-9 July 1963, The Hague. The second draft proposals for density hydrometers for use in milk was discussed.

**ISO/TC 90/WG 4 Apparatus for the Determination of Fat in Milk** — (Sectt: Germany) — Third meeting, 9 July 1963, The Hague. It was decided to include the following items in the programme of work after obtaining the approval of TC 90:

- a) Van Gulik butyrometers for determination of fat content of cheese,
- b) Tolerance of the delivered volume of the amyl alcohol pipette,
- c) Centrifuges for the Gerber test, and
- d) Mojonier flasks.

**ISO/TC 92 Fire Tests on Building Materials and Structures** — (Sectt: UK) — Third plenary meeting, 23-26 September 1963, Berlin. Among other things, the following documents were discussed:

- a) Revised draft test for combustibility of materials, and
- b) Second draft proposal for an ISO Recommendation for fire resistance test of structures.

**ISO/TC 93 Starch (Including Derivatives and By-Products)** — (Sectt: Germany) — Second meeting, 19 April 1963, Detmold (Germany). India was not represented at this meeting. The following working groups were set up:

WG 9 Sampling of starch

WG 10 Terminology

WG 11 Determination of different sugars in liquid glucose

The items which were dealt with included:

- a) Determination of starch,
- b) Determination of moisture contents of starch,
- c) Crude protein content,
- d) Measurement of starch viscosity,
- e) Determination of the dry matter in starch hydrolysis products,
- f) Determination of DE value of starch hydrolysis products,
- g) Determination of colour, discoloration and turbidity of starch syrups,

- h) Candy test for starch syrups,
- j) Sampling of starch, and
- k) Terminology.

**ISO/TC 94/SC 1/WG 1 Helmets for Industrial Workers** — (Sectt: Germany) — Meeting 26 and 27 November 1963, Essen. The subcommittee discussed the method of measurement of the mechanical behaviour of protective helmets during the drop tests, method of testing of helmets for electrical insulation, rigidity of the sides of helmets and details of head model and decided to finalize the various requirements relating to these tests in the light of further work agreed to be undertaken.

**ISO/TC 96 Cranes Derricks and Excavators** — (Sectt: UK) — India enrolled as a participating (P) member of the working group of this technical committee. This working group would deal with (a) classification by duty and range of capacities for cranes; (b) stability, including consideration of wind loads; (c) testing procedure for cranes; and (d) crane ropes and associated pulleys, drums, etc.

**ISO/TC 99 Semi-manufactures of Timber** — (Sectt: Rumania) — Plenary meeting, 28-31 May 1963, Bucharest. The committee considered the draft ISO proposals on classification of various types of flooring boards. The draft ISO proposal on mosaic flooring boards was at an advanced stage of processing.

**ISO/TC 102 Iron Ores** — (Sectt: Japan) — First plenary meeting, 18-25 March 1963, Tokyo. A delegation from India attended the meeting. Two subcommittees, one for sampling of iron ores and the other for chemical analysis, and one working group for physical tests were set up at this meeting. The subcommittee on sampling discussed at length the terminologies and the basic principles of sampling, and the Secretariat was requested to redraft the ISO proposals in the light of the discussions and the agreements reached. The subcommittee on chemical analysis discussed draft ISO proposals on methods of chemical analysis covering total iron, silica, alumina and phosphorus. The working group established a programme for further study and discussions at its next meeting.

India's comments on the second draft ISO proposals relating to (a) sampling of iron ores, and (b) preparation of samples for iron ores, were forwarded to the secretariat.

**ISO/TC 104 Freight Containers** — (Sectt: USA) — No meeting held. However, Working Group B 'Dimensions' held its third meeting on 23-24 April 1963 at Stockholm and Working Group C 'Specification Testing and Marking' held two meetings, one on 25 and 26 April 1963 at Stockholm and the other on 3-6 December 1963 in Paris. The committee circulated the third draft proposal on dimensions and ratings of freight containers to member-countries for their approval.

**ISO/TC 107 Treatments of Metallic Surfaces** — (Sectt: Italy) — First meeting, 10-11 October 1963, Turin, Italy. At this meeting, the committee defined its scope and also modified its title as 'Metallic and other Non-organic Coatings'. The following four working groups were formed:

- WG 1 Terminology (Sectt: Switzerland)
- WG 2 Methods of Inspection and Co-ordination of Test Methods (Sectt: Italy)
- WG 3 Electrodeposited Coatings (Sectt: UK)
- WG 4 Hot Dip Coating (Galvanizing, etc) (Sectt: Germany)

India has informed the secretariat of ISO/TC. 107 that she would like to be a 'P' member in Working Groups 2, 3 and 4, and 'O' member in Working Group 1.

## 2. INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC)

**2.1** As on 31 March 1964, there were 55 IEC technical committees, 55 subcommittees, 4 expert committees and 86 working groups. India took part in all technical committees and subcommittees and in a few working groups, besides holding the secretariat and chairmanship of the technical committee on Electric Fans.

**2.2** A brief report on the work of IEC committees of interest to India is given below:

### XXVIII ANNUAL GROUP MEETINGS AT VENICE

The Twenty-eighth Annual Group Meetings were held in Venice (Italy) from 26 May to 8 June 1963. Besides IEC Council and Committee of Action, 50 technical committees, subcommittees, working groups and advisory committees met on that occasion. A total of about 700 delegates, including three from India, attended these meetings.

**IEC Council** — The council adopted the new General Directives for the work of IEC and approved the revised version of Statutes and Rules of Procedure to come into force immediately.

The important provisions envisaged in the revision are:

- a) meeting of the council every year instead of once in three years,
- b) members of the Committee of Action remaining in office for six years instead of nine years, and
- c) term of office of chairmen of technical committees being limited to five years.

Another subject of vital interest to India concerned the treasurer's proposal for a new scale for the contribution of national committees. The proposal, which was eventually accepted despite opposition from Canada

and India, envisaged contribution from the national committees on a percentage basis. As a result of this decision, India's contribution to IEC has been increased from 1.2 percent of the total expenditure to 2.3 percent.

The council admitted the Republic of Korea as a member of IEC.

**Committee of Action**—The committee considered but did not accept a Swiss proposal to hold the IEC General Meetings once in two or three years instead of yearly, as at present, as it was felt that the present practice, which permitted attendance of experts in several technical meetings at one place and during the same period, was more economical.

As a result of India's efforts, international recognition had been obtained in ISO for standard atmospheric testing conditions suitable for tropical and semi-tropical regions in addition to those already recognized and suited for temperate regions. It was announced at this meeting that a document on this subject had been issued last year and had received the approval of national committees. It is thus a matter of satisfaction for India that her efforts have proved fruitful at the IEC level as well.

**Advisory Panel on Safety Matters (APSM)**—The panel submitted a preliminary document giving definitions of various classes of equipment with regard to their protection against electric shock and a few other related definitions. It was decided to circulate the document to national committees for comments, making it clear that it dealt with low voltage equipment only.

The panel also submitted its report on the progress made by International Commission on Rules for the Approval of Electrical Equipment (CEE) with regard to the revision of their specifications for cooking and heating appliances, and motor-operated appliances for domestic and similar uses. Realizing the need to give world-wide guidance in these fields, APSM recommended that IEC should study, as soon as practicable, whether the corresponding joint IEC/CEE specifications should be enlarged.

**TC 3 Graphical Symbols**—(Sectt: Switzerland)—The committee noted the reports on the voting of various national committees on documents concerning graphical symbols for resistors, generating stations and substations, semiconductor devices, and architectural diagrams. The committee also discussed documents on graphical symbols for capacitors, electronic tubes, valves and rectifiers, electrical equipment of machine tools, polarity of windings, transducers and magnetic amplifiers.

**TC 4 Hydraulic Turbines**—(Sectt: USA)—The field test code, model test code and pump test code were approved for publication. Two working groups were set up in order to prepare model storage pump test code and to collect and correlate data relating to vibration measurements.

**TC 8 Standard Voltages, Current Ratings and Frequencies**—(Sectt: Italy)—The committee approved the draft revision of

IEC Publication 38 'Standard system voltages' for circulation under the Six Months' Rule. An important decision taken by the committee was not to include the values 42 kV (Highest System Voltage) and 35 kV (Nominal System Voltage). The draft for standard frequencies for centralized control installations was approved for circulation and the French Memorandum regarding the standardization of series of voltages for different equipments was referred to the Working Group on Standardization of Voltages Above 1 000 V.

**TC 9 Electric Traction Equipment**—(Sectt: France)—The committee discussed a report on the preparation of rules for testing electric rolling stock on completion of construction and before it is pressed into service. The committee also decided to revise IEC Publication 77 'Specification for electrical control equipment installed on motor vehicles'.

**TC 12 Radio-Communication**—(Sectt: Netherlands)—This committee met along with its subcommittees, SC 12A Radio Receiving Equipment, SC 12B Safety and SC 12C Radio Transmitting Equipment. Considerable progress was made on the revision of IEC Publication 69 (1954) 'Recommended methods of measurement on receivers for amplitude-modulation broadcast transmissions, and a number of drafts on measurement of transmitting equipment was approved for circulation under the Six Months' Rule. A working group was constituted to examine the draft for recommended instructional symbols with regard to terminal devices and control for radio-communication equipment and electronic devices employing similar techniques.

**SC 12A Radio Receiving Equipment**—(Sectt: Netherlands)—The subcommittee made progress in the revision of IEC Publication 69 and considered the subjects of measurement of susceptibility of FM receivers to impulsive interference, measurement of susceptibility of AM receivers to interference, etc, and set up a new working group to study the subject of community aerial systems.

**SC 12B Safety**—(Sectt: Netherlands)—Draft revision of IEC Publication 65 (1952) 'Safety requirements for electric mains-operated radio receiving apparatus' was considered in the light of comments received. It was also decided to add safety requirements for Class 2 equipment.

**SC 12C Radio Transmitting Equipment**—(Sectt: Netherlands)—Part I 'Requirements' and Part II 'Test methods' of draft 'Recommendations for safety requirements for radio transmitters' were approved for publication and a number of documents covering methods of measurement for radio transmitters was approved for circulation under the Six Months' Rule.

**TC 15 Insulating Materials**—(Sectt: Italy)—Documents on the test cell for measuring the resistivity of insulating materials, dielectric constant and dissipation factor, standard conditions for use during

pre-conditioning and the conditioning and testing of solid electrical insulating materials, and methods of test for electric strength of electrical insulating materials at power frequencies were approved for issue under the Six Months' Rule. The committee also recommended extension of its scope of work to cover preparation of specifications for insulating materials.

**TC 16 Terminal Markings and Other Identifications** — (Sectt: Netherlands) — Documents on identification of bare conductors by colours, terminal marking of power transformers, insulated conductors and terminals on indicating, recording, and measuring instruments were discussed.

**TC 30 Extra-High Voltages** — (Sectt: Switzerland) — A document on system voltages above 220 kV was approved for publication. Consideration was also given to the standardization of dc high voltages.

**SC 31C Increased Safety Apparatus** — (Sectt: Germany) — This subcommittee discussed a document on construction and testing methods of electrical apparatus for use in flammable gas atmospheres in the mining industry and in industries other than mining.

**TC 32 Fuses** — (Sectt: France) — Three subcommittees were formed to undertake work on: (a) high voltage fuses, (b) low voltage fuses, and (c) miniature fuses. A part of a document on high voltage fuses was also discussed.

**TC 34 Lamps and Related Equipment** — (Sectt: UK) — The four subcommittees, namely, SC 34A Lamps; SC 34B Lamp, Caps and Holders; SC 34C Auxiliaries for Discharge Lamps; and SC 34D Luminaires met at Venice. Two documents were approved for circulation under the Two Months' Procedure and eight for circulation under the Six Months' Rule. A panel was set up to study the question of creepage distances of lamp caps and holders and a decision was taken to prepare recommendations for quartz iodine lamps. An offer was made by the German Standards Body to make available at standard price, bulk quantities of gauges for E 27 and E 40 lamp holders and lamp caps in accordance with IEC Publication 61.

**TC 36 Insulators** — (Sectt: Italy) — 'Testing specification for indoor and outdoor post insulators with a rated voltage greater than 1 000 V' was approved for publication and the modifications to be made to the document covering recommendations for tests on large hollow porcelains intended for use in electrical installations was approved for circulation under the Two Months' Procedure. In addition, draft for dimensional standard for indoor and outdoor post insulators intended for system voltages greater than 1 000 V was approved for circulation under the Six Months' Rule.

**TC 37 Lightning Arresters** — (Sectt: USA) — Draft revision of Publication 99-1 'Non-linear resistor-type arresters' was discussed.

**TC 40 Capacitors and Resistors for Electronic Equipment** — (Sectt: Netherlands) — The specification for radio interference suppression capacitors was adopted for publication. The following documents, besides others, were approved for circulation under the Six Months' Rule:

- a) Revision of IEC Publication 108 Recommendations for ceramic dielectric capacitors, Type 1, and
- b) Specification for polystyrene film dielectric capacitors.

Other important documents discussed at the meeting covered:

- a) variable capacitors;
- b) aluminium electrolytic capacitors;
- c) non-wire wound resistors, Types 1 and 2;
- d) wire wound variable resistors, Type 2; and
- e) dimensions of ceramic dielectric capacitors of the plate type.

**TC 43 Electric Fans** — (Sectt: India) — This committee met under the chairmanship of Shri S. N. Mukerji, Director, National Test House, Calcutta and considered two documents concerning fans for use on-board ships and ventilating fans for non-industrial use. It was agreed to prepare revised documents for consideration at the next meeting, to be held in Tokyo in 1965.

The committee also recommended to the Committee of Action to arrange for preparation of an IEC recommendation on the double and reinforced insulation for the guidance of different technical committees of IEC, as such types of insulation were being used increasingly in domestic appliances and equipment like fans.

**TC 44 Electrical Equipment of Machine Tools** — (Sectt: Switzerland) — A document on additional recommendations for electrical equipment of machine tools was approved for circulation under the Six Months' Rule. Other documents discussed at the meeting covered Recommendations for electronic controlled equipment of machine tools and code for signs of signalling lamps used for machine tools.

**TC 45 Electrical Measuring Instruments Used in Connection with Ionizing Radiation** — (Sectt: Germany) — As a result of the meeting of this committee together with four working groups, discussion was completed on the drafts on index of electrical measuring instruments and associated apparatus comprising list of instruments and definitions, and draft recommendations concerning power sources for portable prospecting.

**TC 49 Piezo-Electric Crystals and Associated Devices** — (Sectt: Netherlands) — The documents approved for circulation at this meeting covered Recommendations for pin connections of quartz crystal

units with 9 pins and those with 3 and 4 electrode vibrators; and measurement of unwanted resonances in crystal units. A few amendments and additions to Publication 122-1 'Quartz crystal units for oscillators, Section one: Standard values and conditions, Section two: Test conditions' and article sheets for quartz crystal units for use in crystal filters, were also approved for circulation.

#### MEETINGS AT OTHER PLACES

**SC 2A Turbine-Type Generators** — (Sectt: UK) — The subcommittee met in Leningrad on 4 and 5 October 1963 and approved certain proposals for amendment of Publications 34-1 and 34-3 to include directly cooled machines.

**SC 2B Dimensions of Rotating Electrical Machines** — (Sectt: Sweden) — The following were approved for circulation under the Six Months' Rule at the meeting held in Paris on 4 to 6 November 1963:

- a) Draft revision of Publication 72-1 (1959) Recommendations for the dimensions and output ratings of electric motors, Part 1: Foot-mounted induction motors with shaft heights between 56 and 315 mm, and
- b) Draft revision of Publication 72-2 (1960) Recommendations for the dimensions and output ratings of electric motors, Part 2: Dimensions of mounting flanges for electric motors.

**SC 2G Synchronous Machine Quantities** — (Sectt: USSR) — The two documents discussed at the meeting in Leningrad on 7 to 9 October 1963 covered:

- a) methods for determining synchronous machine quantities from tests, and
- b) unconfirmed methods for determining synchronous machine quantities from tests.

The former was approved for circulation under the Six Months' Rule.

**SC 2H Degree of Protection of Enclosures—Methods of Cooling** — (Sectt: France) — Draft Recommendations for the types of enclosures and methods of cooling for rotating electrical machinery was discussed at the meeting held in Paris from 6 to 8 November 1963.

**TC 2 Rotating Machinery** — (Sectt: UK) — In addition to receiving the reports on the progress made by different subcommittees, this committee considered in Leningrad from 7 to 10 October 1963 a part of the draft revision of Publication 34-1 'Recommendations for rotating electrical machinery'. The committee agreed to meet next in Brussels in 1964 to consider the remaining portion.

**TC 7 Aluminium** — (Sectt: Canada) — The committee met in London on 23 and 24 July 1963 and recommended to the committee of

Action to modify its title to 'Bare Aluminium Conductors' and to set up a separate committee to deal with copper and copper alloy conductors. The committee also approved, for circulation under the Six Months' Rule, three draft Recommendations covering:

- a) aluminium conductors, steel reinforced;
- b) aluminium stranded conductors; and
- c) aluminium alloy stranded conductors (aluminium, magnesium or silicon type).

**TC 13 Measuring Instruments** — (Sectt: Hungary) — This committee met in Budapest on 11 and 19 September 1963. Subcommittees SC 13A Integrating Meters, SC 13B Indicating Instruments, and SC 13C Electronic Measuring Instruments also met on that occasion.

Draft Recommendations for electronic voltmeters was approved for circulation under the Six Months' Rule. In addition, draft revision of IEC Publication 51 'Recommendations for indicating electrical measuring instruments and their accessories' and draft on Recommendations for amplitude modulated radio frequency signal generators were discussed.

**TC 17 Switchgear and Controlgear** — (Sectt: Sweden) — The committee met in Bergamo (Italy) on 23-26 October 1963. SC 17A High-Voltage Switchgear and Controlgear and SC 17B Low-Voltage Switchgear and Controlgear also met on that occasion.

The committee considered comments received on the document proposed by the Working Group on Definitions. A new subcommittee (SC 17C) was set up to deal with both high and low-voltage metal enclosed switchgear.

**SC 20A High-Voltage Cables** — (Sectt: UK) — The subcommittee met in Belgrade on 5 and 10 October 1963 and noted that as a result of circulation under the Six Months' Rule, draft Recommendations for (a) tests on non-draining paper-insulated metal sheathed cables for alternating voltages from 10 kV up to and including 33 kV, and (b) cable selection, had been approved by majority of members. The subcommittee also approved two draft Recommendations covering impulse tests on cables and their accessories and tests on the corrosion resistance of the protection for metallic cable sheaths, for circulation under the Six Months' Rule.

**SC 20B Low-Voltage Cables** — (Sectt: Netherlands) — Draft Recommendations covering the following were approved for publication at the meeting held on 4-6 October 1963 in Belgrade:

- a) Colours of the cores of flexible cables and cords,
- b) Nominal cross-sectional areas and composition of round copper conductors for rubber or polyvinyl chloride insulated cables and flexible cords with a rated voltage not exceeding 750 V.

In addition, draft Recommendations for (a) code designation of cables and cords covered by the draft specification for rubber and PVC insulated flexible cables and cords, and (b) nominal cross-sectional areas and compositions of conductors of insulated cables for electric installations, were approved for circulation under the Six Months' Rule.

**TC 20 Electric Cables** — (Sectt: UK) — Besides approving the Recommendations of SC 20A and SC 20B, this committee set up a Preparatory Working Group to propose methods of test for PVC insulation and sheath, applicable to a wide range of sizes and types of cables. The committee also modified titles of its two subcommittees to read as 'SC 20A High-Voltage Cables' and 'SC 20B Low-Voltage Cables', and allotted the subject of welding cables to SC 20B for preparation of draft Recommendations.

**TC 21 Accumulators** — (Sectt: Czechoslovakia) — Three documents covering dimensions of scooter batteries, lead-acid traction batteries, and supplement to Publication 95-2 'Lead-acid starter batteries, Part 2: Dimensions', were approved for circulation under the Six Months' Rule at the meeting held in Montreux on 23-26 September 1963.

A new subcommittee was set up to deal with alkaline batteries.

**SC 22A Mercury-Arc Convertors** — (Sectt: Switzerland) — Draft Recommendations for mercury-arc convertors for reversible power was considered at the meeting held in Montreux on 16-21 September 1963.

**SC 22B Semiconductor Convertors** — (Sectt: Sweden) — This subcommittee met in Montreux on 23-27 September 1963. Draft Recommendations for thyristor power convertors was discussed at the meeting. It was agreed to prepare a revised document for consideration at the next meeting.

**TC 22 Static Power Convertors** — (Sectt: Switzerland) — The Committee met on 16 and 27 September 1963 in Montreux and approved the Recommendations of SC 22A and SC 22B.

**TC 33 Power Capacitors** — (Sectt: Netherlands) — Three draft Recommendations covering ac motor capacitors, coupling capacitors, and self-healing power capacitors, were considered by the committee in London on 12-14 November 1963.

**TC 35 Primary Cells and Batteries** — (Sectt: France) — India was represented at the meeting held in London from 14 to 16 October 1963. The documents discussed at that meeting covered, besides others, (a) storage test in extreme conditions of temperature and humidity, (b) shape to be given to lower part of cylindrical cells, (c) cells for the supply of electric fence controllers, and (d) proposals for the third edition of IEC Publication 86 (1957) 'Recommendations for primary cells and batteries (including additions of new types of batteries and deletion of obsolete ones)'.

**SC 46C L.F. Cables and Wires** — (Sectt: Belgium) — Draft Recommendations for the following were considered at the meeting held in Brussels on 23-25 September 1963:

- a) Guide for the preparation of standard sheets;
- b) Wires with one solid or stranded conductor, PVC insulated for equipment;
- c) Wires and cables with one stranded conductor, PVC insulated, screened, for equipment;
- d) Wires with two or three twisted solid conductors, PVC insulated, for distribution;
- e) Wires and cables with two twisted solid conductors, PVC insulated, screened, for equipment;
- f) L.F. cables and wires with polyethylene insulation and polyethylene sheath: general test and measuring methods; and
- g) Colouring and coding of l.f. cables and wires.

**TC 47 Semiconductor Devices** — (Sectt: France) — The more important documents considered by the committees covered nomenclature, definitions and letter symbols; essential ratings and characteristics — reverse blocking triode thyristors; essential ratings and characteristics — tunnel diodes; essential ratings and characteristics — low-power small signal diodes; and general rules for mechanical standardization.

**TC 55 Winding Wires** — (Sectt: Germany) — Draft specification sheets for (a) self-fluxing enamelled wires, (b) enamelled wires with high mechanical properties, (c) heat bonding enamelled wires with high mechanical properties, (d) enamelled wires for elevated temperatures, and (e) heat bonding self-fluxing enamelled wires, were discussed by the committee in Vienna on 21-25 October 1963. Other documents discussed at the meeting covered packing materials for winding wires, such as containers and delivery spools.

### 3. COMMONWEALTH STANDARDS CONFERENCE

3.1 The Commonwealth Standards Conference at its fifth meeting held at Sydney (Australia) in October 1962 had considered the question of an agreed guide for drafting standards and appointed a subcommittee with Dr. A. N. Ghosh, Joint Director, ISI, as its chairman. The subcommittee prepared a document entitled 'Recommended sequence of clauses in standard specifications', and circulated it to member countries.

During the year under report, comments were received on this document from the Standards Bodies of Australia, Canada and South Africa, which, in turn, were circulated to all Standards Bodies of Commonwealth countries for their information in order to facilitate a final agreement on the subject at a special meeting of the representatives of Commonwealth

Standards Bodies proposed to be held at the time of ISO General Assembly and Group Meetings in India in November 1964.

#### 4. UK STANDARDS ENGINEERS CONFERENCE

4.1 Dr. Lal C. Verman, Director, ISI, attended the Ninth Annual Conference of UK Standards Engineers, held at London on 15 and 16 May 1963. The Conference, comparable in many ways to the Indian Standards Convention organized by ISI every year, dealt with the use of standards in any branch of industry, commerce and administration in the United Kingdom. The year 1963 being the National Productivity Year, the general theme underlined in papers and discussion was the importance of standards as a means of increasing efficiency and productivity. The attendance at the Conference was of real value inasmuch as it helped in bringing out more clearly the comparative nature of the two events in India and the United Kingdom.

#### 5. NATIONAL CONFERENCE ON STANDARDIZATION OF AMERICAN STANDARDS ASSOCIATION

5.1 At the invitation of the American Standards Association, the Director, ISI, attended its National Conference on Standardization held in Washington on 17-19 February 1964. The Conference is somewhat similar to the Indian Standards Convention held annually by ISI. Addressing the Conference in a session concerned with world viewpoints on standardization, the Director explained at length the reasons that motivated India's participation in international work on standardization.

5.2 An extract from the letter received from Mr. R. E. Gay, Managing Director, American Standards Association, about the reaction to Director's participation is given below:

"Your talk contributed greatly to the success of the session on 'World Viewpoints on Standardization' and to the Conference as a whole. We are just beginning to receive the reactions—all favourable—touched off by your message. Your comments had been eagerly sought both by attendees to the Conference and by a number of ASA correspondents; and your audience will, of course, extend far beyond that in attendance at the session through the publicity given to your talk and the publication of your remarks in the official proceedings of the Conference.

I am particularly cognizant of the fact that your trip to this country to address our Conference was made at considerable sacrifice to yourself and to the Indian Standards Institution. This places us doubly in your debt."

## PART IV APPENDICES

### APPENDIX A

(See page 5)

#### INDIAN STANDARDS PUBLISHED AND IN PRESS DURING 1963-64

(This list gives the new Indian Standards published during 1963-64 and those which were under print on 31 March 1964. It does not include standards which were under print on 31 March 1963 and printed during the year under report. The latter were included in a similar list published as Appendix A in last year's Annual Report.)

Sr. No.		Rs
<b>AGRICULTURAL AND FOOD PRODUCTS</b>		
<b>Animal Feeds</b>		
1.	IS : 2503-1963 Decorticated safflower ( <i>KARDI</i> ) oilcake as livestock feed	1-00
<b>Beverages</b>		
2.	IS : 2346-1963 Carbonated beverages ... ..	5-00
<b>Biscuits and Confectionery</b>		
3.	IS : 2397-1963 Wafer biscuits ... ..	1-50
<b>Cereals and Pulses Products</b>		
4.	IS : 2400-1963 <i>BESAN</i> ... ..	2-50
5.	IS : 2639-1964 <i>PAPAD</i> ... ..	3-00
6.	IS : 2650-1964 <i>BOMBAY HALWA</i> ... ..	3-00
<b>Dairy Equipment</b>		
7.	IS : 2336-1963 Stainless steel milk vats ... ..	2-00
8.	IS : 2337-1963 Aluminium milk vats ... ..	2-00
9.	IS : 2342-1963 Manually operated milk can washer ... ..	2-00
10.	IS : 2343-1963 Can washing trough ... ..	2-00
11.	IS : 2492-1963 Road milk tankers ... ..	1-50
12.	IS : 2495-1963 Cheese hoops ... ..	1-50
13.	IS : 2496-1963 Butter mould ... ..	1-50
14.	IS : 2497-1963 Wooden butter scoop ... ..	1-50
15.	IS : 2498-1963 Cheese knife ... ..	2-00
16.	IS : 2499-1963 Butter scotch-hand ... ..	1-50
17.	IS : 2504-1964 Hand-operated cheese press (vertical) ... ..	1-50
18.	IS : 2647-1964 Cheese mill ... ..	1-50
19.	IS : 2648-1964 Pipe washing and sterilizing chest ... ..	2-00
20.	IS : 2649-1964 Hand-operated butter worker ... ..	2-00
<b>Farm Implements and Machinery</b>		
21.	IS : 2559-1963 Garden rake ... ..	2-00
22.	IS : 2563-1963 Hedge shears, straight edge type ... ..	2-00
23.	IS : 2564-1963 Blade harrow, <i>GUNTAKA</i> type ... ..	2-00
24.	IS : 2565-1963 Ridger, animal drawn ... ..	2-50



Sl. No.	Rs
<b>Fish and Fishery Products</b>	
25. IS : 2345-1963 Dried prawn pulp ... ..	2-50
26. IS : 2420-1963 Mackerel ( <i>Rastrelliger</i> sp.) canned in oil ... ..	1-50
27. IS : 2421-1963 Sardines ( <i>Sardinella</i> sp.) canned in oil ... ..	1-50
<b>Food Colours</b>	
28. IS : 1699 (Part II)-1963 Methods of sampling and test for coal tar food colours, Part II ... ..	1-00
29. IS : 2557-1963 Annatto colour for food products... ..	2-00
30. IS : 2558-1963 Ponceau 4R ... ..	2-50
<b>Meat and Meat Products</b>	
31. IS : 2475-1963 Bacon, smoked ... ..	2-50
32. IS : 2476-1963 Ham ... ..	1-50
33. IS : 2536-1963 Mutton and goat flesh—fresh, chilled and frozen ... ..	2-50
34. IS : 2537-1963 Beef and buffalo flesh—fresh, chilled and frozen ... ..	2-50
<b>Pest Control Equipment</b>	
35. IS : 2477-1963 Hand rotary duster, shoulder mounted type ... ..	2-50
<b>Pesticidal Formulations</b>	
36. IS : 2355-1963 Ethoxy ethyl mercury chloride concentrate, stabilized ... ..	2-50
37. IS : 2356-1963 Formulations based on phenyl mercury salicylate ... ..	2-50
38. IS : 2357-1963 Formulations based on phenyl mercury acetate ... ..	2-00
39. IS : 2358-1963 Formulations based on stabilized methoxy ethyl mercury chloride concentrate ... ..	2-00
40. IS : 2359-1963 Formulations based on stabilized ethoxy ethyl mercury chloride concentrate ... ..	2-00
41. IS : 2555-1963 Official test insecticide (OTI) ... ..	1-00
42. IS : 2567-1963 Malathion emulsifiable concentrates ... ..	4-50
43. IS : 2568-1963 Malathion dusting powders ... ..	4-00
44. IS : 2569-1963 Malathion water dispersible powder concentrates ... ..	4-50
<b>Pesticides</b>	
45. IS : 2353-1963 Phenyl mercury chloride, technical ... ..	2-50
46. IS : 2354-1963 Ethyl mercury chloride, technical ... ..	2-50
47. IS : 2570-1963 Methyl parathion, technical ... ..	3-00
<b>Quality Control</b>	
48. IS : 2491-1963 Code for sanitary conditions for food processing units ... ..	2-50
<b>Spices and Condiments</b>	
49. IS : 2322-1963 Chillies ... ..	2-00
50. IS : 2323-1963 Mustard powder ... ..	2-00
51. IS : 2443-1963 Coriander, whole ... ..	1-50
52. IS : 2444-1963 Coriander powder ... ..	1-50
53. IS : 2445-1963 Chilli powder ... ..	1-50
54. IS : 2446-1963 Turmeric powder ... ..	1-50
55. IS : 2447-1963 Cumin, whole ... ..	1-50
<b>Starch Derived Products</b>	
56. IS : 2404-1963 Malt extract ... ..	3-00

Sl. No.	Rs
<b>Sugar and By-Products</b>	
57. IS : 498-1963 Sugar, vacuum pan (plantation white), for grading (second revision) ... ..	2-50
<b>Tobacco Products</b>	
58. IS : 2344-1963 Chewing tobacco, ZARDA, flake type ... ..	4-50
<b>BUILDING</b>	
<b>Aggregates</b>	
59. IS : 383-1963 Aggregates, coarse and fine, from natural sources, for concrete (revised) ... ..	4-00
60. IS : 2386 (Part I)-1963 Methods of test for aggregates for concrete: Part I Particle size and shape ... ..	4-00
61. IS : 2386 (Part II)-1963 Methods of test for aggregates for concrete: Part II Estimation of deleterious materials and organic impurities ... ..	3-50
62. IS : 2386 (Part III)-1963 Methods of test for aggregates for concrete: Part III Specific gravity, density, voids, absorption and bulking ... ..	4-50
63. IS : 2386 (Part IV)-1963 Methods of test for aggregates for concrete: Part IV Mechanical properties ... ..	5-50
64. IS : 2386 (Part V)-1963 Methods of test for aggregates for concrete: Part V Soundness ... ..	2-00
65. IS : 2386 (Part VI)-1963 Methods of test for aggregates for concrete: Part VI Measuring mortar making properties of fine aggregates ... ..	1-00
66. IS : 2386 (Part VII)-1963 Methods of test for aggregates for concrete: Part VII Alkali aggregates reactivity ... ..	5-00
67. IS : 2386 (Part VIII)-1963 Methods of test for aggregates for concrete: Part VIII Petrographic examination ... ..	4-50
<b>Air Conditioning and Refrigeration</b>	
68. IS : 660-1963 Safety code for mechanical refrigeration (revised) ... ..	3-00
69. IS : 2370-1963 Sectional cold rooms (walk-in type) ... ..	4-50
<b>Air Conditioning Equipment</b>	
70. IS : 2374-1963 Ice tanks ... ..	1-50
<b>Boards and Sheets</b>	
71. IS : 2093-1964 Asbestos cement building boards ... ..	2-00
72. IS : 2380-1963 Methods of test for wood particle boards and boards from other lignocellulosic materials ... ..	6-50
<b>Builder's Hardware</b>	
73. IS : 207-1964 Gate and shutter hooks and eyes (revised) ... ..	2-00
74. IS : 452-1963 Door springs, rat tail type (revised) ... ..	2-00
75. IS : 453-1963 Spring hinges, double-acting (revised) ... ..	2-00
76. IS : 724-1964 Mild steel and brass cup, ruler and square hooks and screw eyes (revised) ... ..	3-00
77. IS : 729-1963 Brass drawer locks, cupboard locks and box locks (revised) ... ..	3-50
78. IS : 1019-1963 Rim latches (revised) ... ..	3-50
<b>Construction Equipment</b>	
79. IS : 2431-1963 Steel wheelbarrows (single-wheel type) ... ..	1-50
80. IS : 2434-1963 Drum asphalt mixer, hand operated ... ..	1-00
81. IS : 2438-1963 Roller pan mixer ... ..	1-50

Sl. No.	Rs
82. IS : 2439-1963 Metal hand rollers ( fixed-weight type )	1-00
83. IS : 2505-1963 Concrete vibrators, immersion type	2-50
84. IS : 2514-1963 Concrete vibrating tables	2-00
<b>Drawing, Estimation and Measurement</b>	
85. IS : 965-1963 Equivalent metric units for scales, dimensions and quantities in general construction work ( revised )	6-00
<b>Fire Fighting Equipment</b>	
86. IS : 954-1963 Carbon dioxide tender for fire brigade use	3-00
87. IS : 955-1964 Dry powder tender for fire brigade use	2-50
88. IS : 2546-1963 Galvanized mild steel fire bucket	2-00
<b>Fire Safety</b>	
89. IS : 2217-1963 Recommendations for providing first-aid fire fighting arrangements in public buildings	2-00
90. IS : 2406-1963 Code of practice for fire safety of non-industrial buildings	3-50
<b>Floor Finish</b>	
91. IS : 2571-1963 Code of practice for laying <i>in-situ</i> cement concrete flooring	4-50
<b>Functional Design</b>	
92. IS : 2440-1963 Code of practice for daylighting of buildings	6-00
93. IS : 2526-1963 Code of practice for acoustical design of auditoriums and conference halls	4-50
<b>General Structural Design and Construction</b>	
94. IS : 2502-1963 Code of practice for bending and fixing of bars for concrete reinforcement	5-00
<b>Gypsum Products</b>	
95. IS : 2469-1963 Glossary of terms relating to gypsum	1-00
96. IS : 2547-1963 Gypsum building plaster	1-50
<b>Manufacture or Processing</b>	
97. IS : 2117-1963 Code of practice for manufacture of hand-made common burnt-clay building bricks	4-00
<b>Modular Co-ordination</b>	
98. IS : 2375-1963 Recommendation for modular co-ordination applied to RCC framed structures	1-00
<b>Painting and Allied Finishes</b>	
99. IS : 1477 ( Part II )-1963 Finishing of ferrous metals in buildings, painting and allied finishes: Part II Schedules and equipment	6-00
<b>Pipes</b>	
100. IS : 1916-1963 Steel cylinder reinforced concrete pipes	2-50
<b>Planning, Regulation and Control</b>	
101. IS : 2332-1963 Nomenclature of floors and storeys	1-50

Sl. No.	Rs
<b>Roof</b>	
102. IS : 2527-1963 Code of practice for fixing rain-water gutters and downpipes for roof drainage	3-50
<b>Sieves and Wire Gauzes</b>	
103. IS : 460-1962 Test sieves ( revised )	5-00
104. IS : 2405-1963 Wire cloth and perforated plates for industrial sieves	2-50
<b>Timber</b>	
105. IS : 399-1963 Classification of commercial timbers and their zonal distribution ( revised )	10-00
106. IS : 1708 ( Part II )-1963 Methods of testing small clear specimens of timber, Part II	3-50
107. IS : 2372-1963 Timber for cooling towers	2-00
108. IS : 2377-1963 Tables for volume of cut sizes of timber	4-00
109. IS : 2408-1963 Methods of static tests of timbers in structural sizes	4-00
110. IS : 2455-1963 Methods of sampling and presentation of data for timber testing	4-50
<b>Timber Design and Construction</b>	
111. IS : 2366-1963 Code of practice for nail-jointed timber construction	5-00
<b>Wall and Ceiling Finish</b>	
112. IS : 2402-1963 Code of practice for external rendered finishes	6-50
113. IS : 2441-1963 Code of practice for fixing ceiling coverings	4-50
114. IS : 2572-1963 Code of practice for construction of hollow concrete block masonry	4-50
<b>Waterproofing and Damp-Proofing</b>	
115. IS : 2645-1964 Integral cement waterproofing compounds	2-00
<b>Water Supply, Drainage and Sanitation</b>	
116. IS : 1172-1963 Basic requirements for water supply, drainage and sanitation ( revised )	4-50
117. IS : 2065-1963 Code of practice for water supply in buildings	10-00
118. IS : 2401-1963 Code of practice for selection, installation and maintenance of domestic water meters	1-50
119. IS : 2470 ( Part I )-1963 Code of practice for design and construction of septic tanks: Part I Domestic purposes	5-00
<b>Water Supply, Sanitation and Drainage Fittings</b>	
120. IS : 771-1963 Glazed earthenware sanitary appliances ( revised )	7-00
121. IS : 780-1963 Sluice valves up to 300 mm size for waterworks purposes ( inside screw non-rising spindle type ) ( revised )	6-00
122. IS : 2326-1963 Flushing cisterns for urinals, automatic	1-50
123. IS : 2373-1963 Water meters ( bulk type )	4-00
124. IS : 2548-1963 Plastic water-closet seats and covers	2-00
125. IS : 2556-1963 Vitreous sanitary appliances ( vitreous china )	6-50
<b>CHEMICALS</b>	
<b>Acids</b>	
126. IS : 501-1963 Oxalic acid, technical and analytical reagent ( revised )	1-50

Sl. No.		Rs
<b>Adhesives</b>		
127.	IS : 2249-1963 Adhesives ( liquid ) for leather belting ...	2-50
128.	IS : 2560-1963 Rubber-based adhesives for tyres and tubes, non-curing ...	2-00
129.	IS : 2561-1963 Rubber-based adhesives for the automatic industry ...	2-50
130.	IS : 2562-1963 Rubber-based adhesives for tyres and tubes, curing ...	2-00
<b>Alcohol and Allied Products</b>		
131.	IS : 229-1964 Ethyl acetate ( revised ) ...	3-50
132.	IS : 230-1964 Normal butyl acetate ( revised ) ...	1-00
133.	IS : 321-1964 Absolute alcohol ( revised ) ...	3-00
134.	IS : 336-1964 Ether ( revised ) ...	4-50
135.	IS : 360-1964 Amyl alcohol ( revised ) ...	3-50
136.	IS : 2302-1962 Tables for alcoholometry ...	15-00
137.	IS : 2631-1964 isoPropyl alcohol ...	2-50
138.	IS : 2632-1964 Crotonaldehyde ...	2-50
<b>Brushware</b>		
139.	IS : 486-1963 Brushes, sash tool, for paints and varnishes ( revised ) ...	3-00
140.	IS : 1103-1963 Brushes, artists' ( revised ) ...	2-50
141.	IS : 1843-1963 Nylon monofilaments ...	2-50
142.	IS : 1844-1962 Bristles ...	4-00
143.	IS : 2616-1963 Brush (i) cleaning tank, and (ii) commode and lavatory ...	2-50
144.	IS : 2621-1964 Brush, commode chutes ...	2-00
145.	IS : 2622-1964 Brush, banister ( hand sweeping ), single ...	2-00
<b>Chemicals, Inorganic ( Miscellaneous )</b>		
146.	IS : 253-1964 Edible common salt ( revised ) ...	4-00
147.	IS : 593-1964 Salt for hide-curing ( wet salting ) ( revised ) ...	3-50
148.	IS : 2333-1963 Plaster of paris ...	4-00
149.	IS : 2449-1963 Silver oxide ...	2-00
<b>Coal Carbonization Products</b>		
150.	IS : 1061-1964 Disinfectant fluids, black and white ( revised ) ...	5-00
151.	IS : 2630-1964 Nitrobenzene, technical ...	3-00
<b>Cosmetics and Toilet Goods</b>		
152.	IS : 2519-1963 Calcium stearate for cosmetic industry ...	3-50
153.	IS : 2520-1963 Zinc stearate for cosmetic industry ...	3-50
154.	IS : 2521-1963 Magnesium stearate for cosmetic industry ...	3-50
155.	IS : 2528-1963 Magnesium carbonate for cosmetic industry ...	3-00
156.	IS : 2529-1963 Magnesium oxide for cosmetic industry ...	3-00
<b>Explosive and Pyrotechnic Materials</b>		
157.	IS : 301-1963 Potassium nitrate for explosives and pyrotechnic compositions ( revised ) ...	4-50
<b>Fertilizers</b>		
158.	IS : 1304-1963 Glossary of terms used in fertilizer trade and industry ( revised ) ...	3-00
159.	IS : 2409-1963 Calcium ammonium nitrate ...	2-50
<b>Fillers, Stoppers and Putties</b>		
160.	IS : 2468-1963 Whiting for putty ...	1-50

Sl. No.		Rs
<b>Glass and Glassware</b>		
161.	IS : 488-1963 Glass making sands ( revised ) ...	3-50
162.	IS : 1112-1963 Glass shells for general lighting service lamps ( revised ) ...	2-50
163.	IS : 2303-1963 Method of grading glass for alkalinity ...	1-50
164.	IS : 2351-1963 Aerated water glass bottles, marble stoppered ...	2-00
165.	*IS : 2553-1964 Safety glass for land transport ...	3-75
<b>Industrial Gases</b>		
166.	IS : 307-1963 Carbon dioxide ( revised ) ...	2-50
167.	IS : 2432-1963 Sulphur dioxide, liquid ...	3-00
<b>Laboratory Glassware and Related Apparatus</b>		
168.	IS : 2618-1963 Test-tubes ...	2-00
169.	IS : 2619-1963 Glass beakers ...	2-50
170.	IS : 2620-1963 Distilling flasks ...	2-00
171.	IS : 2626-1963 Petri dishes ...	2-00
172.	IS : 2627-1963 Glossary of terms relating to liquid-in-glass thermometers ...	1-00
<b>Leather, Leather Goods and Leather Dressings</b>		
173.	IS : 2545-1963 Vegetable tanned lizardskins ...	2-50
174.	IS : 2573-1963 Leather gauntlets for welders ...	1-50
175.	IS : 2574-1963 Leather gauntlets for workers in iron and steel industry ...	1-50
176.	IS : 2575-1963 Leather mittens for workers in iron and steel industry ...	1-50
<b>Metal Containers and Closures</b>		
177.	IS : 1406-1963 Rectangular tins ( revised ) ...	2-00
178.	IS : 2471-1963 Methods of test for metal containers ...	2-50
179.	IS : 2552-1963 Steel drums ( galvanized and ungalvanized ) ...	2-00
<b>Oil Pastes</b>		
180.	IS : 289-1963 Aluminium paste for paints ( revised ) ...	2-00
<b>Oils and Fats, Oleaginous Seeds and Fruits</b>		
181.	IS : 542-1963 Coconut oil ( revised ) ...	1-50
182.	IS : 544-1963 Groundnut oil ( revised ) ...	1-50
183.	IS : 545-1963 Mahua oil ( revised ) ...	1-00
184.	IS : 546-1963 Mustard oil ( revised ) ...	1-50
185.	IS : 547-1963 Sesame oil ( revised ) ...	1-50
<b>Paper and Allied Products</b>		
186.	IS : 2483-1963 Ticket board ...	1-50
187.	IS : 2617-1964 Millboard, greyboard and strawboard ...	1-00
<b>Petroleum and Petroleum Products</b>		
188.	IS : 588-1963 Mosquito larvicidal oil ( revised ) ...	2-50
189.	IS : 2166-1963 Computation of capacity tables for horizontal and tilted oil storage tanks ...	5-00

\*This is B.S. 857:1954 recognized as Indian Standard for certification marking purposes.

Sl. No.		Rs
241.	IS : 2448 (Part I)-1963 Adhesive insulating tapes for electrical purposes: Part I Tapes with cotton textile substrates ... ..	2-00
242.	IS : 2464-1963 Built-up mica for electrical purposes ... ..	2-00
243.	IS : 2534-1963 Method of test for electric strength of solid insulating materials at power frequencies ... ..	3-50
<b>Insulators</b>		
244.	IS : 731-1963 Porcelain insulators for overhead power lines (3-3 kV and above) ( <i>revised</i> ) ... ..	5-50
245.	IS : 2486 (Part I)-1963 Insulator fittings for overhead power lines of 3-3 kV and above : Part I General requirements and tests ... ..	3-00
246.	IS : 2486 (Part II)-1963 Insulator fittings for overhead power lines of 3-3 kV and above : Part II Dimensional requirements ... ..	5-00
247.	IS : 2544-1963 Porcelain post insulators (3-3 kV and above) ... ..	5-50
<b>Lamps and Lamp Accessories</b>		
248.	IS : 2215-1963 Starters for fluorescent lamps ( <i>revised</i> ) ... ..	3-50
249.	IS : 2261-1963 Lamps for flashlights ... ..	3-00
250.	IS : 2407-1963 Photometric integrators ... ..	2-00
251.	IS : 2592-1964 Lamps for lighting on board ships ... ..	4-50
252.	IS : 2596-1964 Bulbs (lamps) for miners' cap-lamps ... ..	3-50
<b>Motors and Generators</b>		
253.	IS : 2254-1964 Dimensions of vertical shaft motors for pumps ... ..	1-00
<b>Power Convertors</b>		
254.	IS : 2511-1963 Polycrystalline semi-conductor rectifier stacks ... ..	4-50
<b>Switchgear and Controlgear</b>		
255.	IS : 375-1963 Marking and arrangement for switchgear bus-bars, main connections and auxiliary wiring ( <i>revised</i> ) ... ..	3-00
256.	IS : 2086-1963 Carriers and bases used in rewirable type electric fuses up to 650 volts ( <i>revised</i> ) ... ..	5-00
257.	IS : 2516 (Part I/Sec 2)-1963 Alternating current circuit-breakers : Part I Requirements, Sec 2 Voltage range 1 000 to 11 000 volts ... ..	5-50
<b>Wiring Accessories</b>		
258.	IS : 2120-1963 15-ampere tumbler switches ( <i>revised</i> ) ... ..	3-50
259.	IS : 2412-1963 Link clips for electrical wiring ... ..	2-00
260.	IS : 2509-1963 Rigid non-metallic conduits for electrical installations ... ..	3-50
<b>Unclassified</b>		
261.	IS : 2551-1963 Danger notice plates ... ..	1-00
<b>MECHANICAL ENGINEERING</b>		
<b>Abrasives</b>		
262.	IS : 2324-1963 Dimensions for grinding wheels ... ..	4-00
<b>Basic Engineering Standards</b>		
263.	IS : 919-1964 Recommendations for limits and fits for engineering ( <i>revised</i> ) ... ..	10-00
264.	IS : 2554-1963 Cast iron angle plates ... ..	3-00

Sl. No.		Rs
<b>Bicycle Components</b>		
265.	IS : 623-1963 Bicycle frames ( <i>revised</i> ) ... ..	2-50
266.	IS : 625-1963 Handle bars ( <i>revised</i> ) ... ..	2-00
267.	IS : 626-1963 Bicycle seat pillars ( <i>revised</i> ) ... ..	1-50
268.	IS : 628-1963 Bicycle pedal assembly ( <i>revised</i> ) ... ..	2-00
269.	IS : 629-1963 Bicycle hub assemblies ( <i>revised</i> ) ... ..	2-00
<b>Hand Tools</b>		
270.	IS : 402-1964 Chisels ( <i>revised</i> ) ... ..	2-50
271.	IS : 510-1964 Blacksmith's anvils (cast steel) ( <i>revised</i> ) ... ..	2-50
272.	IS : 2586-1964 Bench vices (machinist's vices) ... ..	2-50
273.	IS : 2587-1964 Pipe vices (open side type and fixed sides type) ... ..	2-00
274.	IS : 2588-1964 Blacksmith's vices ... ..	2-00
275.	IS : 2615-1964 General requirements for pliers, pincers and nippers ... ..	4-50
<b>Instruments (Drawing, Optical and Surveying)</b>		
276.	IS : 1360-1963 Engineers pattern tee squares ( <i>revised</i> ) ... ..	1-50
277.	IS : 1444-1963 Engineers pattern drawing boards ( <i>revised</i> ) ... ..	1-50
278.	IS : 2352-1963 Procedure for basic climatic and durability tests for optical instruments ... ..	5-50
279.	IS : 2466-1963 Beam compasses ... ..	1-50
280.	IS : 2533-1963 Geometry boxes ... ..	2-50
281.	IS : 2539-1963 Plane tables ... ..	2-00
<b>Internal Combustion Engines and Automotive Vehicles</b>		
282.	IS : 2634-1964 Helical springs for automobile suspension ... ..	2-00
<b>Machine Tools &amp; Small Tools</b>		
283.	IS : 664-1963 Centre drills ( <i>revised</i> ) ... ..	2-00
284.	IS : 2163-1963 Carbide tipped single point turning tools ... ..	5-00
285.	IS : 2169-1963 Milling arbors ... ..	5-50
286.	IS : 2367-1963 Test chart for box column drilling machines ... ..	2-50
287.	IS : 2368-1963 Test chart for cylindrical grinders ... ..	3-00
288.	IS : 2392-1963 Sizes for general purpose lathes ... ..	1-00
289.	IS : 2425-1963 Test chart for pillar type drilling machines ... ..	2-50
290.	IS : 2426-1963 Test chart for bench drilling machines ... ..	2-00
291.	IS : 2473-1963 Dimensions for centre holes ... ..	1-00
292.	IS : 2515-1963 Test chart for under crank type shearing machines and guillotines ... ..	2-00
293.	IS : 2534-1963 Carbide tipped dead centres ... ..	1-00
294.	IS : 2538-1963 Test chart for bench grinders ... ..	1-50
295.	IS : 2540-1964 Dimensions for threaded centre holes ... ..	1-00
296.	IS : 2582-1963 Dimensions for type 'A' and type 'B' spindle noses and back plates ... ..	5-00
297.	IS : 2583-1963 Dimensions for camlock type spindle noses and back plates ... ..	5-00
298.	IS : 2594-1963 Hacksaw blades ... ..	3-50
299.	IS : 2642-1964 Sizes of machine tool tables ... ..	1-00
<b>Mechanical Handling, Lifting</b>		
300.	IS : 2429-1963 Electrically welded mild steel chain, short linked and pitched or calibrated, for lifting purposes ... ..	4-00

Sl No.		Rs
<b>Non-Destructive Testing</b>		
360.	IS : 2417-1963 Glossary of terms relating to ultrasonic testing ...	5-00
361.	IS : 2478-1963 Glossary of terms relating to industrial radiology ...	6-00
362.	IS : 2595-1963 Code of practice for radiographic testing ...	5-00
<b>Ores and Raw Materials</b>		
363.	IS : 2246-1963 Methods of sampling fluorspar (fluorite) ...	3-00
364.	IS : 2411-1963 Methods of chemical analysis of fluorspar (fluorite) ...	4-00
<b>Pig Iron, Cast Iron and Malleable Cast Iron</b>		
365.	IS : 2640-1964 Pearlitic malleable iron castings ...	2-00
<b>Refractories</b>		
366.	IS : 195-1963 Mortar, fireclay, for laying fireclay refractory bricks (second revision) ...	1-00
367.	IS : 2042-1963 Insulating refractories ...	1-00
368.	IS : 2043-1963 Siliceous fireclay refractories ...	1-00
<b>Steel Castings</b>		
369.	IS : 276-1963 Plain austenitic manganese steel castings (revised) ...	1-50
370.	IS : 503-1963 Alloy austenitic manganese steel castings (revised) ...	1-50
371.	IS : 2644-1964 High tensile steel castings ...	2-00
<b>Steel Forgings</b>		
372.	IS : 2611-1964 Carbon chromium molybdenum steel forgings for high temperature service ...	2-00
<b>Steel Products, Wrought</b>		
373.	IS : 513-1963 Carbon steel sheets, cold rolled (revised) ...	2-50
374.	IS : 649-1963 Methods of testing steel sheets for magnetic circuits of power electrical apparatus (revised) ...	3-50
375.	IS : 727-1964 Hard drawn carbon steel wire for springs for general engineering purposes (revised) ...	2-00
376.	IS : 1079-1963 Carbon steel sheet and strip, hot rolled (revised) ...	1-50
377.	IS : 1993-1962 Cold-reduced tinplate and cold-reduced blackplate ...	3-00
378.	IS : 2049-1963 Colour code for the identification of wrought steels for general engineering purposes ...	3-50
379.	IS : 2517-1963 Bright bars for threaded components ...	1-00
380.	IS : 2589-1964 Hard-drawn steel wire for upholsterys prings ...	1-00
381.	IS : 2591-1964 Hot rolled bars for threaded components ...	1-00
<b>Steel Tubes and Pipes</b>		
382.	IS : 1161-1963 Steel tubes for structural purposes (revised) ...	3-00
383.	IS : 1239-1964 Mild steel tubes and tubulars (revised) ...	5-50
384.	IS : 2328-1963 Method for flattening test on steel tubes ...	1-00
385.	IS : 2329-1963 Method for bend test on steel tubes ...	1-00
386.	IS : 2330-1963 Method for flanging test on steel tubes ...	1-00
387.	IS : 2335-1963 Method for drift expanding test on steel tubes ...	1-00
388.	IS : 2379-1963 Colour code for the identification of pipelines ...	2-50
389.	IS : 2416-1963 Boiler and superheater tubes for marine and naval purposes ...	3-50

Sl No.		Rs
<b>Structural Steel Sections</b>		
390.	IS : 1864-1963 Dimensions for angle sections with legs of unequal width and thickness ...	1-50
391.	ISI handbook for structural engineers No. 1 Structural steel sections (revised) ...	12-50
<b>Welding</b>		
392.	IS : 814-1963 Covered electrodes for metal arc welding of mild steel (revised) ...	5-50
393.	IS : 1395-1964 Molybdenum and chromium molybdenum low alloy steel electrodes for metal-arc welding (revised) ...	4-50
394.	IS : 1442-1964 Covered electrodes for the metal arc welding of high tensile structural steel (revised) ...	5-00
395.	ISI handbook for manual metal arc welding for welders ...	1-00
<b>Unclassified</b>		
396.	IS : 2500 (Part I)-1963 Sampling inspection tables : Part I Inspection by attributes and by count of defects ...	6-00
397.	IS : 2549-1963 Code for classification of processed ferrous scrap ...	1-50
<b>TEXTILES</b>		
<b>Aircraft Materials</b>		
398.	IS : 2651-1964 Cotton webbing, dyed, for aircraft safety belts and harnesses ...	2-50
<b>Chemical Test Methods</b>		
399.	IS : 9-1963 Method for determination of dimensional changes of cotton and linen woven fabrics on washing near the boiling point (revised) ...	2-00
400.	IS : 1299-1963 Method for determination of dimensional changes on washing of fabrics woven from rayon and synthetic fibres (revised) ...	2-00
401.	IS : 2349-1963 Method for determination of wettability of cotton fabrics ...	1-50
402.	IS : 2350-1963 Method for estimation of residual chlorine in cotton textile materials ...	1-50
403.	IS : 2369-1963 Method for determination of absorbency of highly absorbent materials such as cotton gauge and cotton wool ...	1-00
<b>Cotton Fabrics, Mill-Made</b>		
404.	IS : 2422-1963 Cotton fabric, dyed, water-resistant ...	2-00
405.	IS : 2457-1963 Cotton umbrella cloth (water-proofed) ...	2-00
406.	IS : 2613-1964 Cotton drill (non-waterproofed) for umbrellas ...	2-00
<b>Cotton Mill Accessories</b>		
407.	IS : 835-1963 Bottom shaft for plain calico cotton looms ...	1-00
408.	IS : 2487-1963 Flat steel healds for cotton, silk, woollen and worsted weaving (excluding jacquard and leno weaving) ...	2-00
409.	IS : 2531-1963 Crank shaft for plain calico cotton looms ...	2-00
410.	IS : 2579-1963 Box back blanks for cotton looms ...	1-00
411.	IS : 2623-1964 Blanks for sley caps for cotton looms ...	1-00
412.	IS : 2624-1964 Boards for sley races for cotton looms ...	1-00
413.	IS : 2625-1964 Blanks for sley bottoms for cotton looms ...	1-00
<b>Cotton Spinning Machinery</b>		
414.	IS : 2510-1963 Bottom fluted rollers for cotton ring spinning frames: straight 'V' shaped equally spaced flutes ...	4-50

Sl. No.	Rs
<b>Grading of Fibres</b>	
415. IS : 2427-1963 Grading of continuous filament viscose rayon yarn and acetate yarn, bright and dull ... ..	5-00
<b>Jute Bags and Fabrics</b>	
416. IS : 2435-1963 Indian hessian ... ..	2-00
417. IS : 2436-1963 Heavy ccc jute bags ... ..	2-50
418. IS : 2437-1963 Jute corn sacks ... ..	2-50
419. IS : 2566-1963 B-twill jute bags ( for packing foodgrains ) ... ..	2-50
420. IS : 2580-1963 Jute bags for packing cement ... ..	3-00
<b>Narrow Fabrics</b>	
421. IS : 1923-1963 Cotton selvedge tape for electrical insulation purposes ( revised ) ... ..	2-50
<b>Packaging</b>	
422. IS : 32-1963 Seaworthy packaging of woollen and worsted cloth and yarn ( revised ) ... ..	1-50
423. IS : 2194-1963 Seaworthy packaging of man-made fibre fabrics ... ..	2-00
424. IS : 2433-1963 Seaworthy packaging of jute products ... ..	1-50
<b>Physical Test Methods</b>	
425. IS : 2387-1963 Weight per linear metre ( or linear yard ) and weight per square metre ( or square yard ) of jute fabrics ... ..	1-00
<b>Rayon Fabrics</b>	
426. IS : 2423-1963 Nylon georgette ... ..	2-00
427. IS : 2424-1963 Nylon taffeta ... ..	2-00
<b>Ropes</b>	
428. IS : 2413-1963 Cotton twine ... ..	2-50
429. IS : 2452-1963 Hawser-laid cotton rope ... ..	4-50
430. IS : 2453-1963 Cable-laid cotton rope ... ..	4-00
<b>Terminology</b>	
431. IS : 2364-1963 Glossary of textile terms — fabrics made from natural fibres ... ..	4-50
<b>Wool Fabrics, Handloom</b>	
432. IS : 697-1963 Woollen druggets for export ( revised ) ... ..	2-50
433. IS : 2481-1963 Shoddy wool blankets ( single faced ) ... ..	2-00
<b>Wool Fabrics, Mill-Made</b>	
434. IS : 668-1963 Serge, ordinary ( revised ) ... ..	2-50
435. IS : 669-1963 Serge, drab mixture ( revised ) ... ..	2-50
436. IS : 670-1963 Serge, worsted, dyed ( superior ) ( revised ) ... ..	2-50
437. IS : 671-1963 Serge, battle dress ( drab mixture ) ( revised ) ... ..	2-50
438. IS : 672-1963 Serge, white, lining ( revised ) ... ..	2-00
439. IS : 673-1963 Cloth, woollen, twill, dyed ( revised ) ... ..	2-00
440. IS : 674-1963 Flannel, hospital, grey ( revised ) ... ..	2-50
441. IS : 675-1963 Cloth, bunting, worsted ( revised ) ... ..	2-00
442. IS : 676-1963 Bunting, worsted ( revised ) ... ..	2-00
443. IS : 677-1963 Cloth, drab mixture, woollen ( water resistant ) No. 1 ( revised ) ... ..	2-50

Sl. No.	Rs
444. IS : 678-1963 Cloth, drab mixture, woollen ( water resistant ) No. 2 ( revised ) ... ..	2-00
445. IS : 679-1963 Great coat cloth, woollen ( revised ) ... ..	2-00
446. IS : 680-1963 Cloth, barathea ( revised ) ... ..	2-50
<b>Wool Hosiery and Knitted Garments</b>	
447. *IS : 2331-1963 Coir mattings, mourzouks and carpets ... ..	2-00
448. IS : 2360-1963 Worsted jerseys ... ..	3-00
449. IS : 2522-1963 Worsted mufflers ... ..	3-00
450. IS : 2523-1963 Worsted hose tops ... ..	3-50
<b>EC</b>	
451. IS : 4-1963 Guide for layout of learned periodicals ( revised ) ... ..	4-00
452. IS : 2381-1963 Recommendations for bibliographical references ... ..	2-50
453. IS : 2550-1963 Glossary of classification terms ... ..	10-00

**HINDI TRANSLATION OF INDIAN STANDARDS**

1. IS : 1020-1963 Conversion tables for ordinary use ( revised ) ... ..	0-75
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**INDIAN STANDARDS WITHDRAWN DURING 1963-64**

1. IS : 165-1950 Aluminium paint, brushing, for general purposes, in dual container
2. IS : 166-1950 Aluminium paint, spraying, for general purposes, in dual container
3. IS : 223-1950 Tensile testing of metals ( ferrous )
4. IS : 270-1950 Code for the manufacture of pickers

**INDIAN STANDARDS AMALGAMATED DURING 1963-64**

1. IS : 867 ( Part I )-1956 and IS : 867 ( Part II )-1959 Methods of sampling and test for phenolic moulding materials have been amalgamated in revision and issued as IS : 867-1963 Methods of test for phenolic moulding materials ( revised )
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\*Transferred to Consumer Products Division.

## APPEN

( See

### INCOME AND EXPENDITURE ACCOUNT FOR

#### EXPENDITURE

Sl No.	HEADS OF EXPENDITURE	AMOUNT Rs
1.	Pay of Officers	934 089-99
2.	Allowances of Officers	143 016-55
3.	Provident Fund Contribution for Officers : i) Interest ii) Contribution	38 628-00 72 461-00
4.	TA for : i) Officers ii) Committee Members	252 198-29 38 671-36
5.	Pay of Establishment	1 038 157-53
6.	Allowances of Establishment	429 486-60
7.	Provident Fund Contribution for Staff : i) Interest ii) Contribution	28 057-00 80 626-00
8.	TA for Staff	18 655-29
9.	Subscription for ISO & IEC	40 254-90
10.	Printing	291 680-23
11.	Conferences : i) National ii) International	23 024-15 —
12.	Certification Testing	54 990-82
13.	Research & Consultation	18-30
14.	Publicity : i) Exhibition ii) Advertising, etc iii) Museum	46 159-09 543-05
15.	Other Charges : i) Stationery ii) Postage & Telegrams iii) Library iv) Telephones v) Furniture vi) Office Equipment vii) Rent & Taxes viii) Electric & Water Charges ix) Advertisement ( Recruitment of Staff ) x) Audit Charges xi) Maintenance of Building, etc xii) Medical Relief xiii) Maintenance & Purchase of Staff Car xiv) Staff Welfare xv) Miscellaneous xvi) Depreciation	148 992-84 127 097-75 47 078-72 73 326-46 38 780-62 26 755-28 57 056-53 41 805-67 24 833-34 1 500-00 17 976-54 54 376-44 16 747-91 9 138-57 77 141-52 156 523-98 282 887-71
Excess of Income/Expenditure Carried Over to Balance Sheet		282 887-71
<b>TOTAL</b>		<b>4 732 738-03</b>

## DIX B

Page 14)

### THE YEAR ENDED 31 MARCH 1964

#### INCOME

Sl No.	HEADS OF INCOME	AMOUNT Rs
1.	Income Other than Government Grants:	
	i) Subscription	807 591-21
	ii) Sale proceeds of ISI Publications ( Net )	601 385-74
	iii) Commission on Sale of Publications Other than ISI Publications	141 762-78
	iv) Certification Marks Fees, Inspection & Testing Charges	566 674-62
	v) Contribution by ISI Employees to CGHS	10 358-00
	vi) Miscellaneous Receipts	50 591-71
	vii) Advertisements in ISI Bulletin	54 373-97
		2 232 738-03
2.	Government Grant for Recurring Expenditure	2 500 000-00

**TOTAL** 4 732 738-03

**APPEN  
BALANCE SHEET AS**

Sl. No.	LIABILITIES		AMOUNT
	Rs	Rs	
1.	Capital Account:		
i)	Balance as per Last Balance Sheet	2 829 547-76	
ii)	Add Cost of Laboratory Equipment, Capitalized	21 331-82	
iii)	Add Cost of Staff Car Donated to Calcutta Branch	15 141-00	
iv)	Add Excess of Income Over Expenditure for the Year	282 887-71	
			3 148 908-29
2.	Reserve & Surplus:		
i)	IEC & ISO Annual Group Meetings Fund:		
a)	Balance as per Last Balance Sheet	57 532-73	
b)	Add Receipt During the Year	81 550-00	
c)	Government Grant for 'INDIA MAKES' Brochure	75 000-00	
		214 082-73	
d)	Less Expenditure During the Year	1 795-33	
			212 287-40
ii)	K.L. Moudgill Prize Fund:		
a)	Balance as per Last Balance Sheet	13 325-58	
b)	Add Receipt During the Year	1 194-84	
		14 520-42	
c)	Less Expenditure During the Year	1 110-00	
			13 410-42
iii)	Gratuity Fund:		
a)	Balance as per Last Balance Sheet	28 094-26	
b)	Add Receipt During the Year	17 036-05	
		45 130-31	
c)	Less Payments During the Year	13 570-55	
			31 559-76
iv)	Company Standardization Training Fund:		
a)	Balance as per Last Balance Sheet	25 412-28	
b)	Add Receipt During the Year	32 009-30	
		57 421-58	
c)	Less Expenditure During the Year	30 658-76	
			26 762-82
v)	ISI Second Building & Laboratory Equipment Fund:		
a)	ISI Second Building:		
i)	Balance as per Last Balance Sheet	81 397-66	
ii)	Interest-Free Deposits (Repayable Within 5 Years)	485 250-00	
iii)	Donations	49 344-00	
			615 991-66
	CARRIED OVER	615 991-66	3 432 928-69

**DIX B—Contd  
AT 31 MARCH 1964**

Sl. No.	ASSETS		AMOUNT
	Rs	Rs	
1.	Fixed Assets:		
i)	ISI Building (Manak Bhavan):		
a)	Balance as per Last Balance Sheet	1 786 275-74	
b)	Less Depreciation Written Off	102 370-37	
			1 683 905-37
ii)	ISI Second Building:		
a)	Balance as per Last Balance Sheet	56 822-60	
b)	Additions During the Year	98 881-98	
			155 704-58
iii)	Laboratory Equipment:		
a)	Balance as per Last Balance Sheet	187 825-49	
b)	Add Transferred from Office Equipment	5 322-98	
c)	Additions During the Year	21 331-82	
		214 480-29	
d)	Less Depreciation Written Off	14 527-65	
			199 952-64
iv)	Furniture & Office Equipment:		
a)	Balance as per Last Balance Sheet	166 321-83	
b)	Less Transferred to Laboratory Equipment	5 322-98	
		160 998-85	
c)	Additions During the Year	60 981-98	
		221 980-83	
d)	Less Depreciation Written Off	31 625-58	
			190 355-25
v)	Staff Cars:		
a)	Balance as per Last Balance Sheet	24 860-99	
b)	Additions During the Year	15 141-00	
		40 001-99	
c)	Less Depreciation Written Off	8 000-38	
			32 001-61
vi)	Library Books:		
a)	Balance as per Last Balance Sheet	14 862-96	
b)	Additions During the Year	1 124-55	
			15 987-51
2.	Investments (at Cost):		
i)	Deposits with the Banks:		
a)	Balance as per Last Balance Sheet	36 510-63	
b)	Additions During the Year	3 440 054-84	
		3 476 565-47	
c)	Less Liquidated During the Year	1 485 139-53	
			1 991 425-94
ii)	K.L. Moudgill Prize Fund: (Shares of Jay Engineering Works)		
			11 400-00
	CARRIED OVER		4 280 732-90



**APPEN  
BALANCE SHEET AS**

**LIABILITIES**

	Rs	AMOUNT Rs
<b>BROUGHT FORWARD</b>	615 991-66	3 432 928-69
b) Laboratory Equipment:		
i) Balance as per Last Balance Sheet	28 302-11	
ii) Less Expenditure During the Year	21 331-82	
c) i) Government Grant	500 000-00	6 970-29
ii) Less Previous Year's Unutilized Balance Adjusted	31 479-51	468 520-49
vi) Contributory Provident Fund:		1 091 482-44
a) Opening Balance as at 1-4-1963:		
Subscription Contribution	1 006 255-00	
704 149-00		
b) Add Subscription (Less Withdrawals) During the Year	1 710 404-00	
c) Add Contribution (Less Refunds) During the Year	167 439-00	
	144 350-00	
Current Liabilities:		2 022 193-00
i) Advance Subscription for 1964		
i) Sundry Creditors:		606 055-12
a) Inland	367 256-65	
b) Abroad	158 351-62	
		525 608-27
<b>TOTAL</b>	<b>7 678 267-52</b>	

I have examined the foregoing accounts and balance sheet of Indian Standards Institution. I have obtained all the information and explanations that I have required, and subject to the observations in the separate Audit Report, I certify, in my opinion, that in my opinion these accounts and Balance Sheet are properly prepared up so as to exhibit a true and fair view of the state of affairs of the Institution according to the best of my information and explanations given to me and as shown by the books of the Institution.

Sd. D. D. DHINGRA  
Accountant General  
Commerce, Works & Miscellaneous, New Delhi

**DIX B—Contd  
AT 31 MARCH 1964**

**ASSETS**

Sl. No.		Rs	AMOUNT Rs
	<b>BROUGHT FORWARD</b>		4 280 732-90
iii)	Contributory Provident Fund:		
a)	National/Defence Savings Certificates	1 706 000-00	
b)	Balance of Advances to Members	91 070-00	
c)	Bank Balance (State Bank of India, Delhi)	225 009-00	
d)	Cash in Hand	114-00	
			2 022 193-00
3.	Current Assets:		
i)	Stock:		
Printing Paper in Hand			344 643-18
ii)	Sundry Debtors:		
a)	Due against Sale of Publications	283 675-30	
b)	Due against Advertisement in ISI Bulletin	33 418-37	
			317 093-67
4.	i) Loans and Advances:		
a)	Conveyance Advances to Staff	69 890-91	
b)	Advances to Staff for Purchases, etc	6 990-07	
c)	Advances to Others	22 048-14	
			98 929-12
ii)	Security Deposits:		
a)	With Telephone Deptt., Bombay and Delhi	150-00	
b)	With Calcutta Electric Supply Corporation	100-00	
c)	With NDMC, New Delhi	3 600-00	
d)	With DESU, Delhi	6 500-00	
e)	With N. Railway, New Delhi	16 000-00	
f)	With Municipal Committee, Mussoorie	260-00	
			26 610-00
iii)	Pre-Paid Expenses:		
a)	Controller of Stationery, Calcutta	42 023-70	
b)	Ghose Estates, Calcutta	5 028-75	
c)	Director, Map Publications, Dehra Dun	215-31	
d)	Estate Office, New Delhi	42 196-45	
			89 464-21
5.	Cash and Bank Balances:		
i)	With Bankers	486 263-01	
ii)	In Office (Including Imprest)	8 459-02	
iii)	Postage Stamps in Hand	3 879-41	
			498 601-44
<b>TOTAL</b>			<b>7 678 267-52</b>

Sd. HARBANS LAL  
Secretary (Administration)  
Indian Standards Institution, New Delhi

# INDIAN STANDARDS INSTITUTION

## GENERAL INFORMATION

Indian Standards Institution (ISI) started functioning in 1947 as the national standards organization of India, with the principal object of preparing and promoting the general adoption of standards on national and international basis.

The overall control of ISI, which is run and financed jointly as a non-profit making body by the Central Government and the private enterprise, is exercised by a General Council, composed of representatives of Central and State Governments, leading industrial, trade, scientific and technical organizations, and subscribing members. The Union Minister for Industry is ex-officio President of ISI.

The Technical activity of ISI is carried out through eight Division Councils — one each for Agricultural and Food Products, Building, Chemical, Consumer Products, Electrotechnical, Mechanical Engineering, Structural and Metals, and Textile. All technical work relating to the formulation and revision of standards is done by committees consisting of experts drawn from manufacturing units, technical institutions, consuming organizations and other bodies concerned, who are appointed by and work under the direction of their respective Division Councils.

To make benefits of standardization available to the common man, ISI is operating, under the Indian Standards Institution Certification Marks Act, 1952, as amended by the Amendment Act, 1961, ISI Certification Marks Scheme, according to which quality goods produced, according to the provision of the relevant Indian Standards, can carry the ISI Certification Mark. This Certification Mark is a third-party guarantee of the quality of marked goods, and licences for its use are granted by ISI to manufacturers producing goods conforming to Indian Standards and maintaining quality control at different stages of production. Checks on the quality of marked goods are exercised by ISI through periodical and surprise factory inspections, testing in independent laboratories of such products obtained from factories and open market, etc.

In the international field, ISI represents India on International Organization for Standardization (ISO), which links 50 countries and functions through 107 technical committees; International Electrotechnical Commission (IEC); and Commonwealth Standards Conference. At present, ISI participates in the work of 78 technical committees of ISO and all technical committees of IEC, covering a wide range of subjects; and holds the Secretariats for 14 committees, subcommittees and working groups of ISO and IEC dealing with subjects of interest to India, including lac, mica, electric fans, pictorial markings for handling of goods, liquid flow measurement through open channels, and spices and condiments.

(Continued from cover page 2.)

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Vice-Chairman L.R. B. R. NIJHAWAN  
Secretary SHRI B. S. KRISHNAMACHAR (ISI)

### Textile Division Council (TDC)

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### Certification Marks Advisory Committee (CMAC)

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### Advisory Committee on Implementation of Indian Standards (ACIIS)

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