Standardization in Emerging Technologies

Bureau of Indian Standards
09th May 2024

Bureau of Indian Standards (BIS)

National Standards Body of India.
Driven by **THE BUREAU OF INDIAN STANDARDS ACT, 2016**

CORE ACTIVITIES OF BIS

- **Standards Formulation**
- Conformity Assessment
  - ✓ Product certification
  - ✓ Self declaration of conformity
  - ✓ Hallmarking
  - ✓ System Certification
- Testing
- Training

Standards development at a glance

16 Division Councils

350 Sectional Committees

22,500+ Standards

Technical divisions for Standardization

Standards are set by BIS through 350 technical committees under 16 division councils

Chemical	Civil Engineering	Electronics and Information Technology	Electro-technical
Food and Agriculture	Management and Systems	Mechanical Engineering	Medical Equipment and Hospital Planning
Metallurgical Engineering	Petroleum, Coal and related products	Production and General Engineering	Textiles
Transport Engineering	Water Resources	Service Sector	AYUSH

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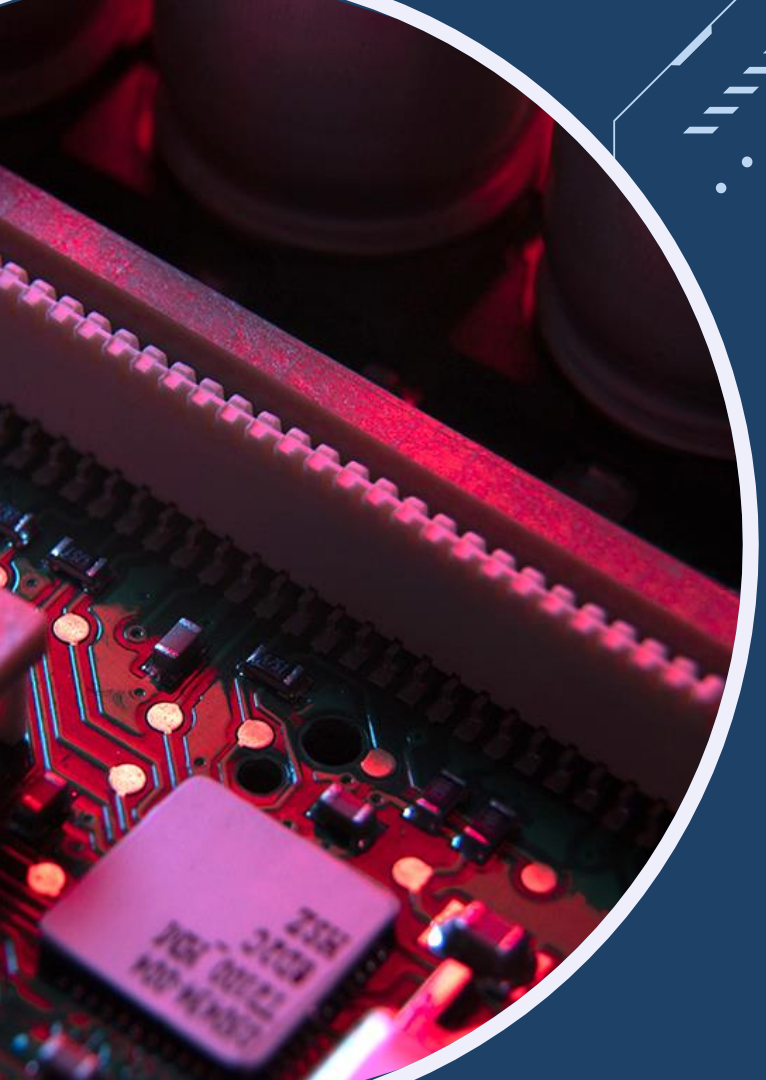


LITD

Standardization in the field of
Electronics and Information Technology (IT) including Information & Communication Technologies (ICT)

LITDC

35	SECTIONAL COMMITTEES	88	WORKING GROUPS
04	SUB-COMMITTEES	1637	STANDARDS PUBLISHED
28	PANELS	1600	EXPERTS

SECTIONAL COMMITTEES

More than 1600 standards have been published by LITD through 35 sectional committees

LITD 01 Environmental Testing Procedures for electronic products	**LITD 02** Reliability Of Electronic and Electrical Components and Equipment	**LITD 03** Electromechanical components and mechanical structures for electronic equipment	**LITD 04** Electronic display devices and Systems	**LITD 05** Semiconductor and other electronic components and devices	**LITD 06** Wires, cables, waveguides and accessories
LITD 07 Audio, video and Multimedia systems and Equipment	**LITD 08** Electronic measuring Instruments, Systems and Accessories	**LITD 09** Electromagnetic Compatibility	**LITD 10** Power system Control and associated Communications	**LITD 11** Fibre optics, Fibres, Cables and devices	**LITD 12** Transmitting & receiving Equipment for Radio Communication
LITD 13 Interconnection and Information exchange among IT equipment and systems	**LITD 14** Software and Systems Engineering	**LITD 15** Data management Systems	**LITD 16** Identification & Data capture techniques, Cards and Security Devices	**LITD 17** Information systems Security and Privacy	**LITD 19** e- Learning

Electronics Committees

IT Committees

SECTIONAL COMMITTEES

LITD 20 Indian Language Technologies And Products	**LITD 22** Geographic Information	**LITD 23** Coding and processing of Audio, Picture, Multimedia and Hypermedia information	**LITD 24** Magnetic Components, Ferrite materials, Piezoelectric and Frequency control devices	**LITD 25** E-governance	**LITD 26** Alarms and Electronic Security Systems
LITD 27 Internet of Things and Digital Twin	**LITD 28** Smart Infrastructure	**LITD 29** BlockChain and distributed ledger technologies	**LITD 30** Artificial Intelligence	**LITD 31** Cloud Computing, IT & Data Centres	**LITD 32** Biometrics
LITD 33 Wearable electronic devices and technologies	**LITD 34** Smart Manufacturing	**LITD 35** Active Assisted Living	**LITD 36** Computer hardware, Peripherals, Office equipment and User Interfaces	**LITD 37** Brain-Computer Interface	

Electronics Committees IT Committees Committees on Emerging Technologies

PANELS

LITD C: Panel 5	LITD C: Panel 8	LITD C: Panel 9	LITD C: Panel 10
Quantum Computing	Metaverse	Trustworthiness	Digital Engineering

Participation in the International standardization work

BIS represents India at ISO and IEC

BIS participation in **ISO, IEC**

- ISO/IEC TC/SCs - ‘Participating’ member: **53**
- ISO/IEC TC/SCs - ‘Observer’ member: **17**
- BIS, as a participating member nominate experts on the working Groups of the ISO/IEC technical committees to participate in international standardization activities.
- These experts are the members of BIS technical committees
- Thus, BIS is a avenue to be a part of the international committees at ISO and IEC and participate in standardization at global level.

Major aspects covered in standards in electronics and IT area

ELECTRONICS

Vocabulary

Graphical Symbols

Safety

Environmental conditions and testing

EMI/EMC

Energy efficiency

Hardware Interfaces

Accessibility etc.

IT/ICT

Foundational Standards- Vocabulary, graphical symbols, reference architecture, use cases

Vocabulary

Interoperability

Information interchange

Safety

Security, Privacy

Trustworthiness, Ethics

Guidelines/ Best practices

Life cycle management

Software quality assurance

Asset management

Data management

EMERGING TECHNOLOGIES AND STANDARDS

LITD 30-Artificial Intelligence Sectional Committee

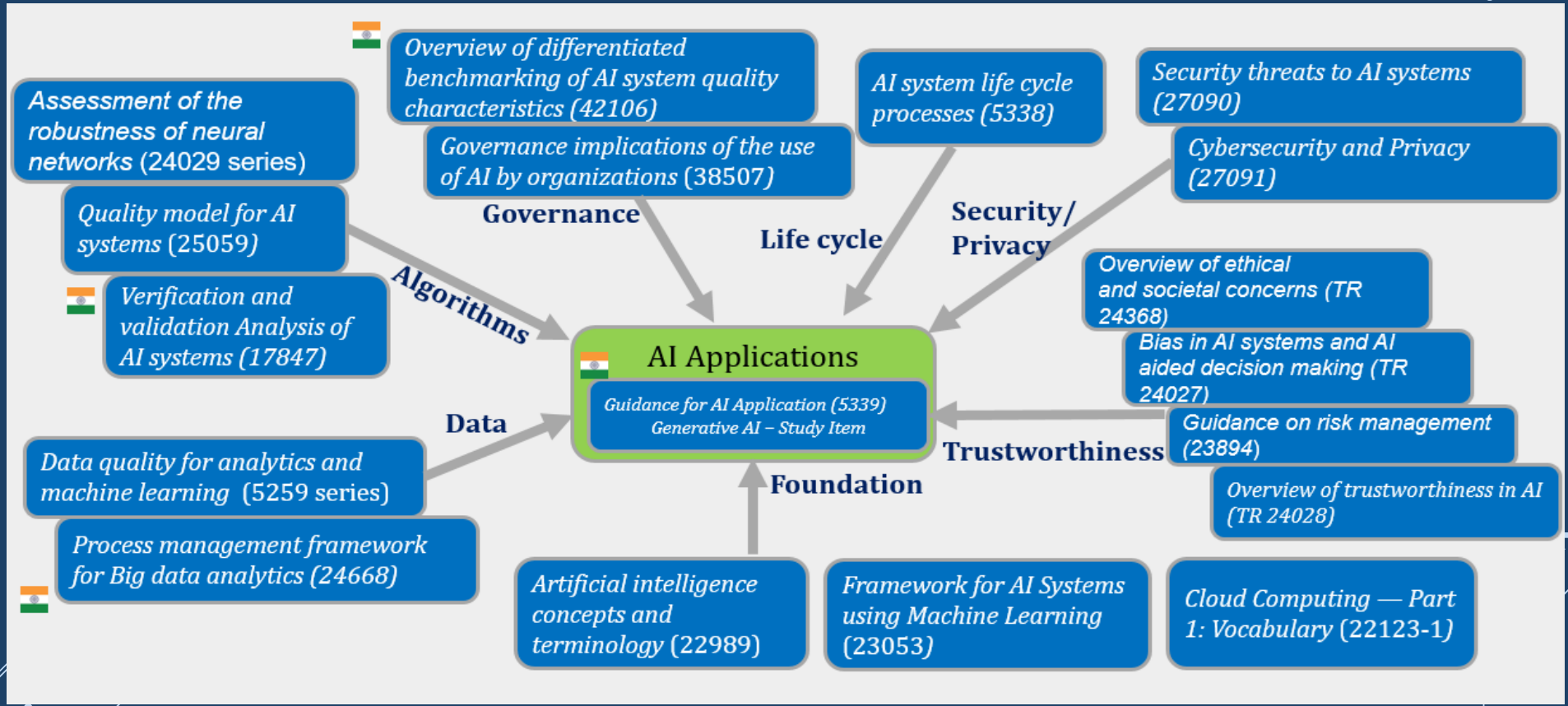
LITD 30

ISO/IEC JTC 1/ SC 42
(Artificial Intelligence)

SCOPE of the committee

- Standardization in the area of Artificial Intelligence and Big Data

Relevant **AI** Standardization Activities



Potential Proposals

- **Reliability of AI systems:** *This proposal Intends to describe reliability measures for AI systems so that reliability is measured and reported before use.*

- **Guidance for Generative AI Applications:** *This document provide guidance to identify value contribution and value realization for each stakeholder when developing or using a generative AI application. This document also provide guidance for governance mechanism to manage use of an existing generative AI application as a service .*

LITD 17 : Information Systems Security And Privacy

LITD 17

ISO/IEC JTC 1/ SC 27
Information security, cybersecurity and privacy protection

SCOPE of the committee

Standardization in Security and Privacy aspects of Information Systems

Standards related to Security and Privacy

- **IS/ISO/IEC 27001** Series Information security, cybersecurity and privacy protection- Information security management systems- Requirements
- **IS 17428 (Part 1) : 2020** Data Privacy Assurance Part 1 Engineering and Management Requirements
- **IS 17428 (Part 2) : 2020** Data Privacy Assurance Part 2 Engineering and Management Guidelines
- **IS 17737 series** Mobile Device Security
- IoT Device Security - Under development

LITD 27 : Internet of Things and Digital Twin

LITD 27

ISO/IEC JTC 1/ SC 41
(Internet of things and digital twin)
WG 3: IoT Foundational Standards
WG 4: IoT Interoperability
WG 5: IoT Applications
WG 6: Digital Twin
WG 7: Maritime, underwater IoT and Digital Twin applications

SCOPE of the committee

To develop standards in the field of Internet of Things & Digital Twin related technologies including sensor networks.

Standards related to IoT

- **IS/ISO/IEC TR 22417:2017** IoT use cases
- **IS/ISO/IEC 30118 series:** OCF specifications
- **ISO/IEC 30141:2018** IoT Reference architecture
- **ISO/IEC 21823 series:** Interoperability for IoT systems (4 parts - Framework, Transport, Semantic and Syntactic interoperability)
- **ISO/IEC 29182 series (7 parts)** Sensor networks: SNRA
- **ISO/IEC 30161-1:2020** Data exchange platform for IoT services - Part 1: General requirements and architecture
- **ISO/IEC 30162:2022** Compatibility requirements and model for devices within Industrial IoT systems
- **ISO/IEC 30140** UWASN (4 parts - Overview and requirements, RA, Entities and interfaces & Interoperability)
- **ISO/IEC 30177** "Internet of Things (IoT) - Underwater network management system (U-NMS) interworking" (Under development) – ***India led project***
- Recently, Indian NB **proposed** an international standard on **"IoT for Stress Management, Good health & Well-being"** to ISO/IEC JTC 1/SC 41 which was appreciated and approved for the draft submission

Moreover, Indian experts are very actively involved in various Working Groups of ISO/IEC JTC 1/SC 41

LITD 31- Cloud Computing, IT and Data Centres Sectional Committee

LITD 31

ISO/IEC JTC 1/ SC 38 Cloud Computing and Distributed platforms

ISO/IEC JTC 1/ SC 39 Sustainability, IT and Data Centres

SCOPE of the committee

To establish Indian standards in the field of a) Cloud Computing and Distributed Platforms including Foundational concepts and technologies, Operational issues, and Interactions among Cloud Computing systems and with other distributed systems

Cloud computing standards

- **IS/ISO/IEC 22123 series:** Information technology — Cloud computing: Vocabulary, Concepts and Reference Architecture.
- **IS/ISO/IEC 19944-1:2020:** Cloud computing and distributed platforms — Data flow, data categories and data use — Part 1: Fundamentals
- **ISO/IEC 19944-2:2022:** Cloud computing and distributed platforms — Data flow, data categories and data use — Part 2: Guidance on application and extensibility
- **ISO/IEC AWI TR 10822-1:** Cloud computing — Multi-cloud management — Part 1: Overview and use cases

LITD 34- Smart Manufacturing Sectional Committee

LITD 34

IEC Systems Committee Smart Manufacturing

IEC SC 65C (Industrial networks), IEC SC 65E (Devices and integration in enterprise systems)

SCOPE of the committee

Standardization in the field of Smart Manufacturing including systems level standardization.

Smart manufacturing standards

- **IEC 62443 series:** Industrial communication networks - Network and system security related standards. (IEC TC 65/SC65E)
- **IEC 62541 series:** OPC Unified Architecture series. (IEC TC 65/SC65E)
- **ISO/IEC TR 63306-1:2020:** Smart manufacturing standards map (SM2) - Part 1: Framework
- **ISO/IEC TR 63306-2:2021:** Smart manufacturing standards map (SM2) - Part 2: Catalogue
- **IEC SRD 63456 ED1:** Systems Reference Deliverable (SRD) - Navigation Tools for Smart Manufacturing (under development
- **IEC SRD 63459 ED1:** Systems Reference Deliverable (SRD) Template for Smart Manufacturing Use Cases (under development)

LITDC Panel 5- Quantum Computing Panel

LITDC P/5

ISO/IEC JTC 1/WG 14 ‘Quantum Information Technology’

SCOPE of the panel

a) To contribute and participate to the work of JTC 1/WG 14,
b) To study the standardization aspects related to quantum computing hardware, software, quantum computing infrastructure and applications including Quantum communication, quantum security and to provide recommendations w.r.t development of standards in the area of quantum computing.

LITDC Panel 8- Metaverse Panel (Newly formulated Panel)

LITDC P/8

ISO/IEC SEG 15 ‘Metaverse’

SCOPE of the panel

To investigate the needs for standardization in the area of Metaverse, taking into account current research, technology and standardization activities, and trends. Moreover, to recommend an initial roadmap for standardization activities in the area of Metaverse.

LITD 33- Wearable Electronic Devices & Technologies Sectional Committee

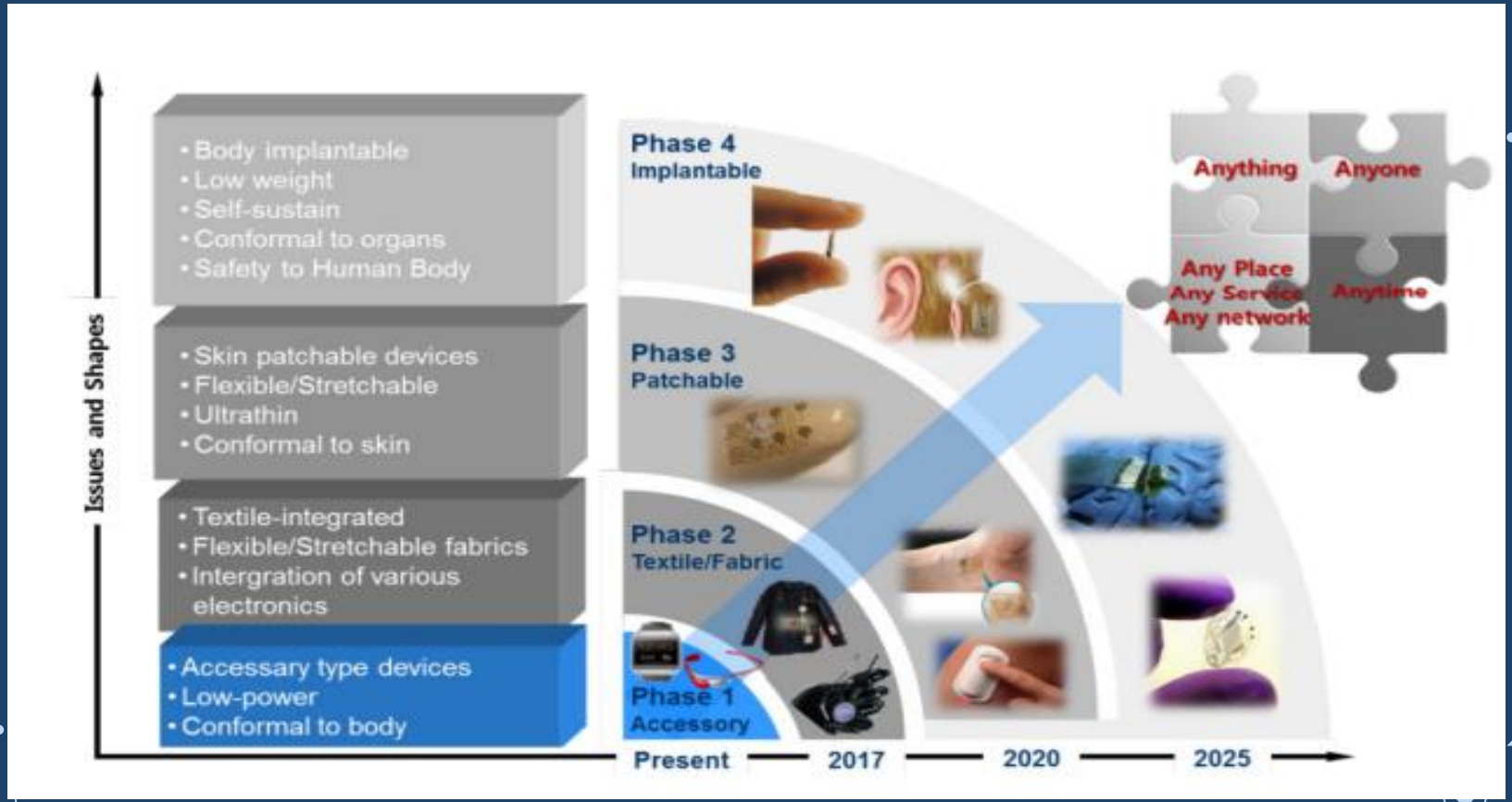
LITD 33

IEC TC 124 ‘Wearable Electronic Devices & Technologies’

SCOPE of the committee

Standardization in the field of wearable electronic devices and technologies which include patchable materials and devices, implantable materials and devices, ingestible materials and devices, and electronic textile materials and devices.

Wearable Standardization landscape



Standards on E-Textiles

Published:

IEC 63203-101-1:2021 Terminology
IEC 63203-201-1: 2022 Measurement method for basic properties of conductive yarns
IEC 63203-201-2: 2022 Measurement methods for basic properties of conductive fabrics & insulating materials
IEC 63203-201-2: 2021 Determination of electrical resistance of conductive textiles
IEC 63203-204-1:2023 Test method for assessing washing durability of etextile products

Under Development:

IEC 63203-203-1 Test method for measuring performance of fabric-based triboelectric nanogenerator (India) - IIT Delhi
IEC 63203-203-2 Test method for measuring performance of fabric-based piezoelectric nanogenerator (India) - IIT Delhi
IEC 63517 Test method for performance of heating products
IEC 63203-204-2 Electrical resistance change in knee and elbow bending test of e-textiles

Standards on Devices & Systems

Published:

IEC 63203-402-2:2024 Performance measurement of fitness wearables - Step Counting
IEC 63203-402-3:2014 Performance measurement of fitness wearables - Accuracy of Heart Rate
IEC 63203-406-1:2021 Surface temperature of wrist-worn wearable electronic devices while in contact with human skin
IEC 63203-801: Smart Body Area Network (SmartBAN)

Under Development:

Test methods of surface electromyography sensors for wearable applications
Mobile Wearable Device Data Security (India) - Delhi University
Performance of stress measurement of wearables
Performance measurement of fitness wearables - Sleep measurements

LITD 09- Electromagnetic Compatibility Sectional Committee

LITD 09

IEC/TC 77 Electromagnetic Compatibility
IEC/SC 77A Low Frequency Phenomena
IEC/SC 77B High Frequency Phenomena
IEC/SC 77C High Power Transient Phenomena

IEC/TC 106 Methods for the assessment of Electric, Magnetic and Electromagnetic fields associated with human exposure

CISPR International special committee on radio interference
CIS/A Radio-interference measurements and statistical methods
CIS/B Interference relating to industrial, scientific and medical radio-frequency apparatus, to other (heavy) industrial equipment, to overhead power lines, to high voltage equipment and to electric traction
CIS/D Electromagnetic disturbances related to electric/electronic equipment on vehicles and internal combustion engine powered devices
CIS/F Interference relating to household appliances tools, lighting equipment and similar apparatus
CIS/H Limits for the protection of radio services
CIS/I Electromagnetic compatibility of information technology equipment, multimedia equipment and receivers

SCOPE of the committee

a) Electromagnetic compatibility of electrical and/or electronic equipment, between themselves and with electrical power networks including Electromagnetic interference.
b) Measurement and calculation methods to assess human exposure to electric, magnetic and electromagnetic fields.

Relevant **EMI/EMC** Standards

IS/CISPR 32 : 2015	Electromagnetic Compatibility of Multimedia Equipment Emission Requirements
IS/CISPR 35 : 2016	Electromagnetic Compatibility of Multimedia Equipment Immunity Requirements
IS 6873 Series	Limits and methods of measurements of radio disturbance characteristics (Based on CISPR 11, CISPR 12, CISPR 14-1 & 2 and CISPR 15)
IS 14700 (Part 4 Series)	Electromagnetic compatibility EMC Part 4 testing and measurement techniques (Based on IEC 61000-4 Series)
IS 15040 : 2020 CISPR 25	Radio Disturbance Characteristics for Protection of Receivers used on Board Vehicles Boats and Internal Combustion Engines Limits and Methods of Measurement
IS/IEC 62209 Series	Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices Human models instrumentation and procedures

LITD 11- Fibre Optics, Fibres, Cables and Devices Sectional Committee

LITD 11

IEC/TC 86 Fibre Optics
IEC/SC 86A Fibres and Cables
IEC/SC 86B Fibre Optic Interconnecting Devices and Passive Components
IEC/SC 86C Fibre Optic Systems and active devices

SCOPE of the committee

To prepare Indian Standard for fibre optics systems and associated components and devices intended for use with communications equipment and devices employing similar techniques.

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THANKS!

DO YOU HAVE ANY QUESTIONS?

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