

**Indian Standards Related to
Public Health Engineering**

Cement

There are 14 types of Cement Standards. These standards cover manufacture and chemical and physical requirements of cements to ensure their quality. All cements are under mandatory BIS certification and bear the popular ISI mark of BIS. Important standards are :

IS No.	Title
IS 269:2015	Specification for ordinary Portland cement (<i>sixth revision</i>)
IS 455:2015	Specification for Portland slag cement (<i>fifth revision</i>)
IS 1489 (Part 1):2015	Specificity on for Portland pozzolana cement: Part 1 Flyash based (<i>fourth revision</i>)
IS 12330:1988	Specification for sulphate resisting Portland

Concrete and Materials

Design codes to be used for construction of structures like treatment plant, water tanks, etc.

Concrete codes

- **IS 456:2000** Plain and reinforced concrete
- **IS 3370 (various parts)** Liquid retaining structures
- **IS 4926:2003** Ready mixed concrete
- **IS 10262:2019** Concrete mix proportioning

Masonry design

- **IS 1905:1987** Structural use of unreinforced masonry

Aggregates

- **IS 383:2016** Coarse and fine aggregates for concrete
- **IS 9142** Artificial lightweight aggregate for concrete: **Part 1** For concrete masonry blocks and for applications other than for structural concrete; **Part 2** Sintered fly ash coarse aggregate

Steel Reinforcements

- **IS 1786:2008** High strength deformed steel bars and wires for concrete reinforcement
- **IS 16172:2014** Reinforcement couplers for mechanical splices of bars for concrete reinforcement

Water Supply and Treatment

These standards help in arriving at water demand for water supply to the households. Some of these are relating to water treatment.

IS 1172:1993 Code of basic requirements for water supply, drainage and sanitation

IS 2064:1993 Code of practice for selection, installation and maintenance of sanitary appliances

IS 2065:1983 Code of practice for water supply in buildings

IS 7090:1985 Guidelines for rapid mixing devices

IS 7208:1992 Guidelines for flocculator devices

IS 10553 (Part 1 to 5):1983 Requirements for chlorination equipment

IS 8419 (Part 1 and 2) Requirements for filtration equipment: **Part 1** Filtration media - sand and gravel; **Part 2** Under drainage system

IS 11401 Requirements for slow sand filters: **Part 1** General guidelines; **Part 2** Design, construction, operation and maintenance

National Building Code of India 2016 : Part 9 Plumbing services (including solid waste management) Section 1 Water supply

Sewage Treatment and Disposal

These standards guide for building drainage, household and municipal sewage disposal and treatment, safety code for entering a sewerage system

- **IS 1742:1983** Code of practice for building drainage
- **IS 2470 (Part 1 and 2)** Code of practice for installation of septic tanks:
Part 1 Design criteria and construction; **Part 2** Secondary treatment and disposal of septic tank effluent
- **IS 4111 (Parts 1 to 5)** Code of practice for ancillary structures in sewerage system
Part 1 Manholes; **Part 2** Flushing tanks; **Part 3** Inverted syphon; **Part 4** Pumping stations and pumping mains (rising mains); **Part 5** Tidal outfalls
- **IS 5611:1987** Code of practice for construction of waste stabilization ponds (faculative type)
- **IS 9872:1981** Precast concrete septic tanks
- **IS 10037** Requirements for sludge dewatering equipment: **Part 1** Sludge drying beds-sand, gravel and underdrains; **Part 2** Vacuum filtration equipment; **Part 3** Centrifugal equipment (Solid bowl type)
- **IS 11972:1987** Code of practice for safety precautions to be taken when entering a sewerage system
- **IS 12314:1987** Code of practice for sanitation with leaching pits for rural community
- **SP 7 (Part 9/ Sec 2)** National Building Code of India 2016 : **Part 9** Plumbing services (including solid waste management) **Section 2** Drainage and sanitation
- **IS 14402:1996** Specification for GRP pipes, joints and fittings for use for sewerage, industrial waste and water (other than potable)

Water Fittings and Sanitary Appliances

Following are the specifications for water meters, valves for water works purposes and products like taps, urinals, cisterns, water closets for use in public toilets

- **IS 779:1994** Water meters (domestic type)
- **IS 2556 (Parts 1 to 17)** Vitreous sanitary appliances (Vitreous China) - specification
- **IS 2692:1989** Ferrules for water services
- **IS 7231:1994** Plastic flushing cisterns for water closets and urinals
- **IS 8931:1993** Copper alloy fancy single taps, combination tap assembly and stop valves for water services
- **IS 12701:1996** Rotational moulded polyethylene water storage tanks
- **IS 778:1984** Specification for 2010 copper alloy gate, globe and check valves for waterworks purposes
- **IS 9739:1981** Pressure reducing valves for domestic water supply systems
- **IS 13095:1991** Butterfly valves for general purposes
- **IS 14845:2000** Resilient seated cast iron air relief valves for water works purposes – specification
- **IS 14846:2000** Sluice valves for water works purposes (50 to 1200 mm)

Pipes and Fittings

Following are the Indian Standards for plastic pipes and fittings for water supply, building drainage and sewerage

Plastics

- **IS 4984:2016** High density polyethylene pipes for water supply
- **IS 4985:2000** Unplasticized PVC pipes for potable water supplies
- **IS 7834 (Part 1 to 8)** Injection moulded PVC socket fittings with solvent cement joints for water supplies
- **IS 8008 (Part 1 to 9)** Injection moulded/machined high density polyethylene (HDPE) fittings for potable water supplies — Specification: Part 1 General requirements for fittings
- **IS 13592:2013** Unplasticized polyvinyl chloride (PVC-U) pipes for soil and waste discharge system for inside and outside buildings including ventilation and rain water system
- **IS 14333:1996** High density polyethylene pipes for sewerage
- **IS 15778:2007** Chlorinated polyvinyl chloride (CPVC) pipes for potable hot and cold water distribution supplies
- **IS 16098 (Part 1 & 2):2013** Structured-wall plastics piping systems for non-pressure drainage and sewerage
- **IS 16647:2017** Oriented unplasticized polyvinyl chloride (PVC-O) pipes for water supply
- **IS 12709:1994** Specification for glass-fibre reinforced plastic (GRP) pipes, joints and fittings for use for potable water supply (first revision)

(contd...)

Pipes and Fittings

Following are the Indian Standards for cement based and metal pipes and fittings

Cement based

- **IS 458:2003** Precast concrete pipes (with and without reinforcement)
- **IS 784:2019** Prestressed concrete pipes (including specials)

Steel and iron

- **IS 1239 (Part 1) : 2004** Steel tubes tubulars and other wrought steel fittings: Part 1 steel tubes
- **IS 1239 (Part 2) : 2011** Steel tubes tubulars and other steel fittings: Part 2 steel pipe fittings
- **IS 1536 : 2001** Centrifugally cast Spun iron pressure pipes for water, gas and sewage
- **IS 1537 : 1976** Vertically cast iron pressure pipes for water, gas and sewage
- **IS 1538 : 1993** Cast iron fittings for pressure pipes for water, gas and sewage
- **IS 1729 : 2002** Cast iron ductile iron drainage pipes and pipe fittings for over ground non-pressure pipeline socket and spigot series
- **IS 5531 : 2014** Cast iron specials for asbestos cement pressure pipes for water and sewage
- **IS 8329 : 2000** Centrifugally cast Spun ductile iron pressure pipes for water, gas and sewage
- **IS 9523 : 2000** Ductile iron fittings for pressure pipes for water, gas and sewage
- **IS 3589 : 2001** Steel pipes for water and sewage 168.3 to 2540 mm Outside Diameter

Laying of Pipes

Following Indian Standards guide for laying and jointing of plastic, cement based and metal pipes

- **IS 783:1985** Laying of concrete pipes
- **IS 3114:1994** Laying of cast iron pipes
- **IS 4127:1983** Laying of glazed stoneware pipes
- **IS 5822:1994** Laying of electrically welded steel pipes for water supply
- **IS 6530:1972** Laying of asbestos cement pressure pipes
- **IS 7634 (Part 1 to 3)** Plastic pipes work for potable water supplies
- **IS 12288:1987** Use and laying of ductile iron pipes

Indian Standards on Pumps

- **IS 8034:2018** - Submersible pumpsets - Specification (Third Revision)
- **IS 14220 : 2018** - Openwell submersible pumpsets - Specification (First Revision)
- **IS 9079 : 2018** - Monoset pumps for clear, cold water for agricultural and water supply purposes - Specification (Third Revision)
- **IS17018 (Part 1):2018** - Solar Photovoltaic Water Pumping Systems Part1 Centrifugal Pumps — Specification

Other Indian Standards on Pumps

- **IS 1710:1989** - Specification for pumps – Vertical turbine mixed and axial flow, for clear cold water (second revision)
- **IS 6595 (Part 1) : 2018** - Horizontal Centrifugal Pumps for Clear, Cold Water — Specification Part 1 Agricultural and Rural Water Supply Purposes (Fourth Revision)
- **IS 8418:1999** - Pumps – Centrifugal self priming – Specification (first revision)
- **IS 8472 : 2019** - Centrifugal Regenerative Pumps for Clear, Cold Water — Specification (Second Revision)

Rainwater Harvesting & Groundwater Recharge

Considering the scarcity of and need for conservation of water, the following standards have been formulated for water harvesting through artificial recharge to ground water and roof top collection mechanisms.

- **IS 14961:2001** Guidelines for rain water harvesting in hilly areas by roof water collection system
- **IS 15797:2008** Roof top rainwater harvesting – Guidelines
- **IS 15792:2008** Artificial recharge to ground water - Guidelines

Standards on Tubewells

IS 2800: 2019 Code of practice for construction and testing of tubewells

- This code applies to drilling, construction and testing of medium to high capacity, filter packed tubewells drilled by rotary/percussion methods and used for agriculture, drinking water, industrial and other related purposes.
- This code gives general guidance as regards to drilling, design, construction and testing procedures for installation of tubewells

Indian Standards on Quality of Drinking Water

IS 10500 : 2012 Drinking water - Specification

- This standard prescribes the requirements and the methods of sampling and test for drinking water

IS 16633 : 2017 /ISO 24512 : 2007 Activities Relating to Drinking Water and Wastewater Services — Guidelines for the Management of Drinking Water Utilities and for the Assessment of Drinking Water Services

- This Standard provides guidelines for the management of drinking water utilities and for the assessment of drinking water services.
- This Indian Standard provides guidelines to the relevant stakeholders for assessing and improving the service to users.

IS 16761 : 2018 /ISO 24510 : 2007 Activities Relating to Drinking Water and Wastewater Services — Guidelines for the Assessment and for the Improvement of the Service to Users

- This Standard specifies the elements of drinking water and wastewater services of relevance and interest to users.
- It provides guidance on how to identify users' needs and expectations and how to assess whether they are being met.

Standards on Solid Waste Management

IS 16557 Solid Waste Management -Segregation, Collection and Utilization at Household/Community Level -Guidelines

This standard describes methodologies for handling of different types of waste generated at house hold/community level.

IS 16556 : 2016 Municipal Solid Waste Compost manure grade – Specification

IS 16702:2018 Vermicompost specification

IS 16632 : 2017 /ISO 24511 : 2007 Activities Relating to Drinking Water and Wastewater Services — Guidelines for the Management of Wastewater Utilities and for the Assessment of Wastewater Services

- This Standard provides guidelines for the management of wastewater utilities and for the assessment of wastewater services.
- This Standard addresses wastewater systems in their entirety and is applicable to systems at any level of development (e.g. pit latrines, on-site systems, networks, treatment facilities).

Standards on Plastic Waste Management

- **IS 14534 : 2016** Plastics – Guidelines for the Recovery and Recycling of plastic Waste (*First Revision*) This standard prescribes guidelines for the selection, segregation and processing of plastics waste/scrap. It establishes the different options for the recovery of plastics waste arising from pre-consumer and post-consumer sources
- **IS/ISO 17088 : 2012 ‘Specifications for Compostable Plastics (First Revision)’**

This Standard specifies procedures and requirements for the identification and labelling of plastics, and products made from plastics, that are suitable for recovery through aerobic composting. The four following aspects are addressed:

- a) biodegradation;
- b) disintegration during composting;
- c) negative effects on the composting process and facility;
- d) negative effects on the quality of the resulting compost, including the presence of high levels of regulated metals and other harmful components

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
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- 2-day Online Training programme on " Transition to IS/ISO/IEC 17025 : 2017 " to be held during 27-28 July 2020.
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etc

CEMENT

There are different types of Cement Standards. These standards cover manufacture and chemical and physical requirements of cements to ensure their quality. All cements are under mandatory BIS certification and bear the popular ISI mark of BIS. Important standards are :

IS No.	Title
IS 269:2015	Ordinary Portland cement
IS 455:2015	Portland slag cement
IS 1489 (Part 1):2015	Portland pozzolana cement: Part 1 Flyash based
IS 8042:2015	White Portland cement
IS 12330:1988	Sulphate resisting Portland cement

PLAIN AND REINFORCED CONCRETE

Concrete is the main material of construction today. Therefore quality and durability of structures largely depends on the production and quality control of concrete, for which the following standards provide required guidance.

- **IS 456:2000** Plain and reinforced concrete
- **IS 1343:2012** Prestressed concrete
- **IS 4926:2003** Ready mixed concrete
- **IS 10262:2019** Concrete mix proportioning

AGGREGATES

The Following standards cover coarse and fine aggregates used in concrete making which may be from natural sources or artificial aggregates such as slag, fly ash and construction/demolition waste aggregates.

- **IS 383:2016** Coarse and fine aggregates for concrete
- **IS 9142** Artificial lightweight aggregate for concrete: **Part 1** For concrete masonry blocks and for applications other than for structural concrete; **Part 2** Sintered fly ash coarse aggregate

STEEL REINFORCEMENT

The following Indian Standards cover reinforcing steel for use in RCC and prestressing steel for use in prestressed concrete.

- **IS 1786:2008** High strength deformed steel bars and wires for concrete reinforcement
- **IS 6003:2010** Indented wire for prestressed concrete
- **IS 6006:2014** Uncoated stress relieved strand for prestressed concrete
- **IS 14268:2017** Uncoated stress relieved low relaxation seven wire (ply) strand for prestressed concrete
- **IS 16172:2014** Reinforcement couplers for mechanical splices of bars for concrete reinforcement
- **IS 16644:2018** Stress-relieved low relaxation steel wire for prestressed concrete

STRUCTURAL STEEL

The following standards cover quality requirements for steel used in construction of steel structures for various applications.

- **IS 811:1987** Cold formed light gauge structural steel sections
- **IS 1161:2014** Steel tubes for structural purposes
- **IS 2062:2011** Hot rolled medium and high tensile structural steel
- **IS 2713:1980** tubular steel poles for overhead power lines
- **IS 4923:2017** Hollow steel sections for structural use

SEALANTS/FILLERS

This standards cover quality requirement for materials used for sealing and filling in concrete joints.

- **IS 1834:1984** Hot applied sealing compound for joints in concrete
- **IS 1838 (Part 1):1983** Preformed fillers for expansion joint in concrete pavement and structures (non extruding and resilient type): Part 1 Bitumen impregnated fibre
- **IS 1838 (Part 2):1984** Preformed fillers for expansion joint in concrete pavement and structures (non extruding and resilient type): Part 2 CNSL Aldehyde resin and coconut pith
- **IS 1838 (Part 3):2011** Preformed fillers for expansion joints in concrete pavements and structures (non-extruding and resilient type) : Part 3 Polymer based
- **IS 11433 (Part 1):1985** One-part gun-grade polysulphide-based joints sealants: Part 1 General requirements
- **IS 12118 (Part 1):1987** Two-parts polysulphide-based sealants: Part 1 General requirements

BRICKS AND BLOCKS

These standards prescribe quality requirements of bricks and concrete blocks popularly used as masonry building units.

- **IS 1077:1992** Common burnt clay building bricks
- **IS 1725:2013** Stabilized soil blocks used in general building construction
- **IS 16720:2018** Pulverized fuel ash-cement bricks
- **IS 2185 (Part 1 to 4)** Concrete masonry units: **Part 1** Hollow and solid concrete blocks; **Part 2** Hollow and solid light weight concrete blocks; **Part 3** Autoclaved cellular Aerated concrete blocks ; **Part 4** Cellular concrete blocks using preformed foam

WOOD PRODUCTS

These standards prescribe quality requirement for various wood and other agro-based panel products used for panelling and partitioning in building construction.

Plywood

- **IS 303:1989** Plywood for general purposes
- **IS 4990:2011** Plywood for concrete shuttering work

Blockboards, Particle Boards and Fibre Boards

- **IS 1659:2004** Block boards
- **IS 3087 & IS 12823** Particle boards (medium density)
- **IS 12406 & IS 14587** Medium density fibreboards
- **IS 14276 & IS 15786** Cement bonded particle boards

WOOD PRODUCTS (contd..)

Bamboo and Coir Board Products

- **IS 13958 & IS 14588** Bamboo mat board
- **IS 14842:2000** Coir veneer board for general purposes
- **IS 15476:2004** Bamboo mat corrugated sheets
- **IS 15491:2004** Medium density coir boards for general purposes
- **IS 15877:2010** Coir faced block boards
- **IS 15878:2010** Coir hardboard for general purposes
- **IS 15972:2012** Bamboo-jute corrugated and semi-corrugated sheets

DOORS AND WINDOWS

This standards cover quality requirements for various types of doors and windows of different materials used for external and internal applications in buildings.

Wooden

- **IS 1003 (Part 1):2003** Timber panelled and glazed shutters: Part 1 Door shutters
- **IS 1003 (Part 2):1994** Timber panelled and glazed shutters: Part 2 Window and ventilator shutters
- **IS 2202 (Part 1):1999** Wooden flush door shutters (solid core type): Part 1 Plywood face panels
- **IS 2202 (Part 2):1983** Wooden flush door shutters (solid core type): Part 2 Particle board face panels and hardboard face panels
- **IS 4021:1995** Timber door, window and ventilator frames

Metal

- **IS 1038:1983** Steel doors, windows and ventilators
- **IS 4351:2003** Steel door frames
- **IS 6248:1979** Metal rolling shutters and rolling grills

DOORS AND WINDOWS (contd..)

Plastic

- **IS 14856:2000** Glass fibre reinforced (GRP) panel type door shutters for internal use
- **IS 15380:2003** Moulded raised high density fibre (HDF) panel doors
- **IS 15931:2012** Solid panel foam UPVC door shutters

Composite Materials

- **IS 16073:2013** Bamboo-jute composite panel door shutter
- **IS 16074:2014** Steel flush door shutters
- **IS 16096:2013** Phenol bonded bamboo-jute composite hollow door shutter

FLOORING AND ROOFING

These standards give quality requirements for paving/flooring and roofing sheets and tiles made of different materials.

Flooring

- **1237:2012** Cement concrete flooring tiles
- **15658:2006** Precast concrete blocks for paving
- **1130:1969** Marble (blocks, slabs and tiles)
- **14223(Part 1):1994** Polished building stones: Part 1 Granite
- **15622:2017** Pressed ceramic tiles

Roofing

- **277:2003** Galvanized steel sheets (plain and corrugated)
- **459:1992** Corrugated and semi-corrugated asbestos cement sheets
- **12866:1989** Plastic translucent sheets made from thermosetting polyester resin (glass fibre reinforced)
- **14862:2000** Fibre cement flat sheets
- **14871:2000** Products in fibre reinforced cement — Long corrugated or asymmetrical section sheets and fittings for roofing and cladding

WATER FITTING AND SANITARY APPLIANCES

Following are the specifications for water meters, valves for water works purposes and products like taps, urinals, cisterns, water closets for use in public toilets.

- **IS 779:1994** Water meters (domestic type)
- **IS 2556 (Parts 1 to 17)** Vitreous sanitary appliances (Vitreous China) - specification
- **IS 2692:1989** Ferrules for water services
- **IS 7231:1994** Plastic flushing cisterns for water closets and urinals
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- **IS 12701:1996** Rotational moulded polyethylene water storage tanks
- **IS 778:1984** Specification for 2010 copper alloy gate, globe and check valves for waterworks purposes
- **IS 9739:1981** Pressure reducing valves for domestic water supply systems
- **IS 13095:1991** Butterfly valves for general purposes
- **IS 14845:2000** Resilient seated cast iron air relief valves for water works purposes – specification
- **IS 14846:2000** Sluice valves for water works purposes (50 to 1200 mm)

PIPES AND FITTINGS

These standards give quality requirements for pipes and their fittings made of different materials used in water supply, drainage and sewerage.

Plastics

- **IS 4984:2016** High density polyethylene pipes for water supply
- **IS 4985:2000** Unplasticized PVC pipes for potable water supplies
- **IS 7834 (Part 1 to 8)** Injection moulded PVC socket fittings with solvent cement joints for water supplies
- **IS 8008 (Part 1 to 9)** Injection moulded/machined high density polyethylene (HDPE) fittings for potable water supplies — Specification: Part 1 General requirements for fittings
- **IS 13592:2013** Unplasticized polyvinyl chloride (PVC-U) pipes for soil and waste discharge system for inside and outside buildings including ventilation and rain water system
- **IS 14333:1996** High density polyethylene pipes for sewerage
- **IS 15778:2007** Chlorinated polyvinyl chloride (CPVC) pipes for potable hot and cold water distribution supplies
- **IS 16098 (Part 1 & 2):2013** Structured-wall plastics piping systems for non-pressure drainage and sewerage
- **IS 16647:2017** Oriented unplasticized polyvinyl chloride (PVC-O) pipes for water supply

Steel and iron

- **IS 1239 (Part 1) : 2004** Steel tubes tubulars and other wrought steel fittings: Part 1 steel tubes
- **IS 1239 (Part 2) : 2011** Steel tubes tubulars and other steel fittings: Part 2 steel pipe fittings

FIREFIGHTING

These standards give quality requirements of portable and fixed firefighting installations..

- **IS 884:1985** First-aid hose reel for fire fighting
- **IS 903:1993** Fire hose delivery couplings, branch pipe, nozzles and nozzle spanner
- **IS 5290:1993** Landing valves
- **IS 8442:2008** Stand post type water and foam monitor for fire fighting
- **IS 9972:2002** Automatic sprinkler heads for fire protection service
- **IS 15683:2018** Portable fire extinguishers – Performance and construction
- **IS 16018:2012** Wheeled fire extinguisher – Performance and construction

Water Proofing

These standards give guidelines for waterproofing and damp-proofing of building and give quality requirements of water-proofing compounds and membranes.

- **IS 2645: 2003** Integral cement waterproofing compound
- **IS 13182:2020** Waterproofing and damp-proofing of wet areas in building
- **IS 16471:2017** Protection of below ground structures against water from the ground
- **IS 16525:2017** Styrene butadiene styrene (SBS) modified bituminous waterproofing and damp-proofing membrane with polyester reinforcement
- **IS 16526:2017** Atactic polypropylene (APP) modified bituminous waterproofing and damp-proofing membrane with glass fibre reinforcement
- **IS 16532:2017** APP modified bituminous water-proofing and damp-proofing membrane with polyester reinforcement
- **IS 16540:2017** Atactic polypropylene (APP) modified high molecular high density polyethylene (HMHDPE) bituminous waterproofing and damp-proofing membrane

PAINTS

These standards cover quality parameters of various paints used for internal and external applications including enamel, distemper, ready mixed paint, cement paint and plastic emulsion paints.

- **IS 133 (Part 1):2013** Enamel, interior: (a) undercoating (b) finishing: Part 1 For household and decorative purposes
- **IS 428:2013** Washable distemper
- **IS 2074 (Part 1):2013** Ready mixed paint, air drying red oxide-zinc chrome, priming: Part 1 For domestic and decorative applications
- **IS 2932 (Part 1):2013** Enamel, synthetic, exterior (a) undercoating, (b) finishing: Part 1 For household and decorative applications
- **IS 2933 (Part 1):2013** Enamel, exterior, (a) undercoating, (b) finishing: Part 1 For domestic and decorative applications
- **IS 3536:2016** Ready mixed paint, brushing, wood primer
- **IS 5410:2013** Cement paint
- **IS 15489:2013** Paint, plastic emulsion

GLASS

These standards cover requirements for different glass and mirrors used during building construction.

- **IS 2553(Part 1):2018** Safety glass: Part 1 General purpose
- **IS 3438:1994** Silvered glass mirrors for general purposes
- **IS 14900:2018** Transparent float glass
- **IS 16982 : 2018** Heat strengthened glass
- **IS 17346 : 2020** Insulating glazing unit

PV Modules

Important standards on terrestrial photovoltaic (PV) modules

- **IS 14286 (Part 1) : 2019/IEC 61215-1 : 2016** PV Panel Terrestrial Photovoltaic (PV) Modules – Design Qualification and Type Approval
- **IS 14286 (Part 2) : 2019/IEC 61215-2 : 2016** Test Procedures
- **IS 14286 (Part 1/ Sec 1) : 2019/IEC 61215-1-1 : 2016** Testing requirements of crystalline silicon photovoltaic PV modules
- **IS 14286 (Part 1/ Sec 2) : 2019/IEC 61215-1-1 : 2016** Testing requirements of thin - Film cadmium telluride CdTe based photovoltaic PV modules
- **IS 14286 (Part 1/ Sec 3) : 2019/IEC 61215-1-1 : 2016** Testing requirements of thin - Film amorphous silicon based photovoltaic PV modules
- **IS 14286 (Part 1/ Sec 4) : 2019/IEC 61215-1-1 : 2016** Testing requirements of thin - Film Cu(In,Ga)(S,Se)₂ based photovoltaic PV modules

LED STREET LIGHTING

The following Indian Standards have been published on LED Street lighting:

- **IS 10322 (Part 5/ Section 3) : 2012** -- Luminaires Part 5
Particular requirements Section 3 Luminaires for Road and Street Lighting
- **IS 16107 (Part 2/Section 2) : 2017** -- Luminaires
Performance Part 2 Particular Requirements Section 2 LED Street Lighting
Luminaire

Street Food Vendors

- **IS 16066 : 2016** Street Food Vendors – Food Safety

This standard lays down control check points with minimum requirements and checklist with grading criteria which if exercised would ensure safe food to the consumer. It covers all mobile/fixed food vendors serving prepared/raw food for human consumption

Rainwater Harvesting & Groundwater Recharge

Considering the scarcity of and need for conservation of water, the following standards have been formulated for water harvesting through artificial recharge to ground water and roof top collection mechanisms.

- **IS 14961:2001** Guidelines for rain water harvesting in hilly areas by roof water collection system
- **IS 15797:2008** Roof top rainwater harvesting – Guidelines
- **IS 15792:2008** Artificial recharge to ground water - Guidelines

Standards on Solid Waste Management

IS 16557 Solid Waste Management -Segregation, Collection and Utilization at Household/Community Level -Guidelines

This standard describes methodologies for handling of different types of waste generated at house hold/community level.

IS 16556 : 2016 Municipal Solid Waste Compost manure grade – Specification

IS 16702:2018 Vermicompost specification

Standards on Plastic Waste Management

- **IS 14534 : 2016** Plastics – Guidelines for the Recovery and Recycling of plastic Waste (*First Revision*) This standard prescribes guidelines for the selection, segregation and processing of plastics waste/scrap. It establishes the different options for the recovery of plastics waste arising from pre-consumer and post-consumer sources
- **IS/ISO 17088 : 2012** ‘Specifications for Compostable Plastics (First Revision)’

This Standard specifies procedures and requirements for the identification and labelling of plastics, and products made from plastics, that are suitable for recovery through aerobic composting. The four following aspects are addressed:

- a) biodegradation;
- b) disintegration during composting;
- c) negative effects on the composting process and facility;
- d) negative effects on the quality of the resulting compost, including the presence of high levels of regulated metals and other harmful components

NATIONAL BUILDING CODE OF INDIA 2016 (NBC 2016)



For more details, visit: <https://bis.gov.in/index.php/standards/technical-department/national-building-code/>

NBC 2016 in Groups

Group	Aspect	Coverage
Group 1	For Planning, Building/ Land Development work	(Parts 0, 1, 2, 3, 4, 5, 10 – Sections 1 & 2 and Part 11)
Group 2	For Structural Design	(Part 0, 6 – Sections 1 to 8 and Part 11)
Group 3	For aspects relating to Construction Management, Practices and Safety and Asset and Facility Management	(Part 0, 7, 11 and Part 12)
Group 4	For Building Services	(Part 0, 8 – Sections 1 to 6 and Part 11)
Group 5	For Plumbing Services	(Part 0, 9 – Sections 1 to 4 and Part 11)

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Important Links

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NEWS AND EVENTS

- Temporary measures for relaxation of provision of BIS Conformity Assessment Regulations 2018 for renewal of licence with late fee and renewal of deferred licence
- Extension of date of implementation of amendments to Indian Standards and revised Indian Standards
- Relaxation in fee for MSME units for licence under Bureau of Indian Standards (Conformity Assessment) Regulations 2018 and its amendments- req

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Training Programmes Planned (Domestic)

Training Programmes Conducted (Domestic)

Proposals for New Programmes

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Fees

Partnerships

International Programmes

Reference Materials

NEWS [VIEW ALL](#)

- on "Laboratory Quality Management System & Internal Audit as per IS/ISO/IEC 17025 : 2017 " to be held during 20-23 July 2020.
- 2-day Online Training programme on " Transition to IS/ISO/IEC 17025 : 2017 " to be held during 27-28 July 2020.
- 4-day Online Training programme on " Medical Laboratories Quality Systems and Internal Audit as per IS/ISO 15189 : 2012 " to be held during 4-7 August 2020.
- 2-day Online Training programme on "Measurement Uncertainty" to be held during 06-07 August 2020.
- 4-day Online Training programme on "Laboratory Quality Management

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BIS STANDARDS PERTAINING TO AGRICULTURE SECTOR

**PROMOTING QUALITY, SAFETY, SUSTAINABILITY
AND ACCESSIBILITY**

IMPORTANT STANDARD ON FARM MACHINERY



IS 12207 : 2019 Agricultural tractors - Recommendations on selected performance characteristics (Fourth Revision)

IS 13539 : 2018 Power tiller - Recommendations on selected performance and other characteristics (Second Revision)

IS 15806 : 2018 Combine harvester - Recommendations on selected performance and other characteristics (First Revision)

IS 17045 : 2018 Rotary tiller (Rotavator) - Tractor driven - Test procedure, and recommendations on selected performance characteristics

IS 11893 : 1986 Specification for potato planter semi-automatic



IS 12207 : 2019 Agricultural tractors - Recommendations on selected performance characteristics (Fourth Revision)

- This standards talks about the followings:
 - Assessment of the evaluative requirements applicable for qualifying minimum performance criteria of the agricultural tractors,
 - Tolerances on the values declared by the manufacturer and in certain cases minimum/maximum values of the performance characteristics and statutory requirements under the relevant act(s) of the agricultural tractors,
 - Criteria for determining variants and new model of tractors for the purpose of testing and certification, and
 - Criteria for providing administrative extension and technical extension to earlier tested tractor model.



IS 12207 : 2019 Agricultural tractors - Recommendations on selected performance characteristics (Fourth Revision)

- This standard is aligned with the OECD requirements.
- Acceptance Criteria In Case Of Breakdowns / Defects

Sl No.	During Initial Commercial Test	During Batch Test
a)	There is no 'critical breakdown' during the course of testing	There is no 'critical breakdown' during the course of testing.
b)	There are not more than 2 major breakdowns and neither of them is of repetitive nature	There are not more than 1 major breakdowns and neither of them is of repetitive nature
c)	There are not more than 5 minor defects during the test and the frequency of each is not be more than two	There are not more than 3 minor defects during the test and the frequency of each is not be more than two
d)	In no case, the total number of breakdowns should exceed five that is, (2 major + 3 minor) or (1 major + 4 minor) or 5 minor breakdowns	In no case, the total number of breakdowns should exceed four that is, (1 major + 3 minor) or 4 minor breakdowns



IS 13539 : 2018 Power tiller - Recommendations on selected performance and other characteristics (Second Revision)

- This standards talks about the followings:
 - I. Tolerances on the values declared by the manufacturer and in certain cases minimum/maximum values of the performance characteristics, statutory requirements under the relevant Act(s) of the agricultural power tillers; and
 - II. Criteria for determining variants and new model of power tillers for the purpose of testing and certification.
- This standard incorporates the 'minimum performance standard' issued by the Ministry of Agriculture and Farmers Welfare for the purpose of institutional financing.



IS 15806 : 2018 Combine harvester - Recommendations on selected performance and other characteristics (First Revision)

- This standards talks about the followings:
 - An assessment of the evaluative requirements applicable for qualifying minimum performance criteria of the combine harvesters,
 - Tolerances on the values declared by the manufacturer, and in certain cases minimum/maximum values of the performance characteristics, and statutory requirements under the relevant Act(s) of the combine harvesters,
 - The criteria for determining variants and new model of combine harvesters for the purpose of testing and certification,
 - Definitions of some of the terms commonly used in relation to testing of combine harvester, and
 - Minimum performance criteria for testing of Straw Management System (SMS) if fitted is also given.



IS 17045 : 2018 Rotary tiller (Rotavator) - Tractor driven - Test procedure, and recommendations on selected performance characteristics

- This standards talks about the followings:
 - This standard prescribes the method of testing for tractor driven rotary tiller (rotavator) in respect of performance of operation and soundness of construction.
 - Assessment of the evaluative requirements applicable for qualifying minimum performance criteria of the rotary tiller (rotavator).
- Rotary tiller is used after the harvesting has been done using combine harvester, to remove the straw left. It cuts the straw and mixes it with the soil, thus, helps in avoiding the burning of the straw



IS 11893 : 1986 Specification for potato planter semi-automatic

- This standard specifies material, constructional, performance and other requirements of semi-automatic potato planter.
- Performance requirements specified in the standard are as follows:
 - The variation in dropping of seed from each chute shall be not more than 5 percent from the average quantity obtained.
 - The variation in quantity of seed dropped per hectare and quantity specified to be dropped at a particular setting shall be not more than 7 percent.
 - The percentage of germ damage shall not exceed 0.5 percent.
 - The variation in dropping due to box filling at 1/4, 1/2, and 3/4 of rated capacity shall not exceed by 10 percent.



IMPORTANT STANDARD ON POST HARVEST MACHINERY



- IS 1973 : 1999 Sugarcane crushers - Specification (Third Revision)
- IS 7898 : 2001 Manually - Operated chaff cutter - Specification (Second Revision)
- IS 9555 : 1999 Rice polisher - Specification (Second Revision)
- IS 14603 : 1998 Potato grader - Test code



IS 7898 : 2001 Manually - Operated chaff cutter -Specification (Second Revision)

- This standard specifies material, construction and other requirements for manually-operated chaff cutter.
- Following cautionary notice shall be mandatorily mentioned on the main body of chaff cutter:
 - Do not wear loose dress, bangles, watch, etc, while feeding the fodder;
 - Do not smoke and light fire near dry fodder being cut;
 - Do not work under the influence of intoxicants like liquor, opium, etc;
 - Children and aged persons should be discouraged for working;
 - Do not push small fodder by hand, use pushing device;
 - Put the cover on blade after completing the work;
 - Lock the flywheel with the locking pin after work; and
 - Never bring hand near feed rolls and open blade.



Women Friendly Agriculture Equipments

- IS 3122: 1982 Specification for budding and grafting knife combined (*First Revision*)
- IS 10663: 1983 Specification for Khurpi
- IS 10664: 1983 Specification for tree pruner
- IS 12409: 1988 Specification for garden sword
- IS 13373: 1992 Specification for garden sword
- IS 13374: 1992 Forestry tools - Handsappie nursery
Kutla – Specification
- IS 13377: 1992 Forestry tools - Shrub cutting knife -
Specification



IMPORTANT STANDARDS ON CROP PROTECTION EQUIPMENT



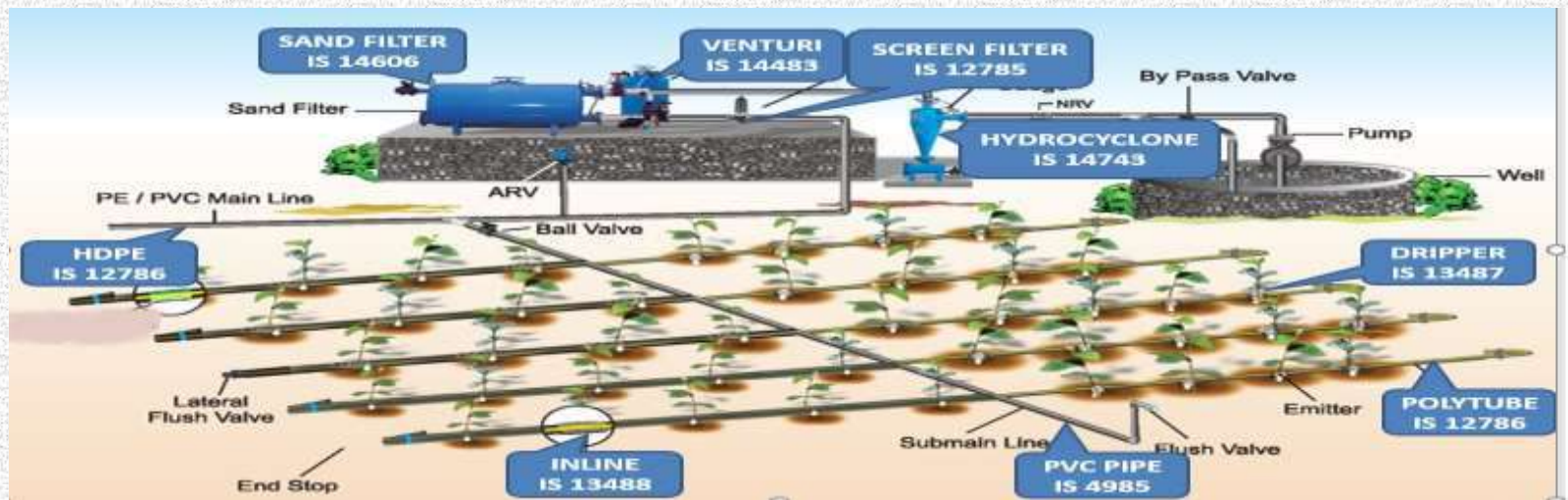
IS 1970 : 1995 Crop protection equipment - Hand - Operated compression - knapsack sprayer - Specification (Fifth Revision)

IS 3062 : 1995 Crop protection equipment - Rocker sprayer - Specification (Fourth Revision)

IS 3652 : 1995 Crop protection equipment. - Foot sprayer - Specification (Fourth Revision)

IS 3906 : 1995 Crop Protection Equipment - Hand-operated Knapsack Sprayer, Piston Type

IMPORTANT STANDARD ON IRRIGATION EQUIPMENT



IS 12786 : 1989 Irrigation equipment - Polyethylene pipes for irrigation laterals – Specification

IS 13488 : 2008 Irrigation equipment - Emitting pipe systems - Specification (First Revision)

IS 14483 (Part 1) : 1997 Fertilizer and chemical injection system: Part 1 venturi injector

IS 14743 : 1997 Irrigation equipment - Hydrocyclone filters - Specification



IS 12786 : 1989 Irrigation equipment - Polyethylene pipes for irrigation laterals – Specification

- This standard lays down requirements for polyethylene pipes of outside diameter from 12 mm up to 32 mm to be used for irrigation laterals that is branch supply lines on which sprayers or drippers or emitters are mounted directly or by means of a fitting or formed in the pipe during production.
- This standard has classified in the pipes in following:

Class of Pipe	Working Pressure	Colour
Class 1	0.20 Mpa	Red
Class 2	0.25 Mpa	Yellow
Class 3	0.40 Mpa	Green

NOTE - Normal working conditions of pipes shall be operation of maximum 800 working hours per year at the pressure rating of the pipe and at a water temperature up to 35°C. If these working conditions are exceeded the next higher class of pipe, that is, pipe with greater wall thickness shall be chosen. With these working conditions the life expectancy of the pipe is 10 years.



IS 13488 : 2008 Irrigation equipment - Emitting pipe systems - Specification (First Revision)

- This standard specifies the mechanical and functional requirements of the emitting pipes and their fittings, test methods and the data to be supplied by the manufacturer to facilitate correct installation and operation in the field.

NOTE - This standard applies to emitting and trickling pipes, hoses, and tubings intended for irrigation, in which the emitting units form an integral part. This standard also applies to the fittings used for connecting these pipes, hoses and tubings. This standard does not apply to continuously porous pipe (porous along its entire length and circumference).

- The material used in the manufacture of emitting pipes and their fittings shall be resistant to fertilizers and chemicals commonly employed in irrigation, and shall be suitable for use with water at temperatures up to 60°C and at pressures designed for the emitting pipe.
- The materials shall, as far as possible, not support the growth of algae and bacteria. The parts of the emitting pipe that are exposed to sunlight, shall be opaque and protected against UV degradation.



Indian Standards on Aluminium Products used in irrigation

Indian Standard	Product Details	Intended Use of Products
IS 7092 (Part 1) : 1992 Aluminium alloy tubes for irrigation purposes- Specification: Part 1 welded tubes	This standard covers the requirement of Electric resistance welded aluminium alloy tubes used for irrigation (including sprinkler irrigation) purposes and suitable for a maximum working pressure of 1 000 kN/m ² (10 kg f/cm ²) for diameters up to and including 200 mm	Used for irrigation purposes.
IS 7092 (Part 2) : 1987 Specification for aluminium alloy tube for irrigation purposes: Part 2 extruded tube	This standards (Part 2) covers the requirements of extruded aluminium alloy tubes used for irrigation purposes and suitable for a maximum working pressure of 1 000kN/m ² (10 kg f/sm ²) for diameters up to and including 200 mm.	Used for irrigation purposes.



Indian Standards on Pumps

- **IS 8034:2018** - Submersible pumpsets - Specification (Third Revision)
- **IS 14220 : 2018** - Openwell submersible pumpsets - Specification (First Revision)
- **IS 9079 : 2018** - Monoset pumps for clear, cold water for agricultural and water supply purposes - Specification (Third Revision)
- **IS17018 (Part 1):2018** - Solar Photovoltaic Water Pumping Systems Part1 Centrifugal Pumps — Specification



Other Indian Standards on Pumps

- **IS 1710:1989** - Specification for pumps – Vertical turbine mixed and axial flow, for clear cold water (second revision)
- **IS 6595 (Part 1) : 2018** - Horizontal Centrifugal Pumps for Clear, Cold Water — Specification Part 1 Agricultural and Rural Water Supply Purposes (Fourth Revision)
- **IS 8418:1999** - Pumps – Centrifugal self priming – Specification (first revision)
- **IS 8472 : 2019** - Centrifugal Regenerative Pumps for Clear, Cold Water — Specification (Second Revision)
- **IS 9694(PT 1):1987** - Code of practice for the selection, installation, operation and maintenance of horizontal centrifugal pumps for agricultural applications Part 1 Selection (first revision)
- **IS 9694(PT 2):1980** - Code of practice for the selection, installation, operation and maintenance of horizontal centrifugal pumps for agricultural application Part 2 Installation



Other Indian Standards on Pumps

- **IS 9694(PT 3):1980** - Code of practice for the selection, installation, operation and maintenance of horizontal centrifugal pumps for agricultural applications
Part 3 Operation
- **IS 9694(PT 4):1980** - Code of practice for the selection, installation, operation and maintenance of horizontal centrifugal pumps for agricultural applications
Part 4 Maintenance
- **IS 10804 (Part 1) : 2018** - Recommended Pumping Systems For Agricultural Purposes Part 1 Surface Pumps (Third Revision)
- **IS 10804 (Part 2) : 2018** - Recommended Pumping Systems and Agricultural Purposes Part 2 Submersible Pump Sets (Third Revision)
- **IS 11346:2002** - Tests for agricultural and water supply pumps – Code of acceptance



Important Standards on good agricultural practices

IS 15930 (Part 1) : 2011 Requirements for good agricultural practices - IndiaGap Part 1 crop base

IS 15930 (Part 3) : 2019 Requirements for good agricultural practices - IndiaGap Part 3
Combinable Crop Base

IS 15930 (Part 4) : 2019 Requirements for good agricultural practices - IndiaGap Part 4 tea base

IS 15930 (Part 5) : 2017 Requirements for good agricultural practices - IndiaGap Part 5 coffee base

IS 15930 (Part 7) : 2018 Requirements for good agricultural practices - IndiaGap Part 7 poultry base

IS 15930 (Part 8) : 2017 Requirements for good agricultural practices - IndiaGap Part 8 cattle and sheep base

IS 16550 (Part 1) : 2016 Organic production system and labelling of organically produced products Part 1 crop based



Important Standards for Soil Health

- Bio fertilizers and Manures
- 1. IS 17135:2019 Biofertilizer Liquid Based Azotobacter spp Inoculants Specification
- 2. IS 17136:2019 Biofertilizer Liquid Based Azospirillum Inoculants Specification
- 3. IS 17137:2019 Biofertilizer Liquid Based Phosphate Solubilizing Bacterial Inoculants PSBI Specification
- 4. IS 16556:2016 Municipal solid waste compost manure grade – Specification
- 5. IS 16702:2018 Vermicompost-specification



Indian Standards on Polyethylene (PE) films/sheets

- IS 2508 : 2016 Polyethylene Films and Sheets Specification

Polyethylene (PE) films/ sheets are used for canal lining, agricultural operations, post-harvest uses, vermiculture, construction/ infrastructure work, dunnage, pond lining, water reservoirs etc.

- IS 14611 : 2016 Multilayered Cross Laminated Sheets Tarpaulins Covers Agricultural Films - Specification First Revision

Multilayered cross laminated sheets, tarpaulins, covers and agricultural films are used for packing, ground covers (mulching), water conservation systems and fumigation covers, agricultural operations, horticulture etc.

Contd-

- IS 17216 : 2019 Polyethylene Mulch Films for Agriculture and Horticulture — Specification

Polyethylene mulch film provides favourable soil moisture for development of roots and plants, prevents weed growth, conserves water, effective in dry land farming, prevents soil erosion and run off etc. This standard guides prospective user to select appropriate polyethylene mulch films for the intended applications.



Indian Standards on Agro Textiles

1 IS 15351:2015 Agro textiles - Laminated high density polyethylene woven geomembrane for water proof lining

Used as lining for canal, pond and reservoir to control seepage and for proper disposal of industrial effluents, etc. This standard Includes four type of geomembranes of 0.25, 0.50, 0.75 and 1.00 mm thickness.

2 IS 15907:2010 Agro textiles - High density polyethylene (HDPE) woven beds for vermiculture

This standard covers HDPE woven beds for vermiculture used in producing compost for agricultural purposes made from 340 GSM, 7 layer laminated fabric. Vermibeds has advantages over the traditional concrete ones in terms of space, durability, ease of handling, yield of compost, cost, etc.

3 IS 16008 (Part 1 & 2):2016 Agro textiles - Shade nets for agriculture and horticulture purposes Part 1 Shade nets made from tape yarns and Part 2 Shade nets made from mono filament yarns

Covers Agro shade nets manufactured from tape yarns for agriculture and horticulture purposes in protecting/ increasing crop yield by providing controlled climatic conditions for the intended crops.



Indian Standards on Agro Textiles

4 IS 16202 : 2014 Agro textiles – Woven ground covers for horticulture application

Used to meet diverse needs of crops in the horticulture sector like suppression of weed growth around the plant, water conservation, soil temperature moderation, increase in yield etc. by blocking extreme climatic conditions of sunlight or cold.

5 IS 16190:2014 Agro textiles – High density polyethylene (HDPE) laminated woven fabric lay flat tubes for irrigation purpose

Covers HDPE laminated woven lay flat tube of internal diameter 50, 63, 75, 90, 110, 125, 150, 175 and 200 mm for irrigation purpose. These lay flat tubes are flexible, foldable, light weight, easy to install.

IS 16390:2015 Agrotexiles-Nylon knitted seamless gloves for tobacco harvesters

Use of these knitted seamless nylon gloves by the workers, while cultivating and harvesting the tobacco plants, can significantly reduce the Green tobacco sickness.



Indian Standards on Agro Textiles

6 IS 16513:2016 Agrotextiles – Insect nets for agriculture and horticulture purposes

Covers insect nets for agriculture and horticulture purposes in protecting crop from insects such as aphids, whitefly, carrot fly, cabbage root fly and caterpillars etc.

7 IS 16089:2013 Jute Agro-Textile — Sapling bags for growth of Seedling/Sapling

Requirements of jute sapling bag made from hessian cloth of 272 GSM for growth of sapling in nursery has been covered. JAT is a natural fabric, made of jute fibre, that helps retain soil humidity at a conducive level, arrest desiccation of soil and attenuates extremes of temperature due to the intrinsic characteristics of jute and capacity to absorb water/moisture up to about 5 times of its dry weight.



Indian Standards on Agro Textiles

8 IS 16718:2017 Polypropylene spun bonded non-woven cropcover fabric for agricultural and horticultural applications

Generally crop covers are placed over plants, seedlings, and/or used as low tunnel to create a micro-climate and ensure early growth and development of the plant/ crop with the valuable end result of both improvement in quality and yield. They also help in protecting the plant from cold/frost and help in reducing use of pesticides.

9 IS 16627 : 2017 Agro textiles — HDPE laminated woven lay flat tube for use in mains and submains of drip irrigation system

Drip irrigation systems using HDPE/PVC pipes as main lines have limitations of installation at undulated surfaces, cost and storage constraints, etc. The flexible, foldable, light weight, easy to install drip irrigation system has been developed so that farmers with low resources (having small land holding) can take advantage of the drip technique. In areas where land is undulated, these lay flat tubes can be installed very easily.



Indian Standards on Agro Textiles

10 IS 17355:2020 Agro Textiles — Polypropylene Spun Bonded Non-Woven Mulch Mat for Agricultural and Horticultural Applications

Non-woven mulch mat do not allow the light to pass through the plane of the fabric and help suppress weed growth effectively without use of chemical weedicides. These are, however, permeable to water, air and fertilizers to ensure supply of necessary nutrients to the plants. The non-woven mulches are lighter in weight, easy to install and helps to retain soil humidity at a conducive level.

11 IS 17356:2020 Agro Textiles — Windshield Nets for Agriculture and Horticulture Purposes

Windshield nets are barriers used to reduce wind speed. Windshield nets are used in various agriculture and horticulture applications mainly to protect young plants, fruit, trees or harvest crops from high speed wind which causes severe damage to crops.



Indian Standards on Agro Textiles

12 IS 17358 (Part 1 & 2):2020 Agro Textiles — Fencing Nets for Agriculture and Horticulture Purposes Part 1 Fencing Nets Made from Extruded Polymer Mesh and Part 2 Fencing Nets Made from Mono Filament Yarns and combination of Tape and Mono Filament Yarns

Fencing is being provided to keep the stray animal, unwanted person etc away from agriculture, horticulture, forest or other areas. Additionally, it also provides the aesthetic to the fenced area and also helps in defining boundaries and better organization of any specified place. HDPE fencing nets are a good alternate to galvanized metal fencing and have an advantage of lighter in weight, easy to install and no problem of corrosion.

13. IS 16008 (Part 1) : 2016 Agro Textiles - Shade Nets for Agriculture and Horticulture Purposes - Specification Part 1 Shade Nets Made from Tape Yarns (First Revision)- This standard prescribes constructional and other performance requirements for synthetic agro shade nets manufactured from tape yarns for agriculture and horticulture purposes in protecting/increasing crop yield by providing partially controlled climatic conditions for the intended crops.

14. IS 16008 (Part 2) : 2016 Agro Textiles - Shade Nets for Agriculture and Horticulture Purposes - Specification Part 2 Shade Nets Made from Mono Filament Yarns (First Revision) This standard prescribes constructional and other performance requirements for synthetic agro shade nets manufactured from mono filament yarns for agriculture and horticulture purposes in protecting/increasing crop yield by providing partially controlled climatic conditions for the intended crops.



Indian Standards on Pesticides

- Pesticides after risk assessment are registered by Central Insecticide Board & Registration Committee, Min. of Agri for use in agriculture, public health and household.
- There are 343 Indian Standard Specifications for pesticides and their formulations including :
 - Technical
 - Liquid
 - Wettable powders/granules (WP/WG)
 - Emulsifiable concentrates (EC)
 - Suspension Concentrates (SC)
- 74 ISS are under voluntary BIS product certification scheme including Malathion, EC (IS 2567 : 1978), Chloropyriphos, EC (8944 : 2005), Deltamethrin, WP (IS 13457 : 1992), Neem Based EC Containing Azadirachtin (IS 14300 : 1995), Carbendazim (MBC) WP (IS 8446 : 1991), Mancozeb, WP (IS IS 8708 : 2006)



Important requirements for pesticide formulations

- For liquids : Flash point, Acidity
- For powders : Moisture, Melting point, material insoluble in acetone, acidity
- For Emulsifiable concentrates : Emulsion stability, Flash point, acidity
- For Wettable powders/granules : Technical content, sieving requirements, Suspensibility, wettability
- Suspension concentrate : Pour ability, spontaneity of dispersion, suspensibility, foam test



Indian Standards on Pesticides

Fungicides

- IS 16706 : 2018 Carpropamid, Technical – Specification
- **IS 16917 : 2018 Tricyclazole + mancozeb, wettable powder (WP) – Specification**
- **IS 16919 : 2018 Mancozeb + carbendazim, wettable powder (WP) – Specification**
- IS 16920 : 2018 Hexaconazole + zineb, wettable powder (WP) – Specification
- IS 17200 : 2019 Validamycin, Technical – Specification
- IS 17201 : 2019 Validamycin, Liquid – Specification
- IS 17202 : 2019 Tricyclazole WG – Specification
- IS 16956 : 2018 Thiodicard, Technical – Specification



Indian Standards on Pesticides (...contd.)

Insecticides

- IS 16707 : 2018 **Carbosulfan granules – Specification**
- IS 16674 : 2019 **Spiromesifen, technical – Specification**
- IS 16955 : 2019 **Spiromesifen, SC – Specification**
- IS 16710 : 2019 **Thiacloprid, technical – Specification**
- IS 16921 : 2018, **Imiprothrin, technical – Specification**
- IS 17125 : 2019 **Novaluron, technical – Specification**
- IS 17203 : 2019 **Novaluron, EC – Specification**

Herbicides

- IS 16708 : 2018 **Oxadiargyl, technical – Specification**



Indian Standards on Warehousing/ storage of food grains

Sl.no.	IS No.	Title
1	IS 609:1955	Code of practice for improvement of existing structures used or intended to be used for food grain storage
2	IS 5503-1: 1969	General requirements for silos for grain storage: Part 1 Constructional requirements
3	IS 5503-2: 1969	General requirements for silos for grain storage: Part 2 Grain handling equipment and accessories
4	IS 6151-1:1971	Storage management code: Part 1 Terminology
5	IS 6151-2:1971	Storage management code: Part 2 General care in handling and storage of agricultural produce and inputs
6	IS 6151-3:1976	Storage management code: Part 3 Specific care in handling and storage of agricultural produce and inputs
7	IS 11816-1: 2010/ ISO 6322-1:1996	Storage of cereals and pulses: Part 1 General recommendations for the keeping of cereals (<i>first revision</i>)
8	IS 11816-2:2009/ ISO 6322-2:2000	Storage of cereals and pulses: Part 2 Practical recommendations (<i>first revision</i>)
9	IS 11816-3:1986	Storage of cereals and pulses: Part 3 Control of attack by vertebrate and invertebrate animals
10	IS 16144 : 2014	Foodgrain storage godowns — Code of practice



Indian Standards on Warehousing/ storage and transportation of fruits & vegetables

- | | |
|---------------------|---|
| 1. IS 6669 : 2001 | Apples - Guide for Cold Storage |
| 2. IS 6670 : 1972 | Guide for storage of potatoes |
| 3. IS 7731 : 1975 | Guide For Storage Of Peaches |
| 4. IS 9303 : 1979 | Guide for Cold Storage of Table Grapes |
| 5. IS 11966 : 1997 | Garlic - Guide to cold storage |
| 6. IS 16118 : 2013 | Strawberries — Guide to Cold Storage |
| 7. IS 16119 : 2013 | Potatoes - Guidelines For Storage In Artificially Ventilated Stores |
| 8. IS 6028 : 2002 | Green Bananas - Guide for Storage and Transport |
| 9. IS 7191 : 2001 | Tomatoes - Guide for Cold Storage and Refrigerated Transport |
| 10. IS 15691 : 2006 | Guidelines for storage and transportation of bamboo shoot |
| 11. IS 7192 : 1974 | Guide For Storage Of Citrus Fruits |
| 12. IS 9311 : 2001 | Onions - Guide for Storage |



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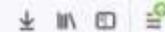
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INDIAN STANDARDS PERTAINING TO ANIMAL HUSBANDRY, FISHERIES & DAIRYING SECTOR



ANIMAL HUSBANDRY



IS 2052 : 2009 Compounded feeds for cattle - Specification

- This standard prescribes the requirements and the methods of sampling and test for compounded cattle feeds for buffaloes, cattle and working bullocks.
- Compounded cattle feeds shall be of three types, namely, Type I, Type II and Type III meant for low, medium and high producing animals.
- The feed shall be free from harmful constituents, metallic pieces and adulterants. The feed shall also be free from fungal growth and insect infestation, and from fermented, musty, rancid or any other objectionable odour.
- The standard also specifies the ingredients which may be used along with limits for quality characteristics such as moisture, crude protein, crude fat, crude fiber, acid insoluble ash, aflatoxin B1, etc.



IS 1374 : 2007 Poultry Feeds – Specification

- This standard prescribes requirement, sampling and methods of test for chicken (*Gallus domesticus*) feeds.
- The standard specifies Types, description and quality characteristics for poultry feeds such as moisture, crude protein, crude fat, crude fiber, acid insoluble ash, salt etc.
- The standard also specifies the following:
 - ✓ Requirements for Minerals, Vitamins, Amino Acids and Fatty Acids per kg of Chicken Feeds
 - ✓ Maximum Prescribed Limit for Harmful Substances and Test Methods in Compound Poultry Feeds
 - ✓ Composition of commonly Used Feed Ingredients along with natural vitamins and macro/micro minerals
 - ✓ Expected Performance of Broilers and Commercial Layer Flocks
- The standard is currently under review.



IS 1664 : 2002 Mineral mixtures for supplementing cattle feeds - Specification

- This standard prescribes the requirements and the methods of sampling and test for mineral mixtures for supplementing cattle feeds which may be of the following types:
 - *Type 1* - Mineral mixtures containing salt
 - *Type 2* - Mineral mixtures without salt
- The standard prescribes the quality parameters such as moisture, Ca, P, Mg, salt, Fe, I, Cu, Mn, Co, F, Zn, S, acid insoluble ash, along with limits for heavy metals such as Pb, As.



IS 7472 : 1986 Specification for Pig Feeds

- This standard prescribes the requirements, and methods of sampling and test for pig feeds.
- The standard specifies 3 types of pig feeds:
 - Pig Starter/Creep Feed
 - Pig Growth Meal
 - Pig Finishing/Breeding Meal
- The standard also specifies description and quality characteristics for pig feeds such as moisture, crude protein, crude fat, crude fiber, total ash, acid insoluble ash, metabolizable energy, etc.
- The standard also specifies the requirements of additional characteristics which need to be declared such as Ca, P, Fe, Cu, Mn, Zn, NaCl, etc.



Indian Standards on Animal Husbandry (pertaining to cattle breeding)

- IS 7179 Specification for disposable plastic artificial insemination pipettes for cattle
- IS 7180 Specification for disposable artificial insemination gloves
- IS 8102 Technical requirements for frozen semen of breeding bull
- IS 11800 Specification for artificial vagina for bovines
- IS 13819 Artificial insemination guns
- IS 13820 Artificial insemination straws



Indian Standards on Poultry Housing

- IS 7518 : 1974 Specification for laying battery cages for poultry
- IS 2732 : 1985 Code of practice for poultry housing

Note: These standards were under revision. However, the discussions on revision are on hold as the matter related to draft regulations on poultry enclosures by DADH, Min of Agriculture is currently sub-judice.



FISHERY SECTOR

Fish Feed & Good Aquaculture Practices



IS 16150 (Part 1) : 2014 Fish Feed — Specification Part 1 Carp Feed

- This standard (Part 1) prescribes the requirements and the methods of sampling and test for Indian major carp (*Catla catla*, *Labeo rohita* and *Cirrhina mrigala*) feeds.
- Carp feed shall be of the following four types:
 - a) *Carp Spawn Feed (CSF)*
 - b) *Carp Fry Feed (CFF)*
 - c) *Carp Grow-out Feed (CGF)*
 - d) *Carp Brood Feed (CBF)*
- The ingredients listed in Annex B shall only be used for manufacturing carp feed.
- The standard prescribes the quality parameters such as moisture, crude protein, crude fat, crude fiber, gross energy, PUFA, physical characteristics etc.



IS 16150 (Part 2) : 2014 Fish Feed — Specification Part 2 Catfish Feed

- This standard (Part 2) prescribes the requirements and the methods of sampling and test for Indian major catfish (*Clarias batrachus*) feeds.
- Catfish feed shall be of the following four types:
 - a) *Catfish Larva Feed (CLF)*
 - b) *Catfish Fry Feed (CFF)*
 - c) *Catfish Grow-out Feed (CGF)*
 - d) *Catfish Brood Feed (CBF)*
- The ingredients listed in Annex B shall only be used for manufacturing catfish feed.
- The standard prescribes the quality parameters such as moisture, crude protein, crude fat, crude fiber, gross energy, physical characteristics etc.



IS 16150 (Part 3) : 2014 Fish Feed — Specification Part 3 Marine shrimp Feed

- This standard (Part 3) prescribes the requirements and the methods of sampling and test for marine shrimp (*Penaeus monodon* and *Litopenaeus vannamei*) feeds for their grow-out culture.
- Marine shrimp feed shall be of the following types:
 - a) *Starter Grade*
 - b) *Grower Grade*
 - c) *Finisher Grade*

The ingredients listed in Annex B shall only be used for manufacturing marine shrimp feed.

- The standard prescribes the quality parameters such as moisture, crude protein, crude fat, crude fiber, gross energy, physical characteristics etc.



IS 16150 (Part 4) : 2014 Fish Feed — Specification Part 4 Fresh water prawn

- This standard (Part 4) prescribes the requirements and the methods of sampling and test for freshwater prawn (*Macrobrachium rosenbergii*) feeds.
- Freshwater prawn feed shall be of the following types:
 - a) *Starter Grade*
 - b) *Grower Grade*
 - c) *Finisher Grade*

The ingredients listed in Annex B shall only be used for manufacturing freshwater prawn feed.

- The standard prescribes the quality parameters such as moisture, crude protein, crude fat, crude fiber, gross energy, physical characteristics etc.



Indian Standards on Good Aquaculture Practices(GAqP)

BIS has formulated 5 Indian Standards on GAqP in order to promote and compliment the Blue Revolution initiative of Govt. of India. The standards are voluntary in nature.

- IS 17281 : 2019 Requirements for Good Aquaculture practices- India GAqP –Shrimp hatchery and grow out farms
- IS 17282 : 2019 Requirements for Good Aquaculture practices- India GAqP- Striped Catfish (*Pangasianodon hypophthalmus*)
- IS 17283 : 2019 Requirements for Good Aquaculture practices- India GAqP- Carps
- IS 17284 : 2019 Requirements for Good Aquaculture practices- India GAqP – Freshwater prawn Culture
- IS 17285 : 2019 Good Aquaculture practices for Cage Culture in Fresh Water



Indian Standards on Good Aquaculture Practices- Features

- These standards envisaging focused approach for implementing good aquaculture practices, traceability etc. through appropriate infrastructure, record keeping and monitoring would reap following broad benefits:
- Increased returns to the farmer producing safe and quality product
- Uniform approach across farms regardless of their sizes
- Traceability through complete integration of food chain,
- Improvement in the environment
- Worker safety and welfare.
- Reputation in the international market as a producer of good quality and safe produce



DAIRYING SECTOR

Dairy products and Equipments



Packaged Pasteurized milk - Specification (IS 13688:1999):

This standard prescribes the requirements, methods of test and sampling for various types of packaged pasteurized milk.

- Type of milk include Species Identified Milk, mixed milk, Full Cream Milk, Standardized Milk, Toned Milk, Double Toned Milk and Skimmed Milk.
- Milk is to be pasteurized in such a way that every particle of milk reaches to at least 63°C and holding at such temperature continuously for at least 30 min or heating it to at least 72°C and holding at such temperature continuously for at least 15 s or any approved temperature time combination that gives a negative Phosphatase Test. All pasteurized milk of different types shall be cooled immediately to a temperature of 4°C, or less.
-
- Milk must be processed pasteurized, packed and handled under strict hygienic conditions as prescribed in IS 2491.
- Chemical requirements: Milk fat %, Milk SNF%, negative phosphatase test, absence of adulterants and urea, upper limits of aflatoxins, lead and arsenic.
- Microbiological requirements : Upper limits of Aerobic plate count, Coliform count, *Listeria monocytogenes*, *Salmonella* sp.



Milk powders

Types

- a) Whole milk powder (IS 1165 :2002)
 - b) Partly skimmed milk powder (IS 14542:1998)
 - c) Skimmed milk powder [IS 13334 (Part 1 & 2)], standard grade and extra grade.
- These standards prescribe physical, chemical and microbiological requirements, methods of sampling and test for milk powders.
 - Obtained by spray or roller drying of standardized milk/partly skimmed milk/skimmed milk of cow or buffalo or a combination thereof by removal of water.
 - Manufactured and packed under hygienic conditions as per IS 2491.
 - Important chemical requirements: Moisture %, Total solids %, Milk fat %, Insolubility index, total ash %, titratable acidity %, negative phosphatase test, absence of adulterants and urea, upper limits of aflatoxins, lead and arsenic.
 - Important microbiological requirements : Upper limits of Bacterial count, Coliform count, *Staphylococcus aureus*, *Shigella*, *Salmonella* sp.



Condensed milk

Types :

- Condensed, Partially Skimmed or Skimmed condensed milk (IS 1166:1986)
- UHT condensed milk and Skimmed UHT condensed milk (IS 12176 : 1987)
- Produced by the evaporation in *vacuo* of milk either whole, partially skimmed, skimmed or reconstituted or recombined milk with suitable adjustment of milk solids and with the addition of sucrose in the form of refined sugar.
- Condensed milk may contain upto a maximum of 0.3 % of added refined lactose, permitted flavours, calcium chloride, citric acid, Na citrate, Na salts of o-phosphoric acid and polyphosphoric acid and not more than 30% of the lactose crystals shall be more than 15 µm in size to maintain good texture of the product.
- The standard also allows fortification of condensed milk with food grade Vitamins A, D and B groups with declaration on the label.
- Important chemical requirements: Milk solids %, Milk fat %, Sucrose %, titratable acidity %,
- Important microbiological requirements : Upper limits of Bacterial count, Coliform count, *Staphylococcus aureus*, Yeast & Mould count



Indian standards on Foods for Infants

- IS 14433:2007 Infant milk substitutes
- IS 1656:2007 Milk cereal based complementary foods
- IS 11536:2007 Processed cereal-based complementary foods
- IS 15757:2007 Follow-up formula – complementary foods



Code of hygienic conditions for production, processing, transportation and storage of milk (IS 7005:1973)

- To protect milk from all possible sources of contamination at each stage of the dairy chain and ensure supply of clean and safe milk to the consumers, the code, IS 7005 has been formulated.
- Important hygienic conditions and practices prescribed in the standard are as under:
 - a) Hygienic requirements for building*
 - b) Plant and Equipment Hygiene*
 - c) Water Supply*
 - d) Sanitary Piping*
 - e) Cleaning and Sanitization of Plant Equipment and Containers*
 - f) Surroundings and Waste Disposal*
 - g) Personnel Health and Cleanliness*



Other IS on dairy products

- Indigenous Dairy Products: Specifications for *Kulfi* (IS 10501:1983), *Dahi* (IS 9617:1980), *Paneer* (IS 10484:1983), *Chakka* and *Shrikhand* (IS 9532:1980), *Burfi* (IS 5550:1970), *Chhana* (IS 5162:1980), *Khoya* (IS 4883:1980), Packed *Gulab Jamun* (IS 11602:1986) and Canned *Rasogolla* (IS 4079:1967) - The important requirements prescribed include compositional requirements like total solids, fat, moisture, sucrose & ash content; microbiological requirements; packaging; labelling and detailed hygienic requirements for manufacture, processing and transportation of dairy products.
- Other product standards include Sterilized milk (IS 4238:2020) Dairy Whitener (IS 12299:1998), Lactose, Commercial (IS 1000:1989)



Indian Standards in dairy sector under mandatory BIS certification

1. IS 1165 Milk powder
2. IS 1166 Condensed milk, partly skimmed and skimmed condensed milk
3. IS 1656 Milk-cereal based complementary foods
4. IS 11536 Processed cereal based complementary foods
5. IS 12176 Sweetened ultra high temperature treated condensed milk
6. IS 13334(Part 1) Skimmed milk powder, standard grade
7. IS 13334(Part 2) Skimmed milk powder, extra grade
8. IS 14542 Partly skimmed milk powder
9. IS 14433 Infant milk substitute
10. IS 15757 Follow –up formula- Complementary Food^s



Indian Standards on Dairy Equipments

The standards cover the details of the material and sanitary design of construction of specialized dairy equipments which facilitate cleaning and use in the dairy industry.

- Stainless steel milk cans 16440:2016
- Aluminium alloy milk cans (IS 1825:1983)
- Insulated stainless steel horizontal milk storage tanks (2688:2009)
- Stainless steel steam jacketed ghee pans (IS 2829:2019)
- settling tanks for ghee (IS 4743:2018)
- Batch pasteurizer (IS 2689:2019)
- Bulk Milk Cooling Tanks (IS 3661:2019)



Bulk Milk Cooling Tanks (IS 3661:2019)

- Specifies requirements for design, construction and performance of bulk milk cooling tanks for refrigeration of fresh raw milk and storage of refrigerated raw milk.
- Applies to bulk milk cooling tanks with automatic control intended for fixed installation in farms or at milk collecting points.
- y applies to tanks for two milkings (in 24 h) and four milkings (in 48 h)the standard is also at par with international standards.
- Covers different bulk milk cooling geometries (rectangular tank, vertical cylindrical, open horizontal-semi cylindrical, horizontal cylindrical, elliptical etc) and capacities varying from 250 to 20,000 litres



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Indian Standards on Medical Devices & Hospital Planning



Medical Devices for Clinical Examination

- **IS 3390 : 1988- Specification for **sphygmomanometers** mercurial (Second Revision)**

Standard lays down the requirements for mercurial sphygmomanometers used for measuring arterial blood pressure in human beings.

IS/IEC 80601 (Part 2 / Sec 30) : 2018 Medical electrical equipment Part 2 - 30 particular requirements for basic safety and essential performance of automated non - Invasive **sphygmomanometers**

- **IS 3391 : 1965- Specification for **stethoscopes****

Standard lays down the requirements for binaural stethoscopes used for the detection and study of sounds arising within the human or animal body. It does not cover special stethoscopes such as multiple lead diaphragm ones or those with extra chest pieces used for demonstration purposes.



Medical Devices for Clinical Examination

- **ISO 15197 : 2013** In vitro diagnostic test systems — Requirements for **blood-glucose monitoring systems** for self-testing in managing diabetes mellitus (First revision)

Specifies requirements for *in vitro* glucose monitoring systems intended for self-measurement by lay persons for management of diabetes mellitus

- **IS 17407 : 2020 – Digital Otoscope – Handheld type**

Standard provides general functional requirements of an otoscope that is digital, handheld type, portable, battery operated and has a display screen with suitable software to capture store and transfer images to examine the external auditory canal and the tympanic membrane of human ear.



ANAESTHETIC & RESUSCITATION DEVICES

Ventilators

- 1). **IS/ISO 80601-2-12 : 2011 'Medical electrical equipment — Part 2-12: Particular requirements for basic safety and essential performance of critical care ventilators**

Specifies basic safety and essential performance of a ventilator in combination with its accessories.

- 2). **IS/ISO 10651-3 : 1997 'Lung ventilators for medical use — Part 3: Particular requirements for emergency and transport ventilators**

Specifies requirements for portable lung ventilators designed for use in emergency situations and transport.

- 3). **IS/ISO 10651-4 : 2002 Lung ventilators — Part 4: Particular requirements for operator-powered resuscitators**

Specifies requirements for operator-powered resuscitators intended for use with all age groups and which are portable and intended to provide lung ventilation to individuals whose breathing is inadequate



Ventilators

4) IS/ISO 10651-5 : 2006 'Lung ventilators for medical use — Particular requirements for basic safety and essential performance — Part 5: Gas-powered emergency resuscitators

Specifies the basic safety and essential performance requirements for gas-powered emergency resuscitators intended for use with humans by first responders.

5) IS/ISO 10651-6 : 2004 'Lung ventilators for medical use — Particular requirements for basic safety and essential performance — Part 6: Home-care ventilatory support devices

Specifies the basic safety and essential performance requirements for home-care ventilator support devices, intended mainly for use in home care.

Suction Apparatus

6) IS/ISO 10079 Part 2 : 2014 'Medical Suction Equipment Part 2 Manually Powered Suction Equipment (First Revision)'

Specifies safety and performance requirements for manually powered suction equipment intended for oro-pharyngeal suction. It applies to equipment operated by foot or by hand or both

7) IS/ISO 10079 (Part 3) : 2014 'Medical suction equipment Part 3 suction equipment powered from a vacuum or positive pressure gas source (First Revision)'

Specifies safety and performance requirements for medical suction equipment powered from a vacuum or positive pressure gas source generating venturi suction.



Cardiovascular Medical Devices

- **IS/ISO 25539-2:2012 Cardiovascular implants — Endovascular devices — Part 2: Vascular stents**

Provides requirements for intended performance, design attributes, materials, design evaluation, manufacturing, sterilization, packaging and information supplied by the manufacturer.

- **IS 11566 : 1986 Specification for valve retractors**

Specifies material, dimensions and other requirements for valve retractor: Used in cardiovascular surgery

- **ISO 7199 : 2016 Cardiovascular implants and artificial organs — Blood-gas exchangers (oxygenators) (*Second revision*)**

specifies requirements for sterile, single-use, extracorporeal blood-gas exchangers (oxygenators) intended for supply of oxygen to, and removal of carbon dioxide from, the blood of humans.



Ophthalmic Implants

Intraocular Lenses (IOL)

1). IS/ISO 11979 : Part 2:1999 Ophthalmic implants - Intraocular lenses: Part 2 optical properties and test methods

Applicable but not limited to non-toric, monofocal IOLs intended for implantation into the anterior segment of the human eye

2). IS/ISO 11979 : Part 3:2006 Ophthalmic implants - Intraocular lenses: Part 3 mechanical properties and test methods

Applicable to all types of IOLs intended for implantation in the anterior segment of the human eye.

3). IS/ISO 11979 : Part 5:2006 Ophthalmic implants - Intraocular lenses: Part 5 biocompatibility

Applicable to any IOL whose primary indication is the correction of aphakia.

4). IS/ISO 11979 : PART 6:2014: Ophthalmic implants - Intraocular lenses: Part 6 shelf - Life and transport stability testing

Specifies tests by which the shelf-life of sterile IOLs in their final packaging can be determined.



Intraocular Lenses (IOL)

5). IS/ISO 11979 : PART 7:2006 Ophthalmic implants - Intraocular lenses: Part 7 clinical investigations

Specifies particular requirements for clinical investigations for posterior and anterior chamber monofocal IOLs for the correction of aphakia & far distance.

6). IS/ISO 11979 : PART 8:2006 Ophthalmic implants - Intraocular lenses: Part 8 fundamental requirements

Specifies fundamental requirements for all types of IOLs excluding corneal implants and transplants.

7). IS/ISO 11979 : Part 9:2006 Ophthalmic Implants - Intraocular Lenses: Part 9 Multifocal Intraocular Lenses

Applicable to any IOL primary indication is the correction of aphakia with the added benefit of useful vision at more than one distance (e.g. far and near).

8). IS/ISO 11979 : Part 10:2006 Ophthalmic implants - Intraocular lenses: Part 10 phakic intraocular lenses

Addresses specific requirements for PIOLs not addressed in the other parts of IS/ISO 11979.

Orthopaedic Medical Devices

- **IS/ISO 21534 : 2007 Non-active surgical implants — Joint replacement implants — Particular requirements**
- specifies particular requirements for total and partial joint replacement implants, artificial ligaments and bone cement, hereafter referred to as implants
- **IS/ISO 21535 : 2007 Non-active surgical implants — Joint replacement implants — Specific requirements for hip-joint replacement implants**
- provides specific requirements for hip joint replacement implants e.g. for intended performance, design attributes, materials, design evaluation, manufacture, sterilization, packaging, information supplied by the manufacturer, and methods of test.
- **IS/ISO 21536 : 2007 'Non-active surgical implants — Joint replacement implants — Specific requirements for knee-joint replacement implants**
- provides specific requirements for knee joint replacement implants e.g. for intended performance, design attributes, materials, design evaluation, manufacture, sterilization, packaging, information supplied by the manufacturer, and methods of test.

DENTISTRY

- **IS 6116 : 1992 Dental equipment - Dental patient chair - Specification First Revision**

Specifies requirements, test methods and details of marking for dental patient chairs and applies to all such chairs, regardless of their construction and also regardless of whether they are electrically powered or not.

- **IS/ISO 24234 : 2015 ISO 24234 :2015 Dentistry - Dental amalgam**

Specifies the requirements and test methods for dental amalgam alloys that are suitable for the preparation of dental amalgam, together with the requirements and test methods for that dental amalgam and the requirements for packaging and marking (including those for dental mercury).



Electrical Clinical Thermometer & Screening Thermograph

IS/ISO 80601-2-56 : 2017 Medical electrical equipment : Part 2 particular requirements for basic safety and essential performance, Section 56 Clinical thermometers for body temperature measurement

Specifies requirements for basic safety and essential performance of all electrical clinical thermometers used for measuring the body temperature of patients.

IS/IEC 80601(Part 2/Sec 59) :2017 Medical Electrical Equipment : Part 2 Particular Requirements for the Basic Safety and Essential Performance, Section 59 Screening thermographs for human febrile temperature screening

Specifies requirements for basic safety and essential performance of screening thermographs intended to be used for the individual non-invasive febrile temperature screening of a human under controlled environmental condition

IMPORTANT UTILITY ITEMS FOR MEDICAL USE

FACE MASKS

1). IS 9473:2002 Respiratory protective devices - Filtering half masks to protect against particles

Specifies requirements and method of sampling and tests for filtering half masks as respiratory protective devices against particles except for escape purposes (N 95 type).

2). IS 16289:2014 Medical Textiles — Surgical Face Masks - Specification

Specifies the performance requirements and test methods of surgical face masks intended to limit the transmission of infective agents from staff to patients and (in certain situations) vice-versa during surgical procedures in operating theatres and other healthcare services .

3). IS 16289:2014 Medical Textiles — Surgical Face Masks - Specification

Specifies the performance requirements and test methods of surgical face masks intended to limit the transmission of infective agents from staff to patients and (in certain situations) vice-versa during surgical procedures in operating theatres and other healthcare services.



Gloves

1). IS 4148: 1989 Surgical Rubber Gloves- Specification (First Revision)

Prescribes the requirements and methods of sampling and tests for re-usable surgical gloves

2). IS 13422: 1992 Disposable surgical rubber gloves specification

Specifies requirements for single-use packaged sterile gloves intended for use in surgical procedures.

3).IS 15354(Part 1):2018/ ISO 11193-1: 2008 Single-use medical examination gloves Part 1 Specification for gloves made from rubber latex or rubber solution (First Revision)

Specifies requirements for packaged sterile, or bulked non-sterile, single-use rubber gloves intended for use in medical examinations and diagnostic or therapeutic procedures.

4). CHD 8 (15375) IS 6994 (Part 5) : XXXX/ISO 374-5 : 2016 Protective Gloves against Dangerous Chemicals and Micro-organisms Part 5 Terminology and performance requirements for micro-organisms risks (under printing)

Specifies the requirements and test methods for protective gloves intended to prevent penetration of bacteria, fungi and virus.



Eye Protector & Face Shield

1. IS 5983 : 1980 -Specification for eye - Protectors (First Revision)

Prescribes requirements for eye protectors meant for protection of eyes against hazards such as flying particles and fragments, splashing material and molten metals, harmful dust, gases or vapours, aerosols and radiation. Specifies five types of eye protectors - Goggles, safety spectacles, safety clip-ons, eye, face, and hand shields, and wire mesh screens

2. IS 8521 (Part 1) : 1977Specification for industrial safety face shields: Part 1 with plastics visor

Prescribes industrial face shields with transparent plastic visor for protection of the face from flying particles or from sprays or flashes of hazardous liquid, molten metals or slag. Specifies three types - Type 1 (face shield without crown protector), Type 2 (face shield with crown protector) and Type 3 (face shield with provision of attachment to a safety helmet).



BLOOD BAG

1). IS/ISO 3826-1 : 2013 - Plastics Collapsible Containers for Human Blood and blood components Part 1 Conventional Containers

Specifies requirements for plastics collapsible, non-vented, sterile containers for the collection, storage, processing, transport, separation, and administration of blood and blood components.

2). IS/ISO 3826-3 : 2006 - Plastics Collapsible Containers for Human Blood and blood components Part 3 Blood Bag Systems with Integrated Features

Specifies requirements, including performance requirements, for integrated features on plastic, collapsible, non-vented, sterile containers



Bandages

- **IS 11163 : 1985 Specification for first - Aid dressings**
 - Specifies the requirements of first-aid dressings.
- **IS 14274 : 1995 Bandage, T - Shaped, calico – Specification**
 - Specifies the requirements of bandage, T-shaped, calico mainly used in hospitals as abdominal bandage.
- **IS 14306 : 1995 Bandage, triangular, calico specification**
 - Specifies the requirements of bandage, triangular, calico used as a sling for supporting fractured/wounded arm.
- **IS 14316 : 1995 Swabs, small, in bag of 50 – Specification**
 - Specifies the requirements of small swabs, in bag of 50 used for dressing of wounds
- **IS 14944 : 2001 Surgical dressings - Methods of test**
 - standard covers test methods for both adhesive and non-adhesive types of dressings.
- **IS 16111 : 2013 Elastic bandage**
 - Standard covers the dimensions and other requirement for elastic bandages intended to provide support and immobilize dressings covering the wounds besides the function of compression and support for orthopaedic purposes



Medical Textiles

- [IS 16468 : 2016](#) Medical textiles - Absorbent cotton (Sterile And Non - Sterile) - Specification
- [IS 16469 : 2016](#) Medical textiles - Open weave bandages – Specification
- [IS 16470 : 2016](#) Medical textiles - Elastic surgical adhesive tapes – Specification
- IS 16600 : 2017 Medical textiles - Nonwoven bandage rolls - Specification
- IS 16668 : 2017 Medical textiles - Salicylic acid adhesive plaster – Specification
- IS 16669 : 2017 Medical textiles - Elastic adhesive dressing – Specification
- IS 16670 : 2017 Medical textiles - Absorbent cotton ribbon gauze - Specification



Medical Textiles

- **IS 17334 : 2019 Medical Textiles " Surgical Gowns and Surgical Drapes " Specification**
- **IS 17423 : 2020 Medical Textiles " Coveralls for COVID-19 " Specification**
- **IS 17349 : 2019 Medical Textiles " Shoe Covers " Specification**
- **IS 6237 : 1971 Specification for handloom cotton cloth for plaster of paris bandages and cut bandages**



ASSISTIVE & REHABILITATION DEVICES

Wheelchairs

1). IS 6571:1991 Rehabilitation equipment - Wheelchairs, non - Folding, adult size, institutional model - Specification (First Revision)

Specifies the requirements for institutional model, adult size, non-folding wheelchairs used in hospitals and similar institution.

2). IS 7454:1991 Rehabilitation equipment - Wheelchairs, folding, adult size - Specification (First Revision)

Specifies the requirements for adult size, folding wheelchairs used by invalids

3). IS 8086:1991 Rehabilitation equipment - Wheelchairs, folding, junior size - Specification (First Revision)

Specifies the requirements for folding wheelchairs used by invalid children.

4). IS 17063 :2018 Specification for rehabilitation equipment - rough terrain active wheelchairs, folding, rider - I, adult and child size

Specifies the requirements for manual, folding wheelchairs for rough terrain active mode for urban/rural outdoor mobility to be used by adults and children with disabilities



HOSPITAL EQUIPMENT

Medical Beds

Hospital Beds

IS : 5029-1979 BEDSTEADS, HOSPITAL, GENERAL PURPOSES (First Revision)

Specifies the requirements of bedsteads suitable for general purposes in hospitals and other similar institutions.

ICU Beds

- **IS 9395 : 1979 Specification for bed, intensive care**

Specifies the requirements for intensive care bed used for the intensive care of the patients in hospitals and dispensaries. It covers materials, shapes and dimensions, construction, performance requirements, workmanship and finish, accessories, instructions for use and maintenance and marking requirements.



Braille (for visually impaired)

1). IS 11279:1985 Specification for braille slate

Specifies requirements for braille slate used for communicating language by the blind persons.

2). IS 12152:1987 Specification for pocket frame, braille writing

Specifies requirements for pocket frame used for writing braille.

3). IS 12184:1987 Specification for stylus for braille writing

Specifies requirements of stylus for braille writing.

4). IS 14429:1997 Braille shorthand machine - Specification

Specifies requirements of Braille shorthand machine, along with paper roll for use by the visually impaired.



CONTRACEPTIVES

1). IS/ISO 4074 : 2015 ISO 4074 : 2015-Natural rubber latex male condoms - Requirements and test methods First Revision

Specifies the requirements for biocompatibility, microbial contamination, design, stability and shelf, life packaging and labelling for male condoms made of natural rubber.

2). IS/ISO 23409 : 2015 ISO 23409 : 2011-Male condoms - Requirements and test methods for condoms made from synthetic materials

Specifies the requirements for biocompatibility, microbial contamination, design, stability and shelf, life packaging and labelling for male condoms made from 100% synthetic materials or a blend of synthetic materials and natural rubber latex.

3). IS/ISO 25841 : 2014 ISO 25841 : 2014-Female condoms - Requirements and test methods

Specifies the requirements for quality verification, design, barrier properties, biocompatibility, clinical investigations, bursting volume & pressure, stability and shelf, life packaging and labelling for female condoms for contraceptive purpose and prevention of sexually transmitted infections.



HOSPITAL PLANNING & MANAGEMENT

IS 12433 (Part 1) : 1988 Basic requirements for hospital planning Part 1 up to 30 bedded hospital

Covers basic requirements for planning a 30 bedded general hospital in respect to functional programme, functional and space requirements, work-flow analysis, manpower requirements, instruments and equipment. Certain essential requirements for building, services and environment have also been covered.

IS 12433 (Part 2) : 2001 Basic requirements for hospital planning Part 2 up to 100 bedded hospital

Covers basic requirements for planning a 100 bedded general hospital in respect to functional programme, functional and space requirements, work-flow analysis, manpower requirements, instruments and equipment. Certain essential requirements for building, services and environment have also been covered.



IS 13808 (Part 1) : 1993 Quality management procedures for out - Patient department OPD and emergency services - Guidelines Part 1 upto 30 bedded hospitals

Lays down guidelines for quality management procedures for OPD & emergency services offered in 30 bedded hospitals.

IS 13808 (Part 2) : 1993 Quality management procedures for diagnostic and blood transfusion services- Guidelines

Lays down guidelines for quality management procedures for diagnostic and blood transfusion services offered in 30-bedded general hospitals with reference to: Pathological Services, Imaging Services, ECG Services and Blood Transfusion Services.

IS 13808 (Part 3) : 1995 Quality management for hospital services Upto 30 - Bedded Hospitals - Guidelines Part 3 wards nursing services and operation theatre

Provides basic guidelines for evolving a well planned quality management programme which would result in quality health care to the patients in relation towards, nursing services, operation theatre and labour room in a 30-bedded general hospital.



IS 13808 (Part 4) : 1996 Quality management for hospital services For 30 - Bedded Hospital - Guidelines Part 4 hospital support services

Lays down guidelines for quality management system for hospital support services offered in a 30-bedded general hospital with reference to Stores, Central sterile and supply department, laundry, kitchen, Housekeeping and maintenance services

IS 13808 (Part 5) : 1996 Quality management for hospital services For 30 - Bedded Hospital - Guidelines Part 5 hospital equipment management

Provides basic guidelines for evolving a well planned programme for equipment management in a 30-bedded hospital which would result in quality health care to the patients.

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NEWS AND EVENTS

- 📅 Temporary measures for relaxation of provision of BIS Conformity Assessment Regulations 2018 for renewal of licence with late fee and renewal of deferred licence
- 📅 Extension of date of implementation of amendments to Indian Standards and revised Indian Standards
- 📅 Relaxation in fee for MSME units for licence under Bureau of Indian Standards (Conformity Assessment) Regulations 2018 and its amendments- req

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- 📅 on "Laboratory Quality Management System & Internal Audit as per IS/ISO/IEC 17025 : 2017 " to be held during 20-23 July 2020.
- 📅 2-day Online Training programme on " Transition to IS/ISO/IEC 17025 : 2017 " to be held during 27-28 July 2020.
- 📅 4-day Online Training programme on " Medical Laboratories Quality Systems and Internal Audit as per IS/ISO 15189 : 2012 " to be held during 4-7 August 2020.
- 📅 2-day Online Training programme on "Measurement Uncertainty" to be held during 06-07 August 2020.
- 📅 4-day Online Training programme on "Laboratory Quality Management



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Power/Energy Sector

IS 16444 (Part 1) : 2015 a.c. Static Direct Connected Watthour Smart Meter Class 1 and 2 — Specification

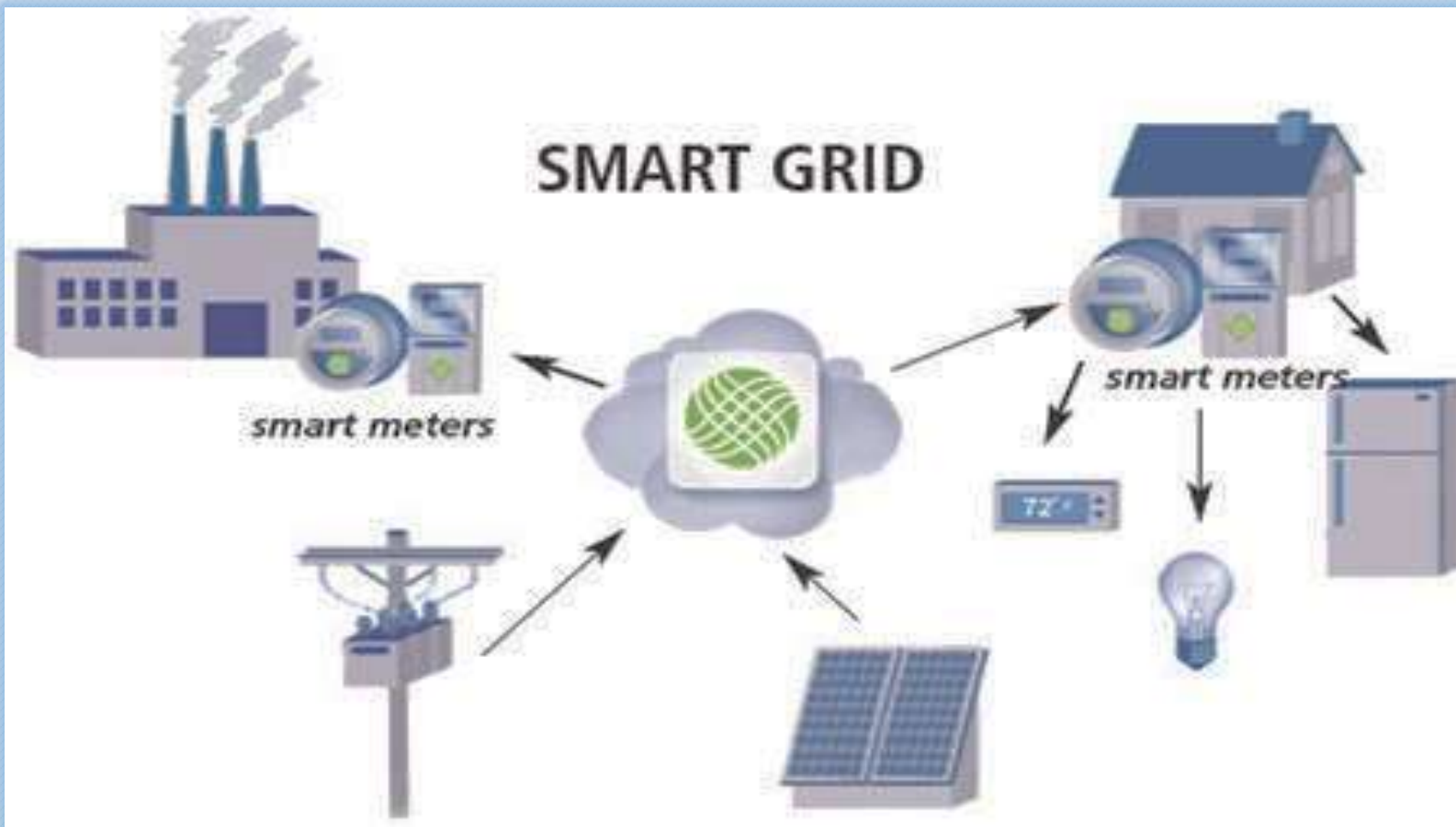


SCOPE – Part 1 of this series specifies static watt-hour smart meters of accuracy class 1 and 2 for the measurement of alternating current electrical active energy of frequency 50 Hz for single phase and three phase balanced and unbalanced loads.

It applies to: a) static watt-hour direct connected meters consisting of measuring element(s), time of use of register(s), display, load switch and built in type bi-directional communication module all integral with the meter housing. b) alternately the bi-directional communication module could be plug-in type on a dedicated slot with suitable sealing arrangement.

The smart meters as per IS 16444 (Part 1) shall be suitable for indoor/outdoor usage and capable of forward (import) or both forward (import) and reverse (export) energy measurement.

IS 16444 (Part 2) : 2017 a.c. Static Transformer Operated Watthour and Var-Hour Smart Meters, Class 0.2S, 0.5S and 1.0S - Part 2 Specification Transformer Operated Smart Meters



SCOPE - Part 2 of this series specifies ac static transformer operated watthour and var-hour smart meters of accuracy class 0.2S, 0.5S and 1.0S for the measurement of alternating current electrical active and reactive energy of frequency in the range 50 Hz for single phase and three phase balanced and unbalanced loads. It applies only to transformer operated static watthour and var-hour meters consisting of measuring element(s) and register(s) enclosed together in the meter case. It also applies to multi-rate tariff meters and meters which measure energy in both directions.

RELEVANCE OF INDIAN STANDARD

- Several programmes have been launched by Government of India to reform the energy and power sector. One such initiative was introduction of IT enabled services that has set the platform for deploying Smart Grids in India. The Smart Grid via its environment friendly and consumer centric approach would offer enhanced reliability, security, safety and efficiency for grid operations. The transition to Smart Grid would achieve the overarching objectives of Government to reduce AT&C losses (Aggregate Technical & Commercial losses) and provide 24×7 power for all.
- Advanced Metering Infrastructure (AMI) is a crucial part of a Smart Grid. It is an integrated system of smart meters, communication networks and data management systems that enables two way communication between the utilities and consumer premises equipment. Electrotechnical Department of BIS has prepared Indian standards IS 16444 (Parts 1 and 2) which specify requirements for direct and transformer connected smart meters.

BENEFITS

A smart meter:

- reveals more detailed energy consumption (compared to old accumulation meters), which could help you find ways to be more energy efficient
- allows connection or disconnection remotely, avoiding delays when moving or swapping electricity retailers or for other monitoring purposes
- allows better monitoring of the quality of electricity supply, including outages
- could help utilities/customers analyse the data to find cheaper electricity plans such as flexible or time-of-use pricing

BENEFITS

A smart meter :

- reveals usage data to assist when designing suitable solar and battery systems (Smart meter data provides critical household usage patterns that are helpful when sizing up a new solar PV system for your home)
- the smart meter provides data and information that are needed by various Smart Grid applications.
- The smart meter is capable of forward (import) or both forward (import) and reverse (export) energy measurement thus providing provision of net metering etc.

IS 17048 : 2018 - Halogen Free Flame Retardant HFFR Cables for Working Voltages up to and including 1100 Volts Specification



SCOPE- This specification covers general requirements of single and multicore cables/cords with rigid as well as flexible annealed bare/tinned copper and aluminium conductor insulated and sheathed (if any) with Thermoplastic or Crosslinked Halogen Free Flame Retardant (HFFR) material for voltages up to and including 1100 V a.c., 50 Hz, used in power and lighting installations including cables for low temperature applications. These cables may be used on d.c. systems for rated voltages up to and including 1500 V to earth. These cables are suitable to use for conductor temperature not exceeding 70°C for thermoplastic or 90°C for crosslinked material.

RELEVANCE OF INDIAN STANDARD

- In all fire disasters, fire, smoke, heat and toxic fumes are the main obstacles to safe evacuation of a building or area.
- A major contribution towards overcoming these hazards is the use of fire resistant and non-halogenated cables
- HFFR is practically halogen free and ensures that people trapped in fire can breathe easy facilitating better chances of their rescue.

ISSs notified under Cables (Quality Control Order)

Indian Standard	Name of Product
IS 694 : 2010	PVC Insulated Sheathed/Unsheathed Cables and cords for working voltages upto and including 1100 V
IS 1554 (Part 1) : 1988 IS 1554(Part 2):1988	PVC Insulated Heavy Duty Cables
IS 7098(Part 1):1988 IS 7098(Part 2):2011 IS 7098(Part 3):1993	Crosslinked Polyethylene Insulated Cables
IS 9968 (Part 1) : 1988 IS 9968 (Part 2) : 2002	Specification for Elastomer Insulated Cables
IS 14255 :1995	Aerial Bunched Cable - for working voltages upto and including 1100 V
IS 17048 : 2018	Halogen Free Flame Retardant (HFFR) Cables for Working Voltages Up to and Including 1100 V – Specification

IS 9537 series - Specification for Conduits for Electrical Installations



Conduit is a part of closed wiring system of circular or noncircular cross section for conductors and/or cables in electrical installations allowing to draw them in and/or to replace them.

IS 9537 series applies to conduits of circular cross section for the protection of conductors and/or cables in electrical installations

IS 9537 series- Published Standards

IS No.	Title	Scope
9537 (Part 1)	General Requirements	This standard applies to conduits of circular cross section for the protection of conductors and /or cables in electrical installations.
9537 (Part 2)	Rigid Steels Conduits	Requirements and methods of test of threaded/threadable plain rigid steel conduits
9537 (Part 3)	Rigid Plain Conduits of Insulating Material	Requirements and methods of tests for circular rigid non-flame propagating and non-threadable plain conduits of insulating materials
9537 (Part 4)	Pliable Self-recovering Conduits of Insulating Material	Requirements and methods of tests for pliable self-recovering plain and corrugated conduits of insulating materials.
9537 (Part 5)	Pliable Conduits of Insulating Material	Requirements for pliable non-flame propagating plain and corrugated conduits of insulating material.
9537 (Part 6)	Pliable Conduits of Metal and Composite Material	Requirements for pliable conduits of metal or composite materials
9537 (Part 8)	Threadable conduits of aluminium alloy	Requirements for plain rigid conduits of aluminium alloy

IS 12615 : 2018 - Line Operated Three Phase a.c. Motors (IE CODE) “Efficiency Classes and Performance Specification”



SCOPE- IS 12615 covers the efficiency classes and performance specifications of single-speed line operated a.c. motors that are rated for operation on a sinusoidal voltage supply and : a) Have a rated power from 0.12 kW to 1 000 kW; b) Have 2, 4, 6 or 8 poles; c) Have a rated voltage U_n up to 1 000 V with a rated frequency of 50 Hz.

Most motors covered by this standard are primarily rated for duty type S1 (continuous duty). Motors rated for duty cycles S2 and above with an equivalent S1 duty are also covered.

Relevance of Indian Standard

- Electric motors are the most important type of electric load in every industry. The motor driven systems account for about seventy percent of the energy consumed by the industry. There is a large potential for cost effective solution in the use of energy efficient motor systems by about twenty to thirty percent. Electric motor systems include a number of energy using products, such as motors, drives, pumps or fans, compressors, blowers and other machines. Energy efficient motors form a major component in contributing to the energy saving by way of increased efficiency of the product itself.
- This standard establishes a set of efficiency values based on frequency, number of poles and motor output power.

IS 16242(Part-1): 2014 – Uninterruptible Power Systems (UPS)

Part 1 General and Safety Requirements for UPS

SCOPE- This part of IEC 62040 applies to uninterruptible power systems (UPS) with an electrical energy storage device in the d.c. link.

The primary function of the UPS covered by this standard is to ensure continuity of an alternating power source. The UPS may also serve to improve the quality of the power source by keeping it within specified characteristics.

This standard is applicable to UPS which are movable, stationary, fixed or for building-in, for use in low-voltage distribution systems and intended to be installed in any operator accessible area or in restricted access locations as applicable



IS 1180 (Part 1) : 2014 — Outdoor/Indoor Type Oil Immersed Distribution Transformers Up to and Including 2 500 kVA, 33kV — Specification

Part 1 Mineral Oil Immersed



SCOPE- This standard specifies the requirements and tests including standard loss levels of mineral oil immersed, natural air-cooled, outdoor/indoor type, double wound distribution transformers for use in power distribution systems with nominal system voltages up to and including 33 kV and of following types and ratings:

- a) Three phase ratings up to and including 200 kVA both non-sealed type and sealed type.
- b) Three phase ratings higher than 200 kVA, up to and including 2 500 kVA both non-sealed type and sealed type.
- c) Single phase ratings up to and including 100 kVA

Relevance of Indian Standard

- Distribution transformers play an important role in the power system as they provide the final voltage transformation by stepping voltages down within a distribution circuit or from a distribution circuit to an end user or application.
- The phenomenal growth of power distribution network has put tremendous responsibilities on the distribution transformer industry to supply reliable and cost- effective transformers.
- The Electrotechnical department of BIS has published IS 1180 (Part 1) which specifies requirements and tests for mineral oil immersed distribution transformers. This standard also specifies various Energy Efficiency Levels (EELs) to ensure energy efficient transformers.

INDIAN STANDARDS ON LED STREET LIGHTING

- The following Indian Standards have been published on LED Street lighting:
- 1) IS 10322 (Part 5/ Section 3) : 2012 -- Luminaires Part 5 Particular requirements Section 3 Luminaires for Road and Street Lighting
- 2) IS 16107 (Part 2/Section 2) : 2017 -- Luminaires Performance Part 2 Particular Requirements Section 2 LED Street Lighting Luminaire

NEED FOR STANDARDS ON LED STREET LIGHTING

- So far luminaires with conventional light sources are being used for the street lighting luminaire. Keeping in view of the energy conservation, increased life and recurring savings on account of maintenance, energy efficient LED based street lighting luminaires are now being extensively used for street light.
- In view of the increased use of LED luminaire for street lighting particularly by the utilities and urban local bodies, national standards have been formulated in order to ensure the desired quality and energy efficiency of the luminaires.

Salient features of IS 10322 (Part 5/ Section 3)

- This standard covers safety and photometric requirements.
- This standard specifies requirements for road and street lighting luminaries for use with tungsten filament, tubular fluorescent, **LED, LED modules** and other discharge lamps on supply voltage not exceeding 1000 V.
- This standard is based on IEC 60598-2-3 .



Salient features of IS 16107(Part 2/Section 2)

- This standard specifies the performance requirements for LED street lighting luminaire suitable for use on dc supplies up to 250 V dc or on ac supplies up to 1 000 V at 50 Hz.
- This standard does not cover LED street light luminaires that intentionally produce coloured light; neither does it cover modules based on OLEDs (organic LEDs).
- The performance requirements are additional to the requirements given in IS 16107 (Part 1).
- The luminaire efficacy shall not be less than 80 lm/W.

COMPULSORY REGSITRATION ORDER

- LED luminaires as per IS 10322 (Part 5/Section 3) are covered under “Electronics and Information Technology Goods (Requirement for Compulsory Registration) Order” notified by Ministry of Electronics & Information Technology (MeitY).
- As per this order, manufacture of the LED street light luminaires must obtain registration from Bureau of Indian Standards (BIS) after getting their product tested from BIS recognized labs.



PV Panel

IS 14286 - Terrestrial Photovoltaic (PV) Modules – Design Qualification and Type Approval



IS 14286 (Part 1) : 2019
IEC 61215-1 : 2016

Test Requirements

IS 14286 (Part 2) : 2019
IEC 61215-2 : 2016

Test Procedures

IS 14286 (Part 1 / Sec 1) : 2019
IEC 61215-1-1 : 2016

Testing requirements of crystalline silicon photovoltaic PV modules

IS 14286 (Part 1 / Sec 2) : 2019
IEC 61215-1-1 : 2016

Testing requirements of thin - Film cadmium telluride CdTe based photovoltaic PV modules

IS 14286 (Part 1 / Sec 3) : 2019
IEC 61215-1-1 : 2016

Testing requirements of thin - Film amorphous silicon based photovoltaic PV modules

IS 14286 (Part 1 / Sec 4) : 2019
IEC 61215-1-1 : 2016

Testing requirements of thin - Film Cu In ga S se ₂ based photovoltaic PV modules

IS 16102 (Part 1 & Part 2) – Self Ballasted LED Lamps for General Lighting Services

Part 1 - Safety Requirements & Part 2 - Performance Requirements

SCOPE- Part 1 specifies the safety and interchangeability requirements, together with the test methods and conditions, required to show compliance of LED lamps with integral means for stable operation, intended for domestic and similar general lighting purposes, having:

- a) a rated power from 1 W to 25 W;
- b) a rated voltage of greater than 50 V up to 250 V and 50 Hz
- c) Edison screw caps E14 , E27 and Bayonet caps B22d and B15d



SCOPE- Part 2 specifies the performance requirements, together with the test methods and conditions, required to show compliance of LED lamps with integral means for stable operation, intended for domestic and similar general lighting purposes, having:

- a) a rated power from 1 W to 25 W;
- b) a rated voltage above 50 V ac up to and including 250 V ac at 50 Hz;
- c) Edison screw caps E14 , E27 and Bayonet caps B22d and B15d

IS 14665 on Traction Lifts



IS 14665 (Parts 1 to 5) cover various requirements for Electric Traction Lifts as follows:

- IS 14665 (Part 1) : 2000 Electric Traction Lifts Part 1 Guidelines For Outline Dimensions Of Passenger, Goods, Service And Hospital Lifts
- IS 14665 (Part 2/Sec 1 & 2) : 2000 Electric traction lifts : Part 2 code of practice for installation, operation and maintenance, Section 1 Passenger and Goods Lifts, Section 2 Service Lifts
- IS 14665 (Part 3/Sec 1 & 2) : 2000 Electric Traction : Part 3 Safety Rules Lifts, Section 1 Passenger and Goods Lifts, Section 2 Service Lifts
- IS 14665 (Part 4/Sec 1 to 9) : 2001 Electric Traction Lifts : Part 4 Components, Section 1 Lift Buffers, Section 2 Lift Guide Rails and Guide Shoes, Section 3 Lift Car frame, Car, Counterweight and Suspension, Section 4 Lift Safety Gears and Governors, Section 5 Lift Retiring Cam, Section 6 Lift Doors and Locking Devices and Contacts, Section 7 Lift Machines and Brakes, Section 8 Lift Wire Ropes, Section 9 Controller and Operating Devices for Lifts
- IS 14665 (Part 5) : 1999 Electric Traction Lifts — Specification Part 5 Inspection Manual

Other relevant standards on Lifts and Escalators

- IS 17106 (Part 1) : 2019/ ISO 22201-1 : 2017 Lifts (Elevators), Escalators and Moving Walks — Programmable Electronic Systems in Safety-related Applications : Part 1 Lifts (Elevators) (PESSRAL)
- IS 15785 : 2007 Installation and maintenance of lift without conventional machine rooms - Code of practice
- IS 15259 : 2002 Installation and maintenance of home lifts - Code of practice
- IS 15330 : 2003 Requirements of Lifts for Persons with Disabilities (*under revision*)
- IS 4591 Code of practice for installation and maintenance of escalators (*under revision*)

Relevance of Indian Standards on Lifts and Escalators

From being a luxury item in the early years, lift has now become an integral part of any building with more than 2 floors. With ageing population and growth of vertical cities, the installation of lifts are multiplying multifold year on year.

Lift being a safety critical item they need to be professionally installed & maintained to ensure safety. In order to ensure orderly development of the industry, Indian standards need to be followed during the installation and maintenance of the equipment.

It is recommended to use IS-compliant lifts and escalators for the safety of equipment and the passengers in States even where a Lift Act is not defined. For home lifts, recommended Indian Standards are IS 14665 and IS 15259. If it is a machine room less elevator then IS 15785, similarly IS 14671 if it is a hydraulic lift.

Quality Control of Lifts

- Various States of India have their own lift laws and rules which refer to the Indian Standards viz. The West Bengal Lifts Act, the Karnataka Lift Laws, the Bombay Lift Act and the Bombay Lift Rules.
- Lift licenses are issued by the State Lift/Electrical Inspectorate in compliance with State's Lift Act/rules

AN OVERVIEW OF ELECTRICAL SAFETY - Indian Standards





Electrical Fire Safety – Indian context

Table 1.9 (Contd...)

Sl. No.	State/UT	No. of Cases	Accidental Fire (Electrical Short Circuit)				No. of Persons Died			
			No. of Persons Injured			Total	No. of Persons Died			Total
			Male	Female	Trans-gender		Male	Female	Trans-gender	
(1)										
STATE										
1	ANDHRA PRADESH	85	0	0	0	0	81	35	0	85
2	ARUNACHAL PRADESH	304	173	63	0	236	118	42	0	160
3	ASSAM	0	0	0	0	0	0	0	0	0
4	BIHAR	0	0	0	0	0	0	0	0	0
5	CHHATTISGARH	3	0	0	0	0	2	1	0	3
6	GOA	2	0	0	0	0	1	1	0	2
7	GUJARAT	0	0	0	0	0	0	0	0	0
8	HARYANA	92	0	0	0	0	63	19	0	82
9	HIMACHAL PRADESH	44	4	1	0	5	38	8	0	46
10	JAMMU & KASHMIR	118	0	0	0	0	98	22	0	118
11	JHARKHAND	0	0	0	0	0	0	0	0	0
12	KARNATAKA	262	0	0	0	0	214	52	0	266
13	KERALA	211	1	0	0	1	160	41	0	201
14	MADHYA PRADESH	2	0	0	0	0	0	0	0	0
15	MAHARASHTRA	0	0	0	0	0	0	0	0	0
16	MANIPUR	3	0	0	0	0	2	1	0	3
17	MEGHALAYA	2	0	0	0	0	1	1	0	2
18	MIZORAM	0	0	0	0	0	0	0	0	0
19	NAGALAND	0	0	0	0	0	0	0	0	0
20	ODISHA	92	0	0	0	0	63	19	0	82
21	PUNJAB	44	4	1	0	5	38	8	0	46
22	RAJASTHAN	118	0	0	0	0	98	22	0	118
23	SIKKIM	0	0	0	0	0	0	0	0	0
24	TAMIL NADU	262	0	0	0	0	214	52	0	266
25	TELANGANA	211	1	0	0	1	160	41	0	201
26	TRIPURA	2	0	0	0	0	0	0	0	0
27	UTTAR PRADESH	222	14	0	0	14	184	38	0	222
28	UTTARAKHAND	8	0	0	0	0	0	0	0	0
29	WEST BENGAL	116	12	0	0	12	104	12	0	116
TOTAL (STATES)		2413	230	0	0	230	1833	422	0	2255
UNION TERRITORIES										
30	A & N ISLANDS	2	0	0	0	0	0	0	0	0
31	CHANDIGARH	4	0	0	0	0	0	0	0	0
32	D & N HAVELI	0	0	0	0	0	0	0	0	0
33	DAMAN & DIU	0	0	0	0	0	0	0	0	0
34	DELHI (UT)	61	14	0	0	14	47	14	0	61
35	LAKSHADWEEP	0	0	0	0	0	0	0	0	0
36	PUDUCHERRY	5	0	0	0	0	4	1	0	5
TOTAL (UTs)		72	14	0	0	14	64	16	0	80
TOTAL (ALL INDIA)		2485	244	0	0	258	1897	438	0	2335

Table 1.9 (Contd...)

Sl. No.	State/UT	No. of Cases	Electrocution				No. of Persons Died			
			No. of Persons Injured			Total	No. of Persons Died			Total
			Male	Female	Trans-gender		Male	Female	Trans-gender	
(1)			(100)	(101)	(102)	(103)	(104)	(105)	(106)	(107)
1	ANDHRA PRADESH	13	0	0	0	0	12	1	0	13
2	ARUNACHAL PRADESH	6	0	0	0	0	4	2	0	6
3	ASSAM	7	0	0	0	0	7	0	0	7
4	BIHAR	0	0	0	0	0	0	0	0	0
5	CHHATTISGARH	2	0	0	0	0	2	0	0	2
6	GOA	273	0	0	0	0	225	52	0	277
7	GUJARAT	220	0	0	0	0	364	17	0	381
8	HARYANA	1057	11	3	0	14	909	157	0	1066
9	HIMACHAL PRADESH	11	0	0	0	0	11	0	0	11
10	JAMMU & KASHMIR	637	1	0	0	1	549	102	0	651
11	JHARKHAND	496	0	0	0	0	400	96	0	496
12	KARNATAKA	41	0	0	0	0	34	7	0	41
13	KERALA	35	659	97	0	756	2	39	4	45
14	MADHYA PRADESH	11	137	18	0	155	0	0	0	0
15	MAHARASHTRA	280	8274	1518	0	9892	0	1	0	1
16	MANIPUR	0	2	0	0	2	0	0	0	0
17	MEGHALAYA	0	3	0	0	3	0	0	0	0
18	MIZORAM	0	0	0	0	0	0	0	0	0
19	NAGALAND	4	70	11	0	85	0	0	0	0
20	ODISHA	0	0	0	0	0	0	0	0	0
21	PUNJAB	10	0	0	0	10	10	0	0	20
22	RAJASTHAN	100	4	0	0	104	86	18	0	104
23	SIKKIM	0	0	0	0	0	0	0	0	0
24	TAMIL NADU	0	0	0	0	0	0	0	0	0
25	TELANGANA	0	0	0	0	0	0	0	0	0
26	TRIPURA	0	0	0	0	0	0	0	0	0
27	UTTAR PRADESH	0	0	0	0	0	0	0	0	0
28	UTTARAKHAND	0	0	0	0	0	0	0	0	0
29	WEST BENGAL	0	0	0	0	0	0	0	0	0
TOTAL (STATES)		10290	278	68	0	364	3480	1026	0	4506
UNION TERRITORIES										
30	A & N ISLANDS	0	0	0	0	0	0	0	0	0
31	CHANDIGARH	0	0	0	0	0	0	0	0	0
32	D & N HAVELI	0	0	0	0	0	0	0	0	0
33	DAMAN & DIU	0	0	0	0	0	0	0	0	0
34	DELHI (UT)	0	0	0	0	0	0	0	0	0
35	LAKSHADWEEP	0	0	0	0	0	0	0	0	0
36	PUDUCHERRY	10	0	0	0	10	10	0	0	20
TOTAL (UTs)		10	0	0	0	10	10	0	0	20
TOTAL (ALL INDIA)		10290	278	68	0	364	3480	1026	0	4506

Electrical Fire Safety – Indian context



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CITIES » BENGALURU

BANGALORE, February 2, 2014

Updated: February 2, 2014 00:36 IST

Electrical accidents kill 94

SPECIAL CORRESPONDENT

COMMENT



9,962 Guj buildings inspected after Surat fire, 9,395 found unsafe

As many as 9,395 buildings across Gujarat, including schools, coaching centres, malls, restaurants and hotels, were found lacking in fire safety regulations during a mass inspection over the Surat coaching centre fire, state Chief Secretary Jagadip Narayan Singh said. Singh said officials in 162 municipalities across the state have inspected 9,962 buildings. Over 20 people were killed in the fire.

[swipe left for more at The Indian Express / Today](#)

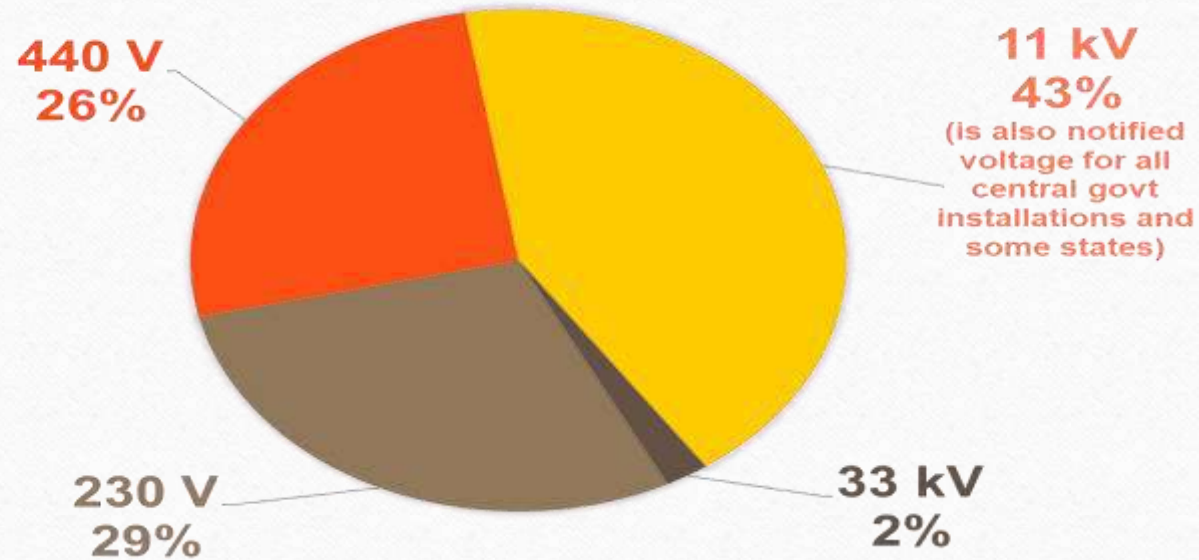
Refreshed Successfully

A total of 713 teams carrying out inspections
[Tap to know more](#)

200 ट्रांसफार्मर के गोदाम में आग, धमाके से पहले काबू

Patrika news network Posted: 2016-01-17 01:35:48 IST | Updated: 2016-01-17 01:35:48 IST

More than 55% electrical incidents occur in 230V – 440V



REGULATIONS, CODES & STANDARDS COVER



Regulations

- Electricity Act 2003
- Central Electricity Authority (Measures related to Safety and Electric Supply) Regulations 2010 and further amendments 2015 and 2018

Standards

- **IS 732 : 2019 – CODE OF PRACTICE FOR ELECTRICAL WIRING INSTALLATIONS**
- **NEC 2011 – NATIONAL ELECTRIC CODE**

Structure of IS 732:2019



This code gives the rules for the design, selection, erection and verification of electrical installations of buildings such as Residential / commercial / public / industrial / agriculture and horticulture premises etc

- Clause 1: Refers to scope of the standard**
- Clause 2: References of different standards**
- Clause 3: Terminology used in the standard**
- Clause 4: Assessment of general characteristics**
- Clause 5: Selection & Erection of Electrical Equipment**
- Clause 6: Verification (Initial and periodic)**

The compliance of Clause 4 , 5 and 6 is necessary to declare a building electrically safe

NATIONAL ELECTRICAL CODE 2011

The National Electrical Code is very important document and covers the followings:

- Standard good practices for selection of various items of electrical equipment forming part of power systems;
- Recommendations concerning safety and related matter in the wiring of electrical installations of buildings or industrial structures, promoting compatibility between such recommendations and those concerning the equipment installed;
- General safety procedures and practices in electrical work; and
- Additional precautions to be taken for use of electrical equipment for special environmental conditions like explosive and active atmosphere

NEC APPLIES TO:

- Standby Generating Plants
- Building Substations
- Domestic Dwellings
- Office Buildings
- Shopping And Commercial Centre's
- Institutions
- Recreation And Other Public Premises
- Medical Establishments
- Hotels
- Sports Buildings
- Industrial Premises
- Temporary And Permanent Outdoor Installations
- Agricultural Premises
- Installations In Hazardous Areas
- Solar Photovoltaic Installations



NATIONAL ELECTRICAL CODE 2011...

☐ NEC contains: 8 Parts and 30 Sections

- Part 1 General and Common Aspects
- Part 2 Electrical installations in stand by generating stations and captive substations
- Part 3 Electrical installations in non-industrial buildings
- Part 4 Electrical installations in industrial buildings
- Part 5 Outdoor installations
- Part 6 Electrical installations in agricultural premises
- Part 7 Electrical installations in Hazardous area
- Part 8 Solar Photovoltaic (PV) power supply systems

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- Temporary measures for relaxation of provision of BIS Conformity Assessment Regulations 2018 for renewal of licence with late fee and renewal of deferred licence
- Extension of date of implementation of amendments to Indian Standards and revised Indian Standards
- Relaxation in fee for MSME units for licence under Bureau of Indian Standards (Conformity Assessment) Regulations 2018 and its amendments- req

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- on "Laboratory Quality Management System & Internal Audit as per IS/ISO/IEC 17025 : 2017 " to be held during 20-23 July 2020.
- 2-day Online Training programme on " Transition to IS/ISO/IEC 17025 : 2017 " to be held during 27-28 July 2020.
- 4-day Online Training programme on " Medical Laboratories Quality Systems and Internal Audit as per IS/ISO 15189 : 2012 " to be held during 4-7 August 2020.
- 2-day Online Training programme on "Measurement Uncertainty" to be held during 06-07 August 2020.
- 4-day Online Training programme on "Laboratory Quality Management



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Thank You

Indian Standards related to Irrigation

Ground Water and Rain Water Harvesting

Groundwater is the water present beneath Earth's surface in soil pore spaces and in the fractures of rock formations. Although it is being depleted at an alarming rate, ground water is a reliable source for meeting the requirements for irrigation, drinking and industrial use.

IS 15792 : 2008 Artificial recharge to ground water guidelines

- These guidelines provide details of methods and techniques aimed at augmentation of ground water resources by modifying the natural movement of surface water.

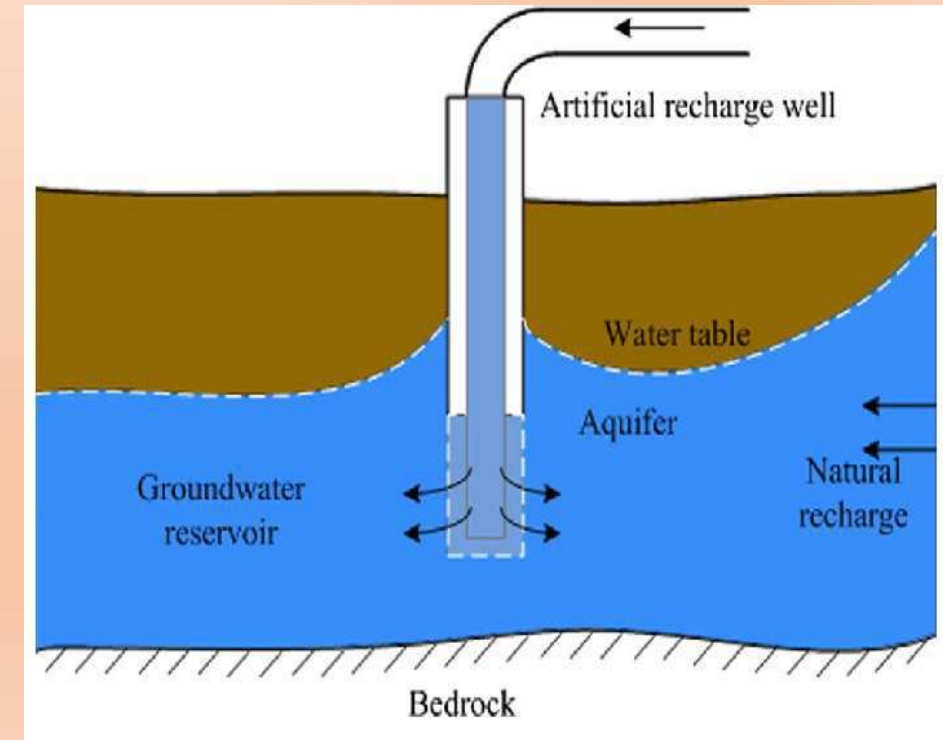
ARTIFICIAL RECHARGE TECHNIQUES

Direct Methods: a) Surface Spreading Techniques (Runoff Conservation Structure, Flooding, Ditch and Furrows, Recharge Basins, Stream Modification/Augmentation),

b) Sub-surface Technique (Injection wells, Gravity head recharge wells, Recharge pits and shafts), and

c) Combination Techniques

Indirect Methods: a) Induced recharge from surface water sources, and b) Aquifer modification: 1) Bore Blasting, and 2) Hydro-fracturing



Ground Water and Rain Water Harvesting

Measurement of Ground Water

- **IS 15896 : 2011 : 2005 Manual methods for measurement of ground water level in a well** - This standard lays down procedures and prescribes the accuracy required of water level measurements made in wells using graduated steel tapes, electric tapes, and air lines. The standard discusses the advantages and limitations of each method and requirements for recording the data.
- **IS 16094 : 2018 Hydrometry - Measuring the water level in a well using automated pressure transducer methods** - This standard provides guidance for the proper selection, installation and operation of submersible pressure transducers and data loggers for the collection of hydrologic data, primarily for the collection of water level data from wells.

Ground Water and Rain water harvesting

Rainwater harvesting The term 'Water Harvesting' connotes collection and storage of rain water and also other activities aimed at harvesting surface water, prevention of loss through evaporation and seepage. Natural recharge to ground water has reduced due to shrinkage of open area consequent to increased urban activities. Ground water levels have registered a marked decline. In view of the gap between demand and supply there is an utmost need for adopting roof top rainwater harvesting and augmenting ground water storage .

- **IS 15797 : 2008 Roof top rainwater harvesting – Guidelines** : This standard lays down guidelines for roof top rainwater harvesting. The standard provides a Tables for calculating the water availability for flat and sloping roof and specifies factors that determine the type and system of water harvesting, design of roof top, storage area, design of efficient artificial recharge structure and Maintenance of Catchment Area, Water Drains and Recharge Structures.
- **IS 14961:2001 Guidelines for rainwater harvesting in hilly areas by roof water collection system** – The standard lay down the general requirements for roof water collection system and its structure in hilly areas.

Canals

Canals are manmade waterways channels, for water conveyance. They help in irrigation, water control and flood prevention. The canal comprises of earth work, concrete, lining, head regulators and expansive joints.



IS 4701 : 1982 Code of practice for earthwork on canals First Revision - The construction of canals involves a variety of earthwork problems. This standard specifies the planning requirements prior to commencement of the work and describes methods for carrying out excavation and construction of embankments (General requirement and Methods of Construction) on canals, requirements for material, preparation of subgrade, Preparation of Ground Surface for Embankment, compaction methods, Tests for Compaction of Earthworks, and disposal of excavated materials.

This standard does not, however, cover design of cuttings and embankment slopes for canals.

Canals

Standards for lining of Canals: Lining of canals is considered an important feature of irrigation projects as it not only minimizes the loss of water due to seepage but also results in achieving considerable economy in the use of cultivable land which would otherwise be prone to water logging due to rise of the water table. Further, lining of canals permits the adoption of high velocities resulting in proportionate savings of the cross-sectional areas of the canal and land width required with corresponding saving in the cost of excavation and masonry works which in certain cases may offset completely the extra cost of lining. Also, the lining improves stability of channel sections thereby reducing the maintenance/cost. Some of the standards related to Canal Lining are given below:

- **IS 11809 : 1994 Lining for canals by stone masonry - Code of practice:** This standard covers masonry lining for canals. The standard provide the requirements and guidance for preparation of subgrade, laying and dimension of stone thickness.
- **IS 10646 Canal linings – Cement concrete tiles – Specification :** This standard lays down requirements of precast cement concrete tiles such as the dimension and flexural strength for canal lining.
- **IS 9698 : 1995 Lining of canals with polyethylene film – code of practice :** This

Canals

- **IS 9097 : 1979 Guide for laying lining of canals with hot bitumen or bituminous felts** - Bitumen, a bye-product of petroleum industry and well known for its binding and water-proofing qualities is being increasingly used in lining work all over the world. Its main advantage over the conventional materials is that no water is required during construction and no curing is necessary. The structure can be put to use immediately after the construction is over. This standard provides guidelines for laying lining of canals with: (a) hot bitumen, and (b) bitumen felts.
- **IS 7113 : 2003 Soil – Cement lining for canals –Code of practice** : This standard lays down general guidelines for lining irrigation canals with 100 to 150 mm thick soil cement lining. The use of soil-cement lining for irrigation canals shall be restricted to small and medium size irrigation canals with capacities up to 10 cumecs and in which the velocity of water does not exceed 1m/s. The standard specifies the requirements for data and materials, guidelines for preparation of subgrade, construction and compaction.

Canals

Measurement of seepage loss from unlined canals

The loss of water by seepage from unlined canals in India generally varies from 0.3 to 7.0 m³/S/106 sqm depending on the permeability of soil through which the canal passes location of water tables, distance of drainage, bed width, side slope and water depth inside the canal. In addition, flow velocity, soil and water temperature, atmospheric pressure and stratification of the underlying soil also affect the seepage rate. The seepage losses from unlined canals can be calculated by analytical methods or determined by direct measurement.

- **IS 9452: 1993 Measurement of seepage losses from canals - Code of practice :** - Part 1 Ponding method - Part 2 Inflow - Outflow method - Part 3 seepage meter method

These standards provide the information on selection of test site, collection of data, equipment required, procedure, analysis of results and advantages and limitations of the method.

- **IS 9447 : 1980 Guidelines for assessment of seepage losses from canals by analytical method :** The standard lays down estimation for horizontal and vertical drainage with figures and graphs, the data requirement for assessment of the seepage losses. The standard also provides workout examples.

Canals

Canal Maintenance

IS 4839 : 1992 Maintenance of canals code of practice:

- Part 1 unlined canals

- Part 2 lined canals

- Part 3 canal structures, drains, outlets, jungle, clearance, plantation and regulation

The standard provides steps to be followed, rules to be observed and actions to be taken to remove aquatic weeds silt disposal, for inspection and maintenance of lining including banks, roads and ramps.

The standard gives necessary guidance regarding the maintenance of a canal for the assistance of engineers in field. However, it is not possible to cover all types of contingencies in this standard and the discretion of the Engineer-in-charge would be required in such cases.

River Training and Erosion Management

Groynes : A wall, crib, row of piles, stone jetty or other barrier projecting outward from the bank into a stream, for the purpose of protecting the bank from erosion or for arresting sand movement along the bank, concentrating the flow of a stream into a smaller channel, etc. It is also called 'Spur', 'Spur Dike', 'Transverse Dike', 'Wing Dam' or 'Jetties'.

- **IS 8408 : 1994 Planning and design of groynes in alluvial river – Guidelines** : Groynes (spurs) are structures constructed transverse to the river flow and extend from the bank into the river. These are widely used for river training and bank protection. This standard covers the planning and design of groynes (spurs) in alluvial river



River Training and Erosion Management

Levees is an elongated naturally occurring ridge or artificially constructed fill or wall that regulates water levels.

- **IS 12094 : 2018** Planning and design of river embankments (Levees) – **Guidelines:** An embankment (levee) is an artificial bank built along banks of a river for the purpose of protecting adjacent land from inundation by flood. Such type of structure is also called ‘embankment’, ‘stop-bank’, ‘bund’ or ‘dyke’. Construction of embankment to control flood is an age-old practice and is still being followed due to its proven suitability. This standard covers planning and design of river embankments (levees) on dry land.



River Training and Erosion Management

Barrages and weirs: Structure with gates erected across a river to regulate the upstream water surface and the flow across the structure.

- **IS 7349:2012 Barrages and weirs - Operation and maintenance – Guidelines**
This standard lays down guidelines for the operation and maintenance of hydro-mechanical installations and civil structures connected with the barrages and weirs.
- **IS 7720:1991 Criteria for investigation, planning and layout for barrages and weirs**
- In order to exercise better control on the river and flow conditions, both upstream and downstream and to limit the afflux without recourse to excessive water way, barrages are generally preferred. This standard lays down the criteria for investigation, planning and layout for barrages and weirs.



River Training and Erosion Management

Guide Bank : To construct an engineering structure across rivers, it is necessary to narrow down its section and restrict its course of flow centrally through the structure built over it. This is achieved by construction of heavy embankments, called 'Guide Banks'. Guide banks are thus meant to confine and guide the river flow through the structure without causing damage to it and its approaches. They also prevent the outflanking of the structure.

- **IS 10751:1994 Planning and design of guide banks for alluvial rivers – Guidelines :** This standard covers the planning and design of guide banks used for the various engineering structures constructed on the alluvial rivers.
- **IS 12926:1995 Construction and maintenance of guide banks in alluvial rivers – Guidelines:** This standard lays down the guidelines for construction and maintenance of guide banks in alluvial rivers. These are to be deemed as guide to good practice of construction and maintenance of guide banks compatible with the current experience and



River Training and Erosion Management

Important Standards on Geotextiles

1. IS 16352:2015 HIGH DENSITY POLYETHYLENE (HDPE) GEOMEMBRANES FOR LINING

High density polyethylene geomembranes, are very low permeability synthetic liners used to control fluid or gas migration within soil, rock, earth or any other geotechnical material, as integral part of a manmade product, structure or system. Geomembranes have become the design choice as part of a cover system due to a variety of factors such as imperviousness, chemical resistance, inertness to surrounding soils, ease and variety of seaming, mechanical strength and elongation, ease of application and economics, product durability and ageing over the designed life of the containment system.

2 IS 16653 : 2017 Geosynthetics — Needle punched nonwoven geobags for coastal and waterways protection — Specification

Specifies requirements for three types of geobags (300/400/600 GSM) made from needle punched non-woven fabric of polyester (PES) or polypropylene (PP), used for coastal and waterways protection applications such as revetments; river training; construction of groynes and artificial reefs; etc, in order to minimize soil erosion and control floods.

3. IS 14715(Part 2):2016 Jute Geo-Textiles Part 2 Control of bank erosion in rivers and waterways

This standard provides requirements of woven jute geotextile (JGT) in control of erosion in rivers and waterways.

Use of woven JGT in controlling river bank erosion is recommended as an eco-friendly substitute of the conventional granular filter comprising graded boulders and ballasts of stone, laterite or similar materials of the desired specific gravity. JGT on its degradation will nourish the bank soil and improve its hydraulic conductivity, fostering quick growth of vegetation under normal situation.

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NEWS AND EVENTS


- Temporary measures for relaxation of provision of BIS Conformity Assessment Regulations 2018 for renewal of licence with late fee and renewal of deferred licence
- Extension of date of implementation of amendments to Indian Standards and revised Indian Standards
- Relaxation in fee for MSME units for licence under Bureau of Indian Standards (Conformity Assessment) Regulations 2018 and its amendments- req

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Reference Materials

NEWS

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- on "Laboratory Quality Management System & Internal Audit as per IS/ISO/IEC 17025 : 2017 " to be held during 20-23 July 2020.
- 2-day Online Training programme on " Transition to IS/ISO/IEC 17025 : 2017 " to be held during 27-28 July 2020.
- 4-day Online Training programme on " Medical Laboratories Quality Systems and Internal Audit as per IS/ISO 15189 : 2012 " to be held during 4-7 August 2020.
- 2-day Online Training programme on "Measurement Uncertainty" to be held during 06-07 August 2020.
- 4-day Online Training programme on "Laboratory Quality Management

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