इंटरनेट मानक

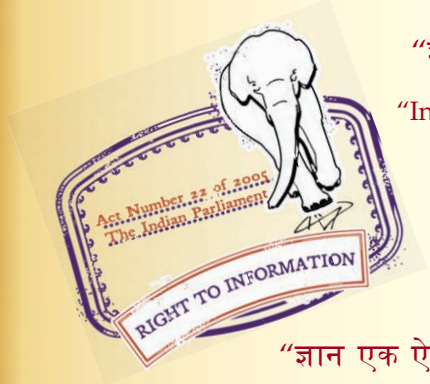
Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 15475-1 (2004): Code of Recommended Practice for Amusement Rides Safety, Part 1: General Information [MED 6: Continuous Bulk Conveying, Elevating, Hoisting Aerial Ropeways and Related Equipment]



"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

BLANK PAGE

भारतीय मानक

मनोरंजन के लिए सुरक्षित सवारी की संस्तुत रीति संहिता

भाग 1 सामान्य सूचना

Indian Standard

CODE OF RECOMMENDED PRACTICE FOR AMUSEMENT RIDES SAFETY

PART 1 GENERAL INFORMATION

ICS 97.200.40

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Continuous Bulk Conveying, Elevating, Hoisting, Aerial Ropeways and Related Equipment Sectional Committee, ME 06

FOREWORD

This Indian Standard (Part 1) was adopted by the Bureau of Indian Standards, after the draft finalized by the Continuous Bulk Conveying, Elevating, Hoisting, Aerial Ropeways and Related Equipment Sectional Committee had been approved by the Mechanical Engineering Division Council.

Amusement parks in India are becoming quite common and people visit these parks quite often. In order to ensure their safety in amusement parks or while enjoying the rides, an attempt has been made to stipulate safety in the form of a National Code. It is hoped that organizers of amusement parks, manufacturers of rides would make use of these codes to ensure overall safety of human beings and equipment at such places.

This standard is being brought out in six parts. This standard covers the general information. Other parts in this series are as follows:

(Part 2) Safety requirements

(Part 3) Design, manufacture and erection

(Part 4) Selection, training and supervision of operators

(Part 5) Operation and maintenance procedures

(Part 6) Performance tests

In preparation of this standard, assistance has been taken from ASTM standards available on amusement rides or its devices. Considerable assistance has also been derived from the following Indian Standards:

IS No.	*Title*
7155	Code of recommended practice on conveyor safety:
(Part 1) : 1986	General information
(Part 2) : 1986	General safety requirements
(Part 6) : 1990	Selection, training and supervision of operators
(Part 7) : 1990	Inspection and maintenance

Indian Standard

CODE OF RECOMMENDED PRACTICE FOR AMUSEMENT RIDES SAFETY

PART 1 GENERAL INFORMATION

1 SCOPE

1.1 This standard (Part 1) covers general information regarding the recommended practice to be adopted in the safe use of amusement rides and devices.

1.2 Amusement rides and devices covered in this standard may be of temporary or permanent nature.

1.3 Nothing in this standard is intended to contravene the provision of any of the existing Government regulation. It is the responsibility of the user of this code to establish appropriate safety and health practices and comply with regulatory and statutory requirements prior to use of the ride or device for carrying passengers for their amusement.

2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
1641 : 1988	Code of practice for fire safety of buildings (general): General principles of fire grading and classification (*first revision*)
1642 : 1989	Code of practice for fire safety of buildings (general): Details of constructions (*first revision*)
1644 : 1988	Code of practice for fire safety of buildings (general): Exit requirements and personal hazard (*first revision*)
1646 : 1997	Code of practice for fire safety of buildings (general): Electrical installations (*second revision*)
3646	Code of practice for interior illumination:
(Part 1) : 1992	General requirements and recommendations for working interior (*first revision*)
(Part 2) : 1966	Schedule of values of illumination and glare index
(Part 3) : 1968	Calculation of coefficients of utilization by the BZ method
15475 (Part 5) : 2004	Code of recommended practice for amusement rides safety: Part 5 Operation and maintenance procedures

3 TERMINOLOGY

3.1 For the purpose of this standard, the following definitions shall apply.

3.1.1 *Amusement/Joy Park* — A particular site provided or allotted or procured for the purpose of entertainment and amusement where one or more rides are temporarily or permanently installed for the riders/visitors.

3.1.2 *Amusement Ride or Amusement Device* — A device or combination of devices or elements that carry, convey or direct a person(s) over or through a fixed or restricted course or within a defined area for the primary purpose of amusement or entertainment.

3.1.3 *Attendant* — A person working under the supervision of an operator, not authorized to operate the ride but in case of emergency should be competent enough to stop/evacuate the ride.

3.1.4 *Carnival* — An enterprise or group of enterprises involved in making arrangement for entertainment or amusement to the public by means of portable amusement rides, devices or temporary structures in any number or combinations which are seasonally organized on a particular location or site.

3.1.5 *Circular Ride* — An amusement ride whose motion is priority rotary in a fixed or variable plane from horizontal to 45 degree inclination.

3.1.6 *Fence* — A type of barrier consisting of, but not limited to posts, boards, wire, stakes or rails, that is, used to restrict the entry of authorized persons from coming into contact with restricted portion or moving portion of ride and also to check the access to certain restricted areas.

3.1.7 *Flat Ride* — An amusement ride that operates on single level over a controlled, fixed course or track or confined to a limited area of operation.

3.1.8 *High Ride* — An amusement ride whose motion is in a fixed or variable plane from horizontal to vertical.

3.1.9 *Kiddie Ride* — An amusement ride designed primarily for use by children up to 12 years of age and/or a person or child below the height of 140 cm.

3.1.10 *Major Modification* — Any change in either the structural or operational characteristics of the ride, which will alter its performance from that specified in the manufacturers design criteria.

3.1.11 *Minor Modification* — Any change that does not alter the structural and operational characteristics of the ride or device nor change its performance from that specified in the manufacturer's design criteria.

3.1.12 *Park Operator* — Individual, group of persons, association, agency or company duly registered and recognized by Indian Association of Amusement Parks and Industries having valid licence from the regulating/statutory authority for making arrangement for entertainment amusement of person(s) by providing, erecting and commissioning one or more amusement ride or devices free of charge or on chargeable basis.

3.1.13 *Rider* — A person permitted by the owner to enjoy a ride within a defined zone and particular time limit.

3.1.14 *Ride Manufacturer* — A person, group of persons, agency or company registered with appropriate authority and having valid licence for designing, fabricating, assembly and procuring various parts equipment, structures, devices which constitute a ride for carrying, conveying riders/visitors for entertainment and amusement.

3.1.15 *Ride Operator* — A person or an agent of an amusement park or carnival directly involved to operate, control, manoeuver, monitor, maintain the electrical/mechanical/hydraulic/pneumatic/gravitational system of an amusement ride or device duly authorized by the owner, park operator and trained through a recognized authority or agency.

3.1.16 *Ride Supplier* — A person or group of persons or agency or company involved in trading and supply of parts, equipment structure, attachments, accessories and devices which constitute a ride used for amusement and entertainment purposes.

3.1.17 *Unscheduled Cessation* — A rare, unusual or irregular stopping of an amusement ride operation, intentional or otherwise, that is, considered abnormal or potentially hazardous in nature or both due to its cause, method or result.

4 MATERIALS

Unless otherwise specified all materials used in construction and operation of amusement ride, devices and its supporting structures shall comply with the relevant Indian Standards where available. A list of such Indian Standards for guidance is given in Annex A. Materials equivalent to or superior to those specified may be used subject to agreement between the manufacturer and the user.

5 GENERAL INFORMATION

5.1 Information related with the safety requirements of the amusement rides of various types may be divided into three stages as follows:

a) Construction stage (design and manufacture);
b) Installation stage (layout, erection and entry into service); and
c) Utilization stage (operation and maintenance).

5.1.1 The safety requirements during construction stage shall be those to be taken care of during the design and manufacture of amusement ride system, equipments and machinery.

5.1.2 The safety requirements during installation shall be those to be taken care of during layout, erection and entry into service of the amusement ride system, equipments and machinery.

5.1.3 The safety requirements during utilization stage shall be those to be taken care of during operation and maintenance of the amusement ride system, equipment and machinery. Operational and maintenance procedures and responsibilities of manufacturer/seller and operator/user are covered in IS 15475 (Part 5).

5.2 Lighting

Suitable lighting for ride system, equipment and machinery shall be provided. For guidance IS 3646 (Part 1), IS 3646 (Part 2) and IS 3646 (Part 3) may be referred.

5.2.1 Permanent lighting shall be installed in tunnels and pits with a switch located convenient to the entrance(s).

5.2.2 Electric outlets for hand lamps shall be provided at convenient locations.

5.2.3 The lamps/lights shall be cleaned regularly.

5.3 Fire Protection

Fire protection facilities shall be provided and shall be to the approval of the statutory authority. For guidance IS 1641, IS 1642, IS 1644 and IS 1646 may be referred.

5.4 List of Indian Standards on conveyors hoists and related passengers handling equipment is given in Annex B for information.

6 INFORMATION TO BE PROVIDED BY THE MANUFACTURER/SELLER AT THE TIME OF SALE

6.1 The manufacturer/seller of amusement ride or device shall provide the minimum information necessary for proper identification, placement, erection and operation of ride or device. Documented instructions shall be furnished for safe operation and maintenance.

6.2 Information Plate

Information plate shall be permanently affixed on each ride or device at a visible location. The following information shall remain legible for the expected life of the ride or device:

a) Ride name and manufacturer,
b) Ride serial number,
c) Ride model number,
d) Date of manufacture,
e) Ride speed — Maximum and minimum revolutions per minute,
f) Direction of travel — When the proper direction of travel is essential to the design operation of the ride the direction of travel shall be designated including its reference point,
g) Passenger capacity by weight — Maximum total passenger weight per passenger position and per ride or device, and
h) Passenger capacity by number — Maximum total number of adult or child passengers per passenger position and per ride or device.

NOTE — Minimum weight/minimum number of persons shall be indicated for operation of ride, where applicable.

6.3 Instructions

Documented instructions for erection, operation and maintenance shall include the following.

6.3.1 *Ride Duration*

Maximum time permitted for ride to be in operation per element of the ride function for amusement purposes or maximum exposure time for a passenger (time restrictions).

6.3.2 *Recommended Balance of Passenger Loading or Unloading*

When passenger distribution is essential for the proper operation of the ride or device, the appropriate loading and unloading procedure, with respect to weight distribution shall be described.

6.4 Electrical Power Requirements

Total electrical power required for safe operation of ride or device shall be declared in watts and volts including minimum and maximum voltage limits.

6.5 Mechanical Power Requirements

Minimum kilowatt of power necessary to operate ride or device properly.

6.6 Water Flow

Minimum/maximum water flow rates.

6.7 Static Information

Height, width, diameter and weight of ride or device in static state (non-operational state).

6.8 Dynamic Information

Height, width, diameter and weight, when ride or device is in operation (Dynamic state).

6.9 Recommended Passenger Restrictions

Where applicable, any recommended passenger limitation such as height, placement, etc.

6.10 Environmental Restrictions

Recommendations for operational restrictions relating to environmental conditions, such as, wind, rain, salt corrosion or device.

6.11 Fastener Schedule

Schedule/manual for correct grade, torque and placement of all fasteners used in the assembly or erection of ride or device.

6.12 Load Distribution per Footing

Maximum static loading and maximum dynamic loading of each footing of ride or device.

6.13 Elements and Structures

Description of all structural interfaces between ride/device and supports including necessary data related with erection, installation and operation of ride or device. Information shall also include the following.

6.13.1 Maximum static design loads of each footing or equivalent structural connection.

6.13.2 Maximum dynamic design loads of each footing or equivalent structural connection.

6.13.3 Any other structural interface design specification.

6.14 Transportation

Trailering information necessary for the transport of a portable ride or device such as height, width, length and weight shall be provided.

ANNEX A

(*Clause* 4)

INDIAN STANDARD SPECIFICATIONS ON MATERIALS

IS No.	*Title*
A-1 STRUCTURAL STEEL	
808 : 1989	Specification for rolled steel beam, channel and angle sections (*third revision*)
811 : 1987	Specification for cold formed light gauge structural steel sections (*revised*)
1161 : 1998	Specification for steel tubes for structural purposes (*fourth revision*)
1239	Specification for steel tubes, tubulars and other wrought steel fittings:
(Part 1) : 1990	Mild steel tubes (*fifth revision*)
(Part 2) : 1992	Mild steel tubulars and other wrought steel pipe fittings (*fourth revision*)
1252 : 1991	Dimensions of hot rolled steel bulb angles (*first revision*)
2062 : 1999	Steel for general structural purposes (*fifth revision*)
3039 : 1988	Structural steels for construction of hulls of ships (*second revision*)
3443 : 1980	Specification for crane rail sections (*first revision*)
3601:1984	Specification for steel tubes for mechanical and general engineering purposes (*first revision*)
3954 : 1991	Hot rolled steel channel sections for general engineering purposes — Dimensions (*first revision*)
4923 : 1997	Hollow steel sections for structural use (*second revision*)
8500 : 1991	Structural steel — Micro alloyed (medium and high strength qualities) — Specification (*first revision*)
A-2 FORGINGS AND CASTINGS	
210 : 1993	Grey iron castings — Specification (*fourth revision*)
1030 : 1998	Carbon steel castings for general engineering purposes — Specification (*fifth revision*)
1865 : 1991	Iron castings with spheroidal or nodular graphite — Specification (*third revision*)
2004 : 1991	Carbon steel forgings for general engineering purposes — Specification (*third revision*)
4367 : 1991	Alloy steel forgings for general industrial use (*first revision*)
4771 : 1985	Abrasion-resistant iron castings (*second revision*)
4896 : 1992	One percent chromium steel castings for resistance to abrasion (*second revision*)
14329 : 1995	Specification for malleable iron castings
A-3 RIVETS	
1929 : 1982	Specification for hot forged steel rivets for hot closing (12 to 36 mm diameter) (*first revision*)
2998 : 1982	Specification for cold forged steel rivets for cold closing (1 to 16 mm diameter) (*first revision*)
A-4 BOLTS	
1363	Hexagon head bolts, screws and nuts of product grade C:
(Part 1) : 2002	Hexagon head bolts (Size ranges M5 to M64) (*fourth revision*)
(Part 2) : 2002	Hexagon head screws (Size ranges M5 to M64) (*fourth revision*)
(Part 3) : 2002	Hexagon nuts (Size ranges M5 to M64) (*fourth revision*)
1364	Hexagon head bolts, screws and nuts of product grades A and B:
(Part 1) : 2002	Hexagon head bolts (Size ranges M1.6 to M 64) (*fourth revision*)
(Part 2) : 2002	Hexagon head screws (Size ranges M1.6 to M 64) (*fourth revision*)
2585 : 1968	Black square bolts and nuts (Diameter ranges 6 to 39 mm) and black square screws (Diameter ranges 6 to 24 mm) (*first revision*)
A-5 CONVEYOR BELTS	
1891	Conveyor and elevator textile belting — Specification:
(Part 1) : 1994	General purpose belting (*fourth revision*)
(Part 2) : 1993	Heat resistant belting (*third revision*)
(Part 3) : 1988	Oil resistant belting (*second revision*)
(Part 4) : 1978	Hygienic belting (*first revision*)
A-6 CHAIN	
2403 : 1991	Short pitch transmission precision steel roller chains and chain wheels (*second revision*)

IS No.	*Title*
3542 : 1980	Extended pitch transmission precision roller chains and chains wheels (*first revision*)
3560 : 1980	Short pitch transmission precision bush chains and chains wheels (*first revision*)
3948 : 1991	Specification for calibrated high tensile steel (round link) chain (Electric butt welded) for chain conveyors and coal plough used in mines (*first revision*)
6834	Specification for conveyor chains, chain wheels and attachments:
(Part 1) : 1973	Chains
(Part 2) : 1976	Chains wheels
(Part 3) : 1973	Attachments

A-7 GEARS

2535 : 1978	Basic rack and modules of cylindrical gears for general engineering and heavy engineering (*second revision*)
3734 : 1983	Dimensions for worm gearing (*first revision*)
5037 : 1969	Specification for basic rack and modules of straight bevel gears for general engineering and heavy engineering

A-8 WIRE ROPES

1856 : 1977	Specification for steel wire ropes for haulage purposes (*second revision*)
2266 : 2002	Steel wire ropes for general engineering purposes (*third revision*)

A-9 CONCRETE

456 : 2000	Code of practice for plain and reinforced concrete (*fourth revision*)

ANNEX B

(*Clause* 5.4)

LIST OF INDIAN STANDARDS ON CONVEYORS, HOISTS AND RELATED PASSENGERS HANDLING EQUIPMENT

IS No.	*Title*
5228 : 2003	Code of practice for construction of continuous movement monocable ropeways with fixed grips intended for transportation of passengers
5229 : 1998	Code of practice for construction of continuous movement monocable ropeways with automatic grips intended for transportation of passengers
5230 : 2003	Code of practice for construction of continuous to-and-fro movement bicable ropeways intended for transportation of passengers
7649 : 1975	Glossary of terms used in connection with aerial ropeways and cableways
8647 : 1977	Specification for design criteria for pneumatic conveying systems
9047	Data sheet for aerial ropeways and cableways:
(Part 2) : 1980	Data to be supplied by intending purchaser for aerial system for transportation of passengers, surface
(Part 3) : 1980	Data to be supplied by intending purchaser for aerial system for transportation of passengers, underground
9228 : 1979	Specification for mono seat chairs for chair-lifts used in winter sports

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act,* 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc : No.. **MED 06 (0667).**

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110 002
Telephones : 2323 0131, 2323 33 75, 2323 9402

Telegrams : Manaksanstha
(Common to all offices)

Regional Offices :		Telephone
Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110 002	2323 7617 2323 3841
Eastern	: 1/14 C.I.T. Scheme VII M, V. I. P. Road, Kankurgachi KOLKATA 700 054	2337 8499, 2337 8561 2337 8626, 2337 9120
Northern	: SCO 335-336, Sector 34-A, CHANDIGARH 160 022	60 3843 60 9285
Southern	: C.I.T. Campus, IV Cross Road, CHENNAI 600 113	2254 1216, 2254 1442 2254 2519, 2254 2315
Western	: Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400 093	2832 9295, 2832 7858 2832 7891, 2832 7892

Branches : AHMEDABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. NAGPUR. NALAGARH. PATNA. PUNE. RAJKOT. THIRUVANANTHAPURAM. VISAKHAPATNAM.

Printed at Prabhat Offset Press, New Delhi-2