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BUREAU OF INDIAN STANDARDS

DRAFT FOR COMMENTS ONLY

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भारतीय मानक मसौदा

**साइकिल — छोटे बच्चों की साइकिल
के लिए सुरक्षा अपेक्षाएँ**

(आई एस 15533 का दूसरा पुनरीक्षण)

Draft Indian Standard

**CYCLES — SAFETY REQUIREMENTS FOR
BICYCLES FOR YOUNG CHILDREN**

(Second Revision of IS 15533)

ICS 43.150; 97.190

Bicycles Sectional Committee, TED 16

**Last date for receipt of comments is
XX/XX/XXXX**

Bicycles Sectional Committee, TED 16

NATIONAL FOREWORD

(Formal Clause to be added later)

This standard was first published in 2004 which was identical to ISO 8098:2002 ‘Cycles — Safety requirements for bicycles for young children’ and was subsequently revised in 2018 to align with revised ISO 8098:2014 ‘Cycles — Safety requirements for bicycles for young children’.

Second revision of this standard is undertaken to align it with the latest version of ISO 8098:2023 ‘Cycles — Safety requirements for bicycles for young children’.

The text of ISO standard is proposed for publication as an Indian Standard without deviations. Certain terminologies and conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

- a) Wherever the words ‘International Standard’ appear referring to this standard, they should be read as ‘Indian Standard’.
- b) Comma (,) has been used as a decimal marker, while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards, which are to be substituted in their respective places, are listed below along with their degree of equivalence for the editions indicated. For undated references, the latest edition of the referenced document applies, including any corrigenda and amendment.

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
ISO 1101 Geometrical product specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out	IS 8000 (Part 1) : 2019/ ISO 1101 : 2017 Geometrical product specifications (GPS) — Geometrical tolerancing: Part 1 Tolerances of form, orientation, location and run-out (<i>second revision</i>)	Identical under dual numbering
ISO 6742-2 Cycles — Lighting and retro-reflective devices — Part 2 Retro-reflective devices	IS/ISO 6742-2 : 2015 Cycles — Lighting and retro — Reflective devices: Part 2 retro - Reflective devices (<i>first revision</i>)	Identical under single numbering
ISO 8124-1 : 2018 Safety of toys — Part 1 Safety aspects related to mechanical and physical properties	IS 9873 (Part 1) : 2019/ ISO 8124-1 : 2018 Safety of toys: Part 1 safety aspects related to mechanical and physical properties (<i>fourth revision</i>)	Identical under dual numbering
ISO 11243 Cycles — Luggage carriers for bicycles — Requirements and test methods	IS 14363 : 2018/ ISO 11243 : 2016 Cycles — Luggage carriers for bicycles — Requirements and test methods (<i>second revision</i>)	Identical under dual numbering

Attention is drawn to the possibility that some of the elements of this standard may be the subject of patent rights. The Bureau of Indian Standards shall not be held responsible for identifying any or all such patent rights.

The Standard contains Annex A and Annex B which are for information only.

This Standard also makes reference to following National Annexes A, B, C and D:

National Annex A Toxicity Test

National Annex B Protrusions

National Annex C Vibration Test Method for Strength Test of Frame-Fork Assembly

National Annex D Details of BIS Certification Marking of Product

Out of these, National annex A, B and C are for information only and compliance to these requirements may be as per agreement between manufacturer and purchaser. National Annex D provides guidance on BIS Certification marking of the product to the manufacturer seeking BIS Certification marking.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

SCOPE

This document specifies safety and performance requirements and test methods for the design, assembly and testing of fully assembled bicycles and sub-assemblies for young children. It also provides guidelines for instructions on the use and care of the bicycles.

This document is applicable to bicycles with a maximum saddle height of more than 435 mm and less than 635 mm, propelled by a transmitted drive to the rear wheel.

It is not applicable to special bicycles intended for performing stunts (e.g. BMX bicycles).

NOTE For bicycles with a maximum saddle height of 435 mm or less, see national regulations for ride-on toys, and with a maximum saddle height of 635 mm or more.

NATIONAL ANNEX A

(National Foreword)

TOXICITY TEST

A-1 PLASTIC COMPONENTS

Plastic components such as Brake Cable, Grips, Brake levers, Pedals etc. should be tested for Total Polycyclic Aromatic Hydrocarbons (PAH) content and Total Phthalate Content.

A-1.1 Total Polycyclic Aromatic Hydrocarbons (PAH) Content

Total Polycyclic Aromatic Hydrocarbons (PAH) content should be determined as per AFPS GS 2014:01 PAK- Analysis by GC-MSD for following 18 compounds:

Naphthalene (91-20-3), Acenaphthylene (208-96-8), Acenaphthene (83-32-9), Fluorene (86-73-7), Phenanthrene (85-1-8), Anthracene (120-12-7), Fluoranthene (206-44-0), Pyrene (129-00-0), Chrysene (218-01-9), Benzo (a) Anthracene (56-55-3), Benzo (b) Fluoranthene (205-99-2), Benzo (k) Fluoranthene (207-08-9), Benzo (j) Fluoranthene (205-82-3), Benzo (e) Pyrene (192-97-2), Benzo (a) Pyrene (50-32-8), Dibenzo (a, h) Anthracene (53-70-3), Indeno (1,2,3-cd) Pyrene (193-39-5), Benzo (g, h, i) Perylene (191-24-2)

Samples tested should meet the following requirements:

Total of 18 PAH's: ≤ 10 mg/kg and Benzo(a)pyrene: ≤ 1 mg/kg

NOTE: CAS number of compounds are given in brackets.

A-1.2 Total Phthalate Content

Total Phthalate Content should be determined by Solvent Extraction followed by GC-MS Analysis. The amount of following 19 compounds should be determined:

- i) DEHP Bis(2-ethylhexyl) phthalate (117-81-7);
- ii) DBP Dibutylphthalate (84-74-2);
- iii) BBP Benzylbutylphthalate (85-68-7);
- iv) DINP Diisononylphthalate (28553-12-0, 68515-48-0);
- v) DIDP Diisodecylphthalate (26761-40-0);
- vi) DNOP Dioctylphthalate (117-84-0);
- vii) DIBP Diisobutylphthalate (84-69-5);
- viii) DHNUP 1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (68515-42-4);
- ix) DIHP 1,2-Benzoldicarbonsäure, Di-C6-8-verzweigte Alkyl ester, C7-reich (71888-89-6);
- x) DMEP Dimethoxyethylphthalat (117-82-8);
- xi) 1,2-Benzoldicarbonsäure, Dipentylester, verzweigt und linear (84777-06-0);
- xii) DIPP Diisopentylphthalat (605-50-5);
- xiii) nPIPP N-Pentyl-isopentylphthalat (776297-69-9);
- xiv) DPP Dipentylphthalat (131-18-0);
- xv) DnHP Dihexylphthalate (84-75-3);
- xvi) DHxP 1,2-Benzenedicarboxylic acid, dihexylester, branched and linear, (68515-50-4);
- xvii) 1,2-Benzenedicarboxylic acid di-C6-10-alkyl esters; 1,2-Benzenedicarboxylic acid, mixed decyl and hexyl and octyldiesters with 0.3% of dihexyl phthalate, (68515-51-5, 68648-93-1);
- xviii) DCP Dicyclohexyl phthalate (84-61-7) and
- xix) Di-n-pentyl phthalate (DNPP).

The presence of none of the above compounds should exceed 0.1 percent.

NOTE: CAS number of compounds are given in brackets

A-2 COATED METAL COMPONENTS

Metal Components with coating such as metal tubes should be subjected to determination of 19 elements for Migration of Heavy Metal as per EN 71-3*. The list of 19 elements along with their maximum migration allowed is given in Table A.1. Samples should meet the migration content requirement of all the elements individually.

* EN 71-3 :2019 Safety of Toys - Part 3: Migration of Certain Elements

Table C.1 Migration Limits of Heavy Metals
(Clause C-2)

SI No. (1)	Element (2)	Limit Max (mg/Kg) (3)
1	Aluminum (Al)	70 000
2	Antimony (Sb)	560
3	Arsenic (As)	47
4	Barium (Ba)	18 750
5	Boron (B)	15 000
6	Cadmium (Cd)	17
7	Chromium (III) (Cr III)	460
8	Chromium-Vi (Cr-vi)	0.2
9	Cobalt (Co)	130
10	Copper (Cu)	7 700
11	Lead (Pb)	160
12	Manganese (Mn)	15 000
13	Mercury (Hg)	94
14	Nickel (Ni)	930
15	Selenium (Se)	460
16	Strontium (Sr)	56 000
17	Tin (Sn)	180 000
18	Organotin	12
19	Zinc (Zn)	46 000

NATIONAL ANNEX B

(National Foreword)

PROTRUSIONS

B-1 Exposed Protrusions

B-1.1 Any rigid, exposed protrusion longer than 8 mm (see L in Fig. D.1) after assembly, with the exception of

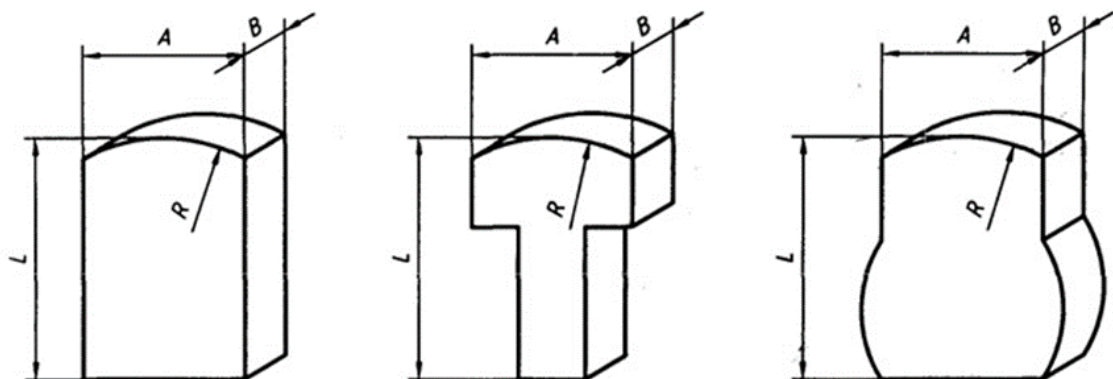
- a) the front gear-change mechanism at the Chainwheel
- b) the rear gear-change mechanism below the chain-stay
- c) the rim- brake mechanism at the front and rear wheels
- d) a lamp-bracket fitted on the head-tube
- e) reflectors
- f) toe-clips and toe straps

should terminate in a radius, R of not less than 6.3 mm. Such protrusions shall have a major end dimension, A of not less than 12.7 mm and a minor dimension B , of not less than 3.2 mm, see Fig. B.1.

B-2 Exclusion zone, protective devices and screw threads

B-2.1 There should be no protrusions on the top tube of a bicycle frame between the saddle and a point 300 mm forward of the saddle, with the exception that control cables no greater than 6.4 mm in diameter and cable clamps made from material no thicker than 4.8 mm may be attached to the top tube.

B-2.2 Foam pads attached to the bicycle frame to act as protective cushions are permitted, provided that the bicycle meets the requirements for protrusions when the pads are removed. A screw thread that is an exposed protrusion should be limited to a protrusion length of one major diameter of the screw beyond the internally threaded mating part.



These shall apply when L is greater than 8 mm.

Fig. B.1 Examples of Dimensions of Exposed Protrusions

B-3 Location of exposed protrusions

B-3.1 The location of exposed protrusions should be established using a test-cylinder (Simulating a limb) conforming to the dimensions shown in Fig. B.2.

B-3.2 Manoeuvre the cylinder in any convenient attitude toward any rigid protrusion on the bicycle. If the central 75 mm long section of the test cylinder comes into contact with any protrusion, that protrusion shall be considered an exposed protrusion and shall comply with the requirements of exposed protrusions.

Dimensions in millimetres

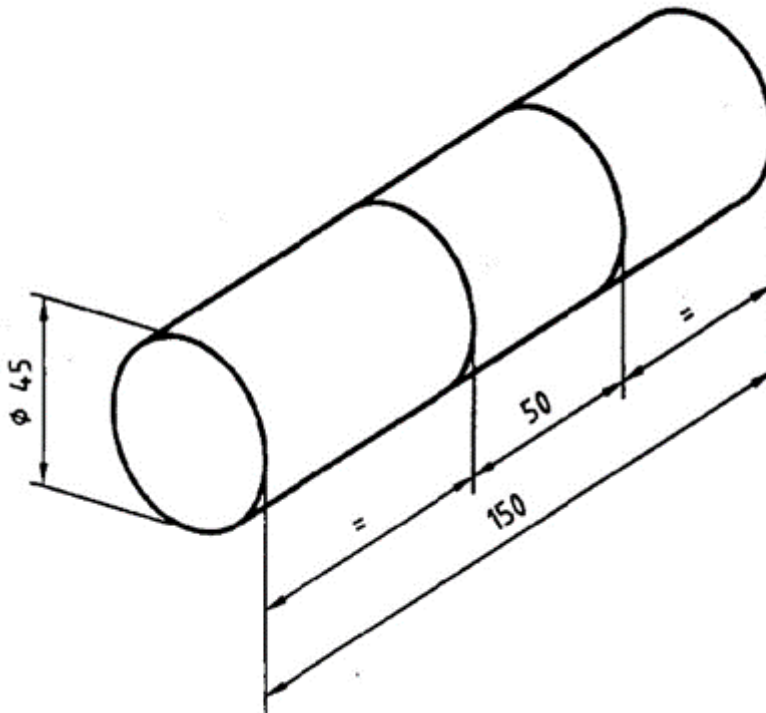
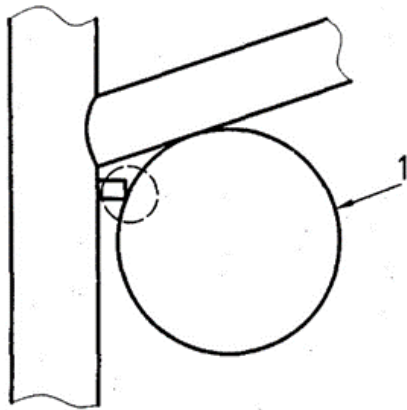
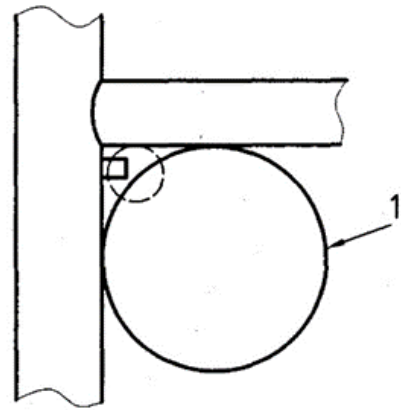


Fig. B.2 Exposed Protrusions Test Cylinder

B-3.3 Examples of exposed protrusions which do, and do not, need to comply with the requirements of clause exposed protrusions are shown in Fig. B.3.



a) Needs to comply



b) Does not need to comply

Key

1 Test cylinder

Fig. B.3 Examples of Exposed Protrusions

NATIONAL ANNEX C

(National Foreword)

VIBRATION TEST METHOD FOR STRENGTH TEST OF FRAME-FORK ASSEMBLY

C-1 TEST METHOD

C-1.1 With a Frame-Fork assembly mounted on the stand so as the ground contact points of both intended wheels are horizontal as shown in Fig.C.1, test shall be made by application of vertical up- and downward vibrations under the conditions given in Table C.1. The front wheel attachment shall be freely movable in the lengthwise orientation.

C-1.2 Using a Seat pillar to be combined with the Frame-Fork assembly, fix the seat pillar at the position of the minimum insertion mark. Secure the Saddle-shape support as shown in 4 onto the seat area and suspend the circular weights dividedly on both sides through the hanger metals so that the total mass of the weight support, hanger metals, and weights is applied to the seat Assembly. The weight support shall be secured to the seat pillar on the axis at 20 mm below the upper extreme of the by a fastening metal. For a Frame-Fork assembly a combined seat pillar, the test may be performed by replacing the combined seat pillar with a unit pillar having the same If the bar connecting the right-hand and left-hand weights contacts with the battery or other parts, test shall be performed with connecting bar removed. For applying load to the Bottom bracket assembly, fix circular weight to the bottom bracket area dividedly on both sides. The weight support to which the weight is fixed shall not be heavier than 2 kg.

C-1.3 For applying load to the head assembly, fix the weight at the position where there is no clearance between the under surface of weight support (of mass not more than 0.5 kg) and the upper surface of the head lock nut by using a metal fitting as shown in Fig. C.1. For a Frame-Fork assembly using a handlebar stem consisting of a stem only, in which the Fork stem is clamped from outside, the test shall be performed with the weight fixed to the upper end of the Fork stem by means of a jig which clamps the Fork stem from outside or by means of handlebar stem.

C-1.4 The Frequency of vibration shall be selected arbitrarily in the range of 5Hz to 12Hz avoiding a resonance.

C-1.5 For testing a Frame-Fork assembly motor assist cycles, fix the battery, the drive unit, control unit or other that are to be mounted under the test conditions in Table C.1, or weights of equivalent masses thereof, on positions where they are actually mounted so that the test assembly simulates the actual application of load on the Frame-Fork In this case, the battery, drive unit and control unit themselves are not the subjects of evaluation for the vibration proof performance. When the drive unit housing or other of the Frame Fork assembly for motor assist cycles constitute a of the Frame-Fork assembly, the test shall be with all such attached.

C-2 TEST CONFORMITY REQUIREMENT

There should be no visible cracks or fractures in any part of the frame /fork assembly besides no loosening of parts. The permanent set measured between the axes (The Wheelbase *see* Fig. C.1) should not exceed 20 mm.

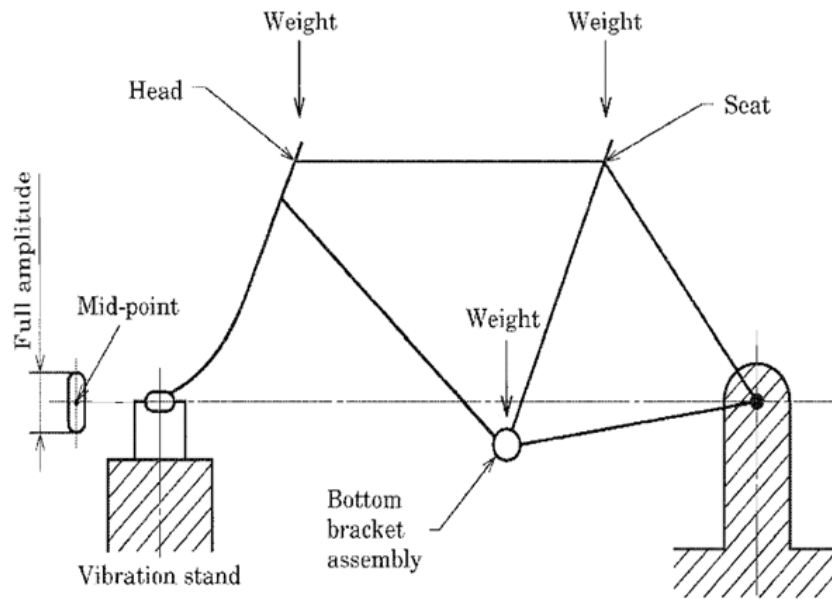


Fig. C.1 Vibration Test of Frame and Fork Assembly

Table C.1 Test Conditions for Vibration Test of Frame – Fork Assembly
 (Clauses C-1.1 and C-1.5)

Weight (mass) kg				Frequency of vibration Hz (5)	Acceleration of vibrating part m/s ² (6)	Number of vibrations (7)
Head assembly (1)	Seat assembly (2)	Bottom bracket assembly (3)	Total (4)			
5	40	10	55	5 to 12	17.6	70 000

NATIONAL ANNEX D

(National Foreword)

BIS CERTIFICATION MARKING

D-1 The Product(s) may also be marked with the standard mark

D-1.1 The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the BIS Act, 2016 and the Rules and Regulations framed thereunder, and the product(s) may be marked with the Standard Mark.

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FOR COMPLETE TEXT OF THE DOCUMENT KINDLY REFER ISO 8098 : 2023 or CONTACT:

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