



भारतीय मानक ब्यूरो BUREAU OF INDIAN STANDARDS

MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG, NEW DELHI 110002

व्यापक परिचालन मसौदा

14 अगस्त 2023

हमारा संदर्भ: सीईडी 35/टी-25

तकनीकी समिति: फर्नीचर विषय समिति, सीईडी 35

प्राप्तकर्ता:

- क) सिविल इंजीनियरी विभाग परिषद् सीईडीसी के सभी सदस्य
- ख) फर्नीचर विषय समिति सीईडी 35 के सभी सदस्य
- ग) रूचि रखने वाले अन्य निकाय

महोदय/महोदया,

निम्नलिखित मानक का मसौदा संलग्न है:

प्रलेख संख्या	शीर्षक
सीईडी 35 (18980)WC	स्कूल का फर्नीचर, कक्षा की कुर्सियाँ और टेबल – मार्गदर्शी सिद्धांत का भारतीय मानक मसौदा (IS 4837 का तीसरा पुनरीक्षण) (ICS 97.140: 97.190)

कृपया इस मानक के मसौदे का अवलोकन करें और अपनी सम्मतियों यह बताते हुए भेजे कि यदि यह मानक के रूप में प्रकाशित हो तो इस पर अमल करने में आपके व्यवसाय अथवा कारोबार में क्या कठिनाइयाँ आ सकती हैं।

सम्मतियों भेजने की अंतिम तिथि : **13 अक्टूबर 2023**

सम्मति यदि कोई हो तो कृपया अधोहस्ताक्षरी को उपरिलिखित पते पर संलग्न फॉर्मेट में भेजें या ced35@bis.gov.in पर ईमेल कर दें।

यदि कोई सम्मति प्राप्त नहीं होती है अथवा सम्मति में केवल भाषा सम्बन्धी त्रुटि हुई तो उपरोक्त प्रलेख को यथावत अंतिम रूप दिया जाएगा। यदि सम्मित तकनीकी प्रकृति की हुई विषय समिति के अध्यक्ष के परामर्श से अथवा उनकी इच्छा पर आगे की कार्यवाही के लिए विषय समिति को भेजे जाने के बाद प्रलेख को अंतिम रूप दे दिया जाएगा।

यह प्रलेख भारतीय मानक ब्यूरो की वेबसाइट www.bis.gov.in पर भी उपलब्ध हैं।

धन्यवाद।

भवदीय,

(अरुण कुमार एस.)
वैज्ञानिक 'ई' एवं निदेशक
(प्रमुख, सिविल इंजीनियरिंग विभाग)

संलग्नक : उपरिलिखित



भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS

MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG, NEW DELHI 110002

DRAFT IN WIDE CIRCULATION

14 August 2023

Our Ref: CED 35/T-25

TECHNICAL COMMITTEE: Furniture Sectional Committee, CED 35

ADDRESSED TO:

- a) All Members of Civil Engineering Division Council, CEDC
- b) All Members of the Furniture Sectional Committee, CED 35
- c) All others interests

Dear Sir/Madam,

Please find enclosed the following document:

Doc No.	Title
CED 35 (18980)WC	Draft Indian Standard School Furniture, Classroom Chairs and Tables – Recommendations <i>(Third Revision of IS 4837)</i> <i>(ICS 97.140: 97.190)</i>

Kindly examine the draft standard and forward your views stating any difficulties which you are likely to experience in your business or profession, if this is finally adopted as National Standard.

Last date for comments: **13 October 2023**

Comments if any, may please be made in the enclosed format and mailed to the undersigned at the above address or preferably through e-mail to ced35@bis.gov.in.

In case no comments are received or comments received are of editorial nature, you will kindly permit us to presume your approval for the above document as finalized. However, in case of comments of technical in nature are received then it may be finalized either in consultation with the Chairperson, Sectional Committee or referred to the Sectional Committee for further necessary action if so desired by the Chairman, Sectional Committee.

The document is also hosted on BIS website www.bis.gov.in.

Thanking you,

Yours faithfully,

(Arunkumar S.)

Scientist-E & Director

Head (Civil Engineering Department)

Encl: As above

BUREAU OF INDIAN STANDARDS**DRAFT FOR COMMENTS ONLY**

(Not to be reproduced without the permission of BIS or used as an Indian Standard)

Draft Indian Standard

**SCHOOL FURNITURE, CLASSROOM CHAIRS AND
TABLES – RECOMMENDATIONS**

(Third Revision of IS 4837)

ICS 97.140: 97.190

Furniture

Sectional Committee, CED 35

Last date of comments

13 October 2023

FOREWORD

(Formal Clauses will be added later)

The standard was first published in 1968 and further revised in 1978 and 1990.

Considering latest growth charts for height, weight and body mass index for 3-18 years old Indian Children and the anthropometric measurements for ergonomic design of students' furniture in India, this standard is revised. The following significant modifications have been incorporated in this revision:

- a) Title of the Indian Standard has been revised.
- b) Age group of children has been revised from 5-17 years to 3-18 years.
- c) The number of furniture size marks have been revised from four to six.
- d) Definition of maximum seat angle and back rest have been revised.

In the formulation of this standard, assistance has been derived from the following:

- i) BS EN 1729-1: 2015 - Furniture - Chairs and Tables for Educational Institutions - Part 1: Functional Dimensions
- ii) Revised IAP growth charts for height, weight and body mass index for 5 to 18-year-old Indian Children; Indian Pediatrics published by the Indian Academy of Pediatrics, 2015; 52 : 47-55
- iii) Anthropometric measurements for ergonomic design of students' furniture in India; Engineering Science and Technology, International Journal 20 (2017) 232 – 239.

This standard contributes to the United Nations Sustainable Development Goals by especially Goal 4 – 'Quality Education : Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all'.

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 : 1960 'Rules for rounding off numerical values (revised)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Draft Indian Standard***SCHOOL FURNITURE, CLASSROOM CHAIRS AND TABLES – GUIDELINES***(Third Revision of IS 4837)***1 SCOPE**

1.1 This standard provides dimensions of the chairs and tables for children in the age group of 3-18 years intended for use in general educational purposes in educational institutions. The chairs and tables have been divided into six size marks related to age groups of children.

1.2 These have been formulated keeping in view the following considerations:

- a) To define a minimum space under the table which shall be kept clear for the knee space.
- b) To define minimum length between the front legs of the table structure based on width between elbows of children when writing, to ensure adequate working space.
- c) To provide data on the reach and stretch of (children) arms to assist in the design of working surfaces, any storage space, etc.
- d) The standard is applicable to furniture for use with portable electronic devices like laptop, tablets, etc but not to laboratory work benches or any similar special applications.
- e) This standard is not applicable to the furniture used by the tutor in classroom.

2 REQUIREMENTS

2.1 There are many postures that are adopted by students in school. However, to assess the fit of the student to chair and table it is necessary for the people to adopt the posture shown in Fig. 1. In the design of chair and table seven basic requirements as follows shall be completely fulfilled simultaneously:

- A** Shod feet flat on floor
- B** Clearance between back of legs and front edge of seat
- C** No pressure at front of seat between seating surface and thighs
- D** Clearance between thigh and underside of table for freedom of movement
- E** Elbows approximately level with table top when upper arm vertical
- F** Firm support for back in lumbar region and below shoulder blades
- G** Adequate clearance between backrest and seat to ensure free movement of buttocks

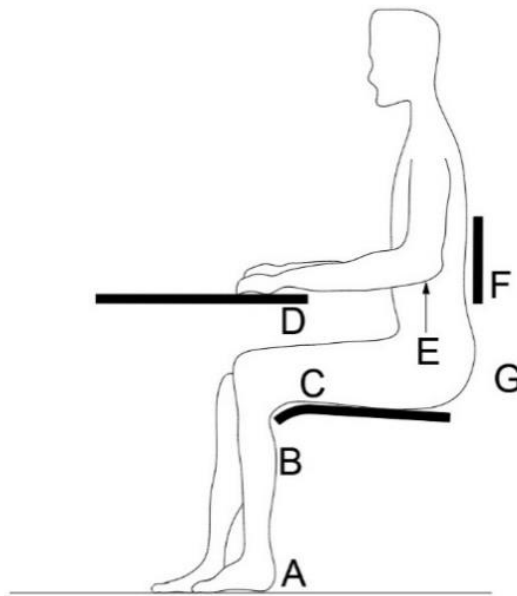


FIG. 1 FIT OF PUPIL TO CHAIR AND TABLE

3 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply;

3.1 Backrest

3.1.1 *Seat Plane to Bottom of Backrest*

The foremost point of the backrest.

3.1.2 *Lower and Upper Limits of Backrest*

The lower and upper limits of the backrest are measured on the centre line of the set plane from the lowest part of the seating surface. The upper and the lower edges of the backrest must be well rounded.

3.2 Seat

3.2.1 *Angles Between Seat and Backrest Planes*

The angle between the seat and backrest planes is measured on the centre of the seat. For chairs of size marks 4 to 6 (see Table 1) designed for extended periods of sitting that is in lecture and assembly hall, angle β may be increased up to a maximum of 106° (see Fig. 2).

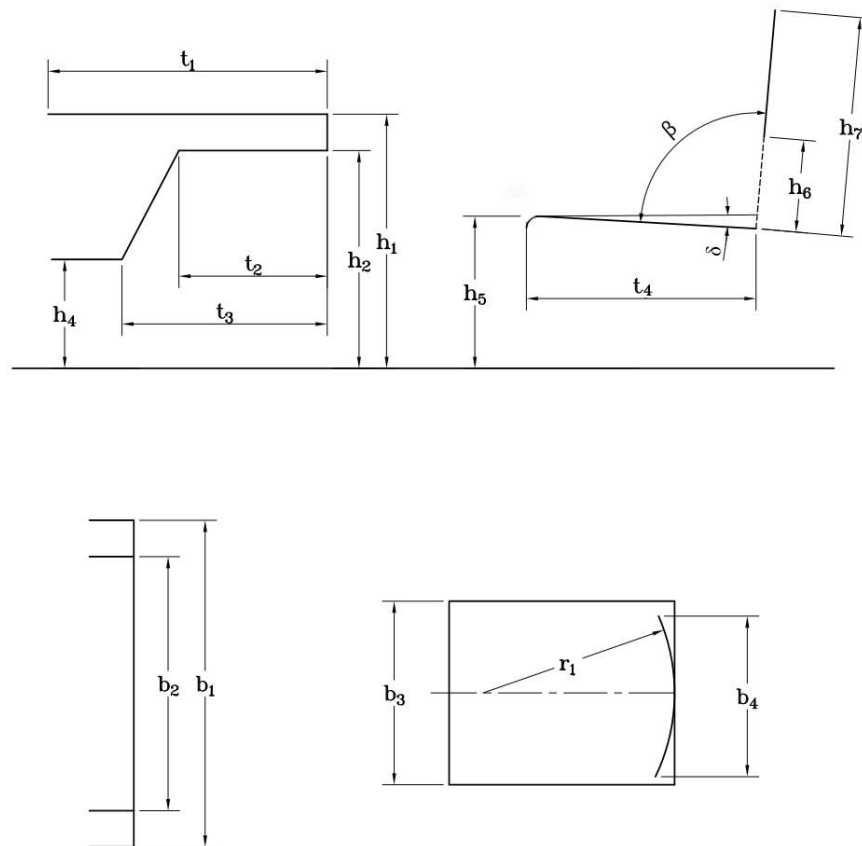


FIG. 2 DIAGRAMMATIC KEY TO DIMENSION

3.2.2 Effective Depth of the seat

The depth of the seat is the dimension measured from front to back access of the chair in the middle of the seat.

3.2.3 Height of the Seat

The height of the seat is measured to the highest point at the front of the seating area on the centre line.

3.2.4 Maximum Angle of the Seat Plane

The main part of the seating surface has to lie between the horizontal and maximum slope of 5° . The seating surface may be flat or include dishing. Any dishing has not to exceed 10 mm in depth and has to occur in the back 2/3 of the effective seat depth. The deepest part of the dishing has to occur 3/4 of the effective seat depth back from the front edge.

3.2.5 Minimum Width of the Seat

The width of the seat is the dimension measured from side to side on a line parallel to the front of the chair, and at the middle of the seat.

3.3 Table

3.3.1 Height of Top

Table top surface are horizontal. When an inclined surface is required, an inclination of 16° is recommended. The edge towards the students has to be approximately at the same height as the specified horizontal surface.

3.3.2 Minimum Depth of the Top

The short dimension measured from front to back edges of the top.

4 DIMENSIONS

4.1 The dimensions of chairs and tables according to their respective size marks, shall be in accordance with Table 1. The distribution of furniture sizes according to age group is given in Fig. 3.

Table 1 Dimensions
(Clauses 3.2.1, 4.1 and Fig. 2)

SI No.	Particular		Furniture Size mark					
			(3)	(4)	(5)	(6)	(7)	(8)
(1)	(2)		1	2	3	4	5	6
1)	Seat							
	h_5	Height of seat (± 10), mm	265	310	350	380	430	460
	t_4	Effective depth of seat (± 20), mm	250	270	320	340	380	420
	b_3	Min. width of seat, mm	240	280	320	340	360	380
	δ	Max. angle of seat, degree	5	5	5	5	5	5
2)	Backrest							
	β	Angle between seat and backrest, degree	95-100	95-100	95-100	95-100	95-100	95-100
	h_6	Seat plane to bottom of backrest (Max.), mm	100	110	140	150	160	170
	h_7	Seat plane to top of backrest (Min.), mm	210	250	280	300	320	330
	b_4	Min. width of backrest, mm	250	250	270	270	300	330
	r_1	Min. Horizontal Radius of backrest, mm	300	300	300	300	300	300
3)	Tables							
	h_1	Height of top (± 10), mm	460	530	580	640	710	760
	t_1	Min. depth of top, mm	450 ⁽¹⁾	450 ⁽¹⁾	450 ⁽¹⁾	450 ⁽¹⁾	450 ⁽¹⁾	450 ⁽¹⁾
	b_1	Min. length of top 1 place, mm	450	450	480 ⁽²⁾	480 ⁽²⁾	480 ⁽²⁾	480 ⁽²⁾
	b_2	Min. length of top 2 place, mm	800	800	900	950	1 100	1 100

SI No.	Particular	Furniture Size mark					
		(3)	(4)	(5)	(6)	(7)	(8)
(1)	(2)	1	2	3	4	5	6
4)	Leg Clearance						
	t_2 Min. depth of knee zone (± 10), mm	300	300	300	330	330	330
	t_3 Min. depth of tibia zone (± 10), mm	350 ⁽³⁾	350 ⁽³⁾	350 ⁽³⁾	350 ⁽³⁾	350 ⁽³⁾	350
	h_2 Min. height of knee zone (± 5), mm	325	395	445	505	575	625
	h_4 Min. height of tibia zone (± 10), mm	300	370	410	465	520	560
<p>(1) Decrease up to 400 mm permissible, only if required by educational conditions. A 400 mm depth top suffices to keep sizes of books, journals, and tall papers.</p> <p>(2) Decrease up to 450 mm permissible, only if required by educational conditions.</p> <p>(3) Footrest inside the tibia zone is permissible up to a height of 150mm from the ground</p>							

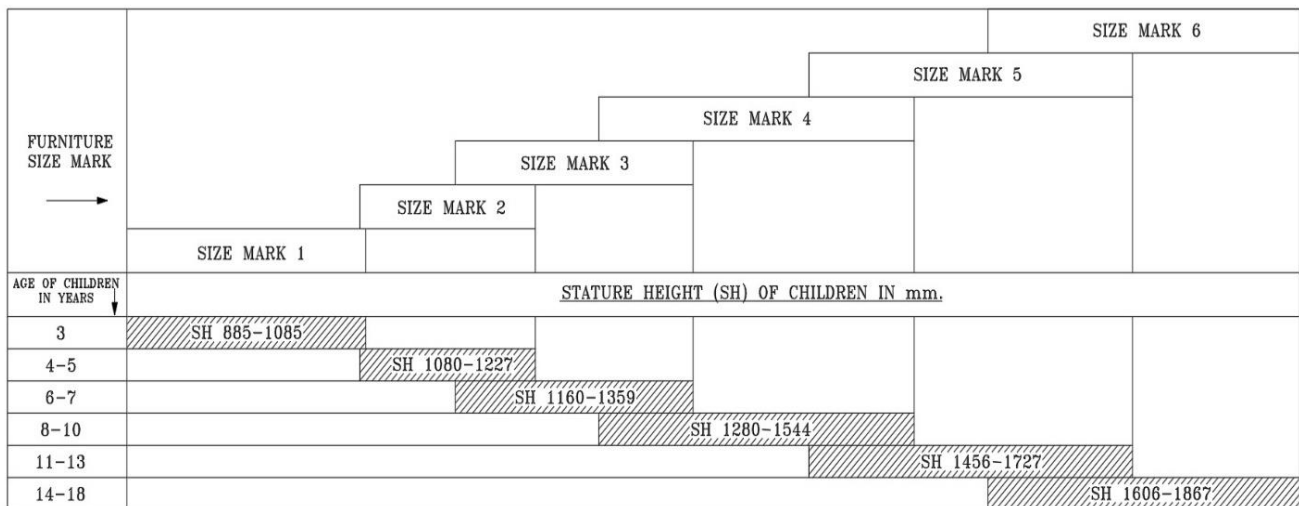


FIG. 3 DISTRIBUTION OF FURNITURE SIZES AS PER STATURE RANGE (CONSIDERED WITHOUT SHOES)

5 RECOMMENDATION

The dimensions are applicable to desks and chairs. The combined units with desk and bench design may follow these guidelines with modifications suitable for ingress and egress as well as space reduction requirements agreed between the user and the manufacturer.
