

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

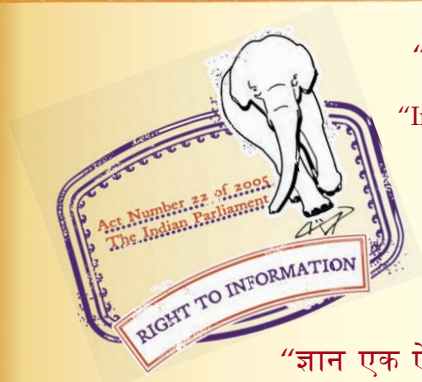
“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 1864 (1979): Hot-rolled steel L-sections for shipbuilding - [CED 7: Structural Engineering and structural sections]



“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”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



Indian Standard
SPECIFICATION FOR
HOT ROLLED STEEL 'L' SECTIONS
FOR SHIPBUILDING
(*First Revision*)

First Reprint APRIL 1989

UDC 669.14-423.2-122.4:629.12:006.78

© Copyright 1979

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

Indian Standard

SPECIFICATION FOR HOT ROLLED STEEL 'L' SECTIONS FOR SHIPBUILDING (First Revision)

Structural Sections Sectional Committee, SMDC 6

Chairman

SHRI M. DHAR

Representing

Kamani Engineering Corporation Ltd, Bombay

Members

SHRI S. BANERJEE
SHRI N. BHATTACHARYA

Steel Re-Rolling Mills Association of India, Calcutta
Garden Reach Shipbuilders and Engineers Ltd,
Calcutta

SHRI B. B. CHAKRAVERTI
SHRI A. K. SHOME (*Alternate*)
SH N. S. CHATTREE

Superintendence Co of India (Pvt) Ltd, Calcutta

Steel Authority of India Ltd, Bhilai Steel Plant,
Bhilai

SHRI V. MUKUNDAN (*Alternate*)
SHRI D. S. DESAI
SHRI D. GADH
SHRI G. R. NAYAR (*Alternate*)
SHRI A. K. GUHA

M. N. Dastur & Co Pvt Ltd, Calcutta
Tata Iron & Steel Co Ltd, Jamshedpur

Inspection Wing, Directorate General of Supplies
& Disposals, New Delhi

SHRI P. C. MUTAFI (*Alternate*)
SHRI M. P. JASUJA

Research & Development Organization, Hindustan
Steel Ltd, Ranchi
Ministry of Railways

JOINT DIRECTOR STANDARD
(WAGON II), RDSO
JOINT DIRECTOR STANDARDS
(B & S), RDSO (*Alternate*)

EMC Projects Pvt Ltd, Calcutta

SHRI OM KHOSLA
SHRI S. N. SINGH (*Alternate*)
SHRI P. LAXMINARAYANA
SHRI V. S. NARAYANARAO (*Alternate*)
SHRI M. L. MEHTA

Hindustan Shipyard Ltd, Vishakhapatnam

Metallurgical & Engineering Consultants (India)
Ltd, Ranchi

SHRI KAMMAL PRAKASH (*Alternate*)
SHRI S. K. MITRA
SHRI P. K. MUKHERJEE

Indian Iron & Steel Co Ltd, Burnpur
The Braithwaite & Co Ltd, Calcutta

(Continued on page 2)

Copyright 1979

BUREAU OF INDIAN STANDARDS

This publication is protected under the *Indian Copyright Act* (XIV of 1957) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

IS : 1864 - 1979

(Continued from page 1)

Members

SHRI D. B. NAIK

SHRI G. S. SONDH (*Alternate*)

SHRI P. V. NAIK

SHRI V. Y. PHATAK

SHRI V. P. AGRAWAL (*Alternate*)

SHRI P. S. RANGAVITTALAN

SHRI S. ROY

SHRI K. V. RAO (*Alternate*)

SHRI S. K. SADHU

SHRI S. C. CHAKRABARTI (*Alternate*)

SHRI N. S. SAMBASIVAM

SHRI A. S. SHETTY (*Alternate*)

SHRI M. C. SARANGDHAR

SHRI M. K. CHATTERJEE (*Alternate*)

SHRI P. K. SOM

SHRI D. SRINIVASAN

SHRI B. P. GHOSH (*Alternate*)

SHRI K. S. SRINIVASAN

SHRI SUNIL BARY (*Alternate*)

SHRI K. SURYANARAYANAN

SHRI R. K. MEHTA (*Alternate*)

SHRI C. R. RAMA RAO,

Director (Struc & Met)

Representing

Engineer-in-Chief's Branch, Army Headquarters
New Delhi

Richardson & Cruddas Ltd, Bombay
Steel Authority of India Ltd, Rourkela Steel Plant,
Rourkela

Iron & Steel Control, Calcutta
Steel Authority of India Ltd, Bokaro Steel Plant,
Bokaro

Jessop & Co Ltd, Calcutta

Tube Investment of India Ltd, Madras

Stup (India) Ltd, Bombay

Institution of Engineers (India), Calcutta
Joint Plant Committee, Calcutta

National Buildings Organization, New Delhi

Indian Aluminium Co Ltd, Calcutta

Director General, ISI (*Ex-officio Member*)

Secretary

SHRI M. S. NAGARAJ

Deputy Director (Struc & Met), ISI

Indian Standard

SPECIFICATION FOR HOT ROLLED STEEL 'L' SECTIONS FOR SHIPBUILDING (*First Revision*)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 30 April 1979, after the draft finalized by the Structural Sections Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 This standard was first published in 1963 as a part of Steel Economy Programme of ISI. In this revision this standard has been brought in line with ISO/DIS 4973 "Hot rolled steel 'L' sections for shipbuilding (metric series)". The title of the standard has also been changed accordingly.

0.3 Table 1A covers 'L' Sections which are supplementary to the range of sizes covered in Table 1. These may be available with mutual arrangement with the supplier.

0.4 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*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard specifies dimensions, sectional properties and dimensional tolerances for hot rolled steel 'L' sections for shipbuilding.

2. MATERIAL

2.1 The 'L' sections may be produced from steel conforming to IS: 226-1975†, IS: 961-1969‡, IS: 2062-1975§ or IS: 3039-1965|| as appropriate.

NOTE — As these sections are intended mainly to be used in shipbuilding, the steel shall, when so required, conform to the specification quoted by the purchaser.

*Rules for rounding off numerical values (*revised*).

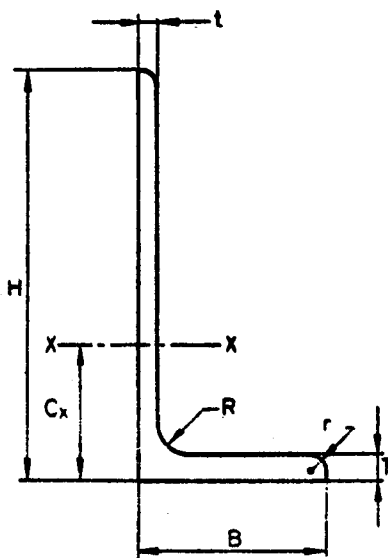
†Specification for structural steel standard quality (*fifth revision*).

‡Specification for structural steel (high tensile) (*second revision*).

§Specification for structural steel (fusion welding quality) (*first revision*).

||Specification for structural steel (shipbuilding quality).

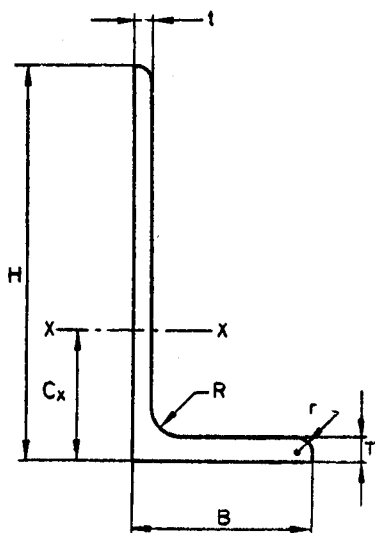
TABLE 1 'L' SECTIONS — DIMENSIONS AND SECTIONAL PROPERTIES
(Clauses 0.3 and 4.1)



DESIGNATION	MASS	DIMENSIONS						SECTIONAL AREA	CENTROIDAL TROID	MOMENT OF INERTIA I_x
		H	B	t	T	R	r			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
L 200 × 90 × 9 × 12	22.0	200	90	9	12	15	7.5	28.1	6.63	1 160
L 225 × 90 × 9 × 12	23.8	225	90	9	12	15	7.5	30.3	7.71	1 610
L 250 × 90 × 9 × 13	26.2	250	90	9	13	15	7.5	33.4	8.64	2 190
L 250 × 90 × 10.5 × 15	30.3	250	90	10.5	15	15	7.5	38.5	8.76	2 510
L 250 × 90 × 11.5 × 16	32.7	250	90	11.5	16	15	7.5	41.7	8.90	2 710
L 275 × 100 × 10.5 × 14	32.8	275	100	10.5	14	15	7.5	41.8	9.72	3 330
L 275 × 100 × 11.5 × 15	35.5	275	100	11.5	15	15	7.5	45.3	9.84	3 500
L 300 × 100 × 10.5 × 15	35.6	300	100	10.5	15	15	7.5	45.3	10.6	4 290
L 300 × 100 × 11.5 × 16	38.5	300	100	11.5	16	15	7.5	49.0	10.7	4 630
L 325 × 120 × 10.5 × 14	39.3	325	120	10.5	14	20	10	50.1	11.3	5 600
L 325 × 120 × 11.5 × 15	42.6	325	120	11.5	15	20	10	54.3	11.4	6 060
L 350 × 120 × 10.5 × 16	43.1	350	120	10.5	16	20	10	54.9	12.0	7 110
L 350 × 120 × 11.5 × 18	47.4	350	120	11.5	18	20	10	60.4	12.0	7 780
L 375 × 120 × 10.5 × 18	46.9	375	120	10.5	18	20	10	59.7	12.7	8 850
L 375 × 120 × 11.5 × 20	51.4	375	120	11.5	20	20	10	65.4	12.7	9 650
L 400 × 120 × 11.5 × 23	56.2	400	120	11.5	23	20	10	71.6	13.3	11 900
L 425 × 120 × 11.5 × 24	59.3	425	120	11.5	24	20	10	75.5	14.2	14 200
L 450 × 120 × 11.5 × 25	62.4	450	120	11.5	25	20	10	89.5	15.1	16 800
L 475 × 120 × 11.5 × 28	67.2	475	120	11.5	28	20	10	85.6	15.7	20 100
L 475 × 120 × 12.5 × 30	72.4	475	120	12.5	30	20	10	92.2	15.9	21 600
L 500 × 120 × 12.5 × 33	77.4	500	120	12.5	33	20	10	98.6	16.5	25 500
L 500 × 120 × 13.5 × 35	82.8	500	120	13.5	35	20	10	105	16.6	27 100

TABLE 1A SUPPLEMENTARY LIST 'L' SECTIONS — DIMENSIONS AND SECTIONAL PROPERTIES

(Clauses 0.3 and 4.1)



DESIGNATION	MASS	DIMENSIONS						SECTIONAL AREA	CENTROID	MOMENT OF INERTIA I_x
		H	B	t	T	R	r			
	kg/m	mm	mm	mm	mm	mm	mm	cm ²	cm	cm ⁴
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
L 75 × 50 × 6 × 8	6.25	75	50	6	8	6.5	4	8.0	2.20	48.0
L 100 × 50 × 8 × 10	11.0	100	65	8	10	11	5.5	13.7	3.13	137
L 100 × 75 × 12 × 15	16.8	100	75	12	15	11	5.5	21.4	3.13	197
L 125 × 75 × 10 × 12	15.8	125	75	10	12	13.5	6.5	20.3	4.08	317
L 150 × 90 × 14 × 18	27.0	150	90	14	18	13.5	6.5	34.6	5.02	742
L 225 × 90 × 10.5 × 14	27.6	225	90	10.5	14	15	7.5	35.1	7.80	1 850
L 250 × 90 × 10 × 15	29.4	250	90	10	15	15	7.5	37.5	8.61	2 440
L 250 × 90 × 12 × 16	33.7	250	90	12	16	15	7.5	43.0	8.99	2 790
L 400 × 100 × 13 × 18	53.8	400	100	13	18	24	12	68.6	15.4	11 500
L 400 × 120 × 12.5 × 25	60.8	400	120	12.5	25	20	10	77.5	13.4	12 900
L 425 × 120 × 12.5 × 26	64.1	425	120	12.5	26	20	10	81.7	14.3	15 400
L 450 × 120 × 12.5 × 27	67.4	450	120	12.5	27	20	10	85.9	15.2	18 200
L 500 × 120 × 11.5 × 30	71.2	450	120	11.5	30	20	10	90.7	16.4	23 600

Note: The sections contained in this table may be available by mutual arrangement with the supplier.

3. DESIGNATION

3.1 Angle sections with unequal width and thickness shall be designated by the alphabet L followed by height of web (H), width of flange (B), thickness of web (t) and thickness of flange (T):

Example: L 250 × 90 × 9 × 13

4. DIMENSIONS

4.1 The dimensions shall be as given in Tables 1 and 1A.

5. TOLERANCES

5.1 Height of Web (H) and Width of Flange (B) — The tolerance on H and B shall be as given below:

H	Tolerance on H and B
mm	mm
Up to and including 200	± 3
Over 200	± 4

5.2 Web Thickness, t — The tolerance on the thickness of web shall be

$$\begin{array}{l} + 1.6 \\ - 0.4 \end{array} \text{ mm}$$

5.3 Flange Thickness, T — The tolerance on the thickness of flange leg T shall be as given in Table 2.

TABLE 2 TOLERANCE ON THICKNESS OF FLANGE

THICKNESS, T		TOLERANCE	
Over	Up to and Including	Over	Under
mm	mm	mm	mm
(1)	(2)	(3)	(4)
—	20	+ 2.0	— 0.4
20	30	+ 2.0	— 0.5
30	35	+ 2.5	— 0.6

5.4 Straightness — The maximum permissible variation in straightness when measured over the entire length shall be $0.003 \times \text{length } (L)$, (see Fig. 1).

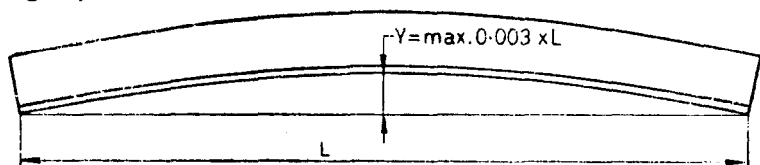


FIG. 1 MEASUREMENT OF STRAIGHTNESS

5.5 Out-of-Square — The legs shall be perpendicular to each other within a maximum deviation of 2.5 percent of B . The deviation shall be measured at the end of shorter leg (*see* Fig. 2).

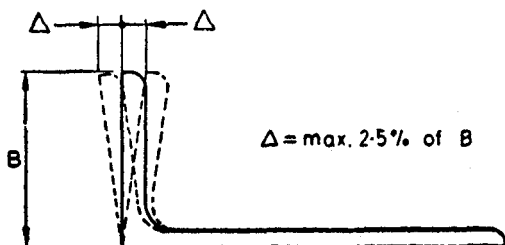


FIG. 2 MEASUREMENT OF OUT-OF-SQUARE

5.6 Flatness — The tolerance on flatness of web shall be subject to agreement between the purchaser and the manufacturer. The deviation from flatness shall however be measured as shown in Fig. 3.

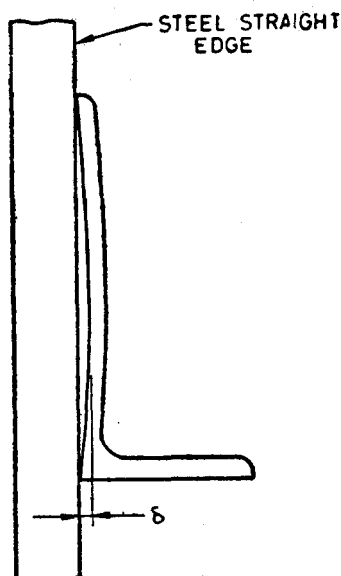


FIG. 3' MEASUREMENT OF DEVIATION IN FLATNESS OF WEB

IS : 1864 - 1979

5.7 Length — The tolerance on length shall be $\begin{smallmatrix} +100 \\ -0 \end{smallmatrix}$ mm. The angle sections may be supplied to tighter length tolerances subject to agreement between the purchaser and the supplier.

5.8 Mass — The tolerance on mass shall be ± 2.5 percent of the mass per unit length given in Tables 1 and 1A.

BUREAU OF INDIAN STANDARDS

Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones : 3 31 01 31, 3 31 13 75

Telegrams : Manaksanstha
(Common to all Offices)

Regional Offices :

Telephone

*Western ; Manakalaya, E9 MIDC, Marol, Andheri (East), 6 32 92 95
BOMBAY 400093

†Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, 36 24 99
Maniktola, CALCUTTA 700054

Northern : SCO 445-446, Sector 35-C { 2 18 43
CHANDIGARH 160036 { 3 16 41

Southern : C. I. T. Campus, MADRAS 600113 { 41 24 42
{ 41 25 19
{ 41 29 16

Branch Offices :

Pushpak, Nurmohamed Shaikh Marg, Khanpur, { 2 63 48
AHMADABAD 380001 { 2 63 49

'F' Block, Unity Bldg, Narasimharaja Square, 22 48 05
BANGALORE 560002

Gangotri Complex, 5th Floor, Bhadbhada Road, T. T. Nagar, 6 27 16
BHOPAL 462003

Plot No. 82/83, Lewis Road, BHUBANESHWAR 751002 5 36 27

53/5 Ward No. 29, R. G. Barua Road,
5th Byelane, GUWAHATI 781003 —

5-8-56C L. N. Gupta Marg, (Nampally Station Road), 22 10 83
HYDERABAD 500001

R14 Yudhister Marg, C Scheme, JAIPUR 302005 { 6 34 71
{ 6 98 32

117/418B Sarvodaya Nagar, KANPUR 208005 { 21 68 76
{ 21 82 92

Patliputra Industrial Estate, PATNA 800013 6 23 05

Hantex Bldg (2nd Floor), Rly Station Road, 52 27
TRIVANDRUM 695001

Inspection Office (With Sale Point):

Institution of Engineers (India) Building, 1332 Shivaji Nagar, 5 24 35
PUNE 410005

*Sales Office in Bombay is at Novelty Chambers, Grant Road, 89 65 28
Bombay 400007

†Sales Office in Calcutta is at 5 Chowringhee Approach, P. O. Princep 27 68 00
Street, Calcutta 700072