UDC 669.14-423

October 1963

Steel Sections
Hot Rolled I-Beams
Narrow Flange I-Beams, I Range
Dimensions, Weights, Permissible Variations, Static Values

DIN 1025 Part 1

Formstahl; Warmgewalzte I-Träger; Schmale I-Träger, I-Reihe;
Maße, Gewichte, zulässige Abweichungen, statische Werte

The permissible variations stated in this Standard agree with the corresponding data in Euronorm 24-62 - Narrow flange I-beams, steel channels, permissible variations.

Dimensions in mm

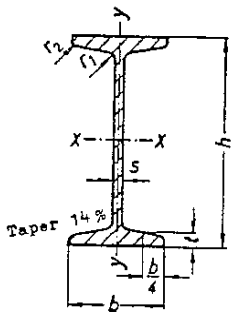
1. Scope

This Standard applies to hot rolled narrow flange I-beams with taper flanges (I Range) in depths from 80 to 600 mm in the grades of steel stated in Section 4.

This Standard does n o t apply to:

Hot rolled I-beams, wide flange I-beams, IPB Range and IB Range, see DIN 1025 Part 2;
Hot rolled I-beams, wide flange I-beams, lightweight type, IPBl Range, see DIN 1025 Part 3;
Hot rolled I-beams, wide flange I-beams, heavy type, IPBv Range, see DIN 1025 Part 4;
Hot rolled I-beams, medium-wide flange, IPE Range, see DIN 1025 Part 5.

2. Designation



Designation of a hot rolled narrow flange I-beam of depth h = 360 mm in a steel according to the code number St 37-2 or material number 1.0112 according to DIN 17100:

I 360 DIN 1025 - St 37-2
or I 360 DIN 1025 - 1.0112

For Explanations, see DIN-Mitteilungen Vol. 41 (1962) No. 11, pp. 517 - 519.

Continued on pages 2 to 4

Table 1.

Symbol	Dimensions for										Cross-section	Weight	Surface area	Relative to bending axis[2]						[3]	[4]
	h	perm. var.	b	perm. var.	s	perm. var.	t	perm. var.[1]	r_1	r_2				$x-x$			$y-y$				
I											F	G	U	J_x	W_x	i_x	J_y	W_y	i_y	S_x	s_x
											cm²	kg/m	m²/m	cm⁴	cm³	cm	cm⁴	cm³	cm	cm³	cm
80	80	±2,0	42	±1,5	3,9	±0,5	5,9	−0,5	3,9	2,3	7,57	5,94	0,304	77,8	19,5	3,20	6,29	3,00	0,91	11,4	6,84
100	100		50		4,5		6,8		4,5	2,7	10,6	8,34	0,370	171	34,2	4,01	12,2	4,88	1,07	19,9	8,57
120	120		58		5,1		7,7		5,1	3,1	14,2	11,1	0,439	328	54,7	4,81	21,5	7,41	1,23	31,8	10,3
140	140		66		5,7		8,6		5,7	3,4	18,2	14,3	0,502	573	81,9	5,61	35,2	10,7	1,40	47,7	12,0
160	160		74		6,3		9,5	−1,0	6,3	3,8	22,8	17,9	0,575	935	117	6,40	54,7	14,8	1,55	68,0	13,7
180	180		82	±2,0	6,9		10,4		6,9	4,1	27,9	21,9	0,640	1450	161	7,20	81,3	19,8	1,71	93,4	15,5
200	200		90		7,5		11,3		7,5	4,5	33,4	26,2	0,709	2140	214	8,00	117	26,0	1,87	125	17,2
220	220	±3,0	98		8,1		12,2		8,1	4,9	39,5	31,1	0,775	3060	278	8,80	162	33,1	2,02	162	18,9
240	240		106	±2,5	8,7		13,1		8,7	5,2	46,1	36,2	0,844	4250	354	9,59	221	41,7	2,20	206	20,6
260	260		113		9,4		14,1		9,4	5,6	53,3	41,9	0,906	5740	442	10,4	288	51,0	2,32	257	22,3
280	280		119		10,1	±0,6	15,2		10,1	6,1	61,0	47,9	0,966	7590	542	11,1	364	61,2	2,45	316	24,0
300	300		125		10,8		16,2		10,8	6,5	69,0	54,2	1,03	9800	653	11,9	451	72,2	2,56	381	25,7
320	320		131	±3,0	11,5		17,3	−1,5	11,5	6,9	77,7	61,0	1,09	12510	782	12,7	555	84,7	2,67	457	27,4
340	340		137		12,2	±0,7	18,3		12,2	7,3	86,7	68,0	1,15	15700	923	13,5	674	98,4	2,80	540	29,1
360	360		143		13,0		19,5		13,0	7,8	97,0	76,1	1,21	19610	1090	14,2	818	114	2,90	638	30,7
380	380		149		13,7		20,5		13,7	8,2	107	84,0	1,27	24010	1260	15,0	975	131	3,02	741	32,4
400	400		155		14,4	±0,8	21,6		14,4	8,6	118	92,4	1,33	29210	1460	15,7	1160	149	3,13	857	34,1
425	425	±4,0	163		15,3		23,0		15,3	9,2	132	104	1,41	36970	1740	16,7	1440	176	3,30	1020	36,2
450	450		170		16,2	±0,9	24,3		16,2	9,7	147	115	1,48	45850	2040	17,7	1730	203	3,43	1200	38,3
475	475		178		17,1		25,6		17,1	10,3	163	128	1,55	56480	2380	18,6	2090	235	3,60	1400	40,4
500	500		185		18,0		27,0		18,0	10,8	179	141	1,63	68740	2750	19,6	2480	268	3,72	1620	42,4
550	550		200		19,0	±1,0	30,0		19,0	11,9	212	166	1,80	99180	3610	21,6	3490	349	4,02	2120	46,8
600	600		215		21,6		32,4		21,6	13,0	254	199	1,92	139000	4630	23,4	4670	434	4,30	2730	50,9

[1]) The permissible variation on the plus side is limited by the overweight permitted.

[2]) J = moment of inertia, W = section modulus
i = radius of gyration, referenced in each case to the bending axis concerned.

[3]) S_x = static moment of half cross-section

[4]) $s_x = J_x : S_x$ = distance between compression and tension centres

The cross-sections, weights, surface areas and static values have been calculated from the dimensions detailed in the Table.

3. Dimensions and permissible dimension and form variations

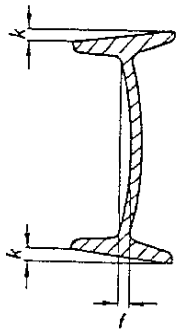
3.1. Cross-section

3.1.1. Hot rolled narrow flange I-beams to this Standard are supplied in the dimensions and with the permissible variations shown in Table 1.

3.1.2. The out-of-squareness k shall not exceed the values shown in Table 2.

Table 2

Width b over	Width b up to	Out-of-squareness k maximum
–	100	1,0
100	215	1% of b



3.1.3. The web bow f shall not exceed the values given in Table 3.

Table 3

Depth h over	Depth h up to	Web bow f maximum
–	100	0,5
100	200	1,0
200	400	1,5
400	600	2,0

3.1.4. The off-centre of web $m = \frac{b_2 - b_1}{2}$ shall not exceed the values given in Table 4.

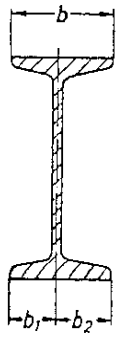


Table 4

Width b over	Width b up to	Off-centre of web m maximum
–	100	1,0
100	215	1% of b

3.2. Straightness

For narrow flange I-beams the permissible variations from straightness q are given in Table 5.

Table 5

Depth h over	Depth h up to	Permissible variation from straightness q
–	400	0,0015 · l
400	600	0,0010 · l

Straightness requirements more stringent than the above shall be agreed to at the time of ordering.

4. Material

Narrow flange I-beams according to this Standard should preferably be made of steel grades according to DIN 17100.
The grade of steel required shall be stated when ordering.

5. Weight and permissible weight variations

5.1. The weights stated in Table 1 have been evaluated from the cross-section on the basis of a density of 7.85 kg/dm³.

5.2. The following weight variations are permitted:

on the delivery as a whole ± 4 %,

on an indi idual beam ± 6 %.

A delivery may comprise narrow flange I-beams with different depths of section.

The weight variation for the purpose of this Standard is the difference between the weight actually supplied and the weight as calculated from the weight according to Table 1 and the metres supplied (when ordering in manufacturing lengths) or the metres ordered (when ordering in fixed lengths and exact lengths).

Table 6

Description	Length		Length details to be given when ordering
	Range	Permissible variation	
Manufacturing length	4000 to 15000	anywhere between 4000 and 15000	none
Fixed length	to 15000	± 50	required fixed length in mm
Exact length[1])	to 15000	between ± 50 and ± 5; the following being preferred: ± 25, ± 10, ± 5	required exact length and required permissible variation in mm

[1]) In the case of exact lengths subject to restricted length variations the bevel produced by non-square cutting shall fall within the permissible length variations.

6. Mode of delivery

6.1. Length data for deliveries of hot rolled narrow flange I-beams (I Range) are contained in Table 6.

6.2. In the case of angled cuts the length shall be taken as the greatest useful length on the assumption that the ends are cut square.

6.3. When ordered by weight it is permissible for the length to vary between the maximum and minimum limits stated for manufacturing lengths.

6.4. Example of order

100 t narrow flange I-beams of depth h = 360 in a steel according to code number St 37-2 or material number 1.0112 according to DIN 17100 in manufacturing lengths:

100 t I 360 DIN 1025 - St 37-2

or 100 t I 360 DIN 1025 - 1.0112

7. Checking accuracy to size

7.1. Scope of test

The number of beams which shall be checked for accuracy to size by measurements made at the manufacturer's works prior to dispatch shall be agreed to at the time of ordering.

7.2. Procedure

When checking straightness according to Section 3.2 the dimension q shall be measured over the full length of the beam.