

I-Beam & H-Beam Dimensional Tables — Complete Sortiment for Global Procurement

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1. Parameter Definitions

Symbol	Parameter	Unit	Description
h	Profile Height	mm	Overall depth of the section
b	Flange Width	mm	Width of each flange
s	Web Thickness	mm	Thickness of the vertical web
t	Flange Thickness	mm	Thickness of each horizontal flange
R	Inner Fillet Radius	mm	Radius at web-flange junction
A	Cross-Sectional Area	cm²	Total area of the profile section
I _x	Moment of Inertia (X-axis)	cm⁴	Bending resistance about major axis
W _x	Section Modulus (X-axis)	cm³	Maximum bending stress capacity
i _x	Radius of Gyration (X-axis)	cm	Slenderness parameter
I _y	Moment of Inertia (Y-axis)	cm⁴	Bending resistance about minor axis
W _y	Section Modulus (Y-axis)	cm³	Lateral bending capacity
i _y	Radius of Gyration (Y-axis)	cm	Lateral slenderness parameter
m	Mass per Meter	kg/m	Unit weight for shipping calculations

Metal Asia supplies all profiles listed in these tables in [full compliance with GOST and GB/T standards](#), with [pre-shipment NDT verification](#) available on request.

2. Normal Beams — Type B (GOST 26020-83)

Normal beams are the most commonly specified profile type for building construction. The height significantly exceeds flange width, optimizing the section for bending resistance.

Series B1

Profile	h, mm	b, mm	s, mm	t, mm	Mass, kg/m	Area, cm²
10B1	100	55	4.1	5.7	8.1	10.32
12B1	117.6	64	3.8	5.1	8.7	11.03
14B1	137.4	73	3.8	5.6	10.5	13.39
16B1	157	82	4.0	5.9	12.7	16.18
18B1	177	91	4.3	6.5	15.4	19.58
20B1	200	100	5.6	8.0	19.8	25.21
22B1	220	110	5.9	8.5	22.7	28.89
24B1	240	110	6.3	9.5	25.8	32.86
27B1	270	125	6.6	10.0	30.7	39.09
30B1	300	135	7.2	10.7	35.9	45.71
33B1	330	140	7.7	11.5	40.9	52.09
36B1	360	145	8.0	12.0	44.8	57.08
40B1	400	155	8.6	13.0	52.1	66.31
45B1	450	160	9.4	14.0	60.3	76.82
50B1	500	170	10.2	15.0	69.8	88.85
55B1	550	180	11.0	16.0	79.8	101.60
60B1	600	190	11.8	17.0	91.0	115.86

Series B2 (Enhanced Section Properties)

Profile	h, mm	b, mm	s, mm	t, mm	Mass, kg/m	Area, cm²
10B2	100	55	4.5	6.1	9.1	11.52
12B2	120	64	4.4	6.3	10.9	13.85
14B2	140	73	4.7	6.9	13.4	17.06
16B2	160	82	5.0	7.4	15.8	20.09
18B2	180	91	5.3	8.0	18.8	23.95
20B2	200	100	5.6	8.5	21.7	27.66
22B2	220	110	6.2	9.2	25.8	32.82
24B2	240	110	6.5	10.0	28.6	36.43
27B2	270	125	6.9	10.7	33.7	42.93
30B2	300	135	7.5	11.5	39.2	49.90
33B2	330	140	8.1	12.2	44.9	57.19
36B2	360	145	8.5	12.8	49.1	62.54
40B2	400	155	9.1	13.7	56.6	72.05
45B2	450	160	10.0	14.6	65.2	83.03
50B2	500	170	10.8	15.8	75.3	95.89
55B2	550	180	11.7	16.7	86.2	109.78
60B2	600	190	12.6	17.8	98.4	125.32

3. Wide-Flange Beams — Type Sh (GOST 26020-83)

Wide-flange beams provide enhanced load-bearing capacity without additional bracing. The flange width approaches the section height, distributing compression forces across a broader area.

Series Sh1

Profile	h, mm	b, mm	s, mm	t, mm	Mass, kg/m	Area, cm²
20Sh1	194	150	6.0	9.0	26.2	33.35
23Sh1	226	155	6.5	10.0	31.2	39.74
26Sh1	258	165	7.0	11.0	37.1	47.26
30Sh1	296	180	7.5	12.0	44.9	57.16
35Sh1	342	200	8.5	13.5	58.4	74.39
40Sh1	388	220	9.5	15.0	74.0	94.26
50Sh1	472	260	11.0	17.0	104.7	133.36
60Sh1	556	300	12.5	20.0	143.0	182.15
70Sh1	640	340	14.0	22.0	184.0	234.39

Series Sh2

Profile	h, mm	b, mm	s, mm	t, mm	Mass, kg/m	Area, cm²
20Sh2	198	150	7.1	10.1	29.1	37.03
23Sh2	228	155	7.8	11.3	34.8	44.28
26Sh2	260	165	8.5	12.5	41.7	53.16
30Sh2	298	180	9.0	13.5	49.8	63.43
35Sh2	346	200	10.0	15.0	64.8	82.52
40Sh2	390	220	11.0	16.5	80.7	102.78
50Sh2	478	260	12.5	18.5	113.0	143.87
60Sh2	562	300	14.0	21.5	154.0	196.15
70Sh2	646	340	16.0	24.0	200.0	254.77

4. Column Beams — Type K (GOST 26020-83)

Column beams are engineered for vertical compression loads. Their massive flanges and web provide maximum stability against buckling, making them the preferred choice for multi-story building columns and bridge piers.

Series K1

Profile	h, mm	b, mm	s, mm	t, mm	Mass, kg/m	Area, cm²
20K1	196	200	6.5	10.0	33.6	42.79
23K1	227	210	7.0	11.0	39.6	50.42
26K1	258	220	7.5	12.0	46.8	59.59
30K1	298	240	8.5	13.0	58.4	74.34
35K1	346	250	9.5	15.0	73.2	93.22
40K1	393	270	10.5	16.5	91.4	116.42

Series K2

Profile	h, mm	b, mm	s, mm	t, mm	Mass, kg/m	Area, cm²
20K2	200	200	8.0	11.5	38.2	48.63
23K2	230	210	9.0	13.0	46.2	58.81
26K2	261	220	9.5	14.0	53.8	68.50
30K2	301	240	10.5	15.0	66.8	85.08
35K2	349	250	12.0	17.5	84.2	107.22
40K2	396	270	13.0	19.0	104.0	132.42

5. Tapered Flange Beams — GOST 8239-89

Tapered flange I-beams feature an inner flange slope of 6–12%. These profiles remain in widespread use for general building construction and are commonly available from stock.

Profile	h, mm	b, mm	s, mm	t, mm	Mass, kg/m	Area, cm²
10	100	55	4.5	7.2	9.46	12.05
12	120	64	4.8	7.3	11.50	14.64
14	140	73	4.9	7.5	13.70	17.43
16	160	81	5.0	7.8	15.90	20.24
18	180	90	5.1	8.1	18.40	23.39
20	200	100	5.2	8.4	21.00	26.71
22	220	110	5.4	8.7	24.00	30.58
24	240	115	5.6	9.5	27.30	34.77
27	270	125	6.0	9.8	31.50	40.12
30	300	135	6.5	10.2	36.50	46.48
33	330	140	7.0	11.2	41.90	53.35
36	360	145	7.5	12.3	48.60	61.89
40	400	155	8.3	13.0	57.00	72.59
45	450	160	9.0	14.2	66.80	85.08
50	500	170	10.0	15.2	78.50	99.95
55	550	180	11.0	16.5	92.60	117.91
60	600	190	12.0	17.8	108.00	137.53

6. Weight Calculation

Formula

Total Weight (kg) = Mass per Meter (kg/m) × Length (m)

Quick Reference — Common Lengths

Profile	kg/m	6 m length	12 m length
20B1	19.8	118.8 kg	237.6 kg
30B1	35.9	215.4 kg	430.8 kg
30Sh1	44.9	269.4 kg	538.8 kg
40K1	91.4	548.4 kg	1,096.8 kg
50Sh1	104.7	628.2 kg	1,256.4 kg

Shipping Note: Use these values for freight cost estimation and container loading calculations. Metal Asia provides optimized loading plans for breakbulk and containerized shipments.

7. Standard Lengths & Tolerances

Supply Types

Type	Length	Notes
Exact Length	4 – 12 m	Standard production lengths
Exact Multiple Length	In agreed increments	By arrangement with mill
Random Length	4 – 15 m	Mixed lengths within tolerance
Limited Random Length	Minimum agreed length	Majority within specified range

Length Tolerances (per GOST 26020-83)

Specified Length	Permissible Deviation
Up to 6 m	+50 mm
6 – 12 m	+70 mm
Over 12 m	By agreement

8. Section Properties

Example: Profile 30B1 (Detailed Properties)

Property	Value	Unit
Height (h)	300	mm
Flange Width (b)	135	mm
Web Thickness (s)	7.2	mm
Flange Thickness (t)	10.7	mm
Mass per Meter	35.9	kg/m
Cross-Sectional Area (A)	45.71	cm ²
Moment of Inertia (I _x)	7,080	cm ⁴
Section Modulus (W _x)	472	cm ³
Radius of Gyration (i _x)	12.45	cm
Moment of Inertia (I _y)	337	cm ⁴
Section Modulus (W _y)	49.9	cm ³

Property	Value	Unit
Radius of Gyration (i_y)	2.72	cm

9. Selection Recommendations

Building Floor Systems

Load Condition	Recommended Profile	Notes
Light loads (≤ 300 kg/m ²)	10B1 – 14B1	Residential, light commercial
Standard loads (300 – 500 kg/m ²)	16B1 – 20B1	Commercial, office buildings
Heavy loads (500 – 800 kg/m ²)	22B1 – 27B1	Industrial floors, parking structures
Industrial buildings	30B1 – 40B1	Manufacturing halls, warehouses

Building Columns

Building Type	Recommended Profile	Notes
Low-rise (≤ 3 stories)	20K1 – 26K1	Cost-optimized column selection
Mid-rise (4 – 12 stories)	30K1 – 40K1	Standard high-rise construction
Heavy industrial / bridges	40K1 – 60K2	Maximum compression capacity

Bridge & Infrastructure Spans

Span Length	Recommended Profile	Notes
Up to 12 m	30B1 – 36B1	Standard approach spans
12 – 18 m	40B1 – 50B1	Medium-span bridges
18 – 30 m	50Sh1 – 60Sh1	Long-span girder bridges
Over 30 m	Welded beams or 70Sh1 – 70Sh2	Custom-engineered solutions

[Request a specification review](#) by our engineering team for project-specific profile selection.

10. Manufacturing Tolerances

Profile Height (h)

Height Range, mm	Tolerance
Up to 180	± 2.0 mm
180 – 360	± 3.0 mm
360 – 600	± 4.0 mm
Over 600	By agreement

Flange Width (b)

Width Range, mm	Tolerance
Up to 100	±2.0 mm
100 – 200	±3.0 mm
Over 200	±4.0 mm

Web Thickness (s)

Thickness Range, mm	Tolerance
Up to 6	±0.5 mm
6 – 10	±0.6 mm
10 – 16	±0.8 mm
Over 16	±1.0 mm

Flange Thickness (t)

Thickness Range, mm	Tolerance
Up to 10	±0.7 mm
10 – 16	±1.0 mm
16 – 25	±1.2 mm
Over 25	±1.5 mm

11. Handling, Storage & Transport

Proper handling preserves dimensional accuracy and surface quality from mill to construction site. [Metal Asia manages complete logistics chains](#) with [pre-shipment quality verification](#) at the mill.

Storage Requirements

- Stack height: **maximum 2 meters**
- Timber spacers between layers (minimum 50 mm)
- Covered storage or weather protection mandatory
- Elevated platforms — avoid ground contact

Transport Protocols

- Mechanical handling only (cranes, forklifts)
- Protective slings — avoid direct chain contact with flanges
- Never drop** from transport bed
- Securing: chains + timber blocks for ocean and rail freight

Ocean Freight

- Breakbulk or flat-rack containers (for lengths > 12 m)
- Lashing per IMO CSS Code
- Full insurance coverage (warehouse to warehouse)

12. Chinese GB/T 11263-2017 Equivalents

Chinese standard GB/T 11263-2017 is the functional equivalent of GOST 26020-83 and GOST 35087-2024. However, geometric parameters are not identical — differences in flange thickness, web thickness, and fillet radius typically range from 0.5 to 1.5 mm. These differences are structurally significant and must be evaluated before substitution.

GOST → GB/T Profile Type Mapping

GOST Type	GB/T 11263 Type	Chinese Designation
B (Normal)	HN (Narrow Flange)	HN200×100, HN300×150
Sh (Wide-Flange)	HW (Wide Flange)	HW400×400, HW500×500
K (Column)	HW (Heavy Wall)	HW300×300 (reinforced)
D (Additional)	HM (Medium Flange)	HM250×175

Dimensional & Mass Comparison: GOST vs. GB/T

GOST Profile	GB/T Equivalent	H × B, mm	GOST Mass, kg/m	GB/T Mass, kg/m	Variance
20B1	HN 200×100	200 × 100	19.8	~21.7	+9.6%
30B1	HN 300×150	300 × 150	35.9	~37.3	+3.9%
40B1	HN 400×200	400 × 200	52.1	~56.1	+7.7%
30Sh1	HW 300×300	300 × 300	44.9	~94.5	Different proportions
40Sh1	HW 400×400	400 × 400	74.0	~172	Different proportions
20K1	HW 200×200	200 × 200	33.6	~49.9	+48.5%
30K1	HW 300×300	300 × 300	58.4	~94.5	+61.8%

GOST 8239-89 → GB/T 706-2016 Mapping

GOST 8239 Profile	GB/T 706 Designation
20	I 20 (I200×100)
30	I 30 (I300×135)
40	I 40 (I400×155)

Critical Procurement Notes

- Dimensional Variance:** Tolerance differences of 0.5–1.5 mm in flange and web thickness require engineering verification before substitution. Do not assume direct interchangeability.
- Wide-Flange Mass Differential:** Chinese HW profiles are substantially heavier than GOST Sh profiles of the same nominal height. Chinese HW uses a near-square proportion (flange width ≈ height), while GOST Sh maintains a more rectangular section. Budget recalculation is essential.
- Mill Test Certificate (MTC):** Chinese mills provide MTCs with mechanical properties correlated to GOST 27772 strength classes (C255, C355) or ASTM/EN equivalents. [Independent NDT verification](#) is available through Metal Asia for all orders.

13. Metal Asia Procurement Services

Metal Asia (www.metal-asia.pw) operates as your **direct-mill procurement partner** for structural steel worldwide. We provide the engineering verification, quality assurance, and logistics management that international steel procurement demands.

Procurement Services

Service	Description
Profile Matching	GOST-to-GB/T cross-reference with engineering sign-off

Service	Description
MTC Verification	Independent audit of mill certificates
Pre-Shipment Inspection	On-site dimensional and NDT inspection at mill
Logistics Management	Mill-to-port-to-site delivery coordination
Customs Clearance	HS code classification, export/import documentation
Cargo Insurance	All-risks coverage for full transport chain
Payment Terms	Letter of Credit, T/T, structured payment options

Our Commitment

- ✔ Mill-direct pricing — no intermediary markups
- ✔ Every batch inspected before release
- ✔ Full documentation package (MTC, CO, invoice, packing list)
- ✔ Supply chain risk management — customs, freight, insurance handled
- ✔ Flexible payment terms for qualified buyers

Maxim Vedunkov

LEAD STRUCTURAL STEEL ENGINEER & INTERNATIONAL PROCUREMENT ADVISOR AT METAL-ASIA.PW

Specializes in mill audits across China's steel-producing provinces, cross-standard steel grade matching (GOST/ASTM/EN/GB), and oversized cargo logistics. **Core principle:** «Every millimeter of section depth translates to load-bearing capacity. When substituting GOST with GB, a 1.5 mm difference in web thickness can alter load capacity by 15%. We measure every profile with calipers and UT gauges before it leaves the mill — not from paperwork, but from the steel itself.»



REQUEST A MILL AUDIT

Your Procurement Contact at www.metal-asia.pw

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