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STRUCTURAL SHAPES



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NET ZERO

NIPPON STEEL
Green Transformation
initiative

STRUCTURAL SHAPES

Leading the New Era on Structural Shapes with Pioneer Spirits.

In April 2019, we changed our corporate name to NIPPON STEEL CORPORATION as part of a fresh start for our business. The manufacture of shaped steel began in 1901, marking the dawn of Japan's steelmaking industry. In that year, the state-owned Yawata Steel Works began manufacturing railroad rails for the first time in Japan. After the production of rails, the manufacturing of heavy steel shapes began with Japan producing its first rolled H-shapes in 1959. After that, for about half a century, as a pioneer in H-shapes, we consistently strived to create and innovate steel technologies. In 1989, we began manufacturing structural H-shapes with uniform depth and width (NSHYPER BEAM™), marking a revolutionary advance in Japan's architectural history. By working with end users, we have aimed to expand the adoption of steel structures in building construction and promote the technological application of the H-shapes to meet diverse customer needs. Structural H-shapes from NIPPON STEEL are now widely used across the industry. Based on the technologies acquired through our extensive history and experience, we remain committed to taking on challenges with passion and creativity, striving to become the world's leading manufacturer. We will continue to work together with you to create new value and drive innovation. We sincerely hope that our structural H-shapes will continue to earn your valued support in the future.

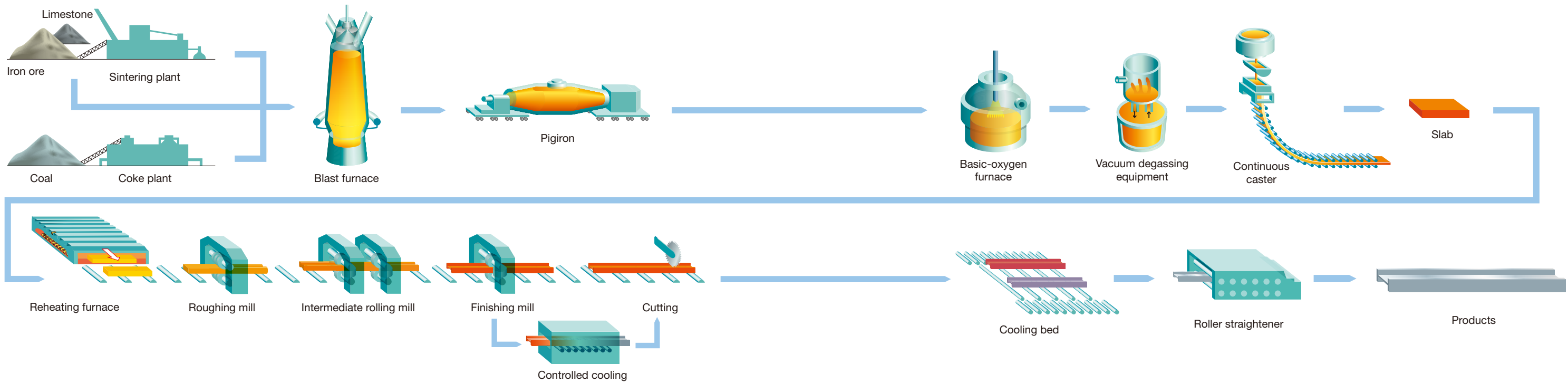
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Conventional Technology: Universal Rolling

From Raw Materials to Products



Universal Rolling

Horizontal roll

Vertical roll

Universal roll for rolling wide-flange beam

Slab or bloom

Roughing

Intermediate rolling

Finish rolling

Breakdown mill

Universal rolling mill

Edging mill

Universal rolling mill

Thermo-Mechanical Control Process (TMCP)

1. Summary of TMCP

TMCP is a steel manufacturing process for structural H-shapes based on a combination of controlled rolling and controlled cooling, enabling simultaneous achievement of high strength and toughness. These H-shapes also offer outstanding weldability due to reduced amount of alloy content while maintaining strength.

2. Example Applications of TMCP

- H-shapes for structural steels (EN10025, EN10225)

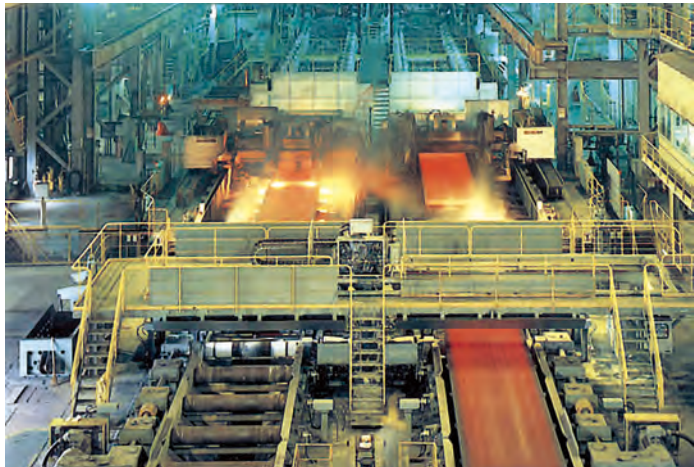
We are committed to supporting the industry's evolving needs—delivering high strength steels, accelerating construction timelines, and contributing to lower CO₂ emissions.



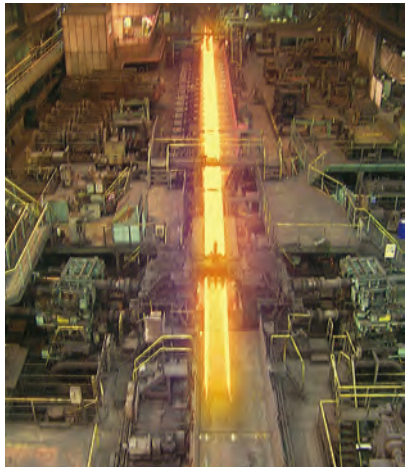
Blast furnace



Basic-oxygen furnace



Continuous caster



Finishing mill

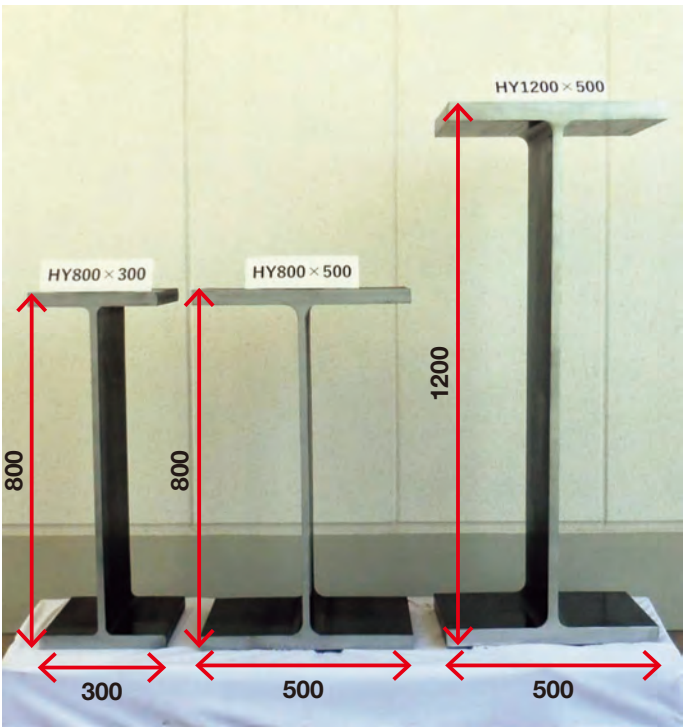


Innovative Technology: NSHYPER BEAM™ and MEGA NSHYPER BEAM™

Features of NSHYPER BEAM™ and MEGA NSHYPER BEAM™

World's Largest Rolled H-Shapes

- Max Depth 1200mm, Max Width 500mm



Wider Size Availabilities* (77 series and 842 sizes)

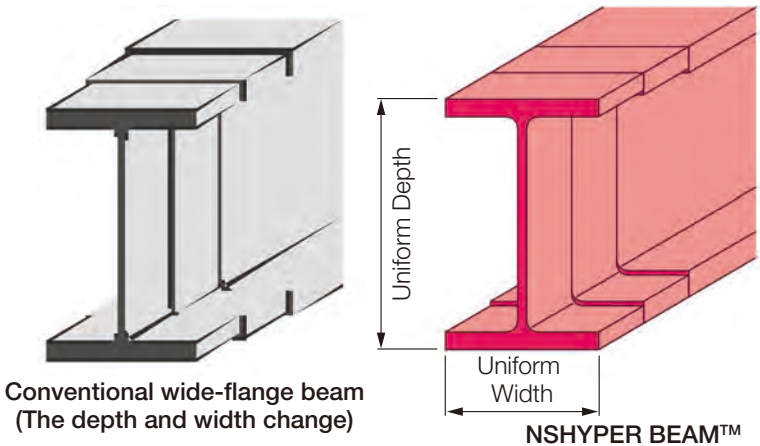
- Depth and Width with 50mm Incremental Unit

Size Table								
		NSHYPER BEAM™			MEGA NSHYPER BEAM™			
Depth	Width	200	250	300	350	400	450	500
400								
450								
500								
550								
600								
650								
700								
750								
800								
850								
900								
950								
1000								
1050								
1100								
1150								
1200								

* For details about our manufacturable sizes, refer to pages 14 and 15.

Uniform Depth and Width within a Same Size Series

- NSHYPER BEAM™ that can replace Built-up H-shapes



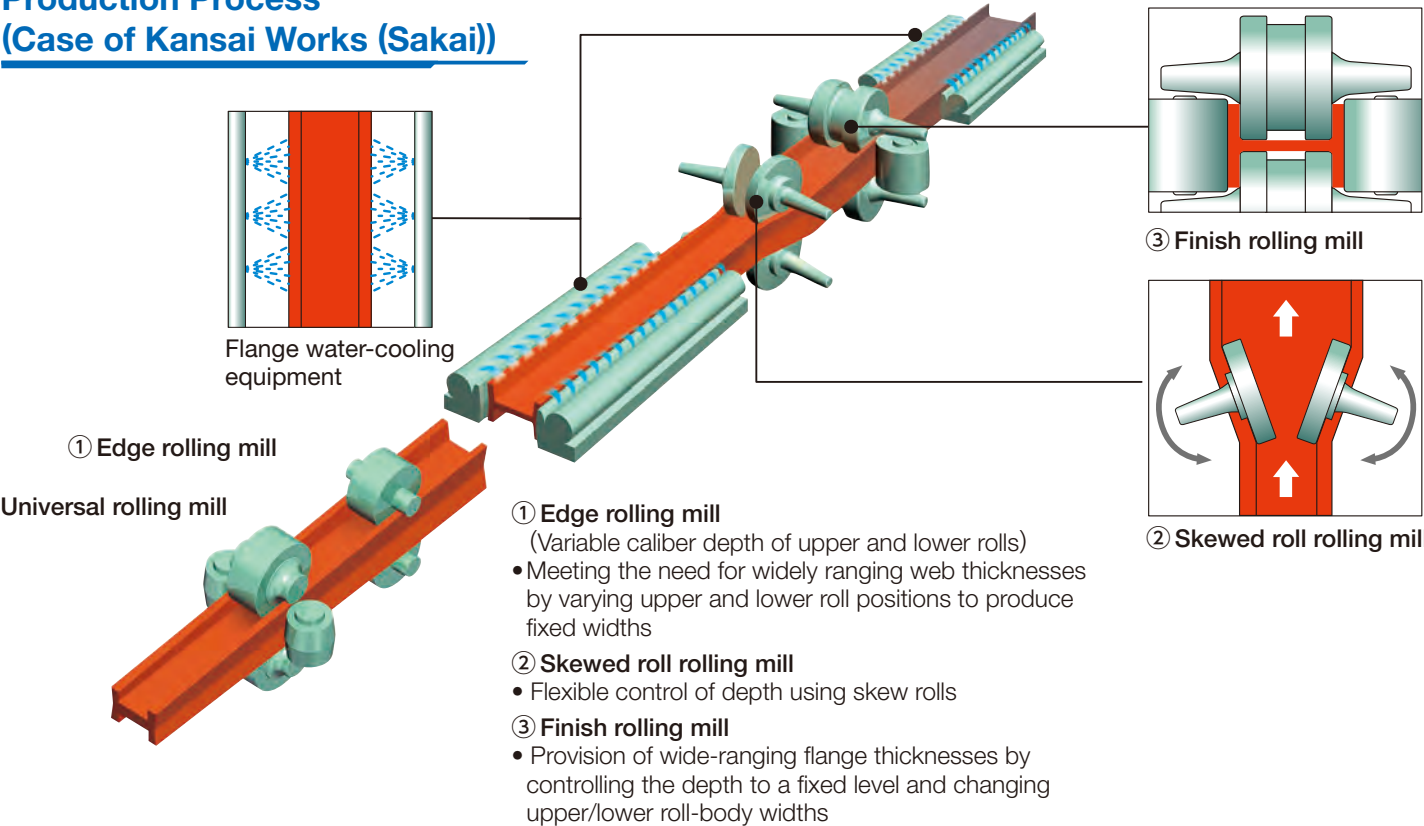
Experience for more than 30 years in Japan

- Popular H-shapes in steel structures covering building and factory as well as onshore & offshore plant fields

Standard sectional dimensions of JIS G 3192

- Registered with standard sectional dimensions of JIS G 3192

Production Process (Case of Kansai Works (Sakai))



Steel Grade & Section Profile

						Section Profile							
						NSHYPER BEAM™	MEGA NSHYPER BEAM™	EN		ASTM	JIS	HC400	
								EN10365		A6/A6M	JIS G 3192 JIS G 3136		
								UB UC	HL HE IPE	W	H		
Product Availability						Page 14~15		Page 16	Page 17	Page 18	Page 19	Page 20	
Dimensions and Properties						Page 24~53		Page 54~57	Page 58~61	Page 62~73	Page 74~75	Page 76~79	
Steel Grade	EN	EN10025-2	S235	JR	Page 8~9	✓		✓	✓	✓	✓	✓	
				J0		✓		✓	✓	✓	✓	✓	
				J2		✓		✓*2	✓*2	✓*2	✓*2	✓*2	
			S275	JR		✓		✓	✓	✓	✓	✓	
				J0		✓		✓	✓	✓	✓	✓	
				J2		✓		✓*2	✓*2	✓*2	✓*2	✓*2	
			S355	JR		✓	✓	✓	✓	✓	✓	✓	
				J0		✓	✓	✓	✓	✓	✓	✓	
				J2		✓	✓*1	✓*2	✓*2	✓*2	✓*2	✓*2	
				K2		✓	✓*1	✓*2	✓*2	✓*2	✓*2	✓*2	
	S460		JR				✓*1		✓*1				
			J0				✓*1		✓*1				
	EN10025-4	S460M					✓*1		✓*1				
	EN10225-2	S355MLO			✓*1	✓*1	✓*1	✓*1	✓*1	✓*1	✓*1		
	JIS	ASTM	A36		Page 10~11	✓		✓	✓	✓	✓		
			A572 Gr50			✓	✓*1	✓	✓	✓	✓	✓	
			A992			✓	✓	✓	✓	✓	✓	✓	
		JIS G 3101	SS400			✓		✓	✓	✓	✓	✓	✓
			JIS G 3106	SM400A		✓		✓	✓	✓	✓	✓	✓
				SM400B		✓		✓	✓	✓	✓	✓	✓
				SM490A		✓		✓	✓	✓	✓	✓	✓
				SM490B		✓		✓	✓	✓	✓	✓	✓
				SM490YA		✓		✓	✓	✓	✓	✓	✓
				SM490YB		✓		✓	✓	✓	✓	✓	✓
				JIS G 3136		SN400A	✓		✓	✓	✓	✓	✓
			SN400B	✓			✓	✓	✓	✓	✓	✓	
			SN490B	✓		✓	✓	✓	✓	✓	✓	✓	

*1 Please contact us in advance to order these combinations.
*2 Please contact us in advance to order with flange greater than 40mm thick.

Photo Courtesy : MODEC, Inc.



Image of FPSO



Steel Grades

Chemical Composition & Mechanical Properties

The information is extracts of the standard. Please refer to the latest edition for details.

EN10025-2

Chemical Compositions											(Max content in %)		
Designation	C Nominal Thickness (mm)			Si	Mn	P *2	S *2	N *2	Cu*2	Other Elements *2	CEV Nominal Thickness (mm)		
	≤ 16	16 < ≤ 40	40 < *2								≤ 30	30 < ≤ 40	40 < ≤ 150
S235JR	0.17	0.17	0.20	—	1.40	0.035	0.035	0.012	0.55	—	0.35	0.35	0.38
S235J0	0.17	0.17	0.17	—	1.40	0.030	0.030	0.012	0.55	—	0.35	0.35	0.38
S235J2	0.17	0.17	0.17	—	1.40	0.025	0.025	—	0.55	—	0.35	0.35	0.38
S275JR	0.21	0.21	0.22	—	1.50	0.035	0.035	0.012	0.55	—	0.40	0.40	0.42
S275J0	0.18	0.18	0.18	—	1.50	0.030	0.030	0.012	0.55	—	0.40	0.40	0.42
S275J2	0.18	0.18	0.18	—	1.50	0.025	0.025	—	0.55	—	0.40	0.40	0.42
S355JR	0.24	0.24	0.24	0.55	1.60	0.035	0.035	0.012	0.55	—	0.45	0.47	0.47
S355J0	0.20	0.20 *1	0.22	0.55	1.60	0.030	0.030	0.012	0.55	—	0.45	0.47	0.47
S355J2	0.20	0.20 *1	0.22	0.55	1.60	0.025	0.025	—	0.55	—	0.45	0.47	0.47
S355K2	0.20	0.20 *1	0.22	0.55	1.60	0.025	0.025	—	0.55	—	0.45	0.47	0.47
S460JR	0.20	0.20 *1	0.22	0.55	1.70	0.030	0.030	0.025	0.55	—	0.47	0.49	0.49
S460J0	0.20	0.20 *1	0.22	0.55	1.70	0.030	0.030	0.025	0.55	—	0.47	0.49	0.49

*1 For nominal thickness > 30 mm : C = 0.22% max..
*2 See specific limitation in the standard.

Mechanical Properties

Designation	Minimum Yield Strength (MPa)						Tensile Strength (MPa)			Impact Test		Minimum Elongation (%) L ₀ = 5.65√S ₀			
	Nominal Thickness (mm)						Nominal Thickness (mm)			Temperature °C	Minimum Energy (J)	Nominal Thickness (mm)			
	≤ 16	16 < ≤ 40	40 < ≤ 63	63 < ≤ 80	80 < ≤ 100	100 < ≤ 150	< 3	3 ≤ ≤ 100	100 < ≤ 150			3 ≤ ≤ 40	40 < ≤ 63	63 < ≤ 100	100 < ≤ 150
S235JR	235	225	215	215	215	195	360/510	360/510	350/500	20	27	26	25	24	22
S235J0	235	225	215	215	215	195	360/510	360/510	350/500	0	27	26	25	24	22
S235J2	235	225	215	215	215	195	360/510	360/510	350/500	-20	27	26	25	24	22
S275JR	275	265	255	245	235	225	430/580	410/560	400/540	20	27	23	22	21	19
S275J0	275	265	255	245	235	225	430/580	410/560	400/540	0	27	23	22	21	19
S275J2	275	265	255	245	235	225	430/580	410/560	400/540	-20	27	23	22	21	19
S355JR	355	345	335	325	315	295	510/680	470/630	450/600	20	27	22	21	20	18
S355J0	355	345	335	325	315	295	510/680	470/630	450/600	0	27	22	21	20	18
S355J2	355	345	335	325	315	295	510/680	470/630	450/600	-20	27	22	21	20	18
S355K2	355	345	335	325	315	295	510/680	470/630	450/600	-20	40 ^{~3}	22	21	20	18
S460JR	460	440	420	400	390	390	—	550/720	530/700	20	27	17	17	17	17
S460J0	460	440	420	400	390	390	—	550/720	530/700	0	27	17	17	17	17

*3 See specific limitation in the standard.

EN10025-4

Chemical Compositions (Max content in %)												
Designation	C	Si	Mn	P *2	S *2	N	Cu *2	Other Elements *2	CEV Nominal Thickness (mm)			
									≤ 16	16 < ≤ 40	40 < ≤ 63	63 < ≤ 120
S460M	0.16 *1	0.60	1.70	0.030	0.025	0.025	0.55	—	0.45	0.46	0.47	0.48
*1 *2 See specific limitation in the standard.												

Mechanical Properties

Designation	Minimum Yield Strength (MPa)						Tensile Strength (MPa)					Impact Test		Minimum Elongation (%) $L_0 = 5.65\sqrt{S_0}$
	Nominal Thickness (mm)						Nominal Thickness (mm)					Temperature °C	Minimum Energy (J)	
	≤ 16	16 < ≤ 40	40 < ≤ 63	63 < ≤ 80	80 < ≤ 100	100 < ≤ 120	40 <	40 < ≤ 63	63 < ≤ 80	80 < ≤ 100	100 < ≤ 120			
S460M	460	440	430	410	400	385	540/720	530/710	510/690	500/680	490/660	20 0 -10 -20	55 47 43 40 *1	17
*1 This value corresponds with 27J at - 30°C (see Eurocode 3).														

EN10225-2

Chemical Compositions										(Max content in %)	
Designation	C	Si	Mn	P	S	N	Cu	Other Elements *1	Nb+V	Nb+V+Ti	CEV
S355MLO (S355G11+M)	0.14	0.55	1.65	0.025	0.015	0.012	0.30	—	0.06	0.08	0.43
*1 See specific limitation in the standard.											

Mechanical Properties

Designation	Minimum Yield Strength (MPa)				Tensile Strength (MPa)	Yield to Tensile Ratio, Max (%)	Impact Test		Minimum Elongation (%) $L_0 = 5.65\sqrt{S_0}$
	Nominal Thickness (mm)						Temperature °C	Minimum Energy (J)	
	≤ 16	16 < ≤ 25	25 < ≤ 40	40 < ≤ 63					
S355MLO (S355G11+M)	355	355	345	335	470/630	0.87	-40	50	22

The information is extracts of the standard. Please refer to the latest edition for details.



ASTM A36

Chemical Requirements

Elements	Max. content in %
Carbon	0.26
Manganese	*1
Silicon	0.40 *1
Phosphorus	0.04
Sulfur	0.05

*1 Flange thickness over 3in. ;min. 0.15% to 0.4%, Mn 0.85-1.35%

Tensile Requirements

Tensile strength, min ksi [MPa]	58-80 [400-550] *1
Yield point,	36 [250]
Elongation in 8 in. [200mm] , min, %	20
Elongation in 2 in. [50mm] , min, %	21 *1

*1 For wide flange shapes with flange thickness over 3in.
The 80 ksi maximum tensile strength dose not apply
and a min.elongation in 2 in. [50 mm] of 19% applies.

ASTM A572 Gr.50

Chemical Requirements

Elements	Max. content in %
Carbon	0.23
Manganese	1.35 *1
Silicon	0.40 *2
Vanadium	*1
Columbium	*1
Phosphorus	0.04
Sulfur	0.05
other elements	*1

*1 See specific limitations in the standard.

*2 Flange thickness over 3in. ;min. 0.15% to 0.4%

Tensile Requirements

Tensile strength, min ksi [MPa]	65 [450] *1
Yield point,	50 [345]
Elongation in 8 in. [200mm] , min, %	18
Elongation in 2 in. [50mm] , min, %	21 *1

*1 For wide flange shapes over 426lbs ,elongation in 2 in.
[50 mm] of 19% minimum applies.

ASTM A992

Chemical Requirements

Elements	Max. content in %
Carbon	0.23
Manganese	1.60 *1
Silicon	0.40
Vanadium	0.15 *1
Columbium	0.05 *1
Phosphorus	0.035
Sulfur	0.045
Copper	0.60
Nickel	0.45
Chromium	0.35
Molybdenum	0.15

*1 See specific limitations in the standard.

Tensile Requirements

Tensile strength, min ksi [MPa]	65 [450]
Yield point,	50 to 65 [345 to 450] *1
Yield to tensile ratio, max	0.85 *1
Elongation in 8 in. [200mm] , min, %	18
Elongation in 2 in. [50mm] , min, %	21

*1 See specific limitations in the standard.

Supplementary Requirments

Charpy V Notch Impact Tests

20ft-lbf [27J] at 70°F [21°C]

Steel Grades

Chemical Composition & Mechanical Properties

The information is extracts of the standard. Please refer to the latest edition for details.

JIS G 3101, 3106, 3136

Chemical Compositions (Max content in %)						
Designation	C Nominal Thickness (mm)		Si	Mn	P	S
	6 ≤ ≤ 50	50 < ≤ 100				
SS400	—	—	—	—	0.050	0.050
SM400A	0.23	0.25	—	2.5 x C	0.035	0.035
SM400B	0.20	0.22	0.35	0.60/1.50	0.035	0.035
SM490A	0.20	0.22	0.55	1.65	0.035	0.035
SM490B	0.18	0.20	0.55	1.65	0.035	0.035
SN400A	0.24	0.24	—	—	0.050	0.050
SN400B	0.20	0.22	0.35	0.60/1.50	0.030	0.015
SN490B	0.18	0.20	0.55	1.65	0.030	0.015
SM490YA	0.20	0.20	0.55	1.65	0.035	0.035
SM490YB	0.20	0.20	0.55	1.65	0.035	0.035

Mechanical Properties

Designation	Minimum Yield Strength (N/mm²)							Tensile Strength (N/mm²)	Yield to Tensile Ratio, Max (%)					Impact Test		Minimum Elongation (%) *		
	Nominal Thickness (mm)								Nominal Thickness (mm)					Temperature °C	Minimum Energy (J)	Nominal Thickness (mm)		
	6 ≤ < 12	12 ≤ < 16	16	16 < ≤ 40	40 < ≤ 75	75 < ≤ 100	≤ 100	6 ≤ < 12	12 ≤ < 16	16	16 < ≤ 40	40 < ≤ 100	5 < ≤ 16			16 < ≤ 40	40 <	
SS400	245	245	245	235	215	215	400/510	—	—	—	—	—	—	—	17	21	23	
SM400A	245	245	245	235	215	215	400/510	—	—	—	—	—	—	—	18	22	24	
SM400B	245	245	245	235	215	215	400/510	—	—	—	—	—	0	27	18	22	24	
SM490A	325	325	325	315	295	295	490/610	—	—	—	—	—	—	—	17	21	23	
SM490B	325	325	325	315	295	295	490/610	—	—	—	—	—	0	27	17	21	23	
SN400A	235	235	235	235	215	215	400/510	—	—	—	—	—	—	—	17	21	23	
SN400B	235	235/355	235/355	235/355	215/335	215/335	400/510	—	80	80	80	80	0	27	18	22	24	
SN490B	325	325/445	325/445	325/445	295/415	295/415	490/610	—	80	80	80	80	0	27	17	21	23	
SM490YA	365	365	365	355	335	325	490/610	—	—	—	—	—	—	—	15	19	21	
SM490YB	365	365	365	355	335	325	490/610	—	—	—	—	—	0	27	15	19	21	

* Refer to the standard.

Classification Society Standards

ABS

Chemical Compositions (Max content in %)								
Designation	C	Si	Mn	P	S *2	Other Elements *1	C+Mn/6	CE t ≤ 50mm
A	0.21*1	0.50	2.5xC/ 0.80/*1	0.035	0.035	—	0.40	—
B	0.21	0.35	0.80/*1	0.035	0.035	—	0.40	—
D	0.21	0.10 - 0.35 *1	0.60/	0.035	0.035	—	0.40	—
AH32, DH32	0.18	0.10 - 0.50 *1	0.90/1.60*1	0.035	0.035	—	—	0.36
AH36, DH36	0.18	0.10 - 0.50 *1	0.90/1.60*1	0.035	0.035	—	—	0.38

*1 See specific limitation in the standard.

*2 For steels of cold flanging quality,
the maximum sulfur content is 0.020%.

Mechanical Properties

Designation	Minimum Yield Strength (MPa)	Tensile Strength (MPa)	Impact Test (J) Nominal Thickness ≤ 50 (mm)			Minimum Elongation*3 (%)
			Temperature °C	Minimum Energy (Average)		
				Long ¹ *2	Transv*2	
A	235	400/520*1	20	—	—	22
B	235	400/520	0	27	20	22
D	235	400/520	-20	27	20	22
AH32	315	440/590	0	31	22	22
DH32	315	440/590	-20	31	22	22
AH36	355	490/620	0	34	24	21
DH36	355	490/620	-20	34	24	21

*1 For Grade A sections, the upper limit
of tensile strength may be 550N/mm².

*2 Either direction is acceptable.

*3 See specific limitation in the standard.

DNV

Chemical Compositions (Max content in %)								
Designation	C	Si	Mn	P	S	Other Elements *1	C+Mn/6	CE t ≤ 50mm
A	0.21*1	0.50	2.5xC/ 0.80/*1	0.035	0.035	—	0.40	—
B	0.21	0.35	0.80/*1	0.035	0.035	—	0.40	—
D	0.21	0.10 - 0.35	0.60/	0.035	0.035	—	0.40	—
E *2	0.18	0.10 - 0.35	0.70/	0.035	0.035	—	0.40	—
A32, D32, E32 *2	0.18	0.50	0.90/1.60*1	0.035	0.035	—	—	0.36
A36, D36, E36 *2	0.18	0.50	0.90/1.60*1	0.035	0.035	—	—	0.38

*1 See specific limitation in the standard.

*2 Please contact us in advance to order
these designations.

Mechanical Properties

Designation	Minimum Yield Strength (MPa)	Tensile Strength (MPa)	Impact Test (J) Nominal Thickness ≤ 50 (mm)			Minimum Elongation*1 (%)
			Temperature °C	Minimum Energy (Average)		
				Long ^l *1	Transv*1	
A	235	400/520	20	—	—	22
B	235	400/520	0	27	20	22
D	235	400/520	-20	27	20	22
E *2	235	400/520	-40	27	20	22
A32	315	440/570	0	31	22	22
D32	315	440/570	-20	31	22	22
E32 *2	315	440/570	-40	31	22	22
A36	355	490/630	0	34	24	21
D36	355	490/630	-20	34	24	21
E36 *2	355	490/630	-40	34	24	21

*1 See specific limitation in the standard.

*2 Please contact us in advance to order
these designations.

Size Structures

NSHYPER BEAM™ & MEGA NSHYPER BEAM™

NSHYPER BEAM™ & MEGA NSHYPER BEAM™ Size Table (EN10025-2 S355JR, J0, J2, K2)

[illegible]

 : Regular sizes (443 sizes)
  : Available sizes (406 sizes, Please contact us in advance to order these section sizes)
  : Mega sizes
 Please contact us in advance to order other steel grades.
  : Extra large sizes

NSHYPER BEAM™ & MEGA NSHYPER BEAM™ Size Table (EN10225-2 S355MLO)

[illegible]

○ : Regular sizes (315 sizes) ■ : Available sizes (455 sizes) □ : Mega sizes
Please contact us in advance to order all sizes ■ : Extra large sizes

Product Availability

Size Structures

UB & UC sections (EN10025-2 S355JR, J0, J2, K2, S460JR, J0), EN10025-4 S460M

Nominal Size		Mass per Meter [kg/m]															
UB 1016 x 305	x	222	249	272	314	350	393	415	438	494	<u>584</u>						
UB 914 x 419	x	343	388														
UB 914 x 305	x	201	224	238	253	271	289	313	345	381	<u>425</u>	<u>474</u>	<u>521</u>	<u>576</u>			
UB 838 x 292	x	176	194	226													
UB 762 x 267	x	<u>134</u>	<u>147</u>	<u>173</u>	<u>197</u>												
UB 686 x 254	x	125	140	152	170												
UB 610 x 305	x	149	179	238													
UB 610 x 229	x	101	113	125	140												
UB 533 x 210	x	82	92	101	109	122											
UB 457 x 191	x	67	74	82													
UB 457 x 152	x	60	67	74													
UB 406 x 178	x	60	67	74													
UC 356 x 406	x	235	287	340	393	467	509	551	592	634	677	744	818	900	990	1086	
UC 356 x 368	x	<u>129</u>	<u>153</u>	<u>177</u>	<u>202</u>												
UC 305 x 305	x	97	118	137	158	198	240	283									
UBP 356 x 368	x	<u>109</u>	<u>133</u>	<u>152</u>	<u>174</u>												
UBP 305 x 305	x	79	88	95	110	126	149	186	223								

Please contact us in advance to order these underlined sizes.
- All sizes above are available in EN10025-2 S355JR, J0, J2, K2.
- Available dimensions of S460JR and S460J0 are indicated in red.
- Available dimensions of S460M are indicated in blue.

HL & HE & IPE sections (EN10025-2 S355JR, J0, J2, K2)

Section						
HL 1000	HL 1000 AA	HL 1000 A	HL 1000 B	HL 1000 M	HL 1000 x 443	HL 1000 x 483
	<u>HL 1000 x 539</u>	<u>HL 1000 x 554</u>	<u>HL 1000 x 591</u>	<u>HL 1000 x 642</u>	<u>HL 1000 x 748</u>	<u>HL 1000 x 883</u>
HL 920	HL 920 x 344	HL 920 x 368	HL 920 x 390	HL 920 x 420	HL 920 x 449	HL 920 x 491
	HL 920 x 537	<u>HL 920 x 588</u>	<u>HL 920 x 656</u>	<u>HL 920 x 725</u>	<u>HL 920 x 787</u>	<u>HL 920 x 970</u>
HE 1000	HE 1000 AA	HE 1000 x 249	HE 1000 A	HE 1000 B	HE 1000 M	HE 1000 x 393
	HE 1000 x 415	HE 1000 x 438	HE 1000 x 494	<u>HE 1000 x 584</u>		
HE 900	HE 900 AA	HE 900 A	HE 900 B	HE 900 M	<u>HE 900 x 391</u>	<u>HE 900 x 466</u>
HE 800	HE 800 AA	HE 800 A	HE 800 B	HE 800 M		
HE 700	HE 700 AA	HE 700 A	HE 700 B	<u>HE 700 M</u>		
HE 650	HE 650 AA	HE 650 A	HE 650 B	<u>HE 650 M</u>		
HE 600	HE 600 AA	HE 600 A	HE 600 B	<u>HE 600 M</u>		
HE 550	HE 550 AA	HE 550 A	HE 550 B	<u>HE 550 M</u>		
HE 500	HE 500 AA	HE 500 A	HE 500 B	<u>HE 500 M</u>		
HE 450	HE 450 AA	HE 450 A	HE 450 B	<u>HE 450 M</u>		
HE 400	HE 400 AA	HE 400 A	HE 400 B	<u>HE 400 M</u>		
IPE 750	<u>IPE 750 x 134</u>	<u>IPE 750 x 147</u>	<u>IPE 750 x 173</u>	<u>IPE 750 x 196</u>		
IPE 600	IPE A 600	IPE 600	IPE O 600			
IPE 550	IPE A 550	IPE 550	IPE O 550			
IPE 500	IPE A 500	IPE 500	IPE O 500			
IPE 450	IPE A 450	IPE 450	IPE O 450			
IPE 400	IPE A 400	IPE 400	IPE O 400			

Please contact us in advance to order these underlined sizes.

Product Availability

Size Structures

ASTM W sections (ASTM A992, A572Gr50)

Nominal Size [Imperial Unit] ☆ [(Metric Unit)]		Mass per Foot [lbs/ft] (Mass per Meter [kg/m])																
W40 (x 16) (1016 x 406)	x	199 (296)	215 (320)	249 (371)	277 (412)	297 (442)	324 (482)	362 (539)	372 (554)	397 (591)	431 (641)	503 (749)	593 (882)					
W40 (x 12) (1016 x 305)	x	149 (222)	167 (249)	183 (272)	211 (314)	235 (350)	264 (393)	278 (414)	294 (438)	327 (487)	331 (493)	392 (583)						
W36 (x 16.5) (914 x 419)	x	231 (344)	247 (368)	262 (390)	282 (420)	302 (449)	330 (491)	361 (537)	395 (588)	441 (656)	487 (725)	529 (787)	652 (970)					
W36 (x 12) (914 x 305)	x	135 (201)	150 (223)	160 (238)	170 (253)	182 (271)	194 (289)	210 (313)	232 (345)	256 (381)	286 (426)	318 (473)	350 (521)	387 (576)				
W33 (x 15.75) (838 x 400)	x	201 (299)	221 (329)	241 (359)														
W33 (x 11.5) (838 x 292)	x	118 (176)	130 (193)	141 (210)	152 (226)	169 (251)												
W30 (x 15) (762 x 381)	x	173 (257)	191 (284)	211 (314)	235 (350)													
W30 (x 10.5) (762 x 267)	x	90 (134)	99 (147)	108 (161)	116 (173)	124 (185)	132 (196)	148 (220)										
W27 (x 14) (686 x 356)	x	146 (217)	161 (240)	178 (265)	194 (289)	217 (323)												
W27 (x 10) (686 x 254)	x	84 (125)	94 (140)	102 (152)	114 (170)	129 (192)												
W24 (x 12.75) (610 x 324)	x	104 (155)	117 (174)	131 (195)	146 (217)	162 (241)	176 (262)	192 (286)										
W24 (x 9) (610 x 229)	x	68 (101)	76 (113)	84 (125)	94 (140)	103 (153)												
W24 (x 7) (610 x 178)	x	55 (82)	62 (92)															
W21 (x 12.25) (533 x 312)	x	101 (150)	111 (165)	122 (182)	132 (196)	147 (219)	166 (247)	182 (271)										
W21 (x 8.25) (533 x 210)	x	48 (71)	55 (82)	62 (92)	68 (101)	73 (109)	83 (124)	93 (138)										
W21 (x 6.5) (533 x 165)	x	44 (65)	50 (74)	57 (85)														
W18 (x 11) (457 x 279)	x	76 (113)	86 (128)	97 (144)	106 (158)	119 (177)	130 (193)	143 (213)	158 (235)	175 (260)	192 (286)							
W18 (x 7.5) (457 x 191)	x	50 (74)	55 (82)															
W18 (x 6) (457 x 152)	x	40 (60)	46 (68)															
W16 (x 10.25) (406 x 260)	x	67 (100)	77 (115)															
W16 (x 7) (406 x 178)	x	40 (60)	45 (67)	50 (74)	57 (85)													
W14 (x 16) (356 x 406)	x	145 (216)	159 (237)	176 (262)	193 (287)	211 (314)	233 (347)	257 (382)	283 (421)	311 (463)	342 (509)	370 (551)	398 (592)	426 (634)	455 (677)	500 (744)	550 (818)	605 (900)
		665 (990)	730 (1086)															
W14 (x 14.5) (356 x 368)	x	90 (134)	99 (147)	109 (162)	120 (179)	132 (196)												
W12 (x 12) (305 x 305)	x	65 (97)	72 (107)	79 (118)	87 (129)	96 (143)	106 (158)	120 (179)	136 (202)	152 (226)	170 (253)	190 (283)	210 (313)	230 (342)	252 (375)	279 (415)	305 (454)	336 (500)
HP14 (HP356)	x	73 (109)	89 (132)	102 (152)	117 (174)													
HP12 (HP305)	x	53 (79)	63 (94)	74 (110)	84 (125)													

Please contact us in advance to order these *underlined sizes*.
☆:: Values in metric unit are exact conversions of ones in imperial unit.

JIS H sections

Nominal Size					
900 x 300	210 (H890 x 299 x 15 x 23)	240 (H900 x 300 x 16 x 28)	283 (H912 x 302 x 18 x 34)	304 (H918 x 303 x 19 x 37)	
800 x 300	207 (H800 x 300 x 14 x 26)				
700 x 300	182 (H700 x 300 x 13 x 24)				
600 x 300	147 (H588 x 300 x 12 x 20)				
600 x 200	103 (H600 x 200 x 11 x 17)				
500 x 300	125 (H488 x 300 x 11 x 18)				
500 x 200	88.2 (H500 x 200 x 10 x 16)				
450 x 300	121 (H440 x 300 x 11 x 18)				
450 x 200	74.9 (H450 x 200 x 9 x 14)				
400 x 400	172 (H400 x 400 x 13 x 21)	232 (H414 x 405 x 18 x 28)	283 (H428 x 407 x 20 x 35)	415 (H458 x 417 x 30 x 50)	605 (H498 x 432 x 45 x 70)
400 x 300	105 (H390 x 300 x 10 x 16)				
400 x 200	65.4 (H400 x 200 x 8 x 13)				
350 x 350	135 (H350 x 350 x 12 x 19)				

Please contact us in advance to other sizes than the above-mentioned, described in the JIS G 3192 dated 2000 or before.

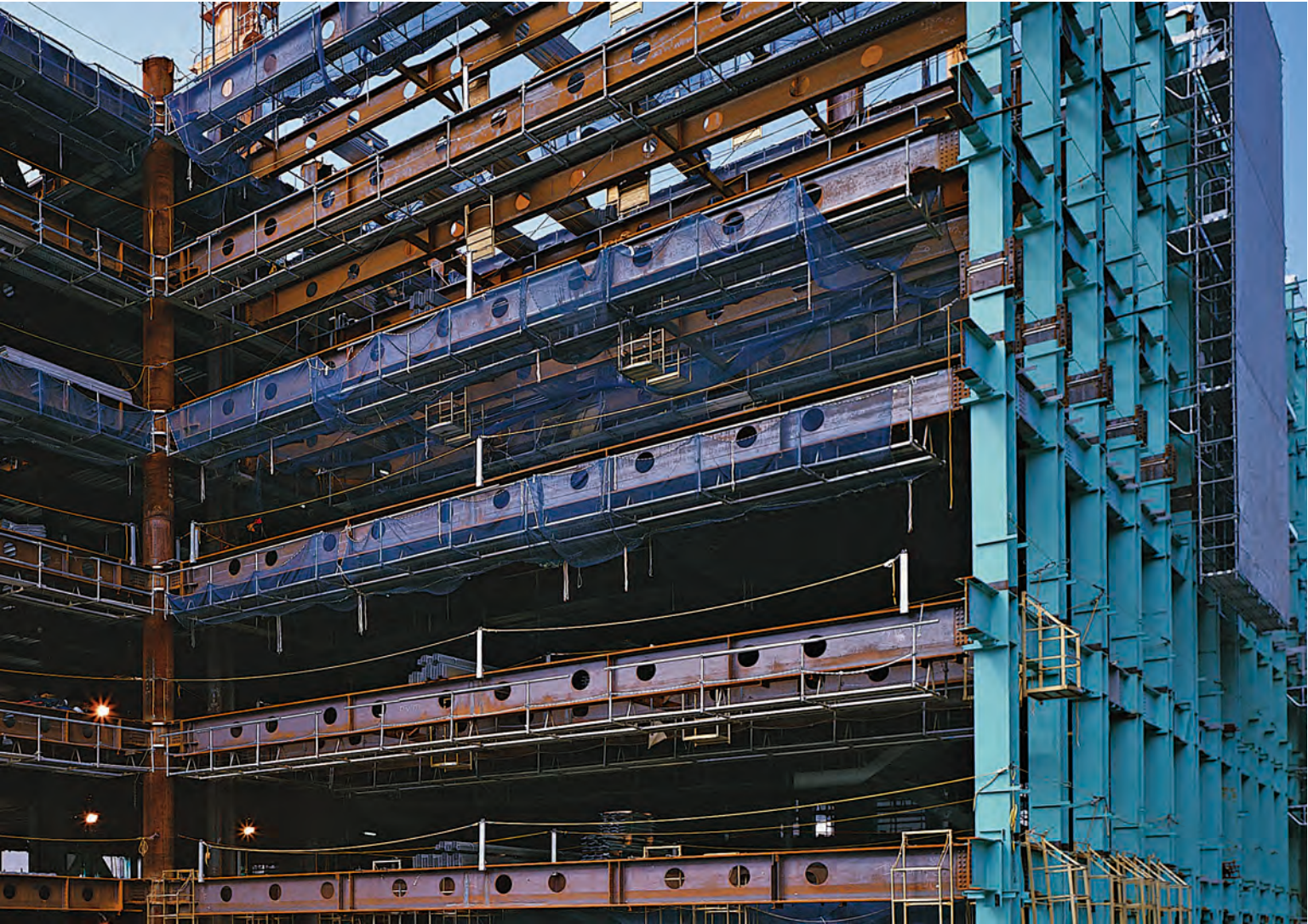
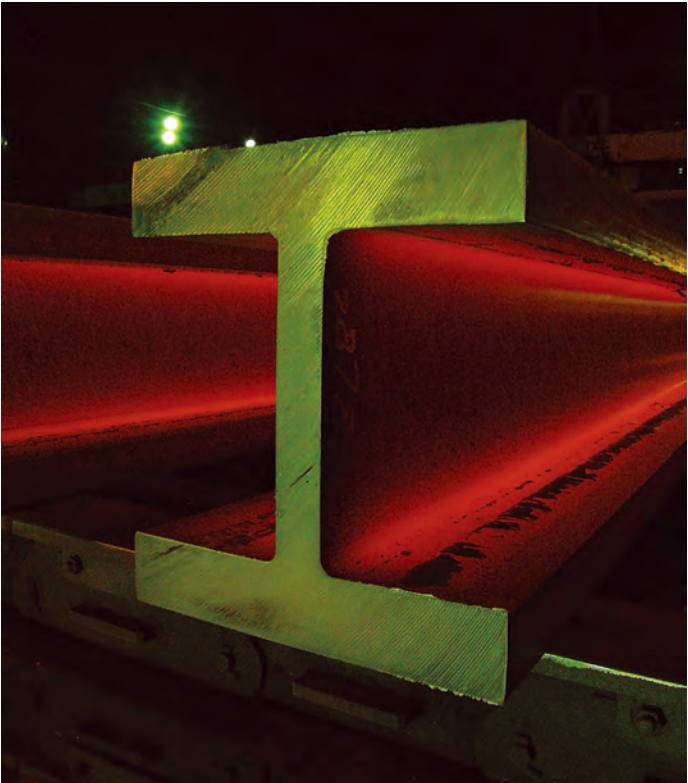
Product Availability

Size Structures

HC400

Section					
508	508 x 432 x 45 x 75	508 x 437 x 50 x 75	508 x 442 x 55 x 75	508 x 447 x 60 x 75	508 x 452 x 65 x 75
	508 x 457 x 70 x 75	508 x 462 x 75 x 75			
498	498 x 427 x 40 x 70	498 x 432 x 45 x 70	498 x 437 x 50 x 70	498 x 442 x 55 x 70	498 x 447 x 60 x 70
	498 x 452 x 65 x 70	498 x 457 x 70 x 70			
488	488 x 422 x 35 x 65	488 x 427 x 40 x 65	488 x 432 x 45 x 65	488 x 437 x 50 x 65	488 x 442 x 55 x 65
	488 x 447 x 60 x 65	488 x 452 x 65 x 65			
478	478 x 417 x 30 x 60	478 x 422 x 35 x 60	478 x 427 x 40 x 60	478 x 432 x 45 x 60	478 x 437 x 50 x 60
	478 x 442 x 55 x 60	478 x 447 x 60 x 60			
468	468 x 417 x 30 x 55	468 x 422 x 35 x 55	468 x 427 x 40 x 55	468 x 432 x 45 x 55	468 x 437 x 50 x 55
	468 x 442 x 55 x 55				
458	458 x 412 x 25 x 50	458 x 417 x 30 x 50	458 x 422 x 35 x 50	458 x 427 x 40 x 50	458 x 432 x 45 x 50
	458 x 437 x 50 x 50				
448	448 x 412 x 25 x 45	448 x 417 x 30 x 45	448 x 422 x 35 x 45	448 x 427 x 40 x 45	448 x 432 x 45 x 45
438	438 x 407 x 20 x 40	438 x 412 x 25 x 40	438 x 417 x 30 x 40	438 x 422 x 35 x 40	438 x 427 x 40 x 40
428	428 x 407 x 20 x 35	428 x 412 x 25 x 35	428 x 417 x 30 x 35	428 x 422 x 35 x 35	
418	418 x 402 x 15 x 30	418 x 407 x 20 x 30	418 x 412 x 25 x 30	418 x 417 x 30 x 30	

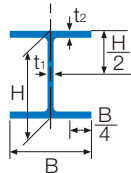
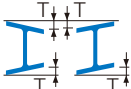
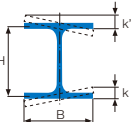
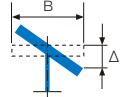
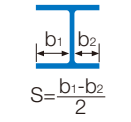
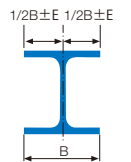
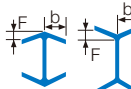
Please contact us in advance to order all sizes.



Rolling Tolerances

Certificate

Unit : mm

Items			NSHYPER BEAM. MEGA NSHYPER BEAM ^{*1} (Rolled H)	JIS G 3192 (Rolled H)	EN10034 (Rolled H)	ASTM A6, [A6M] ^{*2} (Rolled H)	[Informative] JASS 6 ^{*3} (Built-up-H)	[Informative] EN1090 Class 2 ^{*4} (Built-up-H)				
Flange Width (B)	110 < B ≤ 210		± 2.0	± 2.0	-2.0 + 4.0	-3/16in. +1/4in. [-5 + 6]	± 2.0	± B/100 but ± 2				
	210 < B ≤ 325				-4.0 + 4.0							
	325 < B ≤ 400				-5.0 + 6.0							
	400 < B				± 3.0							
Depth (H)	400 < H ≤ 700		± 2.0	± 2.0 (B≤400) ± 3.0 (B>400)	-3.0 + 5.0	± 1/8in. [-3 + 4]	± 2.0	± 2				
	700 < H < 800			± 3.0	-5.0 + 5.0		± 3.0					
	800 ≤ H ≤ 900											
	900 < H ≤ 1000											
	1000 < H		± 3.0									
Thickness	Flange (t ₂)	10 ≤ t ₂ < 16	-0.3 + 1.7 ^{*5}	± 1.0 ^{*6}	-1.5 + 2.5	-	-	-				
		16 ≤ t ₂ < 20	-0.7 + 2.3 ^{*5}	± 1.5 ^{*6}	-2.0 + 2.5							
		20 ≤ t ₂ < 25										
		25 ≤ t ₂ < 30								± 1.7 ^{*6}	-2.5 + 2.5	
		30 ≤ t ₂ < 40	-3.0 + 3.0									
		40 ≤ t ₂ < 60		-1.5 + 2.5 ^{*5}	± 2.0 ^{*6}							
		60 ≤ t ₂		-	-					-4.0 + 4.0	-	-
	Web (t ₁)	7 ≤ t ₁ < 10	± 0.7	± 0.7	± 1.0							
		10 ≤ t ₁ < 16	± 1.0	± 1.0	± 1.5							
		16 ≤ t ₁ < 20			± 2.0							
		20 ≤ t ₁ < 25				-	-	-				
		25 ≤ t ₁ < 40	± 2.5									
		40 ≤ t ₁ < 60	± 3.0									
		60 ≤ t ₁										
		Squareness of flanges	T	H ≤ 300	-	B x 1.0% but 1.5	-	-		-	-	
H > 300	2.0			B x 1.2% but 1.5								
k + k'	110 < B		-	-	B x 2% and 6.5	1/4in. (H ≤ 12in.) 5/16in. (H > 12in.) [6 (H ≤ 310)] [8 (H > 310)]	-	-				
Δ	110 < B		-	-	-	-	-	B/100 but 3 ^{*7}				
Web off-centre	S	110 < B ≤ 325	± 2.0	± 2.0	-	± 2.0						
		325 < B ≤ 400		± 3.5								
		400 < B ≤ 500										
	E	B ≤ 500	-	-	-	3/16in. (≤ 426lb/ft) 5/16in. (> 426lb/ft) [5 (≤ 634kg/m)] [8 (> 634kg/m)]	-		± 4 ^{*7}			
Plate curvature (W)	H ≤ 350		2.0	2.0	-	-	H/150 and 4	(H-2×t ₂)/150 but 3				
	350 < H < 550			2.5								
	550 ≤ H < 600			3.0								
	600 ≤ H											
Flatness of flanges(F)			b × 1% and 1.5mm	b × 1.5% and 1.5mm (B ≤ 400mm)	-	-	2b/100 and 2 ^{*7}	b/75 but 2 ^{*7}				

Note *1 It is subjected for JIS G3101(SS), JIS G3106(SM) and JIS G3136(SN)

*2 It is subjected for W and HP. [] is for A6M.

*3 Japanese Architectural Standard Specification

*4 Functional tolerances Permitted deviation Δ

*5 If Steel Grade is JIS G3101(SS) or JIS G3106(SM), JIS G3192 is applied.

*6 If Steel Grade is JIS G3136(SN), tolerances for NSHyper beam is applied.

*7 The tolerance for General case

- CE Mark Factory Production Control Certificate (FPC) based on Construction Products Regulation -CPR 305/2011/EU
- FPC based on BC1: 2012, Singapore
- JIS (Japanese Industrial Standards)
- IS (Indian Standards)
- MS (Malaysian Standards; SIRIM Certification)
- ISO9001

Classification Society Standards

- ABS (American Bureau of Shipping, USA)
- DNV (Det Norske Veritas, Norway)
- NK (Nippon Kaiji Kyokai, Japan)
- BV (Bureau Veritas, France)
- LR (Lloyd's Register of Shipping, United Kingdom)

Environmental Products Declaration

• SuMPO EPD

Our H-shapes have successfully passed third-party verification under the SuMPO Environmental Labeling Program by the Sustainable Management Promotion Organization (SuMPO), and have acquired the SuMPO Environmental Product Declaration (EPD) verification. This EPD verification system evaluates the quantitative environmental impacts of the entire lifecycle of a product, covering not only resource extraction to manufacturing, but also its recycling effects. Nippon Steel's customers can use this EPD information to evaluate the environmental impacts of the structures they plan to construct.

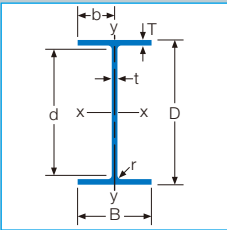


JR-AJ-19003E-D
JR-AJ-19004E-C
JR-AJ-24049E

NSHYPER BEAM™
Jumbo wide flange shapes
Wide flange shapes

<https://ecoleaf-label.jp/epd/45>
<https://ecoleaf-label.jp/epd/46>
<https://ecoleaf-label.jp/epd/1915>

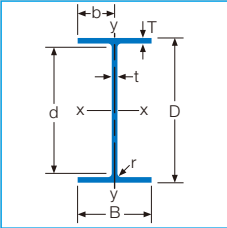
Dimensions and Properties



MEGA NSHYPER BEAM™ [Metric Unit]

Nominal Size		Mass per Meter kg/m	Depth of section D mm	Width of section B mm	Thickness		Root Radius r mm	Depth between Filletts d=(D-2T-2r) mm	Ratios for Local Buckling		Second Moment of Area		Radius of Gyration		Elastic Modulus		Plastic Modulus		Buckling Parameter u	Torsional Index x	Warping Constant H cm ⁶	Torsional Constant J cm ⁴	Area of Section A cm ²	Section Classification							
					Web t mm	Flange T mm			Flange b/T for AISC	Web d/t for AISC	Axis x-x I _x cm ⁴																				

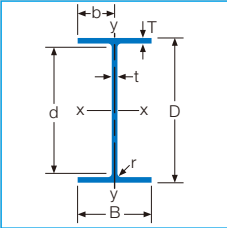
Dimensions and Properties



MEGA NSHYPER BEAM™ [Metric Unit]

Nominal Size		Mass per Meter kg/m	Depth of section D mm	Width of section B mm	Thickness		Root Radius r mm	Depth between Filletts d=(D-2T-2r) mm	Ratios for Local Buckling		Second Moment of Area		Radius of Gyration		Elastic Modulus		Plastic Modulus		Buckling Parameter u	Torsional Index x	Warping Constant H cm ⁶	Torsional Constant J cm ⁴	Area of Section A cm ²	Section Classification							
					Web t mm	Flange T mm			Flange b/T for AISC	Web d/t for AISC	Axis x-x I _x cm ⁴																				

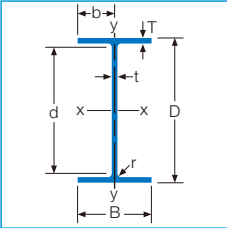
Dimensions and Properties



NSHYPER BEAM™ [Metric Unit]

Nominal Size		Mass per Meter kg/m	Depth of section D mm	Width of section B mm	Thickness		Root Radius r mm	Depth between Filletts d=(D-2T-2r) mm	Ratios for Local Buckling		Second Moment of Area		Radius of Gyration		Elastic Modulus		Plastic Modulus		Buckling Parameter u	Torsional Index x	Warping Constant H cm ⁶	Torsional Constant J cm ⁴	Area of Section A cm ²	Section Classification							
					Web t mm	Flange T mm			Flange b/T																						

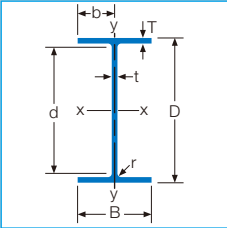
Dimensions and Properties



NSHYPER BEAM™ [Metric Unit]

Nominal Size		Mass per Meter kg/m	Depth of section D mm	Width of section B mm	Thickness		Root Radius r mm	Depth between Filletts d=(D-2T-2t) mm	Ratios for Local Buckling		Second Moment of Area		Radius of Gyration			Elastic Modulus		Plastic Modulus		Buckling Parameter u	Torsional Index x	Warping Constant H cm ⁶	Torsional Constant J cm ⁴	Area of Section A cm ²	Section Classification							
					Web <																											

Dimensions and Properties

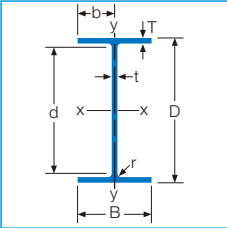


ASTM W sections [Imperial Unit]

Nominal Size		Mass per Foot lbs	Depth of Section D inch	Width of Section B inch	Thickness		Root Radius r inch	Depth between Filletts d=(D-2T-2r) mm	Ratios for Local Buckling		Second Moment of Area		Radius of Gyration			Elastic Modulus		Plastic Modulus		Buckling Parameter u	Warping Constant H inch ⁶	Torsional Constant J inch ⁴	Area of Section A inch ²	Section Classification															
					Web t inch	Flange T inch			Flange b/T for AISC	Web d/t for AISC	Axis x-x Ix inch ⁴	Axis y-y Iy inch ⁴	Axis x-x rx inch	Axis y-y ry inch		Axis x-x Zx inch ³	Axis y-y Zy inch ³	Axis x-x Sx inch ³	Axis y-y Sy inch ³						AISC360-16				BS EN 1993-1-1										
																									A572 Gr50, A992				S355										
																									Axial Compression		Pure Bending		Axial Compression		Pure Bending								
																									Flange	Web	Flange	Web	Flange	Web	Flange	Web							
HP14 x	117 *	117	14.21	14.885	0.805	0.805	0.598	11.4	9.25	14.2	1,220	443	5.96	3.59		172	59.5	194	91.4	0.821	19,900	8	34.4	nS	nS	C	C	c2	c1	c2	c1								
	102 *	102	14.01	14.785	0.705	0.705	0.598	11.4	10.49	16.2	1,050	380	5.92	3.56		150	51.4	169	78.8	0.821	16,800	5	30.0	nS	nS	nC	C	c3	c1	c3	c1								
	89 *	89	13.83	14.695	0.615	0.615	0.598	11.4	11.95	18.5	904	326	5.88	3.53		131	44.3	146	67.7	0.822	14,200	4	26.1	nS	nS	nC	C	c3	c1	c3	c1								
	73 *	73	13.61	14.585	0.505	0.505	0.598	11.4	14.44	22.6	729	261	5.84	3.49		107	35.8	118	54.6	0.823	11,200	2	21.4	S	nS	nC	C	c4	c1	c4	c1								
HP12 x	84	84	12.28	12.295	0.685	0.685	0.598	9.7	8.97	14.2	650	213	5.14	2.94		106	34.6	120	53.2	0.829	7,140	4	24.6	nS	nS	C	C	c2	c1	c2	c1								
	74	74	12.13	12.215	0.605	0.610	0.598	9.7	10.01	16.1	569	186	5.11	2.92		93.8	30.4	105	46.6	0.830	6,160	3	21.8	nS	nS	nC	C	c3	c1	c3	c1								
	63	63	11.94	12.125	0.515	0.515	0.598	9.7	11.77	18.9	472	153	5.07	2.89		79.1	25.3	88.3	38.7	0.831	5,000	2	18.4	nS	nS	nC	C	c3	c1	c3	c1								
	53	53	11.78	12.045	0.435	0.435	0.598	9.7	13.84	22.3	393	127	5.04	2.86		66.7	21.1	74.0	32.2	0.832	4,080	1	15.5	S	nS	nC	C	c4	c1	c4	c1								

Please contact us in advance to order these sizes with "*" mark.
Dimensions except for root radius referred to BS EN 10365.

Dimensions and Properties

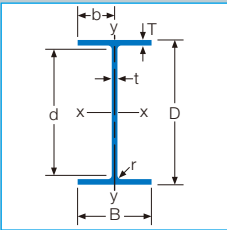


JIS H sections [Metric Unit]

Nominal Size			Mass per Meter	Depth of section	Width of section	Thickness		Root Radius	Depth between Filletts	Ratios for Local Buckling		Second Moment of Area		Radius of Gyration			Elastic Modulus		Plastic Modulus		Buckling Parameter	Torsional Index	Warping Constant	Torsional Constant	Area of Section	Section Classification							
						Web	Flange			Flange b/T for AISC	Web d/t for AISC	Axis x-x I _x cm ⁴	Axis y-y I _y cm ⁴	Axis x-x r _x cm	Axis y-y r _y cm		Axis x-x Z _x cm ³	Axis y-y Z _y cm ³	Axis x-x S _x cm ³	Axis y-y S _y cm ³						AISC360-16				BS EN 1993-1-1			
																										A572 Gr50, A992				S355			
																										Axial Compression		Pure Bending		Axial Compression		Pure Bending	
																										Flange	Web	Flange	Web	Flange	Web	Flange	Web
900 x 300	x 304	H918 x 303 x 19 x 37	304	918	303	19	37	18	808.0	4.09	42.5	535,000	17,200	37.2	6.67		11,700	1,140	13,400	1,780	0.878	28.0	33	1,230	387.4	nS	S	C	C	c1	c4	c1	c1
	x 283	H912 x 302 x 18 x 34	283	912	302	18	34	18	808.0	4.44	44.9	491,000	15,700	36.9	6.59		10,800	1,040	12,300	1,620	0.876	30.2	30	979	360.1	nS	S	C	C	c1	c4	c1	c1
	x 240	H900 x 300 x 16 x 28	240	900	300	16	28	18	808.0	5.36	50.5	404,000	12,600	36.4	6.43		8,990	842	10,300	1,320	0.872	35.9	24	580	305.8	nS	S	C	C	c1	c4	c1	c1
	x 210	H890 x 299 x 15 x 23	210	890	299	15	23	18	808.0	6.50	53.9	339,000	10,300	35.6	6.20		7,610	687	8,750	1,080	0.863	42.2	19	361	266.9	nS	S	C	C	c1	c4	c1	c1
800 x 300	x 207	H800 x 300 x 14 x 26	207	800	300	14	26	18	712.0	5.77	50.9	286,000	11,700	33.0	6.67		7,160	781	8,100	1,210	0.882	33.9	18	440	263.5	nS	S	C	C	c1	c4	c1	c1
700 x 300	x 182	H700 x 300 x 13 x 24	182	700	300	13	24	18	616.0	6.25	47.4	197,000	10,800	29.2	6.83		5,640	721	6,340	1,110	0.887	31.5	12	343	231.5	nS	S	C	C	c1	c4	c1	c1
600 x 300	x 147	H588 x 300 x 12 x 20	147	588	300	12	20	13	522.0	7.50	43.5	114,000	9,010	24.7	6.94		3,890	601	4,350	921	0.886	31.2	7	199	187.2	nS	S	C	C	c1	c4	c1	c1
600 x 200	x 103	H600 x 200 x 11 x 17	103	600	200	11	17	13	540.0	5.88	49.1	75,600	2,270	24.0	4.16		2,520	227	2,900	358	0.863	38.4	2	97	131.7	nS	S	C	C	c1	c4	c1	c1
500 x 300	x 125	H488 x 300 x 11 x 18	125	488	300																												

Please contact us in advance to order these sizes with "*" mark.
Dimensions except for root radius referred to BS EN 10365.

Dimensions and Properties



HC400 [Metric Unit]

Nominal Size		Mass per Meter	Depth of section	Width of section	Thickness		Root Radius	Depth between Filletts	Ratios for Local Buckling		Second Moment of Area		Radius of Gyration		Elastic Modulus		Plastic Modulus		Buckling Parameter	Torsional Index	Warping Constant	Torsional Constant	Area of Section	Section Classification								
					Web	Flange			Flange b/T for AISC	Web d/t for AISC	Axis x-x I _x cm ⁴	Axis y-y I _y cm ⁴	Axis x-x r _x cm	Axis y-y r _y cm										AISC360-16				BS EN 1993-1-1				
																								A572 Gr50, A992				S355				
																								Axial Compression		Pure Bending		Axial Compression		Pure Bending		
																								Flange	Web	Flange	Web	Flange	Web	Flange	Web	
448	448 x 432 x 45 x 45	435	448	432	45.0	45.0	22.0	314.0	4.80	7.0	177,000	60,800	17.9	10.5		7,900	2,810	9,350	4,390	0.824	8.4	24.7	4,070	554.1	nS	nS	C	C	c1	c1	c1	c1
	448 x 427 x 40 x 45	417	448	427	40.0	45.0	22.0	314.0	4.74	7.9	173,000	58,600	18.1	10.5		7,730	2,750	9,100	4,260	0.831	8.7	23.8	3,630	531.7	nS	nS	C	C	c1	c1	c1	c1
	448 x 422 x 35 x 45	400	448	422	35.0	45.0	22.0	314.0	4.69	9.0	169,000	56,500	18.2	10.5		7,570	2,680	8,850	4,130	0.839	9.0	22.9	3,270	509.3	nS	nS	C	C	c1	c1	c1	c1
	448 x 417 x 30 x 45	382	448	417	30.0	45.0	22.0	314.0	4.63	10.5	166,000	54,500	18.5	10.6		7,400	2,610	8,600	4,000	0.847	9.2	22.1	2,980	486.9	nS	nS	C	C	c1	c1	c1	c1
	448 x 412 x 25 x 45	365	448	412	25.0	45.0	22.0	314.0	4.58	12.6	162,000	52,500	18.7	10.6		7,230	2,550	8,340	3,880	0.856	9.4	21.3	2,750	464.5	nS	nS	C	C	c1	c1	c1	c1
438	438 x 427 x 40 x 40	384	438	427	40.0	40.0	22.0	314.0	5.34	7.9	152,000	52,100	17.6	10.3		6,950	2,440	8,150	3,800	0.824	9.3	20.6	2,850	489.0	nS	nS	C	C	c1	c1	c1	c1
	438 x 422 x 35 x 40	367	438	422	35.0	40.0	22.0	314.0	5.28	9.0	149,000	50,300	17.8	10.4		6,790	2,380	7,910	3,680	0.832	9.7	19.9	2,510	467.1	nS	nS	C	C	c1	c1	c1	c1
	438 x 417 x 30 x 40	349	438	417	30.0	40.0	22.0	314.0	5.21	10.5	145,000	48,400	18.1	10.4		6,630	2,320	7,670	3,570	0.841	10.1	19.2	2,240	445.2	nS	nS	C	C	c1	c1	c1	c1
	438 x 412 x 25 x 40	332	438	412	25.0	40.0	22.0	314.0	5.15	12.6	142,000	46,700	18.3	10.5		6,470	2,270	7,430	3,460	0.850	10.3	18.5	2,030	423.3	nS	nS	C	C	c1	c1	c1	c1
	438 x 407 x 20 x 40	315	438	407	20.0	40.0	22.0	314.0	5.09	15.7	138,000	45,000	18.6	10.6		6,310	2,210	7,190	3,350	0.860	10.4	17.8	1,870	401.4	nS	nS	C	C	c1	c1	c1	c1
428	428 x 422 x 35 x 35	334	428	422	35.0	35.0	22.0	314.0	6.03	9.0	129,000	44,000	17.4	10.2		6,030	2,080	7,000	3,240	0.825	10.5	17.0	1,900	424.9	nS	nS	C	C	c1	c1	c1	c1
	428 x 417 x 30 x 35	317	428	417	30.0	35.0	22.0	314.0	5.96	10.5	126,000	42,400	17.7	10.3		5,880	2,030	6,770	3,130	0.834	11.0	16.4	1,650	403.5	nS	nS	C	C	c1	c1	c1	c1
	428 x 412 x 25 x 35	300	428	412	25.0	35.0	22.0	314.0	5.89	12.6	122,000	40,900	17.9	10.3		5,720	1,980	6,540	3,030	0.843	11.4	15.8	1,460	382.1	nS	nS	C	C	c1	c1	c1	c1
	428 x 407 x 20 x 35	283	428	407	20.0	35.0	22.0	314.0	5.81	15.7	119,000	39,400	18.2																			

Please contact us in advance to order these sizes with "*" mark.
Dimensions except for root radius referred to BS EN 10365.

Applications

OIL & GAS ENERGY FACILITIES

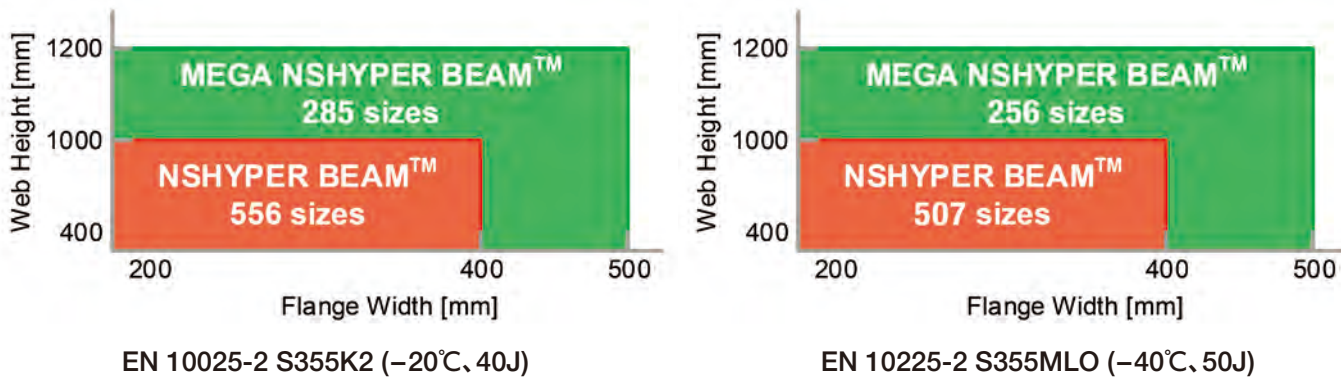
High Safety against fracture is required for members of offshore structures even in super-cold environments.



Extra Large Cross-Sections with Excellent Low-Temperature Toughness

NSHYPER BEAM™ has extra-large cross-sections with Excellent Low-Temperature Toughness. A number of size selections can be used.

Available Size



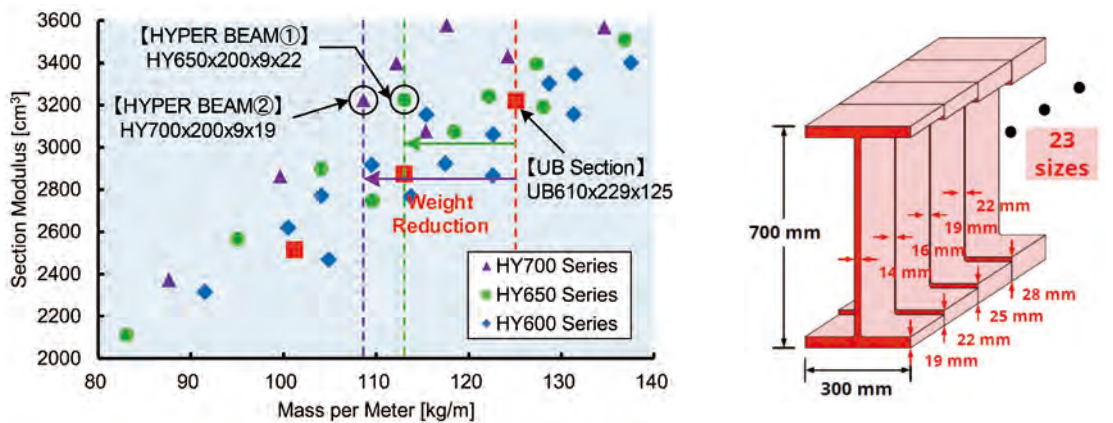
INFRASTRUCTURE BUILDINGS

To optimize design and fabrication works, shorten work periods and enhance cost savings is required for members for infrastructure buildings.



NSHYPER BEAM™ that can replace Built-up H-shapes

With a large number of section sizes and thin webs of NSHYPER BEAM™, steel weight can be reduced further than conventional H-shapes such as ASTM W and UB sections. And NSHYPER BEAM™ can replace Built-up H-shapes due to its uniform depth and width within the same size range.



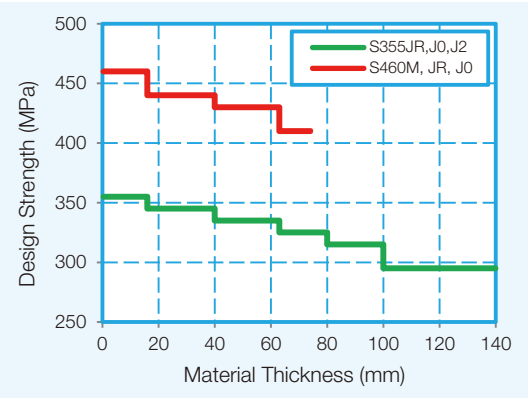
Applications

High Strength Steel Grade (S460)

Features of High Strength Steel Grade

High strength H-shapes with guaranteed high toughness

The design strength of S460 is approximately 25% greater than that of S355. Therefore, an economical design is achievable in situations where the member is subjected to large compressive forces. The Charpy value is guaranteed as 40 J at -20°C for S460M and 27 J at 0°C for S460J0.



Current available size

The current available sizes in S460M are UC356 x 406 (≤ 634 kg/m) and W14 x 16 (≤ 426 lbs/ft).

The current available size in S460JR, J0 is UB914x419 (≤ 388kg/m),UB914x305 (238kg/m≤ , ≤345kg/m).

Nominal Size	Mass per Meter [kg/m]									
UB914 x 419 x	343	388								
UB914 x 305 x	201	224	238	253	271	289	313	345	381	425
	474	521	576							
UC356 x 406 x	235	287	340	393	467	509	551	592	634	677
	744	818	900	990	1086					

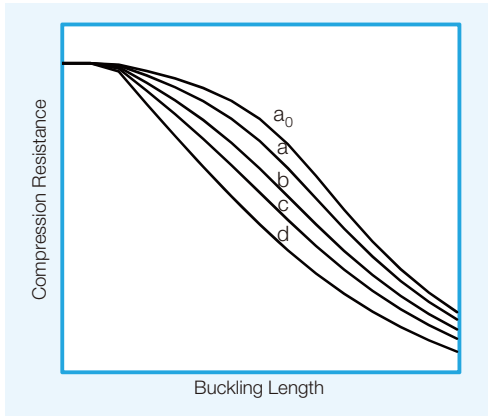
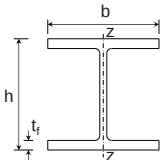
☐ S460JR, J0 is Available
☐ S460M is Available

Design Advantage of S460 based on EN 1993-1-1

Favorable buckling curves for compression resistance

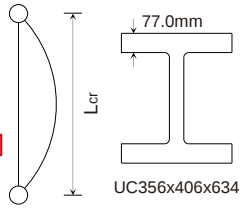
In Euro Code EN 1993-1-1, there are five categories in buckling curves related to calculation of compression resistance. These buckling curves are classified into a₀, a, b, c, and d according to imperfection factors based on steel grades and section profiles. For structural H-shapes with S460, more favorable buckling curves are set, compared with S355, especially where t_f ≤ 100 mm.

Limits(mm)		Axis	Buckling Curve			
			S355		S460	
			Rolled	Welded	Rolled	Welded
h/b	tf<40	z-z	c	c	a	c
≤1.2	tf<100		c	c	a	d
h/b	tf<40		c	c	a ₀	c
>1.2	tf<100		c	d	a	d



Thanks to favorable buckling curves, the rate of increase of compression resistance (N_{b,z,Rd}) compared with S355 is greater than that of design strength (f_y). As a result, a significant reduction of steel weight is achieved by replacing “S355” with “S460”.

*Buckling length L _{cr} : 4.0m				
Section	Steel Grade	Design Strength f _y (MPa)	Buckling Curve	Compression Resistance* N _{b,z,Rd} (kN)
UC356x406x634	S355	325	c	22784
	S460	410	a	30494



Worldwide Experience

Buildings



[High-rise Building]
Country : United Arab Emirates
Product : W14x16 series



【High-rise Building】
Country : Indonesia
Product : W14x16 series

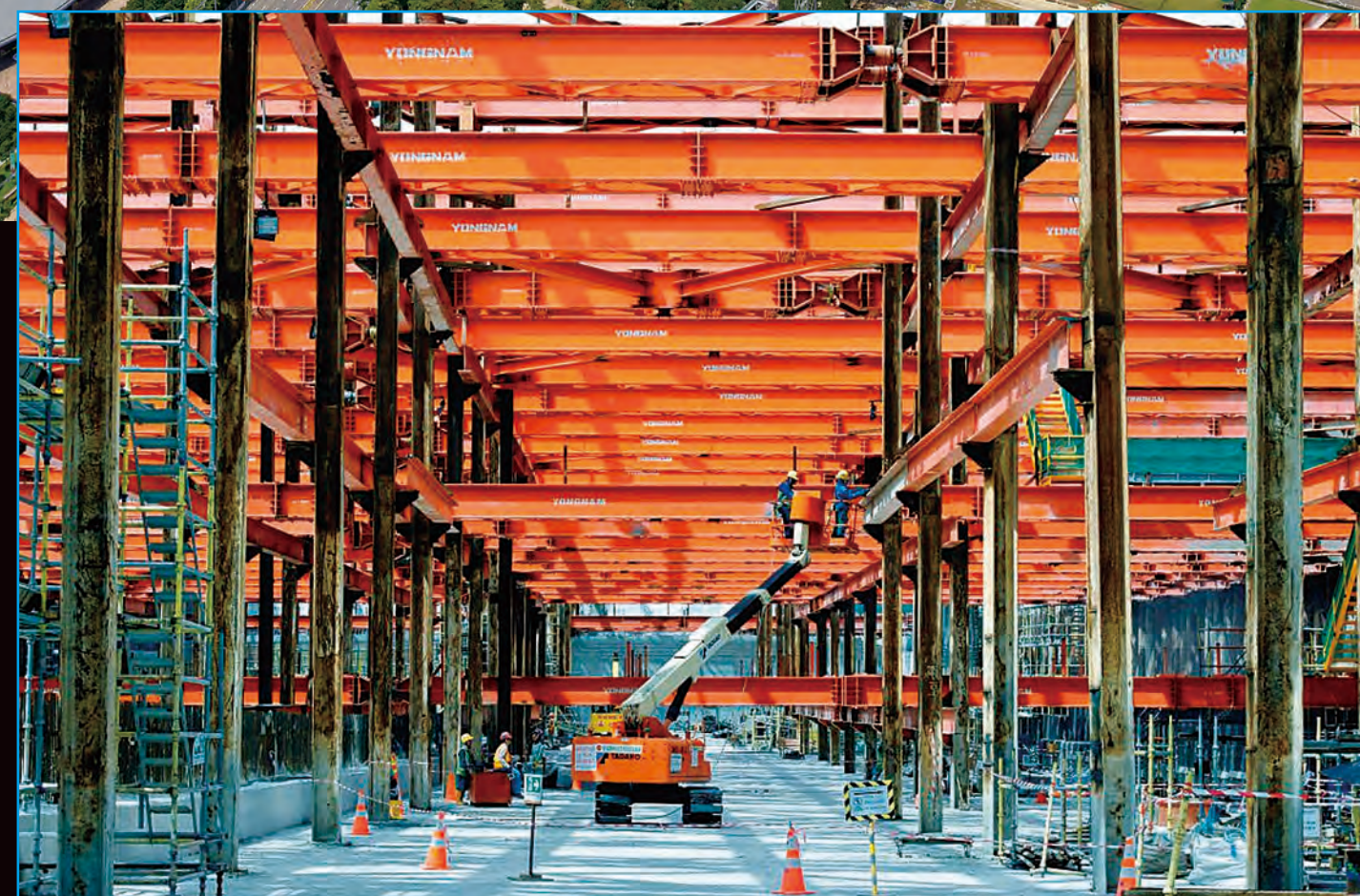
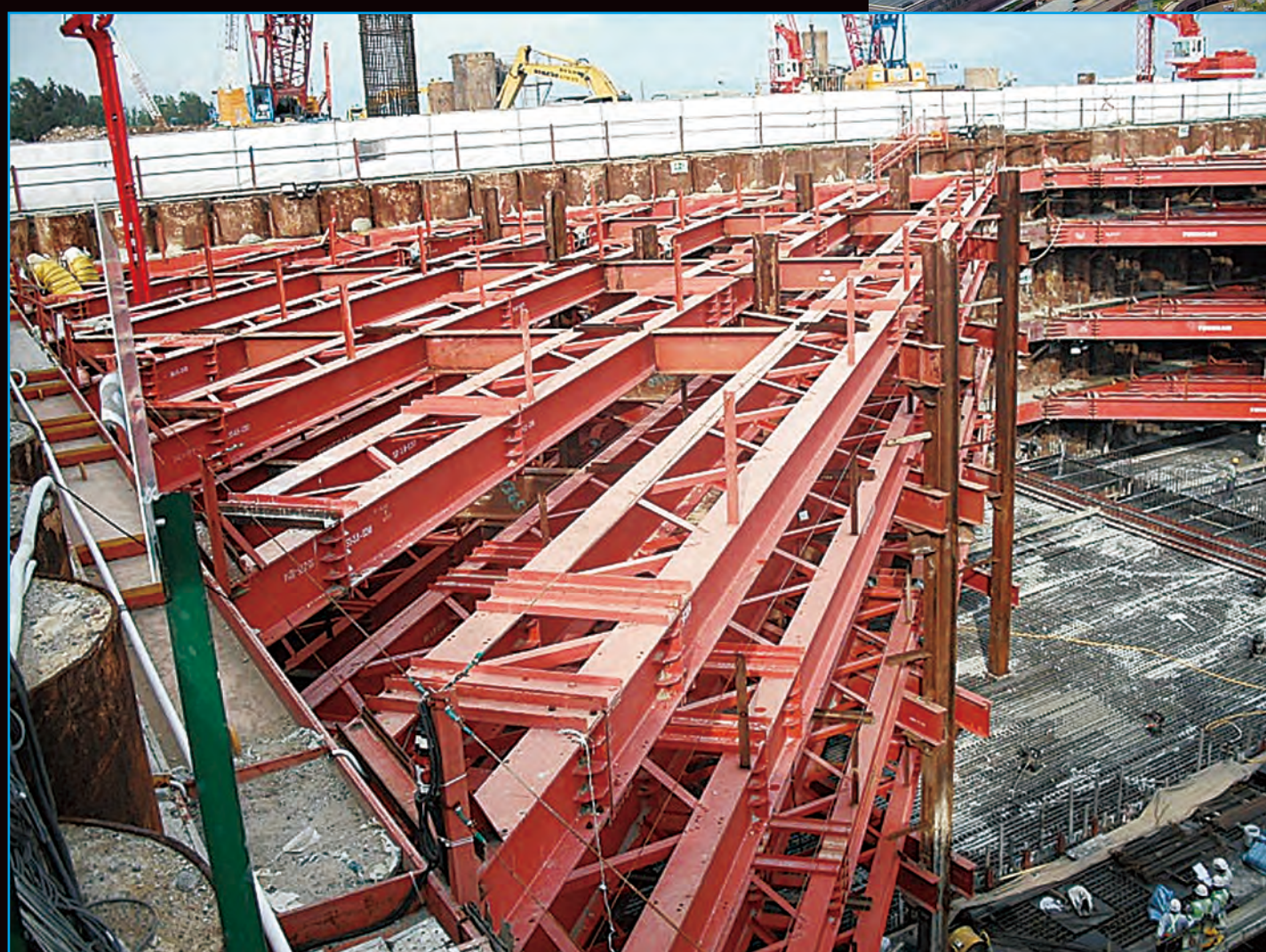


【High-rise Building】
Country : Japan
Product : NSHYPER BEAM™

Soil Retaining Structures



[Temporary Retaining Wall]
Country : Singapore
Product : NSHYPER BEAM™
UC356x406 series



Industrial Facilities



[Steel Finishing Plant]
Country : Indonesia
Product : NSHYPER BEAM™



[Heat Recovery Steam Generator]
Country : Thailand
Product : NSHYPER BEAM™



Oil & Gas Facilities



[Offshore Structure]
Country : Singapore
Product : NSHYPER BEAM™



[Onshore Module Structure]
Country : Australia
Product : NSHYPER BEAM™

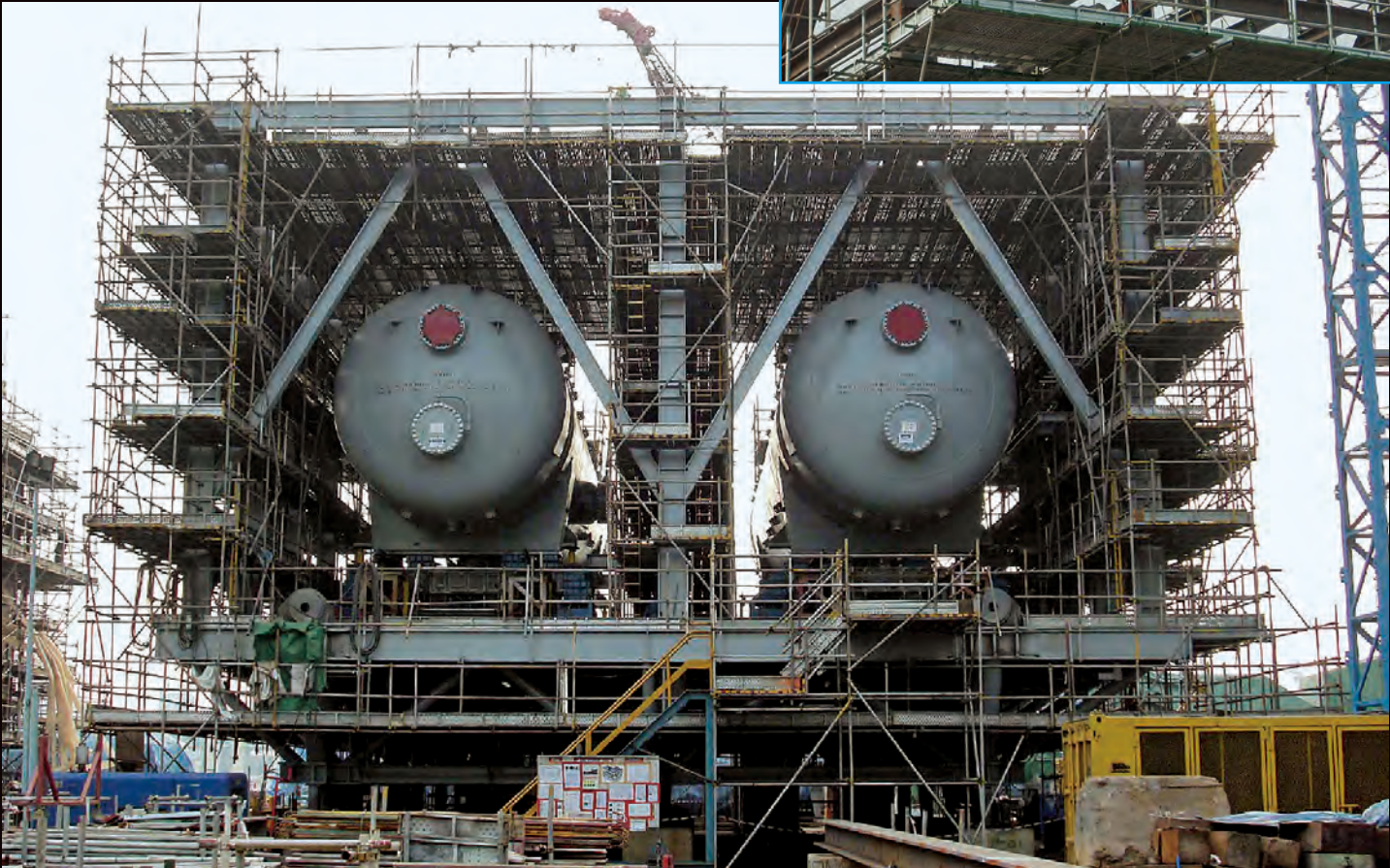


Image courtesy of INPEX CORPORATION