



Promising Reliability, For Now and Tomorrow

HOLLOW STRUCTURAL SECTIONS (HSS)



Company Profile

International Industries Limited (IIL) is Pakistan's largest manufacturer of steel, stainless steel and plastic pipes with an annual manufacturing capacity of 750,000 tons and annual revenues of almost PKR 25 billion (USD 203 million).

IIL was incorporated in Pakistan in 1948, is quoted on the Pakistan Stock Exchange and has an equity of over PKR 8.8 billion and has featured on the listing of Pakistan's Top 25 Companies consecutively for more than 10 years.

IIL is a part of a group of Companies that includes:

International Steels Limited (ISL): Pakistan's largest manufacturer of galvanized, cold rolled and color coated steel sheets and coils. ISL has an annual manufacturing capacity of over 1 million tons and annual revenues of over PKR 47 billion (USD 381 million).

Pakistan Cables Limited (PCL): Pakistan's premium manufacturer of electrical cables, wires, copper rod, PVC compound and aluminum sections with annual revenues in excess of PKR 10 billion (USD 77 million).

IIL Australia Pty Limited: IIL's wholly owned Australian subsidiary which represents the Group's interest in the Asia Pacific region.

IIL is a proud recipient of numerous accolades including the Management Association of Pakistan's "Corporate Excellence Award" for the Industrial Metals & Mining Sector, the National Forum for Environment & Health's "Environment Excellence Award" and the Employers Federation of Pakistan's "OHSE award".

IIL also has a credible export pedigree with an ever-expanding footprint in 60 countries across 6 continents.

As a result, IIL has been awarded the "FPCCI Export Performance Award" consecutively for 19 years. With an unshakeable focus on health, safety & environment, IIL is a reputable corporate citizen. The Company is ISO 9001, ISO 14001, ISO 45001, API 5L, PSQCA, UL and CE certified and manufactures its products according to international standards and specifications.





Vision & Mission

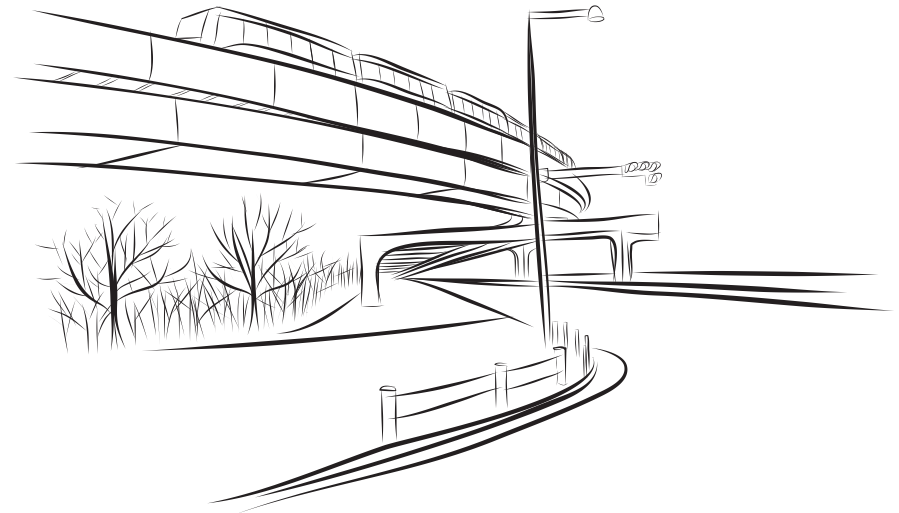
Vision

To be a globally respected, innovative and entrepreneurial company, enriching lives while remaining focused on providing competitive quality products and services.

Mission

International Industries Limited is a customer focused, quality conscious company committed to economies of scale. It shall continually enhance the effectiveness of its quality, environmental, occupational health & safety management systems. IIL is committed to be an ethical company and shall conform to all applicable legal requirements, as well as fulfill and exceed the expectations of all stakeholders.

Team work, continual improvement, waste reduction, protection of the environment, improvement in safety practices, a fair return to shareholders and fulfillment of social responsibility shall be the hallmark of all activities.





Certifications

International Industries Limited is ISO 9001, ISO 14001, ISO 45001, API 5L, PSQCA, CE & UL certified. The company manufactures according to international standards & specifications (ASTM, AS/NZ, BS, EN, SLSI, DIN)

STANDARD	DESCRIPTION	CERTIFIED BY
ISO 9001	Quality Management System	Lloyds Register Quality Assurance
ISO 14001	Environment Management System	
ISO 45001 (Old Standard OHSAS 18001)	Occupational Health & Safety Management Systems	
API Specification Q1 ® & 5L	Manufacturer of Line Pipe Plain End, HFW, PSL 1	American Petroleum Institute (USA)
	Manufacturer of Line Pipe Plain End, HFW, PSL-1 & PSL-2	
BS EN 10255 & 10226	CE Mark for Hot Dip Galvanized ERW Carbon Steel Pipes	CNC Services (Germany)
BS EN 10296-1, BS EN 10305-5 & BS 1717	CE Mark for ERW Tubes from Cold Rolled Carbon Steel	
BS EN 39, 10219, 10240 ASTM A-500, A252, A53 AS/NZS 1163, 4792	CE Mark for Cold Formed Welded Structural Hollow Sections (HSS)	
UL-852 ASTM 795	UL certification for (ERW & Galvanized Pipes for Fire Sprinkler System)	Underwriters Laboratories, UL
PS:4533-34/1999 (R)	License for the use of Pakistan Standard Mark for PPRC Pipe	Pakistan Quality Control Authority (PSQCA)
DIN 16962 / 1980	License for the use of Pakistan Standard Mark for PPRC Fittings	
PS:3580-2014(R)	Polyethylene Pipe for water Supply "MEGAFLO" Brand	
ASTM A53/2012	MS Pipe (Mild Steel Pipe) - FACTORY-1	
ASTM A53/2012	MS Pipe (Mild Steel Pipe) - FACTORY-2	



ASSURANCE

QUALITY

Quality & Reliability

Our Corporate Slogan - *“Promising Reliability, For Now and Tomorrow”* reflects the fact that International Industries Limited (IIL) is firmly committed to quality. By adhering to globally recognized standards and regulations, IIL ensures that each of its products stand up to the quality expectations of its valued customers.

A comprehensive quality assurance and control system is employed throughout the production process; from production planning and raw material inventory control all the way through production, packing, storage and shipping.

IIL uses the highest quality raw materials and state-of-the-art machinery, operated by fully trained and highly skilled professionals in an environment of continuous improvement backed by R&D.

Furthermore, our fully capable in-house testing & quality control labs ensure that the dimensional, physical and chemical elements of our products meet and exceed the most stringent of global quality standards.





About Hollow Structural Sections (HSS)

IIL's hollow structural sections (HSS) are steel sections that can be used in a variety of structural applications which includes construction of buildings, warehouses, residences, bridges, pedestrian walkways and virtually any other type of structure, and for general fabrication. IIL manufactures circular hollow sections (CHS), square hollow sections (SHS) and rectangular hollow sections (RHS) in various sizes, thicknesses and material grades.

Around the world, leading engineers, designers, architects and fabricators are finding efficient new uses for hollow structural sections in a variety of settings. The use of these hollow sections significantly reduces the time and optimizes the cost of construction as compared to other construction materials while providing enhanced design flexibility and high salvage value without compromising aesthetic appeal or structural integrity.

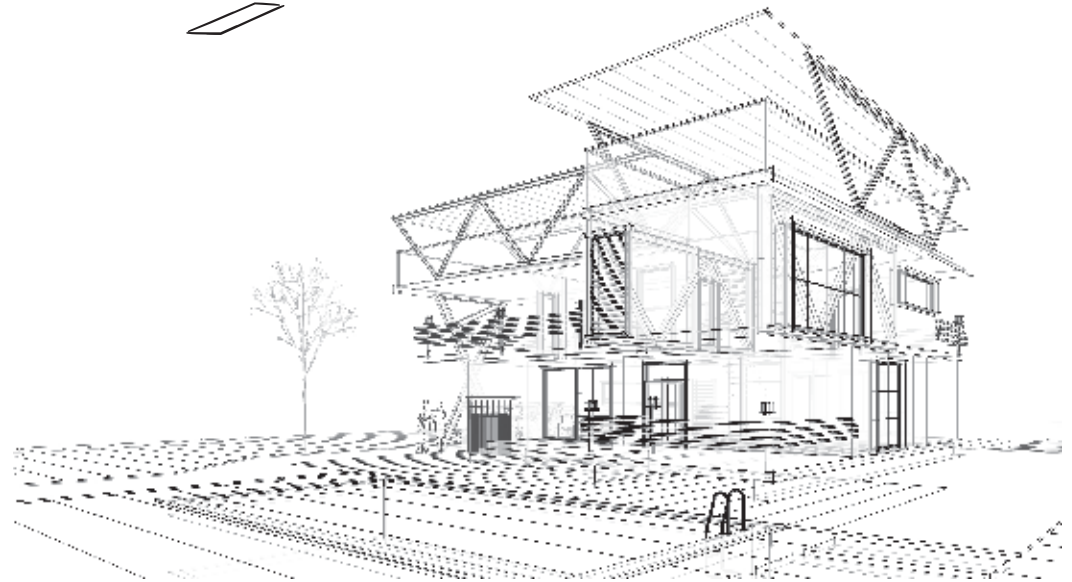
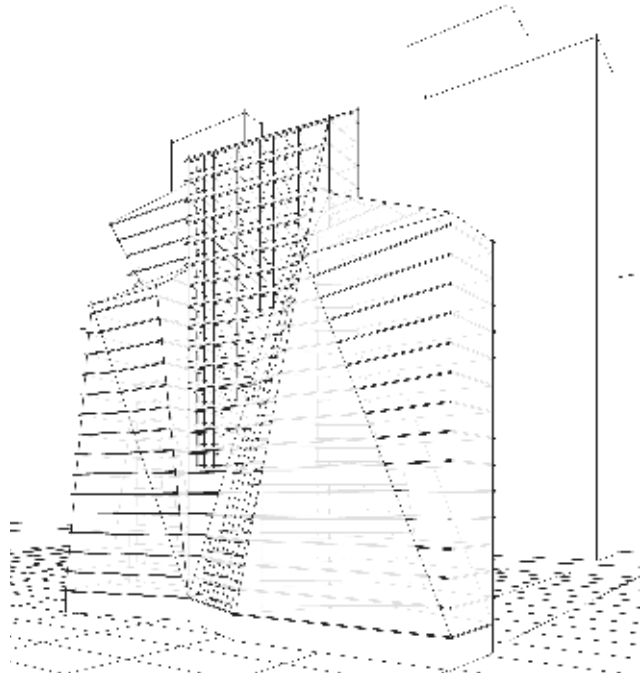
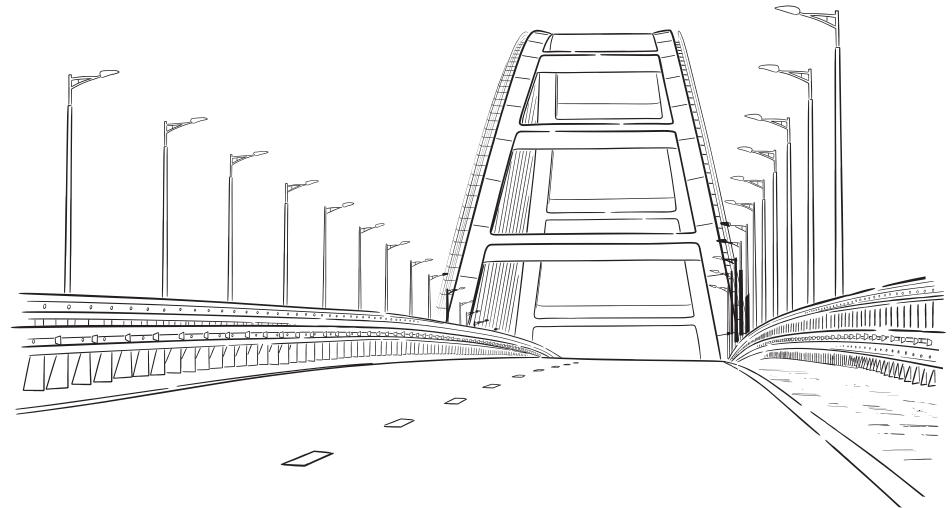
IIL's HSS can be manufactured according to the following international quality standards, which reflect IIL's adherence to high quality manufacturing.

- **BS EN 10219 (Grade S235, S275, S355)**
- **ASTM A500 (Grade A, B, C)**
- **ASTM A53 (Sch. 10, 20, 30, 40, 60 & 80)**
- **ASTM A252 (Grade 1, 2 & 3)**



HSS Applications

- Commercial Buildings
- Warehouses/Sheds
- Pedestrian Walkways
- Overhead Bridges
- Residential Buildings
- Infrastructural Projects
- General Fabrication



Reasons to Use IIL HSS



SPEED OF CONSTRUCTION

Steel construction is quick which contributes to low labor costs and quicker lead times on projects. A complete structure can be constructed with approximately 60%+ reduction in construction time depending on the scale of the project.



VERSATILITY OF DESIGN

IIL HSS's high strength-to-weight ratio & flexibility contributes to the versatility in design, making it the ideal choice for construction of almost all types of structures.



ENVIRONMENTALLY FRIENDLY

IIL HSS is made from steel, one of the world's most recyclable and recycled materials. It produces zero waste and creates less disruption in the environment.



FASTER RETURN ON INVESTMENT

Faster speed of construction leads to a quicker return on investment. Building with steel allows a property to be developed in a short period of time, thereby allowing quicker monetization of the project and a faster return on investment.



EASE OF OFF-SITE CONSTRUCTION

With off-site modular construction, the majority of the construction process can occur in a controlled environment that is not subject to environmental or weather conditions ensuring greater efficiency and quality.



SALVAGE VALUE

Steel sections can be dismantled and reused if needed. Furthermore, steel attracts considerable salvage value at the end of its useful life.

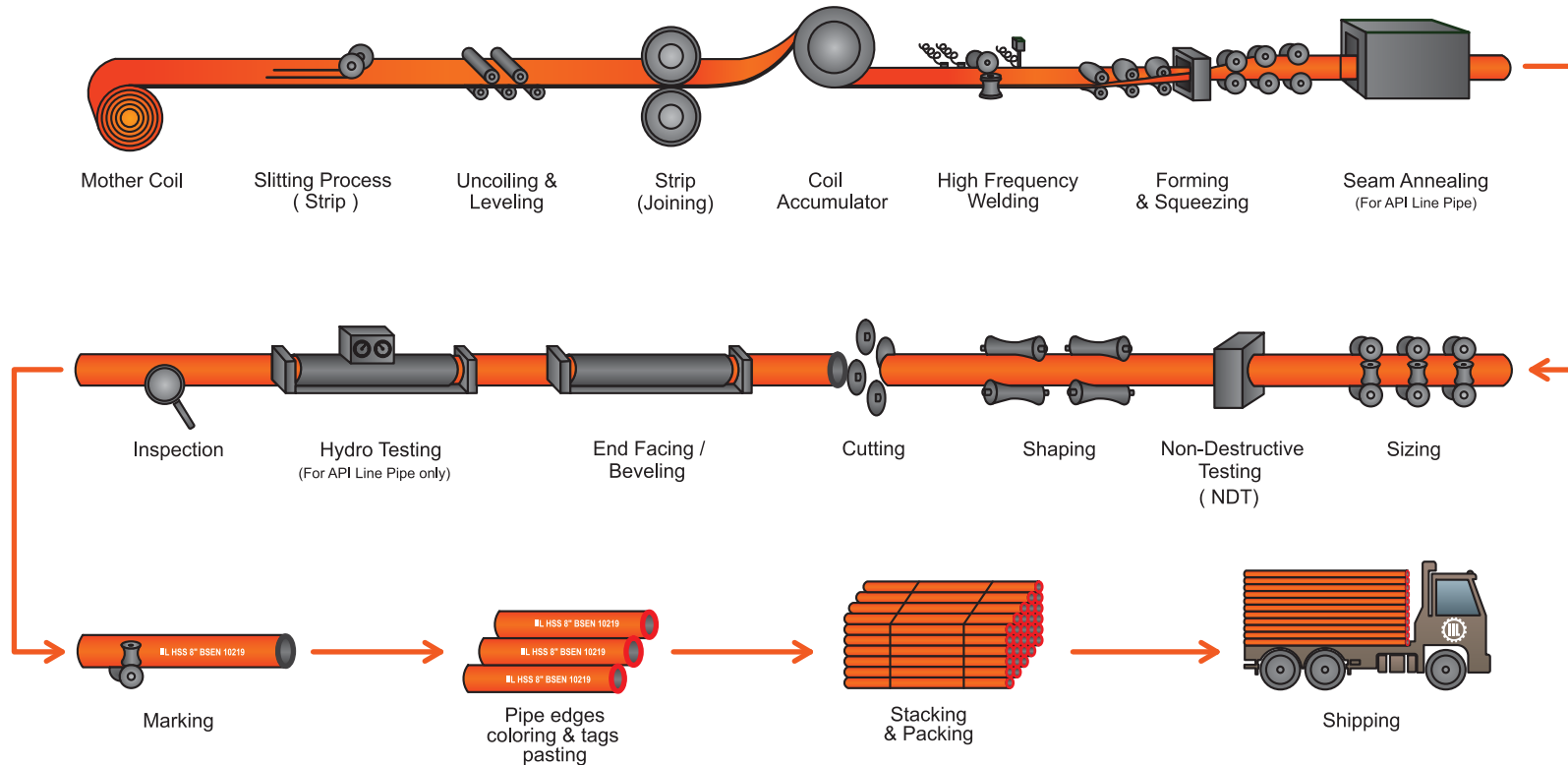
Steel vs. Concrete

STEEL STRUCTURES VS CONCRETE STRUCTURES		
Point of difference	Concrete structure	Steel structure
Earthquake resistance	Concrete structures are brittle so they are less earthquake resistant	Steel structures are more earthquake resistant than concrete structures
Load carrying capacity	In comparison to steel the load carrying capacity of concrete is low	The load carrying capacity of steel structure is higher
Salvage value	The scrap value of concrete is NIL	High salvage value
Foundation	The foundation for the concrete structures should be strong because of the heavier weight of concrete	Steel structures can be made with considerably simpler foundations
Construction time	Concrete structures require curing time at various stages which considerably delays the completion time frame	Steel structures can be completed approximately 60% faster than concrete structures
Joining	Construction joints, expansion joints, contraction joints etc. are needed in concrete structures	The steel component are joined by using rivets, welding, nuts & bolts, etc. in steel structures
Design Flexibility	Once the structure is built, design modification becomes very difficult and may require demolishing the structure	Even when the structure has been built, slight design modifications can be made easily



HSS Manufacturing Process

ILL's state-of-the-art large diameter hollow structural section tube mill is located on a dedicated 10 acre facility in Karachi, Pakistan.



Product Range

Conforming to BS EN 10219

Circular Hollow Sections (CHS)

Grade	Size (mm)	Thickness (mm)														
		2.00	2.50	3.00	3.20	3.60	4.00	4.50	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
S235	33.7															
	42.4															
S235 & S275	48.3															
	60.3															
	63.5															
	76.1															
	88.9															
	101.6															
	114.3															
	139.7															
S235, S275 & S355	168.3															
	219.1															
	273.0															
	323.9															

1" = 25.4 mm

Intermediate thicknesses within the range can be provided upon request

	Ex-Stock
	Made to order

Steel Grade	Chemical Composition					Mechanical properties					
	C	Si	Mn	P	S	Tensile strength Mpa		Minimum yield strength Mpa %	"Minimum impact energy Kv"		
	Max %	Max %	Max %	Max %	Max %	<3mm Thickness	≥ 3mm Thickness		at least temperature of		
									-20	0 °C	20 °C
S235JRH	0.17	—	1.40	0.040	0.040	360~510	360~510	235	-	-	27
S275J0H	0.20	—	1.50	0.035	0.035	430~580	410~560	275	-	27	-
S275J2H	0.20	—	1.50	0.030	0.030				27	-	-
S355J0H	0.20	0.55	1.60	0.035	0.035	510~680	470~630	355	-	27	-
S355J2H	0.20	0.55	1.60	0.030	0.030				27	-	-
S355K2H	0.20	0.55	1.60	0.030	0.030				40	-	-

Product Range

Conforming to BS EN 10219

Square Hollow Sections (SHS)

Grade	Size (mm)	Thickness (mm)															
		1.80	2.00	2.50	3.00	3.20	3.60	4.00	4.50	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
S235 & S275	25 x 25	Ex-Stock	Made to order	Ex-Stock													
	30 x 30	Ex-Stock	Made to order	Ex-Stock													
	38 x 38	Ex-Stock	Made to order	Ex-Stock	Ex-Stock												
	40 x 40	Ex-Stock	Made to order	Ex-Stock	Ex-Stock	Ex-Stock											
S235, S275 & S355	50 x 50		Made to order	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock										
	60 x 60		Made to order	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock									
	63.5 x 63.5		Made to order	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock								
	70 x 70		Made to order	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock							
	75 x 75		Made to order	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock						
	80 x 80		Made to order	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock					
	90 x 90		Made to order	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock				
	100 x 100		Made to order	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock			
	127 x 127*									Made to order	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock		
	152.4 x 152.4*									Made to order	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	
	203.2 x 203.2*									Made to order	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock
	254 x 254*									Made to order	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock

1" = 25.4 mm

Intermediate thicknesses within the range can be provided upon request

* To be manufactured at negative tolerance

	Ex-Stock
	Made to order

Steel Grade	Chemical Composition					Mechanical properties					
	C	Si	Mn	P	S	Tensile strength Mpa		Minimum yield strength Mpa %	"Minimum impact energy Kv ^e at least temperature of		
	Max %	Max %	Max %	Max %	Max %	<3mm Thickness	≥ 3mm Thickness		-20 °C	0 °C	20 °C
S235JRH	0.17	—	1.40	0.040	0.040	360~510	360~510	235	-	-	27
S275J0H	0.20	—	1.50	0.035	0.035	430~580	410~560	275	-	27	-
S275J2H	0.20	—	1.50	0.030	0.030				27	-	-
S355J0H	0.20	0.55	1.60	0.035	0.035	510~680	470~630	355	-	27	-
S355J2H	0.20	0.55	1.60	0.030	0.030				27	-	-
S355K2H	0.20	0.55	1.60	0.030	0.030				40	-	-

Product Range

Conforming to BS EN 10219

Rectangular Hollow Sections (RHS)

Grade	Size (mm)	Thickness (mm)											
		2.00	3.00	3.20	3.60	4.00	4.50	5.00	6.00	7.00	8.00	9.00	10.00
S235, S275 & S355	25 x 50	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock								
	30 x 60	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock								
	40 x 60	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock								
S235 & S275	40 x 80		Made to order	Made to order	Made to order	Made to order	Ex-Stock	Ex-Stock					
	50 x 75	Ex-Stock	Ex-Stock	Ex-Stock	Made to order	Ex-Stock	Ex-Stock	Ex-Stock					
	50 x 100	Ex-Stock	Ex-Stock	Ex-Stock	Made to order	Ex-Stock	Ex-Stock	Ex-Stock					
	75 x 100	Ex-Stock	Ex-Stock	Ex-Stock	Made to order	Ex-Stock	Ex-Stock	Made to order					
S235, S275 & S355	100 x 150					Ex-Stock	Ex-Stock	Made to order	Ex-Stock	Made to order	Ex-Stock		
	100 x 200					Ex-Stock	Ex-Stock	Made to order	Ex-Stock	Made to order	Ex-Stock	Made to order	
	100 x 250							Made to order	Ex-Stock	Made to order	Ex-Stock	Made to order	Ex-Stock

1" = 25.4 mm

Intermediate thicknesses within the range can be provided upon request

 Ex-Stock
 Made to order

Steel Grade	Chemical Composition					Mechanical properties					
	C	Si	Mn	P	S	Tensile strength Mpa		Minimum yield strength Mpa %	"Minimum impact energy Kv ^e at least temperature of		
Name	Max %	Max %	Max %	Max %	Max %	<3mm Thickness	≥ 3mm Thickness			-20 °C	0 °C
S235JRH	0.17	—	1.40	0.040	0.040	360~510	360~510	235	-	-	27
S275J0H	0.20	—	1.50	0.035	0.035	430~580	410~560	275	-	27	-
S275J2H	0.20	—	1.50	0.030	0.030				27	-	-
S355J0H	0.20	0.55	1.60	0.035	0.035	510~680	470~630	355	-	27	-
S355J2H	0.20	0.55	1.60	0.030	0.030				27	-	-
S355K2H	0.20	0.55	1.60	0.030	0.030				40	-	-

Product Range

Conforming to ASTM A500

Circular Hollow Sections (CHS)

Grade	NPS	2.11	2.77	2.87	2.90	3.05	3.18	3.38	3.56	3.68	3.91	4.57	4.78	5.16	5.49	5.74	6.02	6.35	6.55	7.04	7.11	7.62	7.92	8.08	8.18	8.38	8.56	##	9.53	10.31	10.97	11.13	12.70					
		A	1																																			
1 1/4																																						
B & C	1 1/2																																					
	2																																					
	2 1/2																																					
	3																																					
	3 1/2																																					
	4																																					
A,B & C	5																																					
	6																																					
	8																																					
	10																																					
	12																																					

Intermediate thicknesses within the range can be provided upon request

Ex-Stock
 Made to order

Chemical Composition (max %)

Grade	Heat Analysis					
	C Max %	Mn Max %	Si Max %	P Max %	S Max %	Cu Min %
A	0.26	1.35	--	0.035	0.035	0.20
B	0.26	1.35		0.035	0.035	0.20
C	0.23	1.35		0.035	0.035	0.20

Mechanical Properties (MPa)

Grade	Round Structural Tubing		
	Tensile Strength	Yield Strength	Elongation % Min
A	310	230	25
B	400	290	23
C	425	315	21

Product Range

Conforming to ASTM A500

Square Hollow Sections (SHS)

Grade	Size	Thickness (mm)																																				
		1.65	1.85	2.11	2.77	2.87	2.90	3.05	3.18	3.38	3.56	3.68	3.91	4.57	4.78	5.16	5.49	5.74	6.02	6.35	6.55	7.04	7.11	7.62	7.92	8.08	8.18	8.38	8.56	9.27	9.53	10.31	10.97	11.13	12.70			
A	1/2" x 1/2"	Ex-Stock																																				
	3/4" x 3/4"	Ex-Stock																																				
	1" x 1"		Made to order	Ex-Stock																																		
A & B	1 1/4" x 1 1/4"			Made to order	Ex-Stock																																	
	1 1/2" x 1 1/2"	Ex-Stock		Made to order	Ex-Stock																																	
	2" X 2"			Made to order	Ex-Stock																																	
	2.5" x 2.5"				Ex-Stock																																	
	3" x 3"					Ex-Stock																																
A, B & C	3-1/2" X 3-1/2"						Ex-Stock																															
	4" X 4"	Ex-Stock		Made to order	Ex-Stock																																	
	5" x 5"																																					
	6" x 6"																																					
	8" x 8"																																					
	10" x 10"																																					

1" = 25.4 mm

Intermediate thicknesses within the range can be provided upon request

 Ex-Stock
 Made to order

Chemical Composition (max %)

Grade	Heat Analysis					
	C Max %	Mn Max %	Si Max %	P Max %	S Max %	Cu Min %
A	0.26	1.35	--	0.035	0.035	0.20
B	0.26	1.35		0.035	0.035	0.20
C	0.23	1.35		0.035	0.035	0.20

Mechanical Properties (MPa)

Grade	Round Structural Tubing		
	Tensile Strength	Yield Strength	Elongation % Min
A	310	270	25
B	400	315	23
C	425	345	21

Product Range

Conforming to ASTM A500

Rectangular Hollow Sections (RHS)

Grade	Size	Thickness (mm)																																					
		1.65	1.85	2.11	2.77	2.87	2.90	3.05	3.18	3.38	3.56	3.68	3.91	4.57	4.78	5.16	5.49	5.74	6.02	6.35	6.55	7.04	7.11	7.62	7.92	8.08	8.18	8.38	8.56	9.27	9.53	10.31	10.97	11.13	12.70				
A & B	1" x 2"	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock		
	1" x 1-1/2"	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock		
	1-1/2" X 2-1/2"	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	
	2" X 3"	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	
	2" X 4"	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock
A, B & C	3" x 4"	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	
	4" x 6"	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	
	4" x 8"	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock
	6" x 10"	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock	Ex-Stock

1" = 25.4 mm

Intermediate thicknesses within the range can be provided upon request

	Ex-Stock
	Made to order

Chemical Composition (max %)

Grade	Heat Analysis					
	C Max %	Mn Max %	Si Max %	P Max %	S Max %	Cu Min %
A	0.26	1.35	--	0.04	0.04	0.20
B	0.26	1.35		0.04	0.04	0.20
C	0.23	1.35		0.04	0.04	0.20

Mechanical Properties (MPa)

Grade	Round Structural Tubing		
	Tensile Strength	Yield Strength	Elongation % Min
A	310	270	25
B	400	315	23
C	425	345	21

Product Range

Conforming to ASTM A252

Circular Hollow Sections (CHS)

Grade	NPS	Thickness (mm)																		
		4.78	5.16	5.49	5.74	6.02	6.35	6.55	7.04	7.11	7.92	8.18	8.38	8.74	9.27	9.53	10.31	10.97	11.13	12.70
1 & 2	4	Ex-Stock	Ex-Stock	Made to order	Made to order	Ex-Stock	Made to order	Made to order	Made to order	Made to order	Made to order	Made to order	Made to order	Made to order	Made to order	Made to order	Made to order	Made to order	Made to order	Made to order
1, 2 & 3	6	Ex-Stock	Ex-Stock	Made to order	Made to order	Ex-Stock	Made to order	Made to order	Made to order	Made to order	Made to order	Made to order	Made to order	Made to order	Made to order	Made to order	Made to order	Made to order	Made to order	Made to order
	8	Ex-Stock	Ex-Stock	Made to order	Made to order	Ex-Stock	Made to order	Made to order	Made to order	Made to order	Ex-Stock	Ex-Stock	Ex-Stock	Made to order	Made to order	Made to order	Made to order	Made to order	Made to order	Made to order
	10	Ex-Stock	Ex-Stock	Made to order	Made to order	Ex-Stock	Made to order	Made to order	Made to order	Made to order	Ex-Stock	Ex-Stock	Ex-Stock	Made to order	Made to order	Made to order	Made to order	Made to order	Made to order	Made to order
	12	Ex-Stock	Ex-Stock	Made to order	Made to order	Ex-Stock	Made to order	Made to order	Made to order	Made to order	Ex-Stock	Ex-Stock	Ex-Stock	Made to order	Made to order	Made to order	Made to order	Made to order	Made to order	Made to order

 Ex-Stock
 Made to order

Chemical Composition

The Steel shall contain no more than 0.050% phosphorous

Mechanical Properties (MPa)

Steel Grade	Tensile Strength (Mpa) minimum	Yield Strength (Mpa) minimum
1	345	205
2	415	240
3	455	310

Calculated minimum Elongatin values

A- % Elongation (min) for thickness 7.90mm or more at 50mm gauge length:

Grade 1	30%
Grade 2	25%
Grade 3	20%

B-For wall thickness <7.90mm, the min. elongation values shall be calculated as:

Grade 1	$48t+15$
Grade 2	$40t+12.5$
Grade 3	$32t+10.00$

where
 t= specified nominal wall thickness, in

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Factory 3

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