Process & Power Generation

ILJIN Steel provides tube and pipe serving the power generation industry where critically high temperatures and pressures necessitate rigorous quality standards.
Made of carbon and alloy steel in accordance with EN and ASTM standard, ILJIN produces a broad range of high quality hot-rolled tube and pipe for process and power generation applications.
Pipe is made in random lengths from 3 to 30m and fixed lengths upon customer request.

Products

Method	O.D(mm)	W.T(mm)	Standards
Seamless	21.3~177.8	2~25	ASTM A106, A179, A192, A210, A213, A335, EN 10216-2, DIN 17175

List of Standards and Ranges for Process & Power Generation

Specification	O.D (mm)	W.T (mm)	Steel Grade
Carbon and alloyed steel			
DIN EN 10216-2 Seamless steel tubes for pressure purposes; Non-alloy and alloy steel tubes with specified elevated temperature properties	16 - 177.8	1.8 - 30	St.45.8, St35.8, 17Mn5, 19Mn5, 15Mo3, 16Mo3, 13CrMo4-5, P235GH, P265GH
ASTM A106/A106M Carbon Steel seamless pipe for high temperature service	17.1 - 177.8	1.65 - 28.58	Gr.A, Gr.B, Gr.C
ASTM A210/A210M Seamless Medium-Carbon Steel Boiler & Superheater Tubes	19.05 - 127	2.11 - 12.7	Gr. A-1, Gr.C
ASTM A179 Seamless Cold-Drawn Low-Carbon Steel Heat-Exchanger & Condenser Tubes	15.88 - 88.9	1.65 - 7.62	Low carbon steel
ASTM A192 Seamless Carbon Steel Boiler Tubes for High-Pressure Service	19.05 - 114.3	2.11 - 11.53	Low carbon steel
DIN 17175 Seamless Tubes of Heat resistant Steels / SUPERSEDE BY DIN EN 10216-2	10 - 177.8	1.8 - 30	St 35.8, St 45.8, 15Mo3, 13CrMo4-4
Alloy steel			
ASTM A335/A335M Seamless Ferritic Alloy Steel Pipe for High-Temperature Service	42.2 - 177.8	On Request	P5, P9, P11, P12, P22, P91 and others
ASTM A213/ASME SA213 Seamless Ferritic and Austenitic Alloy Steel Boiler, Superheater and Heat-Exchanger Tubes.	20.6 - 127	2.87 - 12.7	T5, T9, T22, T91
Low temperature service			
DIN EN 10216-4 Seamless steel tubes for pressure purposes; Non-alloy and alloy steel tubes with specified low temperature properties	16 - 177.8	1.8 - 30	P215NL; P265NL
ASTM A333 Seamless and Welded Carbon Steel Pipe for Low-Temperature Service (only seamless for ILJIN)	17.1 - 177.8	1.65 - 30	Grade 1; Grade 6
ASTM A334 Seamless and Welded Carbon and Alloy Steel Tubes for Low-Temperature Service (only seamless for ILJIN)	17.1 - 177.8	1.65 - 30	Grade 1; Grade 6

Mechanical Properties acc. to ASTM A213 & A335 Grade

Steel Grade	Tensile testing at room temperature			Impact Strength
	Yield Strength MPa, Min.	Tensile Strength MPa, Min.	Elongation A% Min.	Average value J, Min
T11	170	415	30	-
T12	220	415	30	-
T22	205	415	30	-
T91	415	585	20	-
P12	220	415	22	35
P22	205	415	22	35
P91	415	585	20	35
P92	440	620	20	35

Chemical Composition % acc. to ASTM A213 & A335 Grade

Steel Grade	C	Mn	P max	S max	Si	Cr	Mo	Ni max	V	Nb	N	Al max	Ti max	others
T11	0.05 ~0.15	0.30 ~0.60	0.025	0.025	0.50 ~1.00	1.00 ~1.50	0.44 ~0.65							
T12	0.05 ~0.15	0.30 ~0.60	0.025	0.025	0.50 max	0.80 ~1.25	0.44 ~0.65							
T22	0.05 ~0.15	0.30 ~0.60	0.025	0.025	0.50 max	1.90 ~2.60	0.87 ~1.13							
T91	0.07 ~0.14	0.30 ~0.60	0.020	0.010	0.20 ~0.50	8.00 ~9.50	0.85 ~1.05	0.40	0.18 ~0.25	0.06 ~0.10	0.030 ~0.07	0.020	0.01	Zr 0.01 max
P12	0.05 ~0.15	0.30 ~0.60	0.025	0.025	0.50 max	0.80 ~1.25	0.44 ~0.65							
P22	0.05 ~0.15	0.30 ~0.60	0.025	0.025	0.50 max	1.90 ~2.60	0.87 ~1.13	0.40						
P91	0.08 ~0.12	0.30 ~0.60	0.020	0.010	0.20 ~0.50	8.00 ~9.50	0.85 ~1.05	0.40	0.18 ~0.25	0.06 ~0.10	0.030 ~0.07	0.020	0.01	Cb 0.06 ~ 0.10 Zr 0.01 max
P92	0.07 ~0.13	0.30 ~0.60	0.020	0.010	0.50 max	8.50 ~9.50	0.30 ~0.60	0.40	0.15 ~0.25	0.04 ~0.09	0.030 ~0.07	0.020	0.01	Cb 0.04 - 0.09 W 1.50 - 2.00 B 0.001 - 0.006 Zr 0.01 max

Correlation Between EN and ASTM Grades

EN	ASTM					
EN 10216-2	A106	A179	A192	A210	A213	A335
P195GH	Grade A	low carbon	low carbon			
P265GH	Grade B			Grade A1		
	Garde C			Grade C		
13CrMo4-5					T12	P12
10CrMo9-10					T22	P22
X10CrMoVNb9-1					T91	P91
X10CrWMoVNb9-2					T92	P92

Dimensional Range acc. to ASTM 106

OD	Wall Thickness, mm																			
mm	2.0	3.0	3.5	4.0	4.5	5.0	5.6	6.3	7.1	8.0	8.0	10.0	11.0	12.5	14.2	16.0	17.5	20.0	22.2	25.0
21.3	■	■	■																	
26.7	■	■	■	■																
33.4		■	■	■	■															
42.4		■	■	■	■	■	■	■	■	■	■	■								
44.5		■	■	■	■	■	■	■	■	■	■	■	■							
48.3		■	■	■	■	■	■	■	■	■	■	■	■	■						
51.0		■	■	■	■	■	■	■	■	■	■	■	■	■						
54.3		■	■	■	■	■	■	■	■	■	■	■	■	■						
57.0		■	■	■	■	■	■	■	■	■	■	■	■	■	■					
60.3		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
63.5		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
70.0		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
73.0		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
76.1				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
82.5				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
88.9				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
101.6				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
108.0				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
114.3				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
127.0						■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
133.0						■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
139.7							■	■	■	■	■	■	■	■	■	■	■	■	■	■
141.3							■	■	■	■	■	■	■	■	■	■	■	■	■	■
152.4							■	■	■	■	■	■	■	■	■	■	■	■	■	■
159.0							■	■	■	■	■	■	■	■	■	■	■	■	■	■
168.3								■	■	■	■	■	■	■	■	■	■	■	■	■
177.8								■	■	■	■	■	■	■	■	■	■	■	■	■