



ArcelorMittal

Seamless
Structural Mechanical
Pipe Brochure

Structural

Seamless hot rolled circular hollow sections are used in applications where the important factors are high strength, light weight, high stress resistance and optimum weldability together with good impact toughness at low temperature (-50°C).

Segment	Norm	Classification	Grades
Structural Onshore	EN 10210-1	SHS of non-alloy quality steels	S235JRH/ S275JOH/ S275J2H/ S355JOH/ S355J2H/ S355K2H
		SHS of fine grain steels	S275NLH/ S275NLH/ S355NH/ S355HLH/ S420NH/ S420NLH/ S460NH/ S460NLH
Structural Offshore	EN 10225	Weldable structural steels for fixed offshore structures	S355G1+N/ S355G14+N/ S355G15+N/ S355G14+QT/ S355G15+QT

Chemistry

Grade	C	Mn	Si	P	S	Cr	Ni	Cu	Al	V	Mo	Ti	Nb	N	CE
	max	max	max	max	max	max	max	max	min	max	max	max	max	max	max
S235JRH	0,17	1,40		0,040	0,040									0,009	0.37 (0.39 WT>16)
S275JOH	0,20	1,50		0,035	0,035									0,009	0.41 (0.43 WT>16)
S275J2H	0,20	1,50		0,030	0,030				0,020						0.41 (0.43 WT>16)
S355JOH	0,22	1,60	0,55	0,035	0,035									0,009	0.45 (0.47 WT>16)
S355J2H	0,22	1,60	0,55	0,030	0,030				0,020						0.45 (0.47 WT>16)
S355K2H	0,22	1,60	0,55	0,030	0,030				0,020						0.45 (0.47 WT>16)
S275NLH	0,20	0.50-1.40	0,40	0,035	0,030	0,30	0,30	0,35	0,020	0,08	0,10	0,03	0,05	0,015	0,40
S275NLH	0,20	0.50-1.40	0,40	0,030	0,025	0,30	0,30	0,35	0,020	0,08	0,10	0,03	0,05	0,015	0,40
S355NH	0,20	0.90-1.65	0,5	0,035	0,030	0,30	0,50	0,35	0,020	0,12	0,10	0,03	0,05	0,020	0.43 (0.45 WT>16)
S355NLH	0,18	0.90-1.65	0,50	0,030	0,025	0,30	0,50	0,35	0,020	0,12	0,10	0,03	0,05	0,02	0.43 (0.45 WT>16)
S420NH	0,22	1,00-1,70	0,6	0,035	0,03	0,3	0,8	0,7	0,02	0,2	0,1	0,03	0,05	0,025	0.50 (0.52 WT>16)
S420NLH	0,22	1,00-1,70	0,6	0,03	0,025	0,3	0,8	0,7	0,02	0,2	0,1	0,03	0,05	0,025	0.50 (0.52 WT>16)
S460NH	0,22	1,00-1,70	0,6	0,035	0,03	0,3	0,8	0,7	0,02	0,2	0,1	0,03	0,05	0,025	0.53 (0.55 WT>16)
S460NLH	0,22	1,00-1,70	0,6	0,03	0,025	0,3	0,8	0,7	0,02	0,2	0,1	0,03	0,05	0,025	0.53 (0.55 WT>16)

Grade	C	Mn	Si	P	S	Cr	Ni	Cu	Al	V	Mo	Ti	Nb	N	CE
	max	max	max	max	max	max	max	max	min	max	max	max	max	max	max
S355G1+N ^a	0,20	0.90-1.65	0,50	0,035	0,030	0,30	0,50	0,35	0,02	0,12	0,10	0,03	0,05	0,015	
S355G14+N ^{b,c}	0,18	1,60	0.15-0.55	0,025	0,010	0,25	0,30	0,35	max 0.06	0,10	0,08	0,02	0,05	0,014	
S355G15+N ^{b,c}	0,18	1,60	0.15-0.55	0,025	0,007	0,25	0,30	0,35	max 0.06	0,10	0,08	0,02	0,05	0,014	0,43
S355G14+QT ^{b,c}	0,18	1,60	0.15-0.55	0,025	0,010	0,25	0,30	0,35	max 0.06	0,10	0,08	0,02	0,05	0,014	
S355G15+QT ^{b,c}	0,18	1,60	0.15-0.55	0,025	0,007	0,25	0,30	0,35	max 0.06	0,10	0,08	0,02	0,05	0,014	0,43

^a Al:N=min 2

^b Nb+V+Ti max = 0.12

^c B max=0.0005; As max=0.02; Pb, Bi, Sb max=0.01; Al:N=min 2

Mechanical Properties

Grade	ReH (YS up) min - t mm			Rm (TS) min - t mm		Elongation (A) % - t mm	
	t≤16	16<t≤40	40<t≤50	t≤3	3<t≤50	t≤40	40<t≤50
S235JRH	235,00	225,00	215,00	360 - 510	360 - 510	26 (24)	25 (24)
S275JOH/J2H	275,00	265,00	255,00	430 - 580	410 - 560	23 (22)	22 (21)
S355JOH/J2H/K2H	355,00	345,00	335,00	510 - 680	470 - 630	22 (20)	21 (20)
Grade	t≤16	16<t≤40	40<t≤50	t≤65		t≤65	
S275NH/NLH	275	265	255	360 - 510		24 (22)	
S355NH/NLH	355	345	335	470 - 630		22 (20)	
S420NH/NLH	420	400	390	520 - 680		19 (17)	
S460NH/NLH	460	440	430	540 - 720		17 (15)	

	Min impact energy KV IJ			
	-50°C	-20°C	0°C	20°C
JRH				27
JOH			27	
J2H		27		
K2H		40		
NH		40		
NLH	27			

Grade	ReH (YS up) min		Rm (TS) min	Elongation (A) %	ReH/Rm max	Min Impact Energy J	
	t≤20	20<t≤40				Temp°C	Energy J
S355G1+N	355	345	470 - 630	22	0,88	-20	50
S355G14+N/+QT	355	345	460 - 620	22	0,88	-40	50
S355G15+N/+QT	355	345	460 - 620	22	0,88	-40	50

Mechanical

Hot rolled seamless tubes used in mechanical engineering are required to sustain high stress levels and have good impact toughness. The tubes are delivered in As Rolled, normalized, or Q&T condition, depending on the application. They are characterized by a heavier wall thickness, tight dimensional tolerances, good weldability and machinability.

Segment	Norm	Classification	Grades
Mechanical Engineering	EN 10297-1	Non-alloy quality steels Alloy quality steels Alloy special steels	E235/ E275/ E315/ E355/ E470/ E275K2/ E420J2 E355K2 34CrMo4

Chemistry

Grade	C	Mn	Si	P	S	Cr	Ni	Cu	Al	V	Mo	Ti	Nb	N
	max	max	max	max	max	max	max	max	min	max	max	max	max	max
E235	0,17	1,20	0,35	0,03	0,04									
E275	0,21	1,40	0,35	0,03	0,04									
E315	0,21	1,50	0,30	0,03	0,04									
E355	0,22	1,60	0,55	0,03	0,04									
E275K2	0,20	0,50-1,40	0,40	0,03	0,03	0,30	0,30	0,35	0,02	0,05	0,10	0,03	0,05	0,015
E355K2	0,20	0,90-1,65	0,50	0,03	0,03	0,30	0,50	0,30	0,02	0,12	0,10	0,05	0,05	0,015
E470	0,16-0,22	1,30-1,70	0,10-0,50	0,03	0,04	-	-	-	0,01	0,08-0,15	-	-	0,07	-
E420J2 ^a	0,16-0,22	1,30-1,70	0,10-0,50	0,03	0,04	0,30	0,40	0,30	0,01	0,08-0,15	0,08	0,05	0,07	0,020
E4260K2 ^a	0,20	1,00-1,70	0,60	0,03	0,03	0,30	0,80	0,70	0,02	0,20	0,10	0,05	0,05	0,025
34CrMo4	0,30-0,37	0,60-0,90	0,40	0,04	0,04	0,90-1,20			0,02-0,05		0,15-0,30			

^a Nb+V=max 0.2

Mechanical Properties

Grade	ReH (YS up) min - t mm			Rm (TS) min - t mm			Elongation (A) % - t mm	
	t≤8	8<t≤20	20<t≤50	t≤16	16<t≤40	40<t≤50	long (trans)	
E235	235	225	215	360	360	360	25 (23)	
E275	275	265	255	410	410	410	22 (20)	
E275K2	275	265	255	410	410	410	22 (20)	
E315	315	305	295	450	450	450	21 (19)	
E355	355	345	335	490	490	490	20 (18)	
E355K2	355	345	335	490	490	470	20 (18)	
E420J2	420	400	390	600	560	530	19 (17)	
E460K2	460	440	430	550	550	550	19 (17)	
E470	470	430	-	650	600	-	17 (15)	
Grade	t≤8	8<t≤20	20<t≤50	t≤8	8<t≤20	20<t≤50	t≤8	8<t≤20
34CrMo4	800	650	550	1000	900	800	11 (9)	12 (10)

Grade	Min impact energy KV [J]		
	-20°C		Wall t
	Long	Trans	
E275K2	40	27	
E355K2	40	27	
E420J2	27	20	
34CrMo4	35		t≤8
	40	25	8<t≤20
	45	27	20<t≤50

Utilites

Pipes of this category can be used for the transport of liquids and gases in buildings, (e.g. sprinkler systems, heating systems, gas or water transportation) with various finishing conditions including Colour Coated for fire protection, gas or air conveyance, or Hot Dip Galvanized for water transportation. We offer Victaulic grooving and threaded and socketed ends. Our products are UL certified for fire defence applications.

Segment	Norm	Classification	Grades
Civil & Industrial Installations	EN 10216-1	Non-alloy steel tubes with specified room temperature properties	P195TR1/P195TR2/ P235TR1/ P235TR2/ P265TR1/ P265TR2
	EN 10255	Non-alloy steel tubes suitable for welding	S195T
	EN 10224	Non-alloy steel tubes and fittings for the conveyance of aqueous liquids	L235/ L275/ L355
	ASME/ASTM A53	Pipe, Steel, Black and Hot Dip, Zinc-Coated, Welded and Seamless	Gr. A/ Gr. B

Chemistry

Grade	C	Mn	Si	P	S	Cr	Ni	Cu	Al	V	Mo	Ti	Nb
	max	max	max	max	max	max	max	max	min	max	max	max	max
P195TR1 ^a	0,13	0,7	0,35	0,025	0,020	0,300	0,3	0,30		0,02	0,08	0,04	0,01
P195TR2 ^a	0,13	0,7	0,35	0,025	0,015	0,300	0,3	0,30	0,020	0,02	0,08	0,04	0,01
P235TR1 ^a	0,16	1,2	0,35	0,025	0,020	0,300	0,3	0,30		0,02	0,08	0,04	0,01
P235TR2 ^a	0,16	1,2	0,35	0,025	0,015	0,300	0,3	0,30	0,020	0,02	0,08	0,04	0,01
P265TR1 ^a	0,2	1,4	0,4	0,025	0,020	0,300	0,3	0,30		0,02	0,08	0,04	0,01
P265TR2 ^a	0,2	1,4	0,4	0,025	0,015	0,300	0,3	0,30	0,020	0,02	0,08	0,04	0,01
L235	0,16	1,2	0,35	0,030	0,025								
L275	0,2	1,4	0,4	0,030	0,025								
L355	0,22	1,6	0,55	0,030	0,025								
S195T	0,2	1,4		0,035	0,030								
Gr A	0,25	0,95		0,050	0,045	0,400	0,4	0,40		0,08	0,15		
Gr B	0,3	1,2		0,050	0,045	0,400	0,4	0,40		0,08	0,15		

^a (Cr+Cu+Mo+Ni)=max 0.70

Mechanical Properties

Grade	ReH (YS up) min - t mm			Rm (TS) min - t mm	Elongation (A) % - t mm
	t≤16	16<t≤40	40<t≤50	t≤16	long (trans)
P195TR1/TR2	195	185	175	320 - 440	27 (25)
P235TR1/TR2	235	225	215	360 - 500	25 (23)
P265TR1/TR2	265	255	245	410 - 570	21 (19)

Grade	ReH (YS up) min - t mm		Rm (TS) min - t mm	Elongation (A) % - t mm
	t≤16	16<t≤40	t≤16	long (trans)
L235	235	225	360-500	25 (23)
L275	275	265	430-570	21 (19)
L355	355	345	500-650	21 (19)

Grade	Min impact energy KV [J]		
	Long		Trans
	0°C	-10°C	0°C
P195TR2	40	28	27
P235TR2	40	28	27
P265TR2	40	28	27

Grade	YS min	TS min
Gr.A	205	330
Gr.B	240	415

Grade	ReH (YS up) min	Rm (TS) min	Elongation (A) %
S195T	195	320 - 520	20

Galvanizing acc. to EN 10240: A1, A2, A3, B1, B2, B3/ EN ISO 1461/ ASTM A53



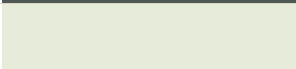
OD (mm)	WT (mm)										
	2,0	2,3	2,6	2,9	3,2	3,6	4,0	4,5	5,0	5,4	6,0
17,2											
21,3											
26,9											
33,7											
42,4											
48,3											
60,3											
63,0											
76,1											
88,9											
101,6											
108,0											
114,3											
133,0											
139,7											
159,0											
168,3											

Colour coating capabilities

Colour type	Water born, anti-corrosive primer, both acrylic and melamine possible
OD range	17.2 - 219.1 mm
WT range	1.8 - 6.3 mm
Length	3 - 7 m

Ends finishing	OD [mm]	WT [mm]	Length [m]
Victaulic end grooving	26.9- 219	1.7 - 8	3 to 14
Threaded and socketed	17.2 - 114.3	2.0 - 6.3	3 to 7

Colours

AM RED +NCS S 3060Y70R	
Brown red RAL 3011	
Signal blue RAL 5005	
Moss green RAL 6005	
Silver grey RAL 7001	
Basalt grey RAL 7012	
Grey white RAL 9002	

General Conditions

Dimensional tolerances - as per relevant standards

Stricter tolerances may be available on enquiry.

Material Condition

+AR (as rolled), +N (normalized), Q (quenched), Q+T (quenched and tempered).

Testing & Inspection

Certification to EN 10204 with 2.1, 2.2, 3.1 or 3.2 as per customer requirement. All the standard testing : tensile, bend, flattening, hardness, hardenability, impact testing (from +20°C to -50°C), cast & product analysis, leak tightness test, as well as NDT such as Eddy Current, Flux Leakage, MPI & Ultrasonic testing.

Delivery Condition

Ends square cut or bevelled according to API 5L, ASME B16.25, DIN 2559, ASTM A106 par. 19.1.2. Plastic end caps where required.

Pipe lengths cut to specific tolerances (upon request)

Pipes for utilities we can be offer with grooved ends (Victaulic G-103 Specification) or threaded and socketed ends acc. to EN 10226-1.

Surface preparation: Black, Hot Dip Galvanized (acc. to EN 10240-A.1) or Colour Coated.

Marking & Packing

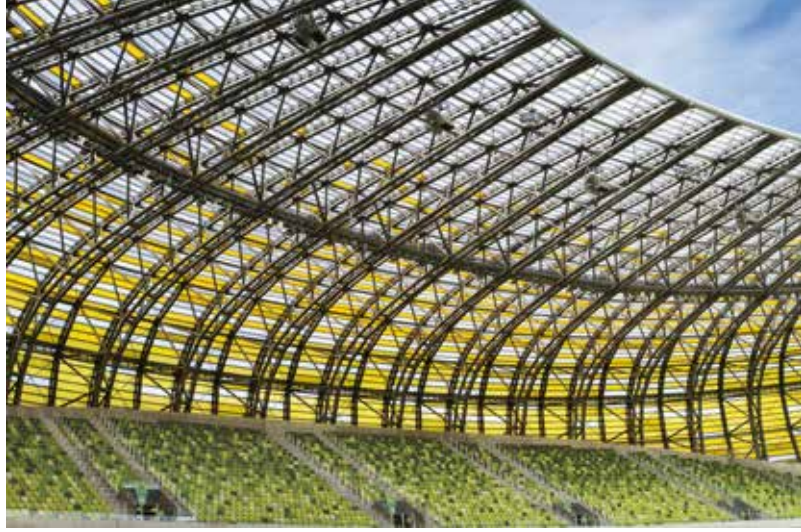
Marking by paint or low stress stamping as per the Standard or the customer's request.

Pipes can be bundled or loose depending on size.

Qualification & Certification

According to the European Directives: CPD & PED

We are certified by TÜV NORD EN ISO 9001 & 14001, TÜV NORD BS OHSAS 18001, TUV CE 0408, AD 2000 WO / W4/ W10, Bureau Veritas & Lloyd's Register, DNV & UL for fire defence systems



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