

Delivery conditions

Tolerances on shape and dimensions of hot rolled steel sheet piles according to EN 10248 (reduced tolerances on request)

Tolerances	AU, PU, PU-R, GU	AZ, AZ-R	AS 500	HZM
Mass ¹⁾	±5%	±5%	±5%	±5%
Length (L)	± 200 mm	± 200 mm	± 200 mm	± 200 mm
Height (h)	h > 200 mm: ±5 mm	h ≥ 300 mm: ±7 mm	-	h ≥ 500 mm: ±7 mm
Thicknesses (t,s)	t, s ≤ 8.5 mm: ± 0.5 mm	t, s ≤ 8.5 mm: ± 0.5 mm	t > 8.5 mm: ± 6%	t, s ≤ 12.5 mm: -1.0 mm / +2.0 mm
	t, s > 8.5 mm: ± 6%	t, s > 8.5 mm: ± 6%		t, s > 12.5 mm: -1.5 mm / +2.5 mm
Width single pile (b)	± 2% b	± 2% b	± 2% b	± 2% b
Width double pile	± 3% b	± 3% b	± 3% b	± 3% b
Straightness (q)	≤ 0.2% L	≤ 0.2% L	≤ 0.2% L	≤ 0.2% L
Ends out of square	± 2% b	± 2% b	± 2% b	± 2% b

¹⁾ From the mass of the total delivery.

Maximum rolling lengths (longer sections available on request)

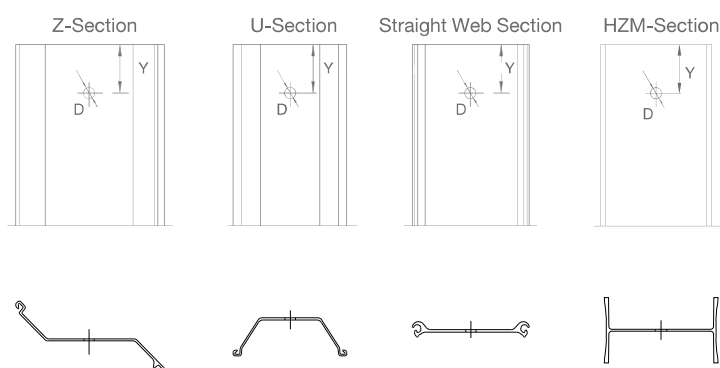
Section	AZ	AZ-R	AU, PU	PU-R	GU sp ¹⁾	GU dp ¹⁾	AS 500	HZM	RH / RZ	OMEGA 18	C9 / C14	DELTA 13
Length [m]	31	24	31	24	24	22	31	33	24	16	18	17

¹⁾ sp = single pile, dp = double pile

Handling holes

Sheet pile sections are normally supplied without handling holes. If requested, they can be provided with handling holes in the centerline of the section. The standard handling hole dimensions are as follows:

Diameter D [mm]	40	40	50	50	63.5	40
Distance Y [mm]	75	300	200	250	230	150
Diameter D [in]	2.5					
Distance Y [in]	9					



Markings

The following markings can be supplied on request:

- Colour marks defining section, length and steel grade.
- Adhesive stickers showing the customer's name, destination, order number, type and length of profile and steel grade.



Steel grades of sheet pile sections

AZ, AZ-R, AU, PU, PU-R, AS and HZM sections are delivered in the steel grades based on EN 10248-1 mentioned below.

GU sections: available up to S 320 GP, please contact us for S 355 GP.

Steel grade EN 10248	Min. yield strength R_{eH} MPa	Min. tensile strength R_m MPa	Min. elongation $L_0=5.65\sqrt{S_0}$ %	Chemical composition (% max)					
				C	Mn	Si	P	S	N
S 240 GP	240	340	26	0.25	–	–	0.055	0.055	0.011
S 270 GP	270	410	24	0.27	–	–	0.055	0.055	0.011
S 320 GP	320	440	23	0.27	1.70	0.60	0.055	0.055	0.011
S 355 GP	355	480	22	0.27	1.70	0.60	0.055	0.055	0.011
S 390 GP	390	490	20	0.27	1.70	0.60	0.050	0.050	0.011
S 430 GP	430	510	19	0.27	1.70	0.60	0.050	0.050	0.011

ArcelorMittal mill specification

S 460 AP	460	550	17	0.27	1.70	0.60	0.050	0.050	0.011
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Materials to other specifications including S 460 AP, A 572 Gr. 65 as well as special steels with improved corrosion resistance (**ASTM A 690**), or copper addition in accordance with EN 10248 Part 1 Chapter 10.4 can be supplied on request.

A modified grade A 690 with higher yield strength is also available upon request.

Galvanisation has an influence on the chemical composition of the steel and must therefore be specified in the purchase orders.

We strongly recommend informing us of all surface treatment to be applied to the product when placing orders.

Europe	EN 10248	S 270 GP	S 320 GP	S 355 GP	S 390 GP	S 430 GP	S 460 AP ¹⁾
USA	ASTM	A 328	–	A 572 Gr.50; A 690	A 572 Gr.55	A 572 Gr. 60	A 572 Gr. 65
Canada	CSA	Gr. 260 W	Gr. 300 W	Gr. 350 W	Gr. 400 W	–	–
Japan	JIS	SY 295	–	–	SY 390	–	–

¹⁾ ArcelorMittal mill specification.

New berthing facility, Ireland



Geometric tolerances of tubular piles

Tolerance on pile length: +/- 200 mm

Standard	Outside diameter D		Wall thickness t	Straightness	Out-of-roundness		Mass	Maximum weld bead height ¹⁾
EN 10219-2	+/- 1% +/- 10.0		+/- 10% +/- 2.0	0.20% of total length	+/- 2%		+/- 6%	t ≤ 14.2: 3.5 t > 14.2: 4.8
API 5L ISO 3183	≤ 1422	+/- 0.5% ≤ 4.0	< 15.0: +/- 10% ≥ 15.0: +/- 1.5	0.20% of total length	D/t ≤ 75 D < 1422	+/- 1.5% ≤ 15.0	+ 10% - 3.5%	t ≤ 13.0: 3.5 t > 13.0: 4.5
	> 1422	as agreed			Else	as agreed		

¹⁾ Tolerance on height of external weld bead for submerged arc-welded hollow sections.
Note: values in "mm" except where specified

Steel grades of tubular pile

Steel grade EN 10219-1	Min. yield strength R _{eH} (t ≤ 16 mm) MPa	Min. yield strength R _{eH} (16 < t ≤ 40 mm) MPa	Min. ultimate tensile strength R _m (3 ≤ t ≤ 40 mm) MPa	Min. elongation L ₀ (t ≤ 40 mm) %	Chemical composition (% max)						
					C	Mn	P	S	Si	N	CEV (t ≤ 20 mm)
S 235 JRH	235	225	340-470	24	0.17	1.40	0.040	0.040	-	0.009	0.35
S 275 JOH	275	265	410-560	20	0.20	1.50	0.035	0.035	-	0.009	0.40
S 355 JOH	355	345	490-630	20	0.22	1.60	0.035	0.035	0.55	0.009	0.45
S 420 MH	420	400	500-660	19	0.16	1.70	0.035	0.030	0.50	0.020	0.43
S 460 MH	460	440	530-720	17	0.16	1.70	0.035	0.030	0.60	0.025	-

Steel grade API 5L ¹⁾	Min. yield strength R _{eH} MPa	Min. ultimate tensile strength R _m MPa	Min. elongation ²⁾ %	Chemical composition for PSL 1 pipe with t ≤ 25.0 mm ⁴⁾ (% max)			
				C ³⁾	Mn ³⁾	P	S
L 245 or B	245	415	23	0.26	1.20	0.030	0.030
L 290 or X 42	290	415	23	0.26	1.30	0.030	0.030
L 320 or X 46	320	435	22	0.26	1.40	0.030	0.030
L 360 or X 52	360	460	21	0.26	1.40	0.030	0.030
L 390 or X 56	390	490	19	0.26	1.40	0.030	0.030
L 415 or X 60	415	520	18	0.26 ⁵⁾	1.40 ⁵⁾	0.030	0.030
L 450 or X 65	450	535	18	0.26 ⁵⁾	1.45 ⁵⁾	0.030	0.030
L 485 or X 70	485	570	17	0.26 ⁵⁾	1.65 ⁵⁾	0.030	0.030

¹⁾ API 5L (2007): American Petroleum Institute / ISO 3183 (2007). PSL: Product Specification Level.

²⁾ Minimum elongation: depends on tensile test piece cross-sectional area.

³⁾ For each reduction of 0.01% below the specified max C concentration, an increase of 0.05% above the specified max Mn concentration is permissible, up to a max of 1.65% for grades L245/B to L360/X52, 1.75% for L390/X56 to L450/X65 and 2.00% for L485/X70.

⁴⁾ 0.50% max for Cu, 0.50% max for Ni, 0.50% max for Cr, 0.15% max for Mb.

⁵⁾ Unless otherwise agreed.



Tubular pile mill, Dintelmond, Netherlands