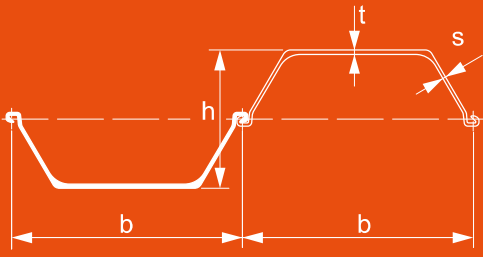


U-Sections



The advantages of U-sections include:

- a wide range of sections forming several series with various geometrical characteristics, allowing a technically and economically optimal choice for each specific project;
- the combination of great profile depth with large flange thickness giving excellent mechanical properties;
- the symmetrical form of the single element has made these sheet piles particularly convenient for re-use;
- the possibility of assembling and crimping the piles into pairs at the mill improves installation quality and performance;
- easy fixing of tie-rods and swivelling attachments, even under water;
- great corrosion resistance, with the steel section being thickest at the critical corrosion points.

Section	Width		Height		Thickness		Sectional area cm ² /m	Mass		Moment of inertia cm ⁴ /m	Elastic section modulus cm ³ /m	Static moment cm ³ /m	Plastic section modulus cm ³ /m	Class ¹⁾							
	b mm	h mm	t mm	s mm	single pile kg/m	wall kg/m ²		S 240 GP	S 270 GP					S 320 GP	S 355 GP	S 390 GP	S 430 GP	S 460 AP			
AUTM sections																					
AU 14	750	408	10.0	8.3	132	77.9	104	28680	1405	820	1663	2	2	3	3	3	3	3			
AU 16	750	411	11.5	9.3	147	86.3	115	32850	1600	935	1891	2	2	2	2	2	3	3			
AU 18	750	441	10.5	9.1	150	88.5	118	39300	1780	1030	2082	2	3	3	3	3	3	3			
AU 20	750	444	12.0	10.0	165	96.9	129	44440	2000	1155	2339	2	2	2	3	3	3	3			
AU 23	750	447	13.0	9.5	173	102.1	136	50700	2270	1285	2600	2	2	2	3	3	3	3			
AU 25	750	450	14.5	10.2	188	110.4	147	56240	2500	1420	2866	2	2	2	2	2	3	3			
PU[®] sections																					
PU 12	600	360	9.8	9.0	140	66.1	110	21600	1200	715	1457	-	-	-	2	2	2	3			
PU 12S	600	360	10.0	10.0	151	71.0	118	22660	1260	755	1543	-	-	-	2	2	2	2			
PU 18 ⁻¹	600	430	10.2	8.4	154	72.6	121	35950	1670	980	1988	2	2	2	2	2	3	3			
PU 18	600	430	11.2	9.0	163	76.9	128	38650	1800	1055	2134	2	2	2	2	2	2	2			
PU 18 ⁺¹	600	430	12.2	9.5	172	81.1	135	41320	1920	1125	2280	2	2	2	2	2	2	2			
PU 22 ⁻¹	600	450	11.1	9.0	174	81.9	137	46380	2060	1195	2422	2	2	2	2	2	3	3			
PU 22	600	450	12.1	9.5	183	86.1	144	49460	2200	1275	2580	2	2	2	2	2	2	2			
PU 22 ⁺¹	600	450	13.1	10.0	192	90.4	151	52510	2335	1355	2735	2	2	2	2	2	2	2			
PU 28 ⁻¹	600	452	14.2	9.7	207	97.4	162	60580	2680	1525	3087	2	2	2	2	2	2	2			
PU 28	600	454	15.2	10.1	216	101.8	170	64460	2840	1620	3269	2	2	2	2	2	2	2			
PU 28 ⁺¹	600	456	16.2	10.5	226	106.2	177	68380	3000	1710	3450	2	2	2	2	2	2	2			
PU 32 ⁻¹	600	452	18.5	10.6	233	109.9	183	69210	3065	1745	3525	2	2	2	2	2	2	2			
PU 32	600	452	19.5	11.0	242	114.1	190	72320	3200	1825	3687	2	2	2	2	2	2	2			
PU 32 ⁺¹	600	452	20.5	11.4	251	118.4	197	75410	3340	1905	3845	2	2	2	2	2	2	2			
GU[®] sections																					
GU 6N	600	309	6.0	6.0	89	41.9	70	9670	625	375	765	3	3	3	4	4	4	4			
GU 7N	600	310	6.5	6.4	94	44.1	74	10450	675	400	825	3	3	3	3	3	4	4			
GU 7S	600	311	7.2	6.9	98	46.3	77	11540	740	440	900	2	2	3	3	3	3	3			
GU 7HWS	600	312	7.3	6.9	101	47.4	79	11620	745	445	910	2	2	3	3	3	3	3			
GU 8N	600	312	7.5	7.1	103	48.5	81	12010	770	460	935	2	2	3	3	3	3	3			
GU 8S	600	313	8.0	7.5	108	50.8	85	12800	820	490	995	2	2	2	3	3	3	3			

Section	Width	Height	Thickness		Sectional area	Mass		Moment of inertia	Elastic section modulus	Static moment	Plastic section modulus	Class ¹⁾																					
			b	h		t	s					cm ² /m	single pile	wall	cm ⁴ /m	cm ³ /m	cm ³ /m	cm ³ /m	S 240 GP	S 270 GP	S 320 GP	S 355 GP	S 390 GP	S 430 GP	S 460 AP								
GU® sections																																	
GU 10N	600	316	9.0	6.8	118	55.8	93	15700	995	565	1160	2	2	3	3	3	3	3	3	3	3												
GU 11N	600	318	10.0	7.4	128	60.2	100	17450	1095	630	1280	2	2	2	2	3	3	3	3	3	3												
GU 12N	600	320	11.0	8.0	137	64.6	108	19220	1200	690	1400	2	2	2	2	2	2	2	2	2	3												
GU 13N	600	418	9.0	7.4	127	59.9	100	26590	1270	755	1535	2	2	2	2	2	2	3	3	3	3												
GU 14N	600	420	10.0	8.0	136	64.3	107	29410	1400	830	1685	2	2	2	2	2	2	2	2	2	2												
GU 15N	600	422	11.0	8.6	146	68.7	115	32260	1530	910	1840	2	2	2	2	2	2	2	2	2	2												
GU 16N	600	430	10.2	8.4	154	72.6	121	35950	1670	980	1988	2	2	2	2	2	3	3	3	3	3												
GU 18N	600	430	11.2	9.0	163	76.9	128	38650	1800	1055	2134	2	2	2	2	2	2	2	2	2	2												
GU 20N	600	430	12.2	9.5	172	81.1	135	41320	1920	1125	2280	2	2	2	2	2	2	2	2	2	2												
GU 21N	600	450	11.1	9.0	174	81.9	137	46380	2060	1195	2422	2	2	2	2	2	3	3	3	3	3												
GU 22N	600	450	12.1	9.5	183	86.1	144	49460	2200	1275	2580	2	2	2	2	2	2	2	2	2	2												
GU 23N	600	450	13.1	10.0	192	90.4	151	52510	2335	1355	2735	2	2	2	2	2	2	2	2	2	2												
GU 27N	600	452	14.2	9.7	207	97.4	162	60580	2680	1525	3087	2	2	2	2	2	2	2	2	2	2												
GU 28N	600	454	15.2	10.1	216	101.8	170	64460	2840	1620	3269	2	2	2	2	2	2	2	2	2	2												
GU 30N	600	456	16.2	10.5	226	106.2	177	68380	3000	1710	3450	2	2	2	2	2	2	2	2	2	2												
GU 31N	600	452	18.5	10.6	233	109.9	183	69210	3065	1745	3525	2	2	2	2	2	2	2	2	2	2												
GU 32N	600	452	19.5	11.0	242	114.1	190	72320	3200	1825	3687	2	2	2	2	2	2	2	2	2	2												
GU 33N	600	452	20.5	11.4	251	118.4	197	75410	3340	1905	3845	2	2	2	2	2	2	2	2	2	2												
GU 16-400	400	290	12.7	9.4	197	62.0	155	22580	1560	885	1815	2	2	2	2	2	2	2	2	2	–												
GU 18-400	400	292	15.0	9.7	221	69.3	173	26090	1785	1015	2080	2	2	2	2	2	2	2	2	2	–												

The moment of inertia and section moduli values given assume correct shear transfer across the interlock.

¹⁾ Classification according to EN 1993-5. Class 1 is obtained by verification of the rotation capacity for a class 2 cross-section.

A set of tables with all the data required for design in accordance with EN 1993-5 is available from our Technical Department.

PU® sections can be rolled-up or -down by 0.5 mm and 1.0 mm. Tailor made profiles can be rolled on request.

Characteristics – AU™ sections

A weight reduction of about 10% compared to the 600 mm PU series has been achieved by optimising the geometric dimensions. The increased width **allows faster installation**, reduces the amount of coating required, due to the smaller perimeter, and increases watertightness thanks to fewer interlocks per metre of wall. Despite their greater width, the driving energy required for AU piles is not higher, thanks to their smooth and open shape and the patented radii at the web/flange connection.

Characteristics – PU® sections

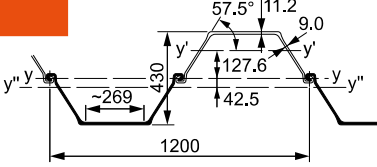
PU sections are 600 mm wide U-piles manufactured in Belval. The shapes of the **PU 18**, **PU 22** and **PU 28** have been engineered with "reinforced shoulders" yielding the optimum section geometry **for hard driving conditions** as well as **multiple re-use**. Re-using steel sheet piles drastically improves the environmental impact of a steel solution.

Characteristics – GU® sections

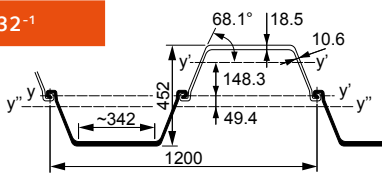
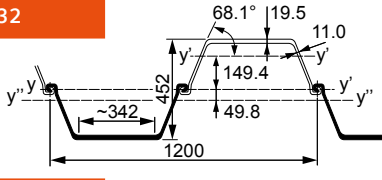
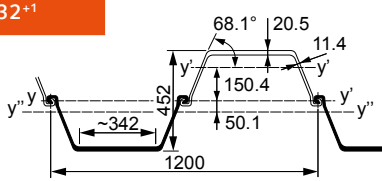
ArcelorMittal's rolling mill in Dabrowa, Poland, produces hot rolled U-shaped steel sheet piles. The rolling mill has extended their portfolio during the last years with following sections: GU 7N, GU 14N, GU 18N, GU 22N, GU 28N, GU 32N and, in 2017, the GU 11N range.

Section	S = Single pile D = Double pile T = Triple pile	Sectional area	Mass	Moment of inertia	Elastic section modulus	Radius of gyration	Coating area ¹⁾
AU™ sections							
AU 14 	Per S	99.2	77.9	6590	457	8.15	0.96
	Per D	198.5	155.8	43020	2110	14.73	1.91
	Per T	297.7	233.7	59550	2435	14.15	2.86
	Per m of wall	132.3	103.8	28680	1405	14.73	1.27
	AU 16 	Per S	109.9	86.3	7110	481	8.04
Per D		219.7	172.5	49280	2400	14.98	1.91
Per T		329.6	258.7	68080	2750	14.37	2.86
Per m of wall		146.5	115.0	32850	1600	14.98	1.27
AU 18 		Per S	112.7	88.5	8760	554	8.82
	Per D	225.5	177.0	58950	2670	16.17	2.00
	Per T	338.2	265.5	81520	3065	15.53	2.99
	Per m of wall	150.3	118.0	39300	1780	16.17	1.33
	AU 20 	Per S	123.4	96.9	9380	579	8.72
Per D		246.9	193.8	66660	3000	16.43	2.00
Per T		370.3	290.7	92010	3425	15.76	2.99
Per m of wall		164.6	129.2	44440	2000	16.43	1.33
AU 23 		Per S	130.1	102.1	9830	579	8.69
	Per D	260.1	204.2	76050	3405	17.10	2.04
	Per T	390.2	306.3	104680	3840	16.38	3.05
	Per m of wall	173.4	136.1	50700	2270	17.10	1.36
	AU 25 	Per S	140.6	110.4	10390	601	8.60
Per D		281.3	220.8	84370	3750	17.32	2.04
Per T		422.0	331.3	115950	4215	16.58	3.05
Per m of wall		187.5	147.2	56240	2500	17.32	1.36
PU® sections							
PU 12 	Per S	84.2	66.1	4500	370	7.31	0.80
	Per D	168.4	132.2	25920	1440	12.41	1.59
	Per T	252.6	198.3	36060	1690	11.95	2.38
	Per m of wall	140.0	110.1	21600	1200	12.41	1.32
	PU 12S 	Per S	90.5	71.0	4830	400	7.30
Per D		181.0	142.1	27190	1510	12.26	1.59
Per T		271.5	213.1	37860	1780	11.81	2.38
Per m of wall		150.8	118.4	22660	1260	12.26	1.32

¹⁾ One side, excluding inside of interlocks.

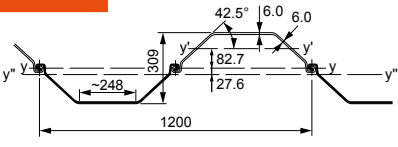
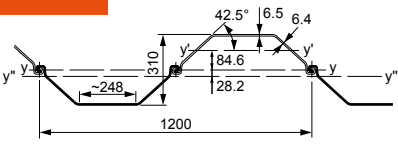
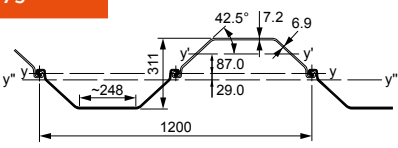
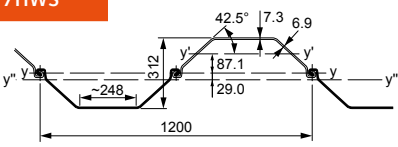
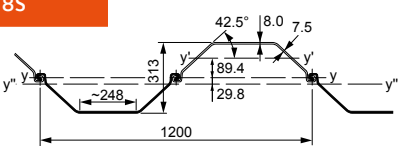
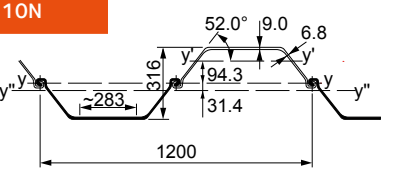
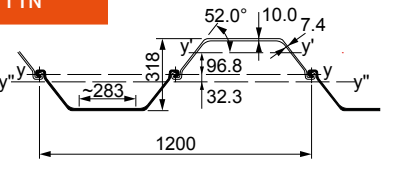
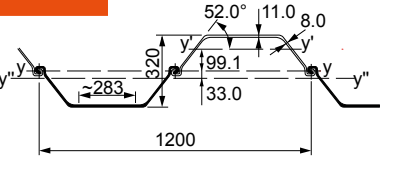
Section	S = Single pile D = Double pile T = Triple pile	Sectional area	Mass	Moment of inertia	Elastic section modulus	Radius of gyration	Coating area ¹⁾
PU® sections							
PU 18⁻¹ 	Per S	92.5	72.6	6960	475	8.67	0.87
	Per D	185.0	145.2	43140	2005	15.30	1.72
	Per T	277.5	217.8	59840	2330	14.69	2.58
	Per m of wall	154.2	121.0	35950	1670	15.30	1.43
PU 18 	Per S	98.0	76.9	7220	485	8.58	0.87
	Per D	196.0	153.8	46380	2160	15.38	1.72
	Per T	294.0	230.7	64240	2495	14.78	2.58
	Per m of wall	163.3	128.2	38650	1800	15.38	1.43
PU 18⁺¹ 	Per S	103.4	81.1	7480	495	8.51	0.87
	Per D	206.8	162.3	49580	2305	15.49	1.72
	Per T	310.2	243.5	68600	2655	14.87	2.58
	Per m of wall	172.3	135.2	41320	1920	15.49	1.43
PU 22⁻¹ 	Per S	104.3	81.9	8460	535	9.01	0.90
	Per D	208.7	163.8	55650	2475	16.33	1.79
	Per T	313.0	245.7	77020	2850	15.69	2.68
	Per m of wall	173.9	136.5	46380	2060	16.33	1.49
PU 22 	Per S	109.7	86.1	8740	546	8.93	0.90
	Per D	219.5	172.3	59360	2640	16.45	1.79
	Per T	329.2	258.4	82060	3025	15.79	2.68
	Per m of wall	182.9	143.6	49460	2200	16.45	1.49
PU 22⁺¹ 	Per S	115.2	90.4	9020	555	8.85	0.90
	Per D	230.4	180.9	63010	2800	16.54	1.79
	Per T	345.6	271.3	87020	3205	15.87	2.68
	Per m of wall	192.0	150.7	52510	2335	16.54	1.49
PU 28⁻¹ 	Per S	124.1	97.4	9740	576	8.86	0.93
	Per D	248.2	194.8	72700	3215	17.12	1.85
	Per T	372.3	292.2	100170	3645	16.40	2.77
	Per m of wall	206.8	162.3	60580	2680	17.12	1.54
PU 28 	Per S	129.7	101.8	10070	589	8.81	0.93
	Per D	259.4	203.6	77350	3405	17.27	1.85
	Per T	389.0	305.4	106490	3850	16.55	2.77
	Per m of wall	216.1	169.6	64460	2840	17.27	1.54
PU 28⁺¹ 	Per S	135.3	106.2	10400	600	8.77	0.93
	Per D	270.7	212.5	82060	3600	17.41	1.85
	Per T	406.0	318.7	112870	4060	16.67	2.77
	Per m of wall	225.6	177.1	68380	3000	17.41	1.54

¹⁾ One side, excluding inside of interlocks.

Section	S = Single pile D = Double pile T = Triple pile	Sectional area cm ²	Mass kg/m	Moment of inertia cm ⁴	Elastic section modulus cm ³	Radius of gyration cm	Coating area ¹⁾ m ² /m
PU[®] sections							
PU 32⁻¹ 	Per S	140.0	109.9	10740	625	8.76	0.92
	Per D	280.0	219.8	83050	3675	17.22	1.83
	Per T	420.0	329.7	114310	4150	16.50	2.74
	Per m of wall	233.3	183.2	69210	3065	17.22	1.52
	PU 32 	Per S	145.4	114.1	10950	633	8.68
Per D		290.8	228.3	86790	3840	17.28	1.83
Per T		436.2	342.4	119370	4330	16.54	2.74
Per m of wall		242.3	190.2	72320	3200	17.28	1.52
PU 32⁺¹ 		Per S	150.8	118.4	11150	640	8.60
	Per D	301.6	236.8	90490	4005	17.32	1.83
	Per T	452.4	355.2	124370	4505	16.58	2.74
	Per m of wall	251.3	197.3	75410	3340	17.32	1.52

¹⁾ One side, excluding inside of interlocks.

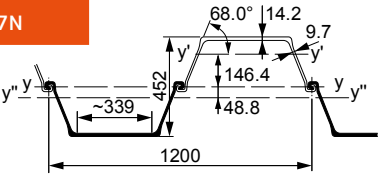
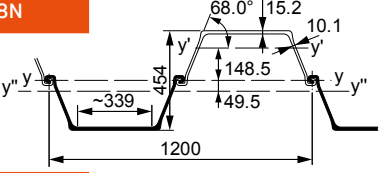
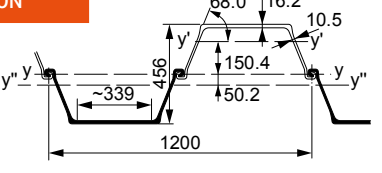
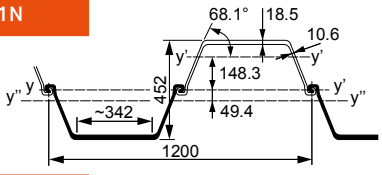
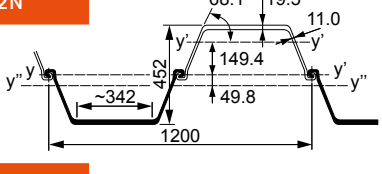
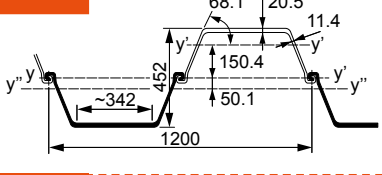
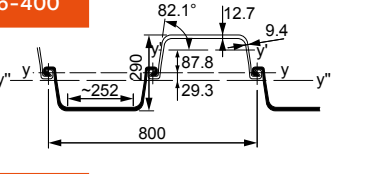
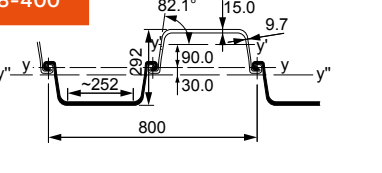


Section	S = Single pile D = Double pile T = Triple pile	Sectional area	Mass	Moment of inertia	Elastic section modulus	Radius of gyration	Coating area ¹⁾
GU® sections							
GU 6N							
	Per S	53.4	41.9	2160	215	6.36	0.76
	Per D	106.8	83.8	11610	750	10.43	1.51
	Per T	160.2	125.7	16200	890	10.06	2.26
	Per m of wall	89.0	69.9	9670	625	10.43	1.26
GU 7N							
	Per S	56.2	44.1	2250	220	6.33	0.76
	Per D	112.4	88.2	12540	810	10.56	1.51
	Per T	168.6	132.4	17470	955	10.18	2.26
	Per m of wall	93.7	73.5	10450	675	10.56	1.26
GU 7S							
	Per S	58.9	46.3	2370	225	6.35	0.76
	Per D	117.9	92.5	13850	890	10.84	1.51
	Per T	176.8	138.8	19260	1045	10.44	2.26
	Per m of wall	98.2	77.1	11540	740	10.84	1.26
GU 7HWS							
	Per S	60.4	47.4	2380	225	6.28	0.76
	Per D	120.9	94.9	13940	895	10.74	1.51
	Per T	181.3	142.3	19390	1050	10.34	2.26
	Per m of wall	100.7	79.1	11620	745	10.74	1.26
GU 8N							
	Per S	61.8	48.5	2420	225	6.26	0.76
	Per D	123.7	97.1	14420	925	10.80	1.51
	Per T	185.5	145.6	20030	1080	10.39	2.26
	Per m of wall	103.1	80.9	12010	770	10.80	1.26
GU 8S							
	Per S	64.7	50.8	2510	230	6.23	0.76
	Per D	129.3	101.5	15360	980	10.90	1.51
	Per T	194.0	152.3	21320	1145	10.48	2.26
	Per m of wall	107.8	84.6	12800	820	10.90	1.26
GU 10N							
	Per S	71.1	55.8	3100	270	6.60	0.78
	Per D	142.2	111.6	18840	1190	11.51	1.55
	Per T	213.3	167.4	26150	1380	11.07	2.32
	Per m of wall	118.5	93.0	15700	995	11.51	1.29
GU 11N							
	Per S	76.7	60.2	3280	280	6.53	0.78
	Per D	153.4	120.4	20930	1315	11.68	1.55
	Per T	230.1	180.7	29010	1515	11.23	2.32
	Per m of wall	127.9	100.4	17450	1095	11.68	1.29
GU 12N							
	Per S	82.3	64.6	3450	290	6.47	0.78
	Per D	164.7	129.3	23060	1440	11.83	1.55
	Per T	247.0	193.9	31890	1650	11.36	2.32
	Per m of wall	137.2	107.7	19220	1200	11.83	1.29

¹⁾ One side, excluding inside of interlocks.

Section	S = Single pile D = Double pile T = Triple pile	Sectional area	Mass	Moment of inertia	Elastic section modulus	Radius of gyration	Coating area ¹⁾
GU[®] sections							
GU 13N 	Per S	76.3	59.9	5440	395	8.44	0.85
	Per D	152.6	119.8	31900	1525	14.46	1.69
	Per T	228.9	179.7	44350	1785	13.92	2.53
	Per m of wall	127.2	99.8	26590	1270	14.46	1.41
GU 14N 	Per S	81.9	64.3	5750	410	8.38	0.85
	Per D	163.8	128.6	35290	1680	14.68	1.69
	Per T	245.6	192.8	48970	1955	14.12	2.53
	Per m of wall	136.5	107.1	29410	1400	14.68	1.41
GU 15N 	Per S	87.5	68.7	6070	425	8.33	0.85
	Per D	175.1	137.4	38710	1835	14.87	1.69
	Per T	262.6	206.2	53640	2130	14.29	2.53
	Per m of wall	145.9	114.5	32260	1530	14.87	1.41
GU 16N 	Per S	92.5	72.6	6960	475	8.67	0.87
	Per D	185.0	145.2	43140	2005	15.30	1.72
	Per T	277.5	217.8	59840	2330	14.69	2.58
	Per m of wall	154.2	121.0	35950	1670	15.30	1.43
GU 18N 	Per S	98.0	76.9	7220	485	8.58	0.87
	Per D	196.0	153.8	46380	2160	15.38	1.72
	Per T	294.0	230.7	64240	2495	14.78	2.58
	Per m of wall	163.3	128.2	38650	1800	15.38	1.43
GU 20N 	Per S	103.4	81.1	7480	495	8.51	0.87
	Per D	206.8	162.3	49580	2305	15.49	1.72
	Per T	310.2	243.5	68600	2655	14.87	2.58
	Per m of wall	172.3	135.2	41320	1920	15.49	1.43
GU 21N 	Per S	104.3	81.9	8460	535	9.01	0.90
	Per D	208.7	163.8	55650	2475	16.33	1.79
	Per T	313.0	245.7	77020	2850	15.69	2.68
	Per m of wall	173.9	136.5	46380	2060	16.33	1.49
GU 22N 	Per S	109.7	86.1	8740	546	8.93	0.90
	Per D	219.5	172.3	59360	2640	16.45	1.79
	Per T	329.2	258.4	82060	3025	15.79	2.68
	Per m of wall	182.9	143.6	49460	2200	16.45	1.49
GU 23N 	Per S	115.2	90.4	9020	555	8.85	0.90
	Per D	230.4	180.9	63010	2800	16.54	1.79
	Per T	345.6	271.3	87020	3205	15.87	2.68
	Per m of wall	192.0	150.7	52510	2335	16.54	1.49

¹⁾ One side, excluding inside of interlocks.

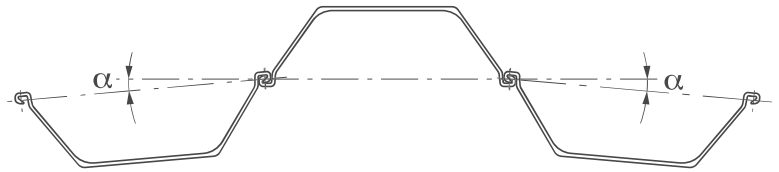
Section	S = Single pile D = Double pile T = Triple pile	Sectional area	Mass	Moment of inertia	Elastic section modulus	Radius of gyration	Coating area ¹⁾	
		cm ²	kg/m	cm ⁴	cm ³	cm	m ² /m	
GU[®] sections								
GU 27N		Per S	124.1	97.4	9740	576	8.86	0.93
		Per D	248.2	194.8	72700	3215	17.12	1.85
		Per T	372.3	292.2	100170	3645	16.40	2.77
		Per m of wall	206.8	162.3	60580	2680	17.12	1.54
GU 28N		Per S	129.7	101.8	10070	589	8.81	0.93
		Per D	259.4	203.6	77350	3405	17.27	1.85
		Per T	389.0	305.4	106490	3850	16.55	2.77
		Per m of wall	216.1	169.6	64460	2840	17.27	1.54
GU 30N		Per S	135.3	106.2	10400	600	8.77	0.93
		Per D	270.7	212.5	82060	3600	17.41	1.85
		Per T	406.0	318.7	112870	4060	16.67	2.77
		Per m of wall	225.6	177.1	68380	3000	17.41	1.54
GU 31N		Per S	140.0	109.9	10740	625	8.76	0.92
		Per D	280.0	219.8	83050	3675	17.22	1.83
		Per T	420.0	329.7	114310	4150	16.50	2.74
		Per m of wall	233.3	183.2	69210	3065	17.22	1.52
GU 32N		Per S	145.4	114.1	10950	633	8.68	0.92
		Per D	290.8	228.3	86790	3840	17.28	1.83
		Per T	436.2	342.4	119370	4330	16.54	2.74
		Per m of wall	242.3	190.2	72320	3200	17.28	1.52
GU 33N		Per S	150.8	118.4	11150	640	8.60	0.92
		Per D	301.6	236.8	90490	4005	17.32	1.83
		Per T	452.4	355.2	124370	4505	16.58	2.74
		Per m of wall	251.3	197.3	75410	3340	17.32	1.52
GU 16-400		Per S	78.9	62.0	2950	265	6.11	0.65
		Per D	157.9	123.9	18060	1245	10.70	1.28
		Per T	236.8	185.9	25060	1440	10.29	1.92
		Per m of wall	197.3	154.9	22580	1560	10.70	1.60
GU 18-400		Per S	88.3	69.3	3290	290	6.10	0.65
		Per D	176.7	138.7	20870	1430	10.87	1.28
		Per T	265.0	208.0	28920	1645	10.45	1.92
		Per m of wall	220.8	173.3	26090	1785	10.87	1.60

¹⁾ One side, excluding inside of interlocks.

Interlock

All AU™, PU® and GU® sheet piles feature Larssen interlocks in accordance with EN 10248. AU, PU and GU (except GU-400), as well as the AZ series, can be interlocked.

Theoretical interlock swing: $\alpha_{\max} = 5^\circ$



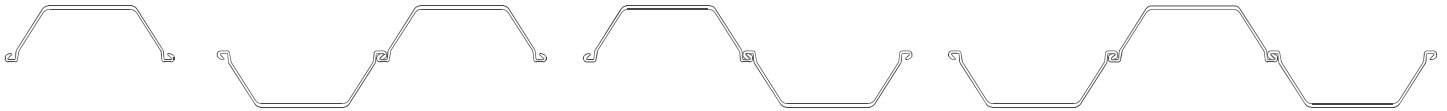
Delivery form

Single Pile

Double Pile
S-Form (standard)

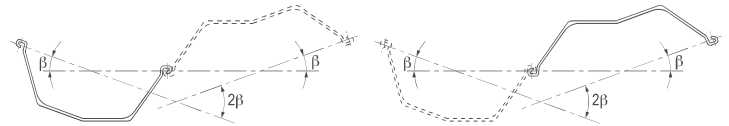
Double Pile
Z-Form (on request)

Triple Pile



Bent piles

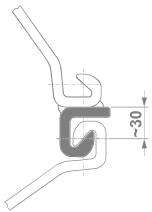
Maximum bending angle: $\beta = 25^\circ$. U-piles are bent in the middle of the flange. They are generally delivered as single piles. Double piles are available upon request.



Corner sections

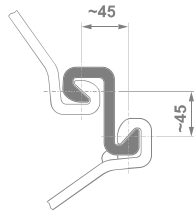
C 9

Mass ~ 9.3 kg/m
Coating area 0.15 m²/m



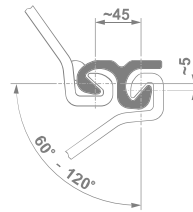
C 14

Mass ~ 14.4 kg/m
Coating area 0.22 m²/m



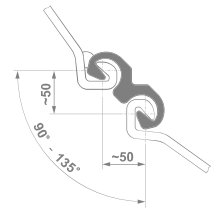
DELTA 13

Mass ~ 13.1 kg/m
Coating area 0.19 m²/m



OMEGA 18

Mass ~ 18.0 kg/m
Coating area 0.24 m²/m



Special corner sections interlocking with U- and Z-sections make it possible to form corner or junction piles without using fabricated special piles. Corner sections are fixed to the sheet pile in accordance with EN 12063.

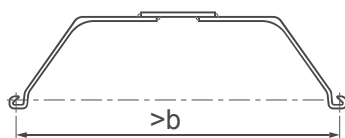
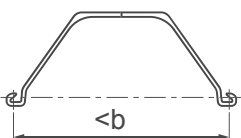
Different welding specifications are available on request. The corner sections are threaded and welded with usually a 200 mm setback from the top of the piles.

Fabricated piles, corner and junction piles

On request, arrangements can be made for widened or narrowed fabricated piles. The following special piles, among others, are available on request as single and double piles.

Narrowed pile

Widened pile



2501

2511

2251

2061

2253

2071

2257

2151

Crimping

Contrary to Z-piles, the interlocks of U-piles have to transmit shear forces. To guarantee proper shear force transmission, ArcelorMittal's U-sections can be delivered as double piles with crimped interlocks.

See sketch for ArcelorMittal's standard crimping pattern. The allowable shear force per crimping point depends on the section and steel grade. A resistance per crimp of minimum 75 kN at a displacement of up to 5 mm can be achieved. The theoretical section properties of a continuous wall may have to be reduced even for double piles crimped²⁾.



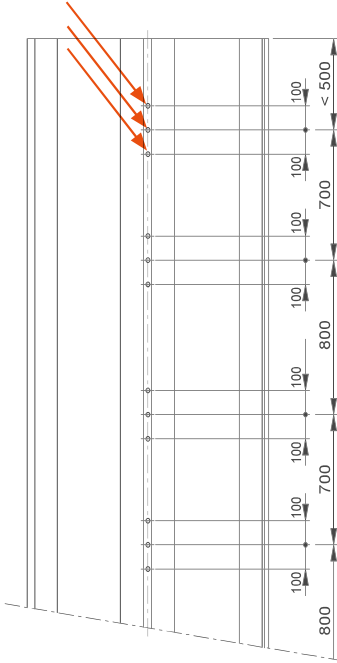
¹⁾ Amount and layout of crimping points may differ at both ends. Special crimping on request.

²⁾ Based on EN1993-5. Please consult our Technical Department for more information.

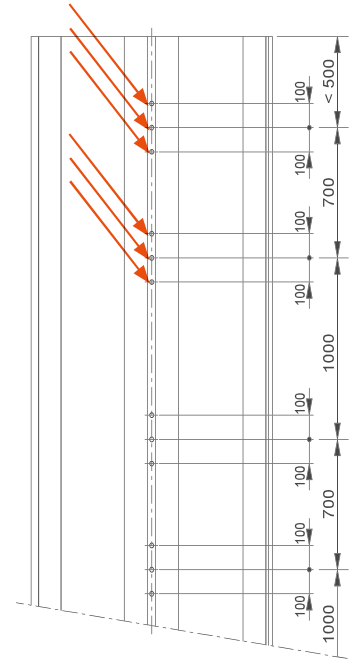
AU standard crimping:
3 crimping points per 0.75 m
= 4 crimping points per m¹⁾

PU/GU standard crimping:
6 crimping points per 1.7 m
= 3.5 crimping points per m¹⁾

3 crimping points



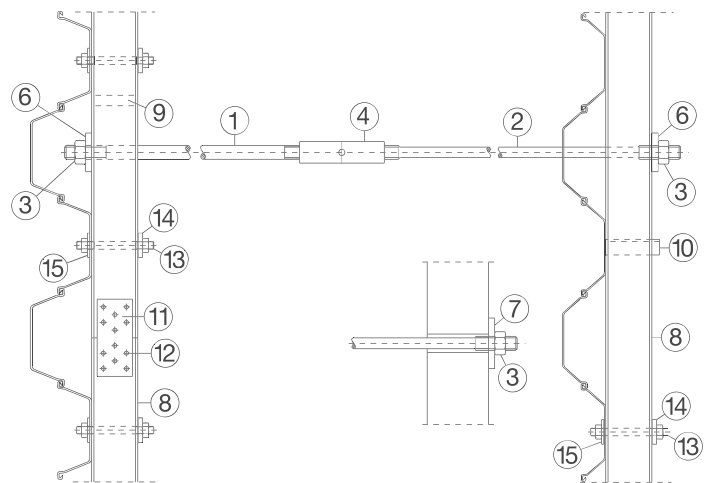
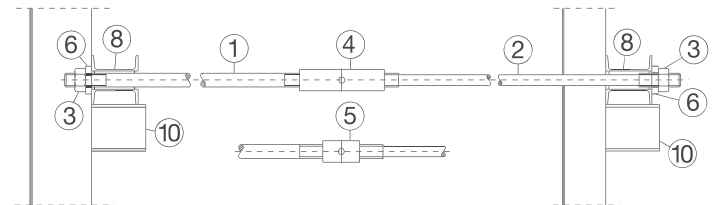
6 crimping points



Tie back system

Most sheet pile retaining walls need supplementary support at the top, in addition to embedment in the soil. Temporary cofferdams generally use walers and struts (fixed or hydraulic) for cross-bracing inside the excavation. Permanent or large retaining walls are often tied back to an anchor wall installed at a certain distance behind the main wall. Injection anchors and anchor piles can also be used.

The drawing shows a typical horizontal tie-rod connection for U-section sheet pile walls.



- 1 Plain tie-rod
- 2 Upset end tie-rod
- 3 Nut
- 4 Turnbuckle
- 5 Coupling sleeve
- 6 Bearing plate

- 7 Bearing plate on concrete
- 8 Waling
- 9 Spacer
- 10 Supporting bracket
- 11 Splicing plate

- 12 Splicing bolt
- 13 Fixing bolt
- 14 Fixing plate
- 15 Fixing plate