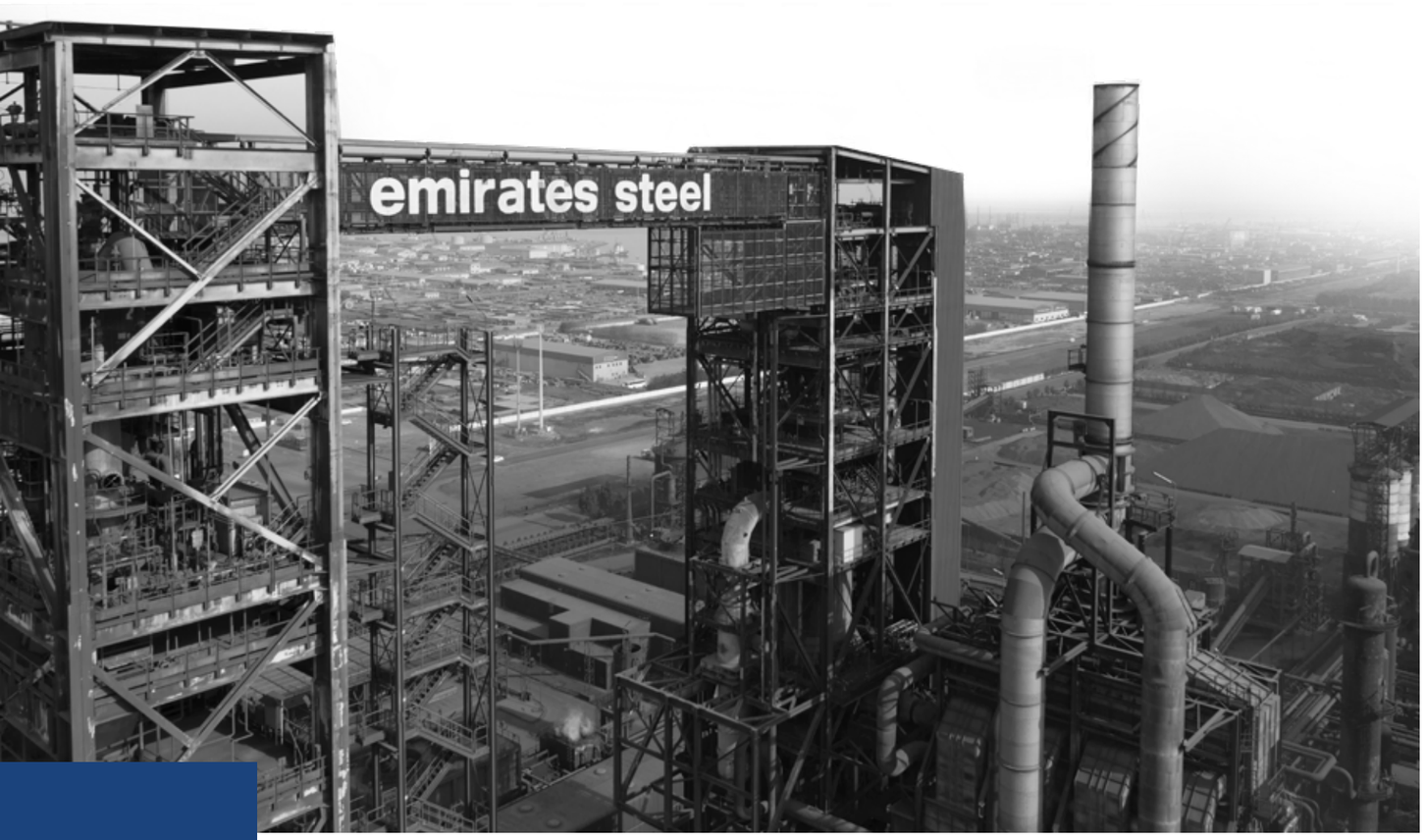
حديد الإمارات أركان
emirates steel arkan

Sheet Piles

Product Catalogue

www.emiratessteel.com



About Emirates Steel

Established in 1998, Emirates Steel is UAE's first and only integrated steel plant and a regional industry leader. Equipped with the latest technology, we produce a wide range of heavy sections, wire rods, rebar and sheet piles of the highest quality. Our customers span a range of sectors including energy, construction and transportation, and we export to more than 40 markets across the Middle East, Africa, Europe, North America, Asia and Australia.

Emirates Steel expanded in a relatively short period of time from a simple re-roller of imported steel billets to a complex integrated manufacturing plant. Emirates Steel utilizes the latest rolling mill technology to deliver tailored products, services and solutions that meet the unique needs of its customers.

Our Vision

To be a world class steel manufacturer providing the highest quality products, services and solutions to our customers and maximizing returns to our shareholders.

Our Mission

- To provide the construction, manufacturing and industrial sectors with their requirements of high quality steel products.
- Maintain safe and environmentally friendly work practices across our operations.
- Create employment opportunities and inspire our workforce to excel.
- Contribute to the industrialization and diversification of the UAE economy in line with Abu Dhabi's Vision 2030.

Heavy Sections

Heavy sections are long steel products used in structures and foundations for buildings. We produce a wide range of heavy sections from 200 to 1,000 millimeters in depth, making us the largest manufacturer of this product in the Middle East.

Sections are used in the construction sector and in the production of structures for industrial and engineering applications. Emirates Steel has the capacity to produce a wide range of structural sections and is the largest producer of jumbo and heavy sections in the Middle East.

Sheet Piles

We are the only producer of hot rolled sheet piles in the Middle East. Sheet piles are used in foundation and construction projects, both in tertiary and marine contexts, to form a wall which is either earth or water tight. Applications often pertain to retaining walls, cofferdams, bulkheads and seawalls.

Wire Rods

Wire rods are designed for a host of product applications such as fasteners, screws, automotive, welding & electrode, construction, engineering, springs, fences, nails, pins, etc.. We are recognized as one of the leading wire rod producers in the GCC, with strong presence in Europe as well as Far East with an annual production capacity of 500,000 metric tons.

Reinforcing Bars

Used exclusively in civil construction, rebars are designed to provide tensile strength to concrete. We have an annual rebar production capacity of 2.5 million tones, making us the leading producer of rebars in the region and also in the Far East.

Hot-rolled sheet piles are extensively used worldwide for temporary and permanent construction works – interlocking sections driven into the ground to provide earth retention and excavation support. They are commonly used for retaining walls, land reclamation, underground structures, such as car parks and basements, in marine locations for riverbank protection, breakwaters, seawalls, cofferdams, quay walls, harbors, ports and terminals.

Manufacturing standard	:	EN 10248
MTC certificate	:	EN 10204 3.1
Length	:	6m up to 31m
Steel grade	:	S355GP, S430GP, ASTM A 572 Grade 50, 60 & 65
Steel grade	:	Special grade on request with high Cu and Ni
Additional facilities	:	Crimping, fabrication and protective coating on request

Z-Sections

Z-Profiles are preferred for permanent structures. The continuous form of the web and the specific location of the external interlock symmetrically on both sides of the neutral axis are the essential characteristics of Z-shaped sheet piles. Both have a positive effect on the section modulus in the sheet pile –at relatively low weight, which results in high-cost efficiency.

Advantages of the Z Sections

- competitive section modulus / weight ratio
- lighter than U-piles when comparing sections with equivalent properties
- increased inertia and accordingly reduced deflection
- large width resulting reduced installation time

Solutions for all Requirements

Road and rail

- Support walls
- Bridge abutment
- Ramps
- Ground water retention
- Tunnels

Water Engineering or Waterfront Structure

- Quays
- Dock construction
- Dolphins
- Waterway support
- Berth facilities
- Locks
- Safety gates
- Flood protection
- Inlet and outlet
- Retaining wall
- Barrage and dams

Environmental and water protection

- Pumping station
- Sewage works
- Storm water overflow
- Storm water retention
- Embankment

Civil Engineering

- Site excavation
- foundations
- trench
- underground car park
- house building

Terms of Delivery*

Deviation limits and dimensional tolerances for hot-rolled sheet piles conforming to EN 10248.

Pile width	Single Piles ± 2%	**Double Piles ± 3%**
Wall Thickness of Z sections	t, s: up to 8.5 mm = ± 0.5 mm; over 8.5 mm = ± 6% s, t	
Height of Z sections	h: up to 200 mm/ 300mm = ± 6 mm; over 300 mm = ± 7 mm;	
Section Interlocks	The interlocks shall have adequate freeplay and must engage in a mannerism so that in-service forces can be transmitted.	

Deviation from straightness

The longitudinal deviation from straightness must not exceed 0.2% of pile length.

Pile length

Sheet pile lengths are permitted to deviate by ± 200 mm from the ordered lengths.

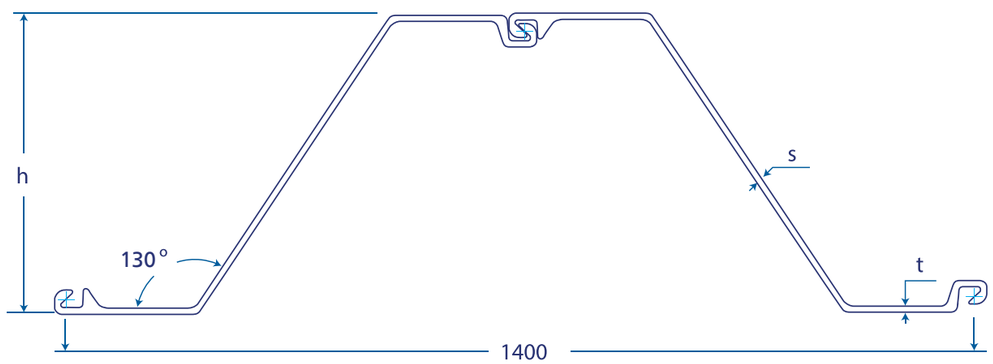
Weight

The tolerance between the arithmetic weight (according to section tables) and weighed weight of the total consignment must be within ± 5%.

* All numbers to be verified/read in accordance with EN 10248

* * Normally the positive tolerance shall be at the discretion of the manufacturer.

ESZ 18-700
FAMILY



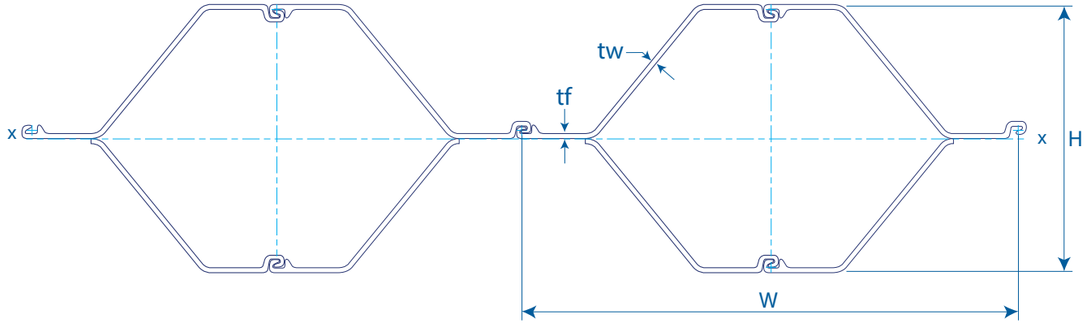
		Cross Sectional Area cm²	Mass kg/m	Moment of Inertia cm⁴	Elastic Section Modulus cm³	Coating Area[1] (both sides) m²/m
ESZ 17 - 700	Single	94.2	74.0	25,450	1,215	1.84
	Double	188.5	148.0	50,910	2,425	3.68
	per m of wall	134.6	105.7	36,360	1,735	2.63
ESZ 18 - 700	Single	98.6	77.4	26,520	1,265	1.84
	Double	197.2	154.8	53,050	2,525	3.68
	per m of wall	140.9	110.6	37,890	1,805	2.63
ESZ 19 - 700	Single	102.9	80.8	27,590	1,310	1.84
	Double	205.9	161.6	55,180	2,625	3.68
	per m of wall	147.1	115.4	39,420	1,875	2.63
ESZ 19 - 700 10/10	Single	107.3	84.2	28,660	1,360	1.84
	Double	214.6	168.5	57,320	2,725	3.68
	per m of wall	153.3	120.3	40,940	1,945	2.63
ESZ 20 - 700	Single	111.6	87.6	29,730	1,410	1.84
	Double	223.3	175.3	59,460	2,820	3.68
	per m of wall	159.5	125.2	42,470	2,015	2.63

1. Both sides of pile, excluding inside of interlocks

ESZ 18-700
FAMILY

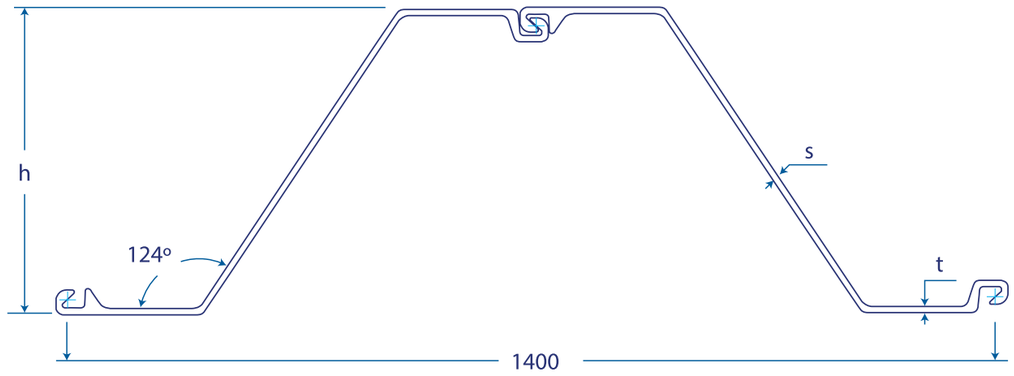
	Single Pile					Per m of wall					
	Width	Height	Flange	Web	Mass	Mass	Moment of Inertia	Elastic Modulus	Plastic Modulus	Static Moment	Radius of Gyration
	b	h	t	s	G	M	I_x	W_x			R_g
	mm	mm	mm	mm	Kg/m	Kg/m²	cm⁴/m	cm³/m	cm³/m	cm³/m	cm
ESZ 17 - 700	700	420	8.5	8.5	74	105.7	36360	1735	2040	1020	16.43
ESZ 18 - 700	700	420	9.0	9.0	77.4	110.6	37890	1805	2130	1065	16.40
ESZ 19 - 700	700	421	9.5	9.5	80.8	115.5	39420	1875	2215	1110	16.37
ESZ 19 - 700 10/10	700	421	10.0	10.0	84.2	120.3	40940	1945	2300	1150	16.34
ESZ 20 - 700	700	422	10.5	10.5	87.6	125.2	42470	2015	2390	1195	16.32

Z Box Pile



	Data for Single Box Piles		Per m of wall					
	Width	Height	Mass[2]	Moment of Inertia	Elastic Modulus	Mass[2]	Moment of Inertia	Elastic Modulus
	w	H	G	I_x	W_x	G	I_x	W_x
	mm	mm	Kg/m	cm⁴	cm³	Kg/m²	cm⁴/m	cm³/m
ESZ 17 - 700	1400	839	259.3	267520	6375	185.2	191090	4555
ESZ 18 - 700	1400	840	271.8	279850	6665	194.1	199890	4760
ESZ 19 - 700	1400	841	284.3	292230	6950	203.0	208740	4965
ESZ 20 - 700	1400	843	309.0	317090	7525	220.7	226490	5375

1) Mass of Piles utilised = 4 x the nominal weight of the single piles
2) Mass of welds is not included, piles cut as shown for calculation
3) Area of outside, excluding inside of locks

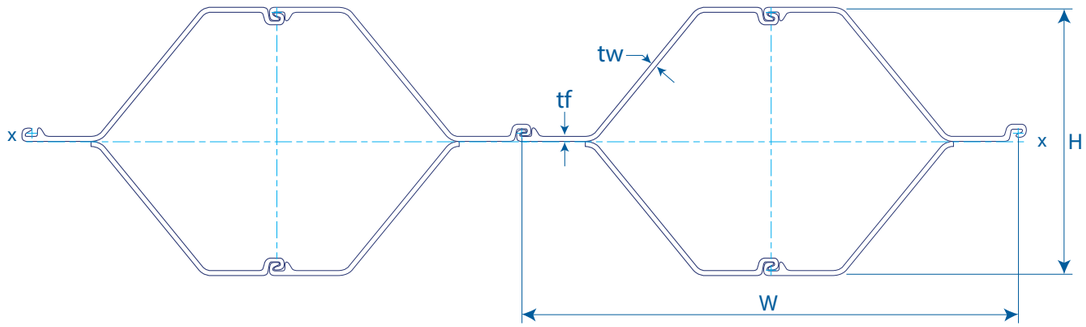


		Cross Sectional Area cm²	Mass kg/m	Moment of Inertia cm⁴	Elastic Section Modulus cm³	Coating Area[1] (both sides) m²/m
ESZ 24 - 700	Single	114.0	89.5	39,110	1,705	1.93
	Double	228.1	179.0	78,220	3,410	3.86
	per m of wall	162.9	127.9	55,870	2,435	2.76
ESZ 26 - 700	Single	123.2	96.7	41,870	1,820	1.93
	Double	246.4	193.4	83,740	3,640	3.86
	per m of wall	176.0	138.1	59,810	2,600	2.76
ESZ 28 - 700	Single	132.3	103.9	44,630	1,935	1.93
	Double	264.7	207.8	89,260	3,870	3.86
	per m of wall	189.1	148.4	67,750	2,765	2.76
ESZ 29 - 700	Single	141.6	111.1	47,410	2,055	1.93
	Double	283.2	222.3	94,830	4,105	3.86
	per m of wall	202.3	158.8	67,740	2,930	2.76

1) Both sides of pile, excluding inside of interlocks

	Single Pile					Per m of wall					
	Width	Height	Flange	Web	Mass	Mass	Moment of Inertia	Elastic Modulus	Plastic Modulus	Static Moment	Radius of Gyration
	b	h	t	s	G	M	I_x	W_x			R_g
	mm	mm	mm	mm	Kg/m	Kg/m²	cm⁴/m	cm³/m	cm³/m	cm³/m	cm
ESZ 24 - 700	700	459	12.0	9.0	89.5	127.9	55870	2435	2810	1405	18.52
ESZ 26 - 700	700	460	13.0	10.0	96.7	138.1	59810	2600	3015	1505	18.44
ESZ 28 - 700	700	461	14.0	11.0	103.9	148.4	63750	2765	3220	1610	18.36
ESZ 29 - 700	700	462	15.0	12.0	111.1	158.8	67740	2930	3430	1715	18.30

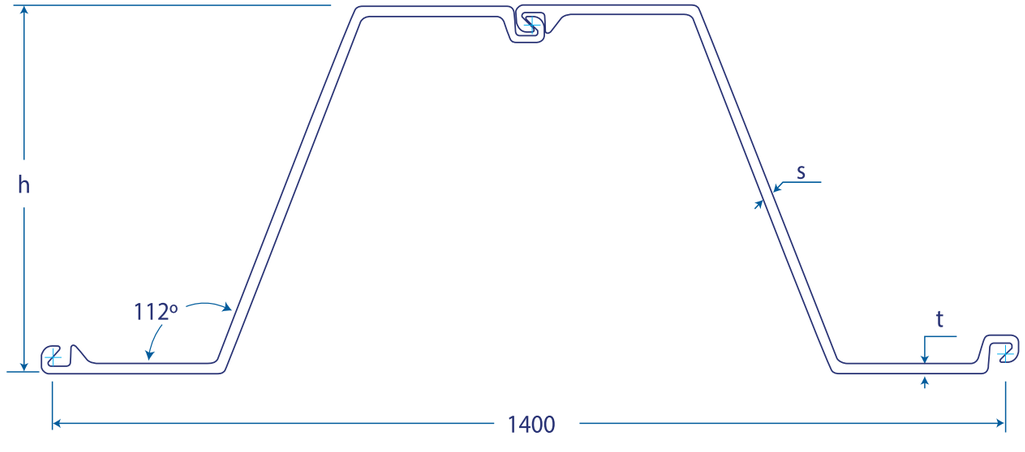
Z Box Pile



	Data for Single Box Piles		Per m of wall					
	Width	Height	Mass [2]	Moment of Inertia	Elastic Modulus	Mass [2]	Moment of Inertia	Elastic Modulus
	w	H	G	I_x	W_x	G	I_x	W_x
	mm	mm	Kg/m	cm⁴	cm³	Kg/m²	cm⁴/m	cm³/m
ESZ 24 - 700	1400	918	309.0	396480	8640	220.7	283200	6170
ESZ 26 - 700	1400	920	335.0	427920	9305	239.3	305660	6645
ESZ 28 - 700	1400	922	361.0	459550	9970	257.9	328250	7120

1) Mass of Piles utilised = 4 x the nominal weight of the single piles
2) Mass of welds is not included, piles cut as shown for calculation
3) Area of outside, excluding inside of locks

ESZ 38-700
FAMILY



		Cross Sectional Area cm^2	Mass kg/m	Moment of Inertia cm^4	Elastic Section Modulus cm^3	Coating Area[1)] (both sides) m^2/m
ESZ 36 - 700	Single	148.1	116.2	63,790	2,505	2.11
	Double	296.2	232.5	127,590	5,015	4.22
	per m of wall	211.5	166.1	91,130	3,580	3.02
ESZ 38 - 700	Single	158.2	124.2	67,800	2,660	2.11
	Double	316.5	248.4	135,600	5,320	4.22
	per m of wall	226.0	177.4	96,860	3,800	3.02
ESZ 40 - 700	Single	168.4	132.2	71,810	2,810	2.11
	Double	336.7	264.3	143,620	5,620	4.22
	per m of wall	240.5	188.8	102,590	4,015	3.02

1. Both sides of pile, excluding inside of interlocks

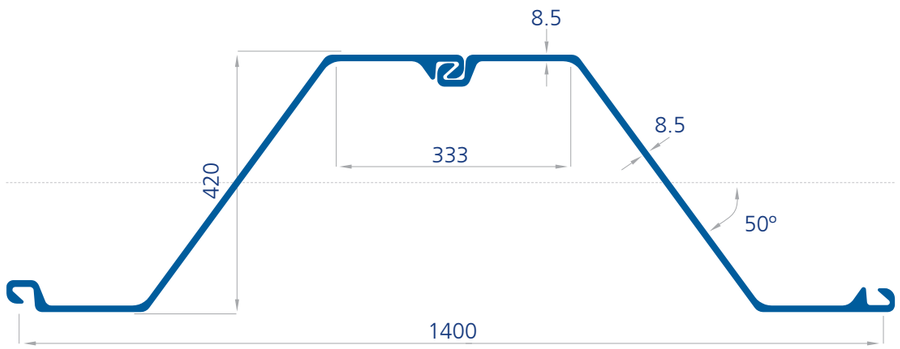
ESZ 38-700
FAMILY

	Single Pile					Per m of wall					
	Width	Height	Flange	Web	Mass	Mass	Moment of Inertia	Elastic Modulus	Plastic Modulus	Static Moment	Radius of Gyration
	b	h	t	s	G	M	I_x	W_x			R_g
	mm	mm	mm	mm	Kg/m	Kg/m^2	cm^4/m	cm^3/m	cm^3/m	cm^3/m	cm
ESZ 36-700	700	509	14.0	11.5	116.2	166.1	91130	3580	4095	2045	20.76
ESZ 38-700	700	510	15.0	12.5	124.2	177.4	96860	3800	4355	2180	20.70
ESZ 40-700	700	511	16.0	13.5	132.2	188.8	102590	4015	4620	2310	20.65

**subject to available rolling campaign

ESZ 17-700
Durability Chart

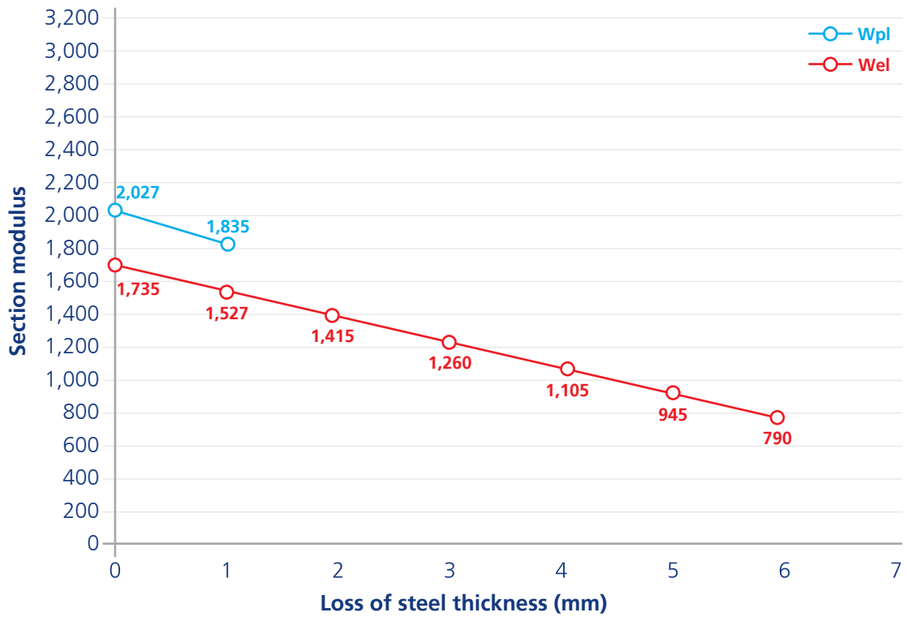
Section Properties and Durability Chart



INITIAL SECTION PROPERTIES

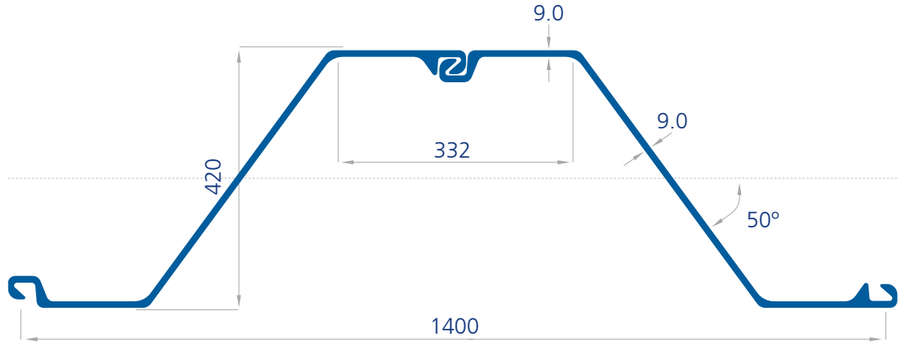
Wel cm³/m	Wpl cm³/m	I cm⁴/m	A cm²/m	tp mm	tw mm	h mm	alpha	b mm	c mm	Av cm²/m
1735	2027	36360	134.6	8.5	8.5	420	50	339	537.2	50.0

Reduced Plastic and Elastic Section Modulus



ESZ 18-700
Durability Chart

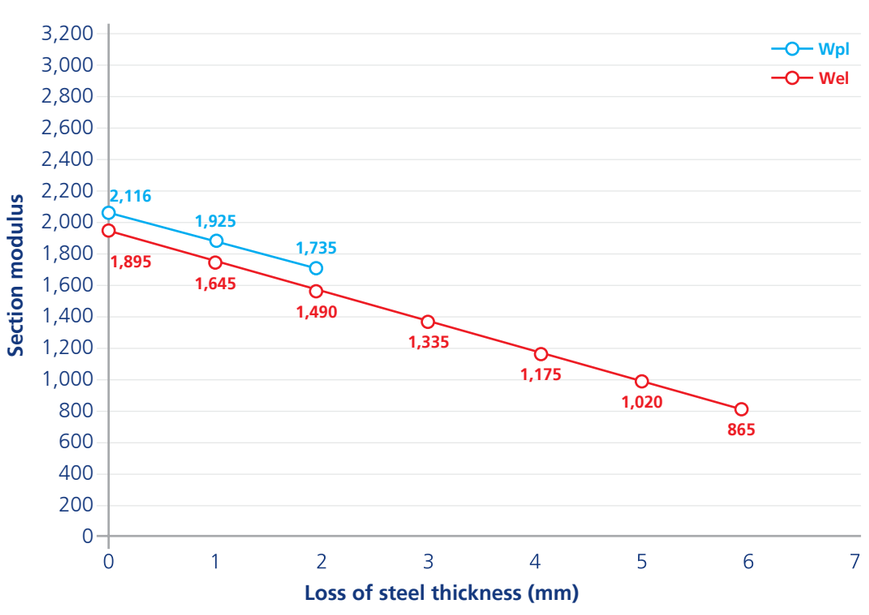
Section Properties and Durability Chart



INITIAL SECTION PROPERTIES

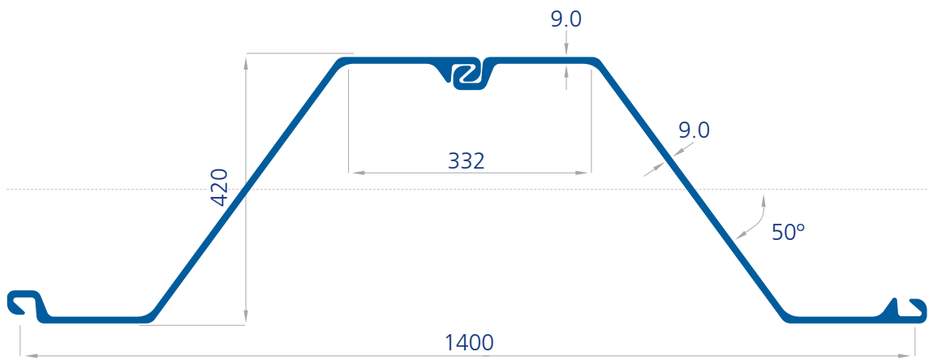
Wel cm³/m	Wpl cm³/m	I cm⁴/m	A cm²/m	tp mm	tw mm	h mm	alpha	b mm	c mm	Av cm²/m
1805	2116	37890	147.1	9.0	9.0	420	50	339	536.55	2.8

Reduced Plastic and Elastic Section Modulus



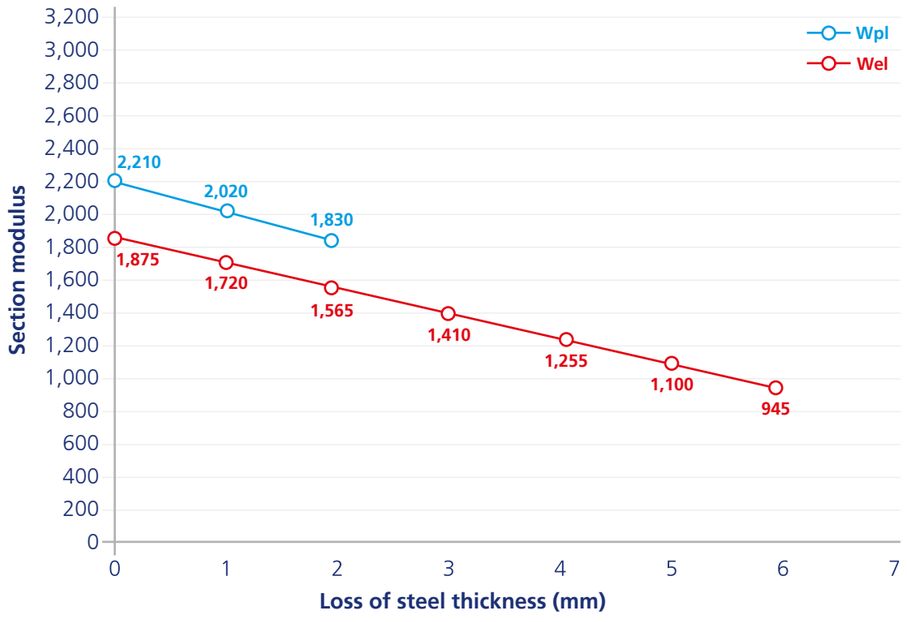
ESZ 19-700
Durability Chart

Section Properties and Durability Chart



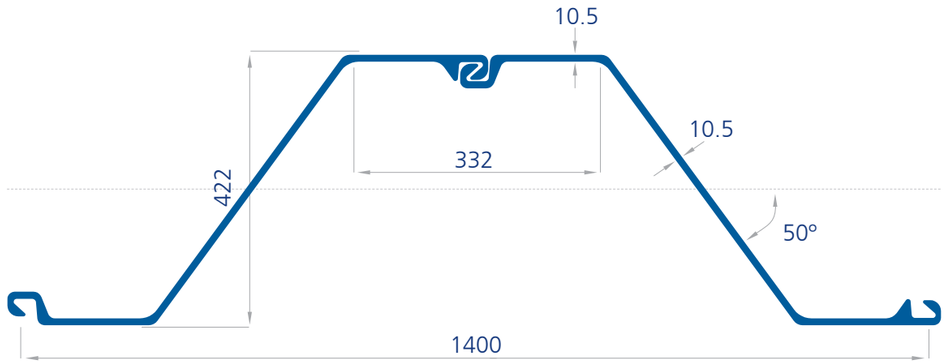
INITIAL SECTION PROPERTIES										
Wel cm³/m	Wpl cm³/m	I cm⁴/m	A cm²/m	tp mm	tw mm	h mm	alpha	b mm	c mm	Av cm²/m
1875	2210	39420	147.1	9.5	9.54	21	50	339	537.2	52.8

Reduced Plastic and Elastic Section Modulus



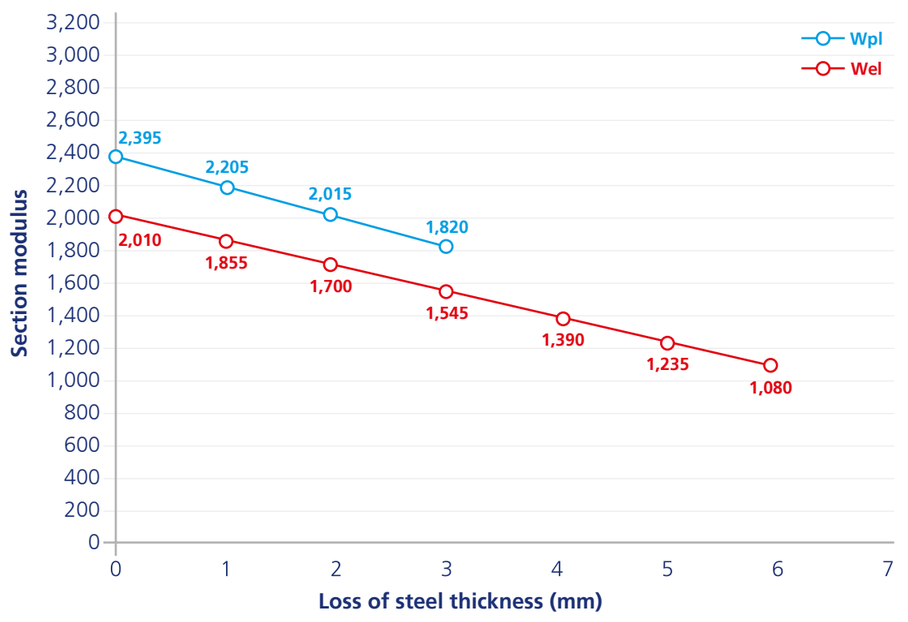
ESZ 20-700
Durability Chart

Section Properties and Durability Chart



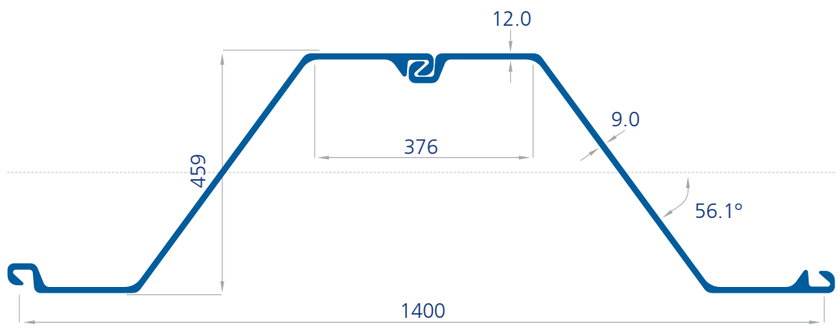
INITIAL SECTION PROPERTIES										
Wel cm³/m	Wpl cm³/m	I cm⁴/m	A cm²/m	tp mm	tw mm	h mm	alpha	b mm	c mm	Av cm²/m
2010	2395	42380	159.3	10.5	10.54	22	50	339	537.2	61.7

Reduced Plastic and Elastic Section Modulus



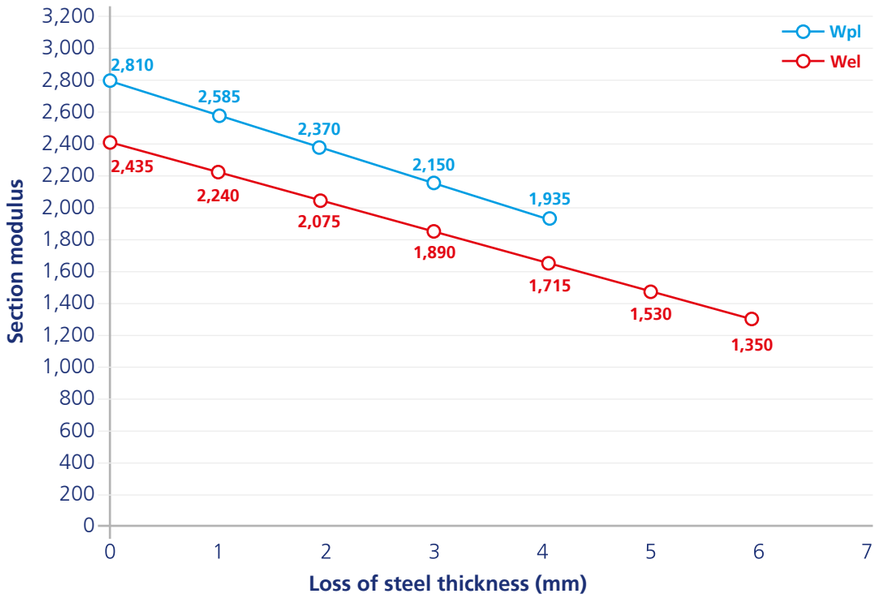
ESZ 24-700
Durability Chart

Section Properties and Durability Chart



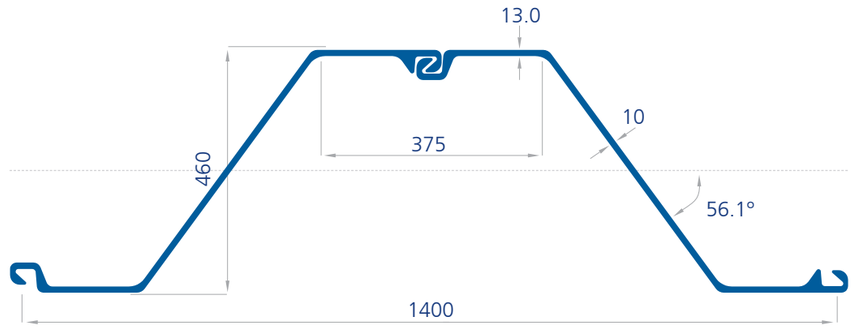
INITIAL SECTION PROPERTIES										
Wel cm^3/m	Wpl cm^3/m	I cm^4/m	A cm^2/m	tp mm	tw mm	h mm	alpha	b mm	c mm	Av cm^2/m
2435	2810	55870	162.9	12.0	9.0	459	56.13	80	538.5	57.5

Reduced Plastic and Elastic Section Modulus



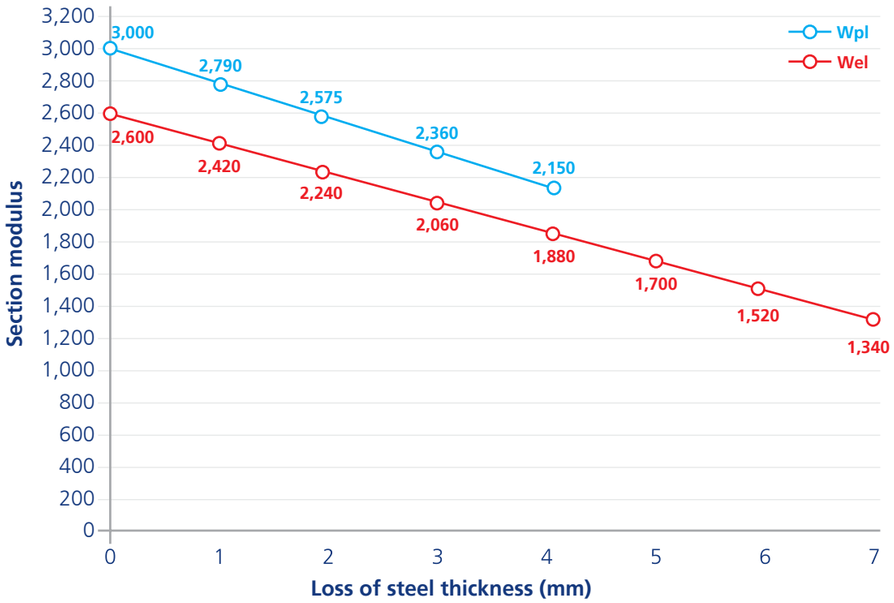
ESZ 26-700
Durability Chart

Section Properties and Durability Chart



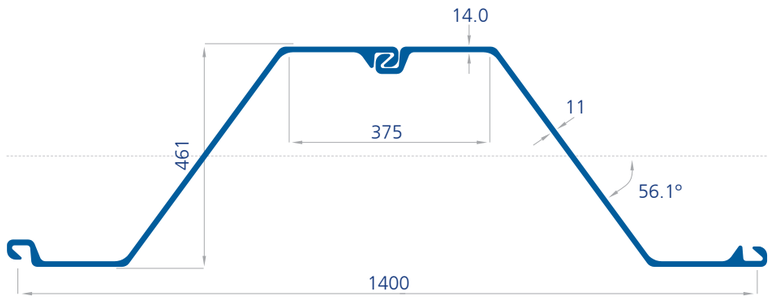
INITIAL SECTION PROPERTIES										
Wel cm^3/m	Wpl cm^3/m	I cm^4/m	A cm^2/m	tp mm	tw mm	h mm	alpha	b mm	c mm	Av cm^2/m
2600	3000	59810	176.0	13.0	10.0	460	56.13	80	538.5	63.9

Reduced Plastic and Elastic Section Modulus



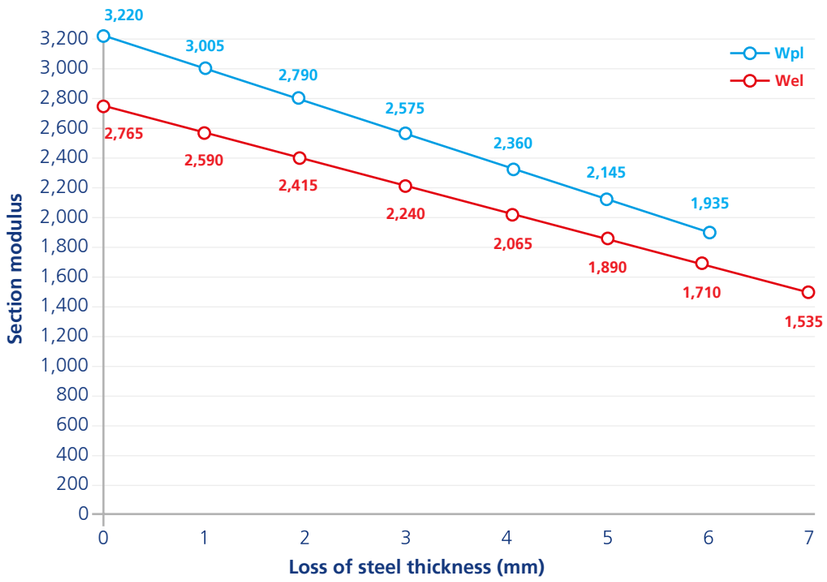
ESZ 28-700
Durability Chart

Section Properties and Durability Chart



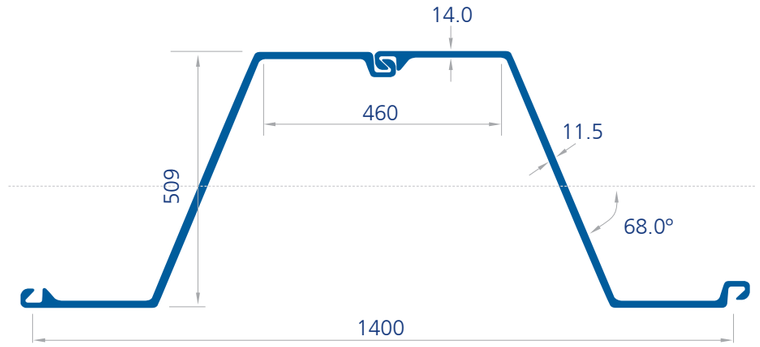
INITIAL SECTION PROPERTIES										
Wel cm³/m	Wpl cm³/m	I cm⁴/m	A cm²/m	tp mm	tw mm	h mm	alpha	b mm	c mm	Av cm²/m
2765	3220	63750	189.1	14.0	11.0	461	56.13	80	538.5	70.2

Reduced Plastic and Elastic Section Modulus



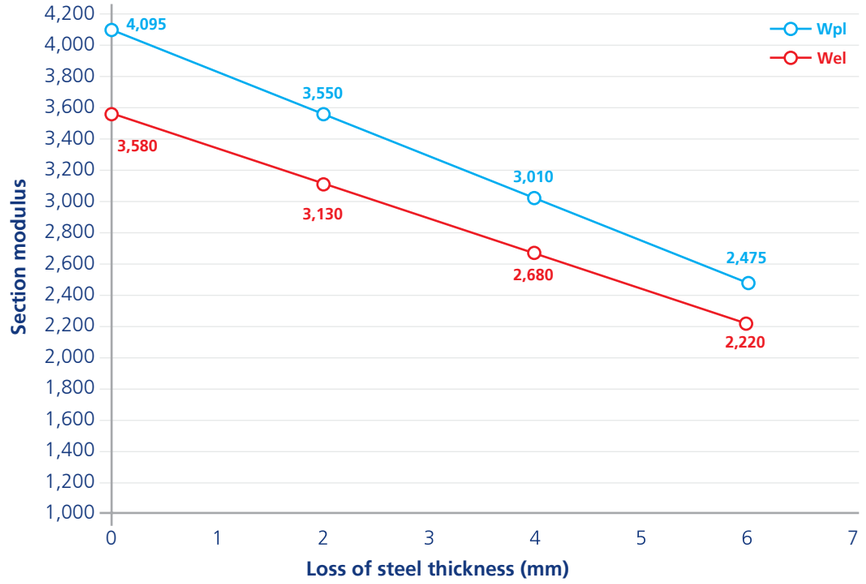
ESZ 36-700
Durability Chart

Section Properties and Durability Chart



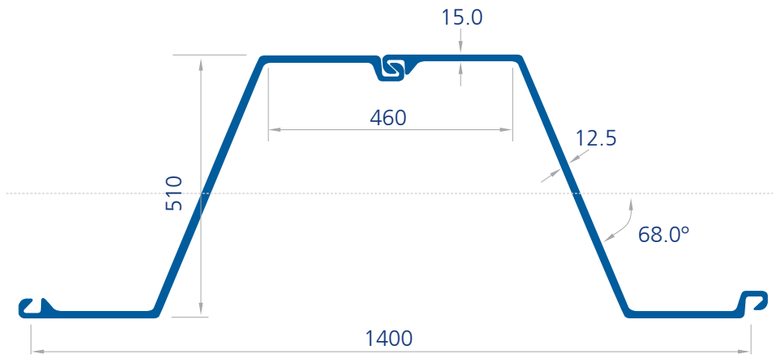
INITIAL SECTION PROPERTIES										
Wel cm³/m	Wpl cm³/m	I cm⁴/m	A cm²/m	tp mm	tw mm	h mm	alpha	b mm	c mm	Av cm²/m
3580	4095	91130	211.54	14.0	11.55	09	68.04	72	533.9	81.3

Reduced Plastic and Elastic Section Modulus



ESZ 38-700
Durability Chart

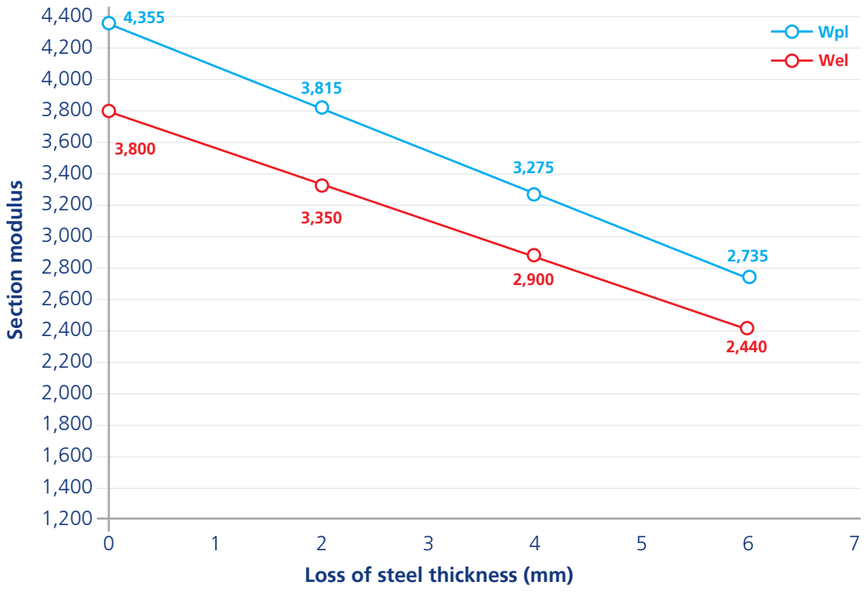
Section Properties and Durability Chart



INITIAL SECTION PROPERTIES

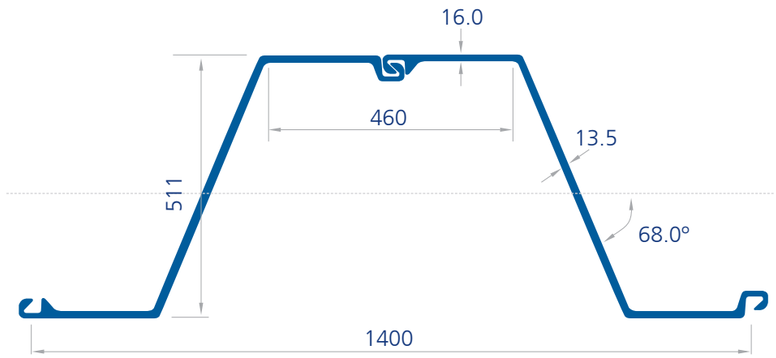
Wel cm³/m	Wpl cm³/m	I cm⁴/m	A cm²/m	tp mm	tw mm	h mm	alpha	b mm	c mm	Av cm²/m
3800	4355	96860	226.04	15.0	12.5	5106	8.04	74	533.9	88.4

Reduced Plastic and Elastic Section Modulus



ESZ 40-700
Durability Chart

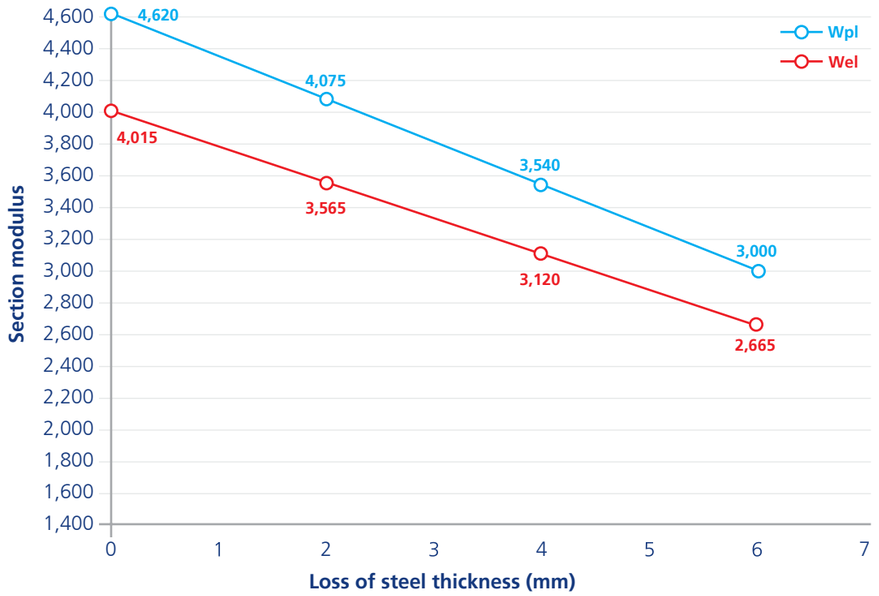
Section Properties and Durability Chart



INITIAL SECTION PROPERTIES

Wel cm³/m	Wpl cm³/m	I cm⁴/m	A cm²/m	tp mm	tw mm	h mm	alpha	b mm	c mm	Av cm²/m
4015	4620	102590	240.53	16.0	13.5	5116	8.04	74	533.9	95.5

Reduced Plastic and Elastic Section Modulus



EN 10248

Steel grade - sheet piles sections		
Steel grade	Min. Yield	Min. Tensile
	Strength (Mpa)	Strength (Mpa)
S270GP	270	410
S355GP	355	480
S390GP	390	490
S430GP	430	510

ASTM

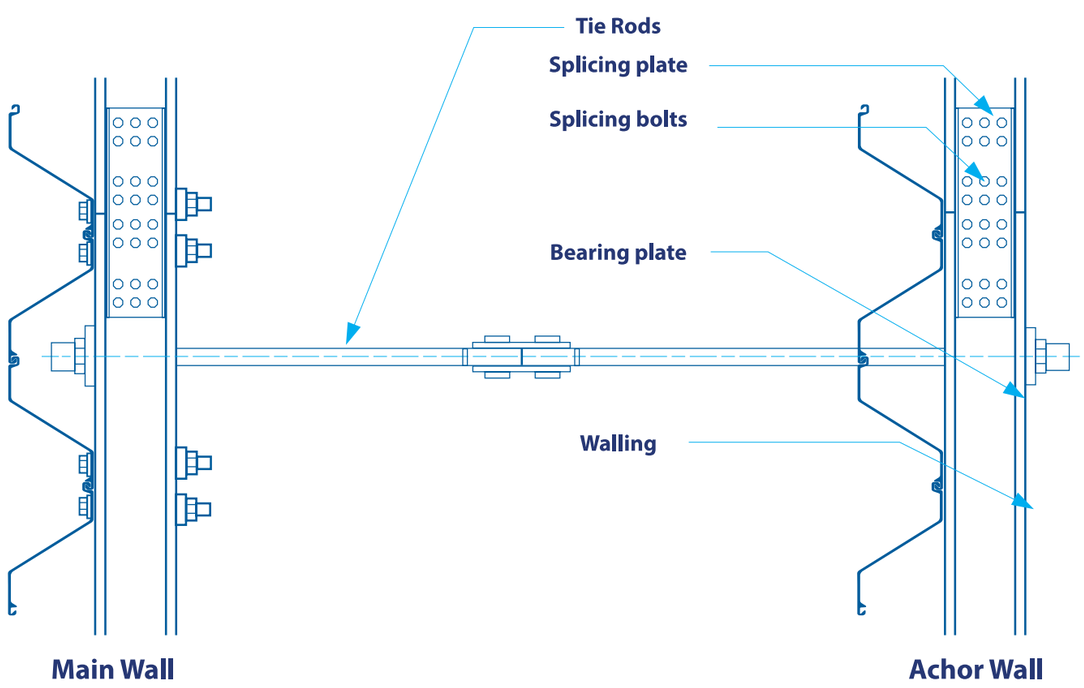
Steel grade - sheet piles sections		
Steel grade	Minimum Yield Strength	
	(ksi)	Mpa
A572 Grade 50	50	345
A572 Grade 60	60	415
A572 Grade 65	65	450

ANCHORING SYSTEMS FOR MARINE STRUCTURES

Usually, sheet pile retaining walls require a supplementary support at the top, in addition to the embedment in the soil. Most large or permanent retaining walls are tied back to an anchor wall, which is installed at a certain distance behind the main wall.

Emirates Steel can offer combined packages, including steel sheet piles, tie-rods, walers and any other required accessory.

The following sketch shows a horizontal tie-rod connection for sheet pile walls.



Typical connection details of sheet piles with tie rods and accessories

Additional Services

- designs and technical calculations
- pairing, crimping and fabrication
- protective coating
- anchorage systems

Quality Assurance & Certifications

(Ü-mark)

Product Conformity Certification

- **EN 10248-1**
- **TUV Germany Certification**
- **Number: 07/201/1326/UHP/2206/17**

HOMOLOGATION CERTIFICATE

Product Conformity Certification

- **EN 10248-1**
- **Ministry of Infrastructure, Italy**
- **Certification Number: 002/18-AM**

Registration of Construction Material

- **EN 10025 – 2, EN 10248**
- **Abu Dhabi Quality & Conformity Council**
- **Ref.: QCC/AC/18/App. # 573/001**

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