

Steel Sheet Piles

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PU STEEL SHEET PILES

Mechanical Properties

PU steel sheet piles can be supplied in grades up to yield strength of 430 N/mm².

Dimensions And Sectional Properties

The PU steel sheet piles are available in the following sizes:

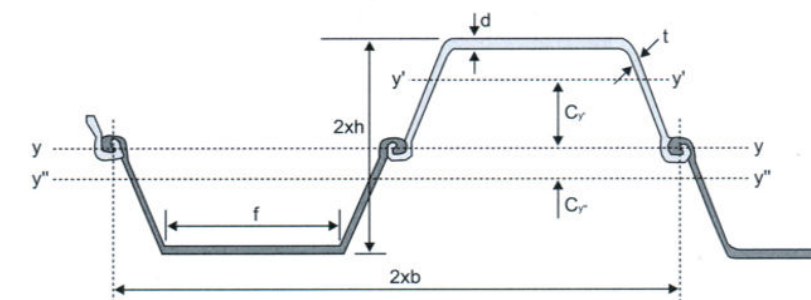


Figure 9 - PU Sheet Piles: Dimensions

Section		h	b	Flat Of Pan f	Thickness Of		C _y	C _{y'}	Mass Per m	Section Area A	Section Modulus Z _y	Moment Of Inertia		Radius Of Gyration r
		mm	mm	mm	pan	web	mm	mm	kg/m	cm ²	cm ³	I _y	I _z	cm
PU 6	per pile	113	600	330	7.5	6.4	68.9	23.0	45.3	57.7	146	1,290	23,900	4.73
	per m wall								75.0	96.0	600	6,720	-	8.36
PU 8	per pile	140	600	317	8.0	8.0	81.5	27.2	54.5	69.5	232	2,360	30,062	5.82
	per m wall								91.0	116.0	830	11,610	-	10.02
PU 12	per pile	180	600	257	9.8	9.0	100.4	33.5	65.9	84.0	366	4,450	34,937	7.28
	per m wall								110	140.0	1,200	21,550	-	12.41
PU 16	per pile	190	600	303	12.0	9.0	115.8	38.6	74.7	95.2	405	5,560	38,037	7.64
	per m wall								124	159.0	1,600	30,520	-	13.87
PU 20	per pile	200	600	365	12.4	9.7	125.3	41.8	84.7	107.9	480	7,080	46,021	8.1
	per m wall								141	180.0	2,000	3,9970	-	14.92
PU 25	per pile	226	600	339	14.2	10.0	142.1	47.4	94.1	119.9	588	9,670	49,089	8.98
	per m wall								157	200.0	2,500	56,500	-	16.81
PU 32	per pile	226	600	341	19.5	11.0	148.6	49.5	114.6	146.0	645	11,100	55,134	8.72
	per m wall								191	243.0	3,200	72,260	-	17.23

Table 24 - PU Steel Sheet Piles: Section Sizes

The PU sheet piles can be delivered in material according to British BS-standards, American ASTM-standards, Euronorms, and Japanese JIS-standards.

INTERLOCKING OPTIONS

Section	PU 6	PU 8	PU 12	PU 16	PU 20	PU 25	PU 32
PU 6	♣	♣	♣	♣	△	△	△
PU 8	♣	♣	♣	♣	△	△	△
PU 12	♣	♣	♣	♣	♣	♣	△
PU 16	♣	♣	♣	♣	♣	♣	△
PU 20	△	△	♣	♣	♣	♣	♣
PU 25	△	△	♣	♣	♣	♣	♣
PU 32	△	△	△	△	♣	♣	♣

♣ Interlocking Possible

△ On request (require in advance indicating length of piles)

Table 25 - PU Steel Sheet Piles: Interlocking Options

DIMENSIONAL TOLERANCES

Width		Thickness Of Pan				Weight ¹⁾	Length	Squareness Of Ends ²⁾	Straightness ³⁾
Single Pile	Interlocked Piles	e ≤ 8mm	8 < e ≤ 12	12 < e ≤ 18	e > 18				
± 2%	± 3%	± 0.5mm	± 0.6mm	± 0.8mm	± 1.2mm	± 4%	± 200mm	≤ 10mm	2%

Note: 1) Of total mass of the complete order.
 2) Of the distance between 2 points of the cross-section.
 3) Maximum deflection on the length of the pile.

Table 26 - PU Steel Sheet Piles: Dimensional Tolerances

The maximum length for this U-type pile is usually between 25 to 31 metres, but longer lengths can be supplied.

HANDLING HOLES AND DOUBLE PILES

The piles can on request be delivered with flame cut handling holes, 50mm diameter, located in the centre of the pan at 200-250 mm from the end.

Piles can also be fastened together to form double poles by pressing or welding the interlocks. Two to six pressing points per meter can be applied according to design requirements. A minimum shear force of 80 kN per one crimping point is admitted.

KSP Steel Sheet Piles

MECHANICAL PROPERTIES

KSP steel sheet piles are manufactured according to JIS 5528 "Hot Rolled Steel Sheet Piles" (1988).

Designation JIS A 5528	Min. Yield Strength R _{eH}	Min. Tensile Strength R _m	Min. Elongation
Steel Name	N/mm ²	N/mm ²	%
SY295	295	490	17
SY390	390	540	15

Table 27 - KSP Steel Sheet Piles: Mechanical Properties

DIMENSIONS AND SECTIONAL PROPERTIES

The KSP steel sheet piles are available in the sizes shown in Table 35 under, Note the three new sizes KSP II_w.

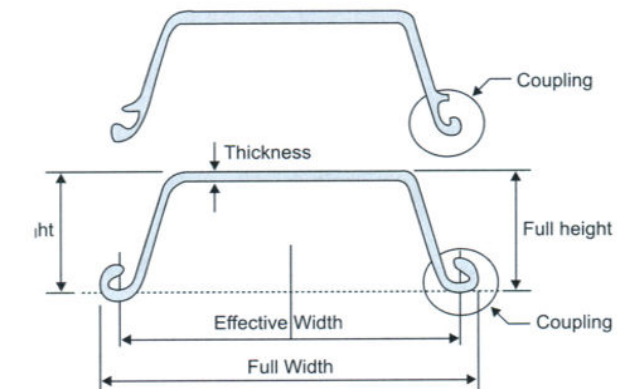


Figure 10 - KSP Steel Sheet Piles: Dimensions

Section	Dimensions			Section Area		Unit Weight		Moment Of Inertia		Modulus Of Section	
	width w	height h	thickness t	A	A/m	M	M/m	I	I/m	Z _y	Z _y /m
	mm	mm	mm	cm ²	cm ² /m	kg/m	kg/m ²	cm ⁴	cm ⁴ /m	cm ³	cm ³ /m
KSP I _A	400	85	8.0	45.21	113.0	35.5	88.8	598	4,500	88	529
KSP II	400	100	10.5	61.18	153.0	48.0	120	1,240	8,740	152	874
KSP II _A	400	120	9.2	55.01	137.5	43.2	108	1,450	10,600	162	880
KSP III	400	130	13.0	76.42	191.0	60.0	150	2,320	17,400	232	1,340
KSP III _A	400	150	13.1	74.40	186.0	58.4	146	2,840	22,800	253	1,520
KSP IV	400	170	15.5	96.99	242.5	76.1	190	4,670	38,600	362	2,270
KSP IV _A	400	185	16.1	94.21	235.5	74.0	185	5,300	41,600	400	2,250
KSP V _L	500	200	24.3	133.8	267.6	105	210	7,960	63,000	520	3,150
KSP VI _L	500	225	27.6	153.0	306.0	120	240	11,400	86,000	680	3,820
KSP II _w	600	130	10.3	78.70	131.2	61.8	103	2,110	13,000	203	1,000
KSP III _w	600	180	13.4	103.9	173.2	81.6	136	5,220	32,400	376	1,800
KSP IV _w	600	210	18.0	135.3	225.5	106	177	8,630	56,700	539	2,700

Note: The sizes are also available in FSP sheet piles.
 Sectional properties given per single pile, and per linear meter wall.

Table 28 - KSP Steel Sheet Piles: Section Sizes And Properties

INTERLOCKING OPTIONS

The sections can be interlocked with each other as shown in Table 36.

Section	KSP I _A	KSP II	KSP II _A	KSP III	KSP III _A	KSP IV	KSP IV _A	KSP V _L	KSP VI _L	KSP II _w	KSP III _w	KSP IV _w
KSP I _A	♣	♣	♣							♣		
KSP II	♣	♣	♣	♣						♣		
KSP II _A	♣	♣	♣		♣					♣		
KSP III		♣		♣	♣	♣				♣	♣	
KSP III _A			♣	♣	♣		♣			♣	♣	
KSP IV				♣		♣	♣	♣			♣	♣
KSP IV _A					♣	♣	♣	♣			♣	♣
KSP V _L						♣	♣	♣	♣			♣
KSP VI _L								♣	♣			
KSP II _w	♣	♣	♣	♣	♣					♣	♣	
KSP III _w				♣	♣	♣	♣			♣	♣	♣
KSP IV _w						♣	♣	♣			♣	♣

Table 29 - KSP Steel Sheet Piles: Interlocking Options

The sheet piles can also be welded together to form box piles, as shown in section "Other section types" under the chapter "Steel sheet piles according to EN 10248:1996".

DIMENSIONAL TOLERANCES

Full Width		Effective Width		Thickness Of Section		
Traditional Single Pile	Wider Width Single Pile	Traditional Single Pile	Wider Width Single Pile	<10mm	≥10mm <16mm	≥16mm
Wx ± 1%	+6mm -5mm	Per meter wall width: Max 4mm deviation.		+1.0mm -0.3mm	+1.2mm -0.3mm	+1.5mm -0.3mm

Full Height	Length	Deflection Of Full Length		Camber Of Full Length		Difference In Vertically Cut Sections
		L ≤ 10mm	L > 10mm	L ≤ 10mm	L > 10mm	
±4%	-0mm	L x 0.12%	L x 0.10%	L x 0.25% max.	L x 0.20% +25mm max.	Within 4% of width

Note: the deflection shall be in the direction parallel to the sheet pile wall and the camber shall be in the direction vertical to the sheet pile wall.

Table 30 - KSP Steel Sheet Piles: Dimensional Tolerances

RECOMMENDED MAXIMUM LENGTHS FOR DRIVING

The recommended driving length for KSP steel sheet piles is maximum 30 meters.

KSP Straight Web Sections

MECHANICAL PROPERTIES

KSP straight web sections are manufactured according to JIS 5528 "Hot Rolled Steel Sheet Piles" (1988).

Designation JIS A 5528	Min. Yield Strength R _{eH}	Min. Tensile Strength R _m	Min. Elongation
Steel Name	N/mm ²	N/mm ²	%
SY295	295	490	17
SY390	390	540	15

Table 31 - KSP Straight web sections: Mechanical Properties

DIMENSIONS AND SECTIONAL PROPERTIES

The KSP straight web sections are available in the following sizes:

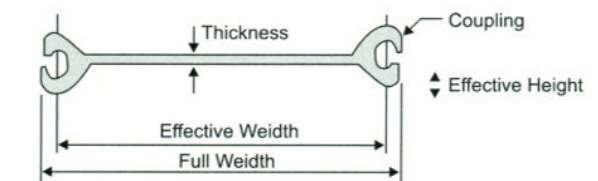


Figure 11 - KSP Straight Web Sections: Dimensions

Section	Dimensions			Section Area Per Pile	Unit Weight Per Wall		Moment Of Intertia Per Wall		Modulus Of Section Per Wall	
	width	height	thickness		Per Pile	Width	Per Pile	Width	Per Pile	Width
	mm	mm	mm	cm ²	kg/m	kg/m ²	cm ⁴	cm ⁴ /m	cm ³	cm ³ /m
KSP FL	500	44.5	9.5	78.57	61.7	123	184	396	45.7	89
KSP FXL	500	47.0	12.7	98.36	77.2	154	245	570	60.3	121

Table 32 - KSP Straight Web Sections: Section Sizes And Properties

Standard Specification	Section Size	Interlocking Strength MN/m
JIS A 5528	KSP FL	4
SY295	KSP FXL	6

Table 33 - KSP Straight Web Sections: Interlocking Strength

The two section can be interlocked with each other.

DIMENSIONAL TOLERANCES

Full Width Single Pile	Full Height	Thickness Of Section			Length
		<10mm	≥10mm <16mm	≥16mm	
±4mm	-	+1.5mm -0.7mm	+1.5mm -0.7mm	-	+ not specified - 0 mm

Deflection Of Full Length		Camber Of Full Length		Difference In Vertically Cut Sections
L ≤ 10mm	L > 10mm	L ≤ 10mm	L > 10mm	
L x 0.15% max.	(L-10m) x 0.10% +15mm max.	L x 0.25% max.	(L-10m) x 0.10% +20mm max.	Within 4% of width

Note: The deflection shall be in the direction parallel to the sheet pile wall and the camber shall be in the direction vertical to the sheet pile wall.

Table 34 - KSP Straight Web Sections: Dimensional Tolerances