Interlocks	
LARSSEN section Interlock design conforming to DIN EN 10248-2 and E 67 of EAU 2004	p
LARSSEN 43, 430	
HOESCH section (LARSSEN interlock) Interlock design conforming to DIN EN 10248-2 and E 67 of EAU 2004	
HOESCH section (finger-and-socket interlock) Interlock design conforming to DIN EN 10248-2 and E 67 of EAU 2004	
PEINER interlock steel/ PEINER sheet piling Interlock design conforming to DIN EN 10248-2 and E 67 of EAU 2004	T
UNION straight-web section Interlock design conforming to DIN EN 10248-2 and E 67 of EAU 2004	
KL lightweight section Interlock design conforming to DIN EN 10249-2	l

### Sheet piling steel grades for hot-rolled sheet piles conforming to DIN EN 10 248-1

		-					
Steel grade	Tensile strength	Minimum yield point	Minimum elongation				
	N/mm <sup>2</sup>	N/mm <sup>2</sup>	%				
S 240 GP	340	240	26				
S 270 GP	410	270	24				
S 320 GP	440	320	23				
S 355 GP	480	355	22				
S 390 GP <sup>1)</sup>	490	390	20				
S 430 GP1)	510	430	19				

<sup>1)</sup> For the higher-strength sheet piling steels S 390 GP and S 430 GP, an approval certificate (Z-30, 1-7) from the building supervisory authorities dated February 28, 2005 is available.

### Higher-strength weldable sheet piling steels according to works standards

Steel grade	Tensile strength	Minimum yield point	Minimum elongation
	N/mm <sup>2</sup>	N/mm <sup>2</sup>	%
St Sp 460	550	460	17
St Sp 500	590	500	16

Further steel grades to national and international standard available on request.

### Materials - Standard steel grades for PEINER sections

Steel grades	Standard
Structural steels	EN 10025
Fine grain structural steels	EN 10113
Weather resistant steels	EN 10155
Sheet piling steels	EN 10248
Special steel grades of the PEINER Träger series	Peiner Träger material standard, minimum yield point from 355 to 460 N/mm <sup>2</sup>
Further steel grades upon request	e.g.: BS, NF, ASTM, JIS, CSAG, GOST, UNI

All sections are available in accordance with current national and international standards and also special specifications if required.

A choice is provided in the table "Steel grades".

# ÜHP proof of conformity for steel sheet piles in accordance with Bauregelliste (list of relevant standards and specifications) A, Part 1

During production, a certified quality management system conforming to DIN EN ISO 9001 upholds a high standard of quality from the start of the process right through to the finished steel sheet piling.

This is an essential precondition for the demanded ÜHP proof of conformity for sheet steel piles in accordance with Bauregelliste A, Part 1.

Following inspection by the North-Rhine/ Westphalian Materials Testing Office (Document No. 11 0001 0 97), HSP Hoesch Spundwand and Profil GmbH in Dortmund is entitled to conformity-mark its steel sheet piles produced in accordance with DIN EN 10248. In addition, all sections are supplied with the rolled HOESCH mark. This means it is possible to trace all approved construction products and exclude confusion with materials without conformity mark approval.

The materials flow, identification, traceability and marking of HSP products are elements of the quality assurance system built up in accordance with DIN EN ISO 9001/2000 and recertified by LRQA from January 1, 2005.

HSP	
HOESCH SPUNDWAND UND PROFIL GMBH	
Dortmund	
DIN EN 10248-1	
S240GP Typ P S270GP S355GP	

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# Deviation limits and dimensional tolerances for hot-rolled sheet piles made of unalloyed steels conforming to DIN EN 10 248-2

Pile width	Single piles $\pm$ 2%; double and triple piles $\pm$ 3%
Wall thicknesses of U sections	t: up to 8.5 mm = $\pm$ 0.5 mm; over 8.5 mm = $\pm$ 6% t s: up to 8.5 mm = $-$ 0.5 mm; over 8.5 mm = $-$ 6% s <sup>1</sup> )
Wall thicknesses of Z sections and straight-web sections	t, s: up to 8.5 mm = $\pm$ 0.5 mm; over 8.5 mm = $\pm$ 6% s, t
Height of U sections	h: up to 200 mm = $\pm$ 4 mm; over 200 mm = $\pm$ 5 mm
Height of Z sections	h: up to 200 mm = $\pm$ 5 mm; von 200 up to 300 mm = $\pm$ 6 mm; over 300 mm = $\pm$ 7 mm
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 $\pm$ 200 mm from the ordered lengths.
Cut	Cut at right angles to the longitudinal axis. The total deviation between the highest and lowest points in the cutting plane, measured on a single pile along the longitudinal axis, must not exceed 2% of pile width.
Weight	The tolerance between the arithmetic weight (according to section tables) and weighed weight of the total consignment must be within $\pm$ 5%.
Section interlocks	The interlocks shall have adequate free play so that the piles can be fitted into each other and they must engage in such a manner that the in-service forces can be transmitted. The minimum interlock overlap on U and Z piles must not be less than 4 mm and on straight-web sections not less than 7 mm.

<sup>1)</sup> Normally the positive tolerance shall be at the discretion of the manufacturer. At the time of the enquiry and order, a limitation on the positive tolerance can be agreed. In this case, the following values should be chosen: + 0.5 mm for s  $\leq$  8.5 mm and + 6 % s for s > 8.5 mm.

## Steel grade for cold-roll formed sheet piles conforming to DIN EN 10 249-1

-		•	
Steel grade	Tensile strength	Minimum yield point	Minimum elongation
	N/mm <sup>2</sup>	N/mm <sup>2</sup>	%
S 275 JRC	410	275	22

# Deviation limits and dimensional tolerances for cold-roll formed sheet piles made of unalloyed steels conforming to DIN EN 10249-2

Pile width	Single piles $\pm$ 2%, double piles $\pm$ 3%
Sheet thickness for nominal widths up to 1200 mm	from 4.00 to 5.00 mm = $\pm$ 0.24 mm; from 5.00 to 6.00 mm = $\pm$ 0.26 mm; from 6.00 to 8.00 mm = $\pm$ 0.29 mm
Sheet thickness for nominal widths from 1200 to 1500 mm	from 4.00 to 5.00 mm = $\pm$ 0.26 mm; from 5.00 to 6.00 mm = $\pm$ 0.28 mm; from 6.00 to 8.00 mm = $\pm$ 0.30 mm
Pile height	up to 200 mm pile height $\pm$ 4 mm
Deviation from straightness	The longitudinal deviation from straightness must not exceed 0.25% of pile length.
Twist	The twist must not exceed 2% of pile length, but must be no more than 100 mm.
Pile length	Sheet pile lengths are permitted to deviate by $\pm$ 50 mm from the ordered lengths.
Cut	Cut at right angles to the longitudinal axis. The total deviation between the highest and lowest points in the cutting plane, measured at right angles to the pile's longitudinal axis, must not exceed 2% of pile width.
Weight	The tolerance between the arithmetic weight (according to section tables) and weighed weight of the total consignment must be within $\pm$ 7%.

### Section abbreviations

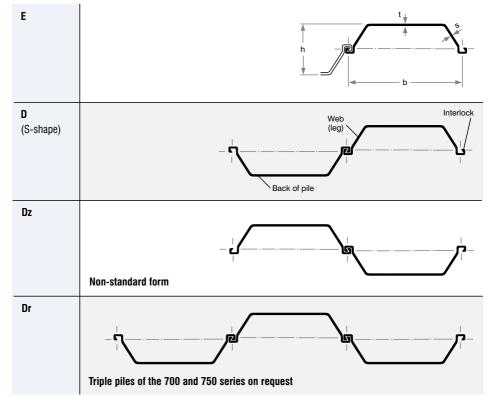
E, Ea, Eb = single pile D, Da, Db, Dz = double pile Dr, Dra, Drb = triple pile V = quadruple pile

### **Adapter piles**

To achieve fixed wall lengths, it may be necessary to fit adapter piles. The system widths of these piles are modified as required, although the width of the individual adapter pile depends on driving requirements.

### **Available LARSSEN sections**

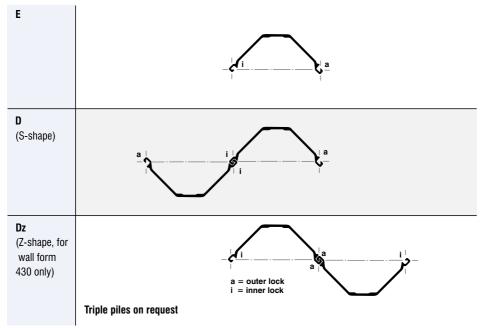
20, 600, 700 and 750 series



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## LARSSEN 43

(Pay attention to interlock position)

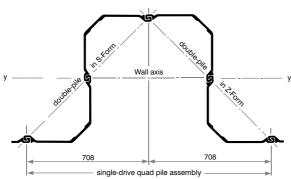






(Wall form of LARSSEN 43)





To withstand the shear forces, it is necessary to cramp the interlocks on the wall axis.

### Handling holes and cramping/welding of LARSSEN sections

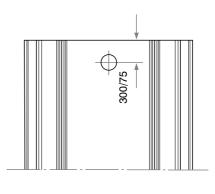
Handling holes can be provided on request. Each pile back is then provided with a hole as indicated on the drawing. Holes can be provided at a distance of either 75 or 300 mm from the upper pile edge (to be stated when ordering).

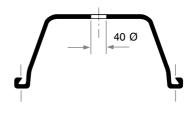
The section moduli stated in this manual for LARSSEN sections necessitate the locking of the pile interlocks, either by factory cramping, factory shear-resistant welding or site welding.

The interlocks of double piles prefabricated in the factory are double-cramped at centers of approx. 0.4 m, while those of triple piles are double-cramped at 0.8 m centers. Cramps may also be spaced more closely by arrangement.

When the interlock bars are pushed in opposite directions, each cramp is capable of absorbing 75 kN after a pushing distance of 5 mm.

If for manufacturing reasons fabricated piles (such as corner, junction and adapter piles) cannot be cramped, they are welded at both ends.





# Ea ~ b b (E in a-position, web rising to the right) Eb Socket finger Socket flange Socket flange Socket finger Web Web Socket thumb Socket thumb Finger Finger Finger flange Finger flange (E in b-position, web falling to the right) Da Back with interlock Back with interlock Web Web Db Triple piles on request

# **Available HOESCH sections**

### Handling holes and cramping/welding of HOESCH sections

Handling holes can be provided on request. Each pile web is then provided with a hole as indicated on the drawing. Holes can be provided at a distance of either 75 or 300 mm from the upper pile edge (to be stated when ordering). Composite piles which have been prefabricated in the factory are cramped at the interlocks on request, i.e. the interlocks are pressed together by means of a punch at regular intervals down the back of the pile.

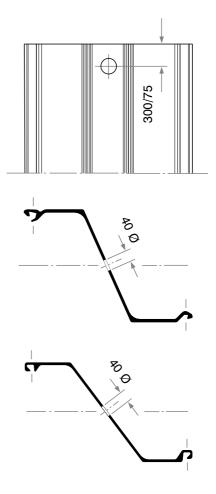
The section moduli of HOESCH sections do not necessitate the cramping of prefabricated interlocks.

On request, cramping can be provided for transport and handling purposes. The cramping points are spaced at 2.40 meters.

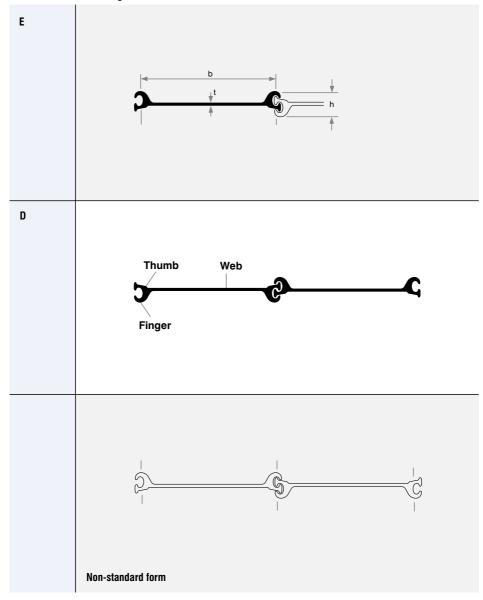
If for manufacturing reasons fabricated piles (such as corner, junction and adapter piles) cannot be cramped, they are welded at both ends.

# Instructions for the site and construction:

- When taking up and inserting unpressed piles together, each pile must be suspended from a lifting hook.
- The position of the cramping mark should be borne in mind if the walls are visible.



# **Available UNION straight-web sections**



# Handling holes and cramping/welding of UNION straight-web sections

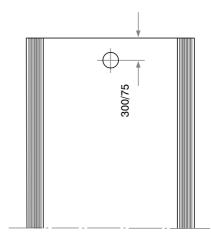
Handling holes are provided on request in the center of each pile web as shown in the drawing.

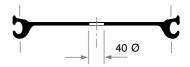
Holes can be provided at a distance of either 75 or 300 mm from the upper pile edge (to be stated when ordering).

The double piles of UNION straight-web sections are always supplied without cramping.

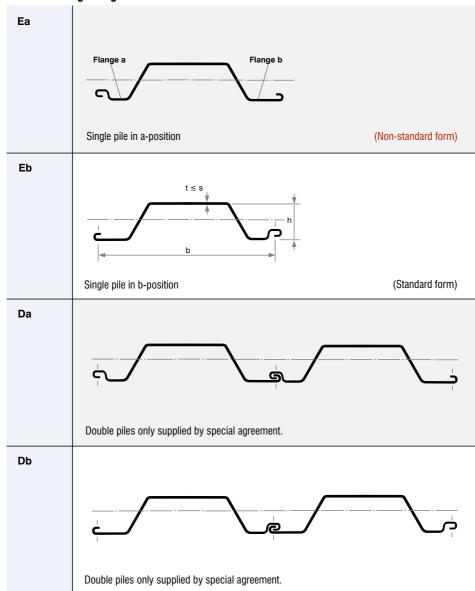
### Note:

When lifting unpressed double or multiple piles on the site, each pile must be suspended from a lifting hook.





3.4.4





### Handling holes in lightweight sections

Lightweight sections are supplied with handling holes. The holes are applied at both ends, as shown in the drawing.

Double piles, which we only supply by special agreement, can be welded in the interlock on one side at the top and bottom.

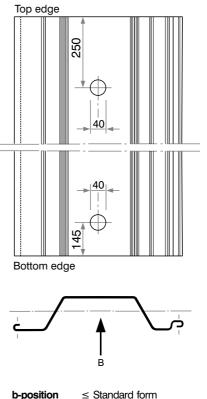
#### The weld seam length is as follows:

- 0.20 m for pile lengths up to 3.0 m
- 0.25 m for pile lengths of 3.0 to 6.0 m
- 0.35 m for pile lengths of 6.0 to 9.0 m

### Note:

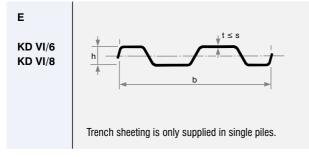
When lifting unwelded double or multiple piles on the site, each pile must be suspended from a lifting hook.

### View B



- **b-position**  $\leq$  Standard form **Handling hole**  $\leq$  250 mm from top edge 145 mm from bottom edge
- a position≤ Non-standard formHandling hole≤ 145 mm from top edge250 mm from bottom edge

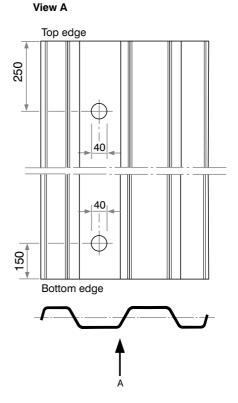
# Available trench sheeting

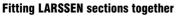


# Handling holes and welding/cramping of trench sheeting

Trench sheeting is supplied with handling holes.

The holes are applied at both ends, as shown in the drawing.





Section	Matching the sections															
	755	703	704	600	601	602	603	604	605	606 n	607 n	22 10/10	23	24	25	43
755				Х	Х	Х										
703 <sup>1)</sup>																
704				Х	Х	Х										
600 <sup>1)</sup>	Х		Х						Х	Х	Х		Х	Х	Х	
601	Х		Х						Х	Х	Х		Х	Х	Х	
602	Х		Х						Х	Х	Х		Х	Х	Х	
603 <sup>1)</sup>																
604 n																
605 <sup>1)</sup>				Х	Х	Х										
606 n				Х	Х	Х										
607 n				Х	Х	Х										
22 10/10																
23				Х	Х	Х										
24 <sup>1)</sup>				Х	Х	Х										
25				Х	Х	Х										
43																

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 $x \leq$ Section interlocks do not match.

<sup>1)</sup> The same applies to section variants of the same name.

These details only apply to once-only section replacement. Always consult us if sections in continuous walls are to be regularly replaced.

3.5.1

гицинд п	OLU	UII 3	COUR	5113 1	ugu	inci													
The section finger	Fits in the section socket												Fits in the corner section						
	1105	1205	1255	1605	1655	1705	1755	1805	2305	2405	2505	2555	2605	3406	3506	3606	3706	3806	HOESCH 3
1105				х	х	х	х	х	х	х	х	х	х	х	х	х	х	х	
12051)				х	х	х	Х	х	х	х	х	Х	х	х	Х	х	х	X	
1255				Х	Х	Х	Х	Х	Х	Х	х	Х	Х	Х	Х	х	Х	X	
1605														Х	Х	Х	Х	X	
1655														Х	Х	Х	Х	X	
1705 <sup>1)</sup>														Х	Х	Х	Х	X	
1755 <sup>1)</sup>														Х	Х	Х	Х	X	
1805														Х	Х	Х	Х	X	
2305				Х	Х	X	Х	Х						Х	Х	Х	Х	X	
2405				Х	Х	X	Х	Х						Х	Х	Х	Х	X	
2505				Х	Х	X	Х	Х						Х	Х	Х	Х	X	
2555 <sup>1)</sup>				X	X	X	Х	Х						Х	Х	Х	Х	X	
2605				Х	Х	X	Х	Х						Х	Х	х	Х	X	
3406	Х	X	Х	X	Х	X	Х	X	Х	Х	Х	X	Х						Х
3506	Х	Х	Х	Х	Х	X	Х	Х	Х	х	Х	X	Х						Х
3606	Х	X	Х	Х	Х	X	Х	X	Х	Х	Х	X	Х						Х
3706	Х	Х	Х	Х	Х	X	Х	Х	Х	Х	Х	X	Х						Х
3806	Х	X	Х	Х	X	X	Х	X	Х	Х	Х	X	Х						Х

# **Fitting HOESCH sections together**

 $x \leq$  Section interlocks do not match.

<sup>1)</sup> The same applies to section variants of the same name.

These details only apply to once-only section replacement. Always consult us if sections in continuous walls are to be regularly replaced.

HOESCH sections with the LARSSEN interlock (1706, 1806, 1856 K, 1906, 2506, 2606 and 2706) fit together.

17

Fitting	HUE	SCH	sect	IONS	toge	tner													
The section socket	Fits	Fits over the section finger														Fits in the corner section			
	1105	1205	1255	1605	1655	1705	1755	1805	2305	2405	2505	2555	2605	3406	3506	3606	3706	3806	HOESCH 3
1105														х	х	х	х	х	
12051)														х	Х	х	х	Х	
1255														х	х	х	х	х	
1605	х	х	х						х	х	х	х	х	х	х	х	х	х	
1655	х	x	x						х	х	х	х	х	х	Х	х	х	х	
1705 <sup>1)</sup>	х	x	х						х	х	х	х	х	х	х	х	х	х	
1755 <sup>1)</sup>	х	x	х						х	х	х	х	х	х	х	х	х	х	
1805	х	x	х						х	х	х	х	х	х	х	x	х	х	
2305	x	x	X											х	х	x	х	х	
2405	х	x	х											х	х	x	х	х	
2505	x	x	x											х	х	х	х	х	
2555 <sup>1)</sup>	х	х	х											х	х	х	х	х	
2605	x	x	х											х	х	х	х	х	
3406	х	х	х	х	х	х	х	х	х	х	х	х	х						х
3506	x	x	x	х	x	х	х	х	х	х	х	х	х						х
3606	х	х	х	х	х	х	х	х	х	х	х	х	х						х
3706	х	x	х	х	x	х	х	х	х	х	х	х	х						х
3806	х	х	х	х	х	х	х	х	х	х	X	х	Х						х
v < 600	otion	intor		a da	not r	noto	h				1)								

# **Fitting HOESCH sections together**

 $x \leq$  Section interlocks do not match.

<sup>1)</sup> The same applies to section variants of the same name.

These details only apply to once-only section replacement. Always consult us if sections in continuous walls are to be regularly replaced.

HOESCH sections with the LARSSEN interlock (1706, 1806, 1856 K, 1906, 2506, 2606 and 2706) fit together.

### Fitting UNION straight-web sections together

The interlocks of all UNION straight-web sections match.