## Interlocks

| LARSSEN section |  |
| :--- | :--- |
| Interlock design conforming |  |
| to DIN EN 10248-2 and |  |
| E 67 of EAU 2004 |  |
| 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 |  |
| 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 |  |

## Available sections, terms of delivery

## 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 |
| :--- | :--- | :--- | :--- |
|  | $\mathrm{N} / \mathrm{mm}^{2}$ | $\mathrm{~N} / \mathrm{mm}^{2}$ |  |
| S 240 GP | 340 | 240 | $\%$ |
| S 270 GP | 410 | 270 | 26 |
| S 320 GP | 440 | 320 | 24 |
| S 355 GP | 480 | 355 | 23 |
| S 390 GP1) | 490 | 390 | 22 |
| S 430 GP1) | 510 | 430 | 20 |

[^0]Higher-strength weldable sheet piling steels according to works standards

| Steel grade | Tensile strength |
| :--- | :--- |
|  | $\mathrm{N} / \mathrm{mm}^{2}$ |
| St Sp 460 | 550 |
| St Sp 500 | 590 |


| Minimum yield point | Minimum elongation |
| :--- | :--- |
|  |  |
| $\mathrm{N} / \mathrm{mm}^{2}$ | $\%$ |
| 460 | 17 |
| 500 | 16 |

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

## Materials - Standard steel grades for PEINER sections

Steel grades
Structural steels
Fine grain structural steels
Weather resistant steels
Sheet piling steels
Special steel grades of the PEINER Träger series
Further steel grades upon request

Standard

EN 10025
EN 10113
EN 10155
EN 10248
Peiner Träger material standard, minimum yield point from 355 to $460 \mathrm{~N} / \mathrm{mm}^{2}$
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".

## Available sections, terms of delivery

## 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. 1100010 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.


## Available sections, terms of delivery

## 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 $8.5 \mathrm{~mm}= \pm 0.5 \mathrm{~mm}$; over $8.5 \mathrm{~mm}= \pm 6 \% \mathrm{t}$ <br> s : up to $8.5 \mathrm{~mm}=-0.5 \mathrm{~mm}$; over $8.5 \mathrm{~mm}=-6 \% \mathrm{~s}^{1)}$ |
| Wall thicknesses of Z sections and straight-web sections | t , s: up to $8.5 \mathrm{~mm}= \pm 0.5 \mathrm{~mm}$; over $8.5 \mathrm{~mm}= \pm 6 \% \mathrm{~s}, \mathrm{t}$ |
| Height of U sections | h: up to $200 \mathrm{~mm}= \pm 4 \mathrm{~mm}$; over $200 \mathrm{~mm}= \pm 5 \mathrm{~mm}$ |
| Height of Z sections | h: up to $200 \mathrm{~mm}= \pm 5 \mathrm{~mm}$; von 200 up to $300 \mathrm{~mm}= \pm 6 \mathrm{~mm}$; over $300 \mathrm{~mm}= \pm 7 \mathrm{~mm}$ |
| 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 $\pm 200 \mathrm{~mm}$ 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 . |

[^1]
## Available sections, terms of delivery

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

| Steel grade | Tensile strength | Minimum yield point | Minimum elongation |
| :--- | :--- | :--- | :--- |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| S 275 JRC | $\mathrm{mm}^{2}$ | 275 | $\%$ |
|  | 410 |  | 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 <br> nominal widths up to <br> $\mathbf{1 2 0 0} \mathbf{~ m m ~}$ | from 4.00 to $5.00 \mathrm{~mm}= \pm 0.24 \mathrm{~mm} ;$ <br> from 5.00 to $6.00 \mathrm{~mm}= \pm 0.26 \mathrm{~mm} ;$ <br> from 6.00 to $8.00 \mathrm{~mm}= \pm 0.29 \mathrm{~mm}$ |
| :--- | :--- |
| Sheet thickness for <br> nominal widths from <br> $\mathbf{1 2 0 0}$ to $\mathbf{1 5 0 0} \mathbf{~ m m ~}$ | from 4.00 to $5.00 \mathrm{~mm}= \pm 0.26 \mathrm{~mm} ;$ <br> from 5.00 to $6.00 \mathrm{~mm}= \pm 0.28 \mathrm{~mm} ;$ <br> from 6.00 to $8.00 \mathrm{~mm}= \pm 0.30 \mathrm{~mm}$ |
| Pile height | up to 200 mm pile height $\pm 4 \mathrm{~mm}$ |
| Deviation from <br> straightness | The longitudinal deviation from straightness must not exceed $0.25 \%$ <br> of pile length. |
| Twist | The twist must not exceed $2 \%$ of pile length, but must be no more <br> than 100 mm. |
| Pile length | Sheet pile lengths are permitted to deviate by $\pm 50$ mm from the ordered <br> lengths. |
| Cut | Cut at right angles to the longitudinal axis. The total deviation between the <br> highest and lowest points in the cutting plane, measured at right angles to the <br> pile's longitudinal axis, must not exceed 2\% of pile width. |
| Weight | The tolerance between the arithmetic weight (according to section tables) and <br> weighed weight of the total consignment must be within $\pm 7 \%$. |

## Available sections, terms of delivery

## Section abbreviations

$$
\begin{aligned}
\text { E, Ea, Eb } & =\text { single pile } \\
\text { D, Da, Db, Dz } & =\text { double pile } \\
\text { Dr, Dra, Drb } & =\text { triple pile } \\
\text { V } & =\text { quadruple pile }
\end{aligned}
$$

## 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


## LARSSEN 43

(Pay attention to interlock position)


Triple piles on request

## LARSSEN 430

(Wall form of LARSSEN 43)
V


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

## Available sections, terms of delivery

## 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.


## Available sections, terms of delivery

## Available HOESCH sections



# Available sections, terms of delivery 

## 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 sections, terms of delivery



Non-standard form

## Available sections, terms of delivery

## 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.


# Available sections, terms of delivery 

## Available KL lightweight sections



## Available sections, terms of delivery

## 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 sus-

## View B


b-position $\leq$ Standard form
Handling hole $\leq 250 \mathrm{~mm}$ from top edge 145 mm from bottom edge
a position $\leq$ Non-standard form
Handling hole $\leq 145 \mathrm{~mm}$ from top edge 250 mm from bottom edge

## Available sections, terms of delivery

## Available trench sheeting



Trench sheeting is only supplied in single piles.

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.

View A


# Available sections, terms of delivery 

Fitting LARSSEN sections together


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

# Available sections, terms of delivery 

Fitting HOESCH sections together

$x \leq$ Section interlocks do not match.
${ }^{1)}$ 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.

# Available sections, terms of delivery 

Fitting HOESCH sections together



[^0]:    ${ }^{1)}$ 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.

[^1]:    ${ }^{1)}$ 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 $\mathrm{s} \leq 8.5 \mathrm{~mm}$ and $+6 \%$ s for $\mathrm{s}>8.5 \mathrm{~mm}$.

