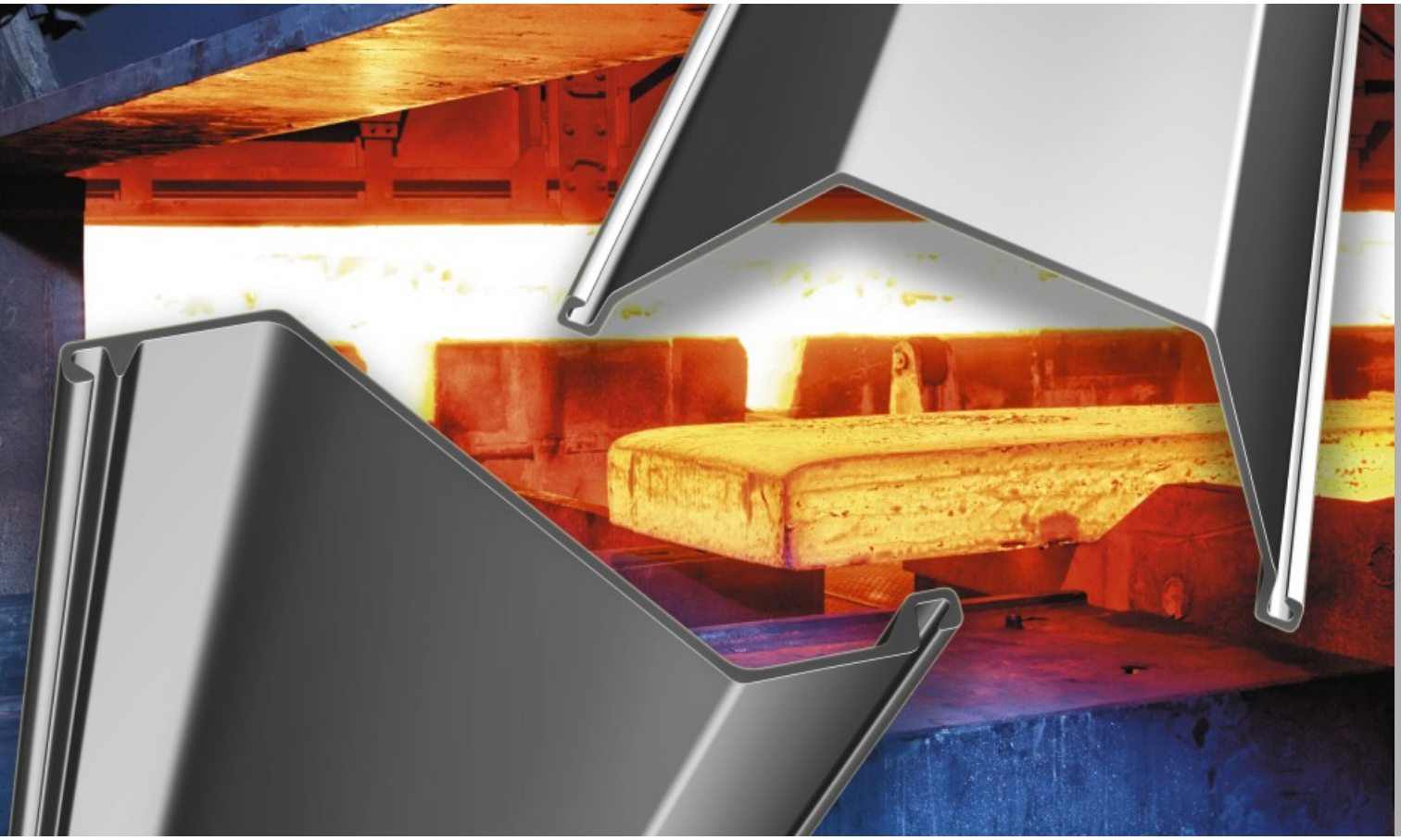


Product range sheet pile sections

Status: January 2013

HOESCH
SPUNDWAND UND PROFIL

A Member of Salzgitter Group

Contents

HSP HOESCH Spundwand und Profil GmbH is one of the leading suppliers of hot-rolled steel piles and shipbuilding sections worldwide.

Since its joining of the Salzgitter Group from June 2000 onwards, the shareholder has secured the company's technical lead through an extensive investment programme and considerably extended the sheet piling programme.

HSP – a company with tradition

Our success is the result of our solid and reliable work. Our strengths lie in our high quality standards, because the way we see it, sheet piling technology does not allow any compromises.

We can refer to more than 100 years of experience with considerable pride. We have been able to continuously extend our market position through intensive research and development work over more than a century, and to consolidate this in comparison with alternative construction methods and products. Our numerous sheet piling solutions, section shapes and variations are an impressive documentation of our creativity, flexibility and development expertise as well as the reliable performance given by our products.

Investment in the future

Sheet piling technology is high-tech, and the innovation cycles are becoming shorter and shorter. Thanks to considerable exertion in the improvement of production technology and to continuous product development, we implement the highest in product quality for the huge challenges of the future.

Tradition and experience are our roots. We design the future based on the knowledge of what is really important.

Customer satisfaction

We know exactly what our customers want, because our performance is based on this knowledge. Quality is at the top of the list, as it should be. If that is your point of view as well, we will be perfect partners because our success is based on quality. We are well-known in the market for precisely that.

Our products have been designed for a wide range of application areas such as water engineering and construction of transport routes, structural and civil engineering, building construction, environment protection, shipbuilding and rail superstructures. We fulfill all the requirements with regard to quality, safety and profitability. Developments in section design and product characteristics don't just take place within our planning team, but very often in cooperation with the user. This produces trust and loyalty.

Our sections are used quickly and at low cost especially in places where traditional methods fail for reasons of topographical conditions, or where rapid driving times are required.

Product quality

Quality assurance during production

We produce perfect sheet piling and shipbuilding sections for a wide range of application fields.

LARSSEN, HOESCH and UNION sections have become unmistakable terms, and have firmly established themselves on the market thanks to our consistent customer and requirement-oriented company policy.

Product quality

Product quality is mostly dependent on a company's know-how and on its readiness to invest in research and development.

HSP is a leading producer of steel sheet piling technology. We have continuously invested huge sums in the performance and quality of our products over the last few years. Recently, our heavy section production line was supplemented with a further DUO reversing stand in 2010, which enables us to produce the widest-possible sheet piling sections using state-of-the-art technology. We achieve the best possible tolerance conformity and even exceed the standards applicable worldwide.

Our computer-controlled 11-roller straightening machine is one of the largest of its type in the world, and enables the best-possible guidance results even when using heavy sheet piling.

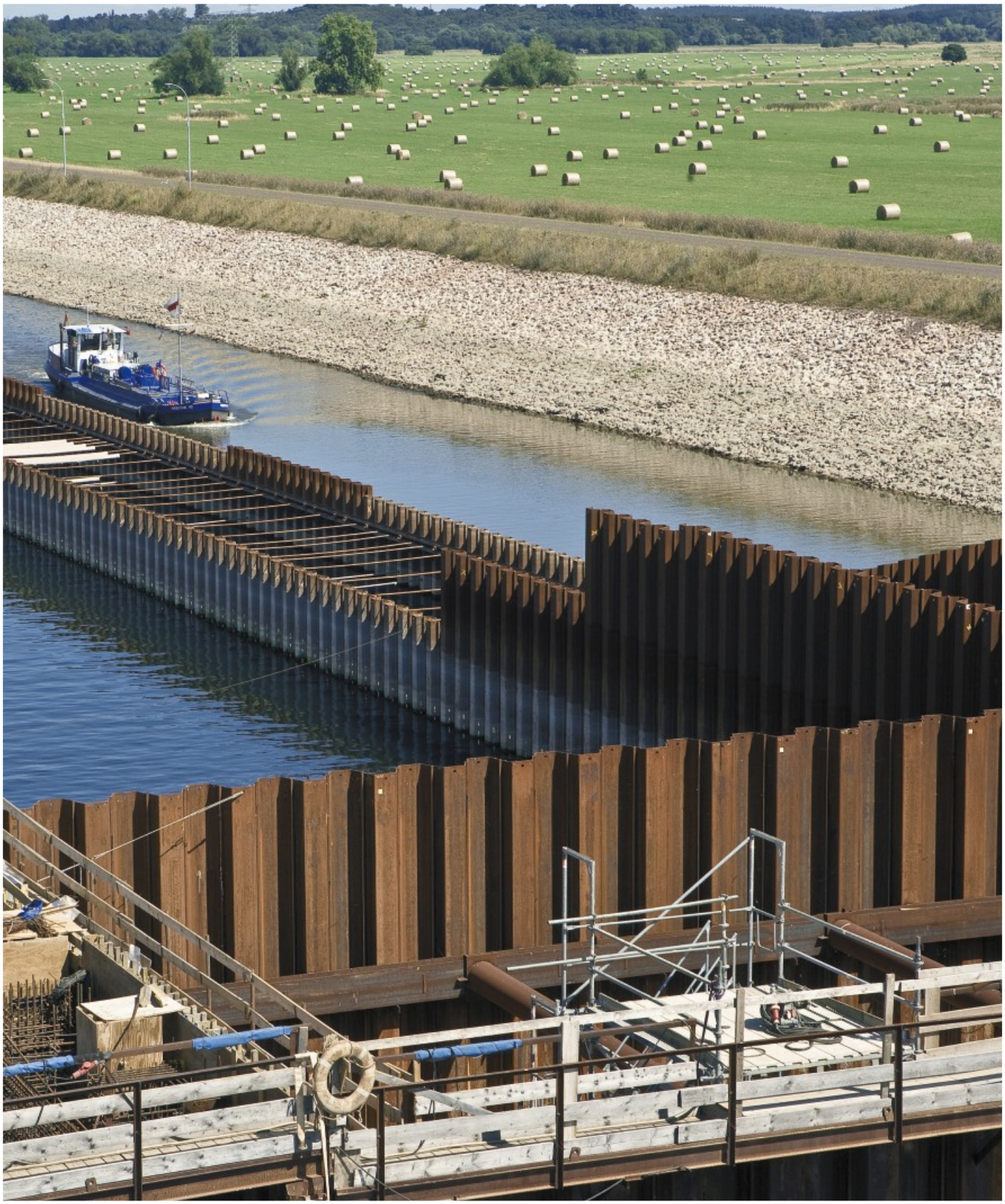
Quality means future

Quality is one of the cornerstones of our company. This makes quality management a guideline for our way of work.

Our continuous inspections start as early as with the delivery of the primary material. During production we place the highest possible requirements on the interests of our customers in order to safeguard the best material properties and to achieve reliable adherence to our product quality.

It goes without saying that our quality management is certified to DIN EN ISO 9001:2008.

Automated systems in our production works guarantee continuous high quality.



Applications

Steel sheet piling has established itself in many application areas. Its high economic efficiency and excellent material properties guarantee reliable solutions.

The properties of the steel material are decisive in the use of steel sheet piling as a prefabricated element. Various structural solutions result, in addition to a wide range of application areas.

Advantages of steel sheet piling

- saves soil excavation and therefore disposal
- shortens construction time through the use of space-saving sheet piling elements ready for installation
- requires little space during construction
- increases safety and provides immediate load-bearing capacity
- construction is independent of weather influences
- simplifies the testability of the material and system properties (even during usage phase)
- guarantees recyclable building materials

Sheet piling must meet exacting requirements

It needs to be the highly durable as a retaining wall since loads have to be transferred vertically and horizontally.

As an enclosure wall, it has to guarantee complete seal tightness in any soil composition, and also has to meet the highest in environmental requirements especially when used to encapsulate contaminants in disposal sites.

Solutions for all requirements

Construction of transport routes

Road and rail
- support walls
- noise protection walls
- bridge abutments
- ramps
- sunken roads / groundwater retention
- tunnels

Civil engineering

- site excavations
- foundations
- trench sheeting
- underground car parks
- house building

Environment protection

Landfills, contaminated sites and enclosures
- vertical-sealed enclosure walls
- excavations for soil replacement
- tank enclosures
- refuse tipping ramps

Noise abatement

- noise protection walls

Water protection

- pumping stations
- sewage works
- stormwater overflow basins
- stormwater retention basins
- securing embankments

Water engineering

Ports
- quay walls
- dock constructions
- dolphins
- ro-ro facilities

Waterways
- waterway supports
- retaining walls
- securing embankments
- berth facilities
- scour protection

Water engineering structures
- locks
- weirs
- bridge abutments
- culverts
- safety gates
- flood protection walls
- pier foundations
- inlets and outlet

Overview sheet pile sections

LARSSEN sections

Section	Section modulus		Weight		Second moment of inertia	Back thickness	Web thickness	Wall height	Section width
	W_y[1]				I_y	t	s	h	b
	cm³/m	cm³/	kg/m²	kg/m	cm⁴/m				
	Wall	**Single pile**	**Wall**	**Single pile**	**Wall**	**mm**	**mm**	**mm**	**mm**
LARSSEN 22	1260	355	123.6	61.8	21420	10.0	9.0	340	500
LARSSEN 22 10/10[3]	1300	372	129.8	64.9	22100	10.0	10.0	340	500
LARSSEN 23	2000	527	155.0	77.5	42000	11.5	10.0	420	500
LARSSEN 24	2500	547	175.0	87.5	52500	15.6	10.0	420	500
LARSSEN 24/12	2550	560	185.4	92.7	53610	15.6	12.0	420	500
LARSSEN 25	3040	562	206.0	103.0	63840	20.0	11.5	420	500
LARSSEN 43	1660	483	166.0[2]	83.0	34900	12.0	12.0	420	500
LARSSEN 430[5]	6450	–	234.5	83.0	241800	12.0	12.0	750[5]	708
LARSSEN 600	510	130	94.0	56.4	3825	9.5	9.5	150	600
LARSSEN 600 K	540	133	99.0	59.4	4050	10.0	10.0	150	600
LARSSEN 601	745	251	78.0	46.8	11520	7.5	6.4	310	600
LARSSEN 602	830	265	89.0	53.4	12870	8.2	8.0	310	600
LARSSEN 603	1200	330	108.0	64.8	18600	9.7	8.2	310	600
LARSSEN 603 K	1240	340	113.5	68.1	19220	10.0	9.0	310	600
LARSSEN 603 10/10[3]	1260	350	116.0	69.6	19530	10.0	10.0	310	600
LARSSEN 604 n	1600	415	123.0	73.8	30400	10.0	9.0	380	600
LARSSEN 605	2020	520	139.2	83.5	42420	12.5	9.0	420	600
LARSSEN 605 K	2030	537	144.5	86.7	42630	12.2	10.0	420	600
LARSSEN 606 n	2500	605	157.0	94.2	54375	14.4	9.2	435	600
LARSSEN 606 nK[3]	2530	617	162.1	97.3	55030	14.4	10.0	435	600
LARSSEN 628	2775	586	165.5	99.3	63270	16.3	9.8	456	600
LARSSEN 607 n	3200	649	190.0	114	72320	19.0	10.6	452	600
LARSSEN 703	1210	414	96.4	67.5	24200	9.5	8.0	400	700
LARSSEN 703 K	1300	426	103.0	72.1	25950	10.0	9.0	400	700
LARSSEN 703 10/10[3]	1340	437	108.0	75.6	26800	10.0	10.0	400	700
LARSSEN 716	1600	511	114.2	79.9	35200	10.2	9.5	440	700
LARSSEN 720	2000	588	128.5	96.4	45000	12.0	10.0	450	750

HOESCH sections (LARSSEN interlock)

HOESCH 1707	1735	1215	104.6	73.2	36435	8.7	8.5	420	700
HOESCH 1807	1800	1260	109.3	76.5	37800	9.2	9.0	420	700
HOESCH 1907	1865	1306	113.9	79.7	39165	9.7	9.5	420	700
HOESCH 2007[3]	1945	1362	119.4	83.6	40845	10.3	10.1	420	700
HOESCH 2407[3]	2450	1715	136.7	95.7	53000	11.0	11.0	440	700
HOESCH 2507	2525	1768	141.4	99.0	55550	11.5	11.5	440	700
HOESCH 2607	2600	1820	146.2	102.3	57200	12.0	12.0	440	700
HOESCH 2707	2705	1894	153.0	107.1	59520	12.7	12.7	440	700
HOESCH 2807	2765	1936	156.7	109.7	60830	13.1	13.1	440	700
HOESCH 3607[3]	3595	2517	167.7	117.4	89875	16.8	10.8	500	700
HOESCH 3707[3]	3696	2587	173.7	121.6	92400	17.4	11.4	500	700
HOESCH 3807[3]	3800	2660	179.8	125.9	95000	18.0	12.0	500	700
HOESCH 3907[3]	3925	2745	186.8	130.8	98000	18.7	12.7	500	700
HOESCH 4007[3]	3970	2780	190.0	133.0	99250	19.0	13.0	500	700

HOESCH sections (finger-and-socket interlock)

HOESCH 1105	1100	633	101.0	58.1	14300	8.8	8.8	260	575
HOESCH 1205	1140	655	107.0	61.5	14820	9.5	9.5	260	575
HOESCH 1205 K	1200	690	112.5	64.7	15600	10.2	10.2	260	575
HOESCH 1255	1250	719	118.0	67.9	16250	10.8	10.8	260	575

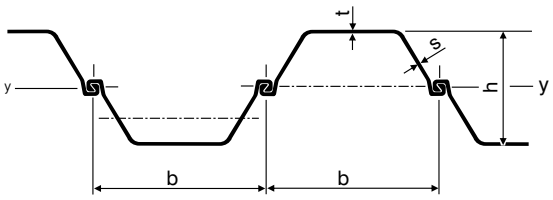
LARSSEN sections rolled-down -0,5

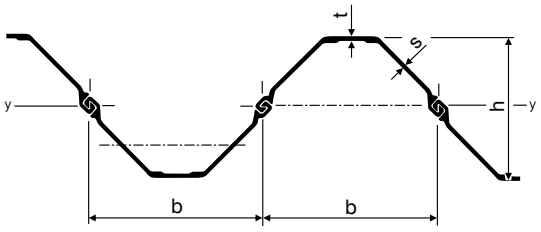
Section modulus		Weight		Second moment of inertia	Back thick-ness	Web thick-ness
W_y[1)]				I_y	t	s
cm^3/m	$cm^3/$	kg/m^2	kg/m	cm^4/m		
Wall	**Single pile**	**Wall**	**Single pile**	**Wall**	**mm**	**mm**
1209	351	120.3	60.2	20555	9.5	8.8
–	–	–	–	–	–	–
1930	539	151.6	75.8	40530	11.0	9.8
2440	585	171.6	85.8	51240	15.1	9.8
–	–	–	–	–	–	–
2980	625	202.6	101.3	62580	19.5	11.3
–	–	–	–	–	–	–
–	–	–	–	–	–	–
480	126	89.0	53.4	3600	9.0	9.1
–	–	–	–	–	–	–
–	–	–	–	–	–	–
790	254	85.5	51.3	12245	7.7	7.6
1150	320	104.5	62.7	17825	9.2	7.9
1190	335	109.5	65.7	18445	9.5	8.7
–	–	–	–	–	–	–
1540	415	119.5	71.7	29260	9.5	8.8
1950	515	135.5	81.3	40950	12.0	8.8
–	–	–	–	–	–	–
2410	585	153.7	92.2	52420	13.9	9.0
–	–	–	–	–	–	–
2700	580	161.8	97.1	61560	15.8	9.6
3130	671	186.5	111.9	70740	18.5	10.4
1150	408	93.0	65.1	23000	9.0	7.7
–	–	–	–	–	–	–
–	–	–	–	–	–	–
1535	507	110.6	77.4	33770	9.7	9.2
1930	582	124.9	93.7	43430	11.5	9.7

LARSSEN sections rolled-up +0,5

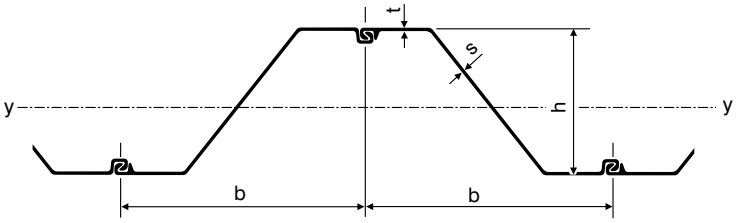
Section modulus		Weight		Second moment of inertia	Back thick-ness	Web thick-ness
W_y[1)]				I_y	t	s
cm^3/m	$cm^3/$	kg/m^2	kg/m	cm^4/m		
Wall	**Single pile**	**Wall**	**Single pile**	**Wall**	**mm**	**mm**
1308	357	126.7	63.4	22235	10.5	9.2
–	–	–	–	–	–	–
2070	551	158.6	79.3	43470	12.0	10.2
2560	581	178.6	89.3	53760	16.1	10.2
–	–	–	–	–	–	–
3100	626	209.6	104.8	65100	20.5	11.7
–	–	–	–	–	–	–
–	–	–	–	–	–	–
540	132	99.0	59.4	4050	10.0	9.9
–	–	–	–	–	–	–
790	246	81.8	49.1	12245	8.0	6.8
880	264	92.5	55.5	13640	8.7	8.4
1250	340	111.5	66.9	19375	10.2	8.5
1290	343	116.5	69.9	19995	10.5	9.3
–	–	–	–	–	–	–
1667	421	126.5	75.9	31675	10.5	9.2
2090	525	142.5	85.5	43890	13.0	9.2
–	–	–	–	–	–	–
2570	610	160.5	96.3	55900	14.9	9.4
–	–	–	–	–	–	–
2845	589	169.0	101.4	64870	16.8	10.0
3270	681	193.5	116.1	73900	19.5	10.8
1270	433	100.0	70.0	25400	10.0	8.3
–	–	–	–	–	–	–
–	–	–	–	–	–	–
1660	517	117.6	82.3	36520	10.7	9.8
2070	597	132.1	99.1	46570	12.5	10.3

LARSSEN sections

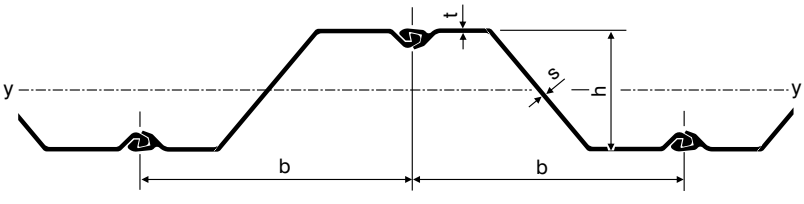




HOESCH sections (LARSSEN interlock)



HOESCH sections (finger-and-socket interlock)



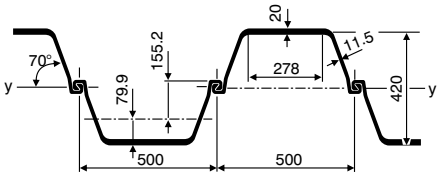
LARSSEN sections

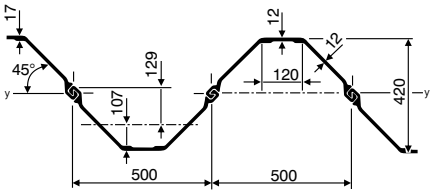
E = Single pile
D = Double pile
Dr = Triple pile
V = Quadruple pile

	Elastic section modulus[6]	Plastic section modulus[6]	Weight	Cross sectional area	Circum-ference[7]	Coating area[8]	Static moment	Second moment of inertia	Radius of gyration	Classification to ENV 1993-5				
	W_y	W_y	kg/m				S_y	I_y	i_y	Steel grades				
	cm³	cm³		cm²	cm	m²/m	cm³	cm⁴	cm	S240GP	S270GP	S355GP	S390GP	S430GP
LARSSEN 22														
Wall	1260	1516	123.6	157.5	284	2.84	758	21420	11.66	2	2	2	2	2
E	355	–	61.8	78.7	164	1.51	–	4049	7.17	–	–	–	–	–
D	1260	–	123.6	157.4	306	2.93	–	21420	11.66	–	–	–	–	–
Dr	1490	–	185.4	236.1	448	4.35	–	29910	11.26	–	–	–	–	–
LARSSEN 22 10/10[3]														
Wall	1300	1574	129.8	165.4	284	2.84	787	22100	11.56	2	2	2	2	2
E	372	–	64.9	82.7	164	1.51	–	4202	7.13	–	–	–	–	–
D	1300	–	129.8	165.4	306	2.93	–	22100	11.56	–	–	–	–	–
Dr	1541	–	194.7	248.1	448	4.35	–	30870	11.15	–	–	–	–	–
LARSSEN 23														
Wall	2000	2300	155.0	197.4	315	3.15	1150	42000	14.60	2	2	2	2	2
E	527	–	77.5	98.7	184	1.72	–	7480	8.71	–	–	–	–	–
D	2000	–	155.0	197.4	342	3.30	–	42000	14.60	–	–	–	–	–
Dr	2350	–	232.5	296.1	500	4.88	–	58470	14.10	–	–	–	–	–
LARSSEN 24														
Wall	2500	2800	175.0	222	315	3.15	1400	52500	15.30	2	2	2	2	2
E	547	–	87.5	111	184	1.72	–	8270	8.63	–	–	–	–	–
D	2500	–	175.0	222	340	3.28	–	52500	15.30	–	–	–	–	–
Dr	2860	–	262.5	333	496	4.84	–	71970	14.70	–	–	–	–	–
LARSSEN 24/12														
Wall	2500	2948	185.4	236.2	315	3.15	1474	53610	15.10	2	2	2	2	2
E	560	–	92.7	118.1	184	1.72	–	8397	8.40	–	–	–	–	–
D	2550	–	185.4	236.2	340	3.28	–	53610	15.10	–	–	–	–	–
Dr	2952	–	278.1	354.3	496	4.84	–	74279	14.50	–	–	–	–	–

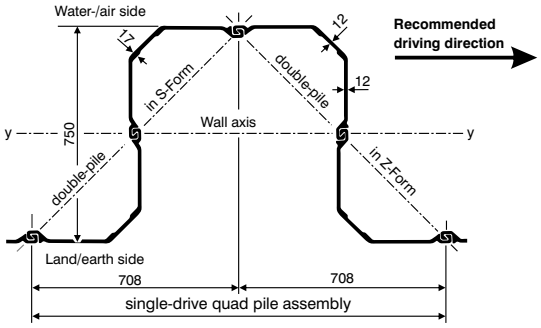
E = Single pile
D = Double pile
Dr = Triple pile
V = Quadruple pile

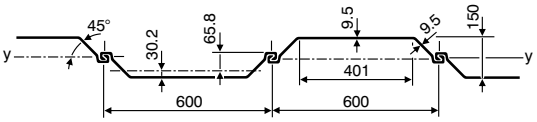
	Elastic section modulus[6]	Plastic section modulus[6]	Weight	Cross sectional area	Circum-ference[7]	Coating area[8]	Static moment	Second moment of inertia	Radius of gyration	Classification to ENV 1993-5				
	W_y	W_y	kg/m				S_y	I_y	i_y	Steel grades				
	cm³	cm³		cm²	cm	m²/m	cm³	cm⁴	cm	S240GP	S270GP	S355GP	S390GP	S430GP
LARSSEN 25														
Wall	3040	3480	206	262	311	3.11	1740	63840	15.61	2	2	2	2	2
E	562	–	103	131	183	1.71	–	8850	8.22	–	–	–	–	–
D	3040	–	206	262	339	3.27	–	63840	15.61	–	–	–	–	–
Dr	3420	–	309	393	494	4.82	–	86940	14.85	–	–	–	–	–
LARSSEN 43														
Wall	1660	2184	166	212	280	2.80	1100	34900	12.80	2	2	2	2	2
E	483	–	83	106	167	1.55	–	6230	7.67	–	–	–	–	–
D	1660	–	166	212	308	2.96	–	34900	12.80	–	–	–	–	–
Dr	1990	–	249	318	449	4.37	–	48670	12.40	–	–	–	–	–
LARSSEN 430														
Wall	6450	7486	234.5[2]	299.4	396	3.96	3750	241800	28.4	2	2	2	2	2
D	4570	–	166.0	212	308	2.96	–	171200	28.4	–	–	–	–	–
V	9130	–	332.0	424	590	5.78	–	342400	28.4	–	–	–	–	–
LARSSEN 600														
Wall	510	580	94.0	119.7	225	2.25	290	3825	5.65	3	3	4	4	4
E	130	–	56.4	71.8	156	1.44	–	850	3.45	–	–	–	–	–
D	614	–	112.8	143.6	291	2.79	–	4590	5.65	–	–	–	–	–
Dr	712	–	169.2	215.4	426	4.14	–	6400	5.46	–	–	–	–	–
LARSSEN 600 K														
Wall	540	618	99.0	126.1	225	2.25	309	4050	5.67	3	3	4	4	4
E	133	–	59.4	75.6	156	1.44	–	880	3.42	–	–	–	–	–
D	648	–	118.8	151.2	291	2.79	–	4860	5.67	–	–	–	–	–
Dr	752	–	178.2	226.8	426	4.14	–	6770	5.46	–	–	–	–	–

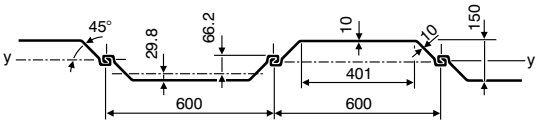




The wall height 750 mm is a non binding dimension. The actual measurement depends mainly upon the installation and ancilliary conditions of the site.







LARSSEN sections

E = Single pile
D = Double pile
Dr = Triple pile
V = Quadruple pile

	Elastic section modulus[6]	Plastic section modulus[6]	Weight	Cross sectional area	Circum-ference[7]	Coating area[8]	Static moment	Second moment of inertia	Radius of gyration	Classification to ENV 1993-5				
	W_y	W_y	kg/m				S_y	I_y	i_y	Steel grades				
	cm³	cm³		cm²	cm	m²/m	cm³	cm⁴	cm	S240GP	S270GP	S355GP	S390GP	S430GP
LARSSEN 601														
Wall	745	836	78.0	98.3	245	2.45	418	11520	10.83	2	2	3	3	3
E	251	–	46.8	59.0	172	1.60	–	2650	6.70	–	–	–	–	–
D	890	–	93.6	118.0	319	3.07	–	13830	10.83	–	–	–	–	–
Dr	1050	–	140.0	177.0	466	4.54	–	19320	10.44	–	–	–	–	–
LARSSEN 602														
Wall	830	964	89.0	113.3	245	2.45	482	12870	10.66	2	2	3	3	3
E	265	–	53.4	6.80	172	1.60	–	2790	6.41	–	–	–	–	–
D	996	–	106.8	136.0	319	3.07	–	15440	10.66	–	–	–	–	–
Dr	1170	–	160.2	204.0	466	4.54	–	21520	10.27	–	–	–	–	–
LARSSEN 603														
Wall	1200	1300	108.0	138.3	260	2.60	650	18600	11.63	3	3	3	4	4
E	330	–	64.8	83.0	181	1.69	–	3830	6.79	–	–	–	–	–
D	1440	–	129.6	166.0	337	3.25	–	22320	11.63	–	–	–	–	–
Dr	1670	–	194.4	249.0	493	4.81	–	31050	11.19	–	–	–	–	–
LARSSEN 603 K														
Wall	1240	1360	113.5	145.0	260	2.60	680	19220	11.55	3	3	3	3	4
E	340	–	68.1	87.0	181	1.69	–	3890	6.69	–	–	–	–	–
D	1490	–	136.2	174.0	337	3.25	–	23060	11.55	–	–	–	–	–
Dr	1720	–	204.3	261.0	493	4.81	–	32180	11.10	–	–	–	–	–
LARSSEN 603 10/10[3]														
Wall	1260	1400	116.0	148.3	260	2.60	700	19530	11.48	3	3	3	3	4
E	350	–	69.6	89.0	181	1.69	–	4067	6.34	–	–	–	–	–
D	1510	–	139.2	178.0	337	3.25	–	23440	11.48	–	–	–	–	–
Dr	1730	–	208.8	267.0	493	4.81	–	32180	10.98	–	–	–	–	–

E = Single pile
D = Double pile
Dr = Triple pile
V = Quadruple pile

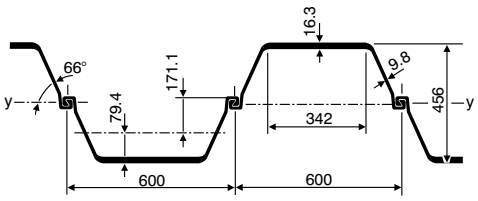
	Elastic section modulus[6]	Plastic section modulus[6]	Weight	Cross sectional area	Circum-ference[7]	Coating area[8]	Static moment	Second moment of inertia	Radius of gyration	Classification to ENV 1993-5				
	W_y	W_y	kg/m				S_y	I_y	i_y	Steel grades				
	cm³	cm³		cm²	cm	m²/m	cm³	cm⁴	cm	S240GP	S270GP	S355GP	S390GP	S430GP
LARSSEN 604 n														
Wall	1600	1862	123.0	156.7	282	2.82	931	30400	13.93	2	3	3	3	3
E	415	–	73.8	94.0	194	1.82	–	5700	7.79	–	–	–	–	–
D	1920	–	147.6	188.0	363	3.51	–	36480	13.93	–	–	–	–	–
Dr	2212	–	221.4	282.0	532	5.20	–	50540	13.39	–	–	–	–	–
LARSSEN 605														
Wall	2020	2340	139.2	177.3	290	2.90	1170	42420	15.47	2	2	2	2	3
E	520	–	83.5	106.4	200	1.88	–	7910	8.62	–	–	–	–	–
D	2420	–	167.0	212.8	374	3.62	–	50900	15.47	–	–	–	–	–
Dr	2790	–	250.5	319.2	548	5.36	–	70510	14.86	–	–	–	–	–
LARSSEN 605 K														
Wall	2030	2386	144.5	184.1	290	2.90	1193	42630	15.22	2	2	2	2	3
E	537	–	86.7	110.4	200	1.88	–	8080	8.55	–	–	–	–	–
D	2436	–	173.4	220.8	374	3.62	–	51160	15.22	–	–	–	–	–
Dr	2814	–	260.1	331.2	548	5.36	–	70900	14.63	–	–	–	–	–
LARSSEN 606 n														
Wall	2500	2820	157.0	200	292	2.92	1410	54375	16.49	2	2	2	2	2
E	605	–	94.2	120	201	1.89	–	9870	9.07	–	–	–	–	–
D	3000	–	188.4	240	377	3.65	–	65250	16.49	–	–	–	–	–
Dr	3430	–	282.6	360	552	5.40	–	90290	15.84	–	–	–	–	–
LARSSEN 606 nK[3]														
Wall	2530	2888	162.1	206.5	292	2.92	1444	55030	16.32	2	2	2	2	2
E	617	–	97.3	123.9	201	1.89	–	9930	8.95	–	–	–	–	–
D	3036	–	194.6	247.8	377	3.65	–	66030	16.32	–	–	–	–	–
Dr	3474	–	291.9	371.7	552	5.40	–	91360	15.68	–	–	–	–	–

LARSSEN sections

E = Single pile
D = Double pile
Dr = Triple pile
V = Quadruple pile

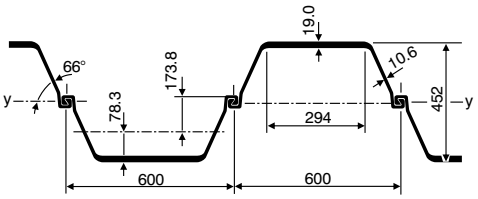
	Elastic section modulus[6]	Plastic section modulus[6]	Weight	Cross sectional area	Circum-ference[7]	Coating area[8]	Static moment	Second moment of inertia	Radius of gyration	Classification to ENV 1993-5				
	W_y	W_y	kg/m				S_y	I_y	i_y	Steel grades				
	cm³	cm³		cm²	cm	m²/m	cm³	cm⁴	cm	S240GP	S270GP	S355GP	S390GP	S430GP

LARSSEN 628



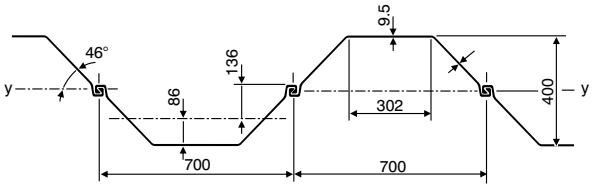
Wall	2775	3192	165.5	210.8	303	3.03	1596	63270	17.32	2	2	2	2	2
E	586	–	99.3	126.5	205	1.90	–	10030	8.90	–	–	–	–	–
D	3330	–	198.6	253.0	386	3.71	–	75920	17.32	–	–	–	–	–
Dr	3768	–	297.9	379.5	568	5.53	–	104570	16.60	–	–	–	–	–

LARSSEN 607 n



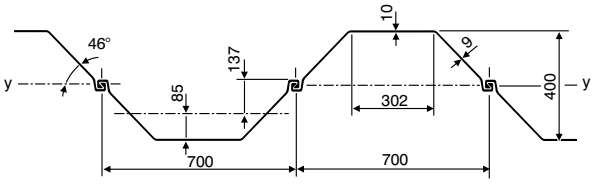
Wall	3200	3620	190	241.7	293	2.93	1810	72320	17.30	2	2	2	2	2
E	649	–	114	145.0	203	1.91	–	11280	8.73	–	–	–	–	–
D	3840	–	228	290.0	380	3.67	–	86790	17.30	–	–	–	–	–
Dr	4330	–	342	435.0	554	5.43	–	119400	16.55	–	–	–	–	–

LARSSEN 703



Wall	1210	1460	96.4	122.9	251	2.51	730	24200	13.90	2	2	3	3	3
E	414	–	67.5	86.0	202	1.90	–	5630	8.00	–	–	–	–	–
D	1700	–	135.0	172.0	377	3.65	–	34000	13.90	–	–	–	–	–
Dr	1980	–	202.5	258.0	553	5.41	–	47100	13.40	–	–	–	–	–

LARSSEN 703 K

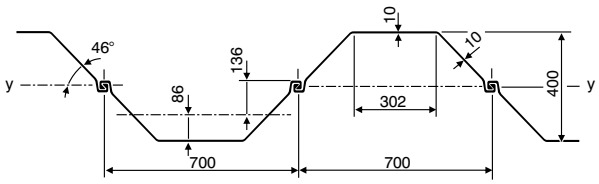


Wall	1300	1575	103.0	131.1	251	2.51	787.5	25950	13.90	2	2	2	2	3
E	426	–	72.1	91.8	202	1.90	–	5830	7.90	–	–	–	–	–
D	1820	–	144.2	183.6	377	3.65	–	36330	13.90	–	–	–	–	–
Dr	2120	–	216.3	275.4	553	5.41	–	50380	13.40	–	–	–	–	–

E = Single pile
D = Double pile
Dr = Triple pile
V = Quadruple pile

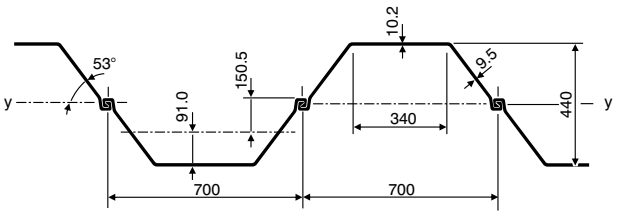
	Elastic section modulus[6]	Plastic section modulus[6]	Weight	Cross sectional area	Circum-ference[7]	Coating area[8]	Static moment	Second moment of inertia	Radius of gyration	Classification to ENV 1993-5				
	W_y	W_y	kg/m				S_y	I_y	i_y	Steel grades				
	cm³	cm³		cm²	cm	m²/m	cm³	cm⁴	cm	S240GP	S270GP	S355GP	S390GP	S430GP

LARSSEN 703 10/10[3]



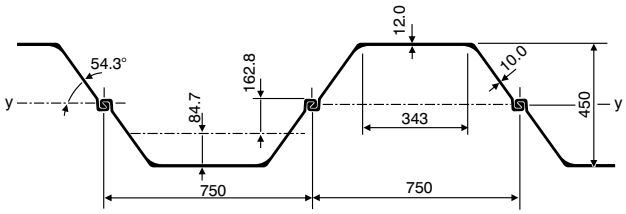
Wall	1340	1572	108.0	137.6	251	2.51	786	26800	13.90	2	2	3	3	3
E	437	–	75.6	96.3	202	1.90	–	5960	7.90	–	–	–	–	–
D	1880	–	151.2	192.6	377	3.65	–	37600	13.90	–	–	–	–	–
Dr	2190	–	226.8	288.9	553	5.41	–	52120	13.40	–	–	–	–	–

LARSSEN 716



Wall	1600	1838	114.2	145.4	268	2.68	919	35200	15.56	2	2	3	3	3
E	511	–	79.9	101.8	211	1.96	–	7690	8.69	–	–	–	–	–
D	2240	–	159.8	203.6	398	3.83	–	49270	15.56	–	–	–	–	–
Dr	2600	–	239.7	305.4	586	5.71	–	67260	14.95	–	–	–	–	–

LARSSEN 720



Wall	2000	2584	128.5	163.7	266	2.66	1292	4500	16.58	2	2	2	2	3
E	588	–	96.4	122.8	222	2.08	–	9575	8.83	–	–	–	–	–
D	3000	–	192.8	245.6	422	4.07	–	67500	16.58	–	–	–	–	–
Dr	3430	–	289.2	368.4	621	6.06	–	93180	15.90	–	–	–	–	–

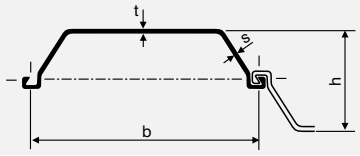
LARSSEN sections

Interlock designs Interlock conforming to DIN EN 10248-2 and E 67 of EAU 2004

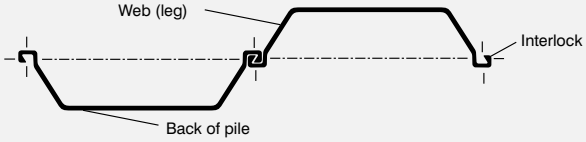
LARSSEN section		LARSSEN section 43, 430	

Available LARSSEN-Profile 500, 600, 700 and 750 series

E



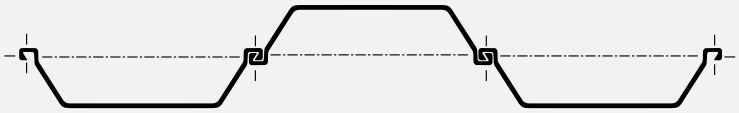
D (S-shape)



Dz

Non-standard type

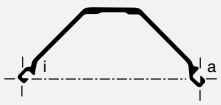
Dr



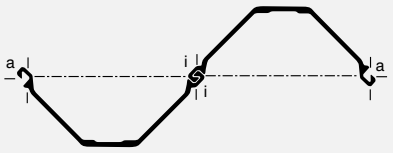
Triple piles of the 700 series available on request.

Available LARSSEN 43 (Pay attention to interlock position)

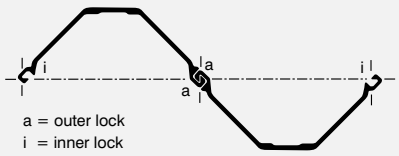
E



D (S-shape)



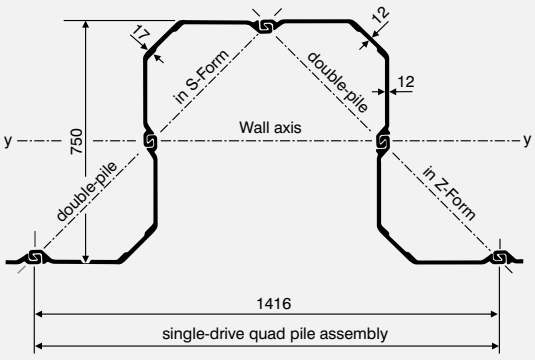
Dz (Z-shape, for wall form 430 only)



Triple piles available on request.

Available LARSSEN 430 (Wall form of LARSSEN 43)

V



The wall height 750 mm is a non binding dimension. The actual measurement depends mainly upon the installation and ancilliary conditions of the site.

Handling holes and cramping/welding of LARSSEN sections

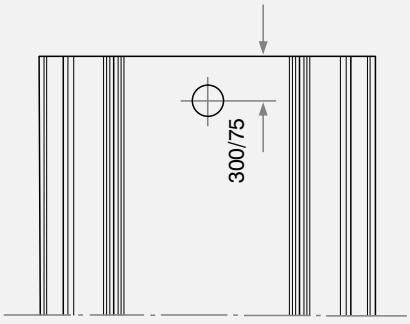
Handling holes can be made on request. Each pile back is then provided with a hole as indicated in the drawing. The holes can be placed at a distance of 75 or 300 mm from the upper edge of the pile (to be stated when ordering).

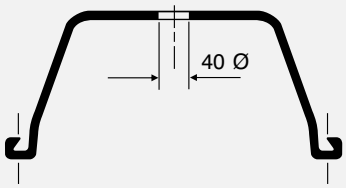
The section moduli stated in this manual for LARSSEN sections require the locking of the pile interlocks, either by factory cramping, factory welding or site welding. The middle interlocks of prefabricated double piles are cramped at intervals of approx. 0.4 m, the middle interlocks of prefabricated triple piles are cramped at intervals of approx. 0.8 m.

Other intervals can be arranged on request.

The shear force absorption of each cramping point is 75 kN at a displacement of 5 mm.

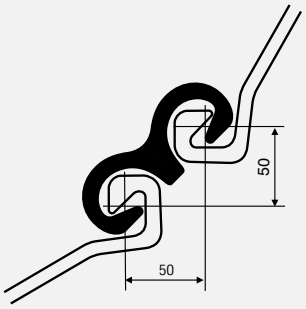
If for manufacturing reasons fabricated piles such as corner, junction and adapter piles cannot be cramped, they are welded at both ends.



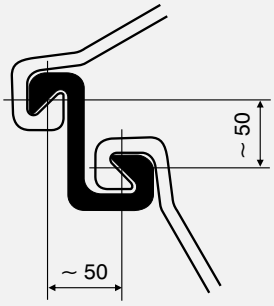


Corner sections

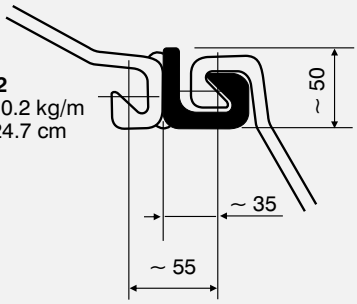
Section Omega 17
Weight: 17.3 kg/m
Circumference: 40.9 cm



Corner section 20
Weight: 15.4 kg/m
Circumference: 37.1 cm

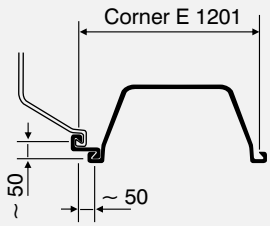


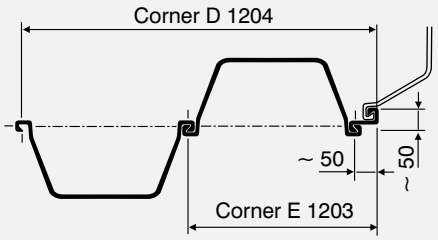
Corner section 22
Weight: 10.2 kg/m
Circumference: 24.7 cm



Larssen corner piles with inserted corner section 20

Sections of the 500, 600, 700-series.

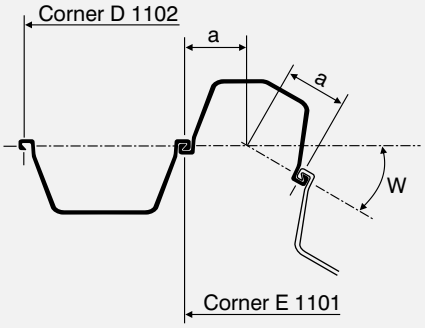


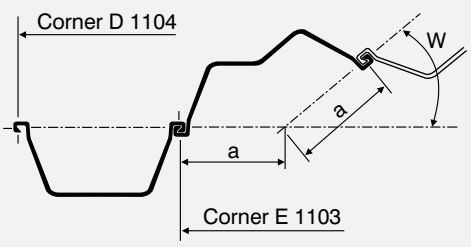


The single hook of corner section 20 is inserted and pressed or welded at both ends.

Larssen folded corner piles

Sections of the 500, 600, 700-series.

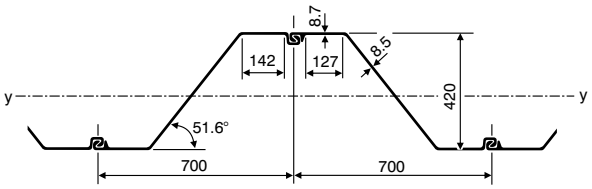


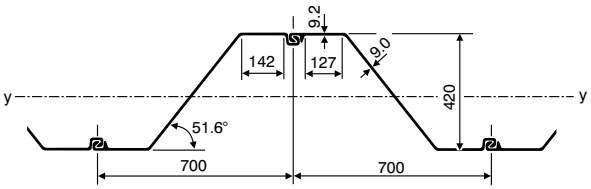


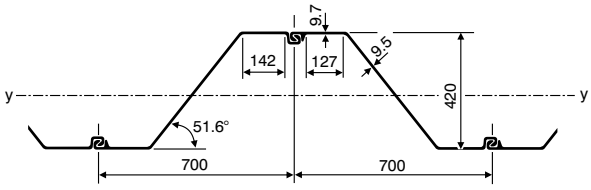
HOESCH sections (LARSSEN interlock)

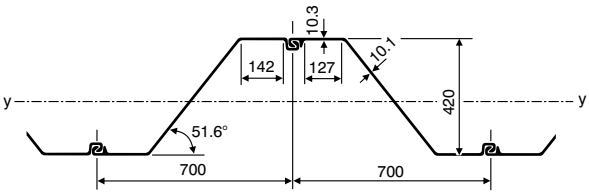
E = Single pile
D = Double pile
Dr = Triple pile
V = Quadruple pile

	Elastic section modulus[6]	Plastic section modulus[6]	Weight	Cross sectional area	Circum-ference[7]	Coating area[8]	Static moment	Second moment of inertia	Radius of gyration	Classification to ENV 1993-5				
	W_y	W_y	kg/m				S_y	I_y	i_y	Steel grades				
	cm³	cm³		cm²	cm	m²/m	cm³	cm⁴	cm	S240GP	S270GP	S355GP	S390GP	S430GP
HOESCH 1707														
Wall	1735	2032	104.6	133.2	260	2.60	1016	36435	16.53	2	2	3	3	3
E	1215	–	73.2	93.3	207	1.92	–	25505	16.53	–	–	–	–	–
D	2430	–	146.4	186.6	390	3.75	–	51010	16.53	–	–	–	–	–
Dr[3]	3645	–	219.6	279.9	572	5.57	–	76515	16.53	–	–	–	–	–
HOESCH 1807														
Wall	1800	2114	109.3	139.2	260	2.60	1057	37800	16.48	2	2	3	3	3
E	1260	–	76.5	97.5	207	1.92	–	26460	16.48	–	–	–	–	–
D	2520	–	153.0	195.0	390	3.75	–	52920	16.48	–	–	–	–	–
Dr[3]	3780	–	229.5	292.5	572	5.57	–	79380	16.48	–	–	–	–	–
HOESCH 1907														
Wall	1865	2194	113.9	145.1	260	2.60	1097	39165	16.43	2	2	3	3	3
E	1306	–	79.7	101.6	207	1.92	–	27420	16.43	–	–	–	–	–
D	2612	–	159.4	203.2	390	3.75	–	54840	16.43	–	–	–	–	–
Dr[3]	3918	–	239.1	304.8	572	5.57	–	82260	16.43	–	–	–	–	–
HOESCH 2007[3]														
Wall	1945	2290	119.4	152.1	260	2.60	1145	40845	16.39	2	2	2	2	3
E	1362	–	83.6	106.5	207	1.92	–	28590	16.39	–	–	–	–	–
D	2724	–	167.2	213.0	390	3.75	–	57185	16.39	–	–	–	–	–
Dr[3]	4086	–	250.8	319.5	572	5.57	–	85775	16.39	–	–	–	–	–



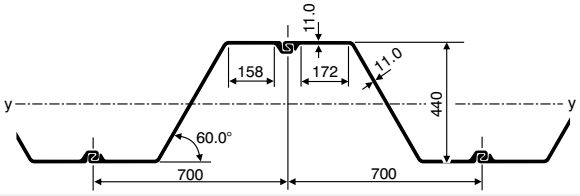


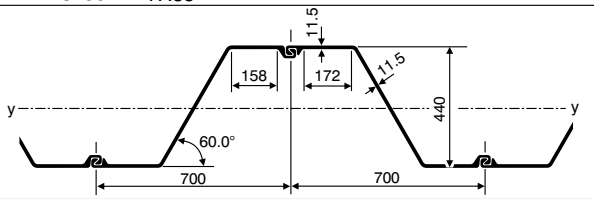


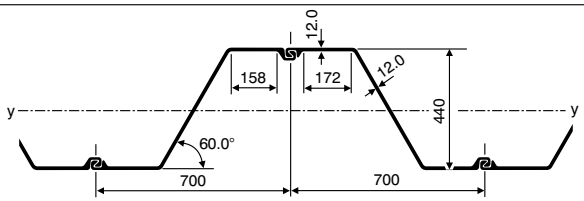


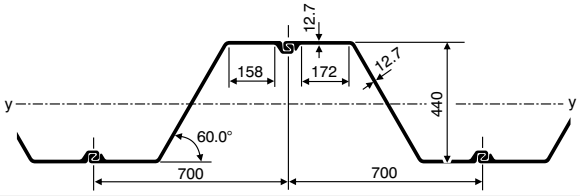
E = Single pile
D = Double pile
Dr = Triple pile
V = Quadruple pile

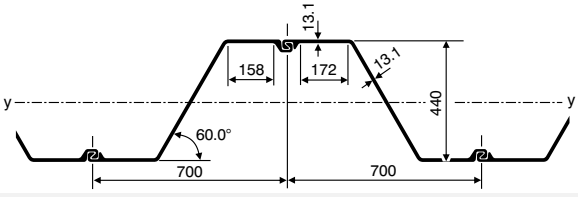
	Elastic section modulus[6]	Plastic section modulus[6]	Weight	Cross sectional area	Circum-ference[7]	Coating area[8]	Static moment	Second moment of inertia	Radius of gyration	Classification to ENV 1993-5				
	W_y	W_y	kg/m				S_y	I_y	i_y	Steel grades				
	cm³	cm³		cm²	cm	m²/m	cm³	cm⁴	cm	S240GP	S270GP	S355GP	S390GP	S430GP
HOESCH 2407[3]														
Wall	2450	2848	136.7	174.1	275	2.75	1424	53900	17.59	2	2	3	3	3
E	1715	–	95.7	121.9	217	2.02	–	37730	17.59	–	–	–	–	–
D	3430	–	191.4	243.8	410	3.95	–	75460	17.59	–	–	–	–	–
Dr[3]	5145	–	287.1	365.7	602	5.87	–	113190	17.59	–	–	–	–	–
HOESCH 2507														
Wall	2525	2936	141.4	180.1	275	2.75	1468	55550	17.56	2	2	3	3	3
E	1768	–	99.0	126.1	217	2.02	–	38890	17.56	–	–	–	–	–
D	1536	–	198.0	252.2	410	3.95	–	77770	17.56	–	–	–	–	–
Dr[3]	5304	–	297.0	378.3	602	5.87	–	116660	17.56	–	–	–	–	–
HOESCH 2607														
Wall	2600	3020	146.2	186.2	275	2.75	1510	57200	17.52	2	2	2	2	3
E	1820	–	102.3	130.4	217	2.02	–	40040	17.52	–	–	–	–	–
D	3640	–	204.6	260.8	410	3.95	–	80080	17.52	–	–	–	–	–
Dr[3]	5460	–	306.9	391.2	602	5.87	–	120120	17.52	–	–	–	–	–
HOESCH 2707														
Wall	2705	3154	153.0	194.9	274	2.74	1577	59520	17.48	2	2	2	2	3
E	1894	–	107.1	136.4	217	2.02	–	41660	17.48	–	–	–	–	–
D	3788	–	214.2	272.8	409	3.94	–	83320	17.48	–	–	–	–	–
Dr[3]	5682	–	321.3	409.2	601	5.86	–	124980	17.48	–	–	–	–	–
HOESCH 2807														
Wall	2765	3154	156.7	199.6	274	2.74	1613	60830	17.46	2	2	2	2	2
E	1936	–	109.7	139.7	217	2.02	–	42580	17.46	–	–	–	–	–
D	3872	–	219.4	279.4	409	3.94	–	85160	17.46	–	–	–	–	–
Dr[3]	5808	–	329.1	419.1	601	5.86	–	127740	17.46	–	–	–	–	–











HOESCH sections (LARSSEN interlock)

E = Single pile
D = Double pile
Dr = Triple pile
V = Quadruple pile

	Elastic section modulus[6]	Plastic section modulus[6]	Weight	Cross sectional area	Circum-ference[7]	Coating area[8]	Static moment	Second moment of inertia	Radius of gyration	Classification to ENV 1993-5				
	W_y	W_y	kg/m				S_y	I_y	i_y	Steel grades				
	cm³	cm³		cm²	cm	m²/m	cm³	cm⁴	cm	S240GP	S270GP	S355GP	S390GP	S430GP
HOESCH 3607[3]														
Wall	3595	4104	167.7	213.6	288	2.88	2052	89875	20.51	2	2	2	2	2
E	2517	–	117.4	149.5	225	2.10	–	62915	20.51	–	–	–	–	–
D	5034	–	234.8	299.0	427	4.12	–	125825	20.51	–	–	–	–	–
Dr[3]	7551	–	352.2	448.5	629	6.14	–	188740	20.51	–	–	–	–	–
HOESCH 3707[3]														
Wall	3696	4232	173.7	221.3	288	2.88	2116	92400	20.43	2	2	2	2	2
E	2587	–	121.6	154.9	225	2.10	–	64680	20.43	–	–	–	–	–
D	5174	–	243.2	309.8	427	4.12	–	129360	20.43	–	–	–	–	–
Dr[3]	7761	–	264.8	464.7	629	6.14	–	199500	20.43	–	–	–	–	–
HOESCH 3807[3]														
Wall	3800	4360	179.8	229.0	288	2.88	2180	95000	20.37	2	2	2	2	2
E	2660	–	125.9	160.3	225	2.10	–	66500	20.37	–	–	–	–	–
D	5320	–	251.8	320.6	427	4.12	–	133000	20.37	–	–	–	–	–
Dr[3]	7980	–	377.7	480.9	629	6.14	–	199500	20.37	–	–	–	–	–
HOESCH 3907[3]														
Wall	3920	4510	186.8	238.0	288	2.88	2255	98000	20.29	2	2	2	2	2
E	2745	–	130.8	166.6	225	2.10	–	68600	20.29	–	–	–	–	–
D	5490	–	261.6	333.2	427	4.12	–	137200	20.29	–	–	–	–	–
Dr[3]	8235	–	392.4	499.8	629	6.14	–	205800	20.29	–	–	–	–	–
HOESCH 4007[3]														
Wall	3970	4574	190.0	242.0	288	2.88	2287	99250	20.25	2	2	2	2	2
E	2780	–	133.0	169.4	225	2.10	–	69475	20.25	–	–	–	–	–
D	5560	–	266.0	338.8	427	4.12	–	138950	20.25	–	–	–	–	–
Dr[3]	8340	–	399.0	508.2	629	6.14	–	208425	20.25	–	–	–	–	–

E = Single pile
D = Double pile
Dr = Triple pile
V = Quadruple pile

	Elastic section modulus[6]	Plastic section modulus[6]	Weight	Cross sectional area	Circum-ference[7]	Coating area[8]	Static moment	Second moment of inertia	Radius of gyration	Classification to ENV 1993-5				
	W_y	W_y	kg/m				S_y	I_y	i_y	Steel grades				
	cm³	cm³		cm²	cm	m²/m	cm³	cm⁴	cm	S240GP	S270GP	S355GP	S390GP	S430GP
HOESCH 1105														
Wall	1100	1256	101.0	128.7	259	2.59	628	14300	10.54	2	2	3	3	3
E	628	–	58.1	74.0	163	1.54	–	8223	10.54	–	–	–	–	–
D	1266	–	116.2	148.0	304	2.95	–	16446	10.54	–	–	–	–	–
Dr[3]	1899	–	174.3	222.0	445	4.36	–	24669	10.54	–	–	–	–	–
HOESCH 1205														
Wall	1140	1330	107.0	135.7	259	2.59	665	14820	10.40	2	2	3	2	3
E	655	–	61.5	78.0	163	1.54	–	8520	10.40	–	–	–	–	–
D	1310	–	123.0	156.0	304	2.95	–	17040	10.40	–	–	–	–	–
Dr[3]	1970	–	184.5	234.0	445	4.36	–	25560	10.40	–	–	–	–	–
HOESCH 1205 K														
Wall	1200	1380	112.5	143.3	259	2.59	690	15600	10.46	2	2	2	2	3
E	690	–	64.7	82.4	163	1.54	–	8970	10.46	–	–	–	–	–
D	1380	–	129.4	164.8	304	2.95	–	17940	10.46	–	–	–	–	–
Dr[3]	2070	–	194.1	247.2	445	4.36	–	26910	10.46	–	–	–	–	–
HOESCH 1255														
Wall	1250	1446	118.0	150.3	259	2.59	723	16250	10.40	2	2	2	2	3
E	719	–	67.9	86.4	163	1.54	–	9340	10.40	–	–	–	–	–
D	1438	–	135.8	172.8	304	2.95	–	18690	10.40	–	–	–	–	–
Dr[3]	2157	–	203.7	259.2	445	4.36	–	28030	10.40	–	–	–	–	–

HOESCH sections

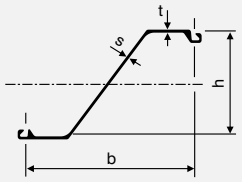
Interlock design Interlock conforming to DIN EN 10248-2 and E 67 of EAU 2004

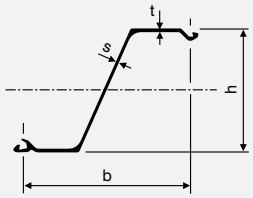
HOESCH section	
LARSSEN interlock	

HOESCH section	
Finger-and-socket interlock	

Available HOESCH sections

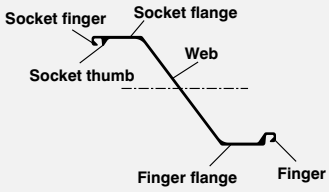
Ea

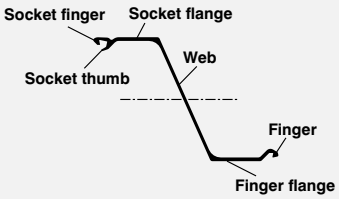




(E in a-position, web rising to the right)

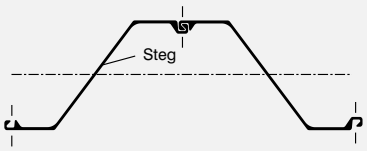
Eb

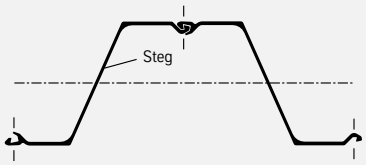




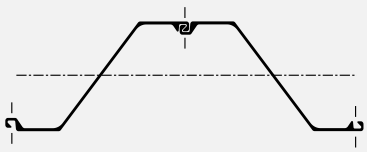
(E in b-position, web falling to the right)

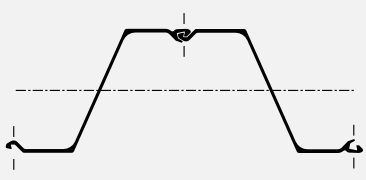
Da





Db





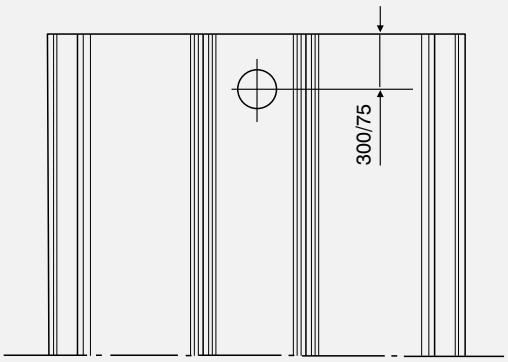
Triple piles on request

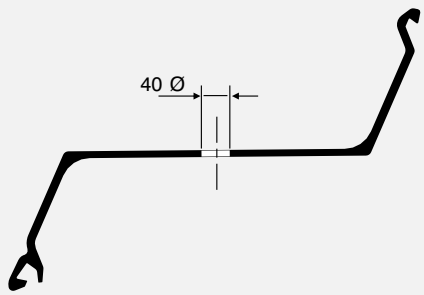
Handling holes and cramping/welding of HOESCH sections

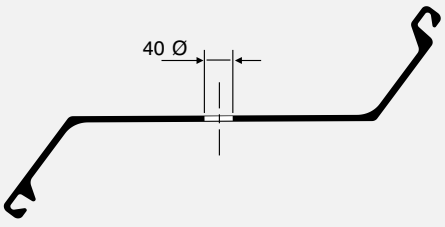
Handling holes can be supplied on request. Each pile back is then provided with a hole as indicated in the drawing. The holes can be placed at a distance of 75 or 300 mm from the upper edge of the pile (to be stated when ordering).

The section moduli of HOESCH sections do not require the locking of the pile interlocks.

On request, mill prefabricated composite piles are cramped for transport and handling purposes. The cramping points are placed at intervals of 2.40 meters.



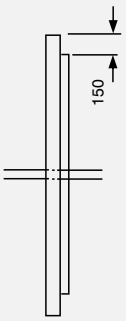




Part-sections for corner and junction piles

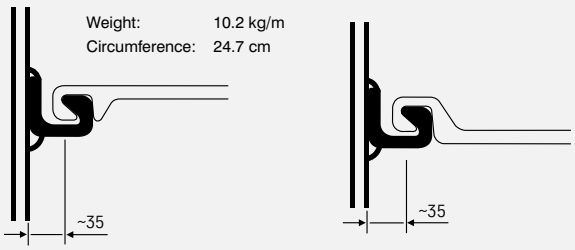
Section i

Section a



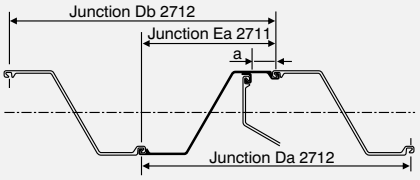
These sections are set back at the top and bottom of the piles. On request they can also be supplied top flush.

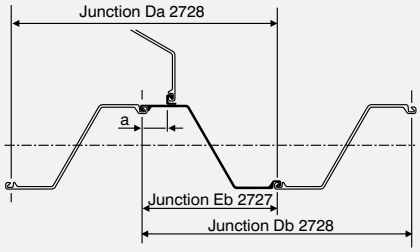
Junction section 20

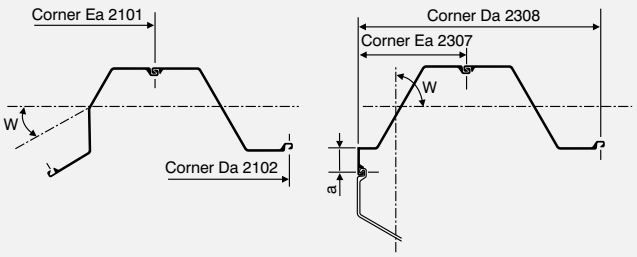


Fitting to all HOESCH sections with LARSSEN interlocks

Corner and junction piles

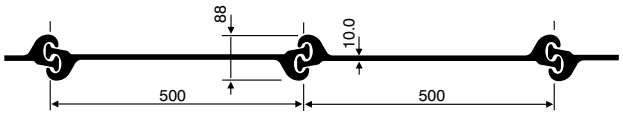


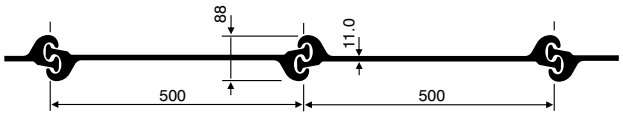


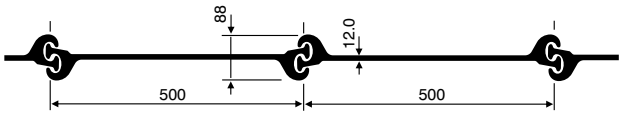


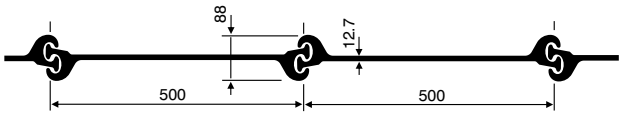
UNION straight-web sections

Section modulus[6]	Weight		Circumference excl. internal surface of interlock		Cross sectional area	Second moment of inertia	Radius of gyration	Coating area[8]	
W_y						I_y	i_y		
cm^3/m	kg/m^2	kg/m	cm/m	cm	cm^2/m	cm^4/m	cm	m^2/m	m^2/m
Wall	**Wall**	**Single pile**	**Wall**	**Single pile[9]**	**Wall**	**Wall**	**Wall**	**Wall**	**Single pile**
FL 510[3]									
90	129.2	64.6	218	136	164.6	350	1.45	2.18	1.19
FL 511									
90	135.6	67.8	218	136	173.0	350	1.42	2.18	1.19
FL 512									
90	142.2	71.1	218	136	181.0	360	1.41	2.18	1.19
FL 512,7[3]									
92	146.8	73.4	218	136	187.0	360	1.39	2.18	1.19









Interlock tensile strengths (R k,s) of 5000 kN/m can be achieved.
Interlock tensile strengths (R k,s) of 6000 kN/m possible upon request.

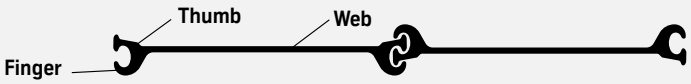
Interlock design Interlock conforming to DIN EN 10248-2 and E 67 of EAU 2004

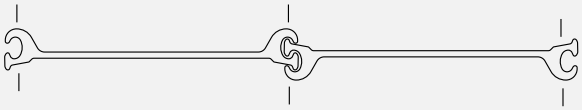
UNION straight-web section

Available types

E

D



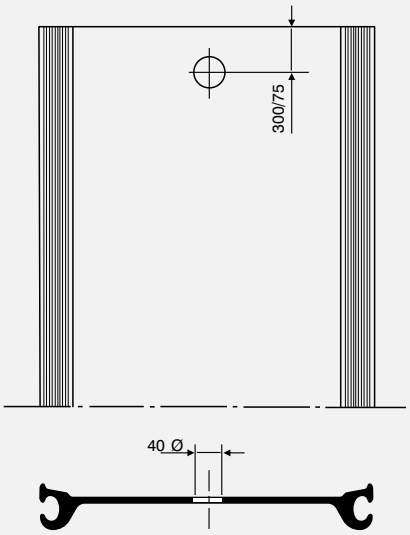


Non-standard delivery form!

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

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

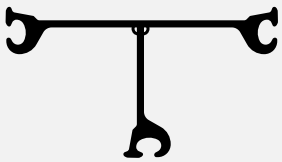
The double piles of UNION straight web sections are always supplied without cramping.



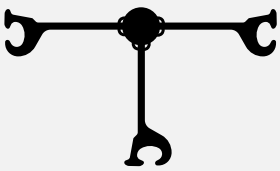
Junction piles

Welded junction piles

T-junction
(for circular cells)

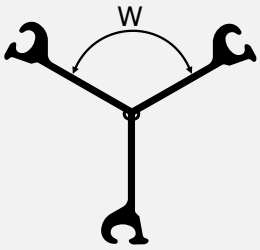


Abz-E 4601

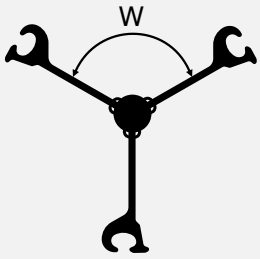


Abz-E 4607

Y-junction
(for polygonal cells)



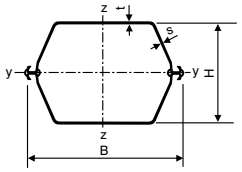
Abz-4603



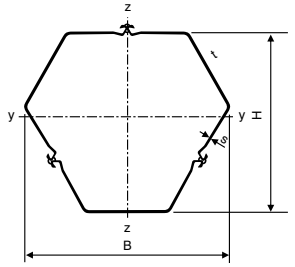
Abz-4605

Steel piles

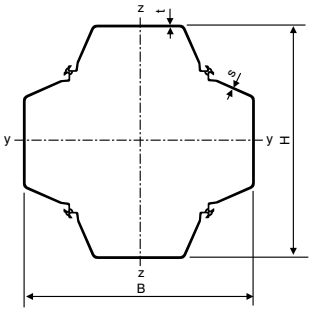
Pile section[10]	Section modulus		Weight	Dimensions				Circum-ference Devel-oped[11]	Area Steel cross section	Included[12]	Second moment of intertia		Radius of gyration
	W_y	W_z		B	H	t	s				I_y	I_z	i_y
	cm³	cm³	kg/m	mm	mm	mm	mm	cm	cm²	cm²	cm⁴	cm⁴	cm
LP 601	1060	1660	94	632	350	7.5	6.4	162	118	1640	18600	52600	12.5
LP 602	1190	1830	107	634	350	8.2	8.0	162	136	1640	20800	58320	12.4
LP 603	1700	2260	130	638	354	9.7	8.2	173	166	1810	30200	72200	13.5
LP 604 n	2210	2630	148	638	424	10.0	9.0	187	188	2160	46900	83900	15.8
LP 23	2310	2330	155	536	470	11.5	10.0	175	197	1960	54300	62400	16.6
LP 24	2840	2400	175	536	470	15.6	10.0	175	222	1960	66700	64300	17.3
LP 716	2550	3080	160	735	483	10.2	9.5	205	204	2650	61500	113180	17.4
LP 25	3440	2720	206	536	470	20.0	11.5	175	262	1960	80700	72800	17.6
LP 605 K	2830	3020	173	637	470	12.2	10.0	192	221	2160	66400	96200	17.3
LP 606 n	3410	3080	188	636	485	14.4	9.2	196	240	2430	82800	97900	18.6
LP 720	3410	3850	193	786	496	12.0	10.0	217	246	2960	84640	151220	18.5
LP 607 n	4340	3460	228	636	502	19.0	10.6	199	290	2490	109100	110100	19.4



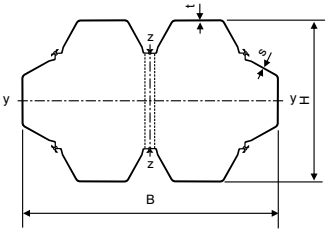
LD 601	3250	3090	140	745	727	7.5	6.4	239	177	4090	114800	115100	25.4
LD 602	3690	3490	160	745	727	8.2	8.0	239	204	4090	130200	129900	25.3
LD 603	4730	4150	194	811	733	9.7	8.2	256	249	4380	168200	168300	26.0
LD 604 n	4760	4520	233	812	712	11.5	10.0	259	296	4080	183200	183400	24.9
LD 23	5430	4860	221	873	768	10.0	9.0	274	282	4890	212000	212100	27.4
LD 24	5470	5160	263	812	712	15.6	10.0	259	333	4080	210000	209600	25.1
LD 716	6530	6100	240	941	890	40.2	9.5	300	305	6220	295050	287060	31.1
LD 25	6390	5860	260	897	792	12.2	10.0	283	330	5190	263600	262700	28.3
LD 605 K	6500	6170	309	812	712	20.0	11.5	259	393	4080	249600	250500	25.2
LD 606 n	7080	6690	283	908	799	14.4	9.2	286	360	5280	298600	303900	28.8
LD 720	8560	7840	289	1002	941	12.0	10.0	319	368	7020	404410	392810	33.2
LD 607 n	8550	7930	342	922	805	19.0	10.6	290	435	5380	366700	365800	29.0



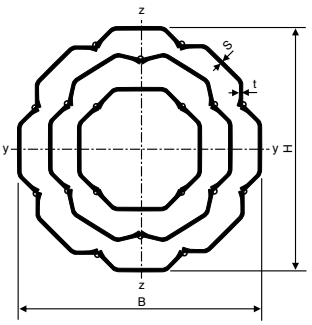
LV 601		5380	187		970		7.5	6.4	325	236	7110	261100	33.3
LV 602		6150	214		970		8.2	8.0	325	272	7110	298100	33.1
LV 603		7830	259		980		9.7	8.2	340	330	7490	383900	34.1
LV 604 n		8010	310		990		11.5	10.0	348	395	6600	396500	31.6
LV 23		9050	295		1046		10.0	9.0	364	376	8190	473500	35.5
LV 24		9240	350		990		15.6	10.0	348	446	6600	457900	32.0
LV 716		10980	320		1205		10.2	9.5	402	407	10550	661240	40.3
LV 605 K		10650	347		1090		12.2	10.0	380	442	8640	580400	36.2
LV 25		11090	412		990		20.0	11.5	348	524	6600	548900	32.4
LV 606 n		11830	377		1105		14.4	9.2	380	480	8700	653400	36.9
LV 720		14360	386		1266		12.0	10.0	427	491	11920	908720	43.0
LV 607 n		14410	456		1122		19.0	10.6	390	580	8830	808400	37.3



LS 601	9680	12220	281	1604	970	7.5	6.4	484	354	12680	469600	979800	36.4
LS 602	11090	14020	320	1604	970	8.2	8.0	484	408	12680	537900	1124300	36.3
LS 603	14200	17460	389	1617	980	9.7	8.2	500	496	13120	695600	1411300	37.5
LS 604 n	14760	17150	465	1526	990	11.5	10.0	511	592	11340	730600	1309000	35.1
LS 23	16500	21710	443	1682	1046	10.0	9.0	538	564	14300	863000	1826000	39.1
LS 24	17180	19570	525	1526	990	15.6	10.0	511	669	11340	850400	1493000	35.7
LS 716	20070	26770	480	1940	1205	10.2	9.5	582	611	18430	1209310	2596840	44.5
LS 25	19530	23120	520	1727	1090	12.2	10.0	560	663	14940	1064500	1996200	40.1
LS 605 K	20700	23310	618	1526	990	20.2	11.5	511	786	11340	1024600	1778500	36.1
LS 606 n	21880	28080	565	1740	1105	14.4	9.2	567	720	15070	1209000	2443000	41.0
LS 720	26320	34670	579	2051	1266	12.0	10.0	620	737	20900	1666230	3554500	47.5
LS 607 n	26860	34110	684	1758	1122	19.0	10.6	576	870	15270	1507000	2998000	41.6



Pile section[13]	Section modulus		Weight	Dimensions				Circum-ference Devel-oped[11]	Area Steel cross section	Included[12]	Second moment of intertia		Radius of gyration
	W_y	W_z		B	H	t	s				I_y	I_z	i_y
	cm³	cm³	kg/m	mm	mm	mm	mm	cm	cm²	cm²	cm⁴	cm⁴	cm
UP 164	2820		190	474		16	16	157	241	1850	66700		16.6
UP 166	6070		284	708		16	16	228	362	3890	214900		24.4
UP 168	10560		380	928		16	16	304	482	6640	490000		31.9

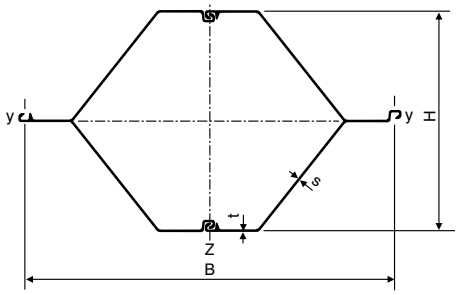


The piles shown here are a selection from the complete range of products.
Other combinations are available on request.

Pile section[13]	Section modulus	Weight	Dimensions				Circum-ference Devel-oped[11]	Area Steel Outline	Included	Outline	Second moment of intertia		Radius of gyration
	W_y		B	H	t	s					I_y	I_z	i_y
	cm³	kg/m²	mm	mm	mm	mm	cm	cm²	cm²	cm²	cm⁴	cm⁴	cm
HP 1707	6310	259.1	1400	840	8.7	8.5	380	347	330	6032	7720	266433	28.41
HP 1807	6580	270.8	1400	840	9.2	9.0	380	347	345	6039	7722	277612	28.37
HP 1907	6840	282.6	1400	840	9.7	9.5	380	347	360	6046	7725	288774	28.32
HP 2007	7160	297.5	1400	840	10.3	10.1	380	347	379	6055	7728	302146	28.24
HP 2407	8750	334.4	1400	880	11.0	11.0	399	356	426	6352	8413	386723	30.13
HP 2507	9040	346.2	1400	880	11.5	11.5	399	356	441	6358	8416	399386	30.09
HP 2607	9330	358.7	1400	880	12.0	12.0	399	356	457	6366	8418	412380	30.04
HP 2707	9740	376.0	1400	880	12.7	12.7	399	356	479	6376	8422	430469	29.98
HP 2807	9970	385.4	1400	880	13.1	13.1	399	356	491	6381	8424	440541	29.95
HP 3607	12450	412.1	1400	1000	16.8	10.8	416	372	525	7235	9529	624934	34.50
HP 3707	12860	427.8	1400	1000	17.4	11.4	416	372	545	7243	9532	645735	34.42
HP 3807	13280	443.5	1400	1000	18.0	12.0	416	372	565	7253	9536	666516	34.35
HP 3907	13760	461.6	1400	1000	18.7	12.7	416	372	588	7264	9540	690736	34.27
HP 4007	13970	469.4	1400	1000	19.0	13.0	416	372	598	7269	9500	701108	34.24

The piles shown here are a selection from the complete range of products.

Other combinations are available on request.



Welding seam edition: outside continuous.
Thickness of welding seam: min. a = 5 mm.

Special services

Engineering department

Our efficient engineering department provides capable advice to our customers in all questions of planning, statics, construction or installation of steel sheet piling.

Welded structures

Our workshops have been producing welded structures from steel piles for over 6 decades. All sheet piling steel grades are suitable for arc welding, subject to general welding regulations.

Foundation piles, dolphins with accessories, HOESCH and LARSSEN box piles, structural piles such as corner and junction piles, piles with shock plates, piles with weld-sealed interlocks and special piles for specific requirements are all manufactured to proven quality standards.

Our workshops fully comply with standards for modern welding operations and are qualified in accordance with DIN 18800, part 7.

The general and special tasks of quality assurance, e.g. non-destructive weld seam testing, are carried out by an independent quality body to German or, if necessary, international regulations.

Corrosion protection

Coating
The most commonly used form of corrosion protection for steel sheet piles is coating. On the basis of experience to date, it can delay the onset of corrosion by over 20 years.

To prevent harm to the environment due to blasting dust and overspray, steel components should be given the necessary corrosion protection in conformity with current regulations and recommendations if possible before installation. Since it is known that, given careful treatment, only minor damage occurs during transport and assembly, we recommend complete coating in the factory.

The choice of coating system depends on the anticipated stressing and the desired service life (see DIN EN ISO 12944). We supply sheet piles with all conventional coating systems and give advice on the choice of system.

Because of the severe stressing to which sheet piling structures are exposed, epoxy resin or polyurethane coatings are usually applied. For the sake of the environment, only tar-substitute products and tar-free systems should be used.

Hot-dip galvanizing
Corrosion protection by hot-dip galvanizing is one of the widely used methods in steel construction. Combined with an additional coating (duplex system), synergies are created.

For the galvanizing of steel sheet piles a special steel analysis is necessary and compliance with regulations governing interlock tolerances. Surface quality and product identification must be taken into account. Notice should therefore be given of the intention to have the piles hot-dip galvanized before the start of rolling. For the requirements and tests/inspections, see DIN EN ISO 1461.

Anchors and accessories

We also supply anchoring elements and accessories. The range includes:

- Anchors and anchor parts
- Anchor connecting elements
- Waling and waling fastenings
- Sheet pile beams
- Recesses, ladders and handrails
- Snubbing posts
- Special components

Knife-edge bearings on steel sheet piles

Using the HOESCH method of knife-edge bearing on steel pile sections, static and dynamic vertical loads can be discharged direct, i.e. without any intermediate structures, from the reinforced concrete bearing into the steel section of HOESCH steel sheet piles.

This renders the following tasks superfluous:

- Welding structural elements into the steel sheet piles to increase the bearing surface
- Slitting the steel sheet piles in the connection zone or drilling holes for reinforcement bars
- Welding reinforcement bars onto the steel sheet piles in order to discharge the tensile forces from the reinforced concrete into the sheet piles.

Approval notices from the Berlin Institute for Construction Technology as well as explanations and examples of applications of the HOESCH knife-edge bearing system on steel sheet piles can be requested from us.

Driving caps

for HOESCH and LARSSEN sections/ piles and UP piles

Available are single, double, triple and quadruple driving caps.

Driving caps with wooden cushions or, if specially requested, with layered steel/ plastic linings.

For driving with leader guidance, caps with integrally cast fastening strips are available.

Testing interlock tightness with signal transmitters during the installation of LARSSEN and HOESCH sections

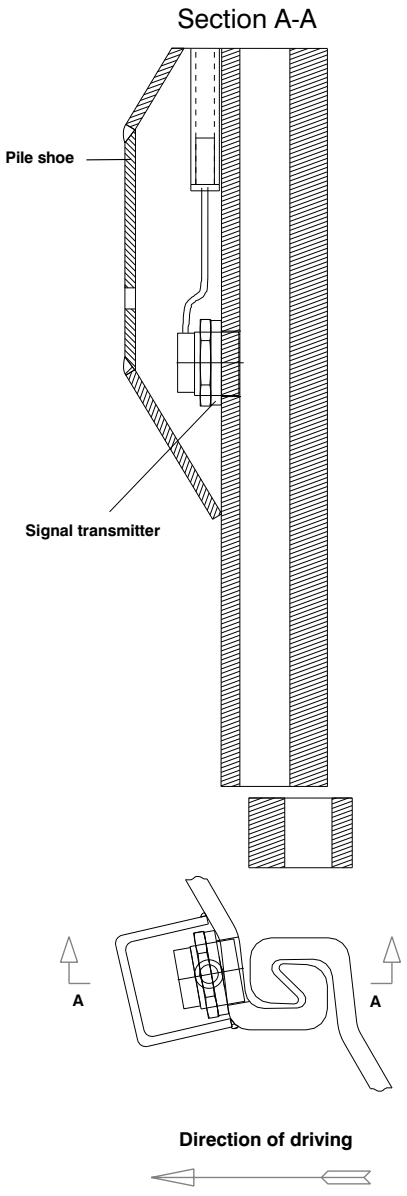
If a sheet piling structure requires an especially high level of tightness (e.g. for the encapsulation of polluted soil or for the sealing of landfills) and/or if driving is expected to be difficult and cause damage to the interlock, the signal transmitter described in the following can be used to test the integrity of the sheet piling. The HOESCH signal transmitter is attached to the foot of the pile to be threaded and tests the interlocks continuously from top to bottom of the sheet piling.

The HOESCH signal transmitter does not of course impair driving.

The HOESCH signal transmitter consists of an inductive proximity switch which, protected by a pile shoe, is fitted at the foot of the pile in the interlock. The measurement cable from the signal transmitter is carried to the head of the pile in a tube fastened to the pile web and connected to the control box.

Controlled by the control box, a high-frequency alternating magnetic field is created at the proximity switch. Changes in the alternating field are indicated by a visual signal at the control box. The alternating field changes for the first time when the pile is threaded and remains unchanged throughout the driving process if driving proceeds smoothly. If a breach of the interlock occurs, the magnetic field changes and the change is indicated at the control box.

Thanks to the low sensing distance of 10 mm, any breach of the interlock is immediately indicated, allowing the necessary action to be taken in good time.



Terms of delivery, steel grades, general information

Terms of delivery

Hot rolled steel piles are supplied according to DIN EN 10248.

Steel grades

The steel grades used for our hot rolled steel piles comply with DIN EN 10248-1.

Other steel grades, e.g. complying with DIN EN 10025 (structural steels) or ASTM, can be supplied on request.

High-strength weldable sheet piling steels with a minimum yield point of up to 460 MPa can be supplied according to works standards.

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/West-phalian Materials Testing Office (Document No. 11 0001 0 97), HSP Hoesch Spundwand and Profil GmbH in Dortmund is entitled to conformitymark 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.

Steel grades for sheet piling to DIN EN 10248-1

Steel grade	Minimum yield point	Tensile strength	Minimum elongation
	MPa	MPa	%
S 240 GP	240	340	26
S 270 GP	270	410	24
S 320 GP	320	440	23
S 355 GP	355	480	22
S 390 GP*)	390	490	20
S 430 GP*)	430	510	19

*) For the higher-strength sheet piling steels S 390 GP and S 430 GP, an approval certificate (Z-30, 1-17) from the building supervisory authorities dated 01.10.2010 has been awarded. The approval, valid until February 28, 2015, and can be made available on request.

Higher-strength weldable sheet piling steels to works standards

Steel grade	Minimum yield point	Tensile strength	Minimum elongation
	Mpa	MPa	%
S 460 HP	460	550	17

Other steel grades according to national or international standards are available on request.

Delivery lengths

LARSSEN, HOESCH and UNION sections in lengths from 30 – 36 m are available on request.

Surface condition

The surface condition of LARSSEN, HOESCH and UNION sections complies with DIN EN 10163 part 3: sections class C.

Basis of billing

The basis of billing is the theoretical weight of the single pile (kg/m).

Inspection documents

Test reports 2.2 and inspection certificates 3.1 and 3.2 are to be stated when ordering.

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 ± 2%; double and triple piles ± 3%
Wall thicknesses of U sections	t: up to 8.5 mm = ± 0.5 mm; over 8.5 mm = ± 6% t s: up to 8.5 mm = – 0.5 mm; over 8.5 mm = – 6% s*
Wall thicknesses of Z sections and straight-web sections	t, s: up to 8.5 mm = ± 0.5 mm; over 8.5 mm = ± 6% s, t
Height of U sections	h: up to 200 mm = ± 4 mm; over 200 mm = ± 5 mm
Height of Z sections	h: up to 200 mm = ± 5 mm; von 200 up to 300 mm = ± 6 mm; over 300 mm = ± 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 ± 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 ± 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.

*) 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 ≤ 8.5 mm and + 6 % s for s > 8.5 mm.

Key to the footnotes

1) The section modulus values of the LARSSEN sections may only be used in structural analyses if at least every second interlock in the wall is locked to take up the shear forces.

2) Wall assembly fabricated from LARSSEN 43 sections. Where quad pile assemblies are supplied, allowance must be made for the weight of the weld seams and reinforcements.

3) Rolling/delivery on request.

4) With the use of quadruple piles b = 1416 mm.

5) The wall height of 750 mm is a dimension without engagement, which mainly depends on the boundary conditions on the job site.

6) Section modulus refers to
E and Dr – the centroidal axis of the respective element
D and per m wall – the wall axis y-y
The section modulus of D, Dr and per m wall requires locking of the factory-crimped interlocks to take up the shear forces.

7) Including the interior of free interlocks of E, D and Dr

8) Excluding the interlock interior – coating on both sides.

9) Including the interior of free interlocks.

10) Can also be supplied with 250 x 20 mm welded-on plates.
Weld seam type: external, continuous
Weld seam thickness: at least a = 5 mm

11) Excluding the interior of free interlocks.

12) Including steel surface. The outlined area is the straightline contour around all external, projecting edges.

13) Can also be supplied with 150 x 20 mm welded-on plates.
Weld seam type: external, continuous
Weld seam thickness: at least a = 5 mm

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