

Hot Rolled Shipbuilding profiles

Bulb flats

Universal flats

L-profiles

Downstreaming

Ruukki Profiler has specialized in production of rolled profiles for shipbuilding and offshore use. In shipbuilding we have long been ranked as one of the top European suppliers of steel profiles and a leading global supplier of European bulb flats. Offshore activities have been focused on platforms operating in the demanding environment of the North and Norwegian Seas, although our profiles are found in offshore structures from the Gulf of Mexico to the Caspian Sea.

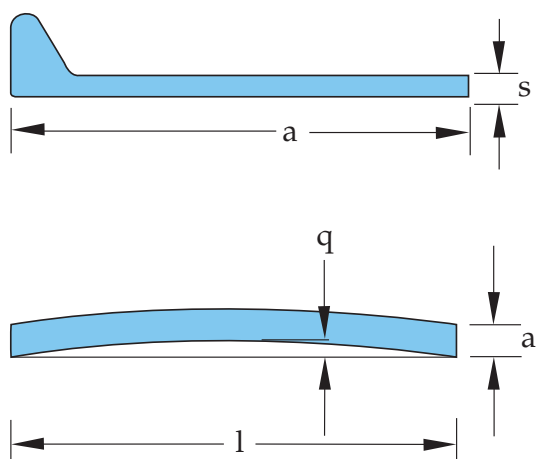
- Applications:
 - steel profiles for all types of ships and applications (oil tankers, container ships, naval vessels etc)
 - offshore structures
 - downstreaming of rolled profiles (shotblasting and priming, grinding)

Ruukki is a metal expert you can rely on all the way, whenever you need metal based materials, components, systems or total solutions. We constantly develop our product range and operating models to match your needs.

● **Bulb flats**

widths of 100 to 430mm

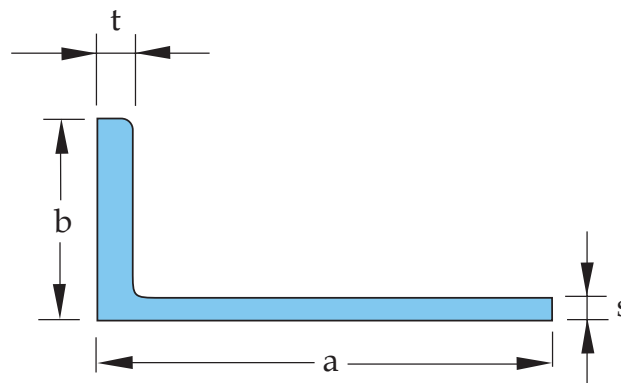
EN 10067: 1996



● **L-profiles**

NS 2659 / ISO 657 / 18 / 1980

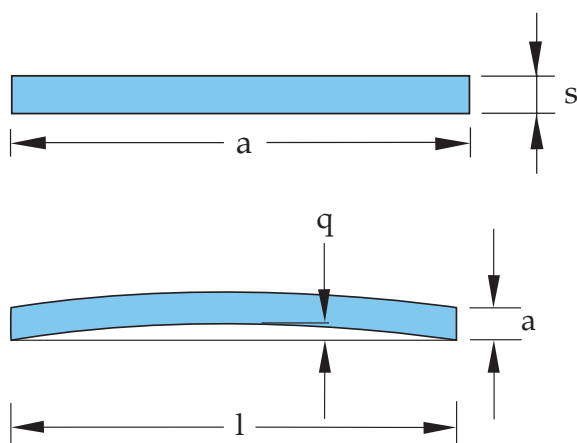
sizes of 200x90x9x12 to 400x120x11,5x23mm



● **Universal flats**

widths from 200 to 600 mm.

DIN 59200



Profiles with specifications outside the standard dimension range, together with heavy equal and unequal angles, can be produced through special agreement.

- **Downstreaming**

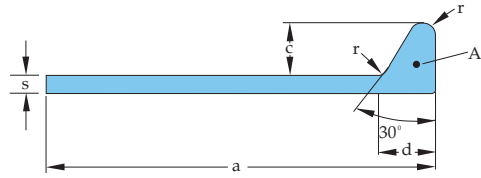
Ruukki Profiler offers high quality downstreaming of rolled profiles.

Shotblasting and priming

Addition of primer is completed using high pressure paint spraying equipment. Applications vary dependent on thickness of primer, primer type and profile type. Normal thickness is between 15 and 20 microns and can increase to a maximum of 50 microns. The shop primers used at Ruukki Profiler fall into one of two main categories. These are Zinc Silicate primers and Low Zinc primers. Strict control is inherent in the production process, with a special quality certificate being issued before the profiles are marked and bundled together.

- **Grinding**

Using the latest technology, four corners of the profile and two of its sides are ground simultaneously. This improves evenness of grinding and increases cost effectiveness. Ruukki Profiler can grind profiles with a thickness of 60mm, including corners to a radius of 2mm.

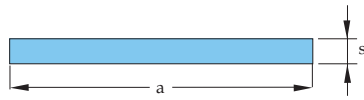


Designation	Dimensions				Area A, cm ²	Weight kg/m	Paint area m ² /m	Section Mod. with plate W _{pl} cm ³	Plate area cm ²	Distance of Centre of Gravity		Second moment of Area		Elastic Modulus		Radius of Gyration	
	a mm	s mm	c mm	d mm						r mm	ex mm	ey mm	Axis x-x cm ⁴	Axis y-y cm ⁴	Axis x-x cm ³	Axis y-y cm ³	Axis x-x cm
HP100x5*	100	5	15.5	14.8	4.5	6.75	0.232	34	60	61.3	4.8	67	1.48	10.9	3.1	3.14	0.47
x6*	100	6	15.5	14.8	4.5	7.74	0.235	38	60	59.5	5.1	76	1.70	12.7	3.3	3.13	0.47
x7	100	7	15.5	14.8	4.5	8.66	0.236	41	60	58.7	5.5	85	1.99	14.5	3.6	3.12	0.48
x8	100	8	15.5	14.8	4.5	9.75	0.238	45	60	57.8	5.9	94	2.31	16.3	3.9	3.11	0.49
HP120x5*	120	5	17	17.7	5	8.12	0.274	48	60	73.9	5.0	117	1.98	15.8	4.0	3.80	0.50
x6*	120	6	17	17.7	5	9.32	0.276	54	60	72.0	5.3	133	2.34	18.4	4.42	3.78	0.50
x7	120	7	17	17.7	5	10.52	0.278	59	60	70.7	5.6	148	2.70	21.0	4.82	3.75	0.51
x8	120	8	17	17.7	5	11.72	0.28	63	60	69.6	6.0	164	3.10	23.6	5.17	3.74	0.51
HP140x7	140	7	19	19.7	5.5	12.43	0.32	81	60	83.1	5.9	241	3.80	29.0	6.44	4.41	0.55
x8	140	8	19	19.7	5.5	13.83	0.322	87	60	81.8	6.3	266	4.32	32.5	6.86	4.39	0.56
x10	140	10	19	19.7	5.5	16.63	0.326	99	60	79.2	7.0	316	5.56	39.8	7.94	4.36	0.58
HP160x7	160	7	22	22.2	6	14.6	0.365	110	60	96.6	6.4	373	5.86	38.6	9.16	5.05	0.63
x8	160	8	22	22.2	6	16.2	0.367	118	60	94.9	6.8	411	6.55	43.3	9.63	5.04	0.64
x9	160	9	22	22.2	6	17.8	0.369	126	60	93.6	7.1	448	7.32	47.9	10.3	5.02	0.64
HP180x8	180	8	25	25.5	7	18.86	0.411	157	60	109	7.4	609	9.90	55.9	13.4	5.68	0.72
x9	180	9	25	25.5	7	20.66	0.413	167	60	107	7.7	663	10.93	61.8	14.2	5.66	0.73
x10	180	10	25	25.5	7	22.46	0.415	176	60	106	8.1	717	12.05	67.8	14.9	5.65	0.73
HP200x9	200	9	28	28.8	8	23.66	0.457	226	100	121	8.4	941	15.76	77.7	18.8	6.31	0.82
x10	200	10	28	28.8	8	25.66	0.459	239	100	120	8.7	1020	17.21	85.0	19.8	6.31	0.82
x12	200	12	28	28.8	8	29.66	0.463	284	100	117	9.4	1160	20.46	99.6	21.8	6.26	0.83
HP220x10	220	10	31	32.1	9	29	0.503	301	100	134	9.3	1400	23.89	105	25.7	6.95	0.91
x12	220	12	31	32.1	9	33.4	0.507	331	100	130	10.0	1590	27.98	122	29.0	6.90	0.92
HP240x10	240	10	34	35.4	10	32.49	0.547	373	100	147	10.0	1860	32.34	126	32.3	7.58	1.00
x11	240	11	34	35.4	10	34.89	0.549	390	100	146	10.3	2000	34.81	137	33.8	7.57	1.00
x12	240	12	34	35.4	10	37.29	0.551	408	100	144	10.6	2130	37.43	148	35.3	7.56	1.00
HP260x10	260	10	37	38.7	11	36.11	0.591	455	100	162	10.7	2477	42.84	153	40.0	8.28	1.09
x11	260	11	37	38.7	11	38.71	0.593	475	100	160	11.0	2610	45.90	162	41.7	8.21	1.09
x12	260	12	37	38.7	11	41.31	0.596	495	100	158	11.3	2770	49.11	175	43.5	8.19	1.09
HP280x11	280	11	40	42.0	12	42.68	0.637	570	100	174	11.7	3330	59.44	191	50.8	8.84	1.18
x12	280	12	40	42.0	12	45.48	0.639	597	100	172	11.9	3550	63.34	206	53.2	8.83	1.18
HP300x11	300	11	43	45.3	13	46.78	0.681	677	100	189	12.4	4190	75.74	222	61.1	9.47	1.27
x12	300	12	43	45.3	13	49.79	0.683	704	100	187	12.6	4460	80.44	239	63.8	9.47	1.27
x13	300	13	43	45.3	13	52.79	0.685	727	100	185	12.9	4720	85.33	256	66.1	9.45	1.27
HP320x12	320	12	46	48.6	14	54.25	0.728	824	100	201	13.4	5530	100.8	274	75.2	10.10	1.36
x13	320	13	46	48.6	14	57.45	0.73	852	100	199	13.6	5850	106.6	294	78.6	10.10	1.36
HP340x12	340	12	49	52.0	15	58.84	0.772	965	100	215	14.1	6760	124.6	313	88.4	10.72	1.46
x14	340	14	49	52.0	15	65.54	0.776	1018	100	211	14.6	7540	138.6	357	94.9	10.73	1.45
HP370x13	370	13	53.5	56.9	16.5	69.7	0.84	1219	100	235	15.4	9470	176.7	402	115	11.66	1.59
x15	370	15	53.5	56.9	16.5	77.1	0.844	1290	100	230	15.9	10490	194.8	455	123	11.67	1.59
HP400x14	400	14	58	61.9	18	81.48	0.908	1578	150	255	16.8	12930	243.6	507	145	12.60	1.73
x16	400	16	58	61.9	18	89.48	0.912	1665	150	250	17.2	14220	266.6	568	155	12.61	1.73
HP430x14	430	14	62.5	66.8	19.5	89.7	0.975	1885	150	277	17.9	16460	313.9	594	175	13.55	1.87
x15	430	15	62.5	66.8	19.5	94.19	0.976	1942	150	274	18.1	17260	327.9	628	181	13.54	1.87
x17	430	17	62.5	66.8	19.5	102.79	0.98	2038	150	269	18.5	18860	356.7	700	193	13.53	1.86

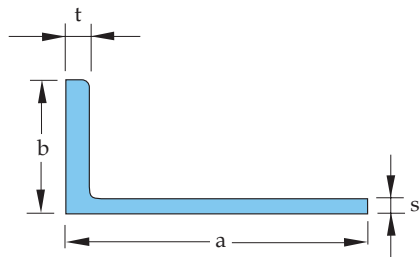
Please note:

1. These profiles(*) are not included in the EN standard.
2. Other EN standard and intermediate thicknesses can be delivered through special agreement.
3. Please see pages 9 and 10 for information on tolerances and delivery conditions, and page 8 for information on surface condition.

● **Universal flats**
weight / m



Width mm (b)	Thickness mm (s)							
	12	15	20	25	30	35	40	50
200	18.84	23.55	31.40	39.25	47.10	54.95	62.80	78.50
250	23.55	29.44	39.25	49.06	58.88	68.69	78.50	98.13
300	28.26	35.33	47.10	58.88	70.65	82.43	94.20	117.75
350	32.97	41.21	54.95	68.69	82.43	96.16	109.90	137.38
400		47.10	62.80	78.50	94.20	109.90	125.60	157.00
450		52.99	70.65	88.31	105.98	123.64	141.30	176.63
500			78.50	98.13	117.75	137.38	157.00	196.25
550			86.35	107.94	129.53	151.11	172.70	
600			94.20	117.75	141.30	164.85		



● **L-profiles**

Dimensions a x b x s x t mm	r ₁ mm	r ₂ mm	Area cm ²	Weight kg/m	ex cm	Moment of inertia cm ⁴	Paint area m ² /m	Section modulus W _{pf} cm ³	Plate area cm ²
200x90x9x12	15	7.5	28.0	22.0	13.37	1 164	0.56	315	100
250x90x9x13	15	7.5	33.4	26.2	16.36	2 193	0.56	445	100
x10.5x15	15	7.5	38.5	30.3	16.24	2 513	0.66	503	100
x11.5x16	15	7.5	41.7	32.7	16.12	2 709	0.66	536	100
300x100x10.5x15	15	7.5	45.3	35.6	19.34	4 291	0.78	692	100
x11.5x16	15	7.5	49.0	38.5	19.21	4 630	0.78	736	100
325x120x10.5x14	20	10	50.1	39.3	21.20	5 604	0.87	840	100
x11.5x15	20	10	54.3	42.6	21.08	6 058	0.87	896	100
350x120x10.5x16	20	10	54.9	43.1	23.02	7 108	0.92	997	100
x11.5x18	20	10	60.4	47.4	23.04	7 778	0.92	1 090	100
400x120x11.5x23	20	10	71.6	56.2	26.74	11 938	1.02	1 537	150

Please note:

1. Figures shown in the table for universal flats are for standard dimensions only. Smaller universal flats and unlisted dimensions within the boundaries of the table can be produced through special agreement.
2. L-profiles are produced through special agreement.
3. Please see pages 6 and 9 for information on tolerances and delivery conditions, and page 3 for information on surface condition.

● Approvals

Ruukki profiler's operations are in accordance with ISO 9001:2000. The company has approval of the world's leading classification societies, such as DnV, LR, GL, BV, ABS, RS, RINA and NK.

STEEL TYPES AND GRADES								
SHIPBUILDING STEELS ACCORDING TO THE RULES OF THE LISTED CLASSIFICATION SOCIETIES (SEE BELOW)					STRUCTURAL STEELS ACCORDING TO EURONORMS			
Strength	Grade	Delivery Condition	Max CE ¹⁾	Others	Euronorm	Grade ²⁾	Delivery Condition	
Normal	A, B	AR	-		EN 10025:1990 + A1:1993	S235JR / S235JRGn ²⁾	AR	
	D	CR				S235J0		
	E	TM				S235J2Gn ²⁾	CR	
High	A32		0,36			S275JR / S275JRGn ²⁾	AR	
	D32					S275J0		
	E32					S275J2Gn ²⁾	CR / TM	
	F32					0,38	S355JR	TM
	A36		S355J0					
	D36		S355J2Gn ²⁾					
	E36		S355K2Gn ²⁾					
	High		F36			0,40	EN 10025-2:2005	S235JR
A40			S235J0					
D40		S235J2	CR					
E40		S275JR	AR					
F40		S275J0						
Extra high		A420	TM	EN 10113-3:1993 or EN 10025-4:2000	S275J2			CR / TM
	D420	S355Jn ²⁾ +M			TM			
	E420	S275M						
	A460	S275ML						
	D460	S355M						
	E460	S355ML						
	A500	S420M						
	D500	S420ML						
Normal	NV 2-2			S460ML				
	NV 2-3			0,34	S355G4+M			
	NV 2-4			0,38	S355G11+M			
High	NV 4-2	S355G12+M						
	NV 4-3	S420G3+M						
NV 4-4	S420G4+M							

1) lower values and a max Pcm can be agreed upon.

2) The letter (suffix) n to be replaced by the current number or letter in the current Euronorm.

Ruukki Profiler AS is approved by the following Classification Societies

DnV - Det norske Veritas

ABS - American Bureau of Shipping

LR - Lloyds Register of Shipping

RS - Russian Maritime Register of Shipping

GL - Germanischer Lloyd

RINA - Registro Italiano Navale

BV - Bureau Veritas

NK - Nippon Kaiji KYOKAI

● **Tolerances**

Tight dimensional and straightness tolerances are becoming even more important in producing steel structures with minimum weight and optimum strength. With low standard tolerances and the possibility of producing narrower tolerances under special agreement, we can meet the most exacting requirements of any project.

Tolerances according to the tables below:

BULB FLATS ACCORDING TO EN 10067:1996					
Dimensions (mm)			Tolerances (mm)		
w	t ¹⁾	l	w		t ²⁾
			EN 10067	Ruukki's standard	
100	5–8	6000– 12 000 ³⁾	± 1.5	± 1.0	+ 0.7 - 0.3
120					
140	7–10	6000–20 000	± 2.0	± 1.5	+1.0 -0.3
160					
180	8-11				
200	9-12				
220	10–12		± 3.0	± 2.25	+1.0 -0.4
240					
260					
280	11–12				
300	11–13				
320	12–13		6000–20 000 Max length: 22 000 if agreed	± 4.0	± 3.0
340	12–14				
370	13–15				
400	14–16				
430	14–21				

¹⁾ Ruukki's standard thickness range. Other thicknesses to be agreed upon.
²⁾ Narrower tolerances to be agreed upon.
³⁾ Longer lengths to be agreed upon.

UNIVERSAL FLATS ACCORDING TO DIN 59200								
Dimensions (mm)			Ruukki's Tolerances (mm)					
w ³⁾	t ¹⁾		l	W	Product thickness (mm)	Tolerance		
200	12-50	Thickness 15-20mm: In steps of 5mm	6000-20 000	±2.0	12-19	+0.8 -0.3		
225				± 2.5				
250								
275					20-24	+0.9 -0.3		
300								
325				15-50	± 3.0	25-29	+1.1 -0.3	
350								
375								
400	20-50						30-50	+1.1 -0.3
425								
450								
475								
500								
525								
550								
575								
600								

- 1) Standard widths. Other widths (between 150 and 600) to be agreed upon.
 2) Ruukki's standard thickness range. Other thicknesses to be agreed upon.
 3) Narrower tolerances to be agreed upon

Other tolerances		
Straightness	Ruukki's special:	0.00125 x length for all products except Bulb 100-120 and Flat Bars
	Ruukki's standard:	0.005 x length for Flat Bars. 0.0025 x length for all other products
Length	+100/-0 mm for all products	

L-PROFILES				
Dimension axbxsxt mm	Width tolerance mm	Thickness tolerance		Length tolerance mm
		web s mm	flange t mm	
200x90x9x12	+/-3	+1.6/-0.4	+2.0/-0.4	-0/+100
250x90x9x13 – 300x100x11.5x16	+/-4	+1.6/-0.4	+2.0/-0.4	-0/+100
325x120x10.5x14 – 350x120x11.5x18	+/-5	+1.6/-0.4	+2.0/-0.4	-0/+100
400x120x11.5x23	+/-5	+1.6/-0.4	+2.0/-0.5	-0/+100
Straightness tolerance				
Standard q ^{max} = +/-0.0025 x l			Special q ^{max} = +/-0.00125 x l	

● **Production schedule**

The annual production schedule (per standard dimension) is as follows: bulb flats up to 12 times, universal flats 12 times, L-profiles, T-Bulb flanges and heavy angles are subject to special agreement. For more detailed information, please contact the marketing department at Ruukki Profiler.

● **Length**

All shipbuilding steels are rolled from specification in the following standard lengths and tolerances.

Product	Dimension mm	Normal length mm	Maximum length mm	Length tolerances mm
Bulb flats	100–120	6–12 000	17 000	-0/+100
	140–300	6–12 000	20 000	-0/+100
	320–430	6–16 000	22 000	-0/+100
Universals	200–600	6–16 000	20 000	-0/+100
L-profiles	200–325	6–16 000	20 000	-0/+100
	350–400	6–16 000	22 000	-0/+100

Please note: Lengths over 20 000mm are available by special agreement.

● **Minimum quantities**

The minimum quantity for rolled profiles is usually 3000kg per item. An item is considered equivalent to a product with the same grade, size, mark length and delivery time.

● **Marking standards for product identification**

Product	Marking method	Identification information
Bulb flats/ Universal flats ≥ 200mm/ L-profiles/angles	One metal tag per bundle. Die stamping/or paint	Classification society, grade, cast number, dimension, length, Ruukki's order and item numbers, special marking (max. 14 characters)

● **Bundling**

Bundling of shipbuilding profiles is completed using an ISO 9001 approved procedure. Each profile type has an individually designed bundling format for increased security during transportation.

Strapping of bundles is completed using steel straps. The number of profiles per bundle can vary, dependent on profile dimensions, although five straps are used as standard for profiles under 16000mm in length and seven straps for profiles of 16000mm and over.

For all profiles the maximum bundle weight is 5000kgs.

- **Working in partnership**

From Europe to South America, the US to the Far East, Ruukki Profiler has agents and representatives across the globe to assist and work closely with you. Add to this, Ruukki profiler's technical team, and you're sure of the support and commitment needed to ensure the project's success.

- **Marketing:**

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