JOIST HANGER

LIGHT BEAM

WWW.JOMA.SE

Joist hanger

-an environmentally friendly alternative.

Light beam, I-beam or masonite beam is a beam consisting of solid flanges and a web of a 10 mm thick OSB or chipboard. This saves up to 47% of raw materials compared to solid beams and joists, which is good for reducing our environmental impact. But the lightweight beam also has many other advantages.

Less material also makes the beams much lighter and contributes to a better working environment for carpenters without compromising on quality and strength.

At Joma, we constantly work to reduce our and others' environmental impact. Therefore, we have developed a completely new range of joist hangers adapted for light beams. The joist hangers are adapted to fasten the light beams both with and without web reinforcements.

The joist hangers are available in two different models, S-I and I-I. S-I stands for "Solid - I-beam" which are developed for when you have a solid primary beam and I-beam as secondary. The upper tabs on the S-I can easily be bent up so that they become straight if you want to attach the beam shoe in the middle of a secondary beam and not line the upper edge.

Model I-I stands for "I-beam - I-beam", which means that there is an I-beam both as primary and secondary. I-I must enclose the primary beam of I-beam both above and below and therefore requires that primary and secondary are of the same height (but not the same width).

Joist hanger I-I

Artikelkod	Benämning
5200800	Joist hanger I-I 47x200
5200801	Joist hanger I-I 47x220
5200822	Joist hanger I-I 47x240
5200802	Joist hanger I-I 47x250
5200803	Joist hanger I-I 47x300
5200804	Joist hanger I-I 47x350
5200805	Joist hanger I-I 47x400
5200806	Joist hanger I-I 47x450
5200807	Joist hanger I-I 47x500
5200808	Joist hanger I-I 70x200
5200809	Joist hanger I-I 70x220
5200823	Joist hanger I-I 70x240
5200810	Joist hanger I-I 70x250
5200811	Joist hanger I-I 70x300
5200812	Joist hanger I-I 70x350
5200813	Joist hanger I-I 70x400
5200814	Joist hanger I-I 70x450
5200815	Joist hanger I-I 70x500

Artikelkod	Benämning
5200824	Joist hanger I-I 97x240
5200816	Joist hanger I-I 97x250
5200817	Joist hanger I-I 97x300
5200818	Joist hanger I-II 97x350
5200819	Joist hanger I-I 97x400
5200820	Joist hanger I-I 97x450
5200821	Joist hanger I-I 97x500

Joist hanger S-I

Artikelkod	Benämning
5200700	Joist hanger S-I 47x200
5200701	Joist hanger S-I 47x220
5200722	Joist hanger S-I 47x240
5200702	Joist hanger S-I 47x250
5200703	Joist hanger S-I 47x300
5200704	Joist hanger S-I 47x350
5200705	Joist hanger S-I 47x400
5200706	Joist hanger S-I 47x450
5200707	Joist hanger S-I 47x500
5200708	Joist hanger S-I 70x200
5200709	Joist hanger S-I 70x220
5200723	Joist hanger S-I 70x240
5200710	Joist hanger S-I 70x250
5200711	Joist hanger S-I 70x300
5200712	Joist hanger S-I 70x350
5200713	Joist hanger S-I 70x400
5200714	Joist hanger S-I 70x450
5200715	Joist hanger S-I 70x500

Artikelkod	Benämning
5200724	Joist hanger S-I 97x240
5200716	Joist hanger S-I 97x250
5200717	Joist hanger S-I 97x300
5200718	Joist hanger S-I 97x350
5200719	Joist hanger S-I 97x400
5200720	Joist hanger S-I 97x450
5200721	Joist hanger S-I 97x500

Exempel för beräkning av vertikalt avstånd mellan horisontella kramlingsrader (a_v):

Ur villkoret för ytterfack vid 3 fack

(2.3) $$w_d \cdot \frac{a_v^2}{10} \leq \left[\frac{t^2}{6}\right] \cdot f_{xd1} \cdot 10^3$$

W_d

a_v

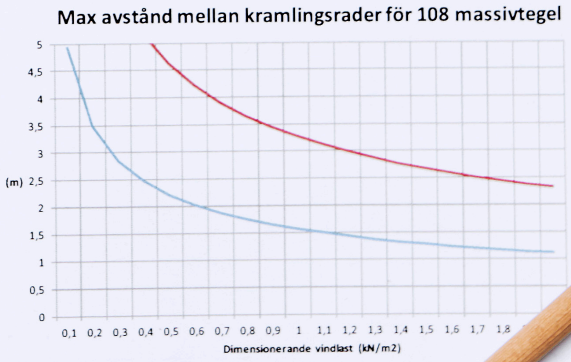
t

$f_{xd1} = \frac{0,25}{2,0} = 0,125$ MPa

erhålls villkoret för max avstånd i met

(2.4) $$a_v \leq 100 \cdot t \cdot \sqrt{\frac{f_{xd1}}{(6 \cdot w_d}}$$ (se röd linje i figur 2.3.1)

Figur 2.3.1 visar det vertikala och horisontella avståndet mellan kramlingsrader i förhållande till dimensionerande vindlast. Figuren är framtagen med samma förutsättningar som i exempel ovan. Vid fall där dessa avstånd ej kan efterlevas ska detta utredas av ansvarig konstruktör.



De två metoderna ska ikombineras.

Vertikalt avstånd mellan horisontella kramlingsrader

Horisontellt avstånd mella vertikala kramlingsra

Figur 2.3.1 Vertikalt (a_v) avstånd mellan horisontella kr ader (blå linje) respektive horisontellt (a_h) avstånd mellan vertikala kramlings d linje). Danskt 108 mm massivtegel, murbruk M2,5.

Dimensioning

On the following pages you will find calculations for the dimensioning of our joist hangers for light beams.

If you have questions about dimensioning the joist hangers, please contact us at teknik@joma.se.

DIMENSIONING

ETA 08/0216

Joist hangers are used when connecting lightweight beams with a flange width of 47-97 mm, as well as connecting lightweight beams and massive beams.

The beam shoes are made of 1.25 ± 0.13 mm sheet steel with quality EN 1.0147 S 350 GD, hot-dip galvanized Z275 according to SS-EN 10326:2004. The fitting has 4 mm holes (type I-I) or 5 mm (type S-I), for mounting with anchor nail 3.1x40 or anchor screw 4.0x30. The values in the tables assume that anchor nails with pullout value fu ≥ 7.6 are used.

The beam shoes are available with two different types S-I and I-I.

MEASURE

Joist hangers S-I and I-I are each manufactured with heights 200, 220, 240, 250, 300, 350, 400, 450 and 500. Joist hangers height 200 and 220 are manufactured with widths of 47 and 70 mm. Other joist hanger heights with widths of 47, 70 and 97 mm. See measurements in figure 1 and 2, and table 1 and 2.

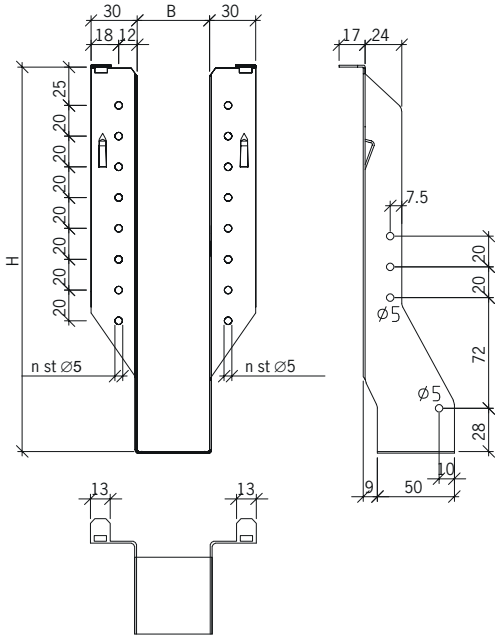


Figure 1. Dimensions for beam shoe type S-I.

Table 1. Dimensions for beam shoes type S-I.

Type	Measurements (mm)		
	H	B	Number of holes per side
S-I 200/47	200	47	6
S-I 200/70	200	70	6
S-I 220/47	220	47	7
S-I 220/70	220	70	7
S-I 240/47	240	47	8
S-I 240/70	240	70	8
S-I 240/97	240	97	8
S-I 250/47	250	47	8
S-I 250/70	250	70	8
S-I 250/97	250	97	8
S-I 300/47	300	47	11
S-I 300/70	300	70	11
S-I 300/97	300	97	11
S-I 350/47	350	47	13
S-I 350/70	350	70	13
S-I 350/97	350	97	13
S-I 400/47	400	47	16
S-I 400/70	400	70	16
S-I 400/97	400	97	16
S-I 450/47	450	47	18
S-I 450/70	450	70	18
S-I 450/97	450	97	18
S-I 500/47	500	47	21
S-I 500/70	500	70	21
S-I 500/97	500	97	21

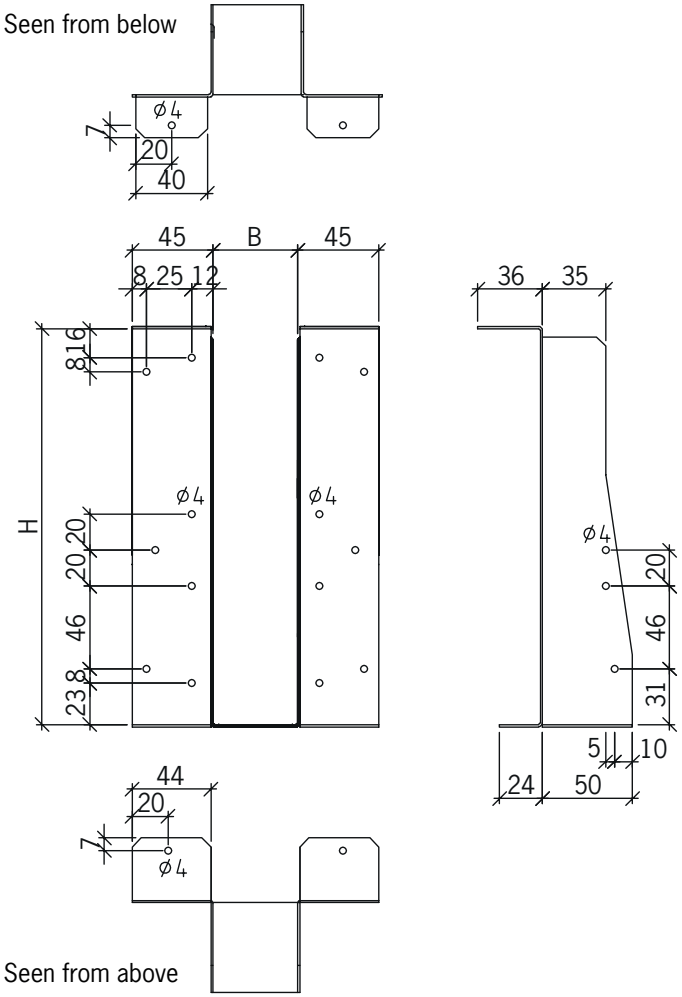


Figure 2. Dimensions for joist hangers type I-I.

Table 2. Dimensions for beam shoe type I-I.

Type	Measurements (mm)	
	H	B
I-I 200/47	200	47
I-I 200/70	200	70
I-I 220/47	220	47
I-I 220/70	220	70
I-I 240/47	240	47
I-I 240/70	240	70
I-I 240/97	240	97
I-I 250/47	250	47
I-I 250/70	250	70
I-I 250/97	250	97
I-I 300/47	300	47
I-I 300/70	300	70
I-I 300/97	300	97
I-I 350/47	350	47
I-I 350/70	350	70
I-I 350/97	350	97
I-I 400/47	400	47
I-I 400/70	400	70
I-I 400/97	400	97
I-I 450/47	450	47
I-I 450/70	450	70
I-I 450/97	450	97
I-I 500/47	500	47
I-I 500/70	500	70
I-I 500/97	500	97

MOUNTING

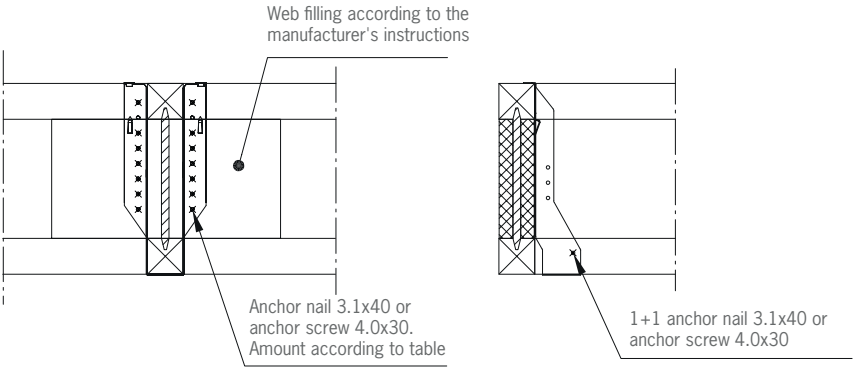
It is assumed that the primary beam does not twist when the joist hanger is loaded.

Joist hangers can be used in climate class 1 and 2. The load values given below assume that the nailing is carried out according to Eurocode EN 1995-1-1:2004, section 8.3.

Anchor nail 3.1x40 or anchor screw 4.0x30 must be used both in the primary beam and in the secondary beam.

Figure 3 shows how joist hanger type S-I are mounted. Web filling must be installed in the primary beam and secondary beam according to the manufacturer's instructions. The number of anchor nails or anchor screws in the primary beam is shown in table 3. For primary beams of the light beam type, nails must be placed in the top two nail holes. The second top nail hole on each side cannot be used. The remaining required number of nails is distributed evenly in the other nail holes.

S-I, mounting option A



S-I, mounting option B

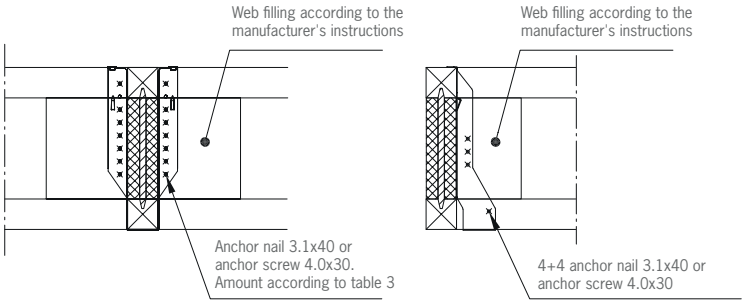
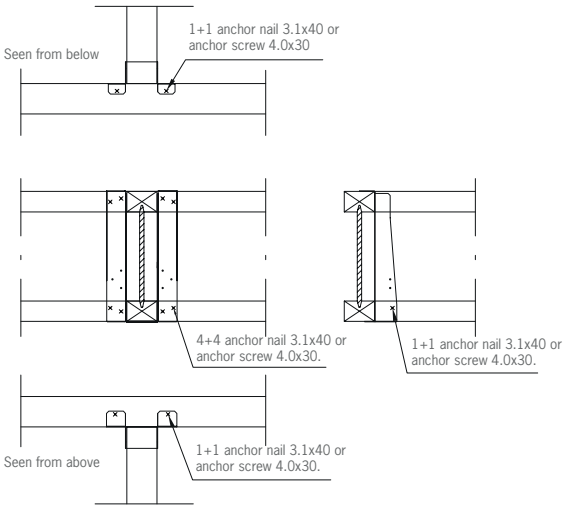


Figure 3. Installation of joist hangers type S-I, options A and B

Figures 4, 5 and 6 show how joist hanger type I-I are mounted for the different alternatives A, B or C. For all alternatives, anchor nails or anchor screws must be mounted in the tabs on the top and bottom of the primary beam. Other anchor nails or anchor screws are mounted for each alternative according to figure 4, 5 or 6. Table 4 shows the total number of anchor nails in the primary beam and secondary beam.

Web filling must be installed in the primary beam and secondary beam according to the manufacturer's instructions.

I-I, mounting option A



Figur 4. Mounting of joist hanger type I-I, option A

I-I, mounting option B

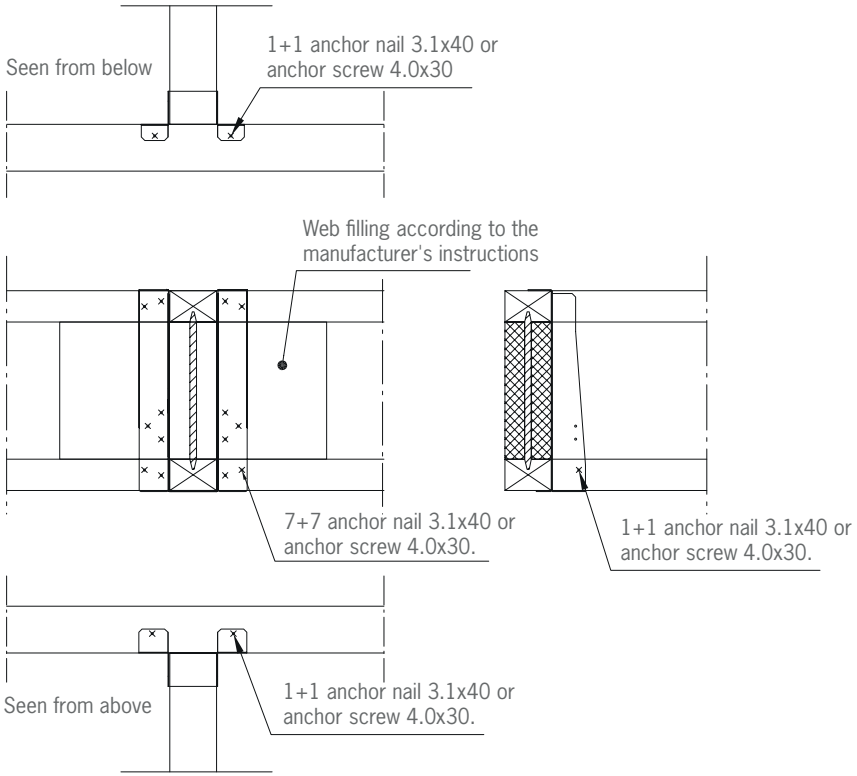
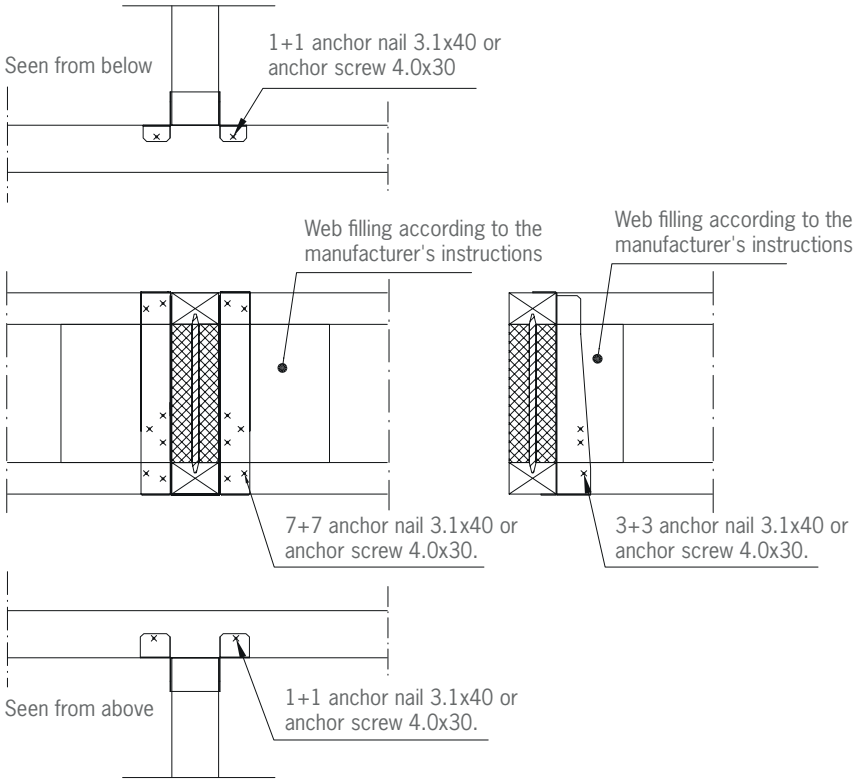


Figure 5. Mounting of joist hanger type I-I, option B.

I-I, mounting option C



Figur 6. Mounting of joist hanger type I-I, option C.

DIMENSIONING BEARING CAPACITY

In table 3, the dimensioning bearing capacity for joist hanger type S-I and the number of anchor nails or anchor screws for the different mounting options A or B are specified.

In table 4, the dimensioning bearing capacity for joist hanger type I-I and the number of anchor nails or anchor screws for the various mounting options A, B or C are specified.

F_{R1d}. specifies the design bearing capacity when the joist hanger is loaded with a downward load and F_{R2d}. specifies the design bearing capacity when the joist hanger is loaded with an upward load.

n_p indicates the total number of anchor nails or anchor screws in the primary beam and n_s total number of anchor nails or anchor screws in the secondary beam.

The same characteristic load-bearing capacity applies to each joist hanger height, regardless of joist hanger width 47, 70 or 97 mm.

The values in the tables apply to load duration class M (k_{mod} = 0,8). In table 5 specify which factor dimensioning load capacity must be multiplied by when the load duration class deviates from M.

The values in the tables assume that the lowest timber quality is C24 (ρ_k = 350 kg/m^3). For wood quality C18, the values in the tables must be multiplied by 0.95 and for wood quality C14, the values in the tables must be multiplied by 0.90.

Anchor nail 3.1x40 or anchor screw 4.0x30 must be used both in the primary beam and in the secondary beam.

The values in the tables indicate the bearing capacity of the joist hanger mounted according to the respective mounting alternative. Primary beam (massive or light beam) and secondary beam of light beams must be dimensioned by the supplier. The required amount of web filling in addition to what is specified in this document must be prescribed and dimensioned by the supplier.

Table 3. Dimensioning bearing capacity, F_{R1d} and F_{R2d} (kN) for joist hanger type S-I.

Load duration class M (k_{mod} = 0,8).

Load duration class M (k_{mod} = 0,8)					
Type	**Mounting type**	n_p	n_s	F_{R1d}	F_{R2d}
S-I 200-47, -70	A	10	2	8,0	1,5
S-I 200-47, -70	B	10	8	8,0	5,8
S-I 220-47, -70	A	12	2	8,6	1,5
S-I 220-47, -70	B	12	8	8,6	5,8
S-I 240-47, -70, -97	A	14	2	9,2	1,5
S-I 240-47, -70, -97	B	14	8	9,2	5,8
S-I 250-47, -70, -97	A	14	2	9,2	1,5
S-I 250-47, -70, -97	B	14	8	9,2	5,8
S-I 300-47, -70, -97	A	18	2	9,5	1,5
S-I 300-47, -70, -97	B	18	8	9,5	5,8
S-I 350-47, -70, -97	A	22	2	9,8	1,5
S-I 350-47, -70, -97	B	22	8	9,8	5,8
S-I 400-47, -70, -97	A	24	2	10,2	1,5
S-I 400-47, -70, -97	B	24	8	10,2	5,8
S-I 450-47, -70, -97	A	26	2	10,7	1,5
S-I 450-47, -70, -97	A	26	8	10,7	5,8
S-I 500-47, -70, -97	A	28	2	11,1	1,5
S-I 500-47, -70, -97	B	28	8	11,1	5,8

Table 4. Dimensioning bearing capacity, F_{R1d} and F_{R2d} (kN) for joist hanger type I-I.

Load duration class M (k_{mod} = 0,8).

Load duration class M (k_{mod} = 0,8)					
Type	**Mounting type**	n_p	n_s	F_{R1d}	F_{R2d}
H 200-47, -70	A	2+2+8	2	8,3	1,5
H 200-47, -70	B	2+2+14	2	8,3	1,5
H 200-47, -70	C	2+2+14	6	8,3	4,3
H 220-47, -70	A	2+2+8	2	8,3	1,5
H 220-47, -70	B	2+2+14	2	8,3	1,5
H 220-47, -70	C	2+2+14	6	8,3	4,3
H 240-47, -70, -97	A	2+2+8	2	9,2	1,5
H 240-47, -70, -97	B	2+2+14	2	9,2	1,5
H 240-47, -70, -97	C	2+2+14	6	9,2	4,3
H 250-47, -70, -97	A	2+2+8	2	9,2	1,5
H 250-47, -70, -97	B	2+2+14	2	9,2	1,5
H 250-47, -70, -97	C	2+2+14	6	9,2	4,3
H 300-47, -70, -97	A	2+2+8	2	9,2	1,5
H 300-47, -70, -97	B	2+2+14	2	9,2	1,5
H 300-47, -70, -97	C	2+2+14	6	9,2	4,3
H 350-47, -70, -97	A	2+2+8	2	9,2	1,5
H 350-47, -70, -97	B	2+2+14	2	9,2	1,5
H 350-47, -70, -97	C	2+2+14	6	9,2	4,3
H 400-47, -70, -97	A	2+2+8	2	9,5	1,5
H 400-47, -70, -97	B	2+2+14	2	9,5	1,5
H 400-47, -70, -97	C	2+2+14	6	9,5	4,3
H 450-47, -70, -97	A	2+2+8	2	9,5	1,5
H 450-47, -70, -97	B	2+2+14	2	9,5	1,5
H 450-47, -70, -97	C	2+2+14	6	9,5	4,3
H 500-47, -70, -97	A	2+2+8	2	9,8	1,5
H 500-47, -70, -97	B	2+2+14	2	9,8	1,5
H 500-47, -70, -97	C	2+2+14	6	9,8	4,3

Table 5. Correction factor for different load duration classes.

Load duration class M (k_{mod} = 0,8)				
P	**L**	**M**	**S**	**I**
0,75	0,88	1,0	1,12	1,38

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