

VARIOMAX

Soffit formwork with H 20 timber beams
Instructions for erection and use

November 2008



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2.0 Product features

In combination with tubular steel props, tripod stands, fork heads and shuttering panels, the **H20 beams** provide flexible, yet cost-effective soffit formwork for any ground-plan, slab thickness and room height.


The **H20 timber** beam is especially practical due to its low weight (5.0 kg/m), its good statical figures, and its exacting workmanship in details.

A very long duration of life is assured by its high-grade bonding and its rounded beam ends.

The **H20 timber** has a general approval by the building supervisory board.



Warning/Caution!:

Cautionary notes and warnings are identified in this erection and usage instruction as . Non-observance with these notes may lead to severe injuries and/or damages!

Legend:



Warning/Caution!:

refers to erection steps which must be followed very carefully, otherwise the proper installation of the **VARIOMAX** cannot be ensured. Non-observance may lead to severe injuries and/or damages.

These warnings and notes require absolute attention in order to ensure the desired safety provided by the **VARIOMAX**.



Inspection:

refers to erection steps which require specific attention by either visual inspection or other means described in more detail.

2.1 General information

These erection and usage instructions provide important information about the installation and application of the **HÜNNEBECK VARIOMAX**, as well as precautions which are necessary for the safe erection and the reliable use. These instructions are intended for the effective work with the **VARIOMAX**. Please read the instructions carefully prior to erection and use of the **VARIOMAX** and keep it handy as a reference book.

2.2 Safety Instructions

The following erection and use instructions contain information regarding the installation and use of the products mentioned or depicted in it.

The illustrations shown in these standard erection and use instructions shall be considered as samples only on how to use "**VARIOMAX**" safely. Add-ons, deviations or changes to specific items always require additional installation instructions by the user, which must be provided based upon the assessment of the risk and, if necessary, requires additional structural analysis. The currently available occupational health and safety regulations always apply to the safety-related use of our products.

The installation must be used in addition to existing fall protection systems. Otherwise, the user shall provide safety measures based on the requirements of § 5 ArbSchG (German law pertaining to the prevention of industrial accidents).

Only undamaged original parts by **HÜNNEBECK** may be used. For this very reason, all components must be visually inspected for their origin and for possible damages prior to any installation. If necessary, those parts must be replaced with original components.

When requiring spare parts, only original **HÜNNEBECK** parts must be used.

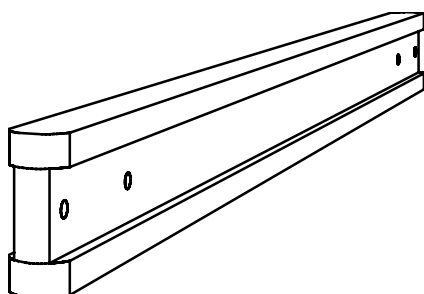
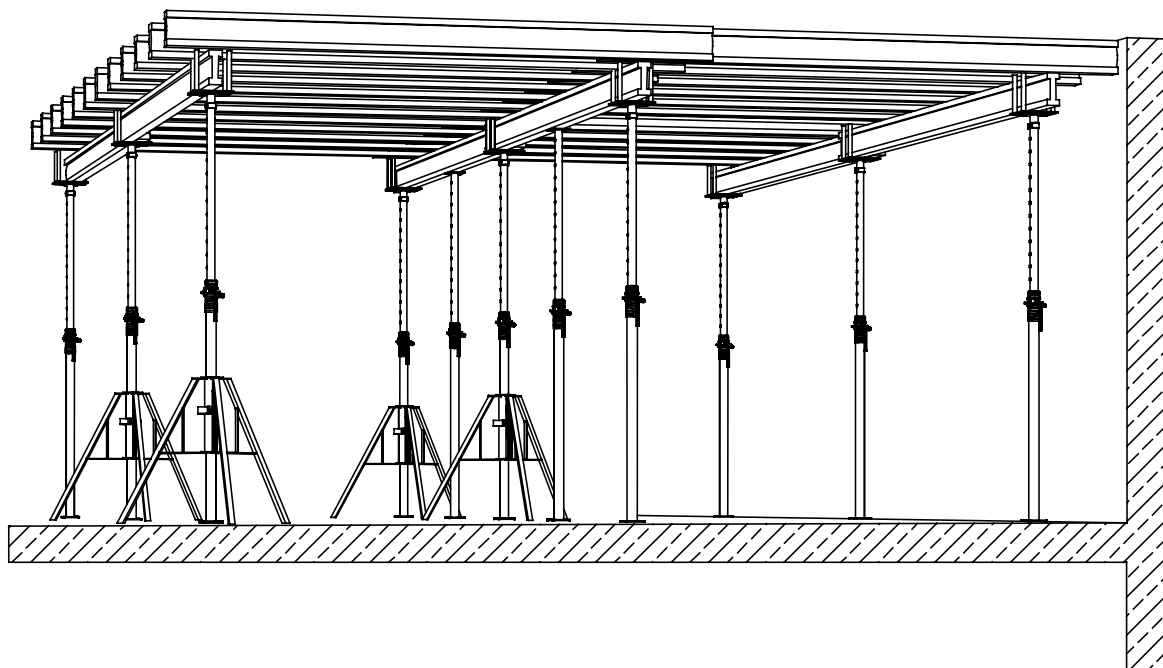
Mixing our systems with those from other manufacturers are inherently dangerous and require a separate inspection.

The illustrations in this erection and use are used to emphasise the recognition of details and therefore, may not always be complete from a safety point of view.

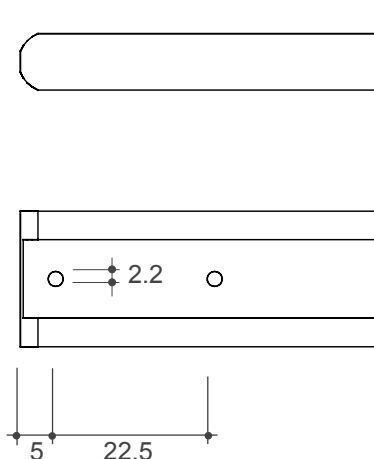
Based on the engineering development, we reserve the right to change any design without prior notice.

The latest issue of the erection and use instructions may be downloaded from the internet, go to www.huenebeck.com or they can be ordered from **HÜNNEBECK** directly.

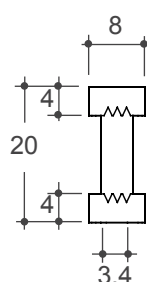
3.0 Overview



Beam end dimensions in [cm]

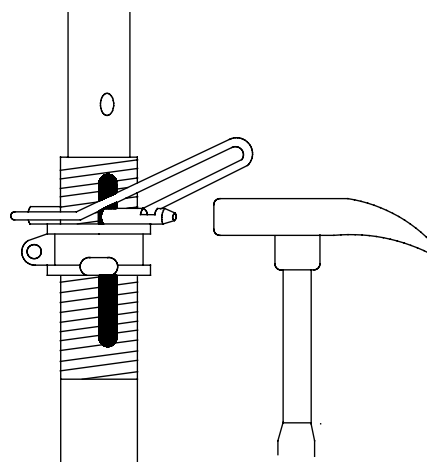


Cross section



Quick lowering mechanism:

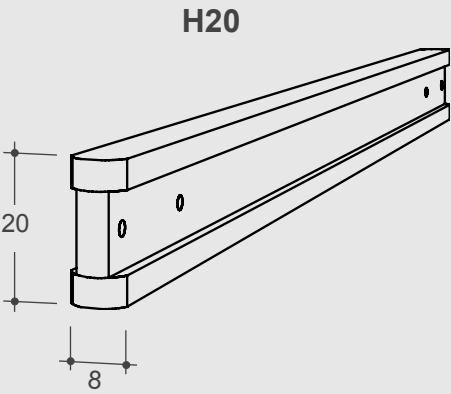
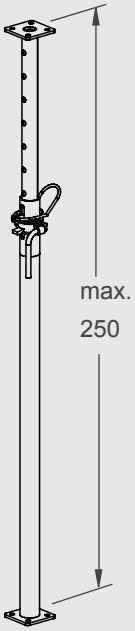
Another special feature is that all the props are equipped with the patented quick-release bolt, which, with a blow of the hammer, immediately releases the adjustment nut.



Practical accessory items make **VARIOMAX soffit formwork** even faster and more efficient. The tripod stand, for example, makes it easier to erect the props.

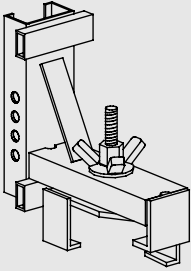
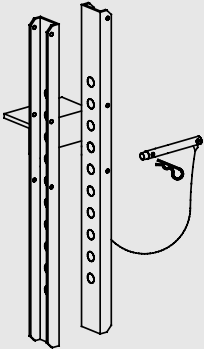

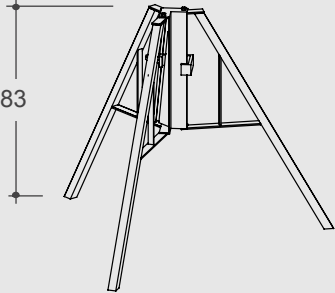
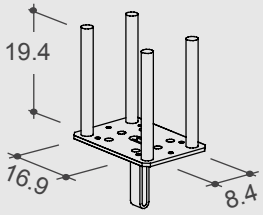
Striking is made easier by lowering the shuttering plane by about 6 cm using the adjustment nut of the steel props. With the space which results from the first lowering and by tilting the timber beams, the shuttering material can be systematically removed, while going easy on materials.
(Subject to technical modifications.)

4.0 Components

	Description	Art. No	Weight kg/pcs.
 <p>H20</p>	H20 - Beam 190	581 760	9.50
	H20 - Beam 245	581 770	12.25
	H20 - Beam 265	581 781	13.25
	H20 - Beam 290	581 792	14.50
	H20 - Beam 330	581 807	16.50
	H20 - Beam 360	581 818	18.00
	H20 - Beam 390	581 829	19.50
	H20 - Beam 450	581 830	22.50
	H20 - Beam 490	581 840	24.50
	H20 - Beam 590	581 851	29.50
	H20 - Beam 1190	582 319	59.50
	H20 - beams in special lengths up to 12.00 m - per running metre	581 862	5.00
	Lengths < 1.90 m / > 7.90 m without drill holes and rounded ends.		
	Timber formwork beams with a height of 20 cm and a width of 8 cm.		
	The H20 beam is approved for the following statical figures:		
 <p>Props</p>	perm. M = 5.00 kNm		
	perm. Q = 11.00 kN		
	E • I = 500 kNm²		
	A general approval of the building authorities is available under registration number: Z-9.1-299.		
	All steel props are provided with a quick-lowering mechanism, anti-crush guard and a protection against dropping-out of the inner tube and are also protected for a long service-life by hot-dip galvanization.		
	*accord. to DIN EN 1065		
	EUROPLUS new 20 - 250	601 390	13.15
	Extension range from 1.47 m - 2.50 m.		
	Perm load* in system-bound use see page 24.		
	Perm load*: 20 kN as single prop.		
	EUROPLUS new 30 - 250	601 430	16.20
	Extension range from 1.47 m - 2.50 m.		
	Perm load* in system-bound use see page 25.		
	Perm load*: 30 kN as single prop.		

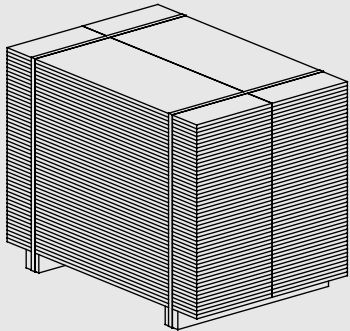
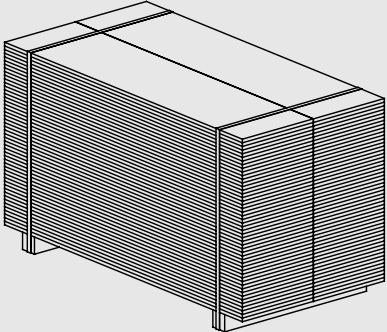
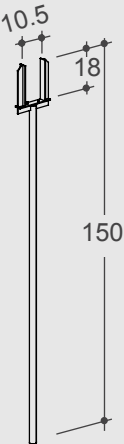
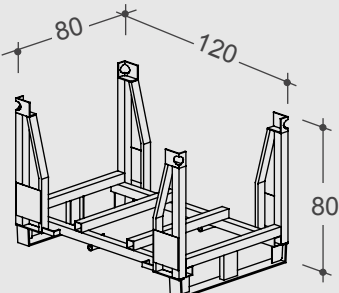
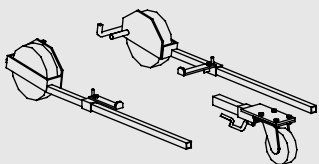
4.0 Components

	Description	Art. No	Weight kg/pcs.
	EUROPLUS new 20 - 300 Extension range from 1.72 m - 3.00 m. Perm load* in system-bound use see page 24. Perm load*: 20 kN as single prop.	601 400	16.82
	EUROPLUS new 30 - 300 Extension range from 1.72 m - 3.00 m. Perm load* in system-bound use see page 25. Perm load*: 30 kN as single prop.	601 440	19.17
	EUROPLUS new 20 - 350 Extension range from 1.98 m - 3.50 m. Perm load* in system-bound use see page 24. Perm load*: 20 kN as single prop.	601 410	20.52
	EUROPLUS new 30 - 350 Extension range from 1.93 m - 3.50 m. Perm load* in system-bound use see page 25. Perm load*: 30 kN as single prop.	601 445	24.24
	EUROPLUS new 20 - 400 Extension range from 2.24 m - 4.00 m. Perm load* in system-bound use see page 24. Perm load*: 20 kN as single prop.	601 415	23.79
	EUROPLUS new 30 - 400 Extension range from 2.24 m - 4.00 m. Perm load* in system-bound use see page 25. Perm load*: 30 kN as single prop.	601 450	28.77
	EUROPLUS new 20 - 550 Extension range from 3.03 m - 5.50 m. Perm load* in system-bound use see page 24. Perm load*: 20 kN as single prop.	601 425	36.08

	Description	Art. No	Weight kg/pcs.
<p>Beam Formwork</p>   	<p>Joist clamping connector Can be fastened to any timber beam like H20 and R24 with 8 cm wide and at maximum 6 cm thick flanges (see page 14-18).</p> <p>Adjustable fixing beam 500 This is fastened with the unlosable bolt to the Joist clamping connector in steps of 1 cm corresponding to the required beam height. The position of the bolt is secured by means of a spring cotter (see page 14-18).</p> <p>Triangular fillet (UZ) Used for beam formwork with 21 mm thick plywood panel. Length : 2.50 m Plastic profile having a length of 2.50 m. This profile can be clamped on the edge of a 21 mm thick shuttering sheet. It breaks the sharp concrete edge by about 2 x 2 cm.</p>	<p>496 469</p> <p>496 458</p> <p>547 555</p>	<p>6.50</p> <p>4.54</p> <p>0.45</p>
<p>Accessories</p>  	<p>Tripod galv. Simplifies the erection of Europlus and AS props for soffit formwork assembly. Only to be used as an erection aid; does not replace the stiffening necessary for the supporting structure (see page 10).</p> <p>Fork head 8/20 Protects H20 beams which serve as primary beams from falling. Holds either 1 or 2 beams. Is secured in the prop with the TOPEC-bolt. (Order 1 x TOPEC-bolt for this purpose.) See page 11.</p>	<p>510 256</p> <p>417 565</p>	<p>11.82</p> <p>2.96</p>

4.0 Components

	Description	Art. No	Weight kg/pcs.
	<p>Steel prop hanger 8 Helps to attach an additional prop to the H20 beam (see page 11).</p>	510 749	1.20
	<p>TOPEC-Bolt (with spring) For securing the inserted fork heads and steel prop hangers (1 each). Can be used with Europlus and AS props. See page 11.</p>	470 804	0.15
	<p>TOPEC-Bolt Alu 500 DC Used for aluminium prop Alu 500 DC and Europlus props 400 EC and 550 DC.</p>	569 384	0.15
	<p>Euro Bracing clamp Attaches stiffening shutterboards to any tubular steel props. (For max. board thickness of 3 x 12 cm)</p>	573 810	1.83
	<p>PROTECTO - Railing post The railing post is the principle item of the PROTECTO system. It can be used either with a board railing or with the PROTECTO Protective grating. When being inserted into one of the various holding devices, it will automatically be fixed by way of the built-in locking mechanism. The railing post is durably protected against corrosion by hot-dip galvanizing.</p>	601 225	3.73
	<p>PROTECTO - Toe board retainer This item serves as a supplementary part to the railing post and secures the toe board of the board railing. The PROTECTO toe board retainer can even be attached to the railing post afterwards.</p>	601 227	0.69
	<p>PROTECTO - Timber beam connector A connecting part and holding device for the PROTECTO - Railing post on standard timber beams with heights of 20 or 24 cm. At the same time it is also applicable as support for the stop-end of the slab formwork. Nail holes are provided in the integrated plate for nailing purposes. The beam connector can simply be assembled by tightening the wing nut of the clamping part with a hammer. It may also be used on timber beams arranged vertically (e.g. wall formwork).</p>	601 291	4.20

	Description	Art. No	Weight kg/pcs.
	<p>3-S-Shuttering panels 150 (Package 75 m²)</p> <p>According to DIN 18215.</p> <p>Thickness 21 mm, L = 1.50 m, W = 0.50 m.</p>	569 708	800.00
	<p>3-S-Shuttering panels 200 (Package 100 m²)</p> <p>According to DIN 18215.</p> <p>Thickness 21 mm, L = 2.00 m, W = 0.50 m.</p>	569 719	1060.00
	<p>Assembly fork</p> <p>Simplifies the laying and removal of H20 shuttering beams (see page 11).</p>	510 554	3.51
	<p>Euro stacking frame 120/80</p> <p>Steel, hot-dip galvanized</p> <p>Load-bearing capacity: 1200 kg</p> <p>For storing and transporting scaffolding and formwork materials. A maximum of 6 stands can be stacked (see page 26).</p>	553 689	54.91
	<p>Mobile-set</p> <p>To manoeuvre the Euro stacking frame.</p> <p>Is simply slotted into the stacking frame, which can then even be moved when loaded (Working load: 1,300 kg).</p> <p>See page 26.</p>	563 722	32.30

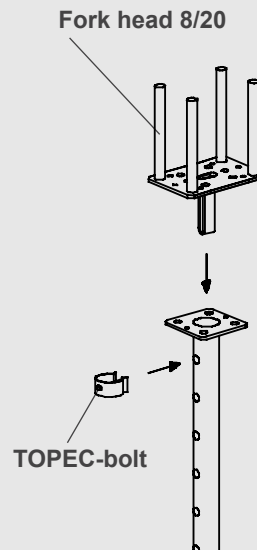
5.0 Use and erection

Prop with fork head 8/20

To begin with, the **Fork heads 8/20** have to be attached to the **EUROPLUS new**.

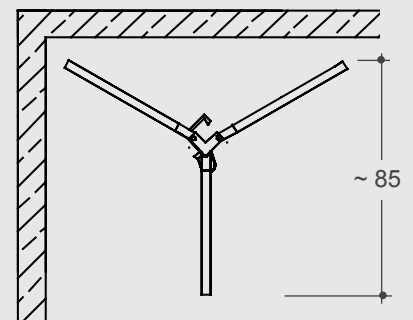
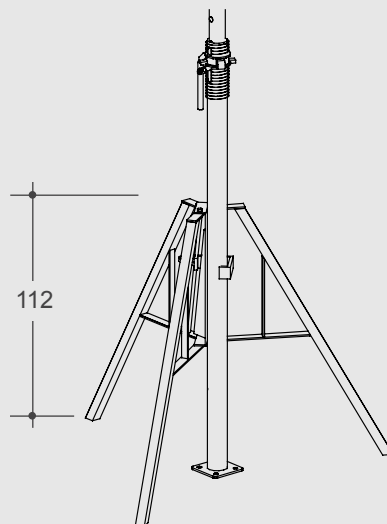
The inserted heads are secured with a **TOPEC-bolt**.

Both **Fork heads 8/20** have a 2-way design. This means that in one position one timber beam, and in the other position - a 90° rotation - two timber beams can be inserted in the head (assuming a 8 cm beam width).



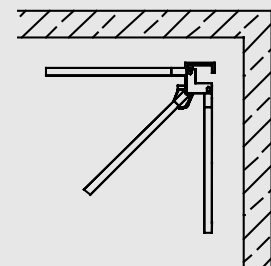
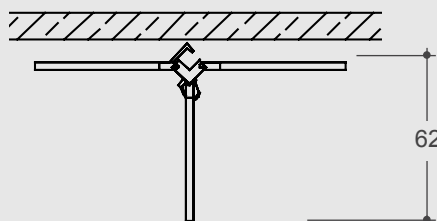
Prop with Tripod galv.

The **Tripod galv.** makes it easier to set up the tubular steel props during erection. The prop is simply set in the open stand and secured through the clamping loop with a gentle blow of the hammer. The **Tripod galv.** can be used with all types of props. The flexibly mounted supporting legs of the **Tripod galv.** permit an optimal fit, even in the corners of the structure.

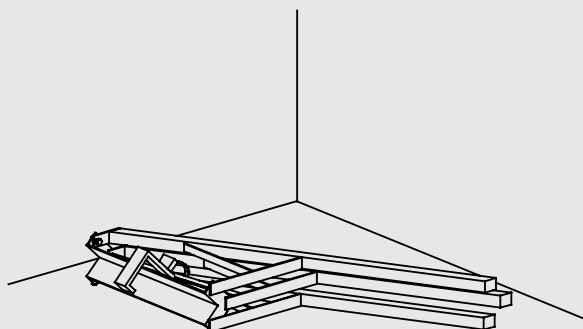


Important note!

After the soffit formwork has been completely erected in the room or area, the **Tripod galv.** can be removed and shifted to the next erection site. It serves only as an aid in assembling the slab formwork.

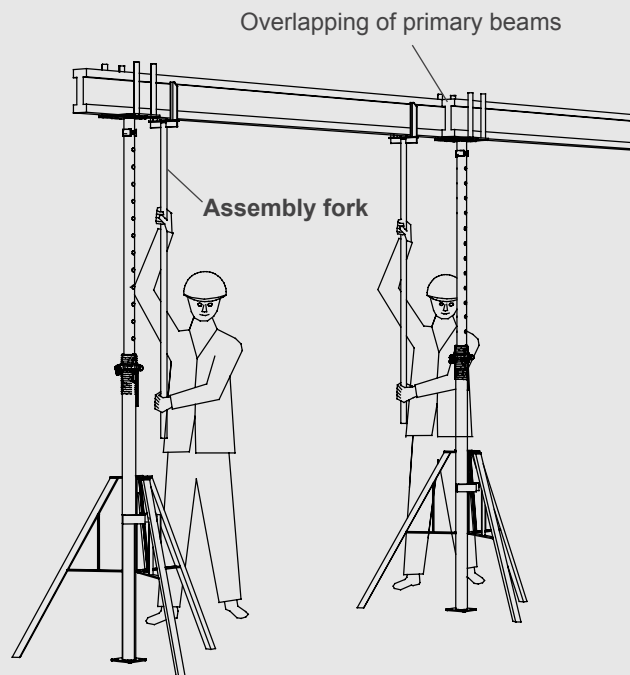


The **Tripod galv.** can be folded up to save space.



Erecting the primary beams

Erection of the **VARIOMAX soffit formwork** begins with setting up the primary beams. For this, the props are set at roughly the required extension length on the ground. The **fork heads** are mounted to them, and then they are set up under the ends of the primary beams (in the case of jointed beams, under the joints as well). To keep them steady, **Uni tripods** are attached to these props.

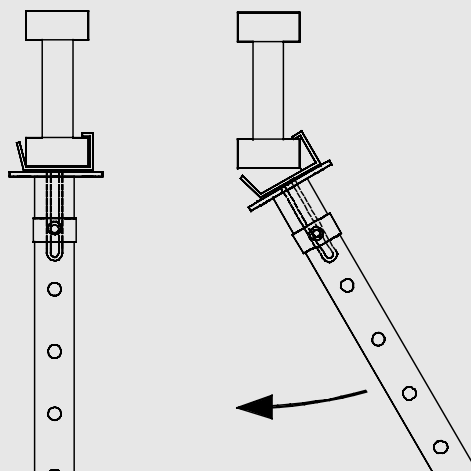
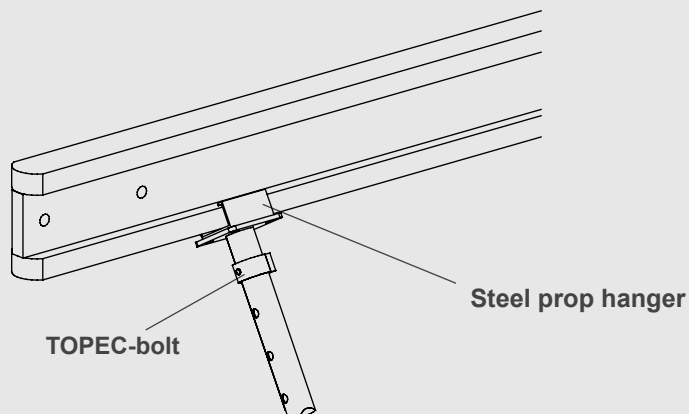


Following this, the **H20 beams** are placed in the **Fork heads 8/20** of the props. The **Assembly forks** make this step much easier.

Then the remaining props should be set up, taking into account the static requirements (room height, slab thickness, and maximum permitted loading capacity of the tubular steel props which are being used).

The **Steel prop hangers** which are attached to the props immediately safeguard them from falling over.

The prop is then swung into place under the primary beam.



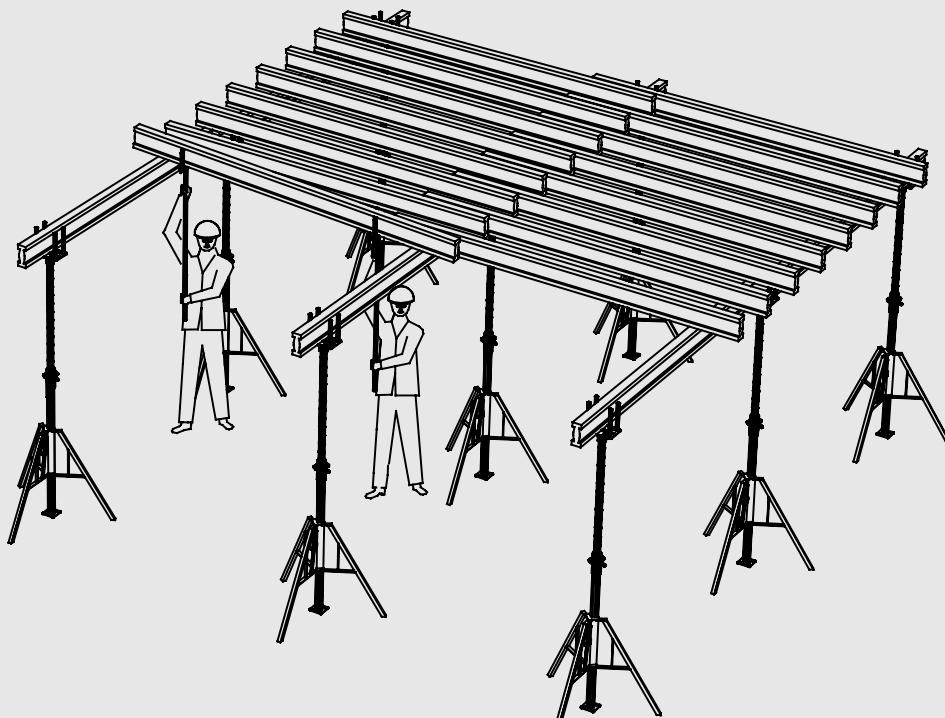
5.0 Use and erection

Placing the secondary beams

The correct distance between the secondary beams must be calculated, in line with the static requirements, by using the loading tables on pages 21 and 22.

A beam must be placed under each shuttering panel joint. Here, too, the work is facilitated by the **Assembly fork**.

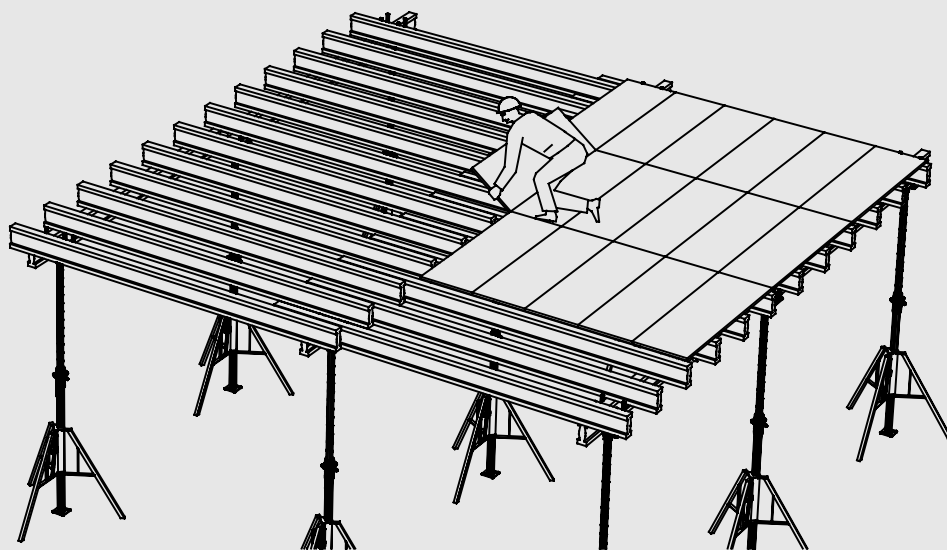
Secondary beams and shuttering skin



Adding the shuttering panels

The shuttering panels are placed on top of the secondary beams and tacked in place. The rigid shuttering structure must be braced against the building.

Adding shuttering panels



Important note!

Safety rails must be erected on the edges of the structure, in line with the regulations for safety and health protection in shuttering and scaffolding ZH1/603.

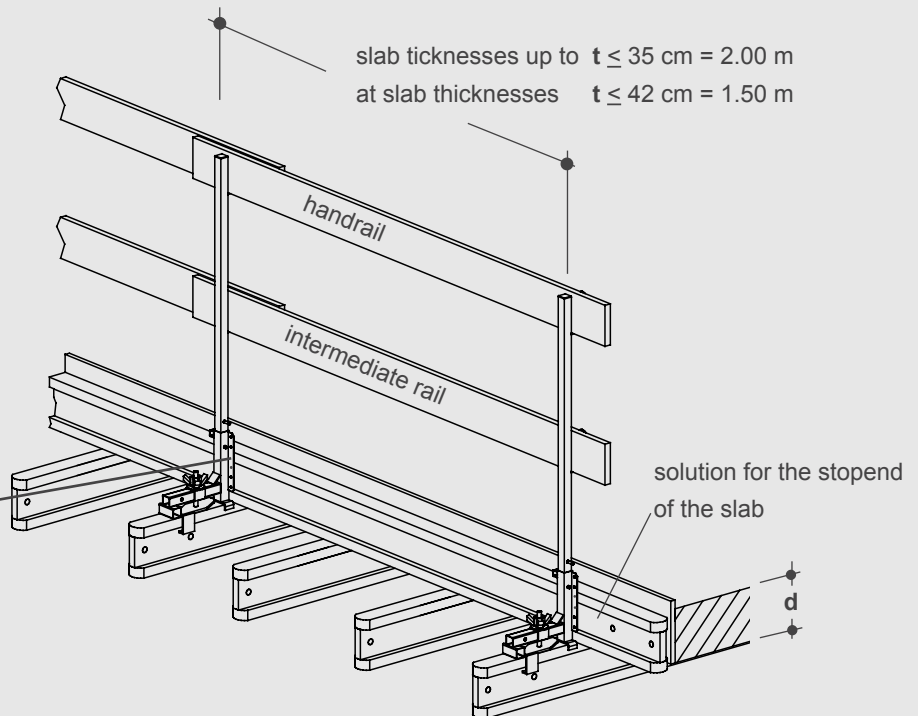
PROTECTO

The **PROTECTO Timber beam connector** is a holding device for the railing post specially designed for the connection on usually applied timber beams with heights of 20 cm or 24 cm. It enables the user to erect the necessary edge protection on cantilevering slab formwork systems and to use it at the same time for supporting the stopend of the slab.



Important note!

Fasten stopend or toe board by means of 2 nails or screws!

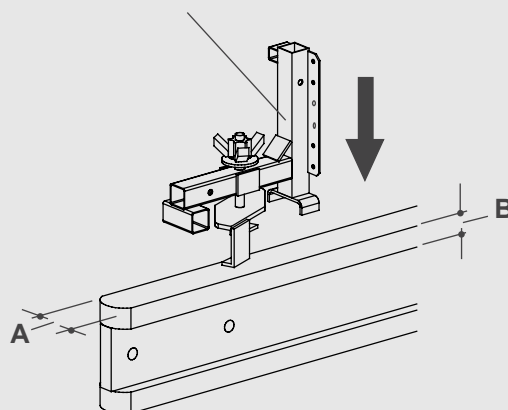


Measure **A** = 8 cm

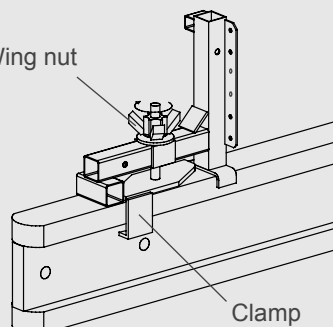
Measure **B** = 4 to 6 cm

Insert the **PROTECTO Railing post** for the edge protection into the socket tube until it is secured by the lower locking pin of the safety mechanism.

PROTECTO Timber beam connector

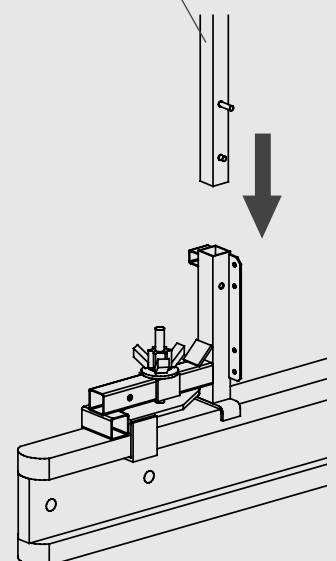


Wing nut



Clamp

PROTECTO Railing post



Visual check!

Pay attention to the correct position of the clamp!

The **PROTECTO Timber beam connector** is fastened on the timber beam by operating the wing nut by hammer blows.

5.0 Use and erection

Joist clamping connector

Can be fastened to any timber beam like **H 20** and **R 24** with 8 cm wide and at maximum 6 cm thick flanges.

Adjustable fixing beam 500

This is fastened with the unlosable bolt to the **Joist clamping connector** in steps of 1 cm corresponding to the required beam height. The position of the bolt is secured by means of a spring cotter

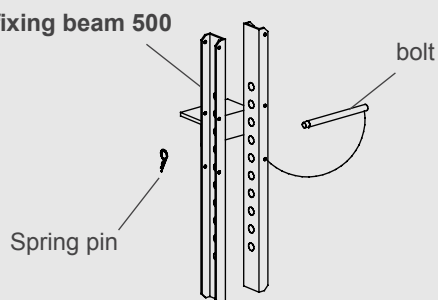
Permissible distances

Joist clamping connectors are only to be arranged opposite on top of the same transverse beam.

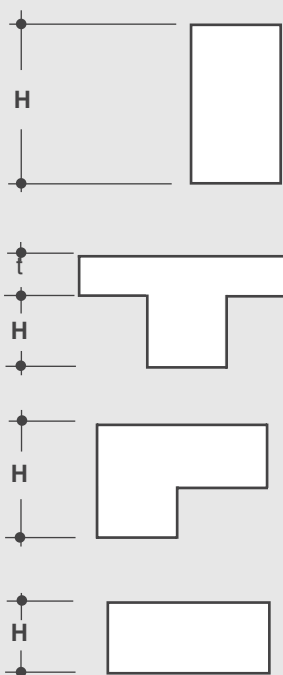
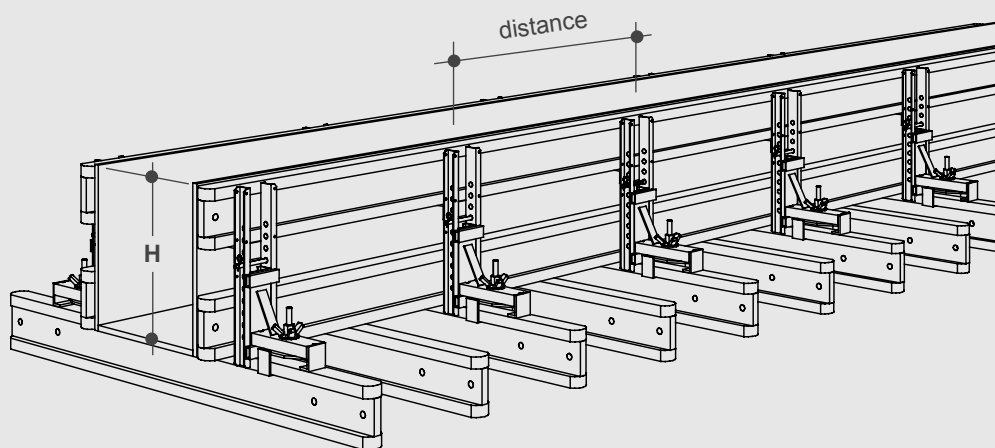
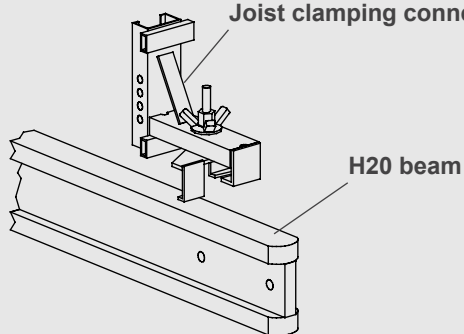
The height „**H** „ of the side formwork is decisive for the calculation.

In case of having perimeter beams, the exterior side is decisive for the permissible distances.

Adjustable fixing beam 500



Joist clamping connector



beam height H (cm)	max. distances of joist clamping connectors		
	without slab [m]	with slab	
		t = 20 cm [m]	t = 30 cm [m]
30	2.25	1.50	1.25
35	2.00	1.25	1.00
40	1.75	1.05	0.90
45	1.50	0.95	0.80
50	1.35	0.85	0.70
55	1.30	0.75	0.60
60	1.05	0.65	0.50
65	0.90	0.50	0.40
70	0.80	0.40	0.35
75	0.60	0.30	
80	0.55		
85	0.45		
90	0.35		

Erect the longitudinal main supports (1).

Place transverse beams (2) on main beams.

Nail bottom shuttering skin (3) on beams (2).

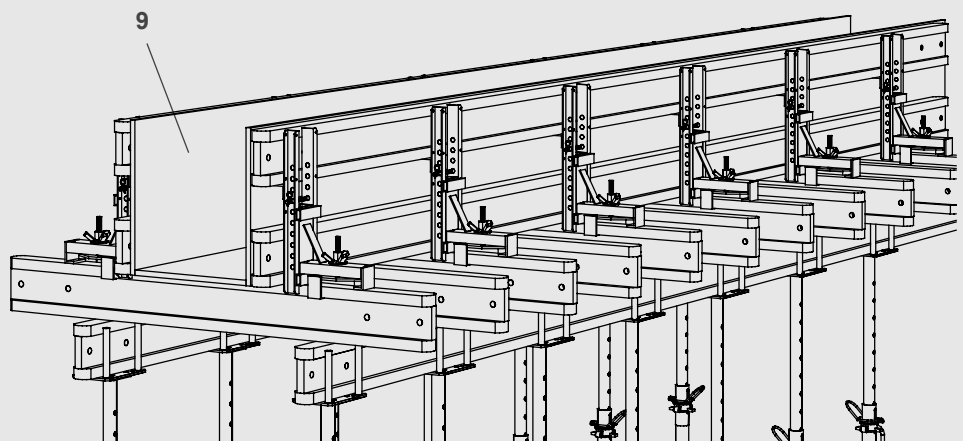
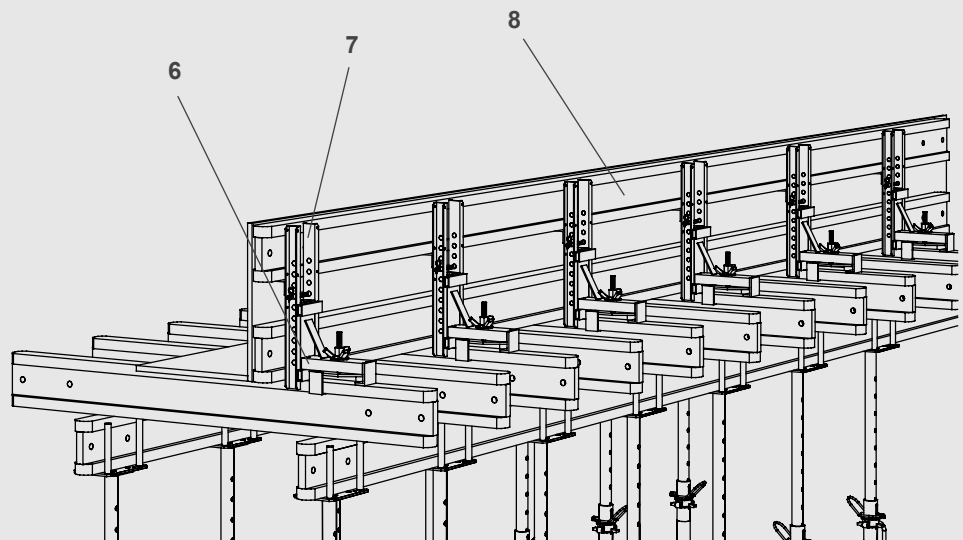
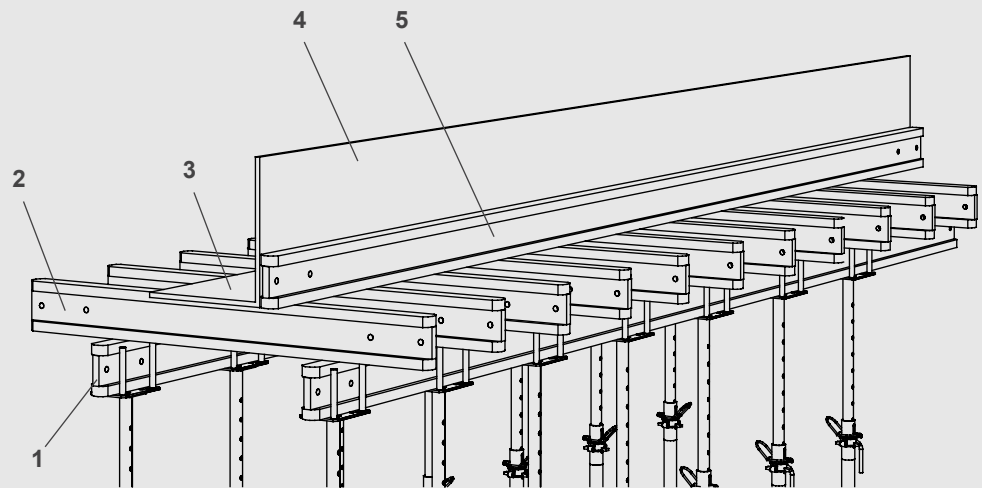
Place and attach side shuttering skin (4).

Put on timber beam (5) or squared timber.

Position **Joist clamping connector** (6) on top of the cross beam (2), press it against side formwork (4 + 5) and tighten wing nut by means of a hammer.

Fix the **Adjustable fixing beam 500** (7) acc. to the desired height of beam formwork. Place upper timber beam (8) on the angle iron welded to the fixing beam (7).

Erection of opposite side shuttering (9) after reinforcement work. Same procedure as already described before.



Important note!

Always arrange the joist clamping connector in opposite position on the same transverse beam!

5.0 Use and erection

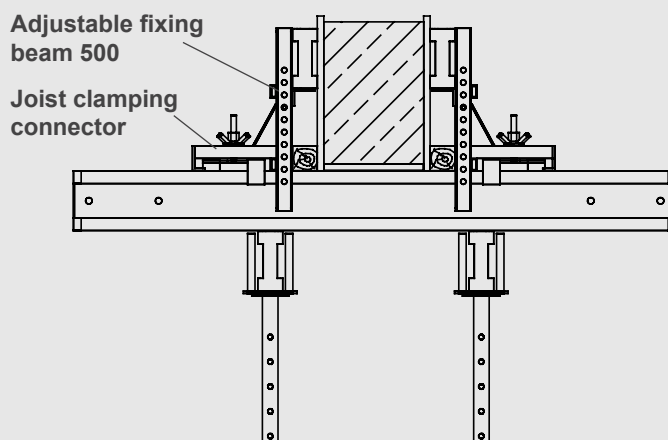
Joist clamping connector and Adjustable fixing beam

Can be fastened to any timber beam like **H20** and **R24** with 8 cm wide and at maximum 6 cm thick flanges.

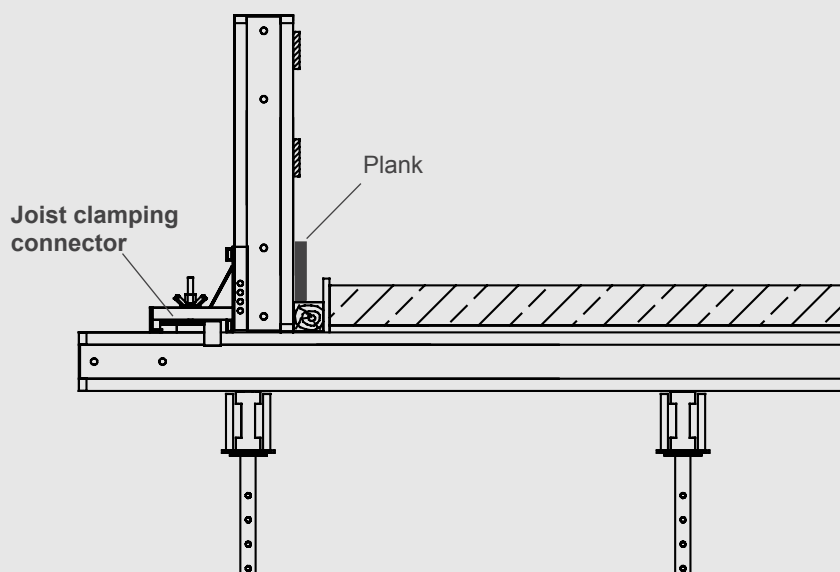
Without mounting the **fixing beam 500**, the 20 cm high timber beam can be directly installed in vertical position in the front profile (reception) of the **Joist clamping connector**.

Examples of application

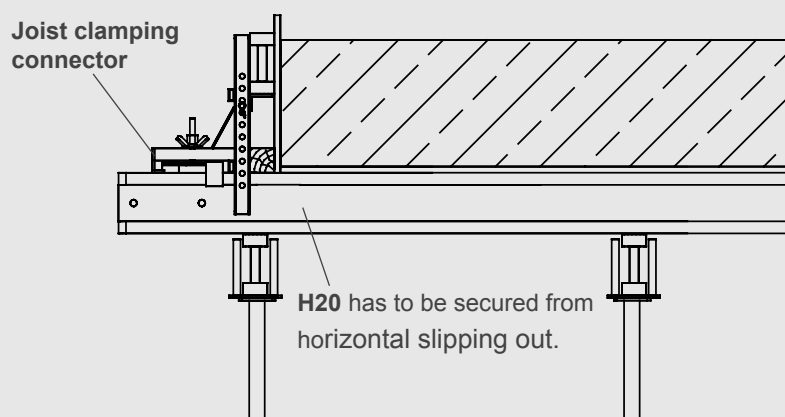
Beam



Guard rail in conjunction with slab stopend shuttering



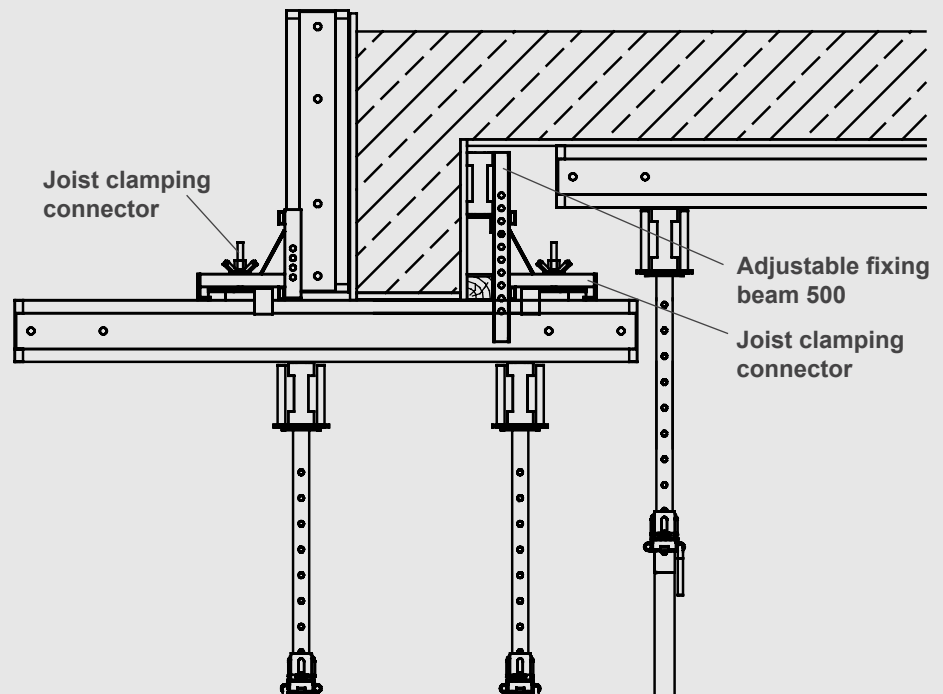
Slab stopend



The exterior side shuttering (here in this example) is formed by means of vertically arranged **H20** inserted in the C-profile of the joist clamping connector.

The application of the **Adjustable fixing beam 500** is not required with this design.

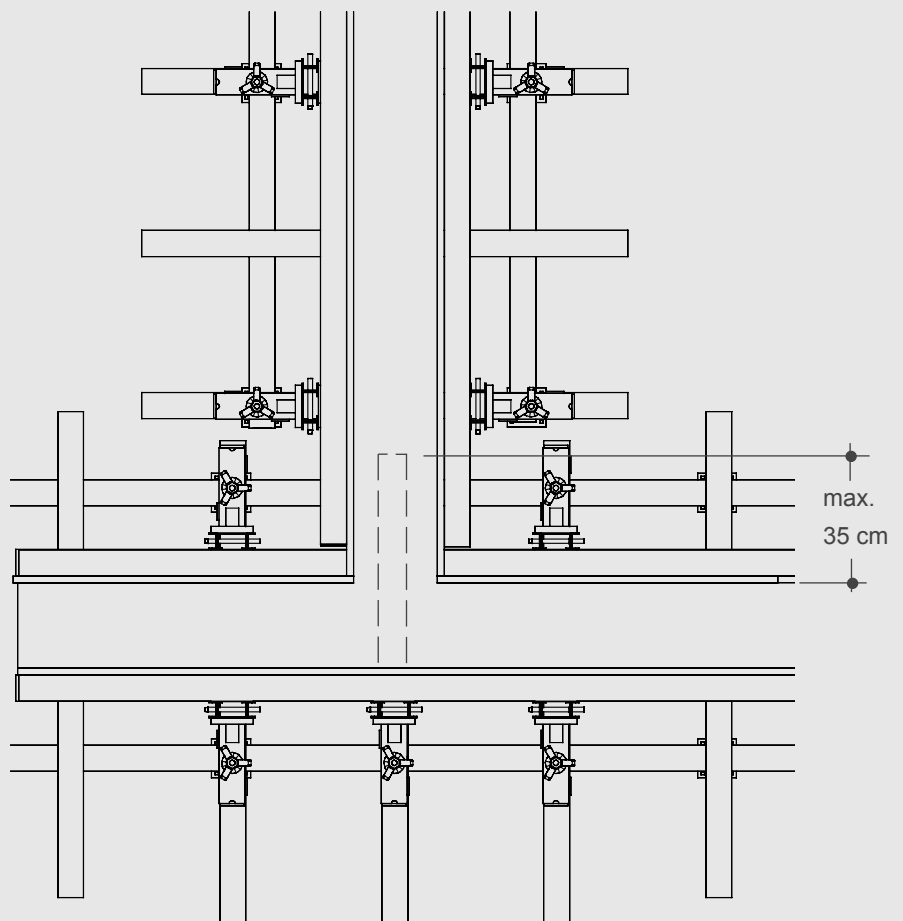
Perimeter beam with slab connection



T-intersections and crossings of beams

Even in these areas it is possible to work with the **Joist clamping connector** easily and without problems and without costly fitting work.

It is only to be noted that the transverse beams must not project more than 35 cm into the cross beams of the rectangularly arranged beam formwork of the intersection.



5.0 Use and erection

When joining timber beam slab formwork and beam formwork, two connecting variations arise through the directions of the secondary beams of the slab formwork.

Direction of secondary beam parallel to the beam formwork

The top **H20 timber beam** of the side shuttering of the beam is arranged in such a way with the secondary beams of the slab formwork that it serves as support beam for the plywood of the slab at the same time.

The top **H20 timber beam** of the side shuttering of the beam is lowered to such a degree that the secondary beam can directly be placed on this.

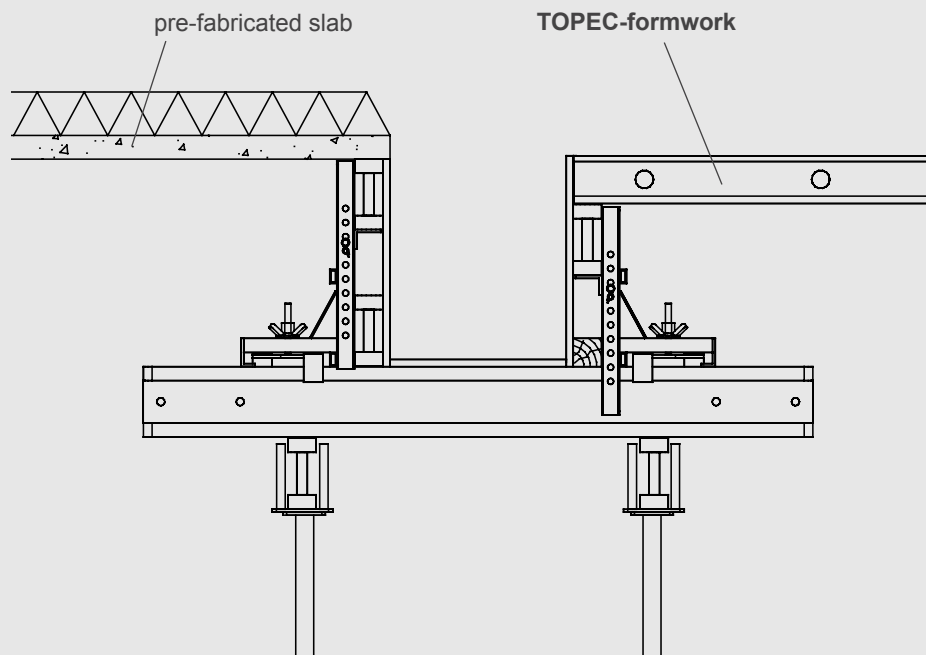
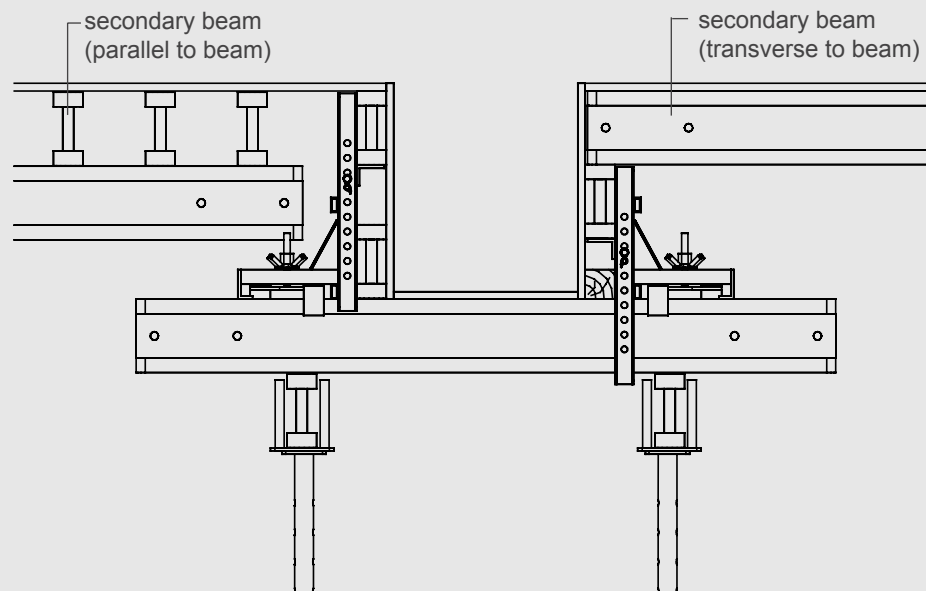
Other slab formwork systems can be bound into the beam formwork without any problems thanks to the height adjustment possibility of the adjustable fixing beam.



Important note!

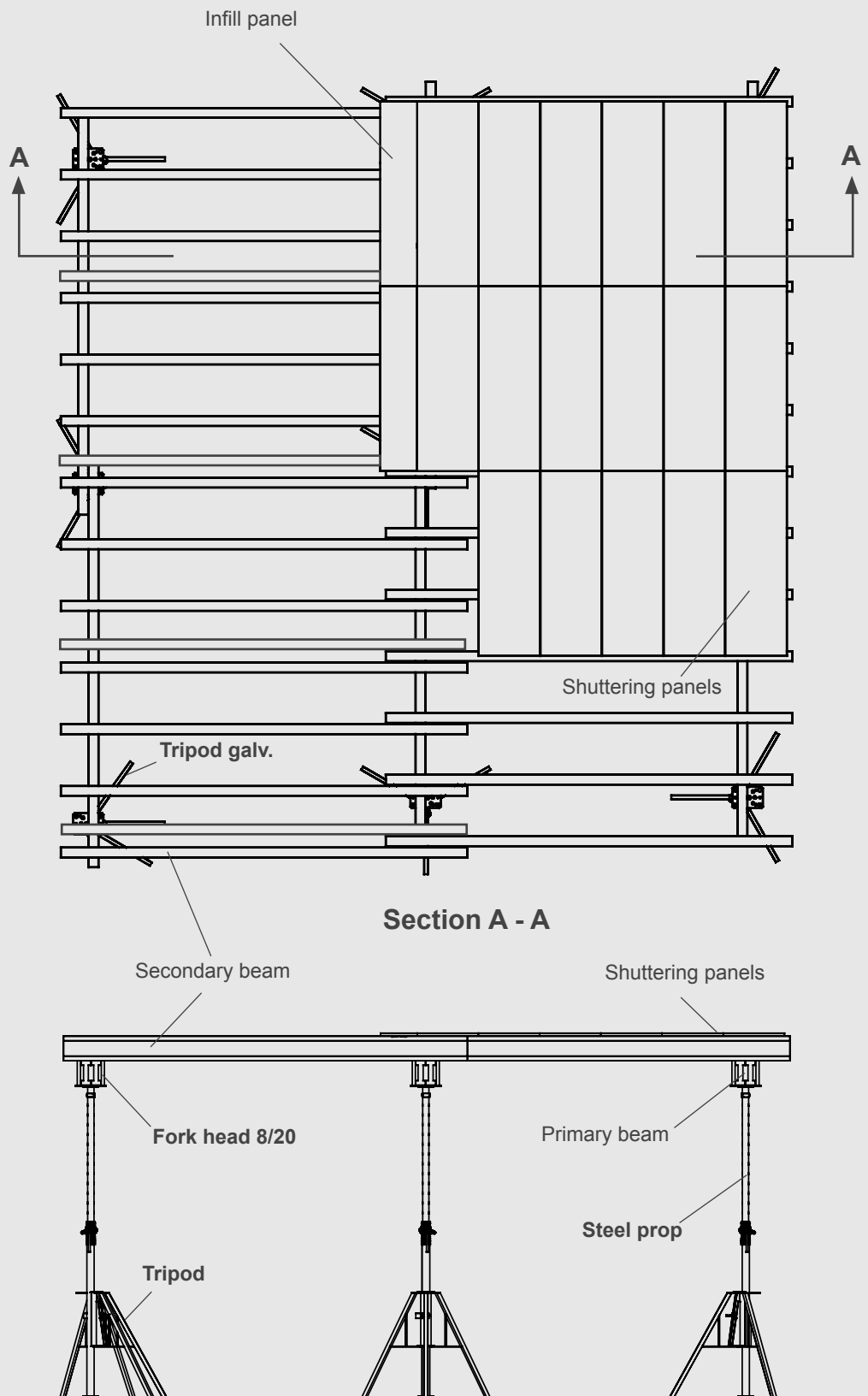
Maximum slab load per each **Joist clamping connector**: 6.5 kN!

Compound use of slab and beam formwork



Shuttering procedures

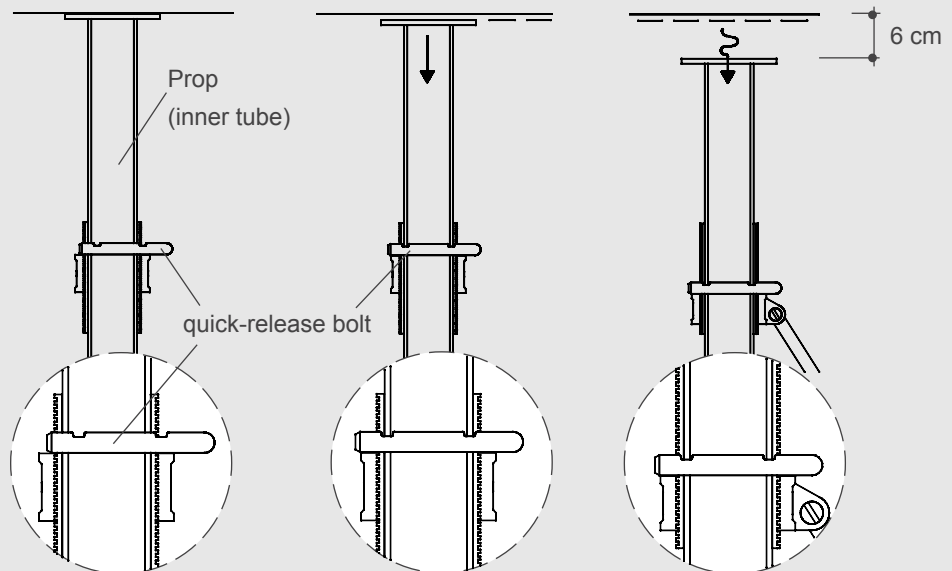
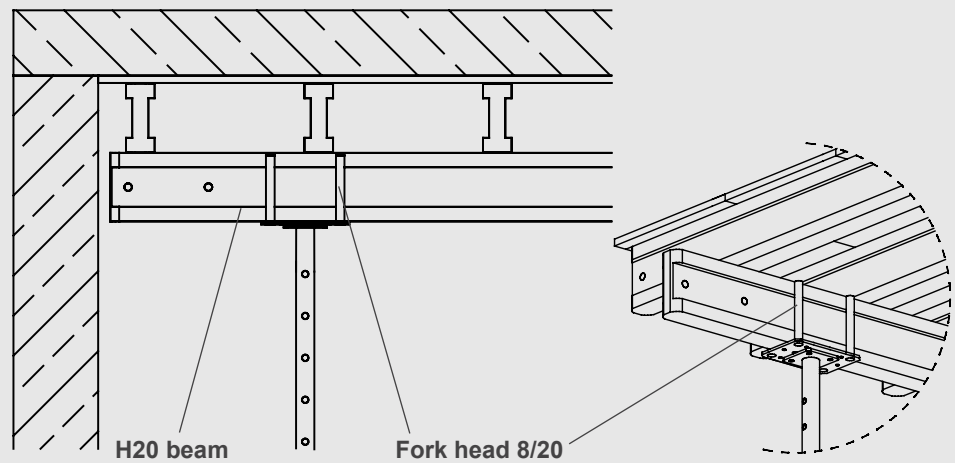
1. Secure **Fork head 8/20** or drop-head in the props.
2. Set up **Tripod** (at least 4 in the corners of the room, plus additional units for primary beam joints.)
3. Secure the props in the **Tripods**.
4. Lay the primary beams in the **Fork heads 8/20**.
5. Attach additional props and steel prop hangers, in line with the table on page 22, under the primary beams.
6. Lay secondary beams.
7. Lay shuttering panels.
8. If necessary, set up auxiliary props under the infill panels, in line with DIN 1045.



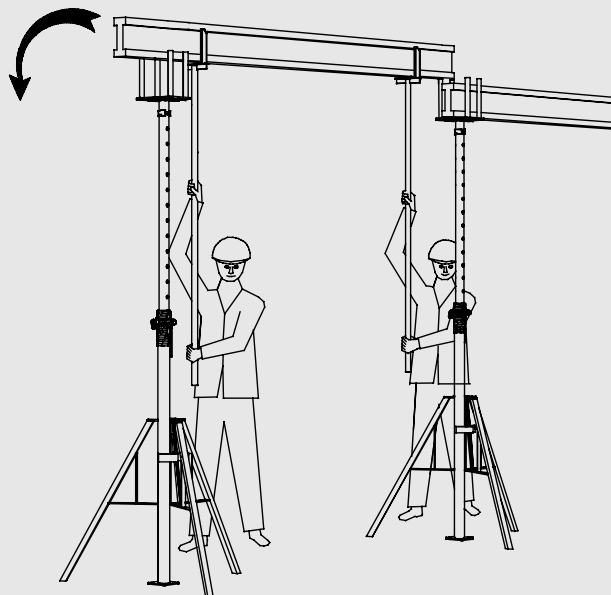
6.0 Stripping

Stripping begins with lowering the props. For all tubular steel props from **HÜNNEBECK**, release bolts immediately reduce the pressure on the thread nut. A blow of the hammer suffices and then the slab shuttering can easily be lowered by about 6 cm turning down the adjustment nut.

Stripping procedures with Fork heads 8/20:



The **Assembly fork** is an effective tool for taking down the primary beams. Remove the **Tripod galv.** from the props, and sort and stack all of the shuttering materials.



7.0 Tables for shuttering panels

VARIOMAX calculation

The existing slab thickness and the selected secondary beam spacing, which depends upon the type and size of the selected shuttering panel, determine the maximum permitted distance between primary beams.

Using the selected primary beam spacing and slab thickness, the maximum permitted distance between

the maximum permitted distance between props for the primary beam axes can then be determined.

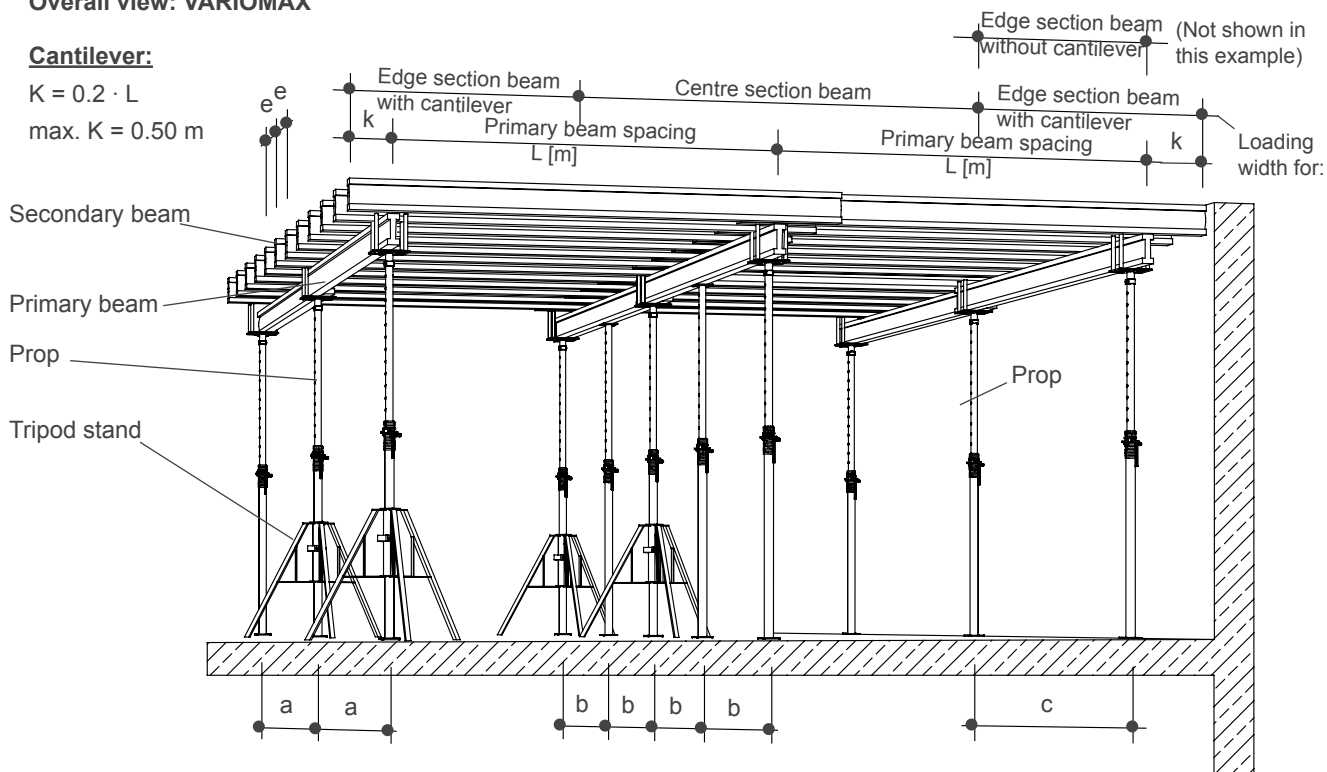
All the figures necessary for the efficient use of **VARIOMAX soffit formwork** can be quickly and precisely determined with the help of the following tables.

Overall view: VARIOMAX

Cantilever:

$$K = 0.2 \cdot L$$

max. $K = 0.50 \text{ m}$



Support spacing for shuttering panels

a, b, c = Prop spacing as per Table III

Table I

Size of shuttering panel	Possible secondary beam spacing „e“	
150/50	e = 75 cm	e = 50 cm
200/50	e = 66,7 cm	e = 50 cm
250/50	e = 62,5 cm	e = 50 cm

Table II

Max. secondary beam spacing [cm]	Slab thickness [cm] 22 mm 3-ply boards
75.0	20
66.7	25
62.5	30
50.0	62

Perm. deflection $L/500$.

Deflection is limited to $f \leq L/500$



Important note:

All figures are only valid for the supporting systems as stated!

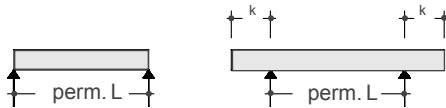
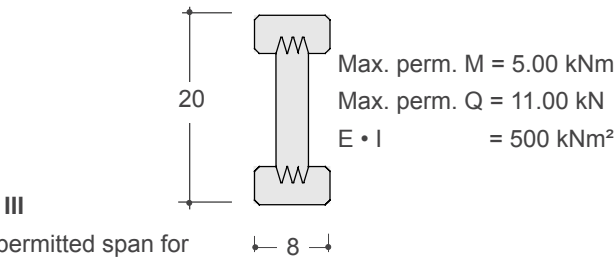
8.0 Load tables for H20

Table III

Max. permitted span for secondary beams L in „m“
= Max. primary beam spacing.

Systems:

(Max. K = 0.50 m)



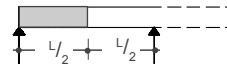
Tips for use:

- Select slab thickness ①
Determine secondary beam spacing „e“ (m) ②
taking into account type of shuttering panel (see page 21) ①
Determine max. span of secondary beam (this is equal to distances between primary beams). ②
Determine final distance between primary beams taking into account the allowable deflection of secondary beams. ①
Determine prop spacing for axes of primary beams taking into account the loading width (Edge section with/without cantilever and centre section). ③

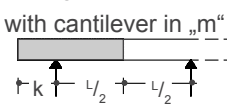
columns:

Loading width for:

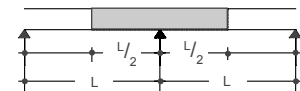
a) Edge section beam without cantilever



b) or edge section beam with cantilever in „m“



c) or centre section beam



(max. k = 0,50 m)

①		②					③											
Slab thickness [cm]	Total load [kN/m²] (*)	Secondary beam spacing [m] (in line with page 21)					Selected primary beam distance, i.e. loading width L [m]											
		0.40	0.50	0.63	0.67	0.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	3.00	3.50	4.00	4.50	
		Max. perm. span of secondary beams = Max. primary beam distance max perm. span L [m]					Max. perm. prop spacing under primary beams L [m] (a, b or c as per page 21)											
10	4.35	3.99	3.71	3.44	3.37	3.24	2.94	2.71	2.48	2.29	2.14	2.02	1.92	1.69	1.44	1.26	1.12	
12	4.87	3.78	3.51	3.26	3.19	3.06	2.78	2.56	2.34	2.17	2.03	1.91	1.81	1.51	1.29	1.13	1.00	
14	5.39	3.60	3.34	3.10	3.04	2.92	2.65	2.44	2.22	2.06	1.93	1.81	1.63	1.36	1.17	1.02	0.91	
16	5.91	3.45	3.21	2.98	2.91	2.80	2.54	2.33	2.12	1.97	1.84	1.65	1.49	1.24	1.06	0.93	0.83	
18	6.43	3.33	3.09	2.87	2.81	2.70	2.45	2.23	2.04	1.89	1.71	1.52	1.37	1.14	0.98	0.86	0.76	
20	6.95	3.22	2.99	2.77	2.71	2.61	2.37	2.15	1.96	1.81	1.58	1.41	1.27	1.06	0.90	0.79	0.70	
22	7.47	3.12	2.90	2.69	2.63	2.53	2.30	2.07	1.89	1.68	1.47	1.31	1.18	0.98	0.84	0.74	0.65	
24	7.99	3.04	2.82	2.62	2.56	2.46	2.24	2.00	1.83	1.57	1.38	1.22	1.10	0.92	0.79	0.69	0.61	
26	8.51	2.96	2.75	2.55	2.50	2.40	2.17	1.94	1.72	1.48	1.29	1.15	1.03	0.86	0.74	0.65	0.57	
28	9.03	2.89	2.68	2.49	2.44	2.34	2.10	1.88	1.62	1.39	1.22	1.08	0.97	0.81	0.70	0.61	0.54	
30	9.61	2.83	2.62	2.44	2.38	2.29	2.04	1.82	1.53	1.31	1.14	1.02	0.92	0.76	0.65	0.57	0.51	
40	12.73	2.57	2.39	2.22	2.17	2.05	1.73	1.38	1.15	0.99	0.86	0.77	0.69	0.58	0.49	0.43	0.38	
50	15.85	2.39	2.22	2.01	1.95	1.83	1.39	1.11	0.93	0.79	0.69	0.62	0.56	0.46	0.40	0.35	0.31	

(*) Total load assumed in the following way:

Weight of concrete	25 kN/m³
Concrete load	26.0 · t [kN/m²]
Dead load of formwork	0.25 kN/m²
Live load	1.50 kN/m²
Total load = Concrete load + Dead load of formwork + Live load	

Deflection of secondary beam is limited to: $f \leq L/500$

These tables **do not** render stability verification unnecessary!

Prop loads

In most cases, the max. permitted prop spacing under primary beams, as stated in Table III, Column ③, results from the perm. shear load „Q“ of the H20 timber beam (2 · 11.0 kN = 22.0 kN = suport load for the steel prop). In this case, the following has to be considered:

If the permitted load „F“ of the prop is less than 22.0 kN, the prop spacing under the primary beams should be reduced by the factor „max. perm. F/22.0 kN“. (See also the example on page 23 under IV. Remark.)



Important note:

The maximum perm. prop load in relation to the extension length can be found in the **HÜNNEBECK** Folding Table with allowable loads for tubular steel props (previous props)! Europlus new props allow 20 kN or 30 kN! Furthermore, the requirements of the DIN 4421, scaffold class III, have to be adhered to!

9.0 H20 Shuttering example

(see also load tables on pages 20 and 21)

(Assumption: Classification acc. to scaffold class III as per DIN 4421 [08/82])

I.) To be used for shuttering example:

Clear floor-to-floor height	h	=	2.60 m
Slab thickness	t	=	16 cm
Selected beam			H20
Secondary beam spacing	e	=	0.75 m
Shuttering skin at hand		=	21 mm

II.) Determining the max. perm. span for secondary beams

In Part ② of Table III on page 22, find where the 16 cm slab thickness row intersects with the 0.75 m secondary beam spacing column, to obtain the maximum permitted span of 2.80 m (= max. primary beam spacing with $f \leq L/500$).

III.) Determining the max. perm. span for primary beams

In Part ③ of Table III, the first horizontal column shows the desired primary beam spacings and thus also the loading widths.

For example, for a room width of 3.50 m, primary beams RJ1 and RJ2 (see ground-plan) have a loading width of 1.75 m. By seeing where the 1.75 m column intersects with the 16 cm slab thickness row, you obtain the max. prop spacing of 1.97 m for the edge section beam. For the centre section beam MJ, taking into account the loading span of 2.5 m, the max. permitted prop spacing is calculated at 1.49 m (= max. prop spacing).

IV.) Selected tubular steel props

The permissible loading figures of the **HÜNNEBECK** steel props can be found in the former load tables (former Europlus props).

Prop extension length:

clear room height - (2 x 20 cm beam height + 21 mm plywood)

Example:

clear room height 2.60 m - 42 cm = 2.18 m Prop extension length

Remark:

Since the max. permitted 'F' of the prop is more than 22 kN, the prop spacing of the primary beams is not to be reduced.

This means: $2 \cdot Q = 22 \text{ kN}$ for H20 beam

An additional example: Clear room height = 3.00 m:
3.00 m - 0.42 m = 2.58 m total prop length
permitted load for Europlus new 20 - 250 = 20.0 kN.

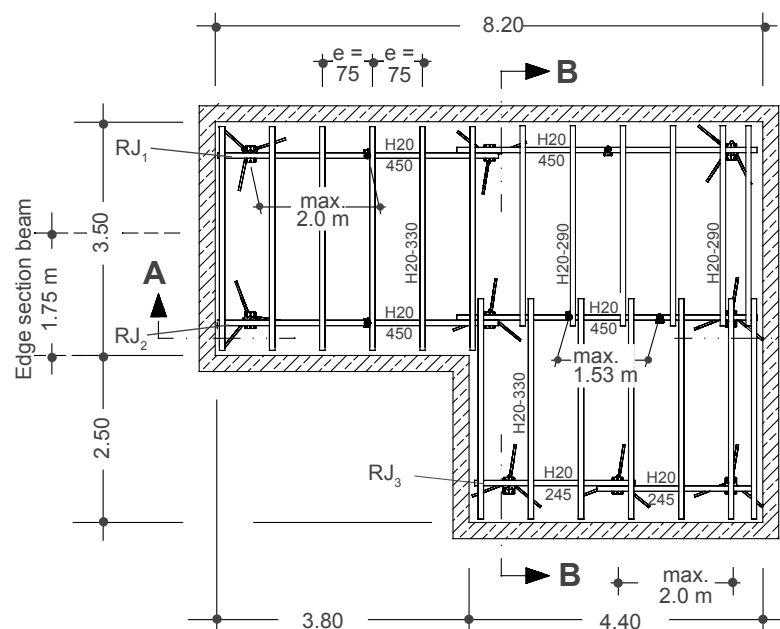
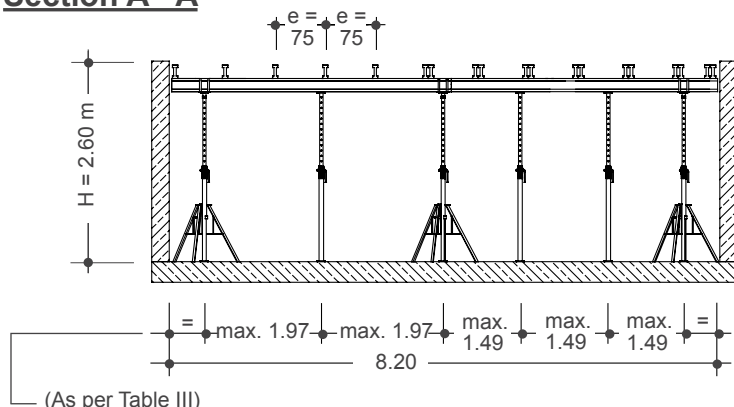
$$\frac{20.0 \text{ kN perm.}}{22 \text{ kN exist.}} = 0.91 \text{ kN}$$

$$0.91 \cdot 1.93 \text{ m} = 1.76 \text{ m perm. prop spacing}$$

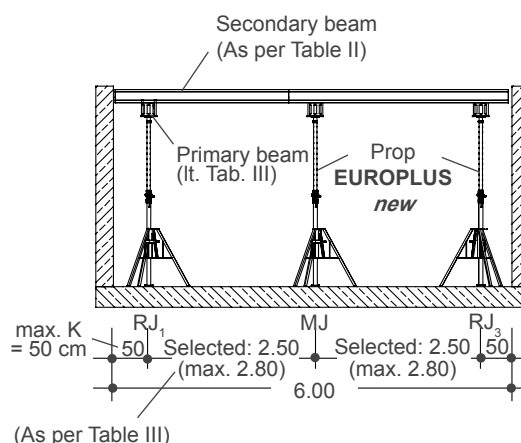
RJ = edge section beam

MJ = centre section beam

Section A - A



Section B - B



Materials summary

(example)

No.	Description	Art.No.
2	H20 - 245	581 770
6	H20 - 290	581 792
13	H20 - 330	581 807
4	H20 - 450	581 830
14	Props 260 DB/DIN	463 021
9	Fork head 8/20	417 565
5	Steel prop hanger	510 749
9	Tripod stand	510 256
Suggested:		
14	TOPEC-bolt	470 804
2	Assembly fork	510 554
2	Euro stacking frame	553 689
1	Mobile Set	563 722

10.0 Load tables for props

Appendix 3: Active resistances of the steel props 20-250, 20-300, 20-350, 20-400 and 20-550

20 kN

Permissible prop loads always 20 kN minimum

HÜNNEBECK EUROPLUS^{new} Permissible prop loads [kN] for use in system-bound arrangement										
Designation L _{min.} - L _{max.} Position of Inner Tube (IT) L [m]	20-250 1.47m-2.50m		20-300 1.72m-3.00m		20-350 1.98m-3.50m		20-400 2.24m-4.00m		20-550 3.04m-5.50m	
	IT _{at top}	IT _{bottom}	IT _{at top}	IT _{bottom}	IT _{at top}	IT _{bottom}	IT _{at top}	IT _{bottom}	IT _{at top}	IT _{bottom}
1.10										
1.20										
1.30										
1.40										
1.50	27.76	27.76								
1.60	27.76	27.76								
1.70	26.54	27.76								
1.80	25.02	27.76	38.48	38.48						
1.90	24.02	27.76	38.48	38.48						
2.00	23.12	27.76	35.09	38.48	27.76	27.76				
2.10	22.72	27.76	32.52	38.48	27.76	27.76				
2.20	22.32	27.76	30.91	38.48	27.76	27.76				
2.30	21.80	27.76	29.30	38.48	27.76	27.76	30.97	30.97		
2.40	21.21	26.52	28.01	38.48	27.76	27.76	30.97	30.97		
2.50	20.61	24.73	27.21	38.48	27.76	27.76	30.97	30.97		
2.60			26.40	35.55	27.76	27.76	30.97	30.97		
2.70			25.44	32.42	27.76	27.76	30.97	30.97		
2.80			23.83	29.69	27.76	27.76	30.97	30.97		
2.90			22.22	26.95	27.76	27.76	30.97	30.97		
3.00			20.61	24.21	27.76	27.76	30.97	30.97		
3.10					27.76	27.76	30.97	30.97	38.48	38.48
3.20					27.76	27.76	30.97	30.97	38.48	38.48
3.30					27.19	27.76	30.37	30.97	38.48	38.48
3.40					25.70	27.76	29.19	30.97	38.48	38.48
3.50					24.21	27.76	28.02	30.97	38.48	38.48
3.60							26.75	30.97	38.48	38.48
3.70							25.35	30.97	38.48	38.48
3.80							23.94	28.95	38.48	38.48
3.90							22.53	26.84	38.48	38.48
4.00							21.12	24.73	38.48	38.48
4.10									38.48	38.48
4.20									38.29	38.48
4.30									36.58	38.48
4.40									34.99	38.48
4.50									33.40	38.48
4.60									31.82	38.48
4.70									30.23	36.71
4.80									28.64	34.12
4.90									27.13	31.71
5.00									26.04	30.29
5.10									24.95	28.87
5.20									23.87	27.45
5.30									22.78	26.03
5.40									21.69	24.60
5.50									20.61	23.18

Inner Tube
(at top)

Inner Tube
(at bottom)

Appendix 3: Active resistances of the steel props 30-150, 30-250, 30-300, 30-350 and 30-400

30 kN

Permissible prop loads always 30 kN minimum

HÜNNEBECK EUROPLUS^{new} Permissible prop loads [kN] for use in system-bound arrangement										
Designation L_{min.} - L_{max.} Position of Inner Tube (IT) L [m]	30-150 1.04m-1.50m		30-250 1.47m-2.50m		30-300 1.72m-3.00m		30-350 1.98m-3.50m		30-400 2.24m-4.00m	
	IT _{at top}	IT _{bottom}	IT _{at top}	IT _{bottom}	IT _{at top}	IT _{bottom}	IT _{at top}	IT _{bottom}	IT _{at top}	IT _{bottom}
1.10	36.06	38.48								
1.20	35.63	38.48								
1.30	35.03	38.48								
1.40	35.03	38.48								
1.50	35.03	38.48	33.33	33.33						
1.60			33.33	33.33						
1.70			33.33	33.33						
1.80			33.33	33.33	37.21	37.21				
1.90			33.33	33.33	37.21	37.21				
2.00			33.33	33.33	37.21	37.21	49.45	49.45		
2.10			33.33	33.33	37.21	37.21	49.45	49.45		
2.20			33.22	33.33	37.21	37.21	49.45	49.45		
2.30			32.74	33.33	37.21	37.21	49.45	49.45	38.48	38.48
2.40			32.34	33.33	36.83	37.21	48.91	49.45	38.48	38.48
2.50			31.94	33.33	36.19	37.21	47.56	49.45	38.48	38.48
2.60					35.55	37.21	46.20	49.45	38.48	38.48
2.70					34.77	37.21	44.85	49.45	38.48	38.48
2.80					33.48	37.21	43.57	48.56	38.48	38.48
2.90					32.20	37.21	42.35	47.07	38.48	38.48
3.00					30.91	36.58	41.13	45.58	38.48	38.48
3.10							39.91	44.09	38.48	38.48
3.20							37.82	41.73	38.48	38.48
3.30							35.52	39.15	38.48	38.48
3.40							33.21	36.58	38.48	38.48
3.50							30.91	34.00	38.48	38.48
3.60									38.48	38.48
3.70									38.48	38.48
3.80									38.48	38.48
3.90									37.94	38.48
4.00									36.06	38.48

Inner Tube
(at top)

Inner Tube
(at bottom)

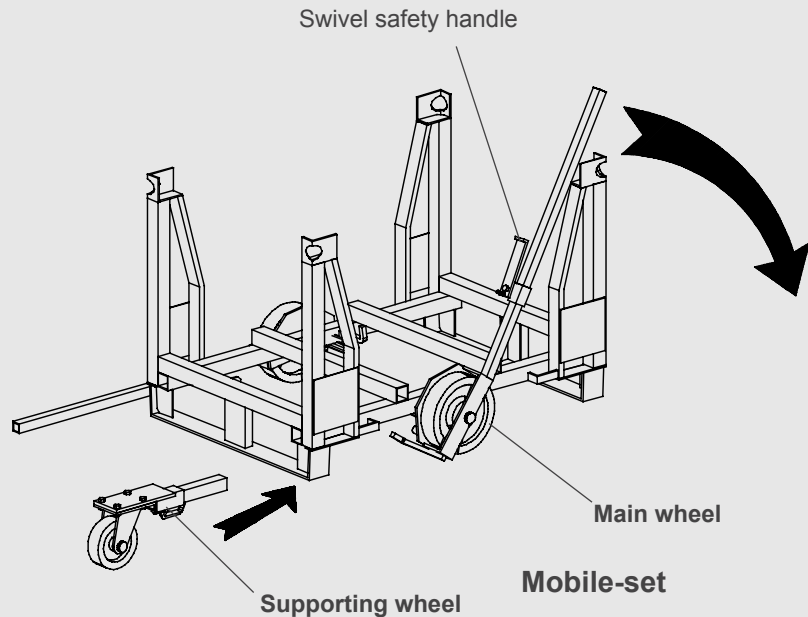
11.0 Stripping and transport aids

The shuttering materials are stored and transported in the practical **Euro stacking frames**. With the mobile set, which can be attached quickly, the materials can be brought within the range of the crane.

The **Euro stacking frame** is designed for a working load of 1,200 kg. It can be moved with a crane, fork lift or the **Mobile-set**, which has a loading capacity of 1,300 kg.

Up to **6** loaded frames may be stacked.

Storing and moving the shuttering materials

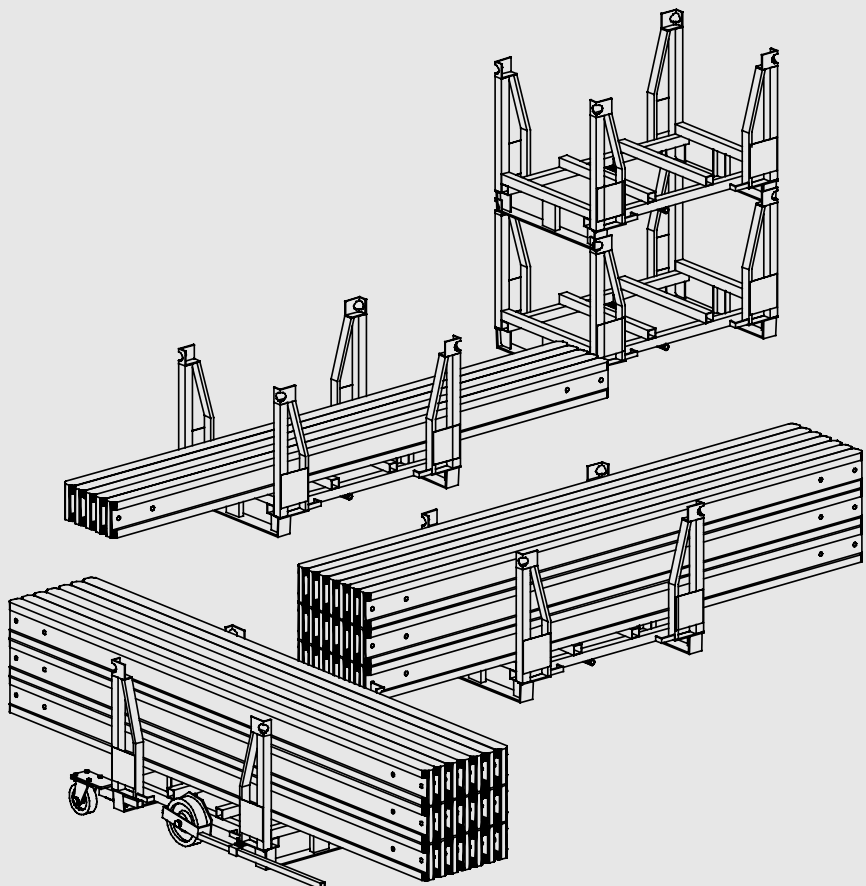


Important note:

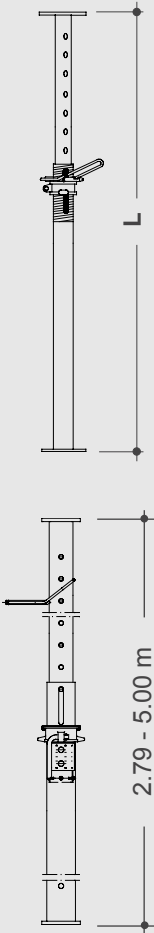
Observe separate operation instructions for the **Euro stacking frame** (HN 45-038)!

The two main wheels of the **Mobile-set** are easy to mount, simply by inserting their axles into the sockets in the **Euro stacking frame**. A swing of the wheel lever lifts the **Euro stacking frame**, and the swivel safety handle keeps the wheel lever in this position.

A supporting wheel which is inserted at the front of the **Euro stacking frame** stabilizes the running gear.



12 .0 Hitherto props

Description	Art. No	Weight kg/pcs.
		
Europlus - props		
Europlus 260 DB/DIN L = 1.54 - 2.60 m	463 021	15.88
Europlus 300 DB/DIN L = 1.72 - 3.00 m	555 118	17.53
Europlus 350 DB/DIN L = 1.98 - 3.50 m	552 147	21.34
Europlus 400 EC L = 2.24 - 4.00 m	583 780	27.11
Europlus 550 DC L = 3.03 - 5.50 m	583 725	38.00
All steel props are provided with a quick-lowering mechanism, anti-crush guard and a protection against dropping-out of the inner tube and are also protected for a long service-life by hot-dip galvanization.		
Alum prop		
Alu 500 DC L = 2.79 - 5.00 m	558 898	24.80
Applicable accord. to DIN 4421 and DIN EN 1065.		
Class D: 20 kN at any extension length.		
Class C: Perm. load depending on extension length: - 2.9 m: 35 kN - 5.0 m: 20 kN.		

Perm. load [kN]

DIN 4421, falsework class III

as per Euronorm
DIN Standards

Size	260 DB/DIN	300 DB/DIN	350 DB/DIN	410 DB/DIN	450 DB/DIN
extension length [m]	1.54 - 2.60 m	1.72 - 3.00 m	1.98 - 3.50 m	2.34 - 4.10 m	2.50 - 4.50 m
1.50	30.00				
1.60	30.00				
1.70	30.00	30.00			
1.80	30.00	30.00			
1.90	28.81	30.00			
2.00	26.00	30.00	30.00		
2.10	23.58	27.21	30.00		
2.20	21.49	24.79	28.93		
2.30	20.00	22.68	26.47	30.00	
2.40	20.00	20.83	24.31	28.47	
2.50	20.00	20.00	22.40	26.24	28.80
2.60	20.00	20.00	20.71	24.26	26.63
2.70		20.00	20.00	22.50	24.69
2.80		20.00	20.00	20.92	22.96
2.90		20.00	20.00	20.00	21.40
3.00		20.00	20.00	20.00	20.00
3.10			20.00	20.00	20.00
3.20			20.00	20.00	20.00
3.30			20.00	20.00	20.00
3.40			20.00	20.00	20.00
3.50			20.00	20.00	20.00
3.60				20.00	20.00
3.70				20.00	20.00
3.80				20.00	20.00
3.90				20.00	20.00
4.00				20.00	20.00
4.10				20.00	20.00
4.20					20.00
4.30					20.00
4.40					20.00
4.50					20.00

Size	550 DC
extension length [m]	3.03 - 5.50 m
3.00	35.00
3.10	34.34
3.20	32.23
3.30	30.30
3.40	28.55
3.50	26.94
3.60	25.46
3.70	24.11
3.80	22.85
3.90	21.70
4.00	20.63
4.10	20.00
4.20	20.00
4.30	20.00
4.40	20.00
4.50	20.00
4.60	20.00
4.70	20.00
4.80	20.00
4.90	20.00
5.00	20.00
5.10	20.00
5.20	20.00
5.30	20.00
5.40	20.00
5.50	20.00

Size	350 EC/DIN	400 EC
extension length [m]	1.98 - 3.50 m	2.24 - 4.00 m
2.00	35.00	
2.10	35.00	
2.20	35.00	35.00
2.30	35.00	35.00
2.40	35.00	35.00
2.50	33.60	35.00
2.60	31.07	35.00
2.70	30.00	32.92
2.80	30.00	30.61
2.90	30.00	30.00
3.00	30.00	30.00
3.10	30.00	30.00
3.20	30.00	30.00
3.30	30.00	30.00
3.40	30.00	30.00
3.50	30.00	30.00
3.60		30.00
3.70		30.00
3.80		30.00
3.90		30.00
4.00		30.00



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