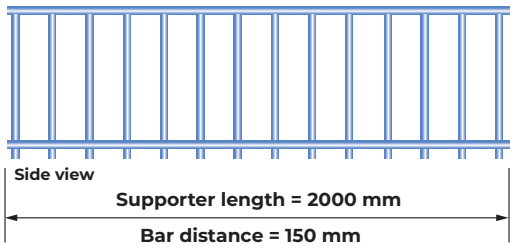
REINFORCEMENT SPACER

Various systems are available to support the upper reinforcement or for spacing reinforcement layers apart e. g. in reinforced concrete slabs.
The choice of system depends on the intended use, the design details of the reinforcement layout, the load during the construction process, the environmental conditions (corrosion protection) and the required support heights.

REINFORCEMENT SPACER

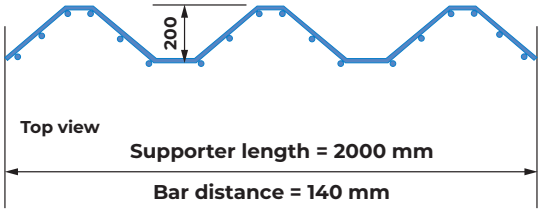
BT

BT chairs rest on the lower reinforcement and thus guarantee the integrity of the underground (formwork). They can also be used in components that place particular requirements on the concrete surface (e.g. finishing the ceiling underlayer at the quality of exposed concrete).



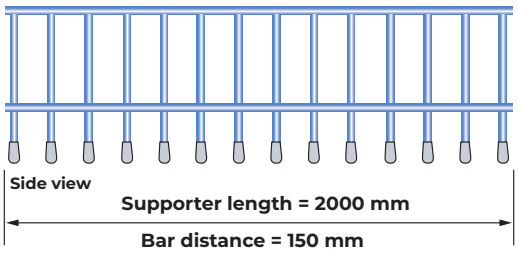
BS

BS chairs rest on the lower reinforcement and thus guarantee the integrity of the underground (formwork). They can also be used in components that place particular requirements on the concrete surface (e.g. finishing the ceiling underlayer at the quality of exposed concrete).



BK

BK chairs rest on the formwork or blinding concrete. They are used in components that do not place particular requirements on the concrete surface and damaging the substrate (contact area) by indentation or punching can be avoided (e.g. sheeting under the base slabs).

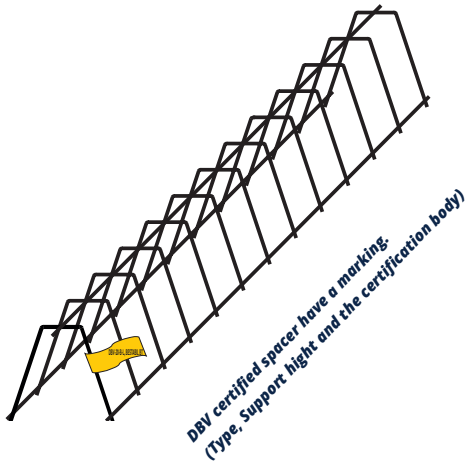


REINFORCEMENT SPACER

STANDARD REINFORCEMENT SPACER (TYPE BT)

DBV-BT certified according DBV data sheet "Supports"

Type	Support height	Contact width	Tolerance of support height
BT	h [mm]	b [mm]	[mm]
5	50	60	± 2
6	60	65	± 2
7	70	70	± 2
8	80	74	± 2
9	90	79	± 2
10	100	84	± 2
11	110	88	± 2
12	120	93	± 2
13	130	92	± 3
14	140	96	± 3
15	150	100	± 3
16	160	101	± 3
17	170	105	± 3
18	180	107	± 3
19	190	111	± 3
20	200	115	± 3
21	210	118	± 3
22	220	119	± 3
23	230	120	± 3
24	240	123	± 3
25	250	127	± 4
26	260	130	± 4
27	270	135	± 4
28	280	140	± 4
29	290	145	± 4
30	300	150	± 4
31	310	155	± 4
32	320	160	± 4
33	330	164	± 4
34	340	168	± 4
35	350	170	± 4
36	360	172	± 4
37	370	174	± 4
38	380	176	± 4
39	390	178	± 4
40	400	180	± 4



Contact type:
Chair rests on the lower reinforcement

Contact width:
± 5 mm

Corrosion protection:
No corrosion protection necessary

Permissible loads (F_{Rd}):
0.67 kN/m (rated value of the load-bearing capacity)

Placing interval:
Placing intervals according to Table 4 of the DBV data sheet

Availability:
BT chairs are available from stock or from production

Delivery form:
Chair length = 2000 mm
Factory bundle BT 5 - BT 20 = pack of 800,
Factory bundle BT 21 - BT 30 = pack of 600,
Factory bundle BT 31 - BT 40 = pack of 400

Price:
On request

Larger support heights are available with type DTV chairs.

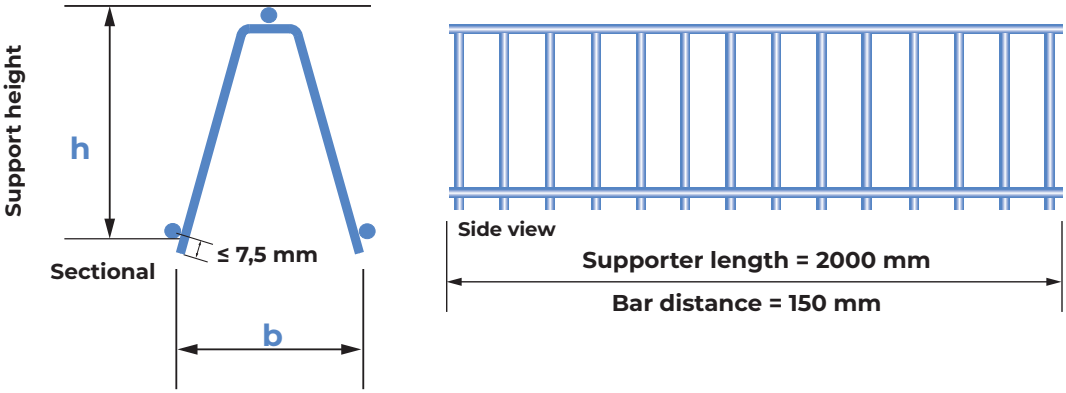
Contact: RSE Reinforcing Steel Europe info@reinforcing-steel.com www.reinforcing-steel.com

REINFORCEMENT SPACER

STANDARD REINFORCEMENT SPACER (TYPE BT)

DBV-BT certified according DBV sheet "Supports"

e. g. for orders of DBV-BT-10

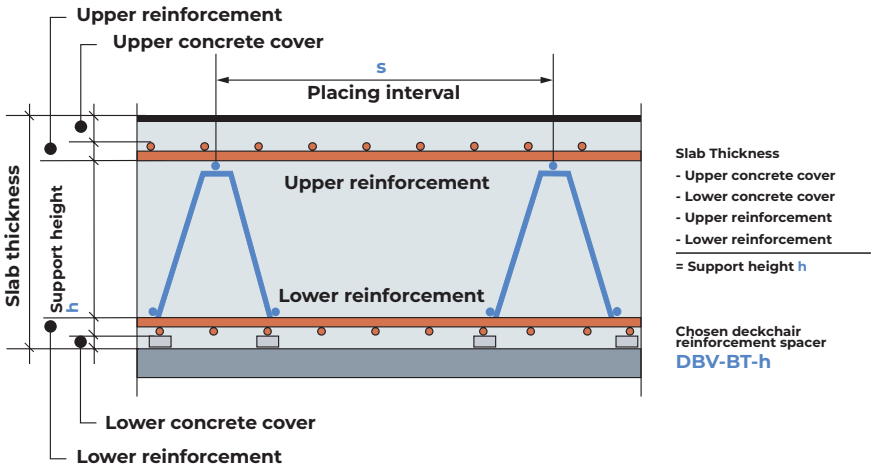


BT chairs rest on the lower reinforcement and thus guarantee the integrity of the underground (formwork). They can also be used in components that place particular requirements on the concrete surface (e.g. finishing the ceiling underlayer at the quality of exposed concrete).

BT chairs are generally used to support the upper reinforcement in slabs, platforms etc. in normal structural engineering and in foundation components (e.g. floor slabs). In this form and design, they **cannot** be used as shearing force supports in shearing force protection.

The support height is the result of the slab thickness minus the concrete cover on top and underneath, and minus the construction of the upper and lower reinforcement.

For example:



REINFORCEMENT SPACER

STANDARD REINFORCEMENT SPACER (TYPE BS)

DBV-BS certified according DBV data sheet "Supports"

Type	Support height	Contact width	Tolerance of support height	Items / Pallet
BS	h [mm]	w [mm]	[mm]	
2	20	200	± 2	3.000
3	30	200	± 2	2.800
4	40	200	± 2	2.600
5	50	200	± 2	2.200
6	60	200	± 2	2.000
7	70	200	± 2	1.600
8	80	200	± 2	1.600
9	90	200	± 2	1.400
10	100	200	± 2	1.200
11	110	200	± 2	1.200
12	120	200	± 2	1.000
13	130	200	± 3	1.000
14	140	200	± 3	800
15	150	200	± 3	800
16	160	200	± 3	800
17	170	200	± 3	800
18	180	200	± 3	600
19	190	200	± 3	600
20	200	200	± 3	600
21	210	200	± 3	600
22	220	200	± 3	600
23	230	200	± 3	400
24	240	200	± 3	400
25	250	200	± 4	400
26	260	200	± 4	400
27	270	200	± 4	400
28	280	200	± 4	400
29	290	200	± 4	400
30	300	200	± 4	400
31	310	200	± 4	200
32	320	200	± 4	200
33	330	200	± 4	200
34	340	200	± 4	200
35	350	200	± 4	200
36	360	200	± 4	200
37	370	200	± 4	200
38	380	200	± 4	200
39	390	200	± 4	200
40	400	200	± 4	200

Contact type:
Chair rests on the lower reinforcement

Corrosion protection:
No corrosion protection necessary

Permissible loads (F_{Rd}):
0.67 kN/m (rated value of the load-bearing capacity)

Placing interval:
Placing intervals according to Table 4 of the DBV data sheet

Availability:
BS chairs are available from stock or from production

Delivery form:
Chair length = 2000 mm
On pallet; see table for quantity

Price:
On request

Larger support heights are available with type DTV chairs.

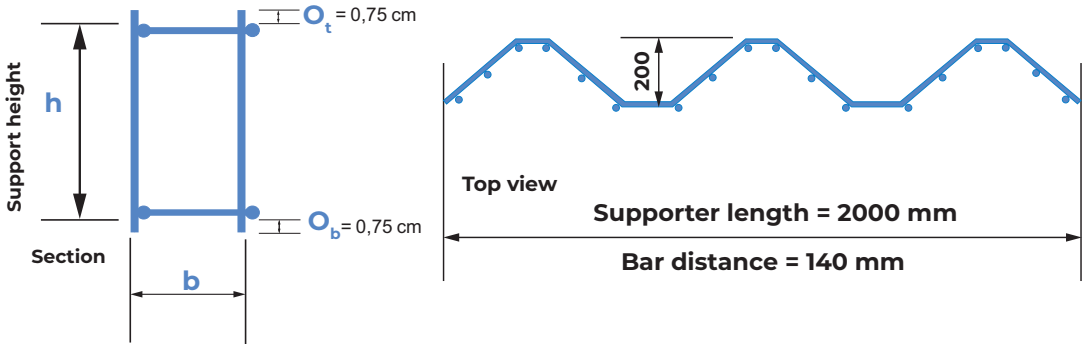
Contact: RSE Reinforcing Steel Europe info@reinforcing-steel.com www.reinforcing-steel.com

REINFORCEMENT SPACER

STANDARD REINFORCEMENT SPACER (TYPE BS)

DBV-BS certified according DBV data sheet "Supports"

e. g. for orders of DBV-BS-10

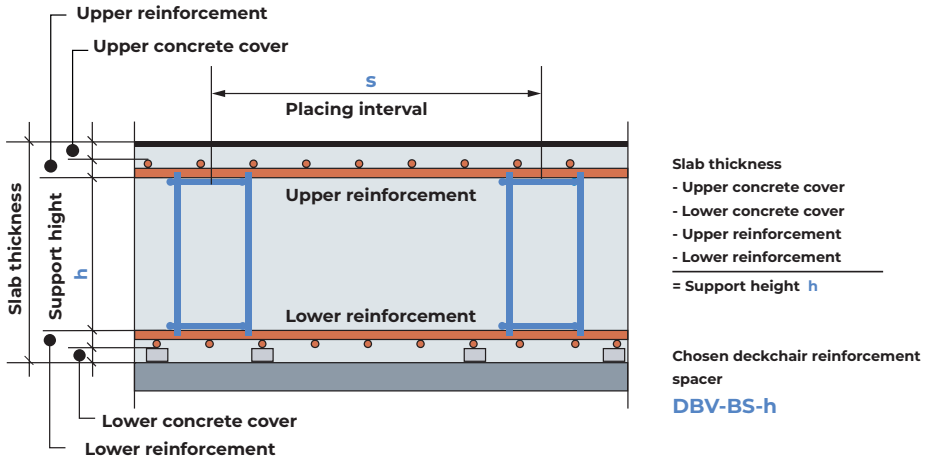


BS chairs rest on the lower reinforcement and thus guarantee the integrity of the substrate (formwork). They can be used in components that place particular requirements on the concrete surface (e.g. finishing the ceiling underlayer at the quality of exposed concrete).

BS chairs are generally used to support the upper reinforcement slabs, platforms etc. in normal structural engineering and in foundation components (e.g. base slabs). In this form and design, they cannot be used as shearing supports in shearing protection.

The support height is the result of the slab thickness minus the concrete cover on top and underneath and minus the construction of the upper and lower reinforcement.

For example:



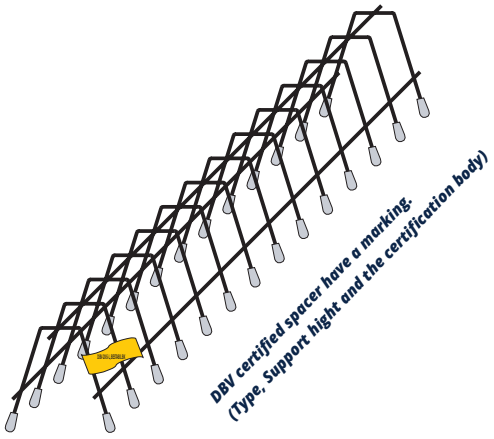
REINFORCEMENT SPACER

STANDARD REINFORCEMENT SPACER WITH PLASTIC FEET (TYPE BK)

DBV-BK certified according DBV data sheet "Supports"

Type	Support height	Overlap	Contact width	Tolerance of the support height
BK	h [mm]	O_b [mm]	w [mm]	[mm]
8	80	29	68	± 2
9	90	33	73	± 2
10	100	36	78	± 2
11	110	38	82	± 2
12	120	42	85	± 2
13	130	46	92	± 3
14	140	50	99	± 3
15	150	54	105	± 3
16	160	57	110	± 3
17	170	60	118	± 3
18	180	64	122	± 3
19	190	67	127	± 3
20	200	71	132	± 3
21	210	74	133	± 3
22	220	77	134	± 3
23	230	81	135	± 3
24	240	84	136	± 3
25	250	87	146	± 4
26	260	91	156	± 4
27	270	95	166	± 4
28	280	98	175	± 4

Larger support heights are available with type DKI chairs.



Contact type:
Chair rests on the formwork

Corrosion protection:
The feet are protected against corrosion with plastic, protection height ≥ 15 mm

Permissible loads (F_{Rd}):
0,67 kN/m (rated value of the load-bearing capacity)

Placing distance:
Placing distance according to Table 4 of the DBV data sheet

Availability:
BK 8 - BK 11 only on request
BK 12 - BK 28 available from stock or from production

Delivery form:
Chair length = 2000 mm
Factory bundle BK 8 - BK 16 = pack of 200
Factory bundle BK 17 - BK 28 = pack of 100

Price:
On request

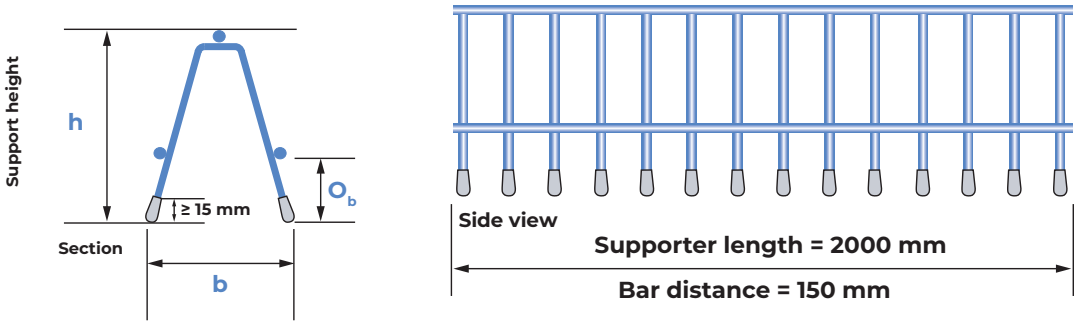
Contact: RSE Reinforcing Steel Europe info@reinforcing-steel.com www.reinforcing-steel.com

REINFORCEMENT SPACER

STANDARD REINFORCEMENT SPACER WITH PLASTIC FEET (TYPE BK)

DBV-BK certified according DBV data sheet "Supports"

e. g. for order of DBV-BK-10

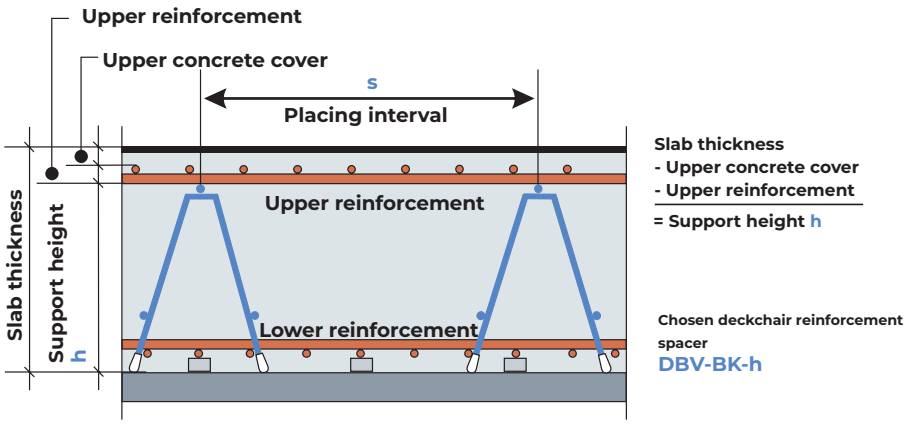


BK chairs rest on the formwork or blinding concrete. They can be used in components that do not place particular requirements on the concrete surface and damaging the substrate (contact area) by indentation or punching can be avoided (e.g. sheeting under the base slabs).

BK chairs are generally used to support the upper reinforcement slabs, platforms etc. in normal structural engineering. In this form and design, they cannot be used as shearing supports in shearing protection.

The support height is the result of the slab thickness minus the concrete cover on top and minus the construction of the upper reinforcement.

For example:



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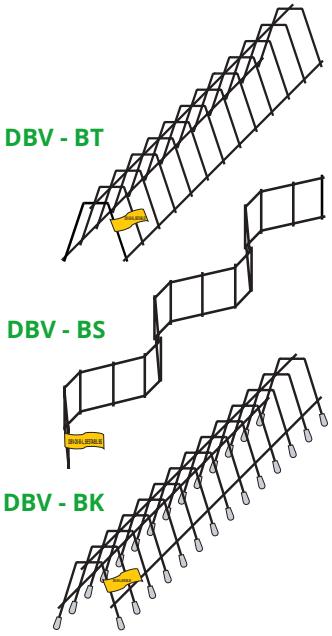
REINFORCEMENT SPACER

FIRM HOLD FOR YOUR REINFORCEMENT

Description

Various systems are available to support the upper reinforcement or secure the space between reinforcing layers, e.g. in reinforced concrete walls. The choice of the correct system depends on the intended use, the structural details of the reinforcement work, the load during the construction process, the environmental conditions (corrosion protection) and the necessary supporting heights.



DIN EN 1992-1-1 stipulates that the measures of ensuring the positional stability of the reinforcement steel as well as the arrangement, size and design of the supports for the upper reinforcement layer, must be indicated on the reinforcement plans.

In addition, DIN EN 1992-1-1 states that the upper and lower reinforcement must be placed with a stipulated nominal size or placing size for concrete cover c_{nom} so that the concrete cover c_{min} is sufficiently secure in the finished element.

In this context, DIN 1045-3:2012-3 makes reference to the data sheet **"Supports"**, by the Deutscher Beton- und Bautechnik-Verein E.V. (the German Concrete and Construction Engineering Association – DBV). The content of this data sheet is thus to be seen as up to date.

Therefore, not observing the defined requirements and rules has significant legal consequences for planners, builders, and suppliers.

The **DBV-BT, -BS** and -**BK** reinforcement spacers meet these requirements.
They are certified according to the DBV data sheet and thus meet all the requirements of DIN EN 1992-1-1.

Excerpts from the DBV data sheet "Supports":
In reinforced and pre-stressed concrete buildings, reinforcement can only do what it is supposed to in terms of load bearing, suitability for use and durability if it is in the location its was intended to be in during planning. For this purpose, spacers or supports are used for the upper reinforcement, which ensure the space for the effective static height, the positional stability of the reinforcement and so they secure the specified concrete cover when built.

... and further:
For all applications, a sufficient number of suitable supports must be installed in such a way that they do not move or twist. They must be able to take the forces exacted upon them during construction without any significant deformation in order to keep the reinforcement in the location it was intended to be in during planning.

To secure the concrete cover as well as the load bearing capacity of the element, the supports must at the time of installation be:

- sturdy enough and sufficiently load-bearing in order to dissipate the load to the reinforcement on top as well as temporarily dissipate any additional load when constructed with only negligible deformation,
- sufficiently stable (prevent tipping over),
- able to be safely fastened - if necessary,
- and have corrosion protection if they rest on the formwork.

The data sheet assists structural engineers, the building site, suppliers and manufacturers. In addition to application and placing rules being specified, the naming, appearance, construction, and tolerances of the products are defined, and the product checks (testing procedure and certification) are regulated.

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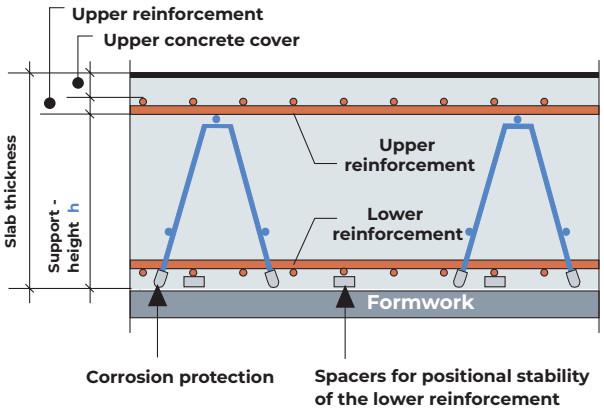
REINFORCEMENT SPACER

DBV DATA SHEET „SUPPORTS“

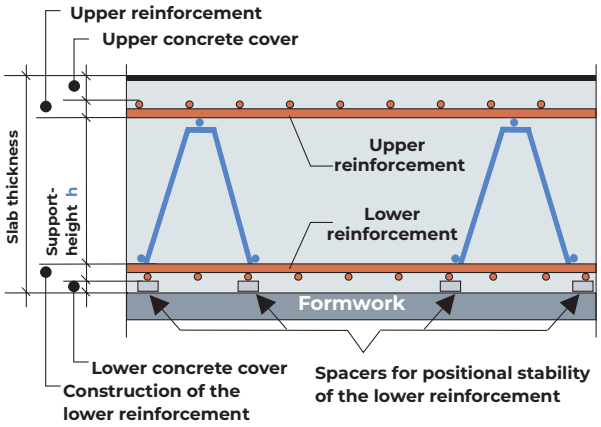
Characteristics / Quality

In principle, the DBV data sheet differentiates between supports that

rest on the formwork:



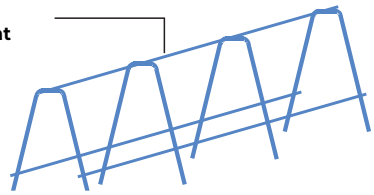
rest on the reinforcement:



Depending on the type of support, i.e. linear or point-shaped support, the permissible loads and placing intervals are defined in the data sheet.

Reinforcement spacers that meet the requirements of the DBV data sheet and are monitored and tested according to the testing guidelines described there, can bear the following permissible loads:

Linear bearing for upper reinforcement



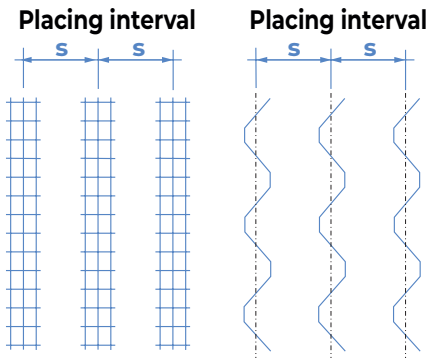
- Linear supports: **F_{Rd} = 0,67 kN/m**

Without mathematical proof, the placing interval must be taken from the following table (DBV data sheet: Supports, table 4)

The values specified in the table are for slab thicknesses of up to 500 mm.

Diameter d_s of the bars	Placing interval s (= space between axes)
	Place linear supports lengthwise without gaps
$d_s \leq 6{,}5$ mm	s = 500 mm
6,5 mm < $d_s \leq 12{,}0$ mm	s = 700 mm
$d_s > 12{,}0$ mm	s = 700 mm *)

*) If for $d_s > 12$ mm a greater placing interval is chosen, this must be proven by calculation.



Top-down view of placing plan for chairs:

For chairs, the placing intervals should be defined as the distance between axes.

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REINFORCEMENT SPACER

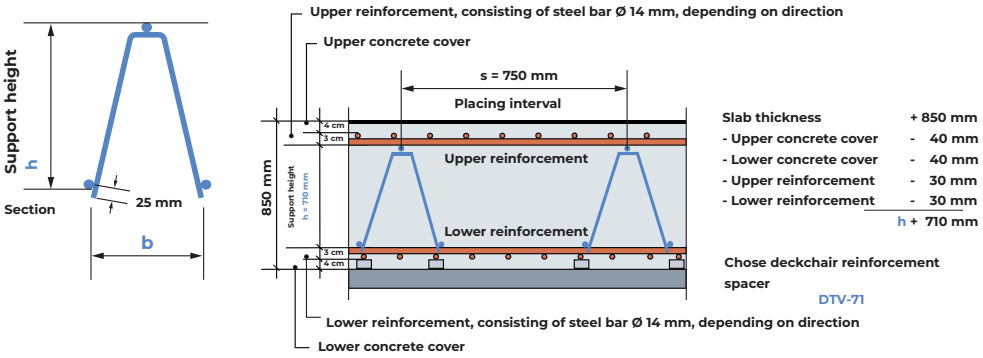
SPECIAL REINFORCEMENT SPACER

For special requirements and/or larger support heights, the user can rely on a range of chairs that have proven themselves in practice.

Reinforcement spacer DTV

An especially stable chair, analogous to type BT, however designed for thicker slabs.

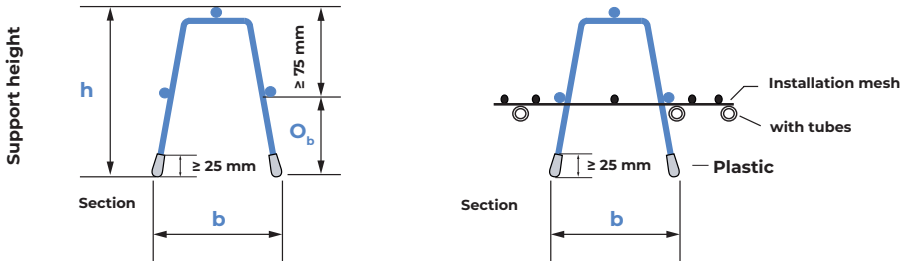
Support heights of
h = from 410 mm to 1200 mm



Reinforcement spacer with plastic feet DKI (for installation ceilings / concrete core activation)

These are particularly stable products, analogous to type BK, however with significantly larger overlap O_b. The larger overlap (O_b) between the formwork and the reinforced cross bar prevents the reinforcement spacers being stressed, e.g. in multi-layer reinforcement or in installation elements that are placed on the lower reinforcement (e.g. insulation). Fixing installation mesh is also possible in the middle of the ceiling.

Support heights of
h = from 160 mm to 400 mm

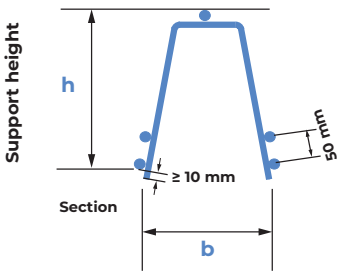


Special support element DQ

Particularly stable chairs with double function. These are designed for not only support the upper reinforcement but can also be used as a splitting force reinforcement.

Support heights of
h = from 200 mm to 1200 mm

Material characteristics acoording to DIN 488
B500A normal ductility
B500B high ductility



Foot design for fixing the shearing force reinforcement according to DIN EN 1992-1-1

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