

3



03

ANGLE BRACKETS

ANGLE BRACKETS

ANGLE BRACKETS TOP 80 / TOP 120

Advantages

- No bothersome centre rib during processing
- Optimised hole pattern
- Full nail fitting always possible
- High stability due to special, discreet corrugation
- Type 80 as an alternative to the "size 90 bracket"
- **GREENLINE** = resource-saving manufacturing



Introduction to statics **from page 110** / Products & statics **from page 120**

ANGLE BRACKET 110/170 S

Advantages

- Universal use for higher loads
- 9 bolt holes Ø 13 mm
- Perfectly suited to take loads F_2 and F_3



Introduction to statics **from page 110** / Products & statics **from page 132**

ANGLE BRACKET TOP KR 90E (EXTRA)

Advantages

- 40 % lighter in comparison to 90 x 90 x 65 x 2.5 mm
- High stability due to raised edge on both sides
- Versatile in use
- Alternative to different brackets such as 70 x 70 x 55 mm and 90 x 90 x 65 mm (for use under consideration of the necessary loads)
- Very good for loads due to the outer rib F_2/F_3 and F_1 suitable



Introduction to statics **from page 110** / Products & statics **from page 124**

ANGLE BRACKETS KR

Advantages

- For connections between timber/timber; timber/concrete
For use on timber/masonry etc.
- Due to the ribs in the bending radius, KR angle brackets are very sturdy, economical and affordable in use for extreme loads
- By making use of the Greenline series, you receive products with resource-saving manufacturing. This gives you an ecologically and economic advantage



Introduction to statics **from page 110** / Products & statics **from page 134**

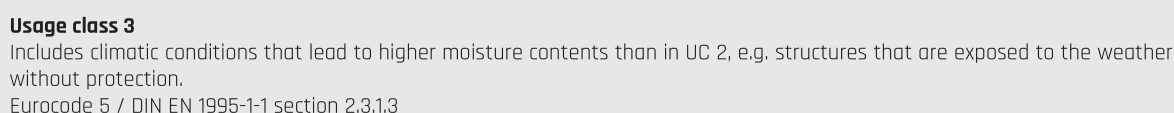
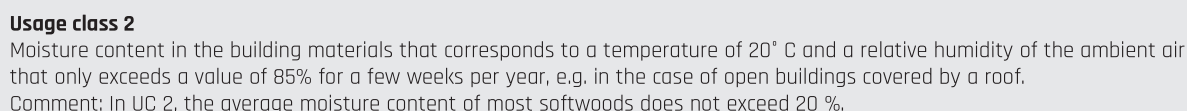
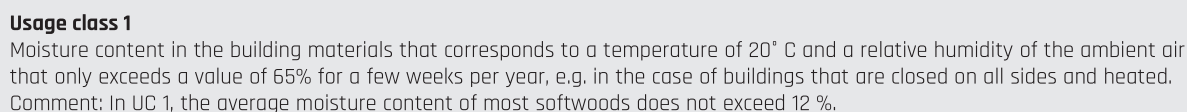
ANGLE BRACKETS

ASSORTMENT

					Height [mm]	Length [mm]	Width [mm]	Basics Statik & Diagramme from page	Products & Statik from page	Products Made of V4A from page
ANGLE BRACKET TOP 80/120										
ANGLE BRACKET 70X70X2.0										
ANGLE BRACKET 70X70 GREENLINE										
ANGLE BRACKET TOP KR90E										
ANGLE BRACKET 90X90X2.5										
ANGLE BRACKET 90X90 GREENLINE										
ANGLE BRACKET 100X100X3.0										
ANGLE BRACKET 100X100 GREENLINE										
STRUT CONNECTOR 135 DEGREES										
ANGLE BRACKET TYPE 110/170L										
ANGLE BRACKET KR 3 MM										
ANGLE BRACKET KR 4 MM										
ANGLE BRACKET TYPE 50/80										
ANGLE BRACKET TYPE 110										
ANGLE BRACKET TYPE 55/80										
ANGLE BRACKET TYPE 60/100										
CONSOLE ANGLE										
ANGLE BRACKET TYPE 40/45										
ANGLE BRACKET TYPE 40/90										
ANGLE BRACKET TYPE 40/120										
ANGLE BRACKET TYPE 692										

ASSORTMENT

	CE symbol
	Steel with indication of the steel quality and galvanisation
	Stainless steel with material number
	Timber/timber connection
	Timber/concrete-connection



ANGLE BRACKETS

APPLICATIONS

3

Application:

Timber/timber; timber/concrete, steel connections

Materials:

350
GD
Z275

250
GD
Z275

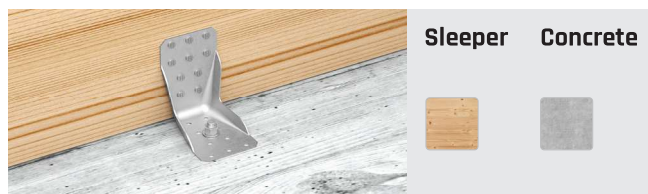
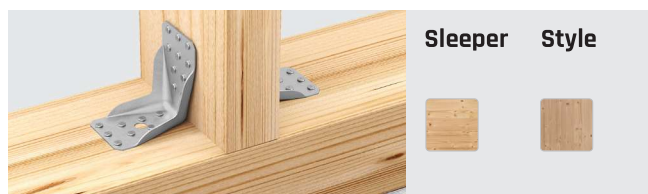
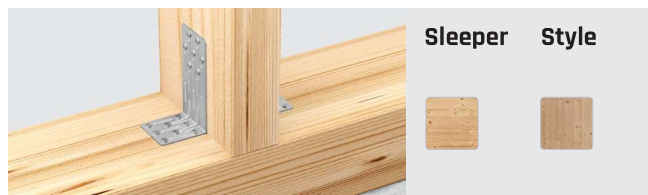
235
JR
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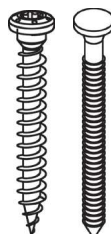
Material thicknesses:

1.5 / 2.0 / 2.5 / 3.0 / 4.0 / 6.0 / 8.0 mm

More on request.



For use in usage classes



Connecting element:

GH threaded nails 4.0 x 35 / 40 / 50 / 60 / 75 / 100 mm

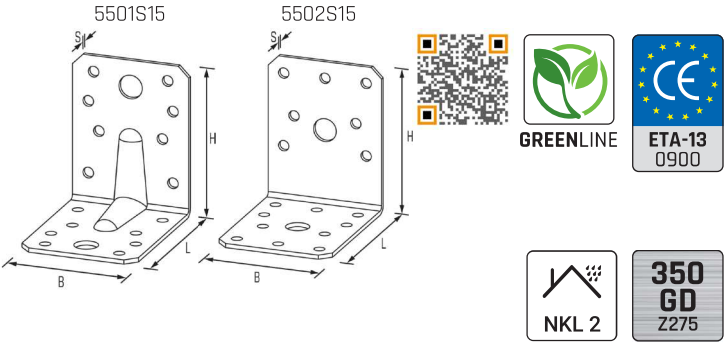
GH screws 5.0 x 25 / 35 / 40 / 50 / 60 / 70 mm

Bolt, dowel or concrete anchor M10, M12

Connecting elements from page 274

ANGLE BRACKETS

TYPE 55/70 1.5

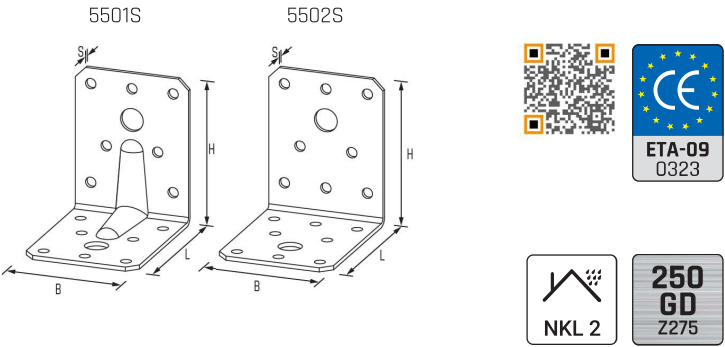


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Art. No.	Rib	Dimensions [mm]							nN Ø 5	nBo Ø 11	EAN 4019346	Weight kg	Pallet 4800	PU 100		
		H	x	L	x	W(B)	x	T(S)								
5501S15	with	70	x	70	x	55	x	1,5	16	2	024607	0.077	4800	100	■	■
5502S15	without	70	x	70	x	55	x	1,5	17	2	024614	0.077	4800	100	■	■

ANGLE BRACKETS

TYPE 55/70 2.0



Art. No.	Rib	Dimensions [mm]							nN Ø 5	nBo Ø 11	EAN 4019346	Weight kg	Pallet 4800	PU 100		
		H	x	L	x	W(B)	x	T(S)								
5501S	mit	70	x	70	x	55	x	2,0	14	2	110089	0.102	4800	100	■	■
5502S	ohne	70	x	70	x	55	x	2,0	14	2	110072	0.102	4800	100	■	■

TYPE 55/70 1.5

Timber / Timber											
Art. No.	H	L	W(B)	T(S)	n _a	NB	VM	F _{1,T,Rk}	F _{2/3,T,Rk}	*F _{4/5,T,Rk}	
5501S15	70	70	55	1,5	16	Full	4.0x40	-	-	-	
							4.0x60	4,80	5,10	11,10	
					-	Partial	4.0x40	-	-	-	
							4.0x60	-	-	-	
5502S15	70	70	55	1,5	14	Full	4.0x40	0,33	4,02	2,51	
							4.0x60	-	-	-	
					-	Partial	4.0x40	-	-	-	
							4.0x60	-	-	-	

Values for 1 angle bracket (* 2 angle brackets opposite each other), pk = 350 kg/m³, f = 0 mm, e = 40 mm, b = 80 mm. For 2 angle brackets opposite each other, the values F_{1,T,Rk}, F_{1,S,Rk}, F_{2/3,T,Rk} can be doubled.

TYPE 55/70 2.0

Timber / Timber																
Art. No.	H	L	W(B)	T(S)	n _a	NB	VM	F _{1,T,Rk}	F _{1,S,Rk}	F _{2/3,T,Rk}	F _{4,T,Rk}	F _{4,S,RK}	F _{5,T,Rk}	F _{5,S,Rk}	*F _{4/5,T,Rk}	*F _{4/5,S,Rk}
5501S	70	70	55	2,0	12	Full	4.0x40	1,23	2,11	3,68	1,16	2,00	1,50	2,87	2,45	4,21
							4.0x60	2,05	2,11	4,85	1,93	2,00	2,50	2,87	4,07	4,21
					8	Partial	4.0x40	1,09	4,63	3,01	1,02	2,87	1,50	2,87	2,16	9,26
							4.0x60	1,81	4,63	3,91	1,70	2,87	2,49	2,87	3,57	9,26
5502S	70	70	55	2,0	13	Full	4.0x40	0,39	0,12	3,92	0,17	0,05	1,51	0,32	0,77	0,25
							4.0x60	0,64	0,12	5,26	0,28	0,05	2,51	0,32	1,29	0,25
					5	Partial	4.0x40	0,39	0,12	2,21	0,17	0,05	1,51	0,32	0,77	0,25
							4.0x60	0,64	0,12	3,04	0,28	0,05	2,51	0,32	1,29	0,25

Values for 1 angle bracket (* 2 angle brackets opposite each other), pk = 350 kg/m³, f = 0 mm, e = 40 mm, b = 80 mm. For 2 angle brackets opposite each other, the values F_{1,T,Rk}, F_{1,S,Rk}, F_{2/3,T,Rk} verdoppelt werden.

TYPE 55/70 1.5

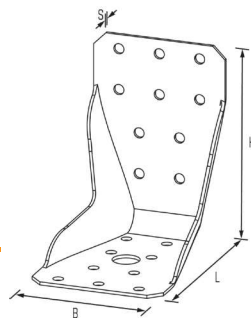
Timber											Concrete										
Art.-Nr.	H	L	W(B)	T(S)	n _a	NB	VM	F _{1,T,Rk}	F _{1Bo,ax,rk}	F _{2/3,T,RK}	F _{2/3,Bo,sx,rk}	F _{4,T,Rk}	F _{4Bo,sx,rk}	F _{5,T,Rk}	F _{5Bo,ax,rk}	F _{5Bo,sx,rk}	*F _{4/5,T,Rk}	F _{4/5Bo,ax,rk}	F _{4/5Bo,sx,rk}		
5501S15	70	70	55	1,5	6	Full	4.0x40	0,18	1,56	1,05	1,05	3,63	3,63	1,16	0,84	1,16	4,37	0,83	3,19		
							4.0x60	-	-	-	-	-	-	-	-	-	-	-	-		
					-	Partial	4.0x40	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							4.0x60	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5502S15	70	70	55	1,5	7	Full	4.0x40	0,29	0,70	1,68	1,68	-	-	-	-	-	2,29	0,27	1,83		
							4.0x60	-	-	-	-	-	-	-	-	-	-	-	-	-	
					-	Partial	4.0x40	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							4.0x60	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Values for 1 angle bracket (* 2 angle brackets opposite each other), pk = 350 kg/m³, f = 0 mm, e = 40 mm, b = 80 mm. For 2 angle brackets opposite each other, the values F_{1,T,Rk}, F_{1,S,Rk}, F_{2/3,T,Rk} can be doubled and the values F_{1,S,Rk}, F_{1,o,s,x,Rk}, F_{2/3,S,Rk} halved

TYPE 55/70 2.0

Timber												Concrete												
Art.-Nr.	H	L	W(B)	T(S)	n _a	NB	VM	F _{1,T,Rk}	F _{1,S,Rk}	k _{1,t,ax}	F _{2/3,T,Rk}	k _{2/3,t,v}	F _{4,T,Rk}	F _{4,S,Rk}	k _{4,t,v}	k _{4,t,ax}	F _{5,T,Rk}	F _{5,S,Rk}	k _{5,t,v}	k _{5,t,ax}	*F _{4/5,T,Rk}	*F _{4/5,S,Rk}	k _{4/5,t,v}	k _{4/5,t,ax}
5501S	70	70	55	2,0	5	Full	4.0x40	9,45	0,25	9,64	1,30	1,00	4,05	0,33	1,00	7,27	1,50	2,87	1,00	0,31	9,00	0,50	1,00	4,82
							4.0x60	11,82	0,25	9,64	2,00	1,00	6,75	0,33	1,00	7,27	2,50	2,87	1,00	0,31	15,00	0,50	1,00	4,82
					4	Partial	4.0x40	7,56	0,25	9,64	1,13	1,00	4,05	0,33	1,00	7,27	1,50	2,87	1,00	0,31	7,20	0,50	1,00	4,82
							4.0x60	9,46	0,25	9,64	1,74	1,00	6,75	0,33	1,00	7,27	2,49	2,87	1,00	0,31	12,00	0,50	1,00	4,82
5502S	70	70	55	2,0	5	Full	4.0x40	9,45	0,03	9,64	1,30	1,00	1,13	0,04	1,00	7,27	1,51	0,32	1,00	0,31	9,00	0,06	1,00	4,82
							4.0x60	11,82	0,03	9,64	2,00	1,00	1,88	0,04	1,00	7,27	2,51	0,32	1,00	0,31	15,00	0,06	1,00	4,82
					2	Partial	4.0x40	3,78	0,03	9,64	0,44	1,00	1,13	0,04	1,00	7,27	1,51	0,32	1,00	0,31	3,60	0,06	1,00	4,82
							4.0x60	4,73	0,03	9,64	0,71	1,00	1,88	0,04	1,00	7,27	2,51	0,32	1,00	0,31	6,00	0,06	1,00	4,82

Values for 1 angle bracket (* 2 angle brackets opposite each other), pk = 350 kg/m³, f = 0 mm, e = 40 mm, b = 80 mm. For 2 angle brackets opposite each other, the values F_{1,T,Rk}, F_{1,S,Rk}, F_{2/3,T,Rk} can be doubled and the values F_{1,S,Rk}, F_{1,o,s,x,Rk}, F_{2/3,S,Rk} halved.



ANGLE BRACKETS

TOP KR 90 E

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Art. No.	Dimensions [mm]							nN	nBo	EAN	Weight	Pallet	PU		
	H	x	L	x	W(B)	x	T(S)	Ø 5	Ø 13	4019346	kg				
110090E	95	x	85	x	65	x	1,5	19	1	110898	0.121	4000	100	■	■



Advantages of angle brackets TOP KR 90 E

- 40 % lighter in comparison to 90 x 90 x 65 x 2.5 mm
- Hole 13 mm
- High stability due to raised edge on both sides
- Versatile in use

YOU CAN USE THE TOP KR 90 E ANGLE BRACKET AS AN ALTERNATIVE TO THE SIZE 70" OR "SIZE 90" BRACKET.

The **TOP KR 90 E** angle bracket has good stability and is versatile in use due to the raised edges on both sides.

Taking the necessary loads into account, it can be used as an alternative for different brackets, such as the 70 x 70 x 55 mm or the 90 x 90 x 65 mm.

This results in low stocking costs.

Due to the nail pattern for timber/timber connections and the outer ribs on both sides, the **TOP KR 90 E** is very suitable for loads F_2/F_3 and F_1 .

Fastening can be done with both GH threaded nails and the GH screw. Connection to concrete is also possible through the 13 mm hole.

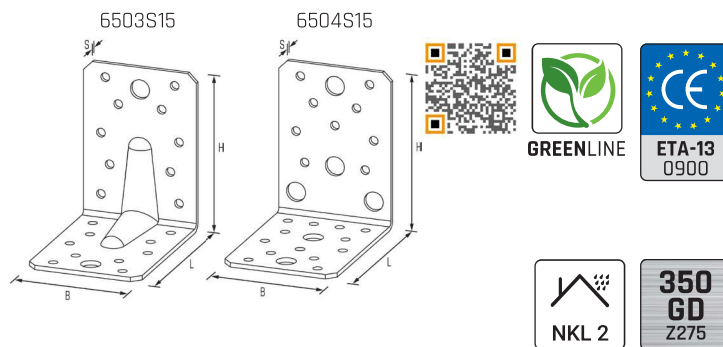
TOP KR 90 E

Timber / Timber																
Art. No.	H	L	W(B)	T(S)	n _a	NB	VM	F _{1,T,Rk}	F _{1,S,Rk}	F _{2/3,T,Rk}	F _{4,T,Rk}	F _{4,S,Rk}	F _{5,T,Rk}	F _{5,S,Rk}	*F _{4/5,T,Rk}	*F _{4/5,S,Rk}
110090E	95	85	65	1,5	19	Full	4,0x40	1,88	2,09	4,76	3,00	3,40	3,53	2,63	3,73	4,19
							4,0x60	3,13	2,09	5,97	5,09	3,40	5,88	2,63	6,26	4,19
					9	Partial	4,0x40	1,34	2,48	1,99	2,14	3,44	0,15	0,17	2,67	4,95
							4,0x60	2,24	2,48	2,76	3,61	3,44	0,25	0,17	4,43	4,95

Values are valid for 1 angle bracket (* 2 angle brackets opposite each other), GH nail, pk = 350 kg/m³, f = 0 mm, e = 40 mm, b = 80 mm, unit of length in mm, unit for force in kN.
For 2 angle brackets opposite each other, the values F_{1,T,Rk} F_{1,S,Rk} F_{2/3,T,Rk} can be doubled.

Timber													Concrete											
Art. No.	H	L	B	S	n _a	NB	VM	F _{1,T,Rk}	F _{1,S,Rk}	k _{1,t,ax}	F _{2/3,T,Rk}	k _{2/3,t,v}	F _{4,T,Rk}	F _{4,S,Rk}	k _{4,t,v}	k _{4,t,ax}	F _{5,T,Rk}	F _{5,S,Rk}	k _{5,t,v}	k _{5,t,ax}	*F _{4/5,T,Rk}	*F _{4/5,S,Rk}	k _{4/5,t,v}	k _{4/5,t,ax}
110090E	95	85	65	1,5	10	Full	4.0x40	18,9	0,94	3,25	2,56	1,00	-	1,53	1,00	2,00	3,53	2,63	1,00	0,32	18,00	1,88	1,00	1,62
							4.0x60	23,64	0,94	3,25	3,89	1,00	-	1,53	1,00	2,00	5,88	2,63	1,00	0,32	30,00	1,88	1,00	1,62
					3	Partial	4.0x40	5,67	0,94	3,25	0,76	1,00	-	1,53	1,00	2,00	0,15	0,17	1,00	0,32	5,40	1,88	1,00	1,62
							4.0x60	7,09	0,94	3,25	1,10	1,00	-	1,53	1,00	2,00	0,25	0,17	1,00	0,32	9,00	1,88	1,00	1,62

Values are valid for 1 angle bracket (* 2 angle brackets opposite each other), GH nail, pk = 350 kg/m³, f = 0 mm, e = 40 mm, b = 80 mm, unit of length in mm, unit for force in kN.
For 2 angle brackets opposite each other, the values F_{1,T,Rk} F_{1,S,Rk} F_{2/3,T,Rk} can be doubled and the values F_{1,t,ax} F_{1,t,v} F_{2/3,t,v} halved.



ANGLE BRACKETS

TYPE 65/90 1.5

Art. No.	Rib	Dimensions [mm]							nN Ø 5	nBo Ø 11	EAN 4019346	Weight kg	Pallet	PU		
		H	x	L	x	W(B)	x	T(S)								
6503S15	with	90	x	90	x	65	x	1,5	20	2	024621	0.114	4800	100	■	■
6504S15	without	90	x	90	x	65	x	1,5	22	6	024638	0.114	4800	100	■	■



GREENLINE

“ ECOLOGICAL, RESOURCE-SAVING AND ECONOMICAL

The **GH “Greenline”** product series, alongside the successfully innovative **„Topline”** series, has been committed for the past 14 years to an increasingly important aspect for the future with the aim manufacturing products with almost unchanged or even better static values in a resource-saving way.

Because huge emissions of approx. 1.7 tons CO₂ per ton of steel are generated in steel production, we already started years ago to search for ways of achieving a reduction in emissions.

Thanks to new production processes and special materials with more strength, we have been able to save approx. **7300 tons of CO₂ in the past 14 years** with **Greenline** articles with reduced cross-sections in comparison to former conventional standard products.

To make things clearer, this corresponds to annual emissions savings of CO₂ for the energy needs of around 1000 German citizens (Source: <https://de.statista.com/IEA>).

In addition to making ecological sense, this is also economically advantageous for everyone involved and saves transport costs that have not yet been included in the calculation.

As the first manufacturer with joist hangers in 1.5 mm and the already established bracing strip in 1.5 mm, more **Greenline** products followed over the years such as standard angle brackets, KR brackets, rafter anchors and nail plates.

In most cases, we have also succeeded in achieving the same or even better static values than conventional standard angle brackets, and at even more lucrative value for money.

TYPE 65/90 1.5

Timber / Timber											
Art. No.	H	L	W(B)	T(S)	n _a	NB	VM	F _{1,T,Rk}	F _{2/3,T,Rk}	*F _{4/5,T,Rk}	
6503S15	90	90	65	1,5	18	Full	4,0x40	-	-	-	
							4,0x60	5,30	6,70	11,70	
					-	Partial	4,0x40	-	-	-	
							4,0x60	-	-	-	
6504S15	90	90	65	1,5	16	Full	4,0x40	0,28	4,11	2,96	
							4,0x60	-	-	-	
					-	Partial	4,0x40	-	-	-	
							4,0x60	-	-	-	

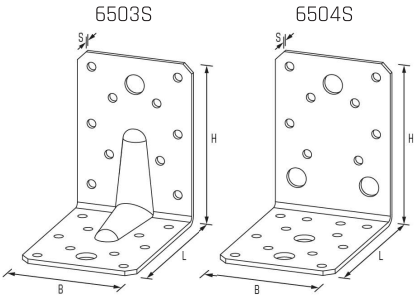
Values are valid for 1 angle bracket (* 2 angle brackets opposite each other), GH nail, $\rho_k = 350 \text{ kg/m}^3$, $f = 0 \text{ mm}$, $e = 40 \text{ mm}$, $b = 80 \text{ mm}$, unit of length in mm, unit for force in kN.
For 2 angle brackets opposite each other, the values $F_{1,T,Rk}$, $F_{1,S,Rk}$, $F_{2/3,T,Rk}$ can be doubled.

Timber												Concrete									
Art. No.	H	L	W(B)	T(S)	n _a	NB	VM	F _{1,T,Rk}	F _{1,B₀,ax,rk}	F _{2/3,T,Rk}	F _{2/3,B₀,sx,rk}	F _{4,T,Rk}	F _{4,B₀,sx,rk}	F _{5,T,Rk}	F _{5,B₀,ax,rk}	F _{5,B₀,sx,rk}	*F _{4/5,T,Rk}	F _{4/5,B₀,ax,rk}	F _{4/5,B₀,sx,rk}		
6503S15	90	90	65	1,5	8	Full	4,0x40	0,15	1,59	1,05	1,05	4,54	4,54	0,96	0,56	0,96	6,06	1,03	4,61		
							4,0x60	-	-	-	-	-	-	-	-	-	-	-	-		
					-	Partial	4,0x40	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							4,0x60	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6504S15	90	90	65	1,5	8	Full	4,0x40	1,64	1,98	3,44	2,06	-	-	-	-	-	2,71	0,27	1,17		
							4,0x60	-	-	-	-	-	-	-	-	-	-	-	-	-	
					-	Partial	4,0x40	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							4,0x60	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Values are valid for 1 angle bracket (* 2 angle brackets opposite each other), GH nail, $\rho_k = 350 \text{ kg/m}^3$, $f = 0 \text{ mm}$, $e = 40 \text{ mm}$, $b = 80 \text{ mm}$, unit of length in mm, unit for force in kN.
For 2 angle brackets opposite each other, the values $F_{1,T,Rk}$, $F_{1,S,Rk}$, $F_{2/3,T,Rk}$ can be doubled and the values $F_{1,v,k}$, $F_{1,ok,k}$, $F_{2/3,v,k}$ halved.

ANGLE BRACKETS

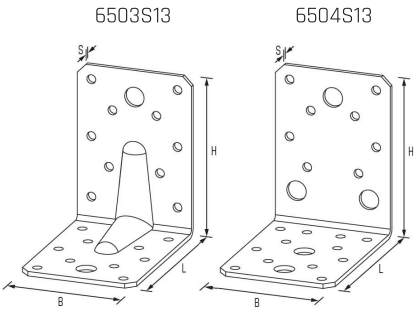
TYPE 65/90 2.5



Art. No.	Rib	Dimensions [mm]							nN	nBo	EAN	Weight	Pallet	PU		
		H	x	L	x	W(B)	x	T(S)	Ø 5	Ø 11	4019346	kg				
6503S	with	90	x	90	x	65	x	2,5	20	2	110119	0.190	4800	100	■	■
6504S	without	90	x	90	x	65	x	2,5	22	5	110126	0.190	4800	100	■	■

ANGLE BRACKETS

TYPE 65/90 2.5 S13



Art. No.	Rib	Dimensions [mm]							nN	nBo	EAN	Weight	Pallet	PU		
		H	x	L	x	W(B)	x	T(S)	Ø 5	Ø 13	4019346	kg				
6503S13	with	90	x	90	x	65	x	2,5	20	2	110614	0.194	4800	100	■	■
6504S13	without	90	x	90	x	65	x	2,5	22	5	110621	0.207	4800	100	■	■

TYP 65/90 2,5

3

Timber / Timber																
Art. No.	H	L	W(B)	T(S)	n _a	NB	VM	F _{1,T,Rk}	F _{1,S,Rk}	F _{2/3,T,Rk}	F _{4,T,Rk}	F _{4,S,Rk}	F _{5,T,Rk}	F _{5,S,Rk}	*F _{4/5,T,Rk}	*F _{4/5,S,Rk}
6503S	90	90	65	2,5	18	Full	4.0x40	1,94	0,38	5,46	2,75	0,53	2,96	0,57	3,89	0,75
							4.0x60	3,24	0,38	7,09	4,58	0,53	4,94	0,57	6,48	0,75
					10	Partial	4.0x40	1,83	0,59	3,53	2,59	0,60	2,45	0,66	3,67	1,17
							4.0x60	3,05	0,59	4,65	4,31	0,60	4,09	0,60	6,11	1,17
6504S	90	90	65	2,5	20	Full	4.0x40	0,49	0,20	6,00	0,22	0,09	1,53	0,60	0,97	0,40
							4.0x60	0,81	0,20	7,95	0,38	0,09	2,55	0,60	1,62	0,40
					10	Partial	4.0x40	0,49	0,20	3,58	0,22	0,09	1,53	0,60	0,97	0,40
							4.0x60	0,81	0,20	4,75	0,38	0,09	2,55	0,60	1,62	0,40

Values are valid for 1 angle bracket (* 2 angle brackets opposite each other), GH nail, pk = 350 kg/m³, f = 0 mm, e = 40 mm, b = 80 mm, unit of length in mm, unit for force in kN.
For 2 angle brackets opposite each other, the values F_{1,T,Rk}, F_{1,S,Rk}, F_{2/3,T,Rk} can be doubled.

Timber													Concrete											
Art. No.	H	L	W(B)	T(S)	n _a	NB	VM	F _{1,T,Rk}	F _{1,S,Rk}	k _{1,t,ox}	F _{2/3,T,RK}	k _{2/3,t,v}	F _{4,T,Rk}	F _{4,S,Rk}	k _{4,t,v}	k _{4,t,ox}	F _{5,T,Rk}	F _{5,S,Rk}	k _{5,t,v}	k _{5,t,ox}	*F _{4/5,T,Rk}	*F _{4/5,S,Rk}	k _{4/5,t,v}	k _{4/5,t,ox}
6503S	90	90	65	2,5	8	Full	4.0x40	15,12	0,02	14,64	1,76	1,00	-	0,04	1,00	7,27	2,96	0,57	1,00	0,26	14,40	0,04	1,00	7,32
							4.0x60	18,91	0,02	14,64	2,76	1,00	-	0,04	1,00	7,27	4,94	0,57	1,00	0,26	24,00	0,04	1,00	7,32
					4	Partial	4.0x40	7,56	0,02	14,64	0,92	1,00	-	0,04	1,00	7,27	2,45	0,60	1,00	0,26	7,20	0,04	1,00	7,32
							4.0x60	9,46	0,02	14,64	1,47	1,00	-	0,04	1,00	7,27	4,09	0,60	1,00	0,26	12,00	0,04	1,00	7,32
6504S	90	90	65	2,5	8	Full	4.0x40	15,12	0,06	9,18	2,57	1,00	1,29	0,07	1,00	7,27	1,53	0,60	1,00	0,32	14,40	0,12	1,00	4,59
							4.0x60	18,91	0,06	9,18	3,78	1,00	2,14	0,07	1,00	7,27	2,55	0,60	1,00	0,32	24,00	0,12	1,00	4,59
					4	Partial	4.0x40	7,56	0,06	9,18	1,40	1,00	1,29	0,07	1,00	7,27	1,53	0,60	1,00	0,32	7,20	0,12	1,00	4,59
							4.0x60	9,46	0,06	9,18	2,12	1,00	2,14	0,07	1,00	7,27	2,55	0,60	1,00	0,32	12,00	0,12	1,00	4,59

Values are valid for 1 angle bracket (* 2 angle brackets opposite each other), GH nail, pk = 350 kg/m³, f = 0 mm, e = 40 mm, b = 80 mm, unit of length in mm, unit for force in kN.
For 2 angle brackets opposite each other, the values F_{1,T,Rk}, F_{1,S,Rk}, F_{2/3,T,Rk} can be doubled and the values F_{1,t,ax}, F_{1,ok,ax}, F_{2/3,t,v} halved.

TYP 65/90 2,5 S13

Timber / Timber																
Art. No.	H	L	W(B)	T(S)	n _a	NB	VM	F _{1,T,Rk}	F _{1,S,Rk}	F _{2/3,T,Rk}	F _{4,T,Rk}	F _{4,S,Rk}	F _{5,T,Rk}	F _{5,S,Rk}	*F _{4/5,T,Rk}	*F _{4/5,S,Rk}
6503S13	90	90	65	2,5	18	Full	4.0x40	1,94	0,38	5,46	2,75	0,53	2,96	0,57	3,89	0,75
							4.0x60	3,24	0,38	7,09	4,58	0,53	4,94	0,57	6,48	0,75
					10	Partial	4.0x40	1,83	0,59	3,53	2,59	0,60	2,45	0,60	3,67	1,17
							4.0x60	3,05	0,59	4,65	4,31	0,60	4,09	0,60	6,11	1,17
6504S13	90	90	65	2,5	20	Full	4.0x40	0,49	0,20	6,00	0,22	0,09	1,53	0,60	0,97	0,40
							4.0x60	0,81	0,20	7,95	0,38	0,09	2,55	0,60	1,62	0,40
					10	Partial	4.0x40	0,49	0,20	3,58	0,22	0,09	1,53	0,60	0,97	0,40
							4.0x60	0,81	0,20	4,75	0,38	0,09	2,55	0,60	1,62	0,40

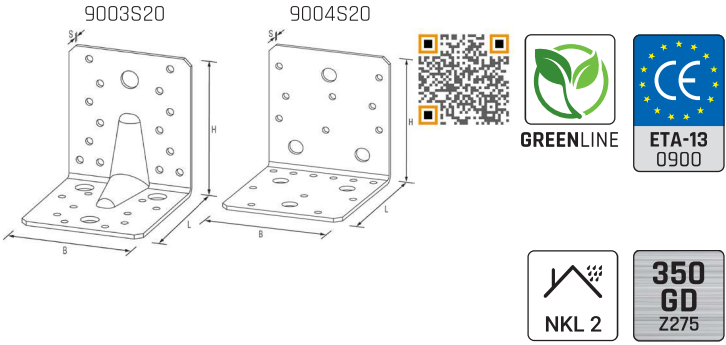
Values are valid for 1 angle bracket (* 2 angle brackets opposite each other), GH nail, pk = 350 kg/m³, f = 0 mm, e = 40 mm, b = 80 mm, unit of length in mm, unit for force in kN.
For 2 angle brackets opposite each other, the values F_{1,T,Rk}, F_{1,S,Rk}, F_{2/3,T,Rk} can be doubled.

Timber													Concrete											
Art. No.	H	L	W(B)	T(S)	n _a	NB	VM	F _{1,T,Rk}	F _{1,S,Rk}	k _{1,t,ax}	F _{2/3,T,RK}	k _{2/3,t,v}	F _{4,T,Rk}	F _{4,S,Rk}	k _{4,t,v}	k _{4,t,ax}	F _{5,T,Rk}	F _{5,S,Rk}	k _{5,t,v}	k _{5,t,ax}	*F _{4/5,T,Rk}	*F _{4/5,S,Rk}	k _{4/5,t,v}	k _{4/5,t,ax}
6503S13	90	90	65	2,5	8	Full	4,0x40	15,12	0,03	12,54	1,76	1,00	-	0,05	1,00	6,15	2,96	0,57	1,00	0,26	14,40	0,05	1,00	6,27
							4,0x60	18,91	0,03	12,54	2,76	1,00	-	0,05	1,00	6,15	4,94	0,57	1,00	0,26	24,00	0,05	1,00	6,27
					4	Partial	4,0x40	7,56	0,03	12,54	0,92	1,00	-	0,05	1,00	6,15	2,45	0,60	1,00	0,26	7,20	0,05	1,00	6,27
							4,0x60	9,46	0,03	12,54	1,47	1,00	-	0,05	1,00	6,15	4,09	0,60	1,00	0,26	12,00	0,05	1,00	6,27
6504S13	90	90	65	2,5	8	Full	4,0x40	15,12	0,07	7,92	2,57	1,00	1,29	0,09	1,00	6,15	1,53	0,60	1,00	0,32	14,40	0,13	1,00	3,96
							4,0x60	18,91	0,07	7,92	3,78	1,00	2,14	0,09	1,00	6,15	2,55	0,60	1,00	0,32	24,00	0,13	1,00	3,96
					4	Partial	4,0x40	7,56	0,07	7,92	1,40	1,00	1,29	0,09	1,00	6,15	1,53	0,60	1,00	0,32	7,20	0,13	1,00	3,96
							4,0x60	9,46	0,07	7,92	2,12	1,00	2,14	0,09	1,00	6,15	2,55	0,60	1,00	0,32	12,00	0,13	1,00	3,96

Values are valid for 1 angle bracket (* 2 angle brackets opposite each other), GH nail, pk = 350 kg/m³, f = 0 mm, e = 40 mm, b = 80 mm, unit of length in mm, unit for force in kN.
For 2 angle brackets opposite each other, the values F_{1,T,Rk}, F_{1,S,Rk}, F_{2/3,T,Rk} can be doubled and the values F_{1,t,ax}, F_{1,ok,ax}, F_{2/3,t,v} halved.

ANGLE BRACKETS

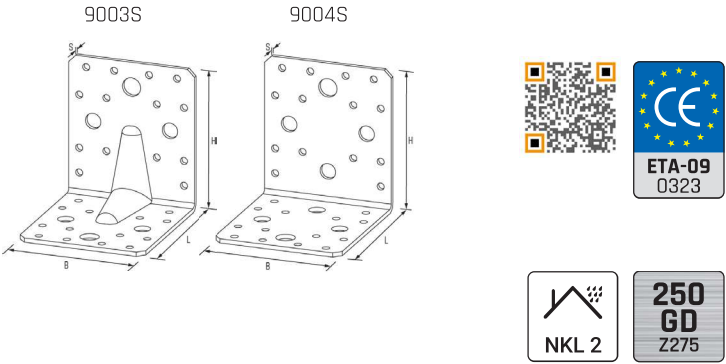
TYPE 90/100 2.0



Art. No.	Rib	Dimensions [mm]							nN	nBo	nBo	EAN	Weight	Pallet	PU		
		H	x	L	x	W(B)	x	T(S)									
9003S20	with	105	x	105	x	90	x	2,0	24	0	4	024669	0,235	3000	50	■	■
9004S20	without	105	x	105	x	90	x	2,0	19	6	0	024676	0,235	3000	50	■	■

ANGLE BRACKETS

TYPE 90/100 3.0



Art. No.	Rib	Dimensions [mm]							nN	nBo	nBo	EAN	Weight	Pallet	PU		
		H	x	L	x	W(B)	x	T(S)									
9003S	with	100	x	100	x	90	x	3,0	28	4	2	110034	0,360	3000	50	■	■
9004S	without	100	x	100	x	90	x	3,0	28	6	2	110041	0,360	3000	50	■	■

TYPE 90/100 2.0

Timber										Timber			
Art. No.	H	L	W(B)	T(S)	n _a	NB	VM	F _{1,T,Rk}		F _{2/3,T,Rk}		*F _{4/5,T,Rk}	
9003S20	105	105	90	2,0	19	Full	4,0x40	-		-		-	
							4,0x60	7,50		10,20		12,40	
					-	Partial	4,0x40	-		-		-	
							4,0x60	-		-		-	
9004S20	105	105	90	2,0	15	Full	4,0x40	-		-		-	
							4,0x60	10,60		9,50		16,50	
					-	Partial	4,0x40	-		-		-	
							4,0x60	-		-		-	

Values are valid for 1 angle bracket (* 2 angle brackets opposite each other), GH nail, pk = 350 kg/m³, f = 0 mm, e = 40 mm, b = 80 mm, unit of length in mm, unit for force in kN.
For 2 angle brackets opposite each other, the values F_{1,T,Rk} F_{1,S,Rk} F_{2/3,T,Rk} can be doubled.

TYPE 90/100 3.0

Timber								Timber								
Art. No.	H	L	W(B)	T(S)	n _a	NB	VM	F _{1,T,Rk}	F _{1,S,Rk}	F _{2/3,T,Rk}	F _{4,T,Rk}	F _{4,S,Rk}	F _{5,T,Rk}	F _{5,S,Rk}	*F _{4/5,T,Rk}	*F _{4/5,S,Rk}
9003S	100	100	90	3,0	26	Full	4,0x40	2,43	0,74	8,69	3,59	1,00	4,54	1,00	4,85	1,48
							4,0x60	4,05	0,74	11,10	5,99	1,00	7,56	1,00	8,09	1,48
					14	Partial	4,0x40	1,85	0,91	5,41	2,73	1,00	4,54	1,00	3,70	1,81
							4,0x60	3,08	0,91	6,76	4,56	1,00	7,56	1,00	6,16	1,81
9004S	100	100	90	3,0	26	Full	4,0x40	0,22	0,34	8,69	0,11	0,17	3,15	1,19	0,45	0,68
							4,0x60	0,38	0,34	11,10	0,19	0,17	5,25	1,19	0,75	0,68
					14	Partial	4,0x40	0,22	0,34	5,41	0,11	0,17	3,15	1,19	0,45	0,68
							4,0x60	0,38	0,34	6,76	0,19	0,17	5,25	1,19	0,75	0,68

Values are valid for 1 angle bracket (* 2 angle brackets opposite each other), GH nail, pk = 350 kg/m³, f = 0 mm, e = 40 mm, b = 80 mm, unit of length in mm, unit for force in kN.
For 2 angle brackets opposite each other, the values F_{1,T,Rk} F_{1,S,Rk} F_{2/3,T,Rk} can be doubled.

TYPE 90/100 2.0

Timber										Concrete												
Art. No.	H	L	W(B)	T(S)	n _a	NB	VM	F _{1,T,Rk}	F _{1,Bo,ax,rk}	F _{2/3,T,RK}	F _{2/3,Bo,sx,rk}	F _{4,T,Rk}	F _{4,Bo,sx,rk}	F _{5,T,Rk}	F _{5,Bo,ax,rk}	F _{5,Bo,sx,rk}	*F _{4/5,T,Rk}	F _{4/5,Bo,ax,rk}	F _{4/5,Bo,ax,rk}			
9003S20	105	105	90	2,0	10	Full	4.0x40	9,48	12,00	6,21	3,91	5,44	2,72	1,62	1,26	0,81	5,78	0,40	2,60			
							4.0x60	-	-	-	-	-	-	-	-	-	-	-	-			
					-	Partial	4.0x40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							4.0x60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9004S20	105	105	90	2,0	8	Full	4.0x40	1,04	1,60	5,15	4,43	-	-	-	-	-	5,71	0,34	2,40			
							4.0x60	-	-	-	-	-	-	-	-	-	-	-	-	-		
					-	Partial	4.0x40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							4.0x60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Values are valid for 1 angle bracket (* 2 angle brackets opposite each other), GH nail, pk = 350 kg/m³, f = 0 mm, e = 40 mm, b = 80 mm, unit of length in mm, unit for force in kN.
For 2 angle brackets opposite each other, the values F_{1,T,Rk} F_{1,S,Rk} F_{2/3,T,Rk} can be doubled and the values F_{1,Bo,Rk} F_{1,Bo,k} F_{2/3,Bo,k} halved.

TYPE 90/100 3.0

Timber													Concrete											
Art. No.	H	L	W(B)	T(S)	n _a	NB	VM	F _{1,T,Rk}	F _{1,S,Rk}	k _{1,tox}	F _{2/3,T,Rk}	k _{2/3,tv}	F _{4,T,Rk}	F _{4,S,Rk}	k _{4,tv}	k _{4,tox}	F _{5,T,Rk}	F _{5,S,Rk}	k _{5,tv}	k _{5,tox}	*F _{4/5,T,Rk}	*F _{4/5,S,Rk}	k _{4/5,tv}	k _{4/5,tox}
9003S	100	100	90	3,0	12	Full	4,0x40	22,68	0,07	5,45	4,49	0,50	-	0,10	0,50	3,64	4,54	1,00	0,50	0,15	21,60	0,13	0,50	2,73
							4,0x60	28,37	0,07	5,45	6,55	0,50	-	0,10	0,50	3,64	7,56	1,00	0,50	0,15	36,00	0,13	0,50	2,73
					8	Partial	4,0x40	15,12	0,07	5,45	3,14	0,50	-	0,10	0,50	3,64	4,54	1,00	0,50	0,15	14,40	0,13	0,50	2,73
							4,0x60	18,91	0,07	5,45	4,71	0,50	-	0,10	0,50	3,64	7,56	1,00	0,50	0,15	24,00	0,13	0,50	2,73
9004S	100	100	90	3,0	12	Full	4,0x40	22,68	0,36	5,45	4,54	0,50	3,60	0,27	0,50	7,27	3,15	1,19	0,50	0,38	21,60	0,71	0,50	2,73
							4,0x60	28,37	0,36	5,45	6,61	0,50	6,00	0,27	0,50	7,27	5,25	1,19	0,50	0,38	36,00	0,71	0,50	2,73
					8	Partial	4,0x40	15,12	0,36	5,45	4,70	1,00	3,60	0,27	1,00	7,27	3,15	1,19	1,00	0,38	14,40	0,71	1,00	2,73
							4,0x60	18,91	0,36	5,45	6,34	1,00	6,00	0,27	1,00	7,27	5,25	1,19	1,00	0,38	24,00	0,71	1,00	2,73

Values are valid for 1 angle bracket (* 2 angle brackets opposite each other), GH nail, pk = 350 kg/m³, f = 0 mm, e = 40 mm, b = 80 mm, unit of length in mm, unit for force in kN.
For 2 angle brackets opposite each other, the values F_{1,T,Rk} F_{1,S,Rk} F_{2/3,T,Rk} can be doubled and the values F_{1,Bo,k} F_{1,Bo,k} F_{2/3,Bo,k} halved.