

3



ANGLE BRACKETS

03

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**

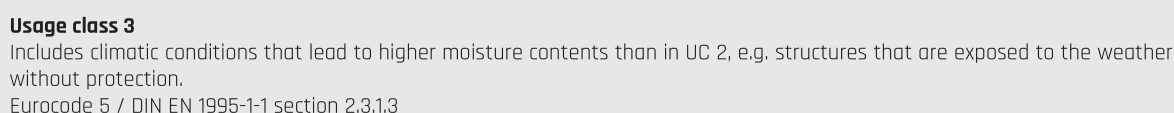
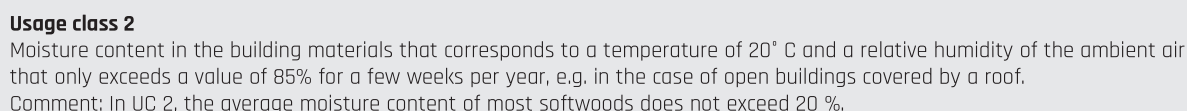
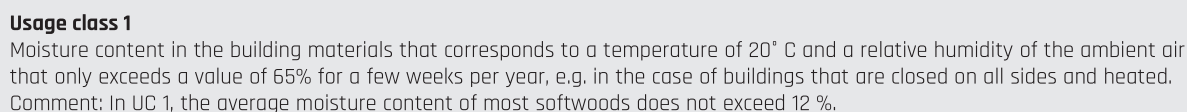
ANGLE BRACKETS

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						80-120	60	55	110	120	
ANGLE BRACKET 70X70X2.0					 	70	70	55	110	122	293
ANGLE BRACKET 70X70 GREENLINE						70	70	55	110	122	
ANGLE BRACKET TOP KR90E						95	85	65	110	124	
ANGLE BRACKET 90X90X2.5					 	90	90	65	110	128	293
ANGLE BRACKET 90X90 GREENLINE						90	90	65	110	126	
ANGLE BRACKET 100X100X3.0					 	100	100	90	110	130	293
ANGLE BRACKET 100X100 GREENLINE						105	105	90	110	130	
STRUT CONNECTOR 135 DEGREES						90-100	90-100	65-90		132	
ANGLE BRACKET TYPE 110/170L						170	110	95	110	132	
ANGLE BRACKET KR 3 MM						95-285	88	65	110	134	
ANGLE BRACKET KR 4 MM						95-285	88	65	110	134	
ANGLE BRACKET TYPE 50/80						90	50	50-80	110	138	
ANGLE BRACKET TYPE 110						90	50	110	110	138	
ANGLE BRACKET TYPE 55/80						80	60	55	110	140	
ANGLE BRACKET TYPE 60/100						100	60	60	110	140	
CONSOLE ANGLE						120-200	54	60	110	142	
ANGLE BRACKET TYPE 40/45						50-90	50-90	40-45	110	144	
ANGLE BRACKET TYPE 40/90					 	90	90	40	110	146	294
ANGLE BRACKET TYPE 40/120						120	95	40	110	146	
ANGLE BRACKET TYPE 692						65	65	90	110	146	

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

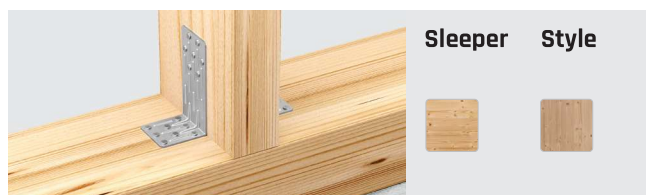
235
JR
feuerverzinkt

A4
1.4571

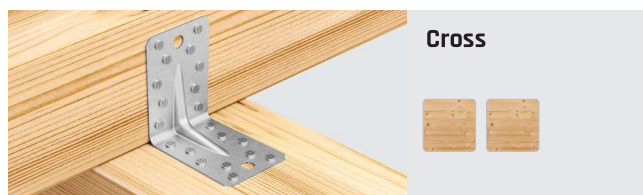
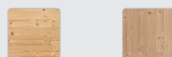
Material thicknesses:

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

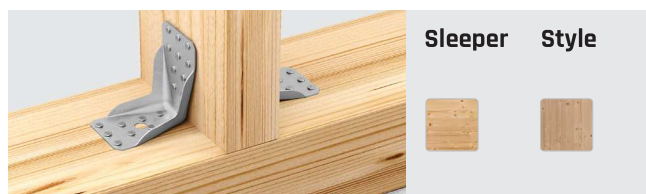
More on request.



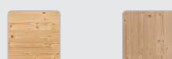
Sleeper Style



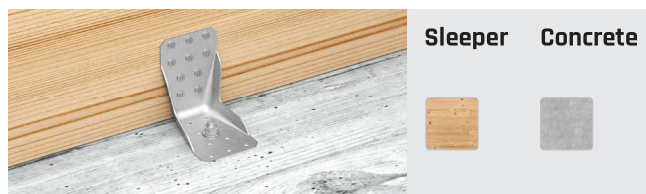
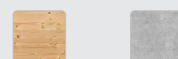
Cross



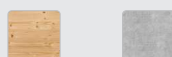
Sleeper Style



Sleeper Concrete



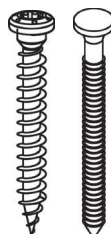
Sleeper Concrete



BSH Concrete



For use in usage classes



Connecting element:

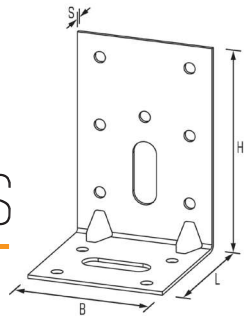
GH threaded nails 4.0 x 35 / 40 / 50 / 60 / 75 / 100 mm
GH screws 5.0 x 25 / 35 / 40 / 50 / 60 / 70 mm

Bolt, dowel or concrete anchor M10, M12

Connecting elements from page 274

MOUNTING BRACKETS

TYPE LLG



3

Art. No.	Dimensions [mm]							nN	LL	LL	EAN	Weight	Pallet	PU		
	H	x	L	x	W(B)	x	T(S)	Ø 5	Ø	Ø	4019346	kg				
3691015	90	x	60	x	60	x	1,5	11	10,5x28	10x30	111505	0.092	4800	100	■	■
3691025	90	x	60	x	60	x	2,5	11	10,5x28	10x30	111512	0.154	4800	100	■	■



The angle brackets are mainly suitable for securing the position of columns on concrete slabs, steel beams and timber sleepers. They are also for securing the position of rafters on beams.

The bracket with the slotted hole has the advantage that the processing in the area of the connection allows greater variability. The optimum fit of the bracket is guaranteed by the slotted hole.

MOUNTING BRACKETS TYPE LLG

3

Timber / Timber																
Art. No.	H	L	W(B)	T(S)	na	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}
3691015	90	60	60	1,5	9	Full	4,0x40	0,18	0,18	3,36	0,11	0,11	1,17	0,95	0,37	0,35
							4,0x60	0,31	0,18	4,21	0,19	0,11	1,95	0,95	0,61	0,35
					-	Partial	4,0x40	-	-	-	-	-	-	-	-	-
							4,0x60	-	-	-	-	-	-	-	-	-
3691025	90	60	60	2,5	9	Full	4,0x40	0,18	0,30	3,36	0,11	0,18	1,17	1,62	0,37	0,60
							4,0x60	0,31	0,30	4,21	0,19	0,18	1,95	1,62	0,61	0,60
					-	Partial	4,0x40	-	-	-	-	-	-	-	-	-
							4,0x60	-	-	-	-	-	-	-	-	-

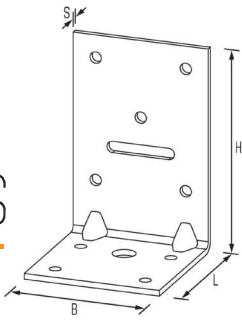
Values are valid for 1 angle bracket (* 2 angle brackets opposite each other), GH nail, $\rho_k = 350 \text{ kg/m}^3$, $f = 0 \text{ mm}$, $e = 40 \text{ mm}$, $b = 80 \text{ mm}$, unit of length in mm, unit for force in kN.
For 2 angle brackets opposite each other, the values $F_{1,T,Rk}$, $F_{1,S,Rk}$,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

Timber													Concrete												
Art. No.	H	L	W(B)	T(S)	na	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}	
3691015	90	60	60	1,5	5	Full	4,0x40	9,45	0,14	7,67	-	-	0,39	0,14	1,00	7,62	1,17	0,95	1,00	0,35	9,00	0,28	1,00	3,83	
							4,0x60	11,82	0,14	7,67	-	-	0,65	0,14	1,00	7,62	1,95	0,95	1,00	0,35	15,00	0,28	1,00	3,83	
					-	Partial	4,0x40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							4,0x60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3691025	90	60	60	2,5	5	Full	4,0x40	9,45	0,24	7,67	-	-	0,39	0,24	1,00	7,62	1,17	1,62	1,00	0,35	9,00	0,48	1,00	3,83	
							4,0x60	11,82	0,24	7,67	-	-	0,65	0,24	1,00	7,62	1,95	1,62	1,00	0,35	15,00	0,48	1,00	3,83	
					-	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 $F_{1,t,v}$, $F_{1,t,ax}$, $F_{2/3,t,v}$ halved.

MOUNTING BRACKETS

TYPE RL



3

Art. No.	Dimensions [mm]							nN	LL	LL	EAN	Weight	Pallet	PU		
	H	x	L	x	W(B)	x	T(S)	Ø 5	Ø	Ø	4019346	kg				
16910	90	x	60	x	60	x	2,5	9	1x10	5x30	110362	0.154	4800	100	■	■
16913	90	x	60	x	60	x	2,5	9	1x12	5x30	110379	0.154	4800	100	■	■

MOUNTING BRACKETS TYPE RL

Timber / Timber																	
Art. No.	H	L	W(B)	T(S)	na	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}	
16910	90	60	60	2,5	9	Full	4.0x40	0,20	0,36	3,43	0,11	0,20	1,17	1,62	0,40	0,72	
							4.0x60	0,33	0,36	4,32	0,19	0,20	1,95	1,62	0,67	0,72	
					-	Partial	4.0x40	-	-	-	-	-	-	-	-	-	-
							4.0x60	-	-	-	-	-	-	-	-	-	-
16913	90	60	60	2,5	9	Full	4.0x40	0,20	0,36	3,43	0,11	0,20	1,17	1,62	0,40	0,72	
							4.0x60	0,33	0,36	4,32	0,19	0,20	1,95	1,62	0,67	0,72	
					-	Partial	4.0x40	-	-	-	-	-	-	-	-	-	-
							4.0x60	-	-	-	-	-	-	-	-	-	-

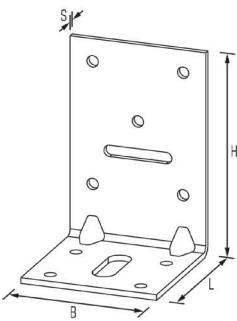
Values are valid for 1 angle bracket (* 2 angle brackets opposite each other), GH nail, $\rho_k = 350 \text{ kg/m}^3$, $f = 0 \text{ mm}$, $e = 40 \text{ mm}$, $b = 80 \text{ mm}$, unit of length in mm, unit for force in kN.
For 2 angle brackets opposite each other, the values $F_{1,T,Rk}$, $F_{1,S,Rk}$,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

Timber													Concrete													
Art. No.	H	L	W(B)	T(S)	na	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}		
16910	90	60	60	2,5	5	Full	4.0x40	9,45	0,55	5,40	2,44	1,00	0,39	0,37	1,00	8,00	1,17	1,62	1,00	0,39	9,00	1,09	1,00	2,70		
							4.0x60	11,82	0,55	5,40	3,40	1,00	0,65	0,37	1,00	8,00	1,95	1,62	1,00	0,39	15,00	1,09	1,00	2,70		
					-	Partial	4.0x40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							4.0x60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16913	90	60	60	2,5	5	Full	4.0x40	9,45	0,63	4,67	2,44	1,00	0,39	0,44	1,00	6,67	1,17	1,62	1,00	0,39	9,00	1,26	1,00	2,33		
							4.0x60	11,82	0,63	4,67	3,40	1,00	0,65	0,44	1,00	6,67	1,95	1,62	1,00	0,39	15,00	1,26	1,00	2,33		
					-	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 $F_{1,k}$, $F_{1,ax,k}$, $F_{2/3,k}$ halved.

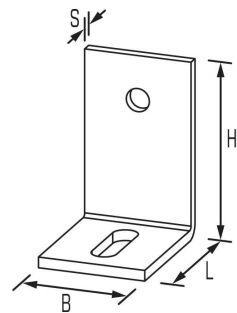
MOUNTING BRACKETS

TYPE LL



Art. No.	Dimensions [mm]							nN	LL		EAN	Weight	Pallet	PU		
	H	x	L	x	W(B)	x	T(S)		Ø 5	Ø						
26910	90	x	60	x	60	x	2,5	9	10x28	5x28	110386	0.154	4800	100	■	■
26913	90	x	60	x	60	x	2,5	9	13x28	5x28	110393	0.154	4800	100	■	■

CONCRETE BRACKETS



Art. No.	Dimensions [mm]							Ø	LL	EAN	Weight	Pallet	PU		
	H	x	L	x	W(B)	x	T(S)								
110A	75	x	75	x	60	x	6,0	14	14x45	110485	0.371	2000	40		■
111A	100	x	75	x	60	x	6,0	14	14x45	110492	0.432	1440	20		■
112A	150	x	75	x	60	x	8,0	14	14x45	110508	0.741	1000	20		■
115AX	150	x	75	x	60	x	8,0	18	18x45	110003	0.741	1000	20		■

Concrete brackets are suited to fixing timber constructions on concrete. They are available in the standard version with a slotted hole and with an open slotted hole on request. Other dimensions are also available on request.

MOUNTING BRACKETS TYPE LL

Timber / Timber																
Art. No.	H	L	W(B)	T(S)	na	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}
26910	90	60	60	2,5	9	Full	4,0x40	0,20	0,36	3,43	0,11	0,20	1,17	1,62	0,40	0,72
							4,0x60	0,33	0,36	4,32	0,19	0,20	1,95	1,62	0,67	0,72
					-	Partial	4,0x40	-	-	-	-	-	-	-	-	-
							4,0x60	-	-	-	-	-	-	-	-	-
26913	90	60	60	2,5	9	Full	4,0x40	0,20	0,36	3,43	0,11	0,20	1,17	1,62	0,40	0,72
							4,0x60	0,33	0,36	4,32	0,19	0,20	1,95	1,62	0,67	0,72
					-	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)	na	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}		
26910	90	60	60	2,5	5	Full	4.0x40	9,45	0,16	9,40	1,66	1,00	-	-	-	-	-	-	-	-	-	-	-	-		
							4.0x60	11,82	0,16	9,40	2,52	1,00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
					-	Partial	4.0x40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							4.0x60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26913	90	60	60	2,5	5	Full	4.0x40	9,45	0,22	7,23	1,70	1,00	-	-	-	-	-	-	-	-	-	-	-	-		
							4.0x60	11,82	0,22	7,23	2,58	1,00	-	-	-	-	-	-	-	-	-	-	-	-	-	
					-	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 $F_{1,v,k}$, $F_{1,ox,k}$, $F_{2/3,v,k}$ halved.