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RAFTER ANCHORS TRUSS CLIPS

GREENLINE TOPLINE

RAFTER ANCHORS / TRUSS CLIPS

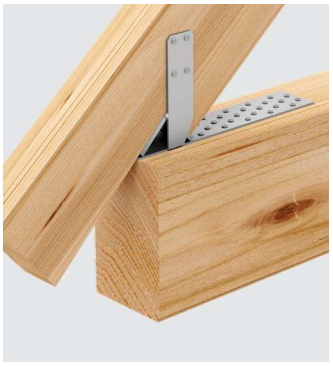
RAFTER ANCHORS TYPE RLD

- Assembly mandrel
- Same product on the right and left side of the rafter
- For use in every rafter angle
- Patent-protected shape
- Optimised nail pattern
- Optional in **GREEN**LINE = resource-saving manufacturing

Basics of statics **from page 226** / Products & statics **from page 228**

TRUSS CLIPS TYPE CONCRETE / TYPE TIMBER

- Abutment of rafters on concrete or ceiling beams
- The complex offset and the angled pivot, or clamping bolt, are not required (timber type)



Basics of statics **from page 232** / Products & statics **from page 234**

2-PIECE TRUSS CLIPS

- For fixing rafters on ceiling beams
- The complex offset and the angled pivot, or clamping bolt, are not required
- From a timber width of approx. 80 mm.

Products **on page 234**

RAFTER ANCHORS/TRUSS CLIPS

ASSORTMENT

								Length [mm]	Width [mm]	Basics Statics from page	Products & Statics from page	Products Made of V4A from page
RAFTER ANCHOR RLD WITH ASSEMBLY MANDREL		CE	250 GD Z275	NKL 2				170-250	36	226	228	
RAFTER ANCHORS		CE	250 GD Z275	NKL 2	A4 1.4571	NKL 3		290-370	34,50	226	230	295
TRUSS CLIPS, TYPE CONCRETE		CE	S235 JR 55µm	NKL 2				170	60-120	232	234	
TRUSS CLIPS, TYPE TIMBER		CE	S235 JR 55µm	NKL 2				300	60-120	232	234	
2-PIECE TRUSS CLIPS		CE	250 GD Z275	NKL 2				60	160		234	

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CE symbol

Steel with indication of the steel quality and zinc coating

Stainless steel with material number

Timber/timber connection

Timber/concrete-connection

Usage class 1
Moisture content in the building materials that corresponds to a temperature of 20° C and a relative humidity of the ambient air that only exceeds a value of 65% for a few weeks per year, e.g. in the case of buildings that are closed on all sides and heated.
Comment: In UC 1, the average moisture content of most softwoods does not exceed 12 %.

Usage class 2
Moisture content in the building materials that corresponds to a temperature of 20° C and a relative humidity of the ambient air that only exceeds a value of 85% for a few weeks per year, e.g. in the case of open buildings covered by a roof.
Comment: In UC 2, the average moisture content of most softwoods does not exceed 20 %.

Usage class 3
Includes climatic conditions that lead to higher moisture contents than in UC 2, e.g. structures that are exposed to the weather without protection. Eurocode 5 / DIN EN 1995-1-1 section 2.3.1.3

RAFTER ANCHORS

TECHNICAL FEATURES

Geometry

L	Length of legs (mm)
W(B)	Width (mm)
T(S)	Material thickness (mm)
Ø [mm]	Diameter

Tables

$F_{z,rk}$	Max. load capacity in load direction [kN]
n	Number of holes Ø 5.0

Timber connecting element

GH threaded nails ETA-13/0523 Ø 4.0 x L [mm]

GH wood connector screw ETA-13/0523 Ø 5.0 x L [mm]

Threaded nails EN 14592 stainless steel Ø 4.0 x L [mm]

Load directions

F_1 ↑ Lifting load

Design

Load capacities for two rafter anchors, each arranged diagonally.

The load capacities can be doubled when arranging four rafter anchors.

Characteristic raw density of timber min. 350 kg/m³.

Proof of cross-tension according to DIN EN 1995-1-1 8.1.4 must be kept.

The min. edge spacing according to EC 5 must be met.

Steel with indication of the steel quality and zinc coating

Stainless steel

Timber/timber connection

Timber/concrete-connection

Usage class 1
Moisture content in the building materials that corresponds to a temperature of 20° C and a relative humidity of the ambient air that only exceeds a value of 65% for a few weeks per year, e.g. in the case of buildings that are closed on all sides and heated.
Comment: In UC 1, the average moisture content of most softwoods does not exceed 12 %.

Usage class 2
Moisture content in the building materials that corresponds to a temperature of 20° C and a relative humidity of the ambient air that only exceeds a value of 85% for a few weeks per year, e.g. in the case of open buildings covered by a roof.
Comment: In UC 2, the average moisture content of most softwoods does not exceed 20 %.

Usage class 3
Includes climatic conditions that lead to higher moisture contents than in UC 2, e.g. structures that are exposed to the weather without protection. Eurocode 5 / DIN EN 1995-1-1 section 2.3.1.3

RAFTER ANCHORS

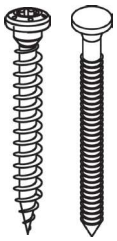
APPLICATIONS

Application:
To secure lifting loads

Materials:

250 GD Z275

Material thickness:
1.5/2.0 mm



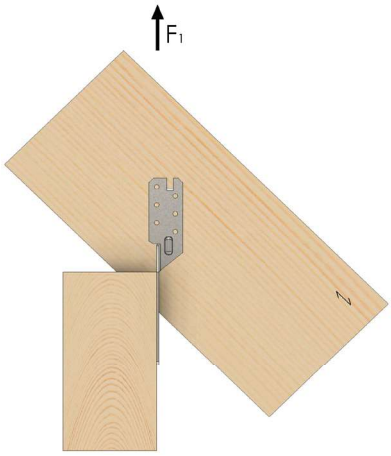
Connecting element:
GH threaded nails 4.0 x 40 / 50 / 60 / 75 / 100 mm
GH screws 5.0 x 25 / 35 / 40 / 50 / 60 / 70 mm

Connecting elements from page 274

For use in usage classes

NKL 1 NKL 2 NKL 3

Load directions



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RAFTER ANCHORS

TYPE RLD

1. Assembly mandrel (your third hand in assembly)
2. Same product on the right and left side of the rafter
3. For use in every rafter angle
4. Patent-protected shape
5. Optimised nail pattern
6. Optionally in GREENLINE = resource-saving manufacturing

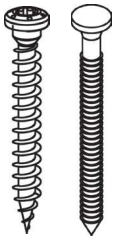
FOR LEFT OR RIGHT-HAND USE - IN EVERY RAFTER ANGLE

ADVANTAGES

- Fast and precise adjustment due to assembly mandrel
- Simple processing in every rafter angle
- Only one product for the left and right side of the rafter
- Quick processing due to the optimally coordinated nail pattern
- No improvement work on the building site

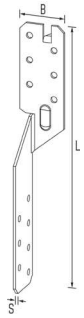
FASTENING ELEMENTS

- GH threaded nail or GH screws



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

Connecting elements from page 274



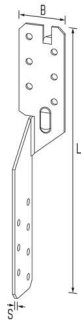
TOPLINE GREENLINE ETA-10 0007

NKL 2 350 GD Z275

RAFTER ANCHORS

TYPE RL-D GREENLINE

Art. No.	Dimensions [mm]					nN	EAN	Weight	Pallet	PU		
	L	x	W(B)	x	T(S)	Ø 5	4019346	kg				
100501RLD15	170	x	36	x	1,5	9	026007	0.060	4200	100	■	
100502RLD15	210	x	36	x	1,5	13	026014	0.070	4200	100	■	
100503RLD15	250	x	36	x	1,5	17	026021	0.093	4200	100	■	



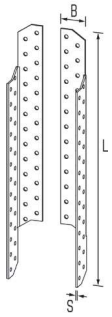
TOPLINE ETA-10 0007

NKL 2 250 GD Z275

RAFTER ANCHORS

TYPE RL-D

Art. No.	Dimensions [mm]					nN	EAN	Weight	Pallet	PU		
	L	x	W(B)	x	T(S)	Ø 5	4019346	kg				
100501RLD	170	x	36	x	2,0	9	115244	0.080	4200	100	■	
100502RLD	210	x	36	x	2,0	13	115251	0.104	4200	100	■	
100503RLD	250	x	36	x	2,0	17	115275	0.124	4200	100	■	



ETA-10 0007

NKL 2 250 GD Z275

RAFTER ANCHORS

Art. No.	Dimensions [mm]					nN	EAN	Weight	Pallet	PU		
	L	x	W(B)	x	T(S)	Ø 5	4019346	kg				
100504	290	x	34,5	x	2,0	2x22	115138	0.202	3900	100	■	
100505	330	x	34,5	x	2,0	2x26	115145	0.235	3000	100	■	
100506	370	x	34,5	x	2,0	2x30	115152	0.274	3000	100	■	

Rafter anchors are used for intersecting timbers, e.g. purlin roofs, or for other sloping roofs.
Horizontal forces can also be absorbed.

TYPE RL-D GREENLINE

Timber / Timber

Art. No.	L	W(B)	T(S)	n_a Ø 5	Connecting element	$F_{Z,Rk}$
100501RLD15	170	36	1,5	4 + 5	4,0x40 / 5,0x40	7,70
100502RLD15	210	36	1,5	6 + 7	4,0x40 / 5,0x40	7,70
100503RLD15	250	36	1,5	8 + 9	4,0x40 / 5,0x40	7,70

TYPE RL-D

Timber / Timber

Art. No.	L	W(B)	T(S)	n_a Ø 5	Connecting element	$F_{Z,Rk}$
100501RLD	170	36	2,0	4 + 5	4,0x40 / 5,0x40	7,70
100502RLD	210	36	2,0	6 + 7	4,0x40 / 5,0x40	7,70
100503RLD	250	36	2,0	8 + 9	4,0x40 / 5,0x40	7,70

Timber / Timber

Art. No.	L	W(B)	T(S)	n_a Ø 5	Connecting element	$F_{Z,Rk}$
100504	290	34,5	2,0	10 + 10	4,0x40 / 5,0x40	10,20
100505	330	34,5	2,0	12 + 12	4,0x40 / 5,0x40	10,20
100506	370	34,5	2,0	14 + 14	4,0x40 / 5,0x40	10,20

TRUSS CLIPS

TECHNICAL FEATURES

Geometry

W(B)	Width [mm]
L	Length [mm]
H	Height [mm]
T(S)	Material thickness [mm]

Tables

n_N	Number of nails in baseplate
n_{Bo}	Number of bolts in baseplate
αΔN	Rafter angle [°]
KLED	Class of load impact duration

Timber connecting element

GH threaded nails ETA-13/0523 Ø 4.0 x 40/60 (mm)
GH screws 5.0 x 40 mm
Bolt, dowel or concrete anchor M16

Design

$F_{,Rk}$	Design value [kN] of the load capacity of normal rafter force (1) that can be absorbed
a.	Normal force [kN] neglecting the influence of the contact force
b.	Normal force [kN] taking into account the contact force (c.); press length surface of 20 mm
c.	Normal force [kN] taking into account the contact force (c.); press length surface of 40 mm

Steel with indication of the steel quality and zinc coating

Timber/timber connection

Timber/concrete-connection

Usage class 1
Moisture content in the building materials that corresponds to a temperature of 20° C and a relative humidity of the ambient air that only exceeds a value of 65% for a few weeks per year, e.g. in the case of buildings that are closed on all sides and heated.
Comment: In UC 1, the average moisture content of most softwoods does not exceed 12 %.

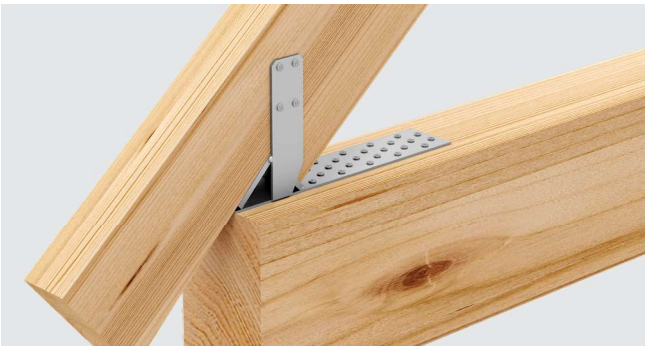
Usage class 2
Moisture content in the building materials that corresponds to a temperature of 20° C and a relative humidity of the ambient air that only exceeds a value of 85% for a few weeks per year, e.g. in the case of open buildings covered by a roof.
Comment: In UC 2, the average moisture content of most softwoods does not exceed 20 %.

Usage class 3
Includes climatic conditions that lead to higher moisture contents than in UC 2, e.g. structures that are exposed to the weather without protection. Eurocode 5 / DIN EN 1995-1-1 section 2.3.1.3

TRUSS CLIPS

APPLICATIONS

Application:
Truss clips are used to transfer the normal and shear forces from rafters to the timber or concrete substructure.

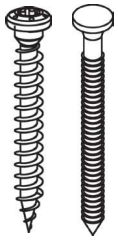


Materials:

250 GD Z275

S235 JR 55µm

Material thickness:
2.5 mm



Connecting element:

GH threaded nails 4.0 x 40 mm
GH screws 5.0 x 40 mm
Bolt, dowel or concrete anchor M16

For use in usage classes

NKL 1 NKL 2

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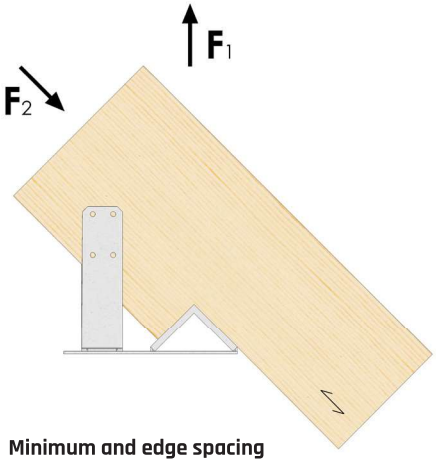
Load directions

The load is primarily introduced via two pressing surfaces.

Press surface 1 is formed between the end grain surface and steel bracket. The normal forces from the rafter are transferred to the angle via the end grain surface. The angular deviation between the perpendicular to the bracket surface and the grain direction of the rafter (for roof pitches α DN≠45°) generates a deflection force, which must also be introduced into the connector by pressing via pressing surface 2 or via the nails in the vertical leg of the truss clip. Some of these deflection forces are also overpressurised.

Press surface 2 is formed between the top edge of the beam position/Concrete ceiling or the rafter holder and the bottom edge of the rafter. Additional suction loads can be absorbed by the vertical legs of the truss clip, provided the legs are nailed with comb nails 4 x 40 mm.



Minimum and edge spacing
Minimum spacing according to Eurocode 5 must be observed.

Connection to timber
The holes of vertical tabs must be fully filled with nails. With a lower number of nails, the load capacity must be reduced linearly. Necessary contact force according to type statics; if the contact force is lower, the normal force increase must be reduced linearly according to the contact force difference. The load capacities only apply in combination with GH threaded nails 4.0 x 400 mm.

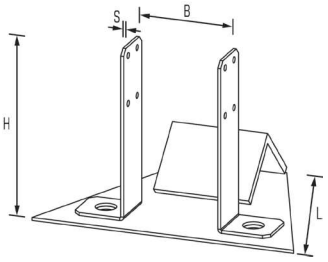
Connection to concrete/ steel
The type B connection is made using bolts, dowels or concrete anchors M16. Proof of fastening in concrete or to rail systems must be provided separately, depending on the manufacturer.

Design tables
The load capacities listed in the tables were determined assuming usage classes 1 and 2 and material quality C24 or GL24c.

Calculation of the design value of load capacities according to DIN 1052:2008.12 and approval
All calculations and values are exclusively for GH products and their connecting elements. The load capacities were calculated on the basis of the corresponding approval and the specifications contained therein. Transfer of the values to other makes is not possible.

TRUSS CLIP

TYPE CONCRETE



ETA-08 0264

NKL 2

S235 JR 55µm

Art. No.	Dimensions [mm]					nN	n	EAN	Weight	Pallet	PU		
	W(B)	x	L	x	T(S)	Ø 5	Ø 17	4019346	kg				
21100	60	x	170	x	2,5	8	2	155080	1.020	360	15		■
21101	80	x	170	x	2,5	8	2	155035	1.200	360	15		■
21102	100	x	170	x	2,5	8	2	155042	1.350	360	15		■
21103	120	x	170	x	2,5	8	2	155066	1.500	240	10		■

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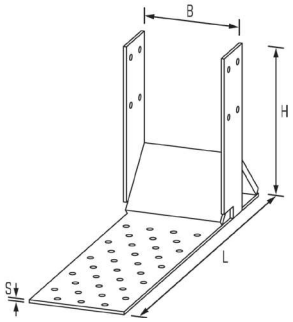
TRUSS CLIP

TYPE TIMBER



ETA-08 0264

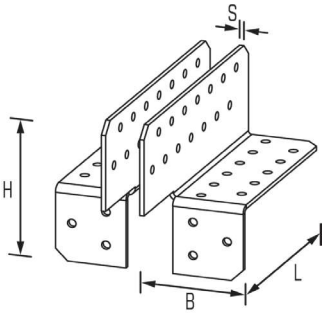
NKL 2

S235 JR 55µm

Art. No.	Dimensions [mm]							nN	EAN	Weight	Pallet	PU		
	W(B)	x	L	x	H	x	T(S)	Ø 5	4019346	kg				
22100	60	x	300	x	140	x	2,5	8+25	155059	1.150	480	20	■	
22101	80	x	300	x	140	x	2,5	8+35	155011	1.310	240	10	■	
22102	100	x	300	x	140	x	2,5	8+45	155028	1.470	240	10	■	
22103	120	x	300	x	140	x	2,5	8+55	155073	1.620	240	10	■	

TRUSS CLIP

TYPE 2-PIECE



ETA-08 0264

NKL 2

250 GD Z275

Art. No.	Dimensions [mm]					nN	EAN	Weight	Pallet	PU		
	W(B)	x	L	x	T(S)	Ø 5	4019346	kg				
23101	160	x	60	x	2,5	8	155004	0.600	1200	25	■	

TYPE CONCRETE

Timber / Concrete

Art. No.	H	L	W(B)	T(S)	αΔN°	n_{Bo} ø17	KLED medium a. $F_{,Rd}$	b. $F_{,Rd}$	c. $F_{,Rd}$
21100	140	170	60	2,5	60	2	11,50	17,70	21,30
21101	140	170	80	2,5	60	2	15,30	23,70	28,40
21102	140	170	100	2,5	60	2	19,10	29,60	35,50
21103	140	170	120	2,5	60	2	22,90	35,50	42,60

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TYPE TIMBER

Timber / Timber

Art. No.	H	L	W(B)	T(S)	αΔN°	n_N ø5	KLED medium a. $F_{,Rd}$	b. $F_{,Rd}$	c. $F_{,Rd}$
22100	140	300	60	2,5	60	6	11,50	17,70	21,30
22101	140	300	80	2,5	60	8	15,30	23,70	28,40
22102	140	300	100	2,5	60	10	19,10	29,60	35,50
22103	140	300	120	2,5	60	12	22,90	35,50	42,60