Connecting systems

for modern timber construction engineering

Certainly a great connection.

knapp-connectors.com/megant

KNAPP®
connectors.com

Friedrich Knapp
Company founder

Welcome to the World of KNAPP®!

As a producer of patented connecting systems we develop and produce high-quality products which are distributed worldwide. Not only will our connecting systems convince – but also inspire you with the wide range of applications. The comprehensive service offers you the possibility to find the best, the most efficient and innovative solution for the realisation of your products. On the following pages you will find our connector systems for modern timber engineering.

MEGANT® | The heavy-duty connector for timber construction engineering up to 500 kN

System advantages:

- Load range - standard sizes up to 341 kN, customized solutions up to 500 kN
- Minimum timber width ≤ 100 mm
- Connection options – on wood, steel or concrete
- Unique – mounting possible from all directions without tilting
- Loadable in all directions
- Fire protection – three sided concealed jointless installation
- Short crane times by a high degree of prefabrication – only 2 cm hooking way
- Dismountable - installed to connect and rebuild

Installation example with MEGANT®:
No reduction of the main beam.

No tilting when mounting!

Threaded rod with washers and hex nuts.

Profiled base plates made of aluminium with fastening holes at 45° and 90°.

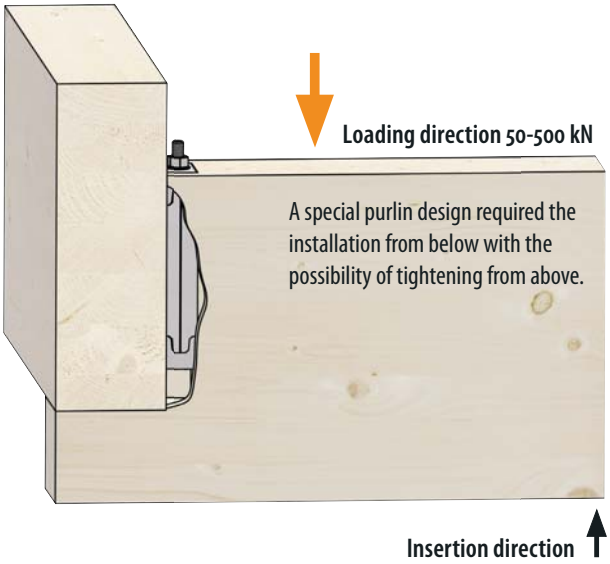
Conical clamping aluminium caps for closed joints in the connection area. Additional mounting holes for easy installation and high horizontal loads.

MEGANT® 290x60x40 | MEGANT® 405x60x40 | MEGANT® 520x60x40 | MEGANT® 290x100x40 | MEGANT® 405x100x40 | MEGANT® 520x100x40 | MEGANT® 280x150x50 | MEGANT® 430x150x50 | MEGANT® 550x150x50

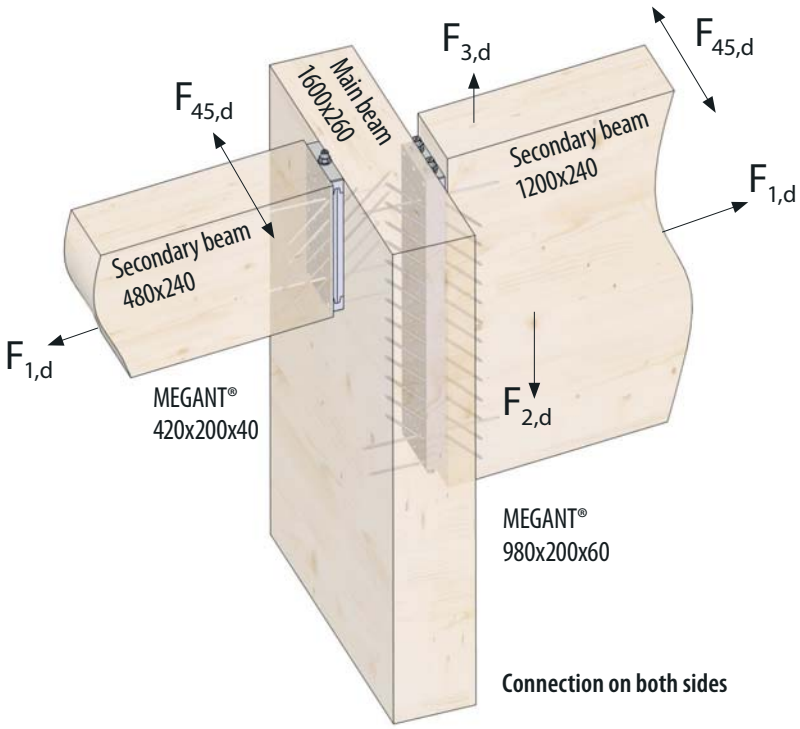
More information:
www.knapp-connectors.com/megant

MEGANT®

Application examples and connection details

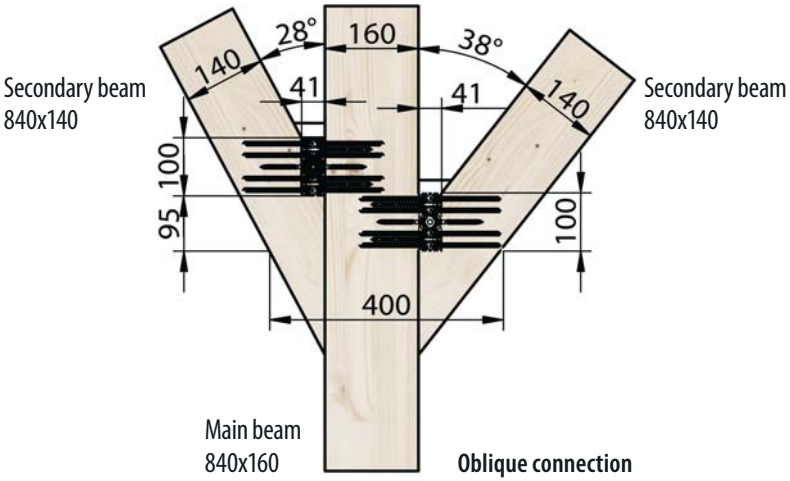


Concealed mounting on three sides by milling the secondary beam and visible mounting on main beam.



Connection finished: The secondary beams are placed in the clamping jaws.

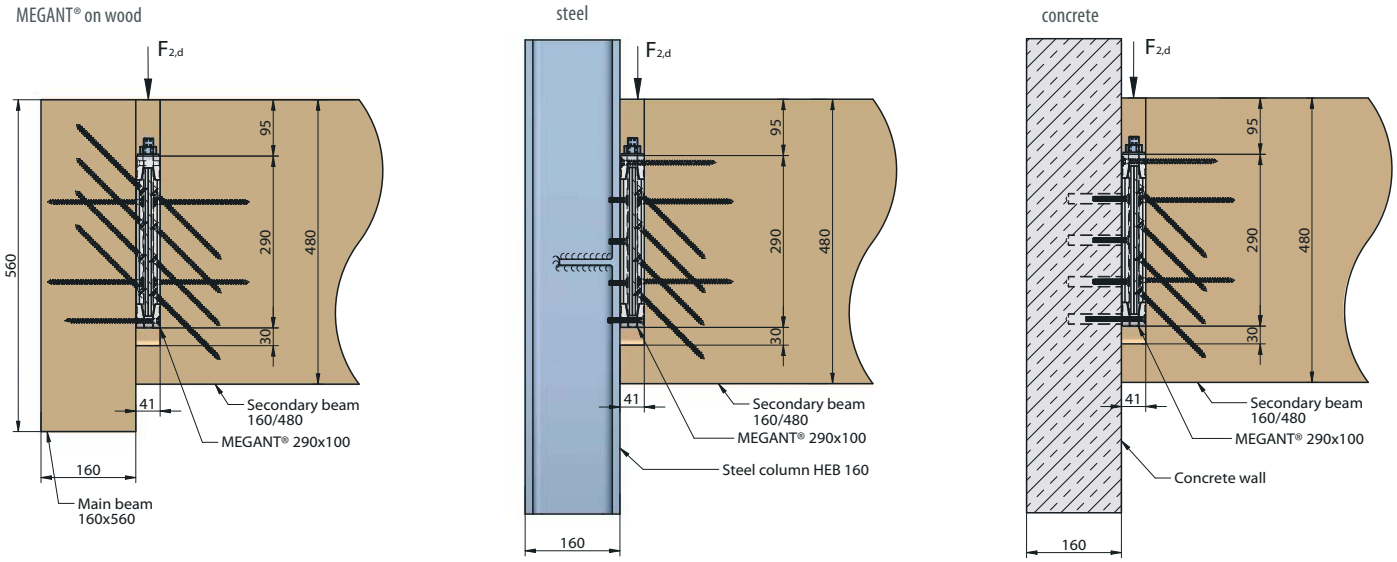
With only 2 cm hooking way, a mounting in cutouts of concrete walls can be done.



MEGANT® oblique connection.

MEGANT®

Example of applications and connection details



MEGANT®

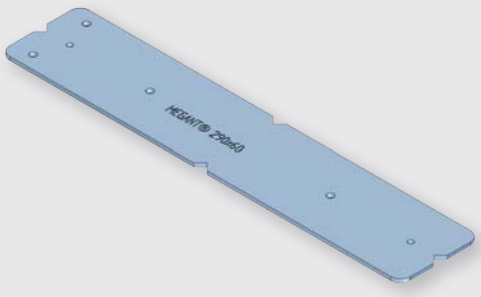
Fire protection

- Is an invisible connection required or particular requirements for fire protection, the system can be easily processed on 3 sides covered.
- Jointless connection - no additional covers or fire protection ribbons required.
- According to DIN4102-2 20 mm wood covering are required for 30 minutes fire resistance. Even a higher fire resistance (i.e. R60) is possible.

MEGANT® drilling-jig

MEGANT®

Art.-Nr. K08030663/00001	Drilling-jig MEGANT® 290x60x40
Art.-Nr. K08030664/00001	Drilling-jig MEGANT® 405x60x40
Art.-Nr. K08030665/00001	Drilling-jig MEGANT® 520x60x40
Art.-Nr. K08030666/00001	Drilling-jig MEGANT® 290x100x40
Art.-Nr. K08030667/00001	Drilling-jig MEGANT® 405x100x40
Art.-Nr. K08030668/00001	Drilling-jig MEGANT® 520x100x40
Art.-Nr. K08030669/00001	Drilling-jig MEGANT® 280x150x50
Art.-Nr. K08030670/00001	Drilling-jig MEGANT® 430x150x50
Art.-Nr. K08030671/00001	Drilling-jig MEGANT® 550x150x50



Application:	For an exact predrilling of the positioning screwing.

MEGANT® screws

CS-screws with cut point (MEGANT® is supplied with the appropriate CS-screws)

Art.-No. Z581 CS-screw 8x160 with patented half-peak

Application: For the positioning and slanted screwing as well as mounting of the clamping jaw of MEGANT ®.

MEGANT®

Overview, static values

MEGANT® 60 - Static values with screws 8x160 in timber quality GL24h

Connector	Min. secondary beam height [mm]	Characteristic values [kN]			
		max $F_{1,Rk}$	max $F_{2,Rk}$	max $F_{3,Rk}$	max $F_{45,Rk}$
290x60x40	104x440	12,8	81	24,6	45,5
405x60x40	104x520	10,4	116	35,4	
520x60x40	104x640	7,5	129	45,9	

MEGANT® 100 - Static values with screws 8x160 in timber quality GL24h

Connector	Min. secondary beam height [mm]	Characteristic values [kN]			
		max $F_{1,Rk}$	max $F_{2,Rk}$	max $F_{3,Rk}$	max $F_{45,Rk}$
290x100x40	142x440	23,9	116	35,4	65,6
405x100x40	142x520	23,9	167	51,0	
520x100x40	142x640	23,9	211	66,1	

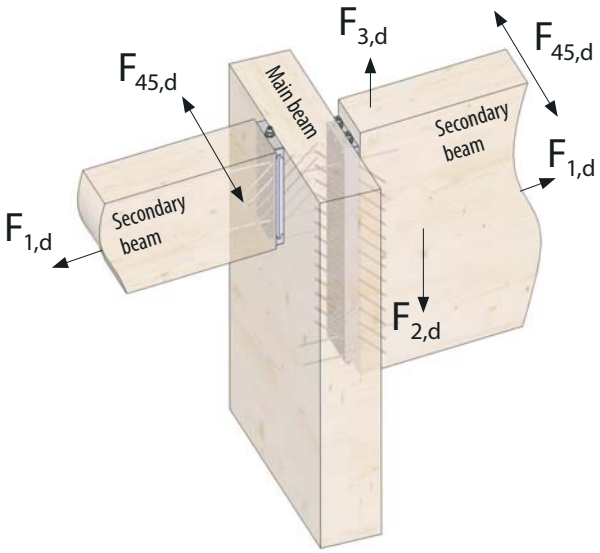
MEGANT® 150 - Static values with screws 8x160 in timber quality GL24h

Connector	Min. secondary beam height [mm]	Characteristic values [kN]			
		max $F_{1,Rk}$	max $F_{2,Rk}$	max $F_{3,Rk}$	max $F_{45,Rk}$
280x150x50	194x360	33,8	109	35,4	65,6
430x150x50	194x520	33,8	204	66,1	82,7
550x150x50	194x640	33,8	265	85,7	
Custom solutions of MEGANT® Special sizes on request (Examples on the list)					
720x150x50	194x780	33,8	352	85,7	82,7
830x150x50	194x895	33,8	409		
1060x150x50	194x1125	12,3	521		
1120x150x50	194x1180	7,0	548		

Certificates for F_1 and F_2 must be splitted and not to be combined !

$F_{1,Rk}$ Characteristic values for traction
$F_{2,Rk}$ Characteristic values in direction of insertion
$F_{3,Rk}$ Characteristic values against the direction of insertion
$F_{45,Rk}$ Characteristic values perpendicular to the direction of insertion

A testable structural predimensioning is available upon request from KNAPP®.



Factor f for other timber species			
GL24c	GL24h	GL28h	GL32h
0,94	1,00	1,06	1,10

MEGANT®

Assembly procedure

13:16 | After aligning the secondary beam, MEGANT® is hooked.

13:21 | For threading and dropping, MEGANT® requires only 2 cm.

13:23 | Insert the threaded rods and drill them into the caps.

13:24 | Tighten the nuts.

13:25 | Connection finished.

MEGANT®

Custom solutions for forces up to 500 kN

- Comprehensive advice from your personal contact and our technical department
- Professional support for project-related detailed preparation and static predimensioning
- Create an optional project-based verifiable static

MEGANT® for 420 kN

Example: Storage hall Großarl (A)

Oblique connections

Example: Restaurant Schnepfenried (FR)

Static calculation by external engineering office.

Construction manuals, .DXF drawings for MEGANT® as well as your personal consultant in your area, please visit:
www.knapp-connectors.com/download

RICON® S | The connector for main and secondary beam up to 100 kN*

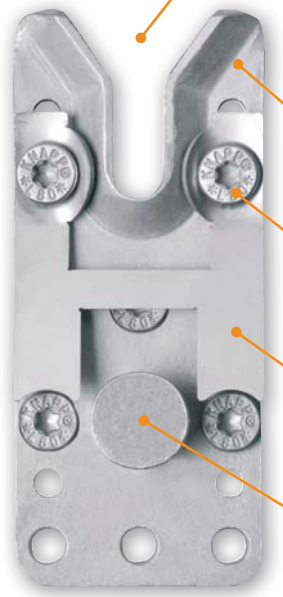
System advantages:

- Connector for timber frame, wood frame buildings and halls
- Timber width from 100 mm upwards
- Universally applicable to timber, steel or concrete
- Simple screwing without predrilling
- Easy hooking by large V-shaping – only 3,5 cm hooking way
- Three- and four-sided concealed connection
- High fire resistence through three- and four-sided concealed mounting
- Adjustable collar bolt up to 5mm length tolerance at full load capacity
- Optional – securing against the insertion direction with clip lock

made in Germany

ETA

CE



The V-shape moulding provides perfect catch of the collar bolt. The strong tension and the short slide-in alleviates the connecting and guarantees joint sealing.

RICON® S is made of premium quality steel, hot-dip galvanized and produced in Germany.

KNAPP® CS-screws with cut point for extra fast starts and screwing. The reinforced shaft provides force-fit connection.

The RICON®S clip lock, made from stainless spring steel, locks the connection against slide-in direction and can optionally be used for stress against slide-in direction or wind suction.

There are different versions of the collar bolt available for RICON® S which offers four different connection options.

RICON® S60 VS 140x60x25

RICON® S60 VS 200x60x25

RICON® S80 VS 200x80x25

RICON® S80 VS 290x80x25

NEW: RICON® S up to 100 kN with welded collar bolt

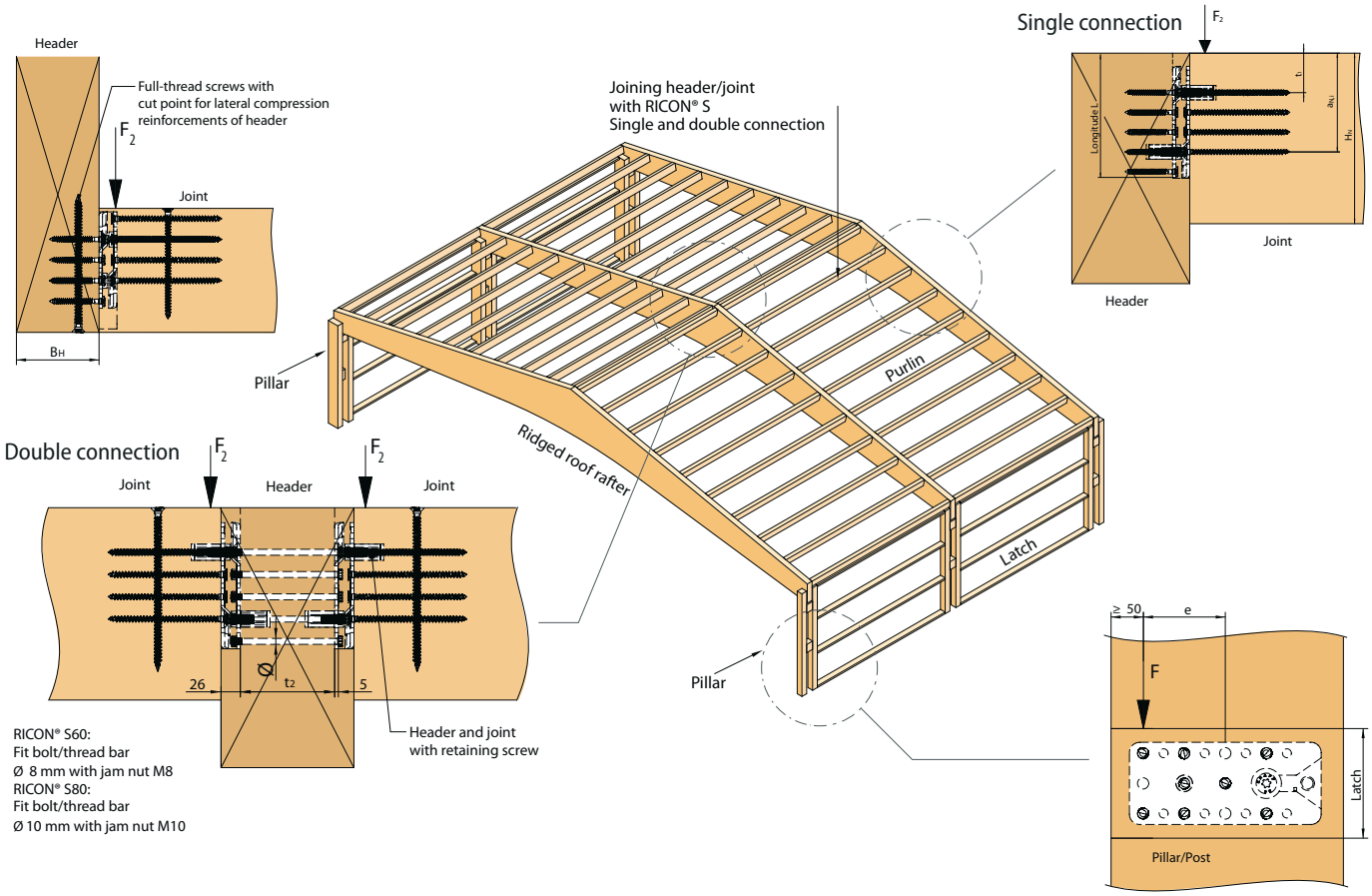
More information:
www.knapp-connectors.com/ricons

*Charact. load carrying capacity $F_{2,Rk}$ in insertion direction applies only to the use of original KNAPP® cs-screws according to ETA 10/0189.

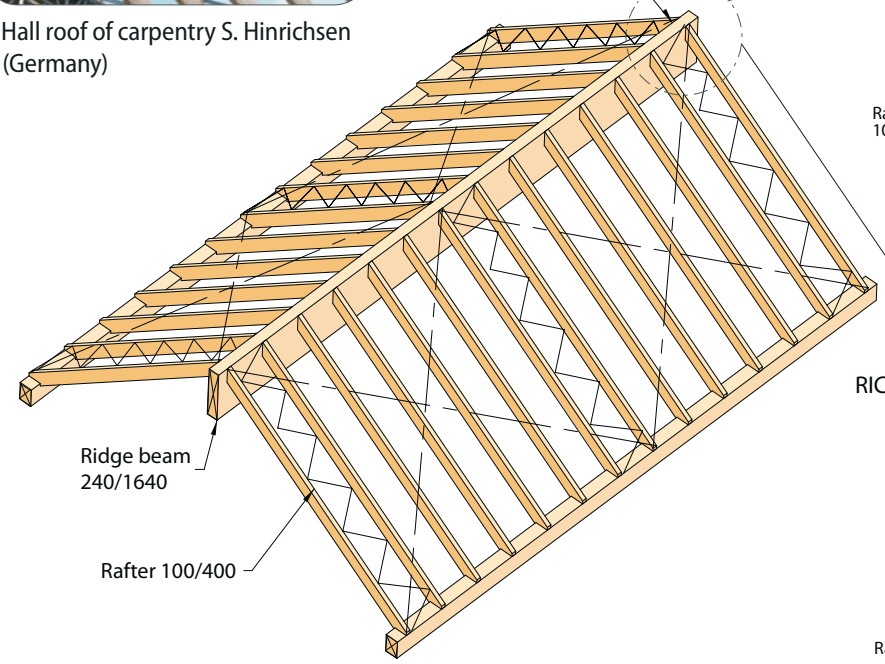
RICON® S

Application examples and connection details

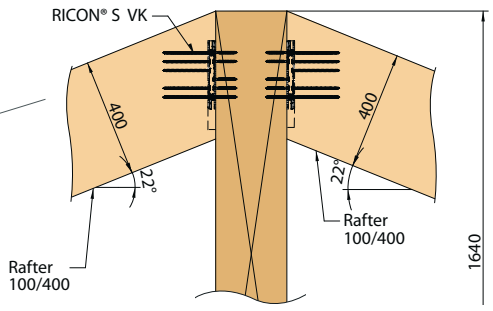
Ridged roof with purlins and latch connections



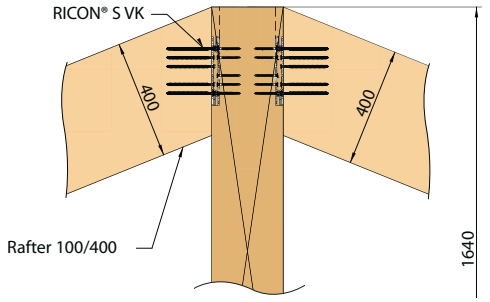
Hall roof of carpentry S. Hinrichsen (Germany)



RICON® S housed into a rafter



RICON® S housed into the ridge beam

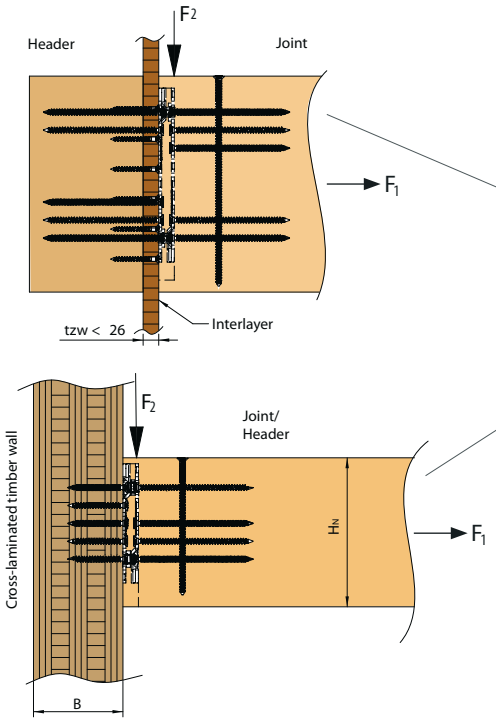


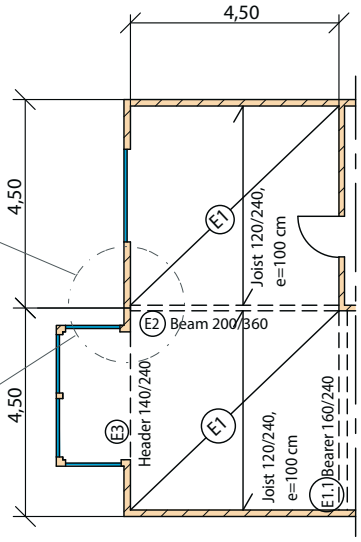
(All dimensions in mm)

RICON® S

Application prefabricated houses

Connecting header with timber frame construction or cross-laminated timber wall



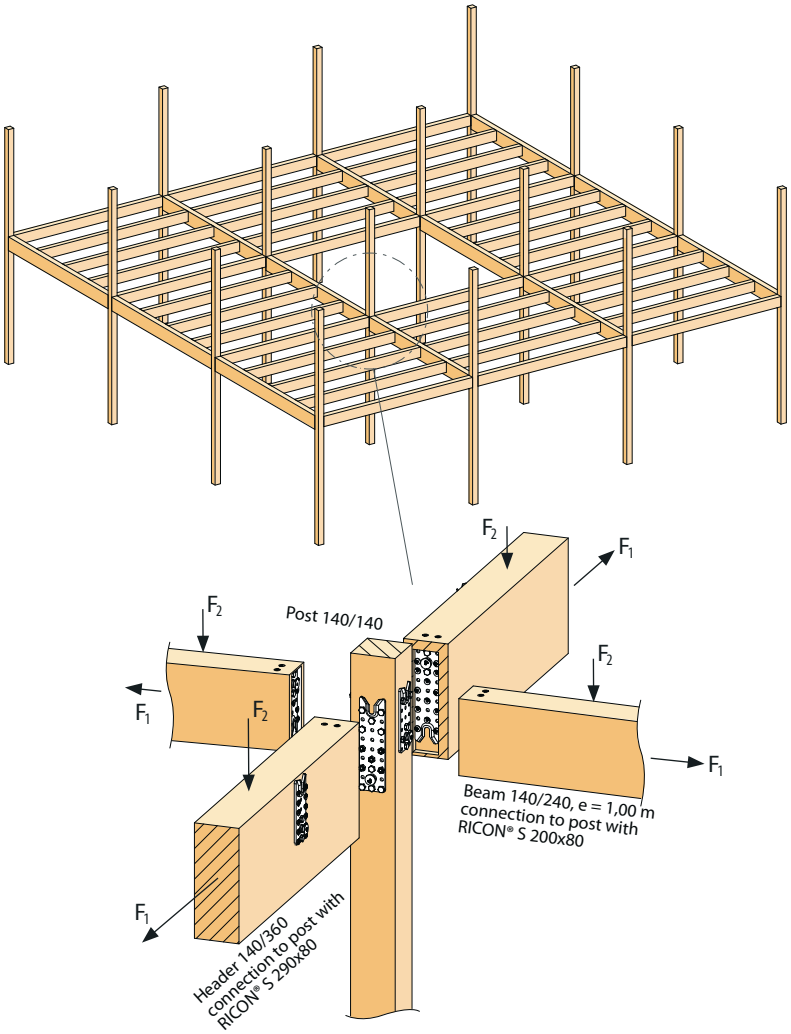


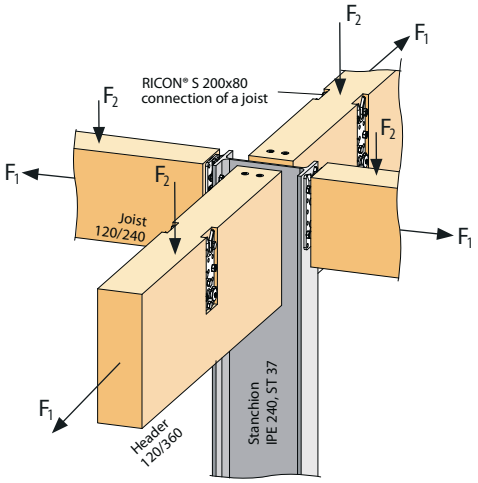
Main floor footprint

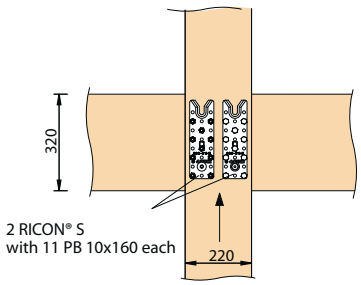
Steel connection

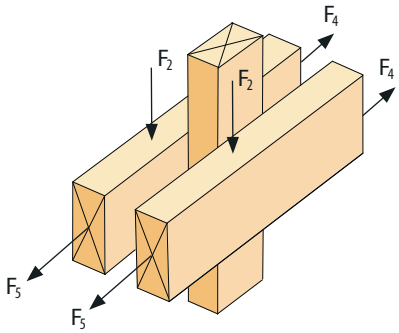
First node for dome

Ceiling of a timber frame construction









Alternative ways to connect

RICON® S60

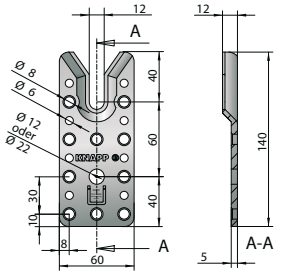
Characteristic values for dimensioning can be taken from the ETA Static Folder.

RICON® S 140/60 - Collar bolts and screwing

Art.-No. **VS:** K126 / **VK:** K130 / **EK:** K146 / **GK:** K134

Header Joint

Minimum screwing : n = 7



RICON® S VS:
Welded collar bolt

Connector	Collar bolt	Screwing Joint	Screwing Header	Charact. values [GL24h] $F_{2,Rk}$ [kN]
140/60	**VS**	10 x CS 8x160	10 x CS 8x80	53,0
140/60	**VK** D12	8 x CS 8x160	8 x CS 8x80	39,8
Available on request:				
140/60	**EK** M12	7 x CS 8x160	7 x CS 8x80	36,0
140/60	**GK** M12	7 x CS 8x160	7 x CS 8x80	36,0
Clip lock: $F_{3,Rk}$ = 18,0 kN				

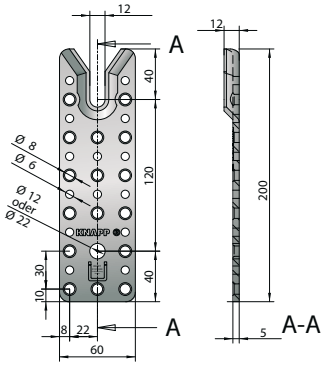
Minimum timber cross section: 100 x 160 mm

RICON® S 200/60 - Collar bolts and screwing

Art.-No. **VS:** K127 / **VK:** K132 / **EK:** K148 / **GK:** K136

Header Joint

Minimum screwing : n = 8



RICON® S VS:
Welded collar bolt

Connector	Collar bolt	Screwing Joint	Screwing Header	Charact. values [GL24h] $F_{2,Rk}$ [kN]
200/60	**VS**	16 x CS 8x160	16 x CS 8x80	60,0
200/60	**VK** D12	9 x CS 8x160	9 x CS 8x80	49,7
Available on request:				
200/60	**EK** M12	8 x CS 8x160	8 x CS 8x80	44,7
200/60	**GK** M12	8 x CS 8x160	8 x CS 8x80	44,7
Clip lock: $F_{3,Rk}$ = 18,0 kN				

Minimum timber cross section: 100 x 220 mm

RICON® S80

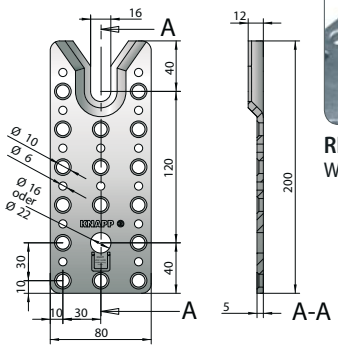
Characteristic values for dimensioning can be taken from the ETA Static Folder.

RICON® S 200/80 - Collar bolts and screwing

Art.-No. **VS:** K128 / **VK:** K138 / **EK:** K153 / **GK:** K142

Header Joint

Minimum screwing : n = 8



RICON® S VS:
Welded collar bolt

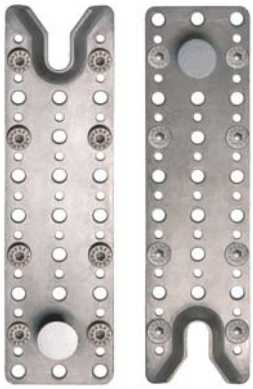
Connector	Collar bolt	Screwing Joint	Screwing Header	Charact. values [GL24h] $F_{2,Rk}$ [kN]
200/80	**VS**	16 x CS 10x200	16 x CS 10x100	100
200/80	**VK** D16	9 x CS 10x200	9 x CS 10x100	70,5
Available on request:				
200/80	**EK** M16	8 x CS 10x200	8 x CS 10x100	63,0
200/80	**GK** M16	8 x CS 10x200	8 x CS 10x100	63,0
Clip lock: $F_{3,Rk}$ = 18,0 kN				

Minimum timber cross section: 120 x 230 mm

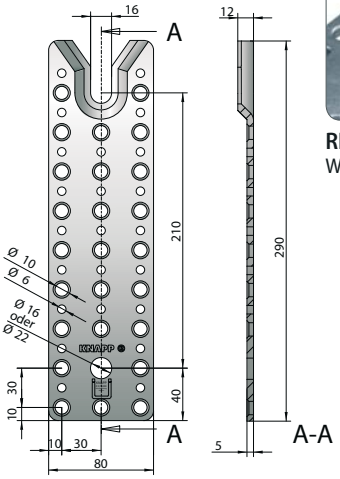
RICON® S 290/80 - Collar bolts and screwing

Art.-No. **VS:** K129 / **VK:** K141 / **EK:** K156 / **GK:** K145

Header Joint



Minimum screwing : n = 8



RICON® S VS:
Welded collar bolt

Connector	Collar bolt	Screwing Joint	Screwing Header	Charact. values [GL24h] $F_{2,Rk}$ [kN]
290/80	**VS**	20 x CS 10x200	20 x CS 10x100	100
290/80	**VK** D16	9 x CS 10x200	9 x CS 10x100	70,5
Available on request:				
290/80	**EK** M16	8 x CS 10x200	8 x CS 10x100	63,0
290/80	**GK** M16	8 x CS 10x200	8 x CS 10x100	63,0
Clip lock: $F_{3,Rk}$ = 18,0 kN				

Minimum timber cross section: 120 x 320 mm

RICON® S

Pre-dimension

Minimum timber cross section for joint for RICON® S connection in reference to uniformly distributed load q_k and span L for glued laminated timber and GL 24 h according DIN 1052 (release 2008) and Eurocode 5

Roofs, rafters, rafter latches

(service classes 1-2, load-duration class: **short-term**) Dead-load g_k (40%) e. g. self-weight and alternating load q_k (60%) e. g. wind, snow, live-load

Span L	Uniformly distributed load q_k					
	q_k = 3,00 kN/m	q_k = 4,00 kN/m	q_k = 5,00 kN/m	q_k = 6,00 kN/m	q_k = 7,00 kN/m	q_k = 8,00 kN/m
	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]
	RICON® S	RICON® S	RICON® S	RICON® S	RICON® S	RICON® S
4,00 m	10/20 140/60	10/22 140/60	10/24 200/60	10/26 200/80	12/26 200/80	12/28 200/80
5,00 m	10/26 200/60	12/26 200/60	12/28 200/60	12/30 200/80	12/32 200/80	12/34 200/80
6,00 m	12/28 200/60	12/32 200/80	12/34 200/80	12/36 200/80	12/38 290/80	12/40 290/80
7,00 m	12/34 200/80	12/36 290/80	12/40 290/80	12/42 290/80	12/44 290/80	
8,00 m	12/38 290/80	12/42 290/80	12/46 290/80	12/48 290/80		

Residential building, ceilings

(service classes 1-2, load-duration class: **medium-term**) Dead-load g_k (40%) e. g. self-weight and alternating load q_k (60%) e. g. wind, snow, live-load

Span L	Uniformly distributed load q_k					
	q_k = 3,00 kN/m	q_k = 4,00 kN/m	q_k = 5,00 kN/m	q_k = 6,00 kN/m	q_k = 7,00 kN/m	q_k = 8,00 kN/m
	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]
	RICON® S	RICON® S	RICON® S	RICON® S	RICON® S	RICON® S
4,00 m	10/20 140/60	10/22 140/60	10/26 200/60	12/26 200/80	12/28 200/80	12/28 200/80
5,00 m	10/26 200/60	12/26 200/60	12/28 200/60	12/32 200/80	12/34 200/80	12/36 200/80
6,00 m	12/28 200/60	12/32 200/80	12/34 200/80	12/38 200/80	12/40 290/80	12/42 290/80
7,00 m	12/34 200/80	12/36 290/80	12/40 R290/80	12/44 290/80		
8,00 m	12/38 290/80	12/42 290/80	12/46 290/80	12/50 290/80		

Storage building, ceilings

(service classes 1-2, load-duration class: **long-term**) Dead-load g_k (40%) e. g. self-weight and alternating load q_k (60%) e. g. wind, snow, live-load

Span L	Uniformly distributed load q_k					
	q_k = 3,00 kN/m	q_k = 4,00 kN/m	q_k = 5,00 kN/m	q_k = 6,00 kN/m	q_k = 7,00 kN/m	q_k = 8,00 kN/m
	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]
	RICON® S	RICON® S	RICON® S	RICON® S	RICON® S	RICON® S
4,00 m	10/22 140/60	10/24 140/60	10/26 200/60	12/26 200/80	12/28 200/80	12/30 200/80
5,00 m	10/26 200/60	12/28 200/60	12/30 200/60	12/34 200/80	12/36 290/80	12/38 290/80
6,00 m	12/28 200/60	12/32 200/80	12/36 200/80	12/40 290/80	12/42 290/80	
7,00 m	12/34 200/80	12/38 290/80	12/42 290/80	12/46 290/80		
8,00 m	12/38 290/80	12/44 290/80	12/48 290/80			

The table values are only to be applied for loading in direction of insertion. The minimum cross section of the secondary beam is calculated for timber C24 (S10). For the connection force of GIGANT, the live load over the bearing was set to 1,0 kN (man load upon the bearing).
Detailed information for static calculation are indicated in the ETA Static Folder. Find more information at www.knapp-verbinder.com/download

RICON® S screws

CS-screws RICON® S60 with cut point (RICON® S will supplied with the appropriate CS-screws)

Art.-No. Z580	CS-screw 8x80 with patented half-peak
Art.-No. Z581	CS-screw 8x160 with patented half-peak

Application: To screw in longitude (8x80) or end grain (8x160).

CS-screws RICON® S80 with cut point (RICON® S will supplied with the appropriate CS-screws)

Art.-No. Z582	CS-screw 10x100 with patented half-peak
Art.-No. Z583	CS-screw 10x200 with patented half-peak

Application: For screwing RICON® S into main (post) or secondary beam (latch).

RICON® S Accessories

Routing-jig RICON® S S60/S80

Art.-No. K510	Routing-jig MULTI F60 (plywood) for all RICON® S60 sizes
Art.-No. K511	Routing-jig MULTI F80 (plywood) for all RICON® S60 sizes
	Advice: The routing-jig MULTI F is suitable for a Ø = 30 mm guide bush (for plunge router) and a Ø = 15 mm TCT router cutter.

Application: For milling in concealed mounting.

TCT router cutter

Art.-No. Z068	TCT router cutter Ø = 15, Length =40 mm and Ø = 12 mm Schaft

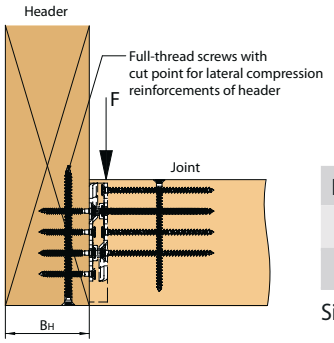
Application: To recess the rebate for RICON® S.

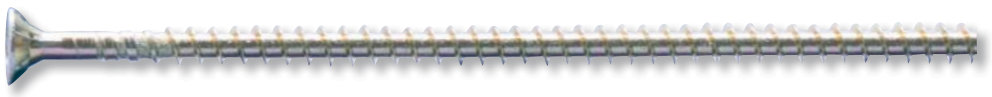
Pan head screws RICON® S80

Art.-No. Z521	PH-screw 10x80
Art.-No. Z522	PH-screw 10x120

Application: For screwing the interlayer on slanted screw connections.

Full threaded CS-screws with cut-point





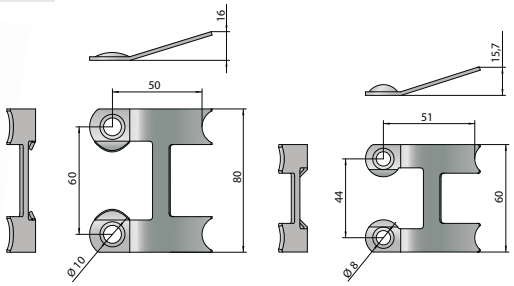
Diameter (d1)	Length (mm)													
Ø = 8 mm	160	180	200	220	240	260	280	300	350	400	450	500	550	600
Ø = 10 mm	160	180	200	220	240	260	280	300	350	400	450	500	550	600

Sizes available on request.

Application: Full threaded countersunk screws for lateral compression reinforcements of header and/or joint.

Clip lock RICON® S (made of stainless spring steel)

Art.-No. K157	Clip lock RICON® S60
Art.-No. K158	Clip lock RICON® S80



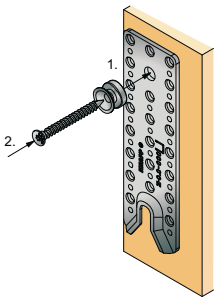
Application: The clip lock locks the connection against slide-in direction and is used for stress against slide-in direction or wind suction.

RICON® S collar bolt

Screwed collar bolt (VK)

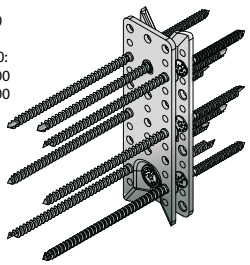
Art.-No. Z595	S80: VK D16
Art.-No. Z594	S60: VK D12

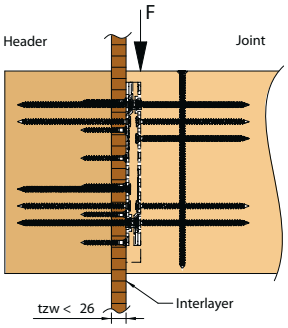
1. Position collar bolt into the provided hole
2. Fasten collar bolt with full threaded CS-screw



Necessary screws :
RICON® S60:
HT: 8x80
NT: 8x160

RICON® S80:
HT: 10x100
NT: 10x200



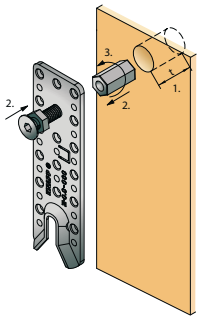


Application: Screwed collar bolt for fast and direct screwing, especially on interlayers.
Hint: This way of connection requires very accurate rebate depth (no tolerances).

Retaining screw collar bolt (EK)

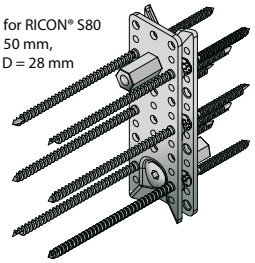
Art.-No. Z558	S60: EK M12
Art.-No. Z559	S80: EK M16

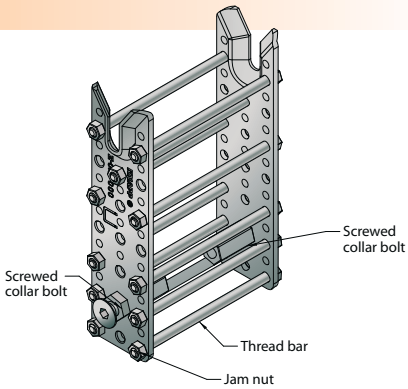
1. Bore blind hole
2. Fasten socket head screw with coupling nut and jam nut to the connector
3. Adjust height and tighten up
4. Plug connectors in blind hole and fasten with RICON® S CS-screws



Blind hole for RICON® S60
Depth: t = 40 mm,
Diameter: D = 22 mm

Blind hole for RICON® S80
Depth: t = 50 mm,
Diameter: D = 28 mm



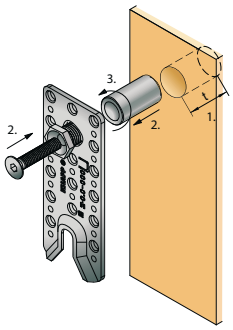


Application: Retaining screw collar bolt for connections to concrete and/or wood components for timber engineering.
Coupling nuts are used to connect pieces of threaded rod, anchor bolt or connecting bolts.

Spring retaining screw collar bolt (GK)

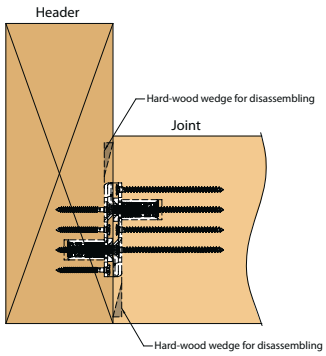
Art.-No. Z592	S60: GK M12
Art.-No. Z593	S80: GK M16

1. Bore blind hole
2. Fasten socket head screw with flansh nut and spring bolt housing on the connector
3. Plug connector in blind hole and fasten with RICON® S CS-screws



Blind hole for RICON® S60
Depth: t = 60 mm,
Diameter: D = 30 mm

Blind hole for RICON® S80
Depth: t = 70 mm,
Diameter: D = 35 mm



Application: Spring retaining holding screw for the installation of components in-between two fixed parts (such as header latches or pillars).

RICON® S

Fire resistance

- Is an invisible connection required or particular requirements for fire protection, the system can be easily processed on three- or four-sides covered.
- Jointless connection – no additional covers or fire protection ribbons required.
- According to DIN4102-2 20 mm wood covering are required for 30 minutes fire resistance. Even a higher fire resistance (for example R60) is possible.

RICON® S

Installation

- Routing machine with KNAPP® routing-jig.
- Installation with CNC joinery machine possible – all data for the standard CNC joinery machine programms are included.

CNC joinery machine

1) Routing with routing-jig and routing machine.

Routing dimensions for RICON® S60 / S80				
Width	Length	Depth (VK, EK)	Depth (GK)	
			End grain	Longitudinal
60 mm / 80 mm	var.	25 mm	13 mm	13 mm

Installation RICON® S VS

2) Position the screws

3) Screw on

4) Screw on counter part

Installation RICON® S VK

2) Position the screws

3) Screw on

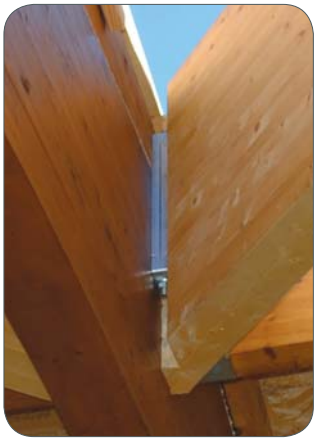
4) Screw on counter part

Construction manuals, .DXF drawings for RICON® S-System as well as your personal consultant in your area, please visit:
www.knapp-connectors.com/download

Recommended software partners for machine processing: cadwork Dietrich's

RICON®, RICON® S, GIGANT

Selected reference project



Object: Sanierung eines Restaurants in Schnepfenried/Frankreich; **Building:** 70ger Jahre; **Redevelopment:** 2012-2013; **Client:** SMA Syndicat mixte d'aménagement des stations de montagne de la vallée de Munster, F-68140 Munster; **Architect:** Ateliers d-Form, F-68230 Soultzbach Les Bains, www.atelier-d-form.com; **Static:** Optime Ingénierie, 68230 Soultzbach Les Bains, contact@optime-be.com, **Structural Engineer:** Dattler, 20 rue des Prés, 68640 Feldbach, www.dattler.fr; **Modded surface:** 1050 m²; **Usable area:** 1050 m²

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