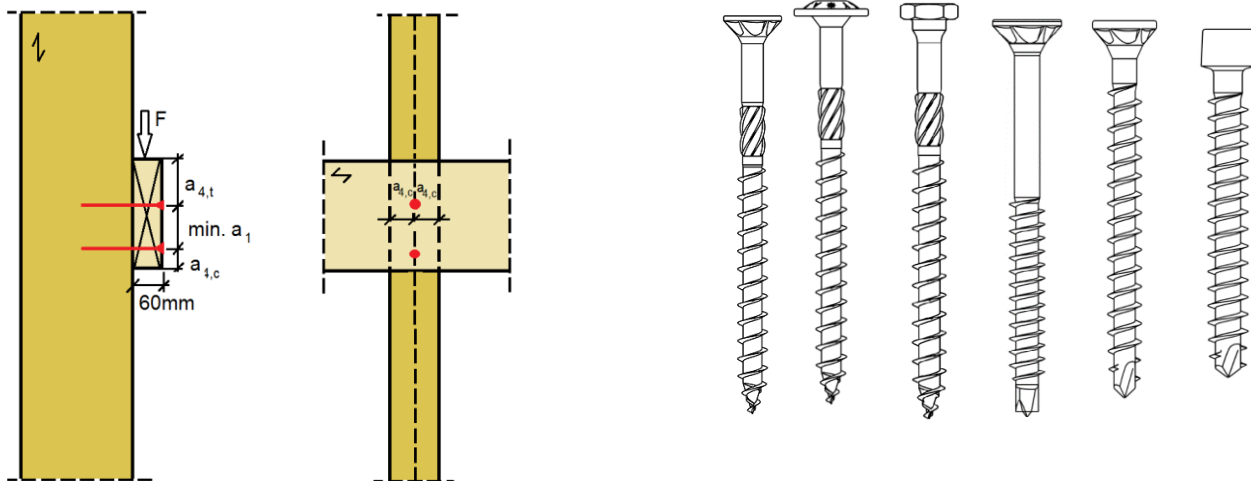
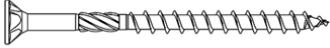
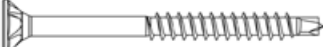

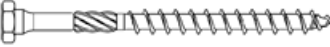






EDGE BEAM CONNECTION FOR ASSY[®] SCREWS WOOD-WOOD



**CONNECTS THE WOOD -
INSTEAD OF SPLITTING IT**

TABLE OF CONTENTS

Determining values		Page 3
Using the table values		Page 7
Edge beam connection 90° with ASSY screws with partial thread		
C24 + screws with partial thread		Page 9
C24 + screws with partial thread + carrier		Page 10
BSH GL 24h + screws with partial thread + carrier	 	Page 11
Edge beam connection 45° with ASSY plus VG		
C24 + full thread screws + carrier		Page 12
BSH GL 24h + full thread screws + carrier		Page 13
Edge beam connection 45° with ASSY plus VG with intermediate layer		
C24 + full thread screws	 	Page 14
Edge spacings		Page 16

NOTE: These are planning aids. These values must be measured by authorized persons for each project.

DETERMINING THE TABLE VALUES FOR ASSY SCREWS 90°

Boundary conditions

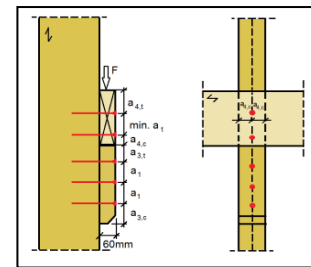
The example calculation is based on ETA-11/0190 and DIN EN 1995-1-1. This example assumes a connection between C24 wood and C24 wood where an edge beam is connected to a wood frame wall. For better load distribution, a carrier is attached to the underside where the screws are introduced under an angle of 90°. The used fasteners are Würth ASSY 3.0 8x160mm. The table does not include the tipping effects of the edge beam. This must be analyzed separately.

Edge beam

Width =	60 mm
Height =	240 mm
$\rho_{k,1}$ =	350 kg/m ³
t_1 =	60 mm

Stand

Width =	60 mm
Height =	200 mm
$\rho_{k,2}$ =	350 kg/m ³
t_2 =	100 mm



Würth ASSY 3.0 Ø8x160 mm (not predrilled)

d =	8 mm	"Screw diameter"
l_g =	160 mm	"Thread length"
d_h =	14.85 mm	"Head diameter"
$M_{y,Rk}$ =	20000 Nmm	"Characteristic yield moment [Annex 1 Table 1.1]"
$f_{ax,k}$ =	11 N/mm ²	"Characteristic pull-out parameter [A.1.3.1]"
$f_{h,k,1}$ =	15.38 N/mm ²	"Bearing strength [A.1.2.2] component 1"
$f_{h,k,2}$ =	15.38 N/mm ²	"Bearing strength [A.1.2.2] component 2"
β =	1,0	"Ratio of the two bearing strengths"

Data according to ETA-11/0190 and corresponding product details

Pullout strength

α =	90°	"Angle between screw axis and direction of grain"
k_{ax} =	1,00	"Factor [A.1.3.1]"
$f_{head,k}$ =	10 N/mm ²	"Head pull-through parameter [A.1.3.2]"
$f_{tens,k}$ =	20000 N	"Characteristic tensile strength [Annex 1 Table 1.1]"
l_{ef} =	80 mm	"Effective thread length in wood (t_2)"
$F_{ax,\alpha,Rk,1}$ =	7040 N	$= k_{ax} \times f_{ax,k} \times d \times l_{ef} \times \left(\frac{\rho_k}{350}\right)^{0,8}$
$F_{ax,\alpha,Rk,2}$ =	2867 N	$= F_{ax,\alpha,Rk,2} = f_{head,k} \times d_h^2 \times \left(\frac{\rho_k}{350}\right)^{0,8}$
$F_{ax,\alpha,Rk,3}$ =	20000 N	"Characteristic tensile strength [Annex 1 Table 1.1]"
$F_{ax,\alpha,Rk}$ =	2867 N	"Minimum pullout strength"

Data according to ETA-11/0190 and corresponding product details

NOTE: These are planning aids. These values must be measured by authorized persons for each project.

DETERMINING THE TABLE VALUES FOR ASSY SCREWS 90°

Calculation according to DIN EN 1995-1-1 8.2.2

$$\begin{aligned}
 \text{a) } 7382 \text{ N} &= f_{h,1,k} \times t_1 \times d \\
 \text{b) } 14765 \text{ N} &= f_{h,2,k} \times t_2 \times d \\
 \text{c) } 5733 \text{ N} &= \frac{f_{h,1,k} \times t_1 \times d}{1 + \beta} \left[\sqrt{\beta + 2\beta^2 \left[1 + \frac{t_2}{t_1} + \left(\frac{t_2}{t_1} \right)^2 \right] + \beta^3 \left(\frac{t_2}{t_1} \right)^2} - \beta \left(1 + \frac{t_2}{t_1} \right) \right] + \frac{F_{ax,Rk}}{4} \\
 \text{d) } 3639 \text{ N} &= 1,05 \frac{f_{h,1,k} \times t_1 \times d}{2 + \beta} \left[\sqrt{2\beta(1 + \beta) + \frac{4\beta(2 + \beta) \times M_{y,Rk}}{f_{h,1,k} \times d \times t_1^2}} - \beta \right] + \frac{F_{ax,Rk}}{4} \\
 \text{e) } 6058 \text{ N} &= 1,05 \frac{f_{h,1,k} \times t_2 \times d}{1 + 2\beta} \left[\sqrt{2\beta^2 \times (1 + \beta) + \frac{4\beta(1 + 2\beta) \times M_{y,Rk}}{f_{h,2,k} \times d \times t_2^2}} - \beta \right] + \frac{F_{ax,Rk}}{4} \\
 \text{f) } \mathbf{3268 \text{ N}} &= 1,15 \sqrt{\frac{2\beta}{1 + \beta}} \sqrt{2M_{y,Rk} \times f_{h,1,k} \times d} + \frac{F_{ax,Rk}}{4}
 \end{aligned}$$

$$F_{v,Rk} = \mathbf{3268 \text{ N}}$$

Design situation according to DIN EN 1995-1-1

Utilization class =	1	"Utilization class [2.3.1.3]"
KLED =	medium	"Load duration class [Table 2.2]"
k_{mod} =	0,8	"Modification factor [Table 3.1]"
γ_M =	1,3	"Part safety coefficient [Table 2.3]"

$$F_{v,Rd} = \mathbf{2011 \text{ N}} = \mathbf{2.01 \text{ kN}} = \frac{F_{v,Rk} \times k_{mod}}{1,3}$$

$$F_{ax,Rd} = \mathbf{1764 \text{ N}} = \mathbf{1.76 \text{ kN}} = \frac{F_{ax,Rk} \times k_{mod}}{1,3}$$

3 screws in edge beam

a_1 =	80 mm	"Spacing between each other in the direction of the grain"
k_{ef} =	0,85	"Table 8.1 DIN EN 1995-1-1:2010-12"
n_{ef} =	2,544	"Effective number"

$$F_{v,Rd} = \mathbf{8314 \text{ N}} \quad \text{"Total load bearing capacity"}$$

NOTE: These are planning aids. These values must be measured by authorized persons for each project.

DETERMINING THE TABLE VALUES FOR ASSY SCREWS 45°

Boundary conditions

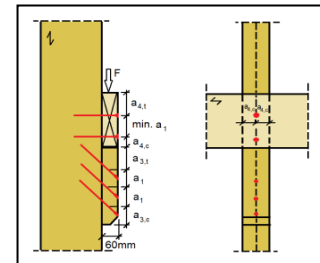
The example calculation is based on ETA-11/0190 and DIN EN 1995-1-1. This example assumes a connection between C24 wood and C24 wood where an edge beam is connected to a wood frame wall. For better load distribution, a carrier is attached to the underside where the screws are introduced under an angle of 45°. The used fasteners are Würth ASSY plus VG 8x180mm. The edge beam is not included in the table. This must still be verified to greater precision.

Carrier

Width =	60 mm
Height =	60 mm
$\rho_{k,1}$ =	350 kg/m ³
t_1 =	84.84 mm

Stand

Width =	60 mm
Height =	200 mm
$\rho_{k,2}$ =	350 kg/m ³
t_2 =	95.16 mm



Würth ASSY plus VG Ø8x180 mm

d =	8 mm	"Screw diameter"
l_g =	180 mm	"Thread length"
d_h =	14.85 mm	"Head diameter"
$M_{y,Rk}$ =	20000 Nmm	"Characteristic yield moment [Annex 1 Table 1.1]"
$f_{ax,k}$ =	11 N/mm ²	"Characteristic pull-out parameter [A.1.3.1]"

Data according to ETA-11/0190 and corresponding product details

Pullout strength

α =	45°	"Angle between screw axis and direction of grain"
k_{ax} =	1,00	"Factor [A.1.3.1]"
$f_{tens,k}$ =	20000 N	"Characteristic tensile strength [Annex 1 Table 1.1]"
l_{ef} =	84.84 mm	"Effective thread length in wood (t_1)"

$$F_{ax,\alpha,Rk,1} = 7465 \text{ N} = k_{ax} \times f_{ax,k} \times d \times l_{ef} \times \left(\frac{\rho_k}{350}\right)^{0,8}$$

$$F_{ax,\alpha,Rk,2} = 20000 \text{ N} \quad \text{"Characteristic tensile strength [Annex 1 Table 1.1]"}$$

$$F_{ax,\alpha,Rk} = 7465 \text{ N} \quad \text{"Minimum pullout strength"}$$

Data according to ETA-11/0190 and corresponding product details

NOTE: These are planning aids. These values must be measured by authorized persons for each project.

DETERMINING THE TABLE VALUES FOR ASSY SCREWS 45°

Calculation according to DIN EN 1995-1-1 8.2.2

$$F_{v,a,Rk} = \mathbf{6598\ N}$$

$$F_{v,a,Rk} = F_{ax,Rk} \times (\cos 45^\circ + \mu \times \sin 45^\circ)$$

μ = friction coefficients between wood/wood $\mu = 0.25$

Design situation according to DIN EN 1995-1-1

Utilization class = 1 "Utilization class [2.3.1.3]"

KLED = medium "Load duration class [Table 2.2]"

k_{mod} = 0,8 "Modification factor [Table 3.1]"

γ_M = 1,3 "Part safety coefficient [Table 2.3]"

$$F_{v,a,Rd} = \mathbf{4060\ N} = \mathbf{4.06\ kN} = \frac{F_{v,a,Rk} \times k_{mod}}{1,3}$$

Example calculation

$F_{V,Ed}$ = **18.0 kN** "Action of edge beam on carrier"

n = 6 units "Number of screws"

n_{ef} = 5,016 "Effective number of screws $n_{ef} = \max\{n^{0.9}; 0.9 \times n\}$ "

$F_{v,a,Rd}$ = **20.36 kN** "Effective resistance"

$$\eta = \mathbf{0,88} \quad \mathbf{< 1.0} \quad \mathbf{88,39\ \%} \quad \eta = \frac{F_{V,Ed}}{F_{v,a,Rd}}$$

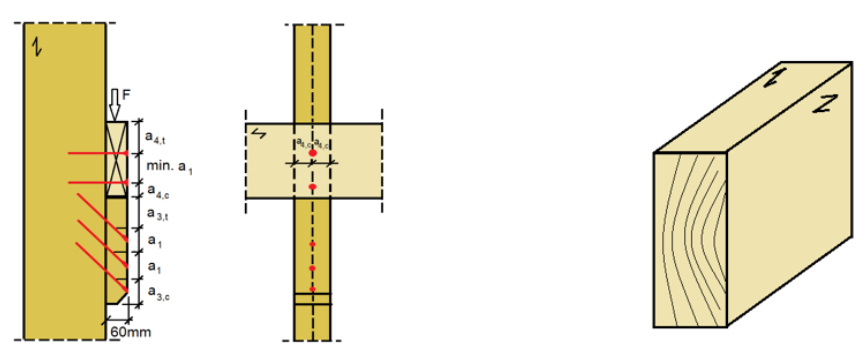
NOTE: These are planning aids. These values must be measured by authorized persons for each project.

USING THE TABLE VALUES FOR EDGE BEAM CONNECTION WITH CARRIER

Example calculation 1

System: Edge beam connection with carrier with ASSY plus VG under 45°
 Carrier: w/h = 60 mm / 60 mm, softwood, strength class C24 according to EN 338
 ($\rho_k = 350 \text{ kg/m}^3$)
 Stand: w/h = 60 mm / 200 mm, softwood, strength class C24 according to EN 338
 ($\rho_k = 350 \text{ kg/m}^3$)
 Basic for calculation: Dimensioning: EC5 or DIN EN 1995-1-1:2010-12 and national German application document DIN 20000-6:2012-06; ETA 11/0190 ASSY wood screws.
 Design force: $F_{v,Ed} = 13,4 \text{ kN}$ (utilization class = 1, KLED = "medium")
 Connection / design load: The table yields the following load bearing capacity for 4 inserted screws ASSY plus VG $\varnothing 8 \times 180 \text{ mm}$.
 Design shearing value: $F_{v,Rd} = 14,15 \text{ kN}$

Characteristic load-bearing capacity $F_{v,Rk}$ and design load-bearing capacity values $F_{v,Rd}$ (KLED="medium", $k_{mod}=0.8$) for wood-wood (for utilization class 1 and 2 each).



Number of angled screws*	Effective number	Dia.: 8 x 180 mm		Dia.: 10 x 180 mm	
		Strength of wood		C24	$K_{mod} 0.8$
2	1,800	11,90 kN	7,32 kN	13,50 kN	8,30 kN
3	2,688	17,70 kN	10,89 kN	20,20 kN	12,42 kN
4	3,482	23,00 kN	14,15 kN	26,10 kN	16,05 kN
5	4,257	28,10 kN	17,28 kN	31,90 kN	19,62 kN
6	5,016	33,10 kN	20,36 kN	37,60 kN	23,12 kN
7	5,762	38,00 kN	23,37 kN	43,20 kN	26,57 kN
8	6,498	42,90 kN	26,38 kN	48,70 kN	29,95 kN

* 90° screws placed in edge beam to secure position

Utilization class	continuously	long	medium	short	short / very short	very short
1 or 2	0,462	0,538	0,615	0,692	0,769	0,846

NOTE: These are planning aids. These values must be measured by authorized persons for each project.

USING THE TABLE VALUES FOR EDGE BEAM CONNECTION WITH INTERMEDIATE LAYER

Example calculation 2

System: Edge beam connection with ASSY plus VG with intermediate layer under 45° for a single-panel ceiling with 4.30 m width, beam spacing 62.5 cm

Edge beam: w/h = 60 mm / 180 mm, softwood, strength class C24 according to EN 338 ($\rho_k = 350 \text{ kg/m}^3$)

Stand: w/h = 60 mm / 180 mm, softwood, strength class C24 according to EN 338 ($\rho_k = 350 \text{ kg/m}^3$)

Boarding: Planking on inside with OSB 15 mm

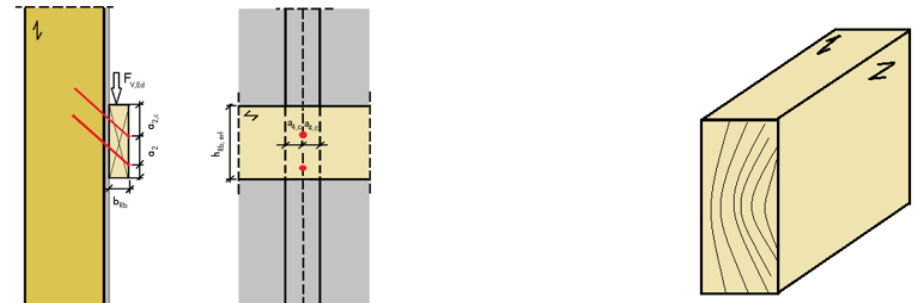
Basic for calculation: Dimensioning: EC5 or DIN EN 1995-1-1:2010-12 and national German application document DIN 20000-6:2012-06; ETA 11/0190 ASSY wood screws.

Actions: $g_k = 2.50 \text{ kN/m}^2$; $q_k = 2.00 \text{ kN/m}^2$ (utilization class = 1, KLED = "medium")

Design force: $V_d = (1.35 \cdot 2.50 + 1.50 \cdot 2.00) \cdot 0.625 \cdot 4.30 / 2 = 8.57 \text{ kN}$

Connection / design load: The table yields the following load bearing capacity for 3 inserted screws ASSY plus VG Ø8x200 mm. Maximum planking thickness 16mm, post width 60 mm

Design value for each connection point: $F_{v,Rd} = 8,76 \text{ kN}$



Characteristic load bearing capacities in kN of ASSY plus VG full thread screws (45°) countersunk/cylinder head screws in softwood C24, utilization class 1 and 2

min b _{Rb} mm	≤ t _{sp} mm	n _s Piece	d ₁ x l _s mm	det.h _{Rb} mm	KLED				
					continuo in kN	medium	short		
60	16	2	6 x 200	110	3,58	4,76	5,36		
				150	5,16	6,87	7,74		
		4		190	6,89	9,17	10,31		
				110	3,58	4,76	5,36		
		36		3	6 x 220	150	5,16	6,87	7,74
						190	6,89	9,17	10,31
	2	120	4,56	6,07		6,83			
		4	230	8,78		11,69	13,15		
	36		3	8 x 200		120	4,56	6,07	6,83
		180				6,58	8,76	9,86	

$F_{v,Rd}$ Design value of the connection's load-bearing capacity in [kN] according to DIN EN 1995-1-1

d_1 Nominal diameter of screw [mm]

l_s Screw length in [mm]

t_{sp} Maximum material thickness of planking [mm]

b_{Rb} Minimum width of the edge beam [mm]

b_{pf} Minimum width of the post [mm]

$det.h_{Rb}$ Height of the edge beam [mm]

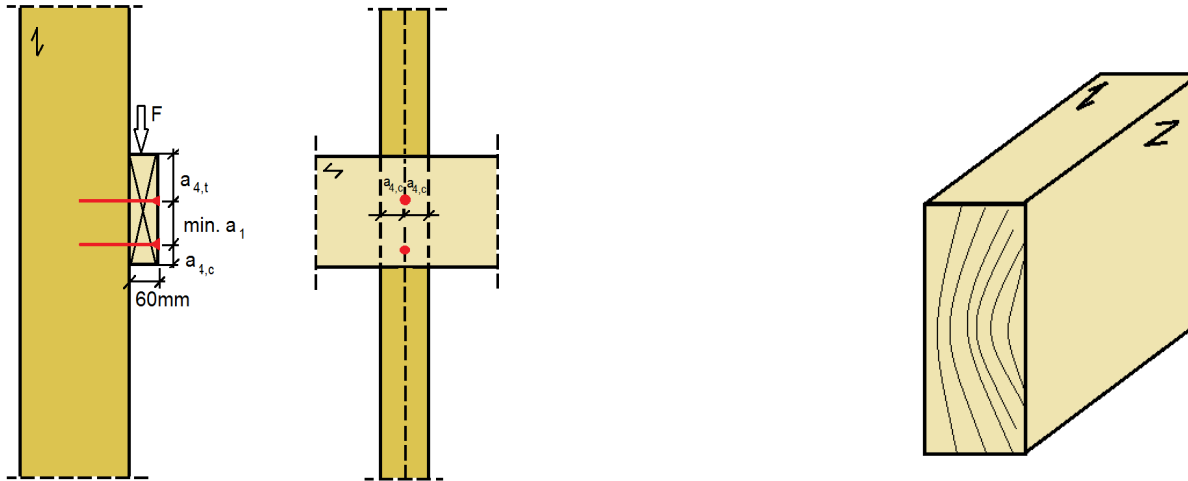
n_s Number of screws per connecting point

b _{Rb}	mm	60	80	100
a _{2,c}	mm	60	80	100

∅	mm	6	8	10	12
a ₂	mm	50	60	70	85
b _{pf}	mm	60	60	60	80

NOTE: These are planning aids. These values must be measured by authorized persons for each project.

EDGE BEAM CONNECTION 90° WITHOUT INTERMEDIATE LAYER WITH ASSY SCREWS WITH PARTIAL THREAD



Characteristic load bearing capacities in kN of ASSY 3.0, ASSY 3.0 ZiNi, and ASSY plus screws with partial thread in softwood C24					
Number of screws	Effective number	Dia.: 8 x 160 mm		Dia.: 10 x 160 mm	
		Strength of wood			
	$k_{ef} = 0.85$	C 24	GL 24h	C 24	GL 24h
2	1,800	5,88 kN	6,16 kN	8,46 kN	9,01 kN
3	2,544	8,31 kN	8,71 kN	11,95 kN	12,74 kN
4	3,249		11,12 kN		16,29 kN
5	3,927		13,45 kN		19,66 kN

Factor k_{mod} / γ_M						
Utilization class	continuously	long	medium	short	short / very short	very short
1 or 2	0,462	0,538	0,615	0,692	0,769	0,846

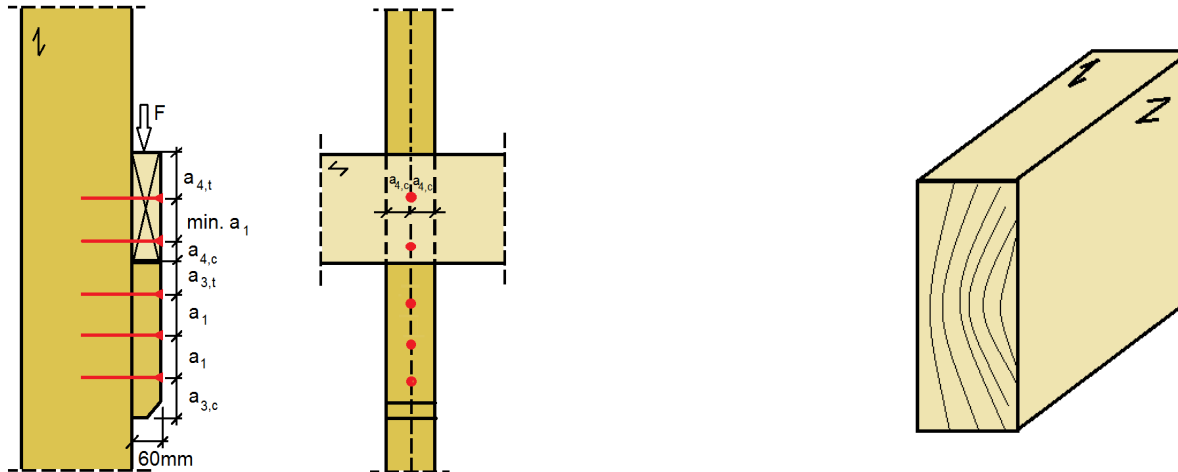
	a_1	$a_{4,c}$ edge beam	$a_{4,t}$	$a_{4,c}$ handle
Edge distances with ASSY plus or predrilled ASSY 3.0 screws with partial thread				
8 mm dia.	40 mm	24 mm	56 mm	24 mm
10 mm dia.	50 mm	30 mm	70 mm	30 mm
Edge distances with non-predrilled ASSY 3.0 screws with partial thread				
8 mm dia.	96 mm	40 mm	80 mm	40 mm
10 mm dia.	120 mm	50 mm	100 mm	50 mm

Calculation assumptions:

Dimensioned in accordance with ETA 11/0190 and DIN EN 1995-1-1. Edge beam connections should have at least two screws. Connections with more than one screw must take into account the spacing rules and the group effect. Screws must be screwed in flush. Thread length l_g must lie completely in component 1. The planner himself must furnish all further verifications, specifically the stable position of this connection.

NOTE: These are planning aids. These values must be measured by authorized persons for each project.

EDGE BEAM CONNECTION 90° WITHOUT INTERMEDIATE LAYER WITH ASSY SCREWS WITH PARTIAL THREAD AND CARRIER



Characteristic load bearing capacities in kN of ASSY 3.0, ASSY 3.0 ZiNi, and ASSY plus screws with partial thread in softwood C24, utilization class 1 and 2					
Number of screws	Effective number	Dia.: 8 x 160 mm		Dia.: 10 x 160 mm	
		Strength of wood			
	$k_{ef} = 0.85$	C 24	$K_{mod} 0.8$	C 24	$K_{mod} 0.8$
3	2,544	8,31 kN	5,11 kN	11,95 kN	7,35 kN
4	3,249	10,62 kN	6,53 kN	15,26 kN	9,38 kN
8	5,856	19,14 kN	11,77 kN	27,51 kN	16,92 kN
12	8,266	27,01 kN	16,61 kN	38,83 kN	23,88 kN

Factor k_{mod} / γ_M						
Utilization class	continuously	long	medium	short	short / very short	very short
1 or 2	0,462	0,538	0,615	0,692	0,769	0,846

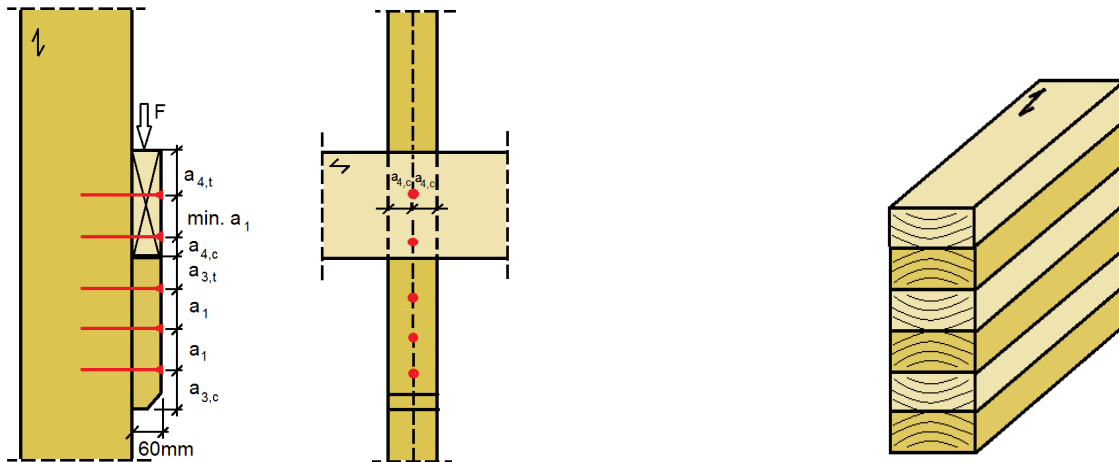
	a_1	$a_{3,t}$	$a_{3,c}$	$a_{4,c}$ edge beam	$a_{4,t}$	$a_{4,c}$ handle
Edge distances with ASSY plus screws or predrilled ASSY 3.0 screws with partial thread						
8 mm dia.	40 mm	96 mm	56 mm	24 mm	56 mm	24 mm
10 mm dia.	50 mm	120 mm	70 mm	30 mm	70 mm	30 mm
Edge distances with non-predrilled ASSY 3.0 screws with partial thread						
8 mm dia.	96 mm	120 mm	80 mm	40 mm	80 mm	40 mm
10 mm dia.	120 mm	150 mm	100 mm	50 mm	100 mm	50 mm

Calculation assumptions:

Dimensioned in accordance with ETA 11/0190 and DIN EN 1995-1-1. Edge beam connections should have at least two screws. Connections with more than one screw must take into account the spacing rules and the group effect. Screws must be screwed in flush. The thread length l_g must lie completely in component 1. The planner himself must furnish all further verifications, specifically the stable position of this connection.

NOTE: These are planning aids. These values must be measured by authorized persons for each project.

EDGE BEAM CONNECTION 90° WITHOUT INTERMEDIATE LAYER WITH ASSY SCREWS WITH PARTIAL THREAD AND CARRIER



Characteristic load bearing capacities in kN of ASSY 3.0, ASSY 3.0 ZiNi, and ASSY plus screws with partial thread in laminated wood GL 24h, utilization class 1 and 2					
Number of screws	Effective number	Dia.: 8 x 160 mm		Dia.: 10 x 160 mm	
		Strength of wood			
	$k_{ef} = 0.85$	GL 24h	$K_{mod} 0.8$	GL 24h	$K_{mod} 0.8$
3	2,544	8,71 kN	5,36 kN	12,74 kN	7,84 kN
4	3,249	11,12 kN	6,84 kN	16,26 kN	10,00 kN
8	5,856	20,05 kN	12,33 kN	29,31 kN	18,03 kN
12	8,266	28,30 kN	17,40 kN	41,38 kN	25,45 kN

Factor k_{mod} / γ_M						
Utilization class	continuously	long	medium	short	short / very short	very short
1 or 2	0,462	0,538	0,615	0,692	0,769	0,846

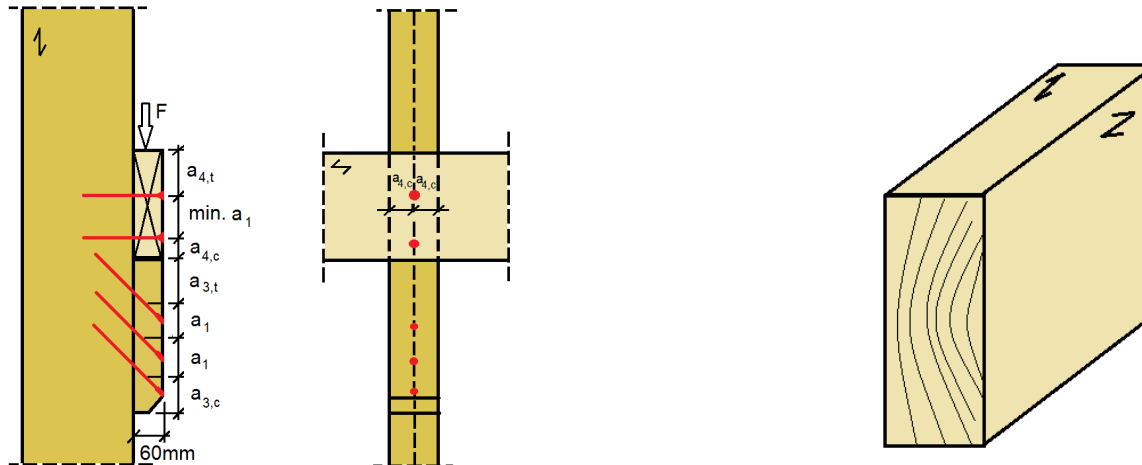
	a_1	$a_{3,t}$	$a_{3,c}$	$a_{4,c}$ edge beam	$a_{4,t}$	$a_{4,c}$ handle
Edge distances with ASSY plus screws or predrilled ASSY 3.0 screws with partial thread						
8 mm dia.	40 mm	96 mm	56 mm	24 mm	56 mm	24 mm
10 mm dia.	50 mm	120 mm	70 mm	30 mm	70 mm	30 mm
Edge distances with non-predrilled ASSY 3.0 screws with partial thread						
8 mm dia.	96 mm	120 mm	80 mm	40 mm	80 mm	40 mm
10 mm dia.	120 mm	150 mm	100 mm	50 mm	100 mm	50 mm

Calculation assumptions:

Dimensioned in accordance with ETA 11/0190 and DIN EN 1995-1-1. Edge beam connections should have at least two screws. Connections with more than one screw must take into account the spacing rules and the group effect. Screws must be screwed in flush. The thread length l_g must lie completely in component 1. The planner himself must furnish all further verifications, specifically the stable position of this connection.

NOTE: These are planning aids. These values must be measured by authorized persons for each project.

EDGE BEAM CONNECTION 45° WITHOUT INTERMEDIATE LAYER WITH ASSY PLUS VG AND CARRIER



Characteristic load bearing capacities in kN of ASSY plus VG full thread screws countersunk/cylinder head screws in softwood C24, utilization class 1 and 2					
Number of angled screws*	Effective number	Dia.: 8 x 180 mm		Dia.: 10 x 180 mm	
		Strength of wood			
	n_{ef}	C24	$K_{mod} 0.8$	C24	$K_{mod} 0.8$
2	1,800	11,90 kN	7,32 kN	13,50 kN	8,30 kN
3	2,688	17,70 kN	10,89 kN	20,20 kN	12,42 kN
4	3,482	23,00 kN	14,15 kN	26,10 kN	16,05 kN
5	4,257	28,10 kN	17,28 kN	31,90 kN	19,62 kN
6	5,016	33,10 kN	20,36 kN	37,60 kN	23,12 kN
7	5,762	38,00 kN	23,37 kN	43,20 kN	26,57 kN
8	6,498	42,90 kN	26,38 kN	48,70 kN	29,95 kN

* 90° screws placed in edge beam to secure position

Factor k_{mod} / γ_M						
Utilization class	continuously	long	medium	short	short / very short	very short
1 or 2	0,462	0,538	0,615	0,692	0,769	0,846

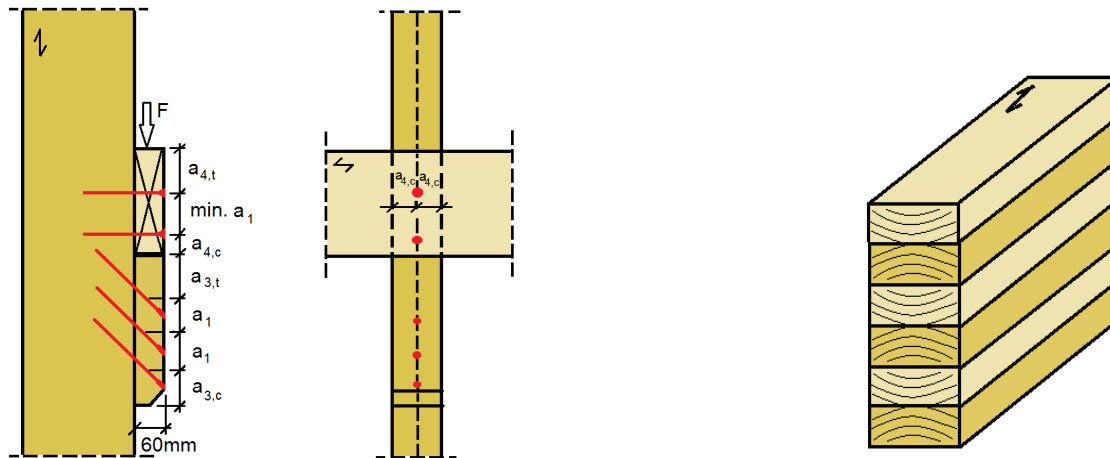
Edge distances with ASSY plus VG full thread screws						
	a_1	$a_{3,t}$	$a_{3,c}$	$a_{4,c}$ edge beam	$a_{4,t}$	$a_{4,c}$ handle
8 mm dia.	40 mm	96 mm	56 mm	24 mm	56 mm	24 mm
10 mm dia.	50 mm	120 mm	70 mm	30 mm	70 mm	30 mm

Calculation assumptions:

Dimensioned in accordance with ETA 11/0190 and DIN EN 1995-1-1. Edge beam connections should have at least two screws. Connections with more than one screw must take into account the spacing rules and the group effect. Screws must be screwed in flush. The edge distances are based on the center of gravity of the full thread screws. The planner himself must furnish all further verifications, specifically the stable position of this connection.

NOTE: These are planning aids. These values must be measured by authorized persons for each project.

EDGE BEAM CONNECTION 45° WITHOUT INTERMEDIATE LAYER WITH ASSY PLUS VG AND CARRIER



Characteristic load bearing capacities in kN of ASSY plus VG screws countersunk/cylinder head screws in laminated wood GL 24h, utilization class 1 and 2					
Number of angled screws*	Effective number	Dia.: 8 x 180 mm		Dia.: 10 x 180 mm	
		Strength of wood			
	n_{ef}	GL 24h	$K_{mod} 0.8$	GL 24h	$K_{mod} 0.8$
2	1,800	12,70 kN	7,81 kN	14,40 kN	8,86 kN
3	2,688	18,90 kN	11,62 kN	21,50 kN	13,22 kN
4	3,482	24,50 kN	15,07 kN	27,90 kN	17,16 kN
5	4,257	30,00 kN	18,45 kN	34,10 kN	20,97 kN
6	5,016	35,40 kN	21,77 kN	40,20 kN	24,72 kN
7	5,762	40,60 kN	24,97 kN	46,10 kN	28,35 kN
8	6,498	45,80 kN	28,17 kN	52,00 kN	31,98 kN

* 90° screws placed in edge beam to secure position

Factor k_{mod} / γ_M						
Utilization class	continuously	long	medium	short	short / very short	very short
1 or 2	0,462	0,538	0,615	0,692	0,769	0,846

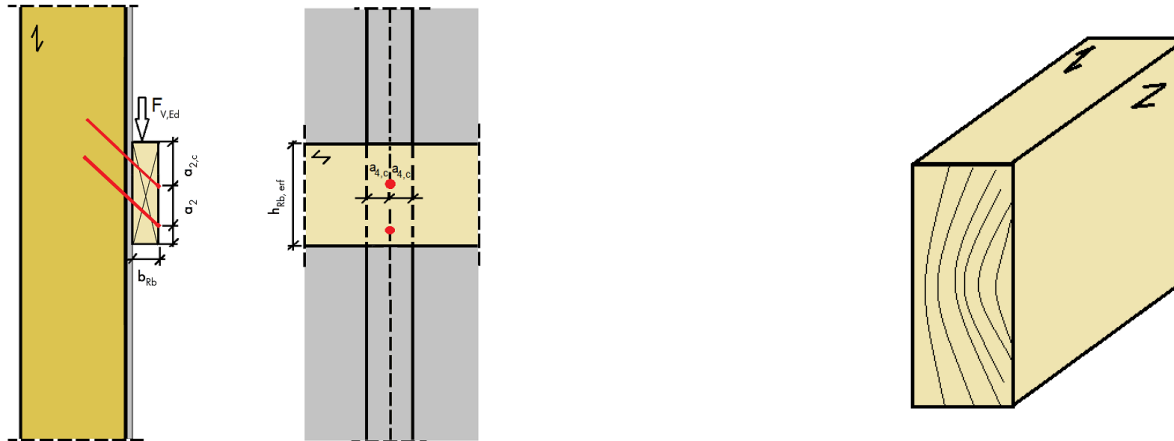
Edge distances with ASSY plus VG full thread screws						
	a_1	$a_{3,t}$	$a_{3,c}$	$a_{4,c}$ edge beam	$a_{4,t}$	$a_{4,c}$ handle
8 mm dia.	40 mm	96 mm	56 mm	24 mm	56 mm	24 mm
10 mm dia.	50 mm	120 mm	70 mm	30 mm	70 mm	30 mm

Calculation assumptions:

Dimensioned in accordance with ETA 11/0190 and DIN EN 1995-1-1. Edge beam connections should have at least two screws. Connections with more than one screw must take into account the spacing rules and the group effect. Screws must be screwed in flush. The edge distances are based on the center of gravity of the full thread screws. The planner himself must furnish all further verifications, specifically the stable position of this connection.

NOTE: These are planning aids. These values must be measured by authorized persons for each project.

EDGE BEAM CONNECTION 45° WITH INTERMEDIATE LAYER WITH ASSY PLUS VG WITHOUT CARRIER



Characteristic load bearing capacities in kN of ASSY plus VG full thread screws (45°) countersunk/cylinder head screws in softwood C24, utilization class 1 and 2

min b_{RB}	$\leq t_{BP}$	n_S	$d_1 \times l_S$	def.h _{RB}	KLED		
					continuous	medium	short
mm	mm	Piece	mm	mm	F _{V,Rd} in kN		
60	16	2	6 x 200	110	3,58	4,76	5,36
		3		150	5,16	6,87	7,74
		4		190	6,89	9,17	10,31
	36	2	6 x 220	110	3,58	4,76	5,36
		3		150	5,16	6,87	7,74
		4		190	6,89	9,17	10,31
	16	2	8 x 200	120	4,56	6,07	6,83
		3		180	6,58	8,76	9,86
		4		230	8,78	11,69	13,15
	36	2	8 x 220	120	4,56	6,07	6,83
		3		180	6,58	8,76	9,86
		4		230	8,78	11,69	13,15
	16	2	10 x 200	140	5,18	6,90	7,76
		3		210	7,48	9,96	11,21
		4		280	9,99	13,30	14,97
	36	2	10 x 220	140	5,18	6,90	7,76
		3		210	7,48	9,96	11,21
		4		280	9,99	13,30	14,97
80	15	2	6 x 260	130	4,77	6,35	7,14
		3		170	6,89	9,17	10,30
		4		210	9,18	12,22	13,75
	35	2	6 x 280	130	4,77	6,35	7,14
		3		170	6,89	9,17	10,30
		4		210	9,18	12,22	13,75
	15	2	8 x 260	140	6,08	8,09	9,10
		3		200	8,78	11,68	13,14
		4		250	11,71	15,58	17,52
	35	2	8 x 280	140	6,08	8,09	9,10
		3		200	8,78	11,68	13,14
		4		250	11,71	15,58	17,52

F_{V,Rd} Design value of the connection's load-bearing capacity in [kN] according to DIN EN 1995-1-1

d₁ Nominal diameter of screw [mm]

l_S Screw length in [mm]

t_{BP} Max. material thickness of planking [mm]

b_{RB} Minimum width of the edge beam [mm]

b_{pf} Minimum width of the post [mm]

def.h_{RB} Height of the edge beam [mm]

n_S Number of screws per connecting point

b _{RB}	mm	60	80	100
α _{2,c}	mm	60	80	100

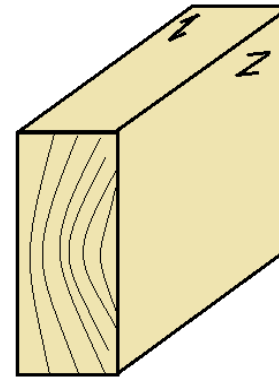
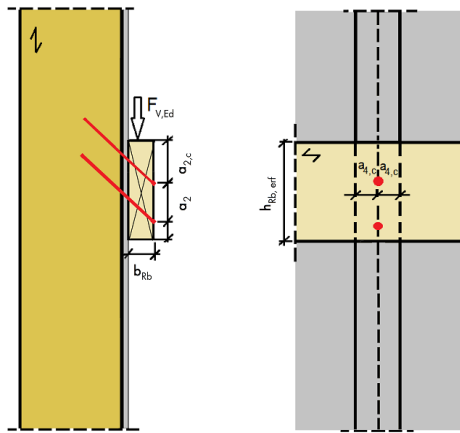
∅	mm	6	8	10	12
α ₂	mm	42	56	70	85
b _{pf}	mm	60	60	60	80

Remarks

Values were calculated under an assumed material strength class C24 (ρ_k = 350kg/m³) according to DIN EN 338. Horizontal load distribution (e.g. from washer effects) must be verified separately. ASSY plus VG screws according to ETA-11/0190.

NOTE: These are planning aids. These values must be measured by authorized persons for each project.

EDGE BEAM CONNECTION 45° WITH INTERMEDIATE LAYER WITH ASSY PLUS VG WITHOUT CARRIER



Characteristic load bearing capacities in kN of ASSY plus VG full thread screws (45°) countersunk/cylinder head screws in softwood C24, utilization class 1 and 2

min b_{Rb}	$\leq t_{BP}$	n_s	$d_1 \times l_s$	det.h _{RB}	KLED		
					continuous	medium	short
mm	mm	Piece	mm	mm	F _{V,Rd} in kN		
80	15	2	10 x 260	160	6,91	9,20	10,35
		3		230	9,98	13,28	14,95
		4		300	13,30	17,71	19,93
	35	2	10 x 280	160	6,91	9,20	10,35
		3		230	9,98	13,28	14,95
		4		300	13,30	17,71	19,93
100	14	2	8 x 320	160	7,60	10,12	11,39
		3		220	10,98	14,61	16,44
		4		270	14,64	19,48	21,92
	34	2	8 x 340	160	7,60	10,12	11,39
		3		220	10,98	14,61	16,44
		4		270	14,64	19,48	21,92
	14	2	10 x 320	180	8,64	11,50	12,94
		3		250	12,48	16,61	18,68
		4		320	16,63	22,15	24,91
	34	2	10 x 340	180	8,64	11,50	12,94
		3		250	12,48	16,61	18,68
		4		320	16,63	22,15	24,91
	14	2	12 x 320	185	10,37	13,80	15,53
		3		270	14,97	19,93	22,42
		4		355	19,96	26,58	29,89
	34	2	12 x 340	185	10,37	13,80	15,53
		3		270	14,97	19,93	22,42
		4		355	19,96	26,58	29,89

F_{V,Rd} Design value of the connection's load-bearing capacity in [kN] according to DIN EN 1995-1-1

d₁ Nominal diameter of screw [mm]

l_s Screw length in [mm]

t_{BP} Max. material thickness of planking [mm]

b_{RB} Minimum width of the edge beam [mm]

b_{pf} Minimum width of the post [mm]

det.h_{RB} Height of the edge beam [mm]

n_s Number of screws per connecting point

b _{RB}	mm	60	80	100
a _{2,c}	mm	60	80	100

∅	mm	6	8	10	12
a ₂	mm	42	56	70	85
b _{pf}	mm	60	60	60	80

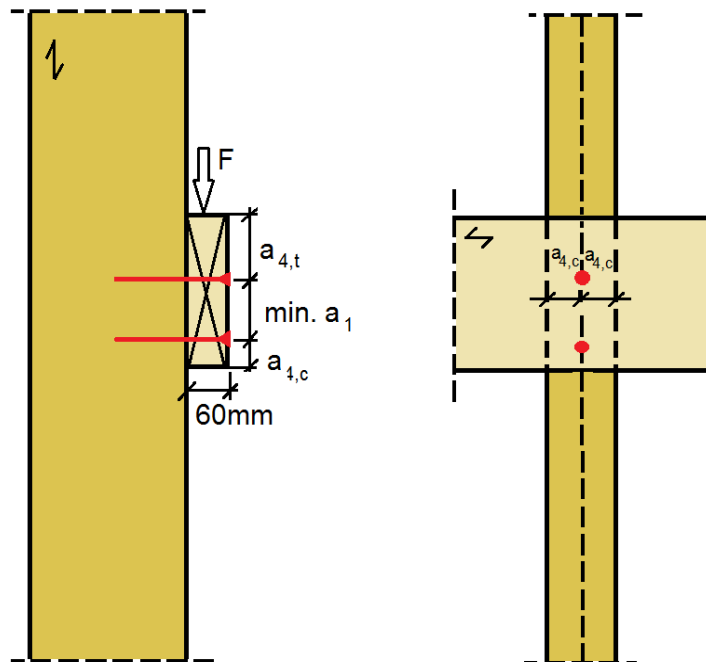
Remarks

Values were calculated under an assumed material strength class C24 ($\rho_k = 350 \text{ kg/m}^3$) according to DIN EN 338. Horizontal load distribution (e.g. from washer effects) must be verified separately. ASSY plus VG screws according to ETA-11/0190.

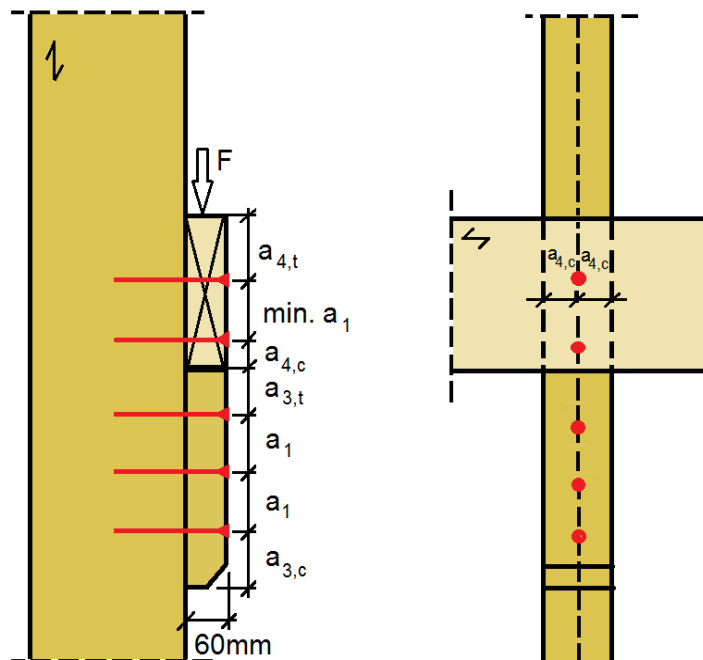
NOTE: These are planning aids. These values must be measured by authorized persons for each project.

EDGE SPACINGS

Edge beam connection 90° without intermediate layer with ASSY screws with partial thread



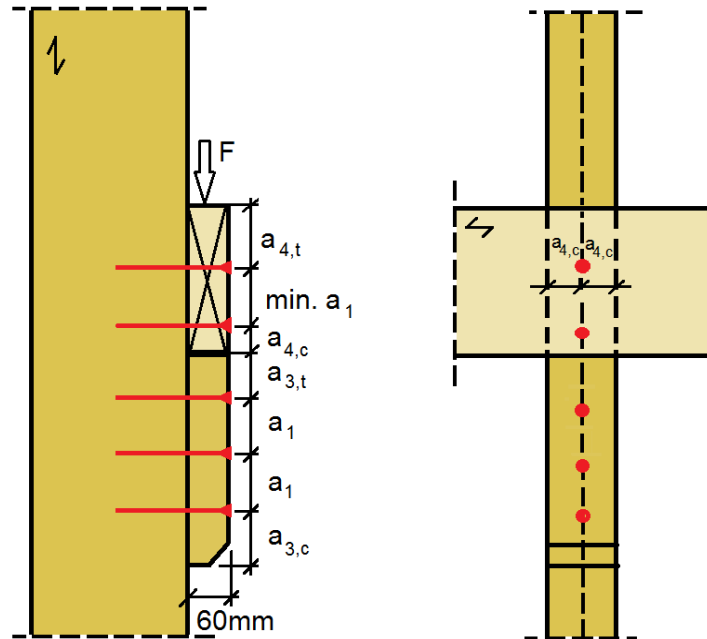
Edge beam connection 90° without intermediate layer with ASSY screws with partial thread and carrier



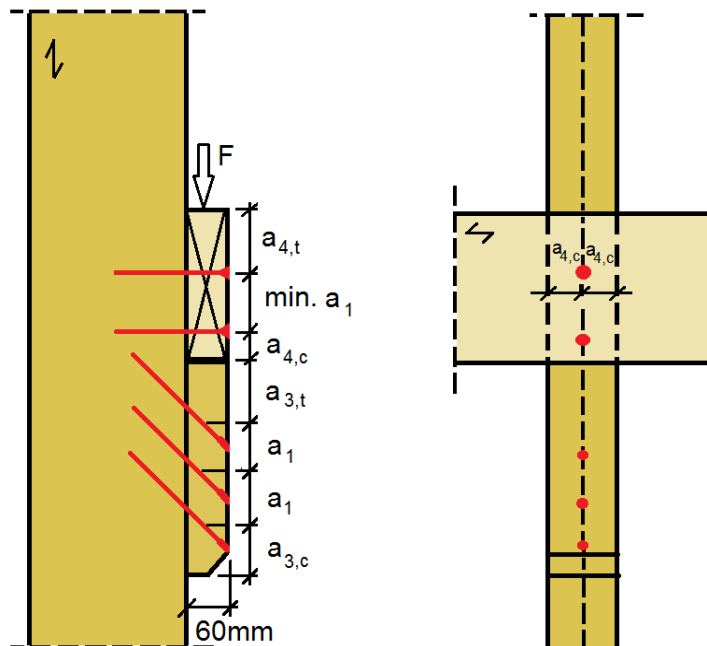
NOTE: These are planning aids. These values must be measured by authorized persons for each project.

EDGE SPACINGS

Edge beam connection 90° without intermediate layer with ASSY screws with partial thread and carrier



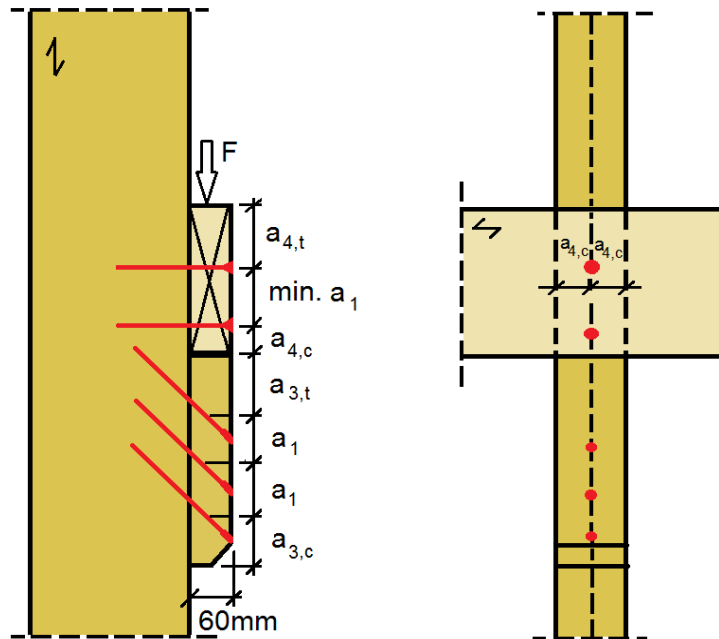
Edge beam connection 45° without intermediate layer with ASSY plus VG and carrier



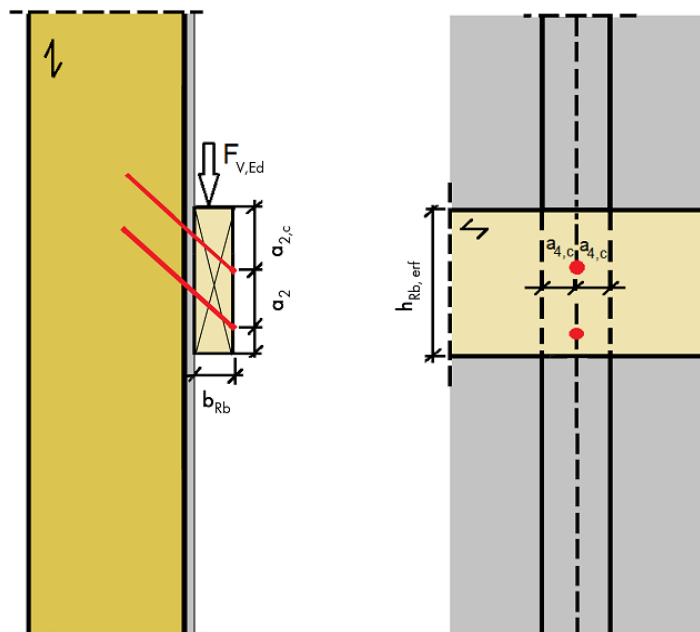
NOTE: These are planning aids. These values must be measured by authorized persons for each project.

EDGE SPACINGS

Edge beam connection 45° without intermediate layer with ASSY plus VG and carrier



Edge beam connection 45° with intermediate layer with ASSY plus VG without carrier



NOTE: These are planning aids. These values must be measured by authorized persons for each project.

ASSY® – THE SCREW FOR WOOD AND BUILDING CRAFTS

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