RAPID® Hardwood

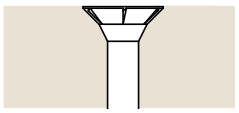
Approved for hardwood and BauBuche without pre-drilling

Characteristics

90° countersunk head

> Countersinks fully into the wood and fits well in steel bores

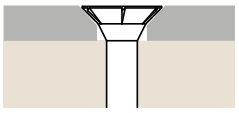
> Milling pockets reduce tearing and splitting in the wood



Washer head

> Highest permissible head pull-through values for sturdy joints pulled tightly together

> No washers required, which makes processing faster



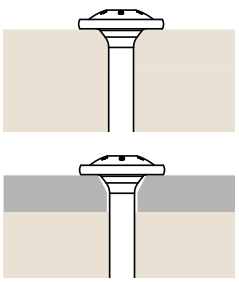
Minimised effort

> The patented friction part greatly reduces screw-in resistance

> Less effort required to screw in

> Faster screwing processes

> Suitable for cordless screwdrivers



Low splitting, high pull-out values

> Also suitable for coniferous timber

> 3-4 times higher values for hardwood, compared to coniferous timber

Patented tip – no pre-drilling necessary

> Bites rapidly even with oblique and cross grained wood screw connections

> Minimised splitting

> No pre-drilling in hardwoods and LVL beech (for lengths up to and including 400 mm; pre-drilling permitted for longer lengths)

Features

The RAPID® Hardwood is the first screw ETA-approved for all hard woods without pre-drilling, both for screwing in side and end timber (90° to 0°) and for screw fittings in the narrow edge of laminated veneer beech lumber.
The unique RAPID® Hardwood makes full loads possible regardless of whether the timber was pre-drilled. However, if you pre-drill with ø max. 6.5 mm screws, the RAPID® Hardwood's screw-in torque will be reduced by 2/3 and the screw distances will be much smaller.

> Saves time by eliminating pre-drilling

> ETA approval

> Tensile capacity comparable to a conventional 10 mm wood construction screw

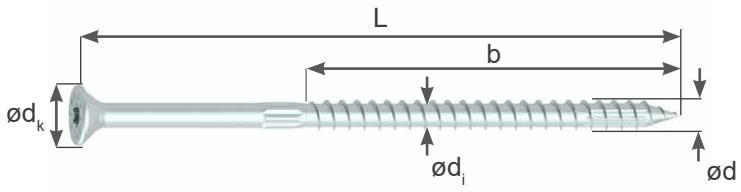
Dimensions & surfaces

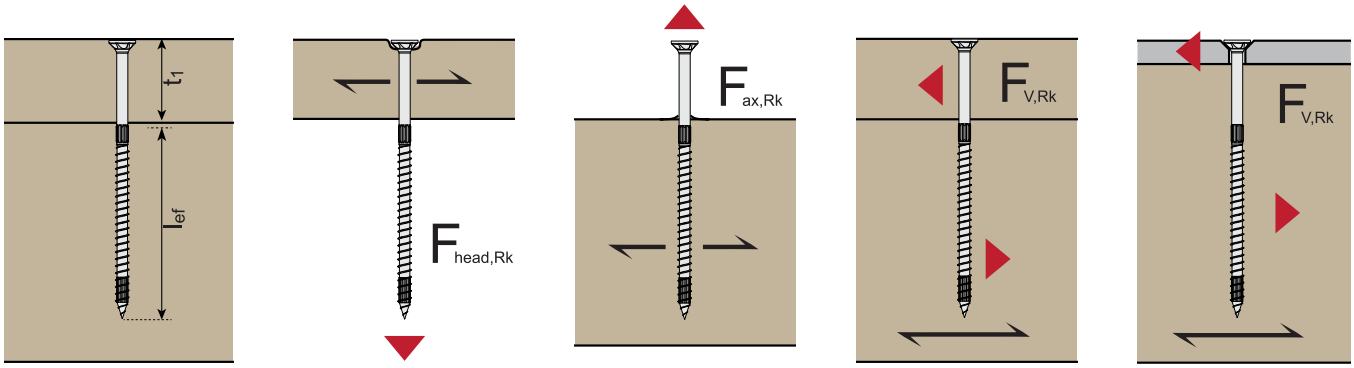
		Countersunk head*	Washer head*
			
Ø 8,0	Drive	T 40	T 40
	Length	80–440 mm	160 mm
	Thread	Single thread	Single thread
	Underhead	Milling pockets	Cone
	Surface	BlueWin 700+, Cr[VI] free	

*Special lengths and other surfaces available by request

RAPID® Hardwood partial thread countersunk head

CHARACTERISTICS AND VALUES			
		LVL beech	C 24
d	**[mm]**	**ø 8**	**ø 8**
d_k	[mm]	15.0	15.0
d_i	[mm]	6.10	6.10
$f_{ax,90,k}$	[N/mm²]	49.2	13.1
$f_{head,k}$	[N/mm²]	46	12.4
$F_{tens,k}$	[kN]	32.8	32.8
$M_{y,k}$	[Nmm]	42 800	42 800



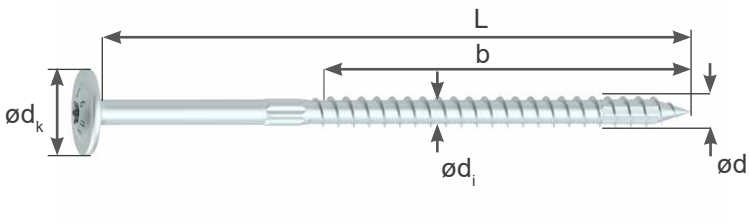


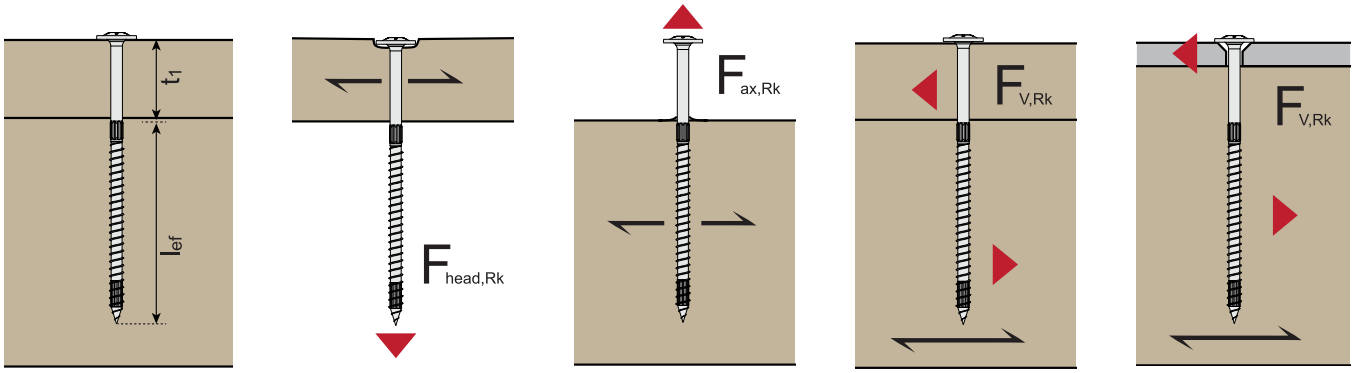
				AXIAL		SHEAR		
				HEAD PULL THROUGH	WITHDRAWAL	TIMBER-TIMBER	METAL-TIMBER	
	ø [mm]	L/b [mm]	$t_{1,min}$ [mm]	$F_{head,Rk}$ [kN]	$F_{ax,Rk}$ [kN]	$F_{v,Rk}$ [kN]	$F_{V,Rk,thin}$ [kN]	$F_{V,Rk,thick}$ [kN]
				LVL BEECH ρ_k=730kg/m³				
ø 8.0	8.0	**80***/60	-	10.35	23.52	-	7.39	13.50
	8.0	**100***/80	-	10.35	31.36	-	9.44	15.25
	8.0	**120**/100	-	10.35	32.80	-	10.78	15.25
	8.0	**140***/100	40	10.35	32.80	7.23	10.78	15.25
	8.0	**160**/100	55	10.35	32.80	7.98	10.78	15.25
	8.0	**200**/100	55	10.35	32.80	7.98	10.78	15.25
	8.0	**240**/100	55	10.35	32.80	7.98	10.78	15.25
	8.0	**280**/100	55	10.35	32.80	7.98	10.78	15.25
	8.0	**320**/100	55	10.35	32.80	7.98	10.78	15.25
	8.0	**440***/100	55	10.35	32.80	7.98	10.78	15.25
				C24 ρ_k=350kg/m³				
ø 8.0	8.0	**80***/60	-	2.79	6.29	-	3.54	6.06
	8.0	**100***/80	-	2.79	8.38	-	4.53	7.37
	8.0	**120**/100	-	2.79	10.48	-	5.51	7.90
	8.0	**140***/100	40	2.79	10.48	3.40	6.35	7.90
	8.0	**160**/100	60	2.79	10.48	3.98	6.35	7.90
	8.0	**200**/100	75	2.79	10.48	4.43	6.35	7.90
	8.0	**240**/100	75	2.79	10.48	4.43	6.35	7.90
	8.0	**280**/100	75	2.79	10.48	4.43	6.35	7.90
	8.0	**320**/100	75	2.79	10.48	4.43	6.35	7.90
	8.0	**440***/100	75	2.79	10.48	4.43	6.35	7.90

*available by request

RAPID® Hardwood partial thread washer head

CHARACTERISTICS AND VALUES			
		LVL beech	C 24
d	**[mm]**	**ø 8**	**ø 8**
d_k	[mm]	22.0	22.0
d_i	[mm]	6.10	6.10
$f_{ax,90,k}$	[N/mm²]	49.2	13.1
$f_{head,k}$	[N/mm²]	60.8	20.4
$F_{tens,k}$	[kN]	32.8	32.8
$M_{y,k}$	[Nmm]	42 800	42 800





			AXIAL				SHEAR				
			HEAD PULL THROUGH		WITHDRAWAL		TIMBER-TIMBER		METAL-TIMBER		
ø	L/b	$t_{1,min}$	$F_{head,Rk}$	$F_{head,ASD}$	$F_{ax,Rk}$	$F_{ax,ASD}$	$F_{v,Rk}$	$F_{v,ASD}$	$F_{V,Rk,thin}$	$F_{V,Rk,thick}$	$F_{v,ASD}$
[mm]	[mm]	[mm]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]
LVL BEECH ρ_k=730kg/m³											
8.0	**160/100**	60	29.43	-	32.80	-	10.78	-	10.78	15.25	-
C24 ρ_k=350kg/m³											
8.0	**160/100**	60	9.87	2.42	10.48	4.00	5.75	1.09	6.35	7.90	1.36

Axial axis to grain: 30° - 90°, $F_{ax,Rk}$ = thread withdrawal, $F_{head,Rk}$ = head pull through, $F_{v,Rk}$ = shear (// to grain 0° – ⊥ to grain 90°), wood/steel plate: l_{ef} = thread length b, t_1 min= minimum wood thickness, t_1 max= maximum wood thickness add-on part (L-b), $F_{V,Rk,thin}$= steel sheet t ≤ d/2, $F_{V,RK,thick}$= steel sheet t ≥ d

Type and printing errors reserved. The values stated are meant to serve as planning guides; projects should only be undertaken by authorised professionals.

Minimum spacing

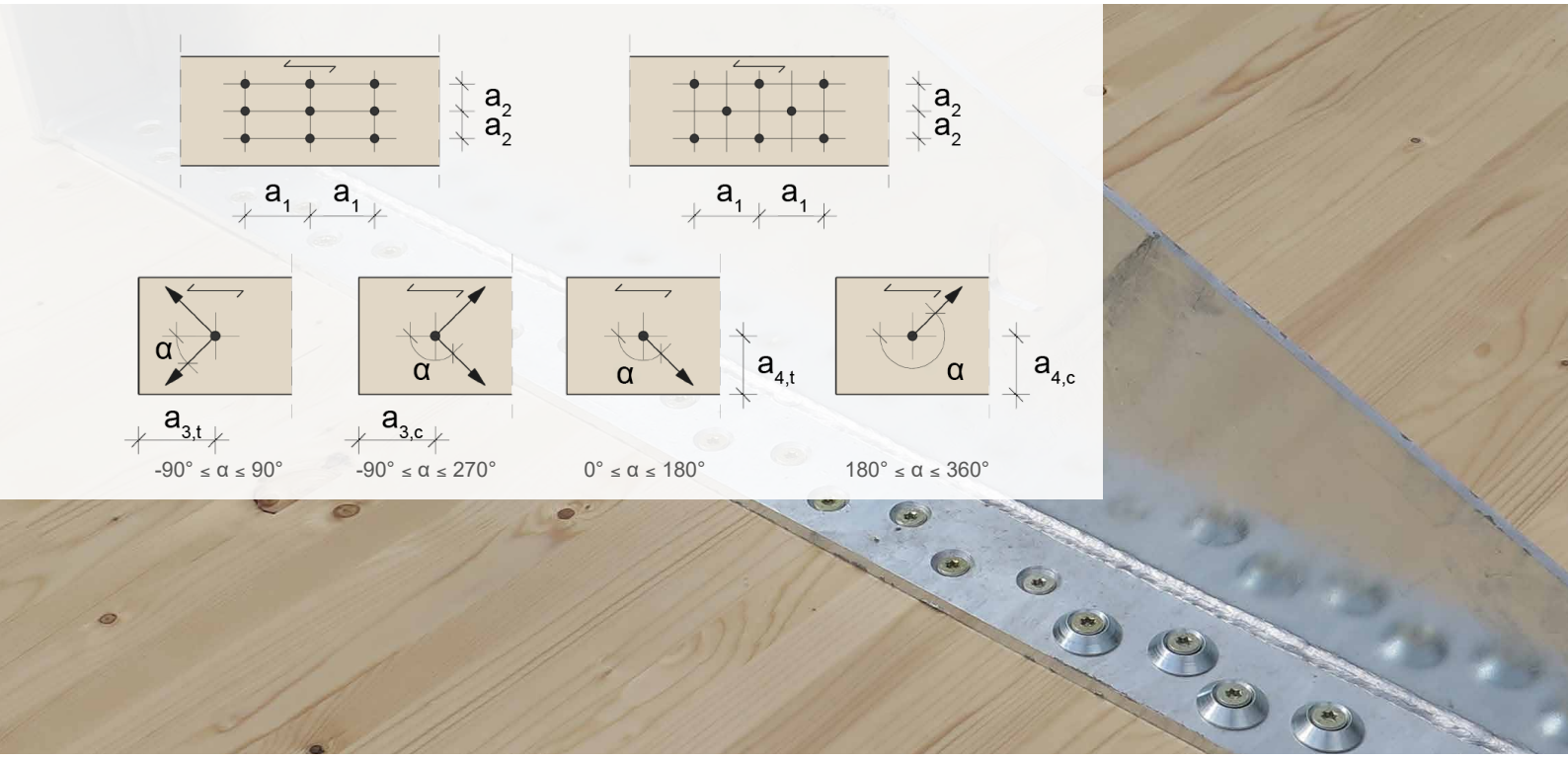
for self-drilling screws RAPID©, StarDrive GPR and for screws with drill bit

		Axial loaded screws		Subjected to axial and shear or only shear stress							
		Softwood and softwood based materials (predrilled, not-predrilled) and Hardwood (predrilled)		Cross laminated timer		Softwood and softwood based materials (predrilled, not-predrilled) and Hardwood (predrilled)					
		end-grain and side-grain		wide face	narrow face	end-grain and side-grain					
Conditions	a1 x a2	≥ 25 x d²	≥ 21 x d²	-	-	α	Screwing in pre-drilled coniferous wood, deciduous wood and LVL deciduous wood*		Screwing **without pre-drilling**			
							d < 5mm	d> 5 mm	Screws d < 5 mm in coniferous wood**	Screws d ≥ 5 mm in coniferous wood**	Screws d ≥ 5 mm with HSP in coniferous wood*	RAPID® Hardwood d=8 mm in deciduous wood and LVL beech**
Axial spacing	a1	5 x d	7 x d	4 x d	10 x d	0°	5 x d		10 x d	12 x d	5 x d	15 x d
						90°	4 x d		5 x d	5 x d	4 x d	7 x d
Edge distance	a1, c	5 x d		-	-	0°			-	-	-	-
						90°						
Axial spacing ⊥	a2	2.5 x d	3 x d	2.5 x d	3 x d	0°	3 x d		5 x d		3 x d	7 x d
						90°	4 x d				4 x d	
Edge distance ⊥	a2, c	4 x d		-	-	0°	-		-	-	-	-
						90°						
Edge distance // loaded	a3, t	-	-	6 x d	12 x d	0°	12 x d		15 x d		12 x d	20 x d
						90°	7 x d		10 x d (15 x d if screw d ≥ 8 and timber thickness t < 5d)		7 x d	15 x d
Edge distance // unloaded	a3, c	-	-	6 x d	7 x d	0°	7 x d				7 x d	15 x d
						90°						
Edge distance ⊥ loaded	a4, t	-	-	6 x d	5 x d	0°	3 x d		5 x d	5 x d	3 x d	7 x d
						90°	5 x d	7 x d	7 x d	10 x d	7 x d	12 x d
Edge distance ⊥ unloaded	a4, c	-	-	2.5 x d	3 x d	0°	3 x d		5 x d (3 x d if a1 and a3 min. 25 x d, even if timber thickness t < 5d)		3 x d	7 x d
						90°						
Distance between screws in screw cross	a cross	1.5 x d										
Minimum timber thickness	t	12d		10d								

Screw diameter	< 8	8	10	12
Minimum thickness t for load-bearing timber parts [mm]	24	30	40	80

- If the timber does not meet the minimum thickness, it should generally be pre-drilled
- Pre-drilling diameter: di (-0.5/+1.0) for coniferous wood di (-0/+0.5) for deciduous wood and LVL
- Woods at risk of splintering (e.g. Douglas fir, silver fir) should be pre-drilled or use a higher minimum thickness according to EN1995-1-1
- Drilled holes for positioning, guidance or orientation are NOT PRE-DRILLED
- All screws (d ≥ 5 mm) may be screwed into deciduous wood and LVL beech up to 10d in length without pre-drilling; the distances for RAPID® Hardwood should be observed
- The minimum binding anchoring depth for screws is 4d, or 20d in end wood.
- The minimum anchoring depth for CLT is 4d on the face side and 10d on the narrow edge (front face)

d = outer thread diameter, d_1 = thread core diameter,
α = angle between direction of force and direction of grain
*See EN1995-1-1, table 8.2 how nails are pre-drilled
**See EN1995-1-1, table 8.2 how nails are not pre-drilled



Information

- Geometry and mechanical properties correspond to ETA 12/0373.
- In connections between main and secondary beams, the main beam must be able to adequately with stand torsion and fixed with fork support.
- The values stated for main/secondary beam connections only apply to vertically oriented loads. Any transverse stress must be verified separately.
- The rope effect has been factored into the calculation of shear-off values.
partial thread, Z-9.1-435 for StarDrive GPR, Z-9.1-656 for RAPID® fullthread, these lower values are only intended as guidance.
- Characteristic values F_{Rk}: Design according to EC5 and ETA 12/0373, these values should be used for calculations
- The design value of the ultimate limit state $F_{v,Rd}$ for the final design of the timber connection is taken from the characteristic values as follows:

$$F_{Rd} = \frac{F_{Rk} \cdot k_{mod}}{\gamma_m}$$

F_{Rd} ... Design value of ultimate limit state subjected to shear-off stress or tension depending on connection
F_{Rk} ... characteristic value of ultimate limit state subjected to shear-off stress or tension depending on connection
γ_m , k_{mod} ... Additional values from corresponding national norms