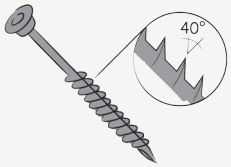
KKF

Exterior screws, pan head

Stainless steel AISI410

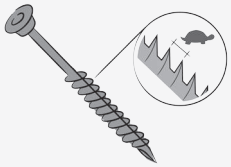
SPECIAL THREADING

Longer length (60%) asymmetric "umbrella" thread



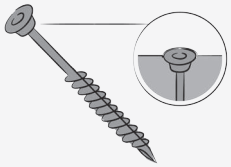
FINE THREAD

Fine thread for the utmost precision when tightening is complete



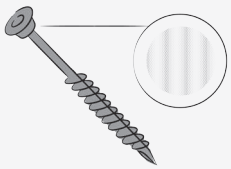
PAN HEAD

Guarantees an excellent surface finish and the possibility of usage on steel plates with circular holes



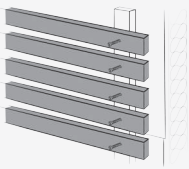
STAINLESS STEEL AISI410

Martensitic stainless steel with an excellent balance between mechanical resistance and corrosion resistance



FIELDS OF USE

Exterior use; appropriate for service classes 1-2-3



AESTHETICS AND PRECISION

The pan head with the flat under head compresses the fibres when tightening is complete and guarantees a perfect aesthetic finish. The fine thread guarantees the utmost precision during tightening

TORSIONAL STRENGTH

The AISI410 martensitic stainless steel has good torsional strength (magnetic steel like carbon steel), which means pre-bored holes can be avoided in many situations

WIDE RANGE

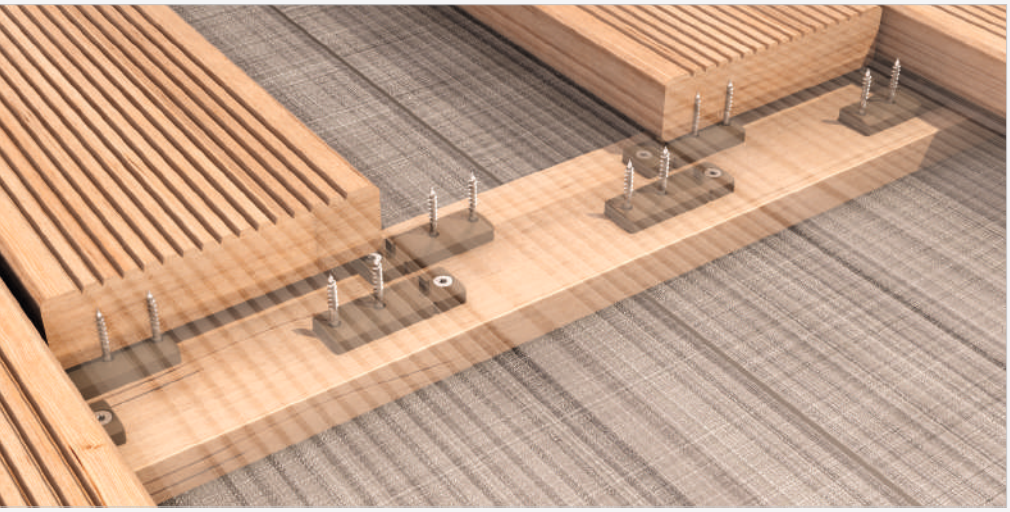
Lengths available from 20mm to 200mm for a vast range of different applications

Applications

Fastening of exterior fences

Fastening of TERRALOCK PP connector (long version) with KKF screws

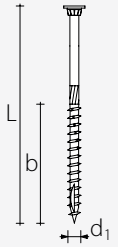
Fastening of TERRALOCK PP connector (short version) with KKF screws

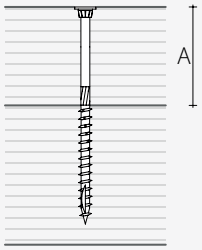


Hidden connectors for patios and façades

connector	code	L x B x H [mm]	description	pcs /pckg.
TERRALOCK PP	**TER60PPM**	60 x 20 x 8	plastic RAL8017 connector for wooden patios (short version)	100
	TER180PPM	180 x 20 x 8	plastic RAL8017 connector for wooden patios (long version)	50

Codes and dimensions



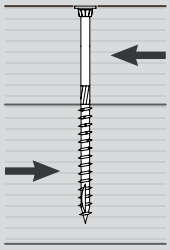


d_1 [mm]	code	L [mm]	b [mm]	A [mm]	pcs/pckg
4 *TX20*	**KKF430**	30	18	12	500
	KKF435	35	20	15	
	KKF440	40	24	16	
	KKF445	45	30	15	200
	KKF450	50	30	20	
4,5 *TX20*	**KKF4520**	20	15	5	100
	KKF4540	40	24	16	250
	KKF4545	45	30	15	
	KKF4550	50	30	20	
	KKF4560	60	35	25	200
	KKF4570	70	40	30	
5 *TX25*	**KKF540**	40	24	16	200
	KKF550	50	30	20	
	KKF560	60	35	25	
	KKF570	70	40	30	
	KKF580	80	50	30	100
	KKF590	90	55	35	
	KKF5100	100	60	40	
6 *TX30*	**KKF680**	80	50	30	100
	KKF6100	100	60	40	
	KKF6120	120	75	45	

Carpenter statics

ALLOWABLE VALUES
DIN 1052:1988

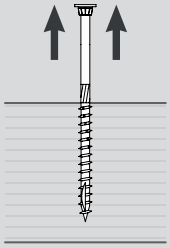
SHEAR V_{adm}



WOOD-WOOD

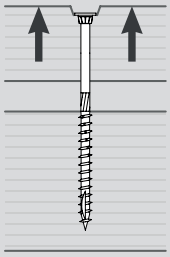
d_1 [mm]	L [mm]	V_{adm}
4	≥ 40	26 kg
4,5	≥ 50	34 kg
5	≥ 60	43 kg
6	≥ 70	61 kg

THREAD WITHDRAWAL N_{adm}



	Length L [mm]									
d_1 [mm]	**30**	**35**	**40**	**45-50**	**60**	**70**	**80**	**90**	**100**	**120**
4	36 kg	40 kg	48 kg	60 kg	-	-	-	-	-	-
4,5	-	-	54 kg	68 kg	79 kg	90 kg	-	-	-	-
5	-	-	60 kg	75 kg	88 kg	100 kg	125 kg	138 kg	150 kg	-
6	-	-	-	-	-	-	150 kg	-	180 kg	225 kg

HEAD PENETRATION N_{adm}



d_1 [mm]	N_{adm}
4	30 kg
4,5	39 kg
5	48 kg
6	70 kg

CALCULATION FORMULAS - SHEAR DIN 1052-2:1988

WOOD-WOOD

$V_{adm} = \min \{ 0,4 \cdot A \cdot d_1; 1,7 \cdot d_1^{\,2} \}$

d_1 [mm]
A [mm]
V_{adm} [kg]

EXAMPLE WOOD-WOOD

KKF 5 x 80 mm

$d_1 = 5$ mm
$A = 30$ mm

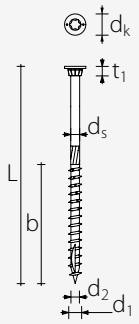
$V_{adm} = \min \{ 0,4 \cdot A \cdot d_1; 1,7 \cdot d_1^{\,2} \}$
$V_{adm} = \min \{ 0,4 \cdot 30 \cdot 5 ; 1,7 \cdot 5^2 \} = \min \{ 60 ; 43 \} = 43$ kg

NOTE

- Allowable values in accordance with DIN 1052:1988.
- The allowable extraction values are calculated considering the threaded part as being completely inserted into the wood.

Geometry and minimum distances

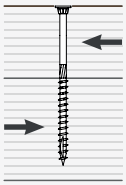
GEOMETRY AND MECHANICAL CHARACTERISTICS



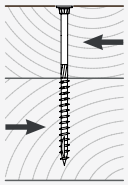
KKF SCREW					
Nominal diameter	**d_1 [mm]**	**4**	**4,5**	**5**	**6**
Head diameter	d_k [mm]	7,80	8,8	9,8	11,8
Tip diameter	d_2 [mm]	2,60	3,05	3,25	4,05
Shank diameter	d_s [mm]	2,90	3,35	3,60	4,30
Head thickness	t_1 [mm]	5,00	5,00	6,00	7,00
Pre-bored hole diameter	d_v [mm]	2,5	3,0	3,0	4,0
Characteristic yield moment	$M_{y,k}$ [Nmm]	3032,6	4119,1	5417,2	9493,7
Characteristic extraction-resistance parameter	$f_{ax,k}$ [N/mm^2]	11,7	11,7	11,7	11,7
Characteristic head-penetration parameter	$f_{head,k}$ [N/mm^2]	16,5	16,5	16,5	16,5
Characteristic tensile strength	$f_{tens,k}$ [kN]	5,0	6,4	7,9	11,3

MINIMUM DISTANCES FOR SHEAR LOADS

	α = 0°				α = 90°			
SCREWS INSERTED WITH PRE-BORED HOLES (1)								
	4	**4,5**	**5**	**6**	**4**	**4,5**	**5**	**6**
a_1 [mm]	20	23	25	30	16	18	20	24
a_2 [mm]	12	14	15	18	16	18	20	24
$a_{3,t}$ [mm]	48	54	60	72	28	32	35	42
$a_{3,c}$ [mm]	28	32	35	42	28	32	35	42
$a_{4,t}$ [mm]	12	14	15	18	20	23	35	42
$a_{4,c}$ [mm]	12	14	15	18	12	14	15	18



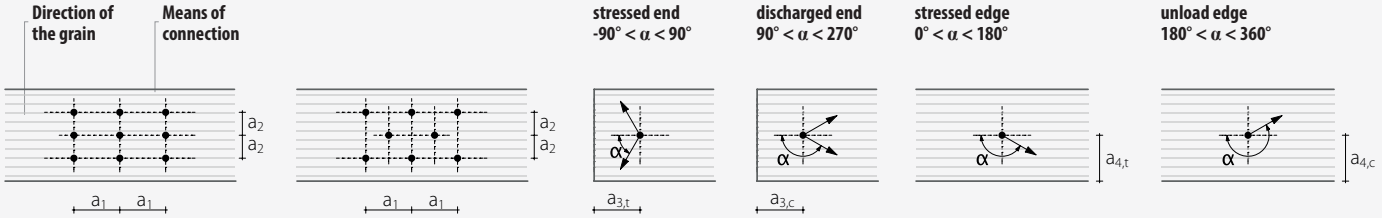
Angle between strength and grain α = 0°



Angle between strength and grain α = 90°

CHARACTERISTIC DENSITY: $\rho_k \leq 420$ kg/m^3								
	α = 0°				α = 90°			
SCREWS INSERTED WITHOUT PRE-BORED HOLES (2)								
	4	**4,5**	**5**	**6**	**4**	**4,5**	**5**	**6**
a_1 [mm]	40	45	60	72	20	23	25	30
a_2 [mm]	20	23	25	30	20	23	25	30
$a_{3,t}$ [mm]	60	68	75	90	40	45	50	60
$a_{3,c}$ [mm]	40	45	50	60	40	45	50	60
$a_{4,t}$ [mm]	20	23	25	30	28	32	50	60
$a_{4,c}$ [mm]	20	23	25	30	20	23	25	30

CHARACTERISTIC DENSITY: $420 \leq \rho_k \leq 500$ kg/m^3								
	α = 0°				α = 90°			
SCREWS INSERTED WITHOUT PRE-BORED HOLES (3)								
	4	**4,5**	**5**	**6**	**4**	**4,5**	**5**	**6**
a_1 [mm]	60	68	75	90	28	32	35	42
a_2 [mm]	28	32	35	42	28	32	35	42
$a_{3,t}$ [mm]	80	90	100	120	60	68	75	90
$a_{3,c}$ [mm]	60	68	75	90	60	68	75	90
$a_{4,t}$ [mm]	28	32	35	42	36	41	60	72
$a_{4,c}$ [mm]	28	32	35	42	28	32	35	42



NOTE

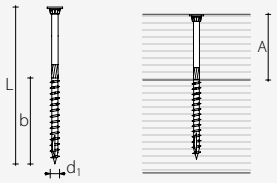
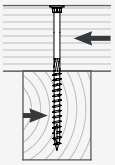
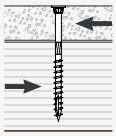
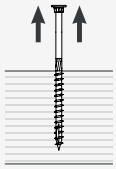
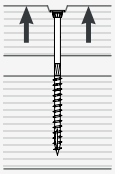
(1) The minimum distances comply with the EN 1995:2008 standard, in accordance with ETA-11/0030.

(2) The minimum distances are in accordance with EN 1995:2008, according to ETA-11/0030, considering a mass density of the wood elements of $\rho_k \leq 420$ kg/m^3.

(3) The minimum distances comply with EN 1995:2008, according to ETA -11/0030, considering a mass density of the wood elements of $420 \leq \rho_k \leq 500$ kg/m^3.

- In the case of OSB-wood joints, the minimum spacings (a_1, a_2) can be multiplied by a coefficient of 0.85.
- In the case of Douglas fir elements (Pseudotsuga menziesii), the minimum distances parallel to the grain (a_1 , $a_{3,t}$, $a_{3,}$) must be multiplied by a coefficient of 1.5.

Designer statics

				SHEAR			TRACTION	
geometry				wood-wood	panel-wood [1]		thread withdrawal [2]	head penetration [3]
								
d_1 [mm]	L [mm]	b [mm]	A [mm]	$R_{V,k}$ [kN]	$R_{V,k}$ [kN]		$R_{ax,k}$ [kN]	$R_{head,k}$ [kN]
4	30	18	12	0,83	S_{PAN} = 15 mm	0,81	0,97	1,16
	35	20	15	0,94		0,90	1,08	1,16
	40	24	16	0,98		0,94	1,30	1,16
	45	30	15	0,96		0,94	1,62	1,16
	50	30	20	1,08		0,94	1,62	1,16
4,5	20 [4]	15	5	0,49	S_{PAN} = 15 mm	0,49	0,91	1,48
	40	24	16	1,16		1,07	1,46	1,48
	45	30	15	1,14		1,07	1,83	1,48
	50	30	20	1,26		1,07	1,83	1,48
	60	35	25	1,40		1,07	2,13	1,48
	70	40	30	1,41		1,07	2,44	1,48
5	40	24	16	1,32	S_{PAN} = 15 mm	1,21	1,62	1,83
	50	30	20	1,46		1,21	2,03	1,83
	60	35	25	1,60		1,21	2,37	1,83
	70	40	30	1,69		1,21	2,71	1,83
	80	50	30	1,69		1,21	3,38	1,83
	90	55	35	1,69		1,21	3,72	1,83
	100	60	40	1,69		1,21	4,06	1,83
6	80	50	30	2,25	S_{PAN} = 15 mm	1,57	4,06	2,66
	100	60	40	2,41		1,57	4,87	2,66
	120	75	45	2,41		1,57	6,09	2,66

GENERAL PRINCIPLES

- Characteristic values comply with EN 1995:2008, in accordance with
- ETA-11/0030.
- Design values are obtained from the following characteristic values:

$$R_d = \frac{R_k \cdot k_{mod}}{\gamma_m}$$

  The coefficients γ_m and k_{mod} should be taken according to the current regulations used for the calculation.
- For the mechanical resistance values and the geometry of the screws, reference was made to ETA-11/0030.
- In the calculations, the density of the wood elements was considered
- equal to $\rho_k = 420$ kg/m³.
- Values were calculated considering the threaded part as being completely inserted into the wood.
- Sizing and verification of the wooden elements and panels must be done separately.
- The shear characteristic resistances are calculated for screws inserted without pre-bored holes. In the case of screws inserted with pre-bored holes, greater resistance values can be obtained.

NOTE

[1] The shear characteristic resistances are calculated considering an OSB panel or particle board with a S_{PAN} thickness.
[2] The axial thread-extraction resistance was calculated considering a 90° angle between the grain and the connector and for a fixing length of b.
[3] The axial resistance to head penetration was calculated using wooden elements.
[4] This screw has not been granted the CE mark.