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Authorised and notified according to Article 29 of the Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011

European Technical Assessment ETA-21/1023 of 2022/01/18

I General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: ETA-Danmark A/S

Trade name of the construction product:	Fastening Screws JF
Product family to which the above construction product belongs:	Fastening screws for sandwich panels
Manufacturer:	EJOT Baubefestigungen GmbH Geschäftsbereich Building Fasteners In der Stockwiese 35 DE-57334 Bad Laasphe Internet www.ejot.de/bau
Manufacturing plant:	Manufacturing plants 8, 13 and 53
This European Technical Assessment contains:	13 pages including 7 annexes which form an integral part of the document
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of:	EAD 330047-01-0602, Fastening Screws for Sandwich Panels
This version replaces:	

II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of the product

The fastening screws for sandwich panels (self-drilling screws) are made of steel. The fasteningscrews are completed with a metallic washer and an EPDM sealing washer. The fastening screws for sandwich panels are made of a bimetal combination of austenitic stainless with drill bits made of carbon steel.

Table 1 Summary of the fastenings screws for sandwich panels

Annex	Fastening screw	Component I	Component II
4	JF3-(FR-)Plus-6.8xL JF6-(FR-)Plus-6.8xL	S280GD to S350GD	Timber
5	JF3-(FR-)Plus-6.8xL JF6-(FR-)Plus-6.8xL	S280GD to S350GD	Timber
6	JF3-(FR-)Plus-6.8xL JF6-(FR-)Plus-6.8xL	S280GD to S350GD	Timber
7	JF3-(FR-)Plus-6.8xL JF6-(FR-)Plus-6.8xL	S280GD to S350GD	Timber

The fastening screws for sandwich panels and the corresponding connections are subject to tension and/or shear forces. Samples of fastenings screws for metal members and sheeting are shown in Figure 1.

Figure 1

2 Specification of the intended use in accordance with the applicable European Assessment Document (hereinafter EAD)

The fastening screws for sandwich panels are intended to be used for fastening sandwich panels to timber supporting structures. The sandwich panels can either be used as wall or roof cladding or as load bearing wall and roof element. The intended use comprises fastening screws for sandwich panels and connections for indoor and outdoor applications.

Fastening screws which are intended to be used in external environments with ≥C2 corrosion according to the standard EN ISO 12944-2 are made of stainless steel. Furthermore, the intended use comprises connections with predominantly static loads (e.g. wind loads, dead loads). The fastening screws for sandwich panels are not intended for re-use.

The performances given in Section 3 are only valid if the fastening screws are used in compliance with the specifications and conditions given in Annex 1 to 7.

The provisions made in this European Technical Assessment are based on an assumed intended working life of the screws of 25 years.

The indications given on the intended working life cannot be interpreted as a guarantee given by the producer or the Technical Assessment Body, but are to be regarded only as a means for selecting the appropriate products in relation to the expected economically reasonable working life of the works.

The real working life might be, in normal use conditions, considerably longer without major degradation affecting the Basic requirements for construction works.

3 Performance of the product and references to the methods used for its assessment

These performances, given in the following paragraphs, are valid as long as the components are the ones described in § 1 and Annexes 1 to 7 of this ETA.

Characteristic		Assessment of characteristic
3.1	**Mechanical resistance and stability (BWR 1)**	
	Shear Resistance of the Connection	See Annexes to this ETA
	Tension Resistance of the Connection	See Annexes to this ETA
	Design Resistance in case of combined Tension and Shear Forces (interaction)	See Annex 2 to this ETA
	Check of Deformation Capacity in case of constraining forces due to temperature	See Annex 2 to this ETA
	Durability	See Annex 4 to 7, material of the fasteners
3.2	**Safety in case of fire (BWR2)**	
	Reaction to fire	The screws are made from steel classified as Euroclass A1 in accordance with EN 13501-1 and Commission Delegated Regulation 2016/364

4 Attestation and verification of constancy of performance (AVCP)

4.1 AVCP system

According to the decision 1998/214/EC of the European Commission 1, as amended by 2001/596/EC, the system of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) is:

2+

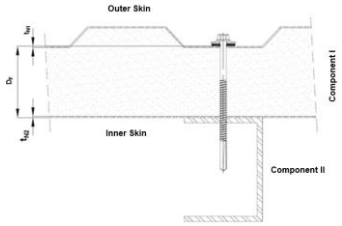
5 Technical details necessary for the implementation of the AVCP system, as foreseen in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at ETA-Danmark prior to CE marking.

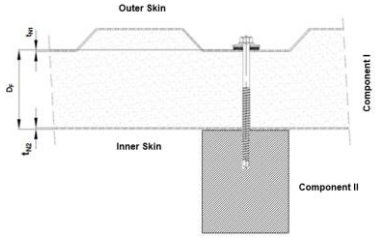
Issued in Copenhagen on
2022-01-18 by

Thomas Bruun
Managing Director, ETA-Danmark

Examples of execution and connection



Component II made of metal



Component II made of timber

Materials and dimensions

Design relevant materials and dimensions are indicated in the Annexes of the fastening screws:

Fastener	Material of the fastening screw
Washer	Material of the sealing washer
Component I	Material of the sandwich panel (outer skin and inner skin)
Component II	Material of substructure

D_F	Thickness of component I
t_{N1}	Thickness of the outer skin of component I
t_{N2}	Thickness of the inner skin of component I
$t_{N,II}$	Thickness of component II made of metal
l_{ef}	Effective screw-in length in component II made of timber (without drill point)
l_g	Screw-in length in component II made of timber (with drill point)
l_b	Length of drill point
d_{pd}	Pre-drill diameter of component I and II

The thickness $t_{N,II}$ corresponds to the load-bearing screw-in length of the fastening screw in component II, if the load-bearing screw-in length does not cover the entire component thickness.

Performance characteristics

The design relevant performance characteristics of a connection are indicated in the Annexes of the fastening screws:

$N_{R,k}$	Characteristic value of tension resistance
$V_{R,k}$	Characteristic value of shear resistance
u	Maximum allowed head displacement of the fastening screw

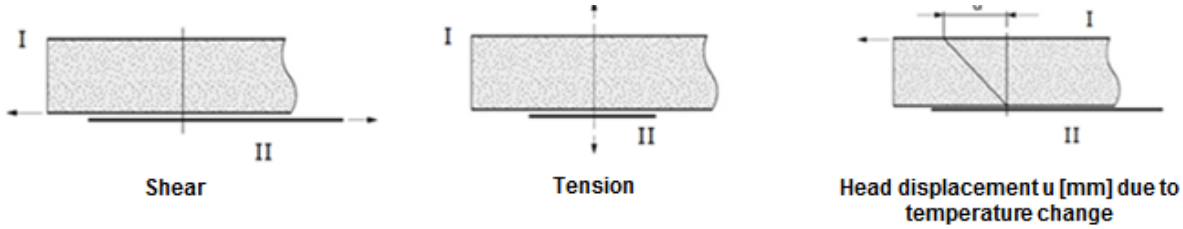
In some cases component-specific performance characteristics are indicated for an individual calculation of the design relevant performance characteristics of a connection:

$N_{R,I,k}$	Characteristic value of pull-through resistance for the outer skin of component I
$N_{R,II,k}$	Characteristic value of pull-out resistance for component II
$V_{R,I,k}$	Characteristic value of hole bearing resistance for the inner skin of component I
$V_{R,II,k}$	Characteristic value of hole bearing resistance for component II

$M_{y,Rk}$	Characteristic value of yield moment of the fastening screw for component II made of timber
$f_{ax,k}$	Characteristic value of withdrawal strength for component II made of timber
$f_{h,k}$	Charakteristic value of embedding strength for component II made of timber

Fastening screws JF	**Annex 1**
Terms and explanations	

Occurred loadings of a connection



Design values

The design values of tension and shear resistance of a connection have to be determined as following:

$N_{R,d}$ Design value of tension resistance
$V_{R,d}$ Design value of shear resistance
γ_M Partial safety factor

The recommended partial safety factor γ_M is 1.33, provided no partial safety factor is given in national regulations or national Annexes to Eurocode 3.

Special conditions

If the component thickness t_{N1}, t_{N2} or $t_{N,II}$ lies in between two indicated component thicknesses, the characteristic value may be calculated by linear interpolation.

For asymmetric components II made of metal (e.g. Z- or C-shaped profiles) with component thickness $t_{N,II} < 3$ mm, the characteristic value $N_{R,k}$ has to be reduced to 70%.

In case of combined loading by tension and shear forces the following interaction equation has to be taken into account:

$$\frac{N_{S,d}}{N_{R,d}} + \frac{V_{S,d}}{V_{R,d}} \leq 1{,}0$$

$N_{S,d}$ Design value of the applied tension forces
$V_{S,d}$ Design value of the applied shear forces

Head displacement

The head displacement of the fastening screw as a result of thermal expansion of the outer skin of the sandwich panel may not exceed the maximum allowed head displacement of the fastening screw.

Installation conditions

The installation is carried out according to manufacturer´s instruction.
The load-bearing screw-in length of the fastening screw specified by the manufacturer has to be taken into account.
The fastening screws have to be processed with suitable drill driver (e.g. cordless drill driver with depth control). The use of impact wrench is not allowed.
The fastening screws have to be fixed rectangular to the surface of the component.
Component I and component II have to be in direct contact to each other. The use of compression resistant thermal insulation strips up to a thickness of 3 mm is allowed.

Component II made of timber

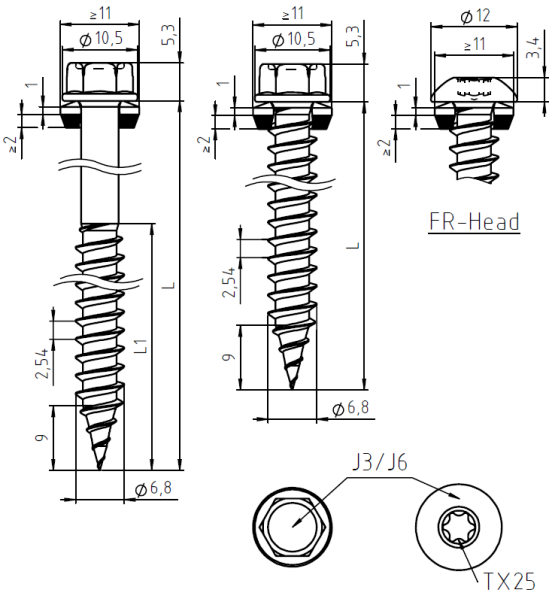
The characteristic values of tension and shear resistance:

$$N_{R,k} = min\begin{cases} N_{R;I,k} \\ N_{R,II,k} * k_{mod} \end{cases} \qquad V_{R,k} = min\begin{cases} V_{R;I,k} \\ V_{R,II,k} * k_{mod} \end{cases}$$

$N_{R,I,k}$ and $V_{R,I,k}$ are given in the Annex of the fastening screw.

$N_{R,II,k}$ is determined according to EN 1995-1-1:2014 + A1:2008, equation (8.40a), with $f_{ax,k}$ given in the Annex of the fastening screw.

$V_{R,II,k}$ is determined according to EN 1995-1-1:2004 + A1:2008, equation (8.9), with $M_{y,Rk}$ given in the Annex of the fastening screw and $f_{h,k}$ according to EN 1995-1-1:2014 + A1:2008, equation (8.15) and equation (8.16).



Materials:

Fastener: stainless steel (A2) – EN ISO 3506
stainless steel (A4) – EN ISO 3506

Washer: stainless steel (A2/A4) – EN ISO 3506
with vulcanised EPDM seal

Component I: S280GD to S350GD – EN 10346

Component II: timber – EN 14081

Drilling capacity: $t_{N2} \leq 1.00$ mm

Timber substructures:

performance determined with
$M_{y,Rk}$ = 10.744 Nm l_b = 9 mm
$f_{ax,k}$ = 12.200 N/mm² for $l_{ef} \geq 27$ mm

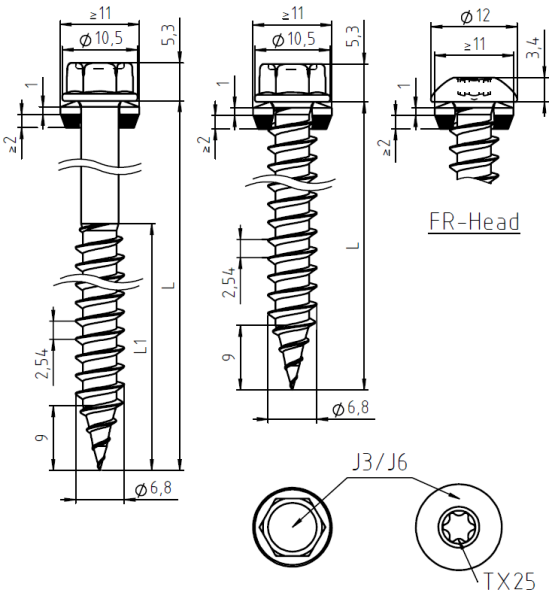
t_{N1} [mm]		l_{ef} [mm]															
		27	30	33	36	39	42	45	48	51	54	57	60	63	66		
$V_{R,k}$ [kN] for t_{N2} =	0.40	0.88	0.98	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	bearing resistance of component I
	0.50	0.88	0.98	1.08	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	
	0.55	0.88	0.98	1.08	1.17	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	
	0.60	0.88	0.98	1.08	1.17	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	
	0.63	0.88	0.98	1.08	1.17	1.27	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	
	0.75	0.88	0.98	1.08	1.17	1.27	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	
	0.88	0.88	0.98	1.08	1.17	1.27	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	
	1.00	0.88	0.98	1.08	1.17	1.27	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	
$N_{R,k}$ [kN] for t_{N1} =	0.40	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	pull-through resistance of component I
	0.50	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	
	0.55	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	
	0.60	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	
	0.63	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	
	0.75	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	
	0.88	2.02	2.22	2.22	2.22	2.22	2.22	2.22	2.22	2.22	2.22	2.22	2.22	2.22	2.22	2.22	
	1.00	2.02	2.24	2.46	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	
$N_{R,II,k}$ [kN] =		2.02	2.24	2.46	2.69	2.91	3.14	3.36	3.58	3.81	4.03	4.26	4.48	4.70	4.93		
max u [mm] for D_F =	30	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	max u [mm] for D_F =
	40	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
	60	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
	80	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	
	100	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	
	120	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	
	≥ 140	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	

– The values indicated above depending on the screw depth l_{ef} shall apply for k_{mod} = 0.90 and the timber strength class C24 (ρ_k = 350 kg/m³). For other values of k_{mod} and timber strength classes see Annex 3.

Fastening screws JF

Self-drilling screw
JF3-(FR-)Plus-6.8xL, JF6-(FR-)Plus-6.8xL
with hexagon head or round head with TX-drive system and sealing washer ≥ Ø11 mm

Annex 4



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Washer: stainless steel (A2/A4) – EN ISO 3506
with vulcanised EPDM seal

Component I: S280GD to S350GD – EN 10346

Component II: timber – EN 14081

Drilling capacity: $t_{N2} \leq 1.00$ mm

Timber substructures:

performance determined with
$M_{y,Rk}$ = 10.744 Nm l_b = 9 mm
$f_{ax,k}$ = 12.200 N/mm² for $l_{ef} \geq 27$ mm

t_{N1} [mm]		l_{ef} [mm]															
		27	30	33	36	39	42	45	48	51	54	57	60	63	66		
$V_{R,k}$ [kN] for t_{N2} =	0.40	0.88	0.98	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	bearing resistance of component I
	0.50	0.88	0.98	1.08	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	
	0.55	0.88	0.98	1.08	1.17	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	
	0.60	0.88	0.98	1.08	1.17	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	
	0.63	0.88	0.98	1.08	1.17	1.27	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	
	0.75	0.88	0.98	1.08	1.17	1.27	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	
	0.88	0.88	0.98	1.08	1.17	1.27	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	
	1.00	0.88	0.98	1.08	1.17	1.27	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	
$N_{R,k}$ [kN] for t_{N1} =	0.40	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	pull-through resistance of component I
	0.50	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	
	0.55	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	
	0.60	2.02	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	
	0.63	2.02	2.24	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	
	0.75	2.02	2.24	2.46	2.69	2.73	2.73	2.73	2.73	2.73	2.73	2.73	2.73	2.73	2.73	2.73	
	0.88	2.02	2.24	2.46	2.69	2.91	3.14	3.23	3.23	3.23	3.23	3.23	3.23	3.23	3.23	3.23	
	1.00	2.02	2.24	2.46	2.69	2.91	3.14	3.36	3.58	3.69	3.69	3.69	3.69	3.69	3.69	3.69	
$N_{R,II,k}$ [kN] =		2.02	2.24	2.46	2.69	2.91	3.14	3.36	3.58	3.81	4.03	4.26	4.48	4.70	4.93		
max u [mm] for D_F =	30	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	max u [mm] for D_F =
	40	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
	60	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
	80	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	
	100	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	
	120	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	
	≥ 140	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	

– The values indicated above depending on the screw depth l_{ef} shall apply for k_{mod} = 0.90 and the timber strength class C24 (ρ_k = 350 kg/m³). For other values of k_{mod} and timber strength classes see Annex 3.

Fastening screws JF

Self-drilling screw
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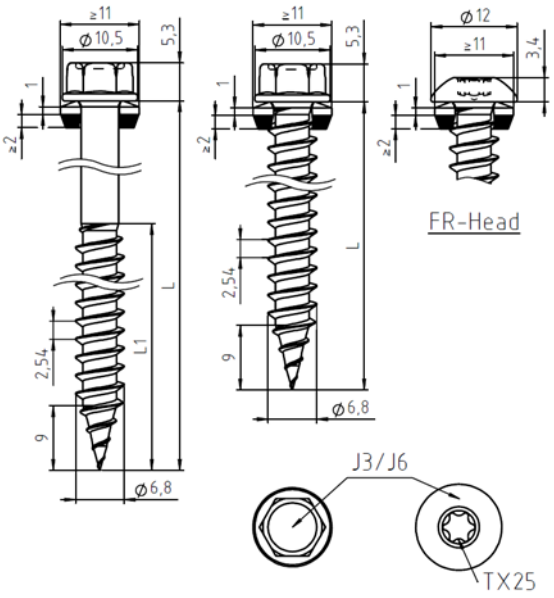
with hexagon head or round head with TX-drive system and sealing washer ≥ Ø16 mm

Annex 5



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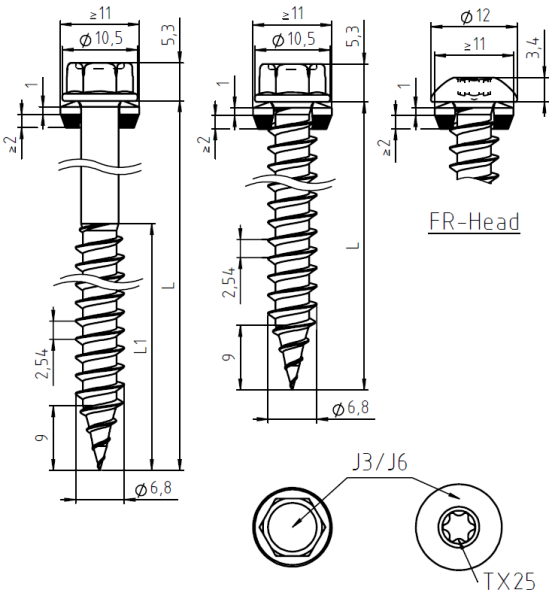
	0.50	0.88	0.98	1.08	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	
	0.55	0.88	0.98	1.08	1.17	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	
	0.60	0.88	0.98	1.08	1.17	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	
	0.63	0.88	0.98	1.08	1.17	1.27	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	
	0.75	0.88	0.98	1.08	1.17	1.27	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	
	0.88	0.88	0.98	1.08	1.17	1.27	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	
	1.00	0.88	0.98	1.08	1.17	1.27	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	
$N_{R,k}$ [kN] for t_{N1} =	0.40	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	pull-through resistance of component I
	0.50	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	
	0.55	2.02	2.24	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.33	
	0.60	2.02	2.24	2.46	2.69	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77	
	0.63	2.02	2.24	2.46	2.69	2.91	3.03	3.03	3.03	3.03	3.03	3.03	3.03	3.03	3.03	3.03	
	0.75	2.02	2.24	2.46	2.69	2.91	3.03	3.03	3.03	3.03	3.03	3.03	3.03	3.03	3.03	3.03	
	0.88	2.02	2.24	2.46	2.69	2.91	3.14	3.23	3.23	3.23	3.23	3.23	3.23	3.23	3.23	3.23	
	1.00	2.02	2.24	2.46	2.69	2.91	3.14	3.36	3.58	3.69	3.69	3.69	3.69	3.69	3.69	3.69	
$N_{R,II,k}$ [kN] =		2.02	2.24	2.46	2.69	2.91	3.14	3.36	3.58	3.81	4.03	4.26	4.48	4.70	4.93		
max u [mm] for D_F =	30	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	max u [mm] for D_F =
	40	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
	60	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
	80	15	15	15	15	15	15	15	15	15	15	15	15	15	15	10	
	100	20	20	20	20	20	20	20	20	20	20	20	20	20	20	10	
	120	20	20	20	20	20	20	20	20	20	20	20	20	20	20	10	
	≥ 140	20	20	20	20	20	20	20	20	20	20	20	20	20	20	10	

– The values indicated above depending on the screw depth l_{ef} shall apply for k_{mod} = 0.90 and the timber strength class C24 (ρ_k = 350 kg/m³). For other values of k_{mod} and timber strength classes see Annex 3.

Fastening screws JF

Self-drilling screw
JF3-(FR-)Plus-6.8xL, JF6-(FR-)Plus-6.8xL
with hexagon head or round head with TX-drive system and sealing washer ≥ Ø19 mm

Annex 6



Materials:

Fastener: stainless steel (A2) – EN ISO 3506
stainless steel (A4) – EN ISO 3506

Washer: stainless steel (A2/A4) – EN ISO 3506
with vulcanised EPDM seal

Component I: S280GD to S350GD – EN 10346

Component II: timber – EN 14081

Drilling capacity: $t_{N2} \leq 1.00$ mm

Timber substructures:

performance determined with
$M_{y,Rk}$ = 10.744 Nm l_b = 9 mm
$f_{ax,k}$ = 12.200 N/mm² for $l_{ef} \geq 27$ mm

t_{N1}		l_{ef} [mm]															
[mm]		27	30	33	36	39	42	45	48	51	54	57	60	63	66		
$V_{R,k}$ [kN] for t_{N2} =	0.40	0.88	0.98	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	bearing resistance of component I
	0.50	0.88	0.98	1.08	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	
	0.55	0.88	0.98	1.08	1.17	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	
	0.60	0.88	0.98	1.08	1.17	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	
	0.63	0.88	0.98	1.08	1.17	1.27	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	
	0.75	0.88	0.98	1.08	1.17	1.27	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	
	0.88	0.88	0.98	1.08	1.17	1.27	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	
	1.00	0.88	0.98	1.08	1.17	1.27	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	
$N_{R,k}$ [kN] for t_{N1} =	0.40	2.02	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	pull-through resistance of component I
	0.50	2.02	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	
	0.55	2.02	2.24	2.46	2.69	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77	
	0.60	2.02	2.24	2.46	2.69	2.91	3.14	3.36	3.46	3.46	3.46	3.46	3.46	3.46	3.46	3.46	
	0.63	2.02	2.24	2.46	2.69	2.91	3.14	3.36	3.58	3.67	3.67	3.67	3.67	3.67	3.67	3.67	
	0.75	2.02	2.24	2.46	2.69	2.91	3.14	3.36	3.58	3.67	3.67	3.67	3.67	3.67	3.67	3.67	
	0.88	2.02	2.24	2.46	2.69	2.91	3.14	3.36	3.58	3.67	3.67	3.67	3.67	3.67	3.67	3.67	
	1.00	2.02	2.24	2.46	2.69	2.91	3.14	3.36	3.58	3.69	3.69	3.69	3.69	3.69	3.69	3.69	
$N_{R,II,k}$ [kN] =		2.02	2.24	2.46	2.69	2.91	3.14	3.36	3.58	3.81	4.03	4.26	4.48	4.70	4.93		
max u [mm] for D_F =	30	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	max u [mm] for D_F =
	40	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
	60	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
	80	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	
	100	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	
	120	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	
	≥ 140	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	

– The values indicated above depending on the screw depth l_{ef} shall apply for k_{mod} = 0.90 and the timber strength class C24 (ρ_k = 350 kg/m³). For other values of k_{mod} and timber strength classes see Annex 3.

Fastening screws JF

Self-drilling screw
JF3-(FR-)Plus-6.8xL, JF6-(FR-)Plus-6.8xL
with hexagon head or round head with TX-drive system and sealing washer ≥ Ø22 mm

Annex 7