



Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments



European Technical Assessment

ETA-11/0174 of 23 November 2023

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the Deutsches Institut für Bautechnik **European Technical Assessment:** Trade name of the construction product Fastening screws E-X Product family Fastening screws for metal members and sheeting to which the construction product belongs Guntram End GmbH Manufacturer Untertürkheimer Straße 20 66117 Saarbrücken DEUTSCHLAND Manufacturing plant Guntram End GmbH Untertürkheimer Strasse 20 D-66117 Saarbrücken This European Technical Assessment 34 pages including 29 annexes which form an integral contains part of this assessment This European Technical Assessment is 330046-01-0602 issued in accordance with Regulation (EU) No 305/2011, on the basis of This version replaces ETA-11/0174 issued on 22 February 2019



European Technical Assessment ETA-11/0174 English translation prepared by DIBt

Page 2 of 34 | 23 November 2023

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Page 3 of 34 | 23 November 2023

Specific part

1 Technical description of the product

The fastening screws are self-drilling or self-tapping screws made of austenitic stainless steel or carbon steel with anticorrosion coating (listed in Table 1). The fastening screws are normally completed with sealing washers consisting of metal washer and EPDM-seal.

Table 1 – Fastening screws for metal members and sheeting

Annex	Fastening screw	Description of product	Application	
8	E-X Bohr 2 5,5 x L	Self-drilling screw with hexagon head and sealing washer ≥ Ø 16 mm	Steel / Steel	
9	E-X Bohr 3 5,5 x L	Self-drilling screw with hexagon head and sealing washer ≥ Ø 16 mm	Steel / Steel	
10	E-X Bohr 5 5,5 x L	Self-drilling screw with hexagon head and sealing washer ≥ Ø 16 mm	Steel / Steel	
11	E-X Bohr RS 6,3 x L	Self-drilling screw with hexagon head and sealing washer ≥ Ø 16 mm	Steel / Steel	
12	E-X Bohr RS 6,3 x L	Self-drilling screw with hexagon head and sealing washer ≥ Ø 16 mm	Steel / Steel	
13	E-X Bohr RS 5,5 x L	Self-drilling screw with hexagon head and sealing washer ≥ Ø 14 mm	Steel / Steel	
14	E-X RS 4,8 x L	Self-drilling screw with hexagon head and sealing washer ≥ Ø 14 mm	Steel / Steel	
15	E-X RS 4,8 x L	Self-drilling screw with hexagon head and sealing washer ≥ Ø 14 mm	Steel / Steel	
16	E-X RS 6,0 x L	Self-drilling screw with hexagon head and sealing washer ≥ Ø 16 mm	Steel / Steel	
10	E-X K3 0,0 X L	Self-drilling screw with torx drive and sealing washer ≥ Ø 16 mm		
17	E-X Bohr RS 4,8 x 20	RS 4,8 x 20 Self-drilling screw with hexagon head and sealing washer $\ge \emptyset$ 14 mm		
17	E-X T25 Bohr RS 4,8 x 20	Self-drilling screw with torx drive and sealing washer ≥ Ø 12 mm	Steel / Steel	
18	E-X Bohr RS 4,8 x L	Self-drilling screw with hexagon head and sealing washer ≥ Ø 14 mm	Steel / Steel	
10	E-X T25 Bohr RS 4,8 x L	Self-drilling screw with torx drive and sealing washer ≥ Ø 12 mm	Steel / Timber	
19	E-X BZ 6,3 x L E-X 8 BZ 6,3 x L	Self-tapping screw with hexagon head and sealing washer ≥ Ø 16 mm	Steel / Steel	
20	E-X A 6,5 x L E-X 8 A 6,5 x L	Self-tapping screw with hexagon head and sealing washer ≥ Ø 16 mm	Steel / Steel Steel / Timber	
21	E-X Bohr RS 6,5 x L	Self-drilling screw with hexagon head and sealing washer $\ge \emptyset$ 16 mm	Steel / Timber	



European Technical Assessment ETA-11/0174

Page 4 of 34 | 23 November 2023

English translation prepared by DIBt

Table 1 – continued

Annex	Fastening screw	Description of product	Application	
22	E-X Bohr 2 5,5 x L	Self-drilling screw with hexagon head and sealing washer ≥ Ø 16 mm	Aluminium /	
22	E-X T25 Bohr 2 5,5 x L	Self-drilling screw with torx drive and sealing washer ≥ Ø 12 mm	Steel	
23	E-X Bohr RS 4,8 x 20	Self-drilling screw with hexagon head and sealing washer ≥ Ø 14 mm	Aluminium /	
23	E-X T25 Bohr RS 4,8 x 20	Self-drilling screw with torx drive and sealing washer ≥ Ø 12 mm	Steel	
24	E-X A 6,5 x L E-X 8 A 6,5 x L	Self-tapping screw with hexagon head and sealing washer ≥ Ø 16 mm	Aluminium / Steel	
05	E-X Bohr 2 5,5 x L	Self-drilling screw with hexagon head and sealing washer ≥ Ø 16 mm	Aluminium /	
25	E-X T25 Bohr 2 5,5 x L	Self-drilling screw with torx drive and sealing washer ≥ Ø 12 mm	Aluminium	
26	E-X Bohr RS 4,8 x 20	Self-drilling screw with hexagon head and sealing washer ≥ Ø 14 mm	Aluminium /	
20	E-X T25 Bohr RS 4,8 x 20	Self-drilling screw with torx drive and sealing washer ≥ Ø 12 mm	Aluminium	
27	E-X A 6,5 x L E-X 8 A 6,5 x L	Self-tapping screw with hexagon head and sealing washer ≥ Ø 16 mm	Aluminium / Aluminium	
28	E-X Bohr RS 6,5 x L	Self-drilling screw with hexagon head and sealing washer ≥ Ø 16 mm	Aluminium / Timber	
29	E-X A 6,5 x L E-X 8 A 6,5 x L	Self-tapping screw with hexagon head and sealing washer ≥ Ø 16 mm	Aluminium / Timber	

2 Specification of the intended use in accordance with the applicable European Assessment Document

The fastening screws are intended to be used for fastening metal sheeting to metal or timber substructures. The sheeting can either be used as wall or roof cladding or as load bearing wall and roof element. The fastening screws can also be used for the fastening of any other thin gauge metal members. The intended use comprises fastening screws and connections for indoor and outdoor applications. Fastening screws which are intended to be used in external environments with \geq 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 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 (1-28).

The verification and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the fastening screws of at least 25 years. The indications given on the working life cannot be interpreted as a guarantee given by the manufacturer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.



European Technical Assessment ETA-11/0174

Page 5 of 34 | 23 November 2023

English translation prepared by DIBt

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

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Shear Resistance of the Connection	see Annexes to this ETA
Tension Resistance of the Connection	see Annexes to this ETA
Design Resistance in combination of tension and shear forces (interaction)	see Annexes to this ETA
Check of Deformation Capacity in case of constraining forces due to temperature	No performance assessed
Durability	No performance assessed

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

In accordance with EAD 330046-01-0602, the applicable European legal act is: Commission Decision 1998/214/EC, amended by 2001/596/EC. The system to be applied is: 2+

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

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at Deutsches Institut für Bautechnik.

Issued in Berlin on 23 November 2023 by Deutsches Institut für Bautechnik

Dr.-Ing. Ronald Schwuchow Head of Section *beglaubigt:* Ortmann

Page 6 of European Technical Assessment ETA-11/0174 of 23 November 2023

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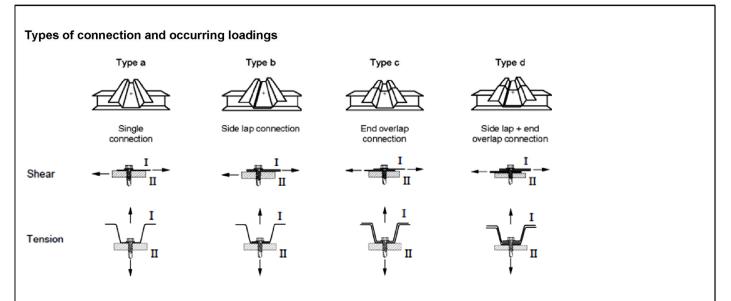


Examples of execution of a connection								
	Component I Component II metal substructure							
Terms for mate	erials							
Fastener Washer Component I Component II	Material of the fastening screw Material of the sealing washer Material of the metal member or sheeting with contact to the screw head Material of the substructure							
Terms for dime	ensions							
t_i t_{ii} $\Sigma(t_i)$ l_{ef} d_{pd} $d_{pd,i}$	Thickness of component I Thickness of component II Sum of the thicknesses of all components Effective screw-in length in timber substructure (without drill point) Pre-drill diameter of component I and component II Pre-drill diameter of component I							
Terms for perfe	ormances							
V _{R,k} N _{R,k} V _{R,I,k} N _{R,II,k}	NR,kCharacteristic value of tension resistance of the connectionVR,I,kCharacteristic value of shear resistance (load bearing) of component INR,I,kCharacteristic value of tension resistance (pull-through) of component I							
Additionally for t	timber substructure the following terms are used:							
M _{y,Rk} fax,k fh,k Рk Ра	Characteristic value of yield moment Characteristic value of withdrawal strength Characteristic value of embedding strength Characteristic value of raw density of structural timber in kg/m ³ Existing value of raw density of structural timber in kg/m ³							
	Used terms in the Annexes							
	Fastening screws for metal members and sheeting	Annex 1						

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Page 7 of European Technical Assessment ETA-11/0174 of 23 November 2023

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Determination of Design Values

The design value of tension and shear resistance has to be determined as follows:

$$N_{R,d} = \frac{N_{R,k}}{Y_M} \qquad \qquad V_{R,d} = \frac{V_{R,k}}{Y_M}$$

The characteristic values $N_{R,k}$ and $V_{R,k}$ are given in the Annexes. For intermediate dimension of metal member or sheeting or substructure the characteristic value of the thinner dimension is used.

The recommended partial safety factor $\gamma_M = 1.33$ is used, provided no partial safety factor is given in national regulations or national Annexes to Eurocode 3.

For the types of connection (a, b, c, d) listed in the Annexes it is not necessary to take into account the effect of constrains due to temperature. Otherwise this has to be considered unless constrains due to temperature do not occur or are not significant (e.g. sufficient flexibility of the substructure).

For asymmetric metal substructures with thickness $t_{II} < 5$ mm (for instance Z- or C-shaped profiles), the characteristic value $N_{R,k}$ given in the Annexes has to be reduced to 70%.

In case of combined tension and shear forces the following interaction equation is taken into account:

$$\frac{N_{S,d}}{N_{R,d}} + \frac{V_{S,d}}{V_{R,d}} \leq 1.0$$

 $N_{S,d}$ and $V_{S,d}$ indicates the design values of applied tension and shear forces.

Installation conditions

The installation is carried out according to the manufacturer's instructions.

The load-bearing screw-in length of the fastening screw given by the manufacturer shall be considered.

The fastening screws are screwed-in with electric screw driver with depth stop. The use of impact wrenches is not allowed. The fastening screws are fixed rectangular to the surface of the metal member or sheeting.

The metal member or sheeting and substructure are in contact to each other. The use of compression resistant thermal insulation strips up to a thickness of 3 mm is allowed.

Basics for the design

A

Fastening screws for metal members and sheeting

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Timber substructures

Characteristic values of tension and shear resistance of the connection for $k_{mod} \neq 0.9$ and / or $\rho_k > 350$ kg/m³ can be determined as follows:

$$N_{R,k} = \min \left\{ \begin{array}{c} N_{R,l,k} \\ N_{R,ll,k} \cdot k_{mod} / 0.9 \cdot (\rho_a / 350)^{0.8} \end{array} \right.$$

$$V_{\mathsf{R},k} = \min \left\{ \begin{array}{c} V_{\mathsf{R},\mathsf{I},k} \\ V_{\mathsf{R},\mathsf{II},k} \cdot k_{\mathsf{mod}} / 0.9 \cdot (\rho_{\mathsf{a}} / 350)^{0.8} \end{array} \right.$$

 $N_{R,l,k}$ und $V_{R,l,k}$ are given in the corresponding Annex of the fastening screw. As far as $N_{R,ll,k}$ and $V_{R,ll,k}$ are not given in the corresponding Annex of the fastening screw applies:

$$\begin{split} & \textbf{N}_{\mathsf{R},\mathsf{II},\mathsf{k}} = f_{\mathsf{ax},\mathsf{k}} \cdot d \cdot l_{\mathsf{ef}} \cdot k_{\mathsf{mod}} \\ & \textbf{V}_{\mathsf{R},\mathsf{II},\mathsf{k}} = F_{\mathsf{v},\mathsf{Rk}} \cdot k_{\mathsf{mod}} \end{split}$$

 $F_{v,Rk}$ has to be determined according to EN 1995-1-1:2004 + A1:2008, equation (8.9) with $M_{y,Rk}$ and $f_{h,k}$ given in the corresponding Annex of the fastening screw and $f_{h,k}$ according:

 $f_{h,k}$ = 0,082(1 - 0,01 · d)· ρ_k

with ρ_k = 350 kg/m³ as far as no specific value is known.

The characteristic values of resistance of the connection shall be determined as follows:

$$N_{R,k} = \min \left\{ \begin{array}{l} N_{R,l,k} \\ N_{R,ll,k} \end{array} \right.$$
$$V_{R,k} = \min \left\{ \begin{array}{l} V_{R,l,k} \\ V_{R,ll,k} \end{array} \right.$$

Aluminium members and sheeting

Characteristic values of tension resistance of the connection can be determined as follows:

$$N_{R,k} = \min \begin{cases} N_{R,l,k} \\ N_{R,ll,k} \end{cases}$$

The characteristic value $N_{R,l,k}$ has to be determined according to EN 1999-1-4:2007 + AC:2009, equation (8.13). The characteristic value $N_{R,l,k}$ is given in the corresponding Annex of the fastening screw.

Perforated steel members and sheeting

Characteristic values of tension and shear resistance of the connection can be determined as follows:

$$N_{R,k} = \min \left\{ \begin{array}{c} N_{R,l,k} \\ N_{R,l,k} \end{array} \right. \qquad V_{R,k} = \min \left\{ \begin{array}{c} V_{R,l,k} \\ V_{R,k} \end{array} \right.$$

The characteristic values $N_{R,l,k}$ and $V_{R,l,k}$ are given in Annex 4 to 7.

The characteristic values $N_{R,II,k}$ and $V_{R,k}$ are given in the corresponding Annex of the fastening screw.

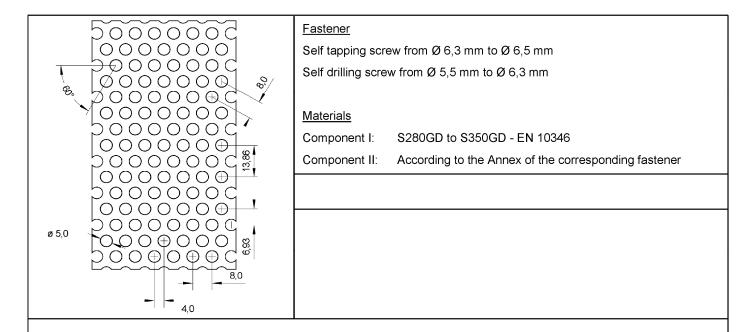
Specific notes to the Annexes

Fastening screws for metal members and sheeting

Page 9 of European Technical Assessment ETA-11/0174 of 23 November 2023

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sh	neet	pe	forated s S28	sheet ma 30GD	ide of	perfo	perforated sheet made of \$320GD				perforated sheet made of \$350GD			
washer Ø [mm]		ı] 16	19	22	25	16	19	22	25	16	19	22	25	
	0,75	2,16	5 2,22	2,24	2,38	2,34	2,40	2,44	2,58	2,54	2,60	2,62	2,78	
	0,88	2,56	2,64	2,64	2,78	2,78	2,86	2,86	3,02	3,00	3,10	3,10	3,26	
[kN]	1,00	2,92	3,04	3,02	3,16	3,16	3,30	3,26	3,42	3,42	3,56	3,52	3,68	
	1,13	3,32	3,48	3,42	3,56	3,60	3,76	3,70	3,86	3,88	4,10	4,00	4,16	
_	1,25	3,70	3,88	3,80	3,94	4,00	4,20	4,10	4,26	4,32	4,54	4,42	4,60	
Iponent [mm] 	1,50	4,46	6 4,74	4,56	4,72	4,84	5,12	4,96	5,10	5,22	5,54	5,34	5,50	
Component t _i [mm] 	0,75	1,40	1,94	2,14	2,22	1,52	2,08	3,32	2,42	1,64	2,26	2,50	2,60	
0	0,88	1,82	2,34	2,62	2,70	1,96	2,54	2,82	2,92	2,12	2,74	3,04	3,14	
[KN]	1,00	2,24	2,74	3,06	3,14	2,44	2,96	3,32	3,42	2,62	3,20	3,58	3,68	
N N	1,13	2,74	3,18	3,58	3,64	2,98	3,44	3,88	3,96	3,20	3,70	4,18	4,26	
	1,25	3,24	3,58	4,08	4,12	3,52	3,88	4,40	4,46	3,78	4,18	4,76	4,80	
	1,50	4,36	6 4,46	5,12	5,12	4,74	4,84	5,56	5,56	5,10	5,22	5,98	5,98	

The characteristic load bearing capacity of component II is according to the Annex of the corresponding fastener.

The thickness of the perforated sheets which are exposed to wind loads shall be at least 1,00 mm.

Fastening of perforated sheets

Load bearing capacity of component I

Page 10 of European Technical Assessment ETA-11/0174 of 23 November 2023

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<u>Fastener</u> Self tapping screw from Ø 6,3 mm to Ø 6,5 mm Self drilling screw from Ø 5,5 mm to Ø 6,3 mm
MaterialsComponent I:S280GD - EN 10346Component II:According to the Annex of the corresponding fastener

sheet		perforated sheet made of S280GD									
Fa	Fastener		s Ø 5	elf drillir ,5 mm t	ng screw o Ø 6,0	/s mm	self tapping screws Ø 6,3 mm to Ø 6,5 mm				
wash	er 🕻	ð [mm]	16	19	22	25	16	19	22	25	
		0,75	2,48	2,52	2,84	2,76	2,38	2,64	3,16	3,24	
	-	0,88	3,04	3,12	3,42	3,32	3,02	3,28	3,78	3,88	
	_ الا	1,00	3,56	3,70	3,84	3,84	3,64	3,96	4,36	4,50	
	V _{R,I,k} [kN]	1,13	4,14	4,26	4,40	4,40	4,36	4,70	5,00	5,18	
_		1,25	4,68	5,84	4,92	4,94	5,06	5,40	5,60	5,84	
onent]]m]		1,50	5,76	6,04	5,90	6,10	6,62	6,94	6,88	7,16	
Component tı [mm]		0,75	2,88	3,16	3,24	3,14	2,86	3,46	3,72	3,92	
0	_	0,88	3,42	3,72	3,76	3,70	3,40	4,02	4,30	4,46	
	_ ۲	1,00	3,92	4,28	4,28	4,20	3,90	4,56	4,82	4,96	
	NR,I,K [KN]	1,13	4,46	4,86	4,88	4,72	4,44	5,12	5,38	5,48	
		1,25	4,96	5,42	5,42	5,26	4,94	5,66	5,88	5,94	
	_	1,50	6,04	6,60	6,60	6,38	6,00	6,74	6,92	6,90	

The characteristic load bearing capacity of component II is according to the Annex of the corresponding fastener.

The thickness of the perforated sheets which are exposed to wind loads shall be at least 1,00 mm.

Fastening of perforated sheets

Load bearing capacity of component I

Page 11 of European Technical Assessment ETA-11/0174 of 23 November 2023

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<u>Fastener</u> Self tapping screw from Ø 6,3 mm to Ø 6,5 mm Self drilling screw from Ø 5,5 mm to Ø 6,3 mm
Materials Component I: S320GD - EN 10346 Component II: According to the Annex of the corresponding fastener

sheet		perforated sheet made of S320GD									
Fa	Fastener				ng screw o Ø 6,0			self tapping screws Ø 6,3 mm to Ø 6,5 mm			
wash	ner (ð [mm]	16	19	22	25	16	19	22	25	
		0,75	2,68	2,74	3,08	3,00	2,68	2,88	3,42	3,50	
	_	0,88	3,30	3,38	3,70	3,60	3,36	3,60	4,10	4,22	
	V _{R,I,k} [kN]	1,00	3,86	4,00	4,16	4,16	4,02	4,30	4,72	4,88	
	V _{R,I,k}	1,13	4,48	4,62	4,76	4,76	4,76	5,08	5,42	5,60	
_		1,25	5,06	5,24	5,32	5,36	5,50	5,84	6,08	6,30	
Component tı [mm]		1,50	6,24	6,54	6,40	6,60	7,10	7,52	7,46	7,76	
ompone tı [mm]		0,75	3,12	3,42	3,50	3,40	3,12	3,68	4,06	4,26	
0	_	0,88	3,70	4,04	4,08	4,00	3,70	4,32	4,68	4,86	
	[kN	1,00	4,24	4,64	4,64	4,54	4,24	4,92	5,24	5,40	
	NR,I,K [KN]	1,13	4,84	5,26	5,28	5,12	4,84	5,54	5,86	5,96	
		1,25	5,38	5,88	5,88	5,70	5,38	6,14	6,40	6,48	
	-	1,50	6,54	7,16	7,16	6,92	6,54	7,38	7,54	7,52	

The characteristic load bearing capacity of component II is according to the Annex of the corresponding fastener.

The thickness of the perforated sheets which are exposed to wind loads shall be at least 1,00 mm.

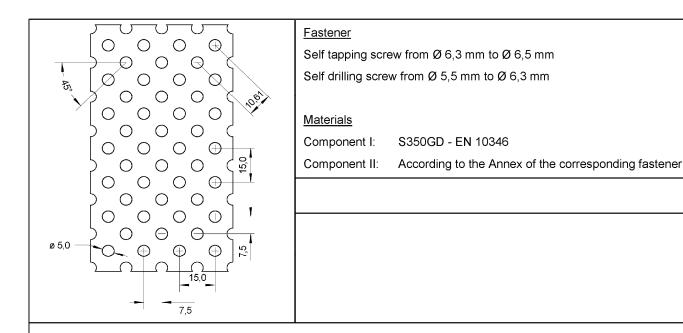
Fastening of perforated sheets

Load bearing capacity of component I

Page 12 of European Technical Assessment ETA-11/0174 of 23 November 2023

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sheet		perforated sheet made of									
Sileet		\$350GD									
Fastener		se Ø5	əlf drillir ,5 mm t	ng screw o Ø 6,0	/s mm			ng screv o Ø 6,5			
washer Ø [mm]		16	19	22	25	16	19	22	25		
		0,75	2,88	2,92	3,30	3,20	2,98	3,20	3,72	3,92	
		0,88	3,54	3,62	3,96	3,86	3,62	3,88	4,42	4,54	
	VR,I,K [KN]	1,00	4,14	4,28	4,46	4,46	4,24	4,52	5,08	5,12	
	<pre></pre>	1,13	4,80	4,94	5,10	5,10	4,92	5,24	5,78	5,74	
_	_	1,25	5,44	5,62	5,70	5,72	5,56	5,92	6,46	6,32	
onent]		1,50	6,24	6,54	6,40	7,02	6,94	7,36	7,86	7,48	
Component t _i [mm] "		0,75	3,34	3,66	3,76	3,64	3,52	4,16	4,52	4,64	
0		0,88	3,96	4,36	4,38	4,28	3,98	4,76	5,04	5,24	
	NR,I,K [KN]	1,00	4,54	4,98	4,96	4,86	4,40	5,24	5,50	5,76	
-	N R, I,	1,13	5,16	5,64	5,64	5,48	4,86	5,76	5,96	6,32	
	_	1,25	5,80	6,28	6,28	6,14	5,38	6,24	6,40	6,80	
		1,50	6,54	7,16	7,16	7,46	6,54	7,38	7,54	7,80	

The characteristic load bearing capacity of component II is according to the Annex of the corresponding fastener.

The thickness of the perforated sheets which are exposed to wind loads shall be at least 1,00 mm.

Fastening of perforated sheets

Load bearing capacity of component I

Page 13 of European Technical Assessment ETA-11/0174 of 23 November 2023

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	<u>Material:</u> Fastener: stainless Steel (1.4301) - EN 10088
	Washer: stainless Steel (1.4301) - EN 10088
	with EPDM- seal
5,5	Component I: S280GD, S320GD - EN 10346
5.5 5.5 10,5 5.5 5.5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Component II: S235 - EN 10025-1 S280GD, S320GD - EN 10346
	<u>Drilling capacity:</u> $\Sigma t_i \le 3.5 \text{ mm}$
	<u>Timber substructures:</u> no performance determined

t.	[mm]								tıı (r	nm]							
4	[]	0.0	63	0.	75	0.	88	1.0	0	1.1	3	1.2	.5	1.	50	2.	00
	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.63	-	-	-	-	-	-	1.20	-	1.50	-	1.70	-	1.70	abc	1.70	abc
	0.75	-	-	-	-	-	-	1.60	-	1.80	-	2.00	-	2.00	ac	2.00	ac
V _{R,k} [kN]	0.88	-	-	-	-	-	-	2.00	-	2.20	-	2.30	-	2.40	-	2.40	а
	1.00	-	-	-	-	-	-	2.20	-	2.60	-	2.70	-	2.70	-	2.70	а
~	1.13	-	-	-	-	-	-	2.20	-	2.60	-	2.70	-	2.70	-	2.70	а
	1.25	-	-	-	-	-	-	2.20	-	2.60	-	2.70	-	2.70	-	2.70	а
	1.50	-	-	-	-	-	-	2.20	-	2.60	-	2.70	-	2.70	-	2.70	а
	1.75	-	-	-	-	-	-	2.20	-	2.60	-	2.70	-	2.70	-	-	-
	2.00	-	-	-	-	-	-	2.20	-	2.60	-	2.70	-	2.70	-	-	-
	0.50	-	-	-	-	-	-	0.38	-	0.43	-	0.54	-	0.76	abc	1.19	abc
	0.55	-	-	-	-	-	-	0.48	-	0.55	-	0.68	-	0.95	abc	1.50	abc
	0.63	-	-	-	-	-	-	0.70	-	0.80	-	1.00	-	1.40	abc	2.20	abc
	0.75	-	-	-	-	-	-	0.70	-	0.80	-	1.00	-	1.40	ac	2.20	abc
l z	0.88	-	-	-	-	-	-	0.70	-	0.80	-	1.00	-	1.40	-	2.20	ac
_ <u>₹</u>	1.00	-	-	-	-	-	-	0.70	-	0.80	-	1.00	-	1.40	-	2.20	а
N _{R,k} [kN]	1.13	-	-	-	-	-	-	0.70	-	0.80	-	1.00	-	1.40	-	2.20	а
	1.25	-	-	-	-	-	-	0.70	-	0.80	-	1.00	-	1.40	-	2.20	а
	1.50	-	-	-	-	-	-	0.70	-	0.80	-	1.00	-	1.40	-	2.20	а
	1.75	-	-	-	-	-	-	0.70	-	0.80	-	1.00	-	1.40	-	-	-
	2.00	-	-	-	-	-	-	0.70	_	0.80	-	1.00	-	1.40	-	-	-

No further specifications.

Self-drilling screw with hexagon head and sealing washer $\ge \emptyset$ 16 mm

Page 14 of European Technical Assessment ETA-11/0174 of 23 November 2023

English translation prepared by DIBt



	Washer: Component I:	ctures:
--	-------------------------	---------

t	[mm]								t _{ii} [n	ņm]		1 1					
4	[]	1.5	50	2.0	00	2.5	50	3.	00	4.0)0	5.0	00	6.0)0	7.	00
	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.63	2.40	ac	2.40	ac	2.40	ac	2.40	abcd	2.40	abc	-	-	-	-	-	-
	0.75	2.70	ac	2.80	ac	2.80	ac	3.30	ac	3.30	ac	-	-	-	-	-	-
l Ž	0.88	3.00	-	3.50	-	3.50	-	4.20	-	4.20	-	-	-	-	-	-	-
V _{R,k} [kN]	1.00	3.20	-	3.60	-	3.60	-	4.30	-	4.30	-	-	-	-	-	-	-
	1.13	3.20	-	3.60	-	3.60	-	4.30	-	4.30	-	-	-	-	-	-	-
	1.25	3.20	-	3.60	-	3.60	-	4.30	-	4.30	-	-	-	-	-	-	-
	1.50	3.20	-	3.60	-	3.60	-	4.30	-	-	-	-	-	-	-	-	-
	1.75	3.20	-	3.60	-	3.60	-	4.30	-	-	-	-	-	-	-	-	-
	2.00	3.20	-	3.60	-	3.60	-	4.30	-	-	-	-	-	-	-	-	-
	0.50	0.54	ac	0.97	ac	0.97	ac	1.57	abcd	1.57	abc	-	-	-	-	-	-
	0.55	0.68	ac	1.23	ac	1.23	ac	1.98	abcd	1.98	abc	-	-	-	-	-	-
	0.63	1.00	ac	1.80	ac	1.80	ac	2.90	abcd	2.90	abc	-	-	-	-	-	-
	0.75	1.00	ac	1.80	ac	1.80	ac	3.50	ac	3.50	ac	-	-	-	-	-	-
l Ŝ	0.88	1.00	-	1.80	-	1.80	-	4.10	-	4.10	-	-	-	-	-	-	-
N _{R,k} [kN]	1.00	1.00	-	1.80	-	1.80	-	4.60	-	4.70	-	-	-	-	-	-	-
R Ř	1.13	1.00	-	1.80	-	1.80	-	4.60	-	5.40	-	-	-	-	-	-	-
	1.25	1.00	-	1.80	-	1.80	-	4.60	-	6.00	-	-	-	-	-	-	-
	1.50	1.00	-	1.80	-	1.80	-	4.60	-	-	-	-	-	-	-	-	-
	1.75	1.00	-	1.80	-	1.80	-	4.60	-	-	-	-	-	-	-	-	-
	2.00	1.00	-	1.80	-	1.80	-	4.60	-	-	-	-	-	-	-	-	-

No further specifications.

Self-drilling screw with hexagon head and sealing washer $\ge \emptyset$ 16 mm

Page 15 of European Technical Assessment ETA-11/0174 of 23 November 2023

English translation prepared by DIBt



Material: Fastener: stainless Steel (1.4301) - EN 10088 Washer: stainless Steel (1.4301) - EN 10088 with EPDM- seal with EPDM- seal Component I: S280GD, S320GD, S350GD - EN 10346 Component II: S235, S275, S355 - EN 10025-1
$\label{eq:stilling} \begin{array}{l} \underline{\text{Drilling capacity:}} & \Sigma t_i \leq 12.50 \text{ mm} \end{array}$ $\label{eq:substructures:} \\ \text{no performance determined} \end{array}$

+ .	[mm]																
4	[]	4.0	00	5.0)0	6.	00	8.	00	10	.00	12.	00	13.	00	14	.00
	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.63	-	-	-	-	4.00	abcd	4.00	abcd	4.00	abcd	-	-	-	-	-	-
	0.75	-	-	-	-	4.50	ac	4.50	ac	4.50	ac	-	-	-	-	-	-
ΙŢ	0.88	-	-	-	-	4.90	ac	5.00	ac	5.00	ac	-	-	-	-	-	-
V _{R,k} [kN]	1.00	-	-	-	-	5.30	ac	5.40	ac	5.50	ac	-	-	-	-	-	-
Second	1.13	-	-	-	-	5.70	-	5.90	ac	6.00	ac	-	-	-	-	-	-
	1.25	-	-	-	-	6.10	-	6.30	ac	6.50	ac	-	-	-	-	-	-
	1.50	-	-	-	-	6.10	-	6.30	-	6.50	-	-	-	-	-	-	-
	1.75	-	-	-	-	6.10	-	6.30	-	6.50	-	-	-	-	-	-	-
	2.00	-	-	-	-	6.10	-	6.30	-	6.50	-	-	-	-	-	-	-
	0.50	-	-	-	-	1.84	abcd	1.84	abcd	1.84	abcd	-	-	-	-	-	-
	0.55	-	-	-	-	2.32	abcd	2.32	abcd	2.32	abcd	-	-	-	-	-	-
	0.63	-	-	-	-	3.40	abcd	3.40	abcd	3.40	abcd	-	-	-	-	-	-
	0.75	-	-	-	-	3.90	ac	3.90	ac	3.90	ac	-	-	-	-	-	-
N _{R,k} [kN]	0.88	-	-	-	-	4.40	ac	4.40	ac	4.40	ac	-	-	-	-	-	-
	1.00	-	-	-	-	4.90	ac	4.90	ac	4.90	ac	-	-	-	-	-	-
R R	1.13	-	-	-	-	5.40	-	5.40	-	5.40	-	-	-	-	-	-	-
	1.25	-	-	-	-	5.80	-	5.80	-	5.80	-	-	-	-	-	-	-
	1.50	-	-	-	-	6.60	-	6.60	-	6.60	-	-	-	-	-	-	-
	1.75	-	-	-	-	6.60	-	6.60	-	6.60	-	-	-	-	-	-	-
	2.00	-	-	-	-	6.60	-	6.60	-	6.60	-	-	-	-	-	-	-

No further specifications.

Self-drilling screw with hexagon head and sealing washer $\ge \emptyset$ 16 mm

Annex 10

E-X Bohr 5 5,5 x L

English translation prepared by DIBt



Ø16 Ø10,5 SW 8 E-X	Material:Fastener:stainless Steel (1.4301) - EN 10088Washer:stainless Steel (1.4301) - EN 10088With EPDM- sealComponent I:S280GD - EN 10346Component II:S280GD - EN 10346
	<u>Drilling capacity:</u> $\Sigma t_i \leq 2.50 \text{ mm}$
4,25 œ	<u>Timber substructures:</u> no performance determined

4 6										t _{ii} [m	m]								
սլ	mm]	0.5	0	0.5	5	0.63		0.7	0.75		8	1.0	0	1.1	3	1.2	5	1.5	60
	0.50	0.89	-	0.95	-	1.06	-	1.17	-	1.17	-	1.17	-	1.17	-	1.17	-	1.17	-
	0.55	0.89	-	1.05	-	1.17	-	1.37	-	1.42	-	1.47	-	1.47	-	1.47	-	1.47	-
	0.63	0.89	-	1.05	-	1.34	-	1.69	-	1.83	-	1.96	-	1.96	-	1.96	-	1.96	-
5	0.75	0.89	-	1.05	-	1.34	-	1.83	-	2.17	-	2.48	-	2.48	-	2.59	-	2.81	-
ĽY	0.88	0.89	-	1.05	-	1.34	-	1.83	-	2.43	-	2.78	-	2.78	-	2.83	-	2.95	-
V _{R,k} [kN]	1.00	0.89	-	1.05	-	1.34	-	1.83	-	2.43	-	3.05	-	3.05	-	3.06	-	3.07	-
>	1.13	0.89	-	1.05	-	1.34	-	1.83	-	2.43	-	3.05	-	3.05	-	3.06	-	-	-
	1.25	0.89	-	1.05	-	1.34	-	1.83	-	2.43	-	3.05	-	3.05	-	3.06	-	-	-
	1.50	0.89	-	1.05	-	1.34	-	1.83	-	2.43	-	3.05	-	-	-	-	-	-	-
	1.75	0.89	-	1.05	-	1.34	-	1.83	-	-	-	-	-	-	-	-	-	-	-
	0.50	0.55	-	0.63	-	0.76	-	0.98	-	1.23	-	1.48	-	1.76	-	2.05	-	2.26	-
	0.55	0.55	-	0.63	-	0.76	-	0.98	-	1.23	-	1.48	-	1.76	-	2.05	-	2.61	-
	0.63	0.55	-	0.63	-	0.76	-	0.98	-	1.23	-	1.48	-	1.76	-	2.05	-	2.70	-
-	0.75	0.55	-	0.63	-	0.76	-	0.98	-	1.23	-	1.48	-	1.76	-	2.05	-	2.70	-
[kN]	0.88	0.55	-	0.63	-	0.76	-	0.98	-	1.23	-	1.48	-	1.76	-	2.05	-	2.70	-
N _{R,k}	1.00	0.55	-	0.63	-	0.76	-	0.98	-	1.23	-	1.48	-	1.76	-	2.05	-	2.70	-
Ż	1.13	0.55	-	0.63	-	0.76	-	0.98	-	1.23	-	1.48	-	1.76	_	2.05	-	-	-
	1.25	0.55	_	0.63	_	0.76	_	0.98	_	1.23	_	1.48	-	1.76	_	2.05	-	-	-
	1.50	0.55	_	0.63	_	0.76	_	0.98	_	1.23	_	1.48	_	_	_		_	_	_
	1.75	0.55	-	0.63	-	0.76	-	0.98	-	-	-	-	-	-	-	-	-	-	-

No further specifications.

Self-drilling screw with hexagon head and sealing washer $\ge \emptyset$ 16 mm

Annex 11

E-X Bohr RS 6,3 x L

English translation prepared by DIBt



Ø16 Ø10,5 SW 8 6,3 6,3 E-X	Material:Fastener:stainless Steel (1.4301) - EN 10088Washer:stainless Steel (1.4301) - EN 10088with EPDM- sealComponent I:S320GD, S350GD, S390GD - EN 10346Component II:S320GD, S350GD, S390GD - EN 10346
	<u>Drilling capacity:</u> $\Sigma t_i \leq 2.50 \text{ mm}$
4,25 w	<u>Timber substructures:</u> no performance determined

										t _{ii} [m	nm]								
ս	[mm]	0.5	0	0.5	5	0.6	3	0.7	5	0.8	_	1.0	0	1.1	3	1.2	5	1.5	0
	0.50	0.96	-	1.03	-	1.15	-	1.26	-	1.26	-	1.26	-	1.26	-	1.26	-	1.26	-
	0.55	0.96	-	1.15	-	1.27	-	1.48	-	1.54	-	1.60	-	1.60	-	1.60	-	1.60	-
	0.63	0.96	-	1.15	-	1.46	-	1.84	-	1.99	-	2.13	-	2.13	-	2.13	-	2.13	-
5	0.75	0.96	-	1.15	-	1.46	-	1.99	-	2.33	-	2.64	-	2.64	-	2.77	-	3.05	-
[kN]	0.88	0.96	-	1.15	-	1.46	-	1.99	-	2.61	-	2.96	-	2.96	-	3.04	-	3.19	-
V _{R,k}	1.00	0.96	-	1.15	-	1.46	-	1.99	-	2.61	-	3.25	-	3.25	-	3.28	-	3.33	-
>	1.13	0.96	-	1.15	-	1.46	-	1.99	-	2.61	-	3.25	-	3.25	-	3.28	-	-	-
	1.25	0.96	-	1.15	-	1.46	-	1.99	-	2.61	-	3.25	-	3.25	-	3.28	-	-	-
	1.50	0.96	-	1.15	-	1.46	-	1.99	-	2.61	-	3.25	-	-	-	-	-	-	-
	1.75	0.96	-	1.15	-	1.46	-	1.99	-	-	-	-	-	-	-	-	-	-	-
	0.50	0.61	-	0.69	-	0.82	-	1.05	-	1.31	-	1.58	-	1.90	-	2.21	-	2.26	-
	0.55	0.61	-	0.69	-	0.82	-	1.05	-	1.31	-	1.58	-	1.90	-	2.21	-	2.61	-
	0.63	0.61	-	0.69	-	0.82	-	1.05	-	1.31	-	1.58	-	1.90	-	2.21	-	2.93	-
	0.75	0.61	-	0.69	-	0.82	-	1.05	-	1.31	-	1.58	-	1.90	-	2.21	-	2.93	-
[kN]	0.88	0.61	-	0.69	-	0.82	-	1.05	-	1.31	-	1.58	-	1.90	-	2.21	-	2.93	-
N _{R,k}	1.00	0.61	-	0.69	-	0.82	-	1.05	-	1.31	-	1.58	-	1.90	-	2.21	-	2.93	-
Ī	1.13	0.61	-	0.69	-	0.82	-	1.05	-	1.31	-	1.58	-	1.90	-	2.21	-	-	-
	1.25	0.61	-	0.69	-	0.82	-	1.05	-	1.31	-	1.58	-	1.90	-	2.21	-	-	-
	1.50	0.61	_	0.69	-	0.82	_	1.05	-	1.31	-	1.58	-	1.90	_	2.21	-	-	-
	1.75	0.61	-	0.69	-	0.82	-	1.05	-	-	-	-	-	-	_	-	-	-	-

No further specifications.

Self-drilling screw with hexagon head and sealing washer $\ge \emptyset$ 16 mm

Annex 12

E-X Bohr RS 6,3 x L

Page 18 of European Technical Assessment ETA-11/0174 of 23 November 2023

English translation prepared by DIBt



≥14 SW 8	<u>Material:</u> Fastener: stainless Steel (1.4301) - EN 10088 Washer: stainless Steel (1.4301) - EN 10088 with EPDM- seal
	Component I: S280GD, S320GD - EN 10346 Component II: S235 - EN 10025-1 S280GD, S320GD - EN 10346
≥20	<u>Drilling capacity:</u> $\Sigma t_i \leq 2.0 \text{ mm}$
3,4	<u>Timber substructures:</u> no performance determined

+ .	[mm]								tı [I	nm]							
ч	[]	0.6	3	0.7	75	0.8	38	1.0	0	1.1	3	1.2	5	1.	50	2.0	00
	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.63	-	-	1.20	ac	1.30	ac	1.80	а	2.10	а	2.80	а	-	-	-	-
	0.75	-	-	1.30	-	1.60	-	2.00	-	2.40	-	3.00	-	-	-	-	-
l Z	0.88	-	-	1.40	-	1.80	-	2.20	-	2.70	-	-	-	-	-	-	-
V _{R,k} [kN]	1.00	-	-	1.50	-	2.00	-	2.40	-	-	-	-	-	-	-	-	-
~	1.13	-	-	1.60	-	2.00	-	-	-	-	-	-	-	-	-	-	-
	1.25	-	-	1.70	-	-	-	-	-	-	-	-	-	-	-	-	-
	1.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.63	0.50	-	0.70	ac	0.90	ac	0.90	а	0.90	а	0.90	а	-	-	-	-
	0.75	0.50	-	0.70	-	1.00	-	1.00	-	1.00	-	1.00	-	-	-	-	-
N _{R,k} [kN]	0.88	0.70	-	0.90	-	1.10	-	1.20	-	1.30	-	-	-	-	-	-	-
×.	1.00	0.70	-	0.90	-	1.10	-	1.40	-	-	-	-	-	-	-	-	-
Z	1.13	0.80	-	1.00	-	1.30	-	-	-	-	-	-	-	-	-	-	-
	1.25	0.80	-	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-
	1.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

No further specifications.

Self-drilling screw with hexagon head and sealing washer $\ge \emptyset$ 14 mm

Annex 13

E-X Bohr RS 5,5 x L

Page 19 of European Technical Assessment ETA-11/0174 of 23 November 2023

English translation prepared by DIBt



$\begin{array}{c c} \hline \\ \hline $	Ø 14 10,5 SW 8 C C 4,8	Material:Fastener:stainless Steel (1.4301) - EN 10088Washer:stainless Steel (1.4301) - EN 10088with EPDM- sealComponent I:S280GD - EN 10346Component II:S280GD - EN 10346

mm1									t _{ii} [m	m]								
mml	0.5	0	0.5	5	0.6	3	0.7	5		-	1.0	0	1.1	3	1.2	25	1.5	50
0.50	0.97	-	0.97	-	0.97	-	0.97	-	0.97	-	0.97	-	0.97	-	0.97	-	0.97	-
0.55	0.97	-	1.15	-	1.15	-	1.15	-	1.15	-	1.15	-	1.15	-	1.15	-	-	-
0.63	0.97	-	1.15	-	1.47	-	1.47	-	1.47	-	1.47	-	1.47	-	1.47	-	-	-
0.75	0.97	-	1.15	-	1.47	-	2.00	-	2.00	-	2.00	-	2.00	-	2.00	-	-	-
0.88	0.97	-	1.15	-	1.47	-	2.00	-	2.64	-	2.64	-	-	-	-	-	-	-
1.00	0.97	-	1.15	-	1.47	-	2.00	-	2.64	-	3.30	-	-	-	-	-	-	-
1.13	0.97	-	1.15	-	1.47	-	2.00	-	-	-	-	-	-	-	-	-	-	-
1.25	0.97	-	1.15	-	1.47	-	2.00	-	-	-	-	-	-	-	-	-	-	-
1.50	0.97	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.50	0.58	-	0.71	-	0.92	-	1.25	-	1.63	-	1.99	-	1.99	-	1.99	-	1.99	-
	0.58	-	0.71	-	0.92	-	1.25	-	1.63	-	1.99	-	1.99	-	1.99	-	-	-
	0.58	-	0.71	-	0.92	-	1.25	-	1.63	-	1.99	-	1.99	-	1.99	-	-	-
	0.58	-	0.71	-	0.92	_	1.25	-	1.63	-	1.99	-	1.99	-	1.99	-	-	-
0.88	0.58	-	0.71	-	0.92	-	1.25	-	1.63	-	1.99	-	-	-	-	-	-	-
	0.58	-	0.71	-	0.92	-	1.25	-	1.63	-	1.99	-	-	-	-	-	-	-
		_		_		_		_	-	_	-	_	-	_	-	_	-	-
		_		_		_		_	-	_	-	-	_	-	-	_	-	_
		_	_	_	_	_		_	_	_	_	_	_	_	_	_	_	_
		_		_		_		_		_		_		_		_		_
	0.55 0.63 0.75 0.88 1.00 1.13 1.25 1.50 1.75 0.50 0.55 0.63 0.75	0.50 0.97 0.55 0.97 0.63 0.97 0.75 0.97 0.75 0.97 0.88 0.97 1.00 0.97 1.13 0.97 1.25 0.97 1.50 0.97 1.50 0.97 1.50 0.97 1.50 0.97 1.50 0.97 1.50 0.97 1.50 0.97 1.50 0.58 0.55 0.58 0.63 0.58 0.75 0.58 0.88 0.58 1.00 0.58 1.13 0.58 1.25 0.58 1.50 0.58	0.50 0.97 - 0.55 0.97 - 0.63 0.97 - 0.75 0.97 - 0.75 0.97 - 0.75 0.97 - 0.75 0.97 - 1.00 0.97 - 1.13 0.97 - 1.50 0.97 - 1.50 0.97 - 1.50 0.97 - 1.50 0.97 - 0.55 0.58 - 0.50 0.58 - 0.55 0.58 - 0.63 0.58 - 0.58 0.58 - 1.00 0.58 - 1.13 0.58 - 1.25 0.58 - 1.50 0.58 -	0.50 0.97 - 0.97 0.55 0.97 - 1.15 0.63 0.97 - 1.15 0.75 0.97 - 1.15 0.75 0.97 - 1.15 0.75 0.97 - 1.15 0.75 0.97 - 1.15 1.00 0.97 - 1.15 1.00 0.97 - 1.15 1.13 0.97 - 1.15 1.15 0.97 - 1.15 1.15 0.97 - 1.15 1.50 0.97 - 1.15 1.50 0.97 - 1.15 1.50 0.97 - - 0.50 0.97 - - 0.50 0.58 - 0.71 0.55 0.58 - 0.71 0.58 0.58 - 0.71 0.58 - 0.71	0.50 0.97 - 0.97 - 0.55 0.97 - 1.15 - 0.63 0.97 - 1.15 - 0.63 0.97 - 1.15 - 0.75 0.97 - 1.15 - 0.75 0.97 - 1.15 - 0.75 0.97 - 1.15 - 0.88 0.97 - 1.15 - 1.00 0.97 - 1.15 - 1.13 0.97 - 1.15 - 1.15 0.97 - 1.15 - 1.50 0.97 - 1.15 - 1.50 0.97 - 1.15 - 1.50 0.97 - 1.15 - 1.50 0.97 - 1.15 - 1.50 0.97 - 0.71 - 0.58 - 0.71	0.50 0.55 0.67 0.55 0.97 - 0.97 - 0.97 0.55 0.97 - 1.15 - 1.15 0.63 0.97 - 1.15 - 1.47 0.75 0.97 - 1.15 - 1.47 0.75 0.97 - 1.15 - 1.47 0.75 0.97 - 1.15 - 1.47 0.88 0.97 - 1.15 - 1.47 1.00 0.97 - 1.15 - 1.47 1.00 0.97 - 1.15 - 1.47 1.15 0.97 - 1.15 - 1.47 1.50 0.97 - 1.15 - 1.47 1.50 0.97 - 1.15 - 1.47 1.50 0.97 - 1.15 - - 0.50 0.97 -	0.50 0.55 0.63 0.50 0.97 - 0.97 - 0.97 - 0.55 0.97 - 1.15 - 1.15 - 0.63 0.97 - 1.15 - 1.47 - 0.63 0.97 - 1.15 - 1.47 - 0.75 0.97 - 1.15 - 1.47 - 0.75 0.97 - 1.15 - 1.47 - 0.88 0.97 - 1.15 - 1.47 - 1.00 0.97 - 1.15 - 1.47 - 1.13 0.97 - 1.15 - 1.47 - 1.50 0.97 - 1.15 - 1.47 - 1.50 0.97 - 1.15 - 1.47 - 1.50 0.97 - 1.15 - 0.92 -	0.50 0.57 - 0.63 0.77 0.50 0.97 - 0.97 - 0.97 - 0.97 0.55 0.97 - 1.15 - 1.15 - 1.15 0.63 0.97 - 1.15 - 1.47 - 1.47 0.75 0.97 - 1.15 - 1.47 - 2.00 0.88 0.97 - 1.15 - 1.47 - 2.00 0.88 0.97 - 1.15 - 1.47 - 2.00 1.00 0.97 - 1.15 - 1.47 - 2.00 1.13 0.97 - 1.15 - 1.47 - 2.00 1.25 0.97 - 1.15 - 1.47 - 2.00 1.50 0.97 - - - - - - - 0.50 0.97<	0.50 0.55 0.63 0.75 0.50 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 1.15 - 1.15 - 1.15 - 1.47 - 0.97 - 1.15 - 1.47 - 2.00 - 0.88 0.97 - 1.15 - 1.47 - 2.00 - 1.00 0.97 - 1.15 - 1.47 - 2.00 - 1.00 0.97 - 1.15 - 1.47 - 2.00 - 1.13 0.97 - 1.15 - 1.47 - 2.00 - 1.25 0.97 - 1.15 - 1.47 - 2.00 - 1.25 0.97<	0.50 0.57 - 0.63 0.75 0.87 0.50 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 1.15 - 1.15 - 1.15 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 2.00 - 2.64 1.00 0.97 - 1.15 - 1.47 - 2.00 -	0.50 0.97 - 1.15 - 1.15 - 1.15 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 2.00 - 2.00 - 2.00 - 2.00 - 2.00 - 2.00 - 2.00 - 2.00 - 2.00 - 2.00 - 2.00 - 2.00 - 2.00 - 2.00 - 2.00 - 1.15 1.15 1.15 1.147 - 2.000 - 1.015 1.15 1.	0.50 0.55 0.63 0.75 0.88 1.0 0.50 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 1.15 - 1.15 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 2.00 - 2.00 - 2.00 - 2.00 0.97 - 1.15 - 1.47 - 2.00 - 2.64 - 3.30 1.13 0.97 - 1.15 - 1.47 - 2.00 - - - - 1.25 0.97 - 1.15 - 1.47 - 2.00 -	0.50 0.57 0.63 0.75 0.88 1.00 0.50 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 1.15 - 1.15 - 1.15 - 1.15 - 1.47 - 1.47 - 1.47 - 1.47 - 2.00 - 2.00 - 2.00 - 2.00 - 2.00 - 2.00 - 2.00 - 2.00 - 2.00 - 2.00 - 2.04 - 3.30 - 1.13 0.97 - 1.15 - 1.47 - 2.00 - - - - - - - 1.15 0.163	0.50 0.55 0.63 0.75 0.88 1.00 1.1 0.50 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 1.15 - 1.15 - 1.15 - 1.15 - 1.15 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 2.00 - 2.64 - <	0.50 0.55 0.63 0.75 0.88 1.00 1.13 0.50 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 1.15 - 1.15 - 1.15 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 2.00 - 2.64 - 2.00 - 1.47 - 1.15 - 1.47 - 2.00 -	0.50 0.55 0.63 0.75 0.88 1.00 1.13 1.2 0.50 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 1.15 - 1.15 - 1.17 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 2.00 - 2.00 - 2.00 - 2.00 - 1.47 - 2.00 - 2.64 - 3.30 - - - - - - - - 3.30 - - - - - - - -<	0.50 0.55 0.63 0.75 0.88 1.00 1.13 1.25 0.50 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 0.97 - 1.15 - 1.15 - 1.15 - 1.15 - 1.15 - 1.15 - 1.17 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 2.00 - 2.00 - 2.00 - 2.00 - 2.00 - 2.00 - 2.04 - - - - - - - 1.15 - 1.47 - 2.00 - 2.04	0.50 0.55 0.63 0.75 0.88 1.00 1.13 1.25 1.5 0.50 0.97 - 1.15 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 1.47 - 2.00 - 2.00 - 2.00 - 2.00 - 2.00 - - - - - - - - - - - - - - - - - -

No further specifications.

Self-drilling screw with hexagon head and sealing washer $\ge \emptyset$ 14 mm

Annex 14

E-X RS 4,8 x L

Page 20 of European Technical Assessment ETA-11/0174 of 23 November 2023

English translation prepared by DIBt



4 6										t _{ii} [m	m]								
Կլ	mm]	0.5	0	0.5	5	0.6	3	0.7	5	0.8	_	1.0	0	1.1	3	1.2	5	1.5	50
	0.50	1.05	-	1.05	-	1.05	-	1.05	-	1.05	-	1.05	-	1.05	-	1.05	-	1.05	-
	0.55	1.05	-	1.25	-	1.25	-	1.25	-	1.25	-	1.25	-	1.25	-	1.25	-	-	-
	0.63	1.05	-	1.25	-	1.60	-	1.60	-	1.60	-	1.60	-	1.60	-	1.60	-	-	-
5	0.75	1.05	-	1.25	-	1.60	-	2.16	-	2.16	-	2.16	-	2.16	-	2.16	-	-	-
L¥	0.88	1.05	-	1.25	-	1.60	-	2.16	-	2.84	-	2.84	-	-	-	-	-	-	-
V _{R,k} [kN]	1.00	1.05	-	1.25	-	1.60	-	2.16	-	2.84	-	3.52	-	-	-	-	-	-	-
>	1.13	1.05	-	1.25	-	1.60	-	2.16	-	-	-	-	-	-	-	-	-	-	-
	1.25	1.05	-	1.25	-	1.60	-	2.16	-	-	-	-	-	-	-	-	-	-	-
	1.50	1.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.50	0.63	-	0.77	-	1.00	-	1.36	-	1.75	-	2.12	-	2.12	-	2.12	-	2.12	-
	0.55	0.63	-	0.77	-	1.00	-	1.36	-	1.75	-	2.12	-	2.12	-	2.12	-	-	-
	0.63	0.63	-	0.77	-	1.00	-	1.36	-	1.75	-	2.12	-	2.12	-	2.12	-	-	-
-	0.75	0.63	-	0.77	-	1.00	-	1.36	-	1.75	-	2.12	-	2.12	-	2.12	-	-	-
N Y	0.88	0.63	-	0.77	-	1.00	-	1.36	-	1.75	-	2.12	-	-	-	-	-	-	-
N _{R,k} [kN]	1.00	0.63	-	0.77	-	1.00	-	1.36	-	1.75	-	2.12	-	-	-	-	-	-	-
Ī	1.13	0.63	-	0.77	-	1.00	-	1.36	-	-	-	-	-	-	-	-	-	-	-
	1.25	0.63	-	0.77	-	1.00	-	1.36	-	-	-	-	-	-	-	-	-	_	-
	1.50	0.63	_	-	_	-	-	-	_	-	_	-	_	-	-	-	-	-	-
	1.75	-	_	-	-	-	_	-	_	-	_	-	-	-	_	-	_	_	-

No further specifications.

Self-drilling screw with hexagon head and sealing washer $\ge \emptyset$ 14 mm

Annex 15

E-X RS 4,8 x L

Page 21 of European Technical Assessment ETA-11/0174 of 23 November 2023

English translation prepared by DIBt



16	16	<u>Material:</u>	
SW 8	10	Fastener:	stainless Steel (1.4301) - EN 10088
		Washer:	stainless Steel (1.4301) - EN 10088 with EPDM- seal
	T30 EX	Component I:	S280GD, S320GD- EN 10346
	37	Component II:	S235 – EN 10025-1 S280GD, S320GD - EN 10346
06.0	Ø 6,0	Drilling capacity	<u>γ:</u> Σt _i ≤ 2.50 mm
		<u>Timber substru</u> no performance	

	····· •									t _{ii} [m	m]								
սլ	mm]	0.4	0	0.5	0	0.6	3	0.7	5	0.8	-	1.0	0	1.1	3	1.2	5	1.5	50
	0.40	0.95	-	0.95	-	0.95	-	0.95	-	0.95	-	0.95	-	0.95	-	0.95	-	0.95	-
	0.50	0.95	-	1.53	-	1.53	-	1.53	-	1.53	-	1.53	-	1.53	-	1.53	-	1.53	-
	0.55	0.95	-	1.53	-	1.75	-	1.75	-	1.75	-	1.75	-	1.75	-	1.75	-	1.75	-
5	0.63	0.95	-	1.53	-	2.10	-	2.10	-	2.10	-	2.10	-	2.10	-	2.10	-	2.10	-
KN	0.75	0.95	-	1.53	-	2.10	-	2.62	-	2.62	-	2.62	-	2.62	-	2.62	-	2.62	-
V _{R,k} [kN]	0.88	0.95	-	1.53	-	2.10	-	2.62	-	3.21	-	3.21	-	3.21	-	3.21	-	3.21	-
>	1.00	0.95	-	1.53	-	2.10	-	2.62	-	3.21	-	3.76	-	3.76	-	3.76	-	3.76	-
	1.13	0.95	-	1.53	-	2.10	-	2.62	-	3.21	-	3.76	-	4.23	-	4.23	-	-	-
	1.25	0.95	-	1.53	-	2.10	-	2.62	-	3.21	-	3.76	-	4.23	-	4.66	-	-	-
	1.50	0.95	-	1.53	-	2.10	-	2.62	-	3.21	-	3.76	-	-	-	-	-	-	-
	0.40	0.46	-	0.74	-	0.74	-	0.74	-	0.74	-	0.74	-	0.74	-	0.74	-	0.74	-
	0.50	0.46	-	0.76	-	1.12	-	1.22	-	1.22	-	1.22	-	1.22	-	1.22	-	1.22	-
	0.55	0.46	-	0.76	-	1.12	-	1.46	-	1.59	-	1.59	-	1.59	-	1.59	-	1.59	-
	0.63	0.46	-	0.76	-	1.12	-	1.46	-	1.81	-	2.13	-	2.18	-	2.18	-	2.18	-
<u> </u>	0.75	0.46	-	0.76	-	1.12	-	1.46	-	1.81	-	2.13	-	2.27	-	2.27	-	2.27	-
N _{R,k} [kN]	0.88	0.46	-	0.76	-	1.12	-	1.46	-	1.81	-	2.13	-	2.27	-	2.27	-	2.27	-
Ī	1.00	0.46	-	0.76	-	1.12	-	1.46	-	1.81	-	2.13	-	2.27	-	2.27	-	2.27	-
	1.13	0.46	-	0.76	-	1.12	-	1.46	-	1.81	-	2.13	-	2.27	-	2.27	-	-	-
	1.25	0.46	-	0.76	_	1.12	-	1.46	-	1.81	-	2.13	-	2.27	-	2.27	-	-	-
	1.50	0.46	-	0.76	-	1.12	-	1.46	-	1.81	-	2.13	-	-	-	-	-	-	-

No further specifications.

Self-drilling screw with hexagon head and sealing washer ≥ Ø 16 mm Self-drilling screw with torx drive and sealing washer ≥ Ø 16 mm

E-X RS 6.0 x L

Page 22 of European Technical Assessment ETA-11/0174 of 23 November 2023

English translation prepared by DIBt



Ø 14	<u>Material:</u>
10,5 Ø 12 T25	Fastener: stainless Steel (1.4301) - EN 10088
SW 8	Washer: stainless Steel (1.4301) - EN 10088 with EPDM- seal
(((E-X))) ((💭))	Component I: S280GD, S320GD - EN 10346
3.8	Component II: S235 - EN 10025-1 S280GD, S320GD - EN 10346
	<u>Drilling capacity:</u> $\Sigma t_i \leq 2.0 \text{ mm}$
3,15 4 3,15 4	<u>Timber substructures:</u> no performance determined

+ 1	[mm]								tıı (r	nm]							
41	0.50		3	0.7	′5	3.0	38	1.0	0	1.1	3	1.2	25	1.	50	2.	00
	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.63	-	-	1.13	ac	1.29	ac	1.45	а	1.45	а	1.45	а	-	-	-	-
	0.75	-	-	1.31	-	1.47	-	1.62	-	1.62	-	1.70	-	-	-	-	-
ΙŢ	0.88	-	-	1.50	-	1.66	-	1.81	-	2.00	-	-	-	-	-	-	-
V _{R,k} [kN]	1.00	-	-	1.50	-	1.66	-	2.00	-	-	-	-	-	-	-	-	-
×	1.13	-	-	1.50	-	1.80	-	-	-	-	-	-	-	-	-	-	-
	1.25	-	-	1.60	-	-	-	-	-	-	-	-	-	-	-	-	-
	1.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.63	0.40	-	0.50	ac	0.60	ac	0.70	а	0.90	а	0.90	а	-	-	-	-
	0.75	0.40	-	0.50	-	0.60	-	0.70	-	0.90	-	1.00	-	-	-	-	-
N _{R,k} [kN]	0.88	0.40	-	0.50	-	0.60	-	0.80	-	1.10	-	-	-	-	-	-	-
	1.00	0.40	-	0.50	-	0.60	-	0.80	-	-	-	-	-	-	-	-	-
R R	1.13	0.40	-	0.50	-	0.70	-	-	-	-	-	-	-	-	-	-	-
	1.25	0.40	-	0.50	-	0.70	-	-	-	-	-	-	-	-	-	-	-
	1.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

No further specifications.

Self-drilling screw with hexagon head and sealing washer $\ge \emptyset$ 14 mm Self-drilling screw with torx drive and sealing washer $\ge \emptyset$ 12 mm

Annex 17

E-X Bohr RS 4,8 x 20. EX T25 Bohr RS 4,8 x 20

Page 23 of European Technical Assessment ETA-11/0174 of 23 November 2023

English translation prepared by DIBt



10,5 SW 8	<u>Material:</u> Fastener: stainless Steel (1.4301) - EN 10088
	Washer: stainless Steel (1.4301) - EN 10088 with EPDM- seal
	Component I: S280GD, S320GD - EN 10346
	Component II: S235 - EN 10025-1 S280GD, S320GD - EN 10346 Structural timber - EN 14081, ≥ C24
	<u>Drilling capacity:</u> $\Sigma t_i \le 2.00 \text{ mm}$
	<u>Timber substructures:</u> performance determined with
3.2	

	[mm]								tıı [n	nm]								V _{R,I}	, k [kN]	
ų	[]	0.6	3	0.7	'5	0.8	8	1.0	0	1.1	3	1.2	5	1.	50	2.0	00	N _{R,I}	, k [kN]	
	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(
	0.55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ring	
	0.63	-	-	1.13	ac	1.29	ac	1.45	а	1.45	а	1.45	а	-	-	-	-	2.40	bear	
	0.75	-	-	1.31	-	1.47	-	1.62	-	1.62	-	1.70	-	-	-	-	-	3.05	ad b	
l T	0.88	-	-	1.50	-	1.66	-	1.81	-	2.00	-	-	-	-	-	-	-	3.65	(load bearing) nent I	
V _{R,k} [kN]	1.00	-	-	1.50	-	1.66	-	2.00	-	-	-	-	-	-	-	-	-	3.65		
<pre>K</pre>	1.13	-	-	1.50	-	1.80	-	-	-	-	-	-	-	-	-	-	-	3.65	star	
	1.25	-	-	1.50	-	-	-	-	-	-	-	-	-	-	-	-	-	3.65	Shear resistance of compo	
	1.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	arr	
	1.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	he	
	2.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	00	
	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(L	
	0.55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	lĝu	
	0.63	0.40	-	0.50	ac	0.60	ac	0.70	а	0.90	а	0.90	а	-	-	-	-	3.30	thro	
	0.75	0.40	-	0.50	-	0.60	-	0.70	-	0.90	-	1.00	-	-	-	-	-	3.95	t di-	
l Z	0.88	0.40	-	0.50	-	0.60	-	0.80	-	1.10	-	-	-	-	-	-	-	4.65	e (p	
N _{R,k} [kN]	1.00	0.40	-	0.50	-	0.60	-	0.80	-	-	-	-	-	-	-	-	-	5.90		
Z Y	1.13	0.40	-	0.50	-	0.70	-	-	-	-	-	-	-	-	-	-	-	5.90	sistance (pull- component I	
	1.25	0.40	-	0.50	-	0.70	-	-	-	-	-	-	-	-	-	-	-	5.90	ofo	
	1.50	-	-		-		-	-	-	-	-	-	-	-	-	-	-	-	ion	
	1.75	-	-		-		-	-	-	-	-	-	-	-	-	-	-	-	Tension resistance (pull-through) of component I	
	2.00	-	-		-		-	-	-	-	-	-	-	-	-	-	-	-	Ť	

The given values are valid for $k_{mod} = 0.90$ and timber strength class C24 ($\rho_k = 350 \text{ kg/m}^3$). For other values of k_{mod} and strength class see Annex 3.

Self-drilling screw with hexagon head and sealing washer $\ge \emptyset$ 14 mm Self-drilling screw with torx drive and sealing washer $\ge \emptyset$ 12 mm

Annex 18

E-X Bohr RS 4,8 x L, E-X T25 Bohr RS 4,8 x L

Page 24 of European Technical Assessment ETA-11/0174 of 23 November 2023

English translation prepared by DIBt



2 16	Material:Fastener:stainless Steel (1.4301) - EN 10088Washer:stainless Steel (1.4301) - EN 10088with EPDM- sealComponent I:S280GD, S320GD - EN 10346Component II:S235 - EN 10025-1S280GD, S320GD - EN 10346
Ø 4,88	Predrill diameter: see Table below
9 04.5	<u>Timber substructures:</u> no performance determined

+ . I	[mm]							_	tıı [r	nm]				_			
ч	[]	1.2	25	1.5	50	2.	00	3.	00	4.	00	6.	00	≥ 7	.00		-
d _{pd}	[mm]		Ø	5.0				Ø	5.3			Ø	5.5	Ø	5.7		-
	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.63	2.50	ac	2.70	ac	2.90	abcd	3.00	abcd	3.10	abcd	3.10	abcd	3.10	abcd	-	-
	0.75	2.60	ac	3.10	ac	3.30	ac	3.60	ac	3.70	abcd	3.70	abcd	3.70	abcd	-	-
V _{R,k} [kN]	0.88	2.80	ac	3.20	ac	3.80	ac	4.10	ac	4.30	ac	4.40	ac	4.40	ac	-	-
i ×	1.00	3.20	-	3.60	ac	4.10	ac	4.80	ac	4.90	ac	5.10	ac	5.10	ac	-	-
< K	1.13	3.40	-	4.00	-	4.60	ac	5.40	ac	5.60	ac	5.80	ac	5.80	ac	-	-
	1.25	3.60	-	4.20	-	5.00	ac	6.10	ac	6.30	ac	6.50	ac	6.50	ac	-	-
	1.50	3.70	-	4.40	-	5.70	-	6.80	-	7.10	-	7.30	-	7.30	-	-	-
	1.75	3.70	-	4.70	-	6.20	-	7.60	-	7.70	-	8.10	-	8.10	-	-	-
	2.00	3.80	-	4.90	-	6.90	-	7.80	-	7.90	-	8.10	-	8.10	-	-	-
	0.50	0.97	ac	1.35	ac	1.51	abcd	1.51	abcd	1.51	abcd	1.51	abcd	1.51	abcd	-	-
	0.55	1.23	ac	1.71	ac	1.91	abcd	1.91	abcd	1.91	abcd	1.91	abcd	1.91	abcd	-	-
	0.63	1.80	ac	2.50	ac	2.80	abcd	2.80	abcd	2.80	abcd	2.80	abcd	2.80	abcd	-	-
	0.75	2.00	ac	2.60	ac	3.10	ac	3.60	ac	3.60	abcd	3.60	abcd	3.60	abcd	-	-
Z	0.88	2.00	ac	2.70	ac	3.30	ac	3.80	ac	3.80	ac	3.80	ac	3.80	ac	-	-
N _{R,k} [kN]	1.00	2.00	-	2.70	ac	3.40	ac	4.00	ac	4.00	ac	4.00	ac	4.00	ac	-	-
N _{R,}	1.13	2.00	-	2.70	-	3.60	ac	4.40	ac	4.40	ac	4.40	ac	4.40	ac	-	-
_	1.25	2.00	-	2.70	-	3.60	ac	4.80	ac	4.90	ac	4.90	ac	4.90	ac	-	-
	1.50	2.00	-	2.70	-	3.60	-	5.60	-	5.90	-	5.90	-	5.90	-	-	-
	1.75	2.00	-	2.70	-	3.60	-	5.80	_	6.90	-	7.10	-	7.10	-	-	-
	2.00	2.00	-	2.70	-	3.60	-	6.00	_	7.30	-	7.60	-	7.60	-	-	_

No further specifications.

Self-tapping screw with hexagon head and sealing washer $\ge \emptyset$ 16 mm

Annex 19

E-X BZ 6,3 x L, E-X 8 BZ 6,3 x L

Page 25 of European Technical Assessment ETA-11/0174 of 23 November 2023

English translation prepared by DIBt



	<u>Material:</u> Fastener: stainless Steel (1.4301) - EN 10088
	Washer: stainless Steel (1.4301) - EN 10088 with EPDM- seal
0 4.7 SW 3/8	Component I: S280GD, S320GD - EN 10346
	Component II: S235 - EN 10025-1 S280GD, S320GD - EN 10346 Structural timber - EN 14081, ≥ C24
	Predrill diameter: see Table below
	<u>Timber substructures:</u> performance determined with

	tı [mm]								tıı [r	nm]								v	FL/NI1
	4 []	0.6	3	0.7	5	0.8	8	1.0	0	1.1	3	1.2	5	1.5	50	2.0	0		, _k [kN] , _k [kN]
C	l _{pd} [mm]	Ø 3.	5	Ø 4	.0				Ø	4.5					Ø	5.0		13,1	,K L]
	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(
	0.55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ring
	0.63	1.30	-	1.50	-	1.80	-	2.00	ac	2.30	ac	2.50	ac	2.90	ac	2.90	ac	2.90	bea
	0.75	1.40	-	1.60	-	1.90	-	2.20	ac	2.50	ac	2.70	ac	3.10	ac	3.10	ac	3.10	(load bearing) nent I
Į	0.88	1.50	-	1.70	-	2.00	-	2.30	-	2.60	-	2.80	ac	3.20	ac	3.20	ac	3.20	(lo;
V _{R.k} [kN]	1.00	1.50	-	1.80	-	2.10	-	2.50	-	2.80	-	3.10	-	3.60	-	3.60	-	3.60	npc npc
_	1.13	1.60	-	1.80	-	2.20	-	2.60	-	2.90	-	3.20	-	3.80	-	3.80	-	3.80	sistance (load l of component l
	1.25	1.60	-	1.90	-	2.30	-	2.70	-	3.00	-	3.30	-	4.00	-	4.00	-	4.00	esis of
	1.50	1.60	-	1.90	-	2.40	-	2.80	-	3.20	-	3.50	-	4.00	-	4.00	-	4.00	Shear resistance of compo
	1.75	1.60	-	1.90	-	2.40	-	2.80	-	3.20	-	3.50	-	4.00	-	4.00	-	4.00	she
	2.00	1.60	-	1.90	-	2.40	-	2.80	-	3.20	-	3.50	-	4.00	-	4.00	-	4.00	5
	0.50	0.49	-	0.59	-	0.70	-	0.76	ac	0.86	ac	0.97	ac	1.13	ac	1.13	ac		(ר
	0.55	0.61	-	0.75	-	0.89	-	0.95	ac	1.09	ac	1.23	ac	1.43	ac	1.43	ac		(pull-through) ent I
	0.63	0.90	-	1.10	-	1.30	-	1.40	ac	1.60	ac	1.80	ac	2.10	ac	2.10	ac		ihrc
	0.75	0.90	-	1.10	-	1.30	-	1.40	ac	1.60	ac	1.80	ac	2.10	ac	2.10	ac	2.10	ull-1 rt I
Į	0.88	0.90	-	1.10	-	1.30	-	1.40	-	1.60	-	1.80	ac	2.10	ac	2.10	ac	2.10	esistance (pull. of component I
N _{R.k} [kN]	1.00	0.90	-	1.10	-	1.30	-	1.40	-	1.60	-	1.80	-	2.20	-	2.20	-	2.20	nce Ince
Z Z	1.13	1.00	-	1.20	-	1.40	-	1.50	-	1.70	-	1.90	-	2.30	-	2.30	-	2.30	ista con
	1.25	1.00	-	1.20	-	1.40	-	1.50	-	1.70	-	1.90	-	2.30	-	2.30	-	2.30	L
	1.50	1.00	-	1.20	-	1.40	-	1.50	-	1.70	-	1.90	-	2.30	-	2.30	-	2.30	
	1.75	1.00	-	1.20	-	1.40	-	1.50	-	1.70	-	1.90	-	2.30	-	2.30	-	2.30	ension
	2.00	1.00	-	1.20	-	1.40	-	1.50	-	1.70	-	1.90	-	2.30	-	2.30	-	2.30	Ť

The given values are valid for $k_{mod} = 0.90$ and timber strength class C24 ($\rho_k = 350 \text{ kg/m}^3$). For other values of k_{mod} and strength class see Annex 3.

Self-tapping screw with hexagon head and sealing washer $\ge \emptyset$ 16 mm

Annex 20

E-X A 6,5 x L, E-X 8 A 6,5 x L

Page 26 of European Technical Assessment ETA-11/0174 of 23 November 2023

English translation prepared by DIBt



	Ø 16 0 4.7 Ø 8.5				stainle with El nt I: S280G	ss Steel (1.4301) - E ss Steel (1.4301) - E PDM- seal GD, S320GD - EN 10 ural timber - EN 1408	N 10088	}	
				Drilling ca	pacity:	$\Sigma t_i \leq 2.0 \text{ mm}$			
Timber substructures: performance determined with Multiple = 9.742 Nm									
	Nm N/mm² for l _{ef} ≥	30.0 mm	ı						
				l _{ef} [mm]			Va		
t,	[mm]	30	35	40	45	50 55 60 6	· · · ·	⊾ [kN] ⊾ [kN]	
	0.50			-				g)	
	0.55 0.63			- 1.16				arin	
	0.83 0.75			1.30			1.44		
Z	0.88	1.39 1.55 1.46 1.62						Shear resistance (load bearing) of component I	
V _{R,k} [kN]	1.00								
< R,	1.13			1.49			1.66	star	
	1.25			1.51			1.68	of	
	1.50			1.53			1.70	ear	
	1.75 2.00			1.59 1.78			1.77	မိ	
	0.50			-			-	<u> </u>	
	0.55			-			-	- dgh	
0.55 0.63 0.75						2.87	2.87	thrc	
						2.91	2.91	nt I	
_	0.88							ce (l	
[kN]			1 00	2.30	2.61			stan.	
I _{R,k} [kN]	1.00	1 69	1.68 1.99		2.01			resistance (pull- of component I	
N _{R,k} [kN]	1.00 1.13	1.68	1.99			295	1295		
N _{R,k} [kN]	1.00 1.13 1.25	1.68	1.99			2.95	2.95		
N _{R,k} [kN]	1.00 1.13	1.68	1.99			2.95	2.95	Tension resistance (pull-through) of component I	

The values listed above in dependence on the screw- in length I_{ef} are valid for k_{mod} = 0.90 and timber strength class C24 (ρ_k = 350 kg/m³). For other values of k_{mod} and strength class see Annex 3.

Self-drilling screw with hexagon head and sealing washer $\ge \emptyset$ 16 mm

Annex 21

E-X Bohr RS 6,5 x L

Page 27 of European Technical Assessment ETA-11/0174 of 23 November 2023

English translation prepared by DIBt



	16 10,5 SW 8 E-X		Fasten Washe Compo Compo	$\begin{tabular}{ c c c c c } \hline Material: \\ \hline Fastener: stainless Steel (1.4301) - EN 10088 \\ \hline Washer: stainless Steel (1.4301) - EN 10088 \\ & with EPDM- seal \\ \hline Component I: Aluminium \\ & with R_m \ge 165 \ N/mm^2 - EN 573 \\ & with R_m \ge 215 \ N/mm^2 - EN 573 \\ \hline Component II: S235 - EN 10025-1 \\ & S280GD, \ S320GD, \ S350GD - EN 10346 \\ \hline \hline Drilling capacity: \Sigmat_i \le 5.00 \ mm \\ \hline Timber substructures: \\ \hline \end{tabular}$						
				substructures ormance dete						
		1								
					nt II, Steel					
		1.00	1.25	tլ[r 1.50	nm] 2.00	2.50	3.00			
	0.50	1.00	-	0.71	0.71	0.71	0.71			
_	0.70	-	_	1.14	1.14	1.14	1.14			
	0.80	-	_	1.35	1.35	1.35	1.35			
L u sit	0.90	_	-	1.47	1.47	1.53	1.59			
	1.00	1.60	1.60	1.60	1.60	1.71	1.83			
Component I, t₁ [mm] Aluminium with R _m ≥ 165 N/mm ² V _{R,k} [kN]	1.10	1.60	1.68	1.74	1.74	1.90	2.06			
Pon ∠ 2	1.20	1.60	1.75	1.88	1.88	2.09	3.29			
L Al	1.50	1.60	1.96	2.31	2.31	2.65	2.99			
ŏ	2.00	1.60	1.96	2.31	3.28	3.28	3.28			
	N _{R,II,k} [kN]	-	-	1.80	1.80	1.80	1.80			
		1								
				•	nt II, Steel					
		4.00	4.05	t _{ii} [r		0.50				
	0.50	1.00	1.25	1.50 0.92	2.00 0.92	2.50 0.92	3.00			
	0.50 0.70		-	1.44	0.92 1.44	0.92 1.44	0.92 1.44			
	0.70		_	1.70	1.70	1.70	1.70			
Component I, t ₁ [mm] Aluminium with R _m ≥ 215 N/mm ² V _{R,k} [kN]	0.90	_	-	1.89	1.89	1.96	2.03			
oonent I, t ₁ uminium w ≥ 215 N/n V _{R,k} [kN]	1.00	2.08	2.08	2.08	2.08	2.22	2.37			
ient 15 15	1.10	2.08	2.16	2.25	2.25	2.45	2.65			
Z Z Z	1.20	2.08	2.24	2.42	2.42	2.67	2.94			
Alt R ^m	1.50	2.08	2.50	2.92	2.92	3.35	3.79			
ŭ –	2.00	2.08	2.50	2.92	4.09	4.09	4.09			

No further specifications.

N_{R,II,k} [kN]

Self-drilling screw with hexagon head and sealing washer $\ge \emptyset$ 16 mm Self-drilling screw with torx drive and sealing washer $\ge \emptyset$ 12 mm

-

1.80

1.80

1.80

_

Annex 22

E-X Bohr 2 5,5 x L, E-X T25 Bohr 2 5,5 x L

1.80

Page 28 of European Technical Assessment ETA-11/0174 of 23 November 2023

English translation prepared by DIBt



Ø 14 10,5 SW 8 T25 10,5	<u>Material:</u> Fastener: stainless Steel (1.4301) - EN 10088
(E-X)	Washer: stainless Steel (1.4301) - EN 10088 with EPDM- seal
	Component I: Aluminium with $R_m \ge 165 \text{ N/mm}^2 - \text{EN 573}$ with $R_m \ge 215 \text{ N/mm}^2 - \text{EN 573}$
	Component II: S235 – EN 10025-1 S280GD, S320GD, S350GD – EN 10346
	$\underline{\text{Drilling capacity:}} \qquad \Sigma t_i \leq 2.50 \text{ mm}$
3,15 3,15	* <u>Timber substructures:</u> no performance determined
	Component II, Steel
	t _∥ [mm] 0.50 0.63 0.75 0.88 0.100

		0.50	0.63	0.75	0.88	1.00
[E	0.50	0.28	0.48	0.67	0.71	0.74
. I., t _i [mm] m with N/mm ² kN]	0.70	0.47	0.73	0.98	1.09	1.19
m w N/m kN	0.80	0.57	0.86	1.14	1.28	1.42
ent l nium .k [k l	0.90	0.58	0.87	1.16	1.38	1.60
onent miniu 165 / _{R,k} []	1.00	0.59	0.89	1.19	1.49	1.79
Component I, Aluminium R _m ≥ 165 N V _{R,k} [kh	N _{R,II,k} [kN]	0.46	0.71	0.95	1.16	1.37

					C	omponent II, Ste	el	
						t _" [mm]		
				0.50	0.63	0.75	0.88	1.00
			0.50	0.60	0.62	0.87	0.92	0.96
t _i [mm] with	\mathbb{H}^2		0.70	0.60	0.93	1.24	1.38	1.51
	N/mm ²	z	0.80	0.72	1.08	1.43	1.61	1.78
iun I	5 2	[kN]	0.90	0.74	1.12	1.49	1.64	1.78
nin	215	/ _{R,k}	1.00	0.77	1.16	1.55	1.67	1.79
Component I, Aluminium	R vi		N _{R,II,k} [kN]	0.46	0.71	0.95	1.16	1.37

No further specifications.

Self-drilling screw with hexagon head and sealing washer $\ge \emptyset$ 14 mm Self-drilling screw with torx drive and sealing washer $\ge \emptyset$ 12 mm

Annex 23

E-X Bohr RS 4,8 x 20, E-X T25 Bohr RS 4,8 x 20

Page 29 of European Technical Assessment ETA-11/0174 of 23 November 2023

English translation prepared by DIBt



0 5.2 0 4.7 SW 3/8	× 04.7 06.5	≥16		Vasher: compone	wi [:] nt I: Ali	ainless S th EPDM uminium th R _m ≥ 1	- seal	,		
		137	c	with R _m ≥ 215 N/mm ² - EN 573 Component II: S235 – EN 10025-1 S280GD, S320GD, S350GD – EN 10346						
	/		E	redrill dia	ameter:	see Tabl	e below			
				imber su						
			n			etermined				
				C	•	nt II, Ste	el			
	0.50	0.63	0.75	0.88	t _{ii} [r 1.00	nmj 1.13	1.25	1.50	2.00	3.00
d _{pd} [mm]	Ø		Ø 4.0	0.00		4.5	1.20	1.00	Ø 5.0	0.00
0.50	0.68	0.71	0.74	0.76	0.78	0.78	0.78	0.78	0.78	0.78
6.70	0.68	0.88	1.07	1.09	1.10	1.10	1.10	1.10	1.10	1.10
08.0 m ² m	0.69	0.97	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24
0.90 J K J	0.70	0.99	1.28	1.28	1.28	1.28	1.28	1.40	1.40	1.40
0660 ≥ 165 N/m w 0660 ≥ 165 N/m w 170 100 100 100 100 100 100 100 100 100	0.71	1.02	1.32	1.32	1.32	1.36	1.41	1.57	1.57	1.57
oner 1.10 ≤ ^{8,} × 1.10 ≤ 1.20	0.71 0.71	1.02 1.02	1.32 1.32	1.32 1.32	1.32 1.32	1.38 1.41	1.45 1.50	1.63 1.70	1.74 1.91	1.74 1.91
	0.71	1.02	1.52	1.52		1.41	1.00			
	0.71	1 02	1.32	1.32		1 47	1.61	1 89		24
	0.71 0.71	1.02 1.02	1.32 1.32	1.32 1.32	1.32	1.47 1.47	1.61 1.61	1.89 1.89	2.41 3.25	2.41 3.25
	0.71 0.71 0.66	1.02 1.02 0.88	1.32 1.32 1.09	1.32 1.32 1.21		1.47 1.47 1.69	1.61 1.61 2.03	1.89 1.89 2.03	2.41 3.25 2.03	2.41 3.25 2.03
United States S	0.71	1.02	1.32	1.32 1.21	1.32 1.32 1.32	1.47 1.69	1.61 2.03	1.89	3.25	3.25
	0.71	1.02	1.32	1.32 1.21	1.32 1.32 1.32 0mpone	1.47 1.69 nt II, Ste	1.61 2.03	1.89	3.25	3.25
	0.71	1.02	1.32	1.32 1.21	1.32 1.32 1.32	1.47 1.69 nt II, Ste	1.61 2.03	1.89	3.25	3.25
d _{pd} [mm]	0.71 0.66 0.50 Ø :	1.02 0.88 0.63 3.5	1.32 1.09 0.75 Ø 4.0	1.32 1.21 Co 0.88	1.32 1.32 1.32 ompone t _{ll} [r 1.00	1.47 1.69 nt II, Ste nm] 1.13 4.5	1.61 2.03 el 1.25	1.89 2.03 1.50	3.25 2.03 2.00 Ø 5.0	3.25 2.03 3.00
d _{pd} [mm]	0.71 0.66 0.50 Ø: 0.88	1.02 0.88 0.63 3.5 0.93	1.32 1.09 0.75 Ø 4.0 0.97	1.32 1.21 C 0.88	1.32 1.32 0mpone t _{II} [r 1.00 Ø 1.01	1.47 1.69 nt II, Ste nm] 1.13 4.5 1.01	1.61 2.03 el 1.25	1.89 2.03 1.50 1.01	3.25 2.03 2.00 Ø 5.0 1.01	3.25 2.03 3.00 1.01
d _{pd} [mm]	0.71 0.66 0.50 Ø : 0.88 0.88	1.02 0.88 0.63 3.5 0.93 1.04	1.32 1.09 0.75 Ø 4.0 0.97 1.20	1.32 1.21 C 0.88 0.99 1.21	1.32 1.32 0mpone t _{II} [r 1.00 Ø. 1.01 1.22	1.47 1.69 nt II, Ste nm] 1.13 4.5 1.01 1.22	1.61 2.03 el 1.25 1.01 1.22	1.89 2.03 1.50 1.01 1.22	3.25 2.03 2.00 Ø 5.0 1.01 1.22	3.25 2.03 3.00 1.01 1.22
d _{pd} [mm]	0.71 0.66 0.50 0.58 0.88 0.88 0.88	1.02 0.88 0.63 3.5 0.93 1.04 1.22	1.32 1.09 0.75 Ø 4.0 0.97 1.20 1.55	1.32 1.21 Co 0.88 0.99 1.21 1.55	1.32 1.32 ompone t_{II} [r 1.00 0, 1.01 1.22 1.55	1.47 1.69 nt II, Ste nm] 1.13 4.5 1.01 1.22 1.55	1.61 2.03 el 1.25 1.01 1.22 1.55	1.89 2.03 1.50 1.01 1.22 1.55	3.25 2.03 2.00 Ø 5.0 1.01 1.22 1.55	3.25 2.03 3.00 1.01 1.22 1.55
d _{pd} [mm]	0.71 0.66 0.50 Ø 3 0.88 0.88 0.88 0.88 0.88	1.02 0.88 0.63 3.5 0.93 1.04 1.22 1.26	1.32 1.09 0.75 Ø 4.0 0.97 1.20 1.55 1.62	1.32 1.21 C 0.88 0.99 1.21 1.55 1.63	1.32 1.32 DMPONE t_{II} [r 1.00 0 / 1.01 1.22 1.55 1.63	1.47 1.69 nt II, Ste nm] 1.13 4.5 1.01 1.22 1.55 1.63	1.61 2.03 el 1.25 1.01 1.22 1.55 1.63	1.89 2.03 1.50 1.01 1.22 1.55 1.79	3.25 2.03 2.00 Ø 5.0 1.01 1.22 1.55 1.79	3.25 2.03 3.00 1.01 1.22 1.55 1.79
d _{pd} [mm]	0.71 0.66 0.50 Ø: 0.88 0.88 0.88 0.88 0.88 0.89 0.91	1.02 0.88 0.63 3.5 0.93 1.04 1.22 1.26 1.31	1.32 1.09 0.75 Ø 4.0 0.97 1.20 1.55 1.62 1.70	1.32 1.21 C 0.88 0.99 1.21 1.55 1.63 1.70	1.32 1.32 0mpone t _{II} [r 1.00 ∅ / 1.01 1.22 1.55 1.63 1.70	1.47 1.69 nt II, Ste nm] 1.13 4.5 1.01 1.22 1.55 1.63 1.79	1.61 2.03 el 1.25 1.01 1.22 1.55 1.63 1.87	1.89 2.03 1.50 1.01 1.22 1.55 1.79 2.03	3.25 2.03 2.00 Ø 5.0 1.01 1.22 1.55 1.79 2.03	3.25 2.03 3.00 1.01 1.22 1.55 1.79 2.03
d _{pd} [mm]	0.71 0.66 0.50 0.88 0.88 0.88 0.88 0.88 0.89 0.91 0.91	1.02 0.88 0.63 3.5 0.93 1.04 1.22 1.26 1.31 1.31	1.32 1.09 0.75 Ø 4.0 0.97 1.20 1.55 1.62 1.70 1.70	1.32 1.21 C 0.88 0.99 1.21 1.55 1.63 1.70 1.70	1.32 1.32 DMPONE t _{II} [r 1.00 Ø / 1.01 1.22 1.55 1.63 1.70 1.70	1.47 1.69 nt II, Ste nm] 1.13 4.5 1.01 1.22 1.55 1.63 1.79 1.81	1.61 2.03 el 1.25 1.01 1.22 1.55 1.63 1.87 1.91	1.89 2.03 1.50 1.01 1.22 1.55 1.79 2.03 2.10	3.25 2.03 2.00 Ø 5.0 1.01 1.22 1.55 1.79 2.03 2.24	3.25 2.03 3.00 1.01 1.22 1.55 1.79 2.03 2.24
d _{pd} [mm]	0.71 0.66 0.50 Ø: 0.88 0.88 0.88 0.88 0.88 0.89 0.91	1.02 0.88 0.63 3.5 0.93 1.04 1.22 1.26 1.31	1.32 1.09 0.75 Ø 4.0 0.97 1.20 1.55 1.62 1.70	1.32 1.21 C 0.88 0.99 1.21 1.55 1.63 1.70	1.32 1.32 0mpone t _{II} [r 1.00 ∅ / 1.01 1.22 1.55 1.63 1.70	1.47 1.69 nt II, Ste nm] 1.13 4.5 1.01 1.22 1.55 1.63 1.79	1.61 2.03 el 1.25 1.01 1.22 1.55 1.63 1.87	1.89 2.03 1.50 1.01 1.22 1.55 1.79 2.03	3.25 2.03 2.00 Ø 5.0 1.01 1.22 1.55 1.79 2.03	3.25 2.03 3.00 1.01 1.22 1.55 1.79 2.03
N _{R,II,k} [kN]	0.71 0.66 0.50 Ø: 0.88 0.88 0.88 0.88 0.88 0.89 0.91 0.91 0.91	1.02 0.88 0.63 3.5 0.93 1.04 1.22 1.26 1.31 1.31 1.31	1.32 1.09 0.75 Ø 4.0 0.97 1.20 1.55 1.62 1.70 1.70 1.70	1.32 1.21 C 0.88 0.99 1.21 1.55 1.63 1.70 1.70 1.70	1.32 1.32 ompone t _{II} [r 1.00 Ø. 1.01 1.22 1.55 1.63 1.70 1.70 1.70	1.47 1.69 nt II, Ste nm] 1.13 4.5 1.01 1.22 1.55 1.63 1.79 1.81 1.32	1.61 2.03 el 1.25 1.01 1.22 1.55 1.63 1.87 1.91 1.95	1.89 2.03 1.50 1.01 1.22 1.55 1.79 2.03 2.10 2.17	3.25 2.03 2.00 Ø 5.0 1.01 1.22 1.55 1.79 2.03 2.24 2.45	3.25 2.03 3.00 1.01 1.22 1.55 1.79 2.03 2.24 2.45

No further specifications.

Self-tapping screw with hexagon head and sealing washer $\ge \emptyset$ 16 mm

Annex 24

E-X A 6,5 x L, E-X 8 A 6,5 x L

Page 30 of European Technical Assessment ETA-11/0174 of 23 November 2023

English translation prepared by DIBt



		Drilling cap	stainless S with EPDM at I: Aluminium with $R_m \ge 1$ with $R_m \ge 2$ at II: Aluminium with $R_m \ge 1$ with $R_m \ge 2$	65 N/mm ² - EN 5 15 N/mm ² - EN 5 65 N/mm ² - EN 5 15 N/mm ² - EN 5 ≤ 7.00 mm	10088 73 73 73
		Component II, A	luminium with	R _m ≥ 165 N/mm²	
			t _။ [mm]		
	1.50	2.00	3.00	4.00	5.00
0.50	0.70	0.72	0.72	0.72	0.72
도 0.70	0.82	1.16	1.16	1.16	1.16
08.0 J ² I	0.98	1.38	1.38	1.38	1.38
0.90 <u> </u>	1.06	1.38	1.61	1.61	1.61
	1.15	1.38	1.85	1.85	1.85
	1.27	1.51	1.99	1.99	1.99
nenir 1.165 א, ד 1.10	1.27				
1000000000000000000000000000000000000	1.39	1.64	2.12	2.12	2.12
(omponent l, t _i [mr Aluminium with R _m ≥ 165 N/mm ² V _{R,k} [kN] 1°00 1°00 1°00 1°00		1.64 2.02	2.53	2.12 2.53	2.12 2.53
Component I, t_1 [mm] Aluminum with R _m \geq 165 N/mm ² V _{R,k} [kN] 1.00 1.20 1.20 5.00	1.39				

					Component II,	Aluminium with F	R _m ≥ 215 N/mm²						
					t _{ii} [mm]								
				1.50	2.00	3.00	4.00	5.00					
			0.50	0.92	0.93	0.93	0.93	0.93					
2			0.70	1.13	1.46	1.46	1.46	1.46					
t _i [mm] with	= ² ⊏		0.80	1.23	1.73	1.73	1.73	1.73					
t, [m with	N/mm ²	-	0.90	1.36	1.76	2.06	2.06	2.06					
-	Ż	[kN]	1.00	1.49	1.79	2.40	2.40	2.40					
inii	215 215	V _{R,k}	1.10	1.64	1.94	2.56	2.56	2.56					
Mponent I, Aluminium		>	1.20	1.79	2.08	2.72	2.72	2.72					
Component Aluminiur			1.50	2.23	2.56	3.21	3.21	3.21					
Ō			2.00	2.23	2.88	3.64	4.41	4.41					
			N _{R,II,k} [kN]	0.99	1.61	3.21	4.42	4.42					

No further specifications.

Self-drilling screw with hexagon head and sealing washer $\ge \emptyset$ 16 mm Self-drilling screw with torx drive and sealing washer $\ge \emptyset$ 12 mm

Annex 25

E-X Bohr 2 5,5 x L, E-X T25 Bohr 2 5,5 x L

Page 31 of European Technical Assessment ETA-11/0174 of 23 November 2023

English translation prepared by DIBt

2 1 0,8



Ø 14 10,5		<u>Material:</u>
10,5 SW 8	T25 10,5	Fastener: Washer:
E-X	Ex	Component I:
4,3	3.8	Component II:
		Drilling capacity:
3,15 4	3,15 4	Timber substruc

matorial	
Fastener:	stainless Steel (1.4301) - EN 10088
	stainless Steel (1.4301) - EN 10088 with EPDM- seal
	Aluminium with $R_m \ge 165 \text{ N/mm}^2 - \text{EN } 573$ with $R_m \ge 215 \text{ N/mm}^2 - \text{EN } 573$
	Aluminium with $R_m \ge 165 \text{ N/mm}^2 - \text{EN } 573$ with $R_m \ge 215 \text{ N/mm}^2 - \text{EN } 573$
Drilling capacity	<u>:</u> Σ $t_i \le 2.50 \text{ mm}$
Timber substruc	ctures:
no porformonoo	determined
no performance	

			Component II, Aluminium with R _m ≥ 165 N/mm ²								
			t _{ii} [mm]								
			0.50	0.70	0.80	0.90	1.00				
<u>د</u>		0.50	0.19	0.35	0.43	0.51	0.59				
t ₁ [mm] with		0.70	0.31	0.57	0.70	0.73	0.77				
l, t _l [mr m with N/mm ²		0.80	0.37	0.68	0.83	0.84	0.86				
iun l	o i	0.90	0.37	0.68	0.84	0.94	1.04				
niniu 165	~	1.00	0.37	0.70	0.86	1.04	1.23				
Component I, Aluminium D > 166 N	u -	N _{R,II,k} [kN]	0.19	0.42	0.53	0.63	0.72				

				Component II, Aluminium with R _m ≥ 215 N/mm ² t _{ll} [mm]								
				0.50	0.70	0.80	0.90	1.00				
Ē			0.50	0.25	0.46	0.56	0.67	0.78				
t _i [mm] with	m ²		0.70	0.40	0.72	0.88	0.96	1.05				
-⊊ ≥	N/mm ²	z	0.80	0.47	0.85	1.04	1.08	1.12				
iun I	പ	[¥N]	0.90	0.47	0.86	1.06	1.21	1.36				
nin	215	/ _{R,k}	1.00	0.48	0.88	1.08	1.34	1.60				
Component I, Aluminium	۳. ۱		N _{R,II,k} [kN]	0.25	0.53	0.67	0.81	0.94				

No further specifications.

Self-drilling screw with hexagon head and sealing washer $\ge \emptyset$ 14 mm Self-drilling screw with torx drive and sealing washer ≥ Ø 12 mm

Annex 26

E-X Bohr RS 4,8 x 20, E-X T25 Bohr RS 4,8 x 20

Page 32 of European Technical Assessment ETA-11/0174 of 23 November 2023

English translation prepared by DIBt



2 - 16 			F V C		st wi nt I: AI wi mt II: AI wi wi	ainless S th EPDM uminium th $R_m \ge 2$ uminium th $R_m \ge 2$ th $R_m \ge 2$	teel (1.4 1- seal 165 N/mr 215 N/mr 165 N/mr 215 N/mr	301) - EN 301) - EN n ² - EN 5 n ² - EN 5 n ² - EN 5 n ² - EN 5	N 10088 573 573 573			
				Predrill diameter: see Table below Timber substructures:								
						etermine	d					
			Compo	nent II, A	Aluminiu	ım with	R _m ≥ 165	N/mm ²				
		t _{il} [mm]										
	0.50	0.70	0.80	0.90			1.20	1.50	2.00	3.00		
d _{pd} [mm]		3.5	Ø 4.0			4.5			Ø 5.0			
0.50 	0.36 0.36	0.48 0.58	0.54 0.69	0.59 0.71	0.63 0.73	0.63 0.73	0.63 0.73	0.63 0.73	0.63 0.73	0.63 0.73		
	0.36	0.63	0.05	0.77	0.78	0.78	0.78	0.78	0.78	0.78		
mponent I, ti [mr Aluminium with Aluminium with R _m ≥ 165 N/mm² V _{R,k} [kN] 060 080	0.36	0.64	0.78	0.80	0.81	0.81	0.81	0.87	0.87	0.87		
	0.36	0.65	0.80	0.82	0.83	0.86	0.88	0.96	0.96	0.96		
0.90 × 1.02 × 1.00 × 1	0.36	0.67	0.82	0.83	0.84	0.87	0.91	1.01	0.99	0.99		
	0.36	0.68	0.84	0.84	0.85	0.89	0.94	1.07	1.02	1.02		
	0.36	0.70	0.88	0.88	0.89	0.96	1.03	1.23	1.11	1.11		
	0.36	0.70	0.88	0.88	0.89	0.96	1.03	1.23	1.25	1.25		
N _{R,II,k} [kN]	0.23	0.40	0.48	0.53	0.58	0.66	0.74	0.98	1.51	2.36		
		Component II, Aluminium with $R_m \ge 215 \text{ N/mm}^2$										
	0.50	0.70	0.00	0.00		nm]	4.00	4.50	0.00	2.00		
d _{pd} [mm]	0.50	0.70 3.5	0.80 Ø 4.0	0.90	1.00	<u>0 1.10 1.20</u> ∅4.5		1.50 2.00		3.00		
0.50	0.46	0.62	0.70	0.78	0.82	4.5 0.82	0.82	0.82	Ø 5.0 0.82	0.82		
0.70	0.46	0.73	0.87	0.90	0.93	0.93	0.93	0.93	0.93	0.93		
	0.46	0.79	0.96	1.02	0.98	0.98	0.98	0.98	0.98	0.98		
	0.46	0.82	1.00	1.03	1.03	1.03	1.03	1.09	1.09	1.09		
onent I, i minium v 215 N/r 100 1 V 8.k [k N]	0.46	0.85	1.04	1.06	1.08	1.13	1.17	1.21	1.21	1.21		
	0.47	0.86	1.05	1.07	1.09	1.15	1.20	1.28	1.28	1.28		
	0.47	0.87	1.07	1.09	1.11	1.17	1.23	1.35	1.35	1.35		
	0.48	0.90	1.11	1.13	1.15	1.23	1.31	1.56	1.56	1.56		
	0.48	0.90	1.11	1.13	1.15	1.23	1.31	1.56	1.56	1.56		
N _{R,II,k} [kN]	0.29	0.50	0.60	0.68	0.75	0.85	0.95	1.24	1.86	3.10		

No further specifications.

Self-tapping screw with hexagon head and sealing washer $\ge \emptyset$ 16 mm

Annex 27

E-X A 6,5 x L, E-X 8 A 6,5 x L

Page 33 of European Technical Assessment ETA-11/0174 of 23 November 2023

English translation prepared by DIBt



									i <u>al:</u> ner: er:	stain	stainless Steel (1.4301) - EN 10088 stainless Steel (1.4301) - EN 10088 with EPDM- seal											
047									Component I: Aluminium with $R_m \ge 165 \text{ N/mm}^2 - \text{EN } 573$ with $R_m \ge 215 \text{ N/mm}^2 - \text{EN } 573$													
06.5								Component II: Structural timber - EN 14081, \ge C24 Drilling capacity: $\Sigma t_l \le 2.00 \text{ mm}$														
32									<u>Timber substructures:</u> performance determined with													
		Ø 4.25							k = k =	9.74	9.74 Nm			26.0 mm								
					26	31	37	43	49	55	61	67	73	V _{R,I,k}	[kN]							
Component I, t _i [mm]	Aluminium with	$R_m \ge 165 \text{ N/mm}^2$	R _m ≥ 165 N/mm² V _{R,II,k} [kN]	V _{R,II,k} [KN]	V _{R,II,k} [kN]	V _{R,II,k} [kN]	V _{R,II,k} [kN]	V _{R,II,k} [kN]	V _{R,II,k} [kN]	V _{R,II,k} [kN]	0.50 0.60 0.70 0.80 0.90 1.00 1.20 1.50 2.00	1.63	1.94	2.32	2.52	2.61	2.70	2.78	2.87	2.95	0.56 0.69 0.81 0.92 1.02 1.12 1.20 1.27 1.45	Shear resistance (load bearing) of component I
				N _{R,II,k} [kN]	1.49	1.78	2.12	2.47	2.81	3.15	3.50	3.84	4.19	-	-							
					26	31	37	43	49	55	61	67	73	V _{R,I,k}	[kN]							
Component I, t _i [mm]	Aluminium with	$R_m \ge 215 \text{ N/mm}^2$	V _{R,II,k} [kN]	0.50 0.60 0.70 0.80 0.90 1.00 1.20 1.50 2.00	1.63	1.94	2.32	2.52	2.61	2.70	2.78	2.87	2.95	0.75 0.90 1.03 1.15 1.25 1.34 1.41 1.47 1.60	Shear resistance (load bearing) of component I							
0																						

For component I of aluminium with a tensile strength of $R_m \ge 185 \text{ N/mm}^2$ the for $R_m \ge 165 \text{ N/mm}^2$ given values for load bearing resistance $V_{R,l,k}$ may be increased by 12%. The lower value of $V_{R,ll,k}$ and load bearing resistance $V_{R,l,k}$ shall be used for further calculation.

The values listed above in dependence on the screw- in length I_{ef} are valid for k_{mod} = 0.90 and timber strength class C24 (ρ_k = 350 kg/m³). For other values of k_{mod} and strength class see Annex 3.

Self-drilling screw with hexagon head and sealing washer $\ge \emptyset$ 16 mm

Annex 28

E-X Bohr RS 6,5 x L

Page 34 of European Technical Assessment ETA-11/0174 of 23 November 2023

English translation prepared by DIBt



0.52						≥16		Fastener: Washer:			stainless Steel (1.4301) - EN 10088 stainless Steel (1.4301) - EN 10088 with EPDM- seal					
0 4 7 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5					≥ Ø 4,7 Ø 6,5	1370			onent I: onent II:	with with	Aluminium with $R_m \ge 165 \text{ N/mm}^2$ - EN 573 with $R_m \ge 215 \text{ N/mm}^2$ - EN 573 Structural timber - EN 14081, $\ge C24$					
	2,54		70	SW 8				<u>Predril</u>	l diame	<u>ter:</u> see	e Table	below				
	01			(E-X)				Timber substructures: performance determined with								
	2							M _{y,Rk} f _{ax,k}		18.39 11.8	Nm N/mm ²	² for	l _{ef} ≥ 2	26.0 mm		
					26	31	37	43	49	55	61	67	73	V _{R,I,k}	[kN]	
Component I, t _i [mm] Aluminium with	Aluminium with	R _m ≥ 165 N/mm²	V _{R,II,k} [KN]	0.50 0.60 0.70 0.80 0.90 1.00 1.20 1.50 2.00	1.63	1.94	2.32	2.70	2.94	3.05	3.15	3.26	3.26	0.63 0.73 0.78 0.87 0.96 0.99 1.02 1.11 1.25	Shear resistance (load bearing) of component I	
				N _{R,II,k} [kN]	1.79	2.14	2.55	2.97	3.38	3.8	4.21	4.63	4.63	-	-	
					26	31	37	43	49	55	61	67	73	V _{R,I,k}	[kN]	
Component I, t _I [mm]	Aluminium with	$R_m \ge 215 \text{ N/mm}^2$	V _{R,II,k} [kN]	0.50 0.60 0.70 0.80 0.90 1.00 1.20 1.50 2.00	1.63	1.94	2.32	2.70	2.94	3.05	3.15	3.26	3.26	0.82 0.93 0.98 1.09 1.21 1.28 1.35 1.56 1.56	Shear resistance (load bearing) of component I	
				N _{R,II,k} [kN]	1.79	2.14	2.55	2.97	3.38	3.8	4.21	4.63	4.63	-	-	

For component I of aluminium with a tensile strength of $R_m \ge 245 \text{ N/mm}^2$ the for $R_m \ge 215 \text{ N/mm}^2$ given values for load bearing resistance V_{R,I,k} may be increased by 14%. The lower value of V_{R,II,k} and load bearing resistance V_{R,I,k} shall be used for further calculation.

The values listed above in dependence on the screw- in length I_{ef} are valid for k_{mod} = 0.90 and timber strength class C24 (ρ_{K} = 350 kg/m³). For other values of k_{mod} and strength class see Annex 3.

Self-tapping screw with hexagon head and sealing washer $\ge \emptyset$ 16 mm

Annex 29

E-X A 6,5 x L, E-X 8 A 6,5 x L