

Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and
Laender Governments



European Technical Assessment

ETA-17/0321
of 12 July 2017

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the European Technical Assessment:

Trade name of the construction product

Product family
to which the construction product belongs

Manufacturer

Manufacturing plant

This European Technical Assessment contains

This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of

Deutsches Institut für Bautechnik

4.8 BP1, 6.3 BP1, 6.3 BP2, 5.5 BP3, 5.5 BP5

Fastening Screws for Metal Members and Sheeting

Fastener Point B.V.
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NIEDERLANDE

Plant 1
Plant 2

39 pages including 33 annexes which form an integral part of this assessment

**European Assessment Document (EAD)
330046-01-0602 "Fastening Screws for Metal Members
and Sheeting", Version 1**

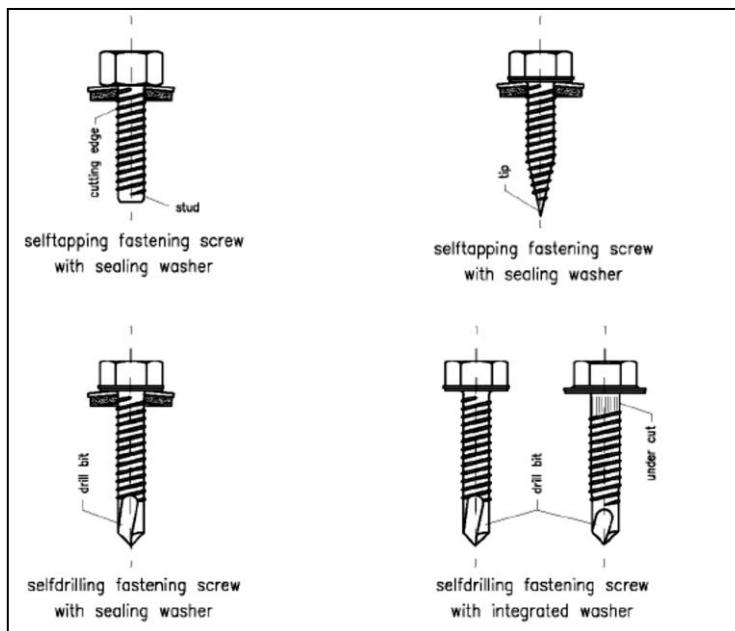
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Specific part**1 Technical description of the product**

The products are fastening screws (self-drilling and self-tapping screws) made of steel. The fastening screws are normally completed with a metallic washer and an EPDM sealing washer. The fastening screws are made of austenitic stainless steel or a bimetal combination with drill bits made of galvanised/painted carbon steel. The fastening screws and the corresponding connections are subject to tension and/or shear forces. Samples of fastenings screws are shown in Figure 1.

**Figure 1: Fastening screws**

The components and the system setup of the product are given in Annex (1-33).

The fastening screws which are content of this ETA are shown in the following Table 1.

Table 1

Annex	Fastening screw	Component I	Component II
4	4,8 BP1 washer size Ø14,0	S280GD to S350GD EN 10346	S280GD to S350GD EN 10346
5	4,8 BP1 washer size Ø16,0		S235 EN 10025-2
6	4,8 BP1 washer size Ø19,0		

Table 1 - continued

Annex	Fastening screw	Component I	Component II
7	4,8 BP1 washer size Ø14,0		
8	4,8 BP1 washer size Ø16,0	S280GD to S350GD EN 10346	Timber ≥ C24 EN 14081
9	4,8 BP1 washer size Ø19,0		
10	6,3 BP1 washer size Ø14,0		S280GD to S350GD EN 10346
11	6,3 BP1 washer size Ø16,0	S280GD to S350GD EN 10346	S235 EN 10025-2
12	6,3 BP1 washer size Ø19,0		
13	6,3 BP1 washer size Ø14,0		
14	6,3 BP1 washer size Ø16,0	S280GD to S350GD EN 10346	Timber ≥ C24 EN 14081
15	6,3 BP1 washer size Ø19,0		
16	6,3 BP2 washer size Ø14,0		S280GD to S350GD EN 10346
17	6,3 BP2 washer size Ø16,0	S280GD to S350GD EN 10346	S235 EN 10025-2
18	6,3 BP2 washer size Ø19,0		
19	6,3 BP2 washer size Ø14,0		
20	6,3 BP2 washer size Ø16,0	S280GD to S350GD EN 10346	Timber ≥ C24 EN 14081
21	6,3 BP2 washer size Ø19,0		
22	5,5 BP3 washer size Ø16,0		S280GD to S350GD EN 10346
23	5,5 BP3 washer size Ø19,0	S280GD to S350GD EN 10346	S235 EN 10025-2
24	5,5 BP3 washer size Ø22,0		
25	5,5 BP3 washer size Ø16,0		
26	5,5 BP3 washer size Ø19,0	S280GD to S350GD EN 10346	Aluminium alloy EN 573 $R_{m,min} \geq 165 \text{ N/mm}^2$
27	5,5 BP3 washer size Ø22,0		

European Technical Assessment**ETA-17/0321**

English translation prepared by DIBt

Page 5 of 39 | 12 July 2017

Table 1 – continued

Annex	Fastening screw	Component I	Component II
28	5,5 BP3 washer size Ø16,0	S280GD to S350GD EN 10346	Aluminium alloy EN 573 $R_{m,min} \geq 215 \text{ N/mm}^2$
29	5,5 BP3 washer size Ø19,0		
30	5,5 BP3 washer size Ø22,0		
31	5,5 BP5 washer size Ø16,0	S280GD to S350GD EN 10346	S280GD to S350GD EN 10346 S235 EN 10025-2
32	5,5 BP5 washer size Ø19,0		
33	5,5 BP5 washer size Ø22,0		

2 Specification of the intended use in accordance with the applicable European Assessment Document EAD 330046-01-0602

The fastening screws are intended to be used for fastening metal sheeting to metal or timber supporting 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 for metal members and sheeting 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 (1-3).

The verifications 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 producer, 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-17/0321**

English translation prepared by DIBt

Page 6 of 39 | 12 July 2017

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 case of combined 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	Performance Class A1 in accordance with EC decision 96/603/EC (as amended)

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

In accordance with EAD No. 330046-01-0602, the applicable European legal act is 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

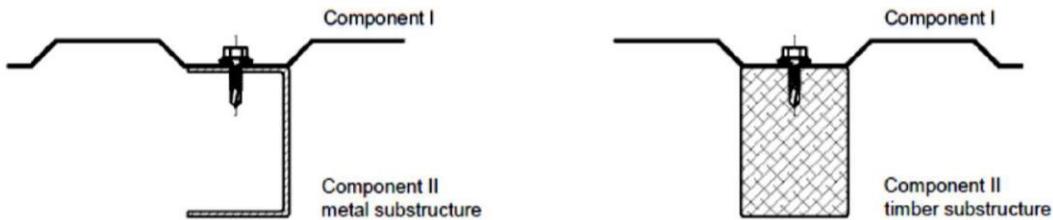
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 12 July 2017 by Deutsches Institut für Bautechnik

BD Dipl.-Ing. Andreas Kummerow
Head of Department

beglaubigt:
Schult

Examples of execution of a connection



Terms for materials

Fastener	Fastening screw
Washer	Sealing washer
Component I	Metal member or sheeting
Component II	Substructure

Terms for dimensions

t_I	Thickness of metal member or sheeting
t_{II}	Thickness of metal substructure
l_{ef}	Effective screw-in length in timber substructure (without drill point)
d_{dp}	Pre-drill diameter of metal member or sheeting and substructure
$d_{dp,I}$	Pre-drill diameter of metal member or sheeting

Terms for performances

$V_{R,k}$	Characteristic value of shear resistance of the connection
$N_{R,k}$	Characteristic value of tension resistance of the connection
$V_{R,I,k}$	Characteristic value of shear resistance of metal member or sheeting
$N_{R,I,k}$	Characteristic value of tension resistance (pull-through) of metal member or sheeting
$N_{R,II,k}$	Characteristic value of tension resistance (pull-out) of the substructure

Additionally for timber substructure the following terms are used:

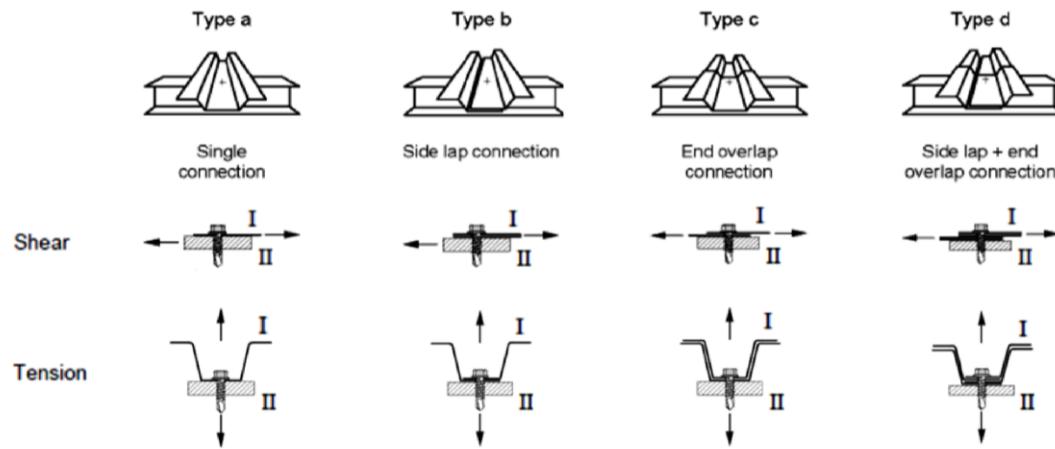
$M_{y,Rk}$	Characteristic value of yield moment
$f_{ax,k}$	Characteristic value of withdrawal strength
$f_{h,k}$	Characteristic value of embedding strength

Used terms in the Annexes

Fastening screws for metal members and sheeting

Annex 1

Types of connection and occurred loadings



Determination of Design Values

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

$$N_{R,d} = \frac{N_{R,k}}{\gamma_M} \quad V_{R,d} = \frac{V_{R,k}}{\gamma_M}$$

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 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.

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

Installation conditions

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

The fastening screws are screwed-in with electric screw driver. 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.

The thickness (or minimum thickness) of metal substructure needs to be covered by the clamping length of the fastening screw. Otherwise only the screwed-in clamping length of the fastening screw may be considered.

Basics for the design

Fastening screws for metal members and sheeting

Annex 2

Timber substructures

Characteristic values of tension and shear resistance of the connection for other k_{mod} or p_k as indicated in the Annexes can be determined as follows:

$$N_{R,k} = \min \left\{ \frac{N_{R,I,k}}{F_{ax,Rk} * k_{mod}}, \frac{V_{R,k}}{F_{v,Rk} * k_{mod}} \right\}$$

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

$F_{ax,Rk}$ indicates the characteristic value of tension resistance of timber substructure. The value has to be determined according to EN 1995-1-1:2004 + A1:2008, equation (8.40a) with $f_{ax,k}$ given in the corresponding Annex of the fastening screw.

$F_{v,Rk}$ indicates the characteristic shear resistance of timber substructure. The value 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.

Aluminium members and sheeting

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

$$N_{R,k} = \min \left\{ \frac{N_{R,I,k}}{N_{R,II,k}} \right\}$$

The characteristic value $N_{R,I,k}$ has to be determined according to EN 1999-1-4:2007 + AC:2009, equation (8.13).

The characteristic value $N_{R,II,k}$ is given in the corresponding Annex of the fastening screw.

Specific notes to the Annexes

Fastening screws for metal members and sheeting

Annex 3

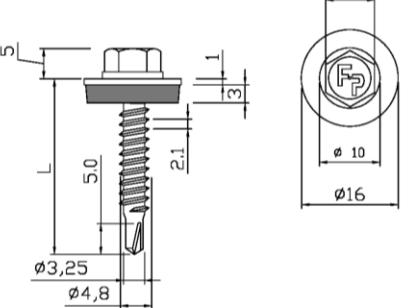
	<u>Materials</u>
	Screw: Stainless steel 1.4301 (A2) – EN ISO 3506
	Washer: Stainless steel 1.4301 (A2) – EN ISO 3506
Component I: S280GD, S320GD and S350GD - EN 10346 Component II: S235 – EN 10025-2 S280GD, S320GD and S350GD - EN 10346	Drill capacity: $\sum t_i \leq 2,75 \text{ mm}$
	<u>Timber substructures:</u> No performance determined

t_{N1} [mm]		t_H [mm]									
		0,40	0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	1,50
V_{R,k} [kN]	0,40	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64
	0,50	0,64	0,91	0,91	0,91	0,91	0,91	0,91	0,91	0,91	0,91
	0,55	0,64	0,91	1,16	1,16	1,16	1,16	1,16	1,16	1,16	1,16
	0,63	0,64	0,91	1,16	1,57	1,57	1,57	1,57	1,57	1,57	1,57
	0,75	0,64	0,91	1,16	1,57	2,17	2,17	2,17	2,17	2,17	2,17
	0,88	0,64	0,91	1,16	1,57	2,17	2,37	2,37	2,37	2,37	2,37
	1,00	0,64	0,91	1,16	1,57	2,17	2,37	2,56	2,56	2,56	2,56
	1,13	0,64	0,91	1,16	1,57	2,17	2,37	2,56	2,98	2,98	2,98
	1,25	0,64	0,91	1,16	1,57	2,17	2,37	2,56	2,98	3,38	3,38
N_{R,k} [kN]	0,40	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,52	1,52	1,52
	0,50	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,67	1,67	1,67
	0,55	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,76	2,00	2,00
	0,63	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,76	2,10	2,53
	0,75	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,76	2,10	2,80
	0,88	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,76	2,10	2,80
	1,00	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,76	2,10	2,80
	1,13	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,76	2,10	2,80
	1,25	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,76	2,10	2,80

„Self drilling Screws“

Self drilling screws 4,8 x L – BP1, washer size Ø 14,0 mm

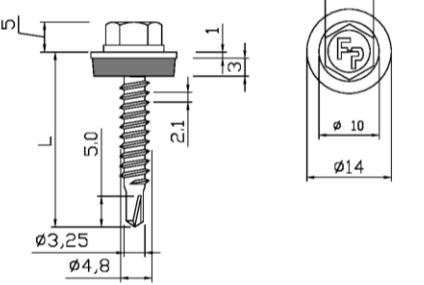
Annex 4

	<u>Materials</u>
	Screw: Stainless steel 1.4301 (A2) – EN ISO 3506
	Washer: Stainless steel 1.4301 (A2) – EN ISO 3506
Component I: S280GD, S320GD and S350GD - EN 10346 Component II: S235 – EN 10025-2 S280GD, S320GD and S350GD - EN 10346	
Drill capacity: $\Sigma t_i \leq 2,75$ mm	
<u>Timber substructures:</u> No performance determined	

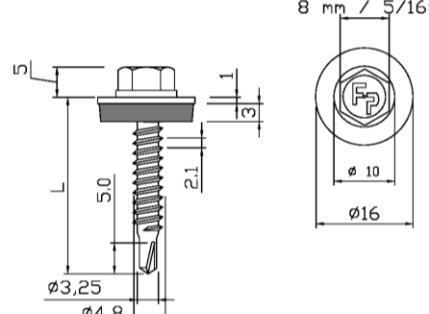
t_{N1} [mm]	t_{II} [mm]										-
	0,40	0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	1,50	
$V_{R,k}$ [kN]	0,40	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64	-
	0,50	0,64	0,91	0,91	0,91	0,91	0,91	0,91	0,91	0,91	-
	0,55	0,64	0,91	1,16	1,16	1,16	1,16	1,16	1,16	1,16	-
	0,63	0,64	0,91	1,16	1,57	1,57	1,57	1,57	1,57	1,57	-
	0,75	0,64	0,91	1,16	1,57	2,17	2,17	2,17	2,17	2,17	-
	0,88	0,64	0,91	1,16	1,57	2,17	2,37	2,37	2,37	2,37	-
	1,00	0,64	0,91	1,16	1,57	2,17	2,37	2,56	2,56	2,56	-
	1,13	0,64	0,91	1,16	1,57	2,17	2,37	2,56	2,98	2,98	-
	1,25	0,64	0,91	1,16	1,57	2,17	2,37	2,56	2,98	3,38	-
$N_{R,k}$ [kN]	0,40	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,70	1,70	-
	0,50	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,76	1,76	-
	0,55	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,76	2,10	-
	0,63	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,76	2,10	-
	0,75	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,76	2,10	-
	0,88	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,76	2,10	-
	1,00	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,76	2,10	-
	1,13	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,76	2,10	-
	1,25	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,76	2,10	-

	<u>Materials</u>
	Screw: Stainless steel 1.4301 (A2) – EN ISO 3506
	Washer: Stainless steel 1.4301 (A2) – EN ISO 3506
Component I: S280GD, S320GD and S350GD - EN 10346 Component II: S235 – EN 10025-2 S280GD, S320GD and S350GD - EN 10346	Component I: S280GD, S320GD and S350GD - EN 10346
	Component II: S235 – EN 10025-2
Drill capacity: $\Sigma t_i \leq 2,75 \text{ mm}$	Drill capacity: $\Sigma t_i \leq 2,75 \text{ mm}$
	<u>Timber substructures:</u> No performance determined

$t_{N1} [\text{mm}]$	$t_{II} [\text{mm}]$										
	0,40	0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	1,50	-
$V_{R,k} [\text{kN}]$	0,40	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64	-
	0,50	0,64	0,91	0,91	0,91	0,91	0,91	0,91	0,91	0,91	-
	0,55	0,64	0,91	1,16	1,16	1,16	1,16	1,16	1,16	1,16	-
	0,63	0,64	0,91	1,16	1,57	1,57	1,57	1,57	1,57	1,57	-
	0,75	0,64	0,91	1,16	1,57	2,17	2,17	2,17	2,17	2,17	-
	0,88	0,64	0,91	1,16	1,57	2,17	2,37	2,37	2,37	2,37	-
	1,00	0,64	0,91	1,16	1,57	2,17	2,37	2,56	2,56	2,56	-
	1,13	0,64	0,91	1,16	1,57	2,17	2,37	2,56	2,98	2,98	-
	1,25	0,64	0,91	1,16	1,57	2,17	2,37	2,56	2,98	3,38	-
$N_{R,k} [\text{kN}]$	0,40	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,70	1,70	-
	0,50	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,76	1,76	-
	0,55	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,76	2,10	-
	0,63	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,76	2,10	-
	0,75	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,76	2,10	-
	0,88	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,76	2,10	-
	1,00	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,76	2,10	-
	1,13	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,76	2,10	-
	1,25	0,36	0,46	0,55	0,70	0,93	1,17	1,40	1,76	2,10	-

	<u>Materials</u>
	<p>Screw: Stainless steel 1.4301 (A2) – EN ISO 3506 Washer: Stainless steel 1.4301 (A2) – EN ISO 3506 Component I: S280GD, S320GD and S350GD - EN 10346 Component II: Timber substructure according to DIN EN 338 $\rho = 350 \text{ kg/m}^2$ (min. C24)</p>
<p>Drill capacity: $\Sigma t_i \leq 1,25 \text{ mm}$</p>	
<u>Timber substructures:</u> <p>Performance determined with $M_{y,Rk} = 4,83 \text{ Nm}$ $f_{ax,k} = 9,741 \text{ N/mm}^2$ for $l_{eff} \geq 30,0 \text{ mm}$</p>	

$t_{N1} [\text{mm}]$	$l_{eff} [\text{mm}]$
30	
$V_{R,k} [\text{kN}]$	0,40
	0,50
	0,55
	0,63
	0,75
	0,88
	1,00
	1,13
	1,25
$N_{R,k} [\text{kN}]$	0,40
	0,50
	0,55
	0,63
	0,75
	0,88
	1,00
	1,13
	1,25

	<u>Materials</u>
	<p>Screw: Stainless steel 1.4301 (A2) – EN ISO 3506 Washer: Stainless steel 1.4301 (A2) – EN ISO 3506 Component I: S280GD, S320GD and S350GD - EN 10346 Component II: Timber substructure according to DIN EN 338 $\rho = 350 \text{ kg/m}^2$ (min. C24)</p>
Drill capacity: $\Sigma t_i \leq 1,25 \text{ mm}$	
<u>Timber substructures:</u> Performance determined with $M_{y,Rk} = 4,83 \text{ Nm}$ $f_{ax,k} = 9,741 \text{ N/mm}^2$ for $l_{eff} \geq 30,0 \text{ mm}$	

$t_{N1} [\text{mm}]$	$l_{eff} [\text{mm}]$
30	
$V_{R,k} [\text{kN}]$	0,40
	0,50
	0,55
	0,63
	0,75
	0,88
	1,00
	1,13
	1,25
$N_{R,k} [\text{kN}]$	0,40
	0,50
	0,55
	0,63
	0,75
	0,88
	1,00
	1,13
	1,25

	<u>Materials</u>
	<p>Screw: Stainless steel 1.4301 (A2) – EN ISO 3506 Washer: Stainless steel 1.4301 (A2) – EN ISO 3506 Component I: S280GD, S320GD and S350GD - EN 10346 Component II: Timber substructure according to DIN EN 338 $\rho = 350 \text{ kg/m}^2$ (min. C24)</p>
Drill capacity: $\Sigma t_i \leq 1,25 \text{ mm}$	
<u>Timber substructures:</u> Performance determined with $M_{y,Rk} = 4,83 \text{ Nm}$ $f_{ax,k} = 9,741 \text{ N/mm}^2$ for $l_{eff} \geq 30,0 \text{ mm}$	

$t_{N1} [\text{mm}]$	$l_{eff} [\text{mm}]$
30	
$V_{R,k} [\text{kN}]$	0,40
	0,50
	0,55
	0,63
	0,75
	0,88
	1,00
	1,13
	1,25
$N_{R,k} [\text{kN}]$	0,40
	0,50
	0,55
	0,63
	0,75
	0,88
	1,00
	1,13
	1,25

	<u>Materials</u>
	Screw: Stainless steel 1.4301 (A2) – EN ISO 3506
	Washer: Stainless steel 1.4301 (A2) – EN ISO 3506
Component I: S280GD, S320GD and S350GD - EN 10346 Component II: S235 – EN 10025-2 S280GD, S320GD and S350GD - EN 10346	Component I: S280GD, S320GD and S350GD - EN 10346
	Component II: S235 – EN 10025-2
Drill capacity: $\Sigma t_i \leq 2,75$ mm	
<u>Timber substructures:</u> No performance determined	

t_{N1} [mm]		t_{II} [mm]									
		0,40	0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	1,50
$V_{R,k}$ [kN]	0,40	1,02	1,02	1,02	1,02	1,02	1,02	1,02	1,02	1,02	1,02
	0,50	1,02	1,26	1,26	1,26	1,26	1,26	1,26	1,26	1,26	1,26
	0,55	1,02	1,26	1,56	1,56	1,56	1,56	1,56	1,56	1,56	1,56
	0,63	1,02	1,26	1,56	2,03	2,03	2,03	2,03	2,03	2,03	2,03
	0,75	1,02	1,26	1,56	2,03	2,75	2,75	2,75	2,75	2,75	2,75
	0,88	1,02	1,26	1,56	2,03	2,75	3,07	3,07	3,07	3,07	3,07
	1,00	1,02	1,26	1,56	2,03	2,75	3,07	3,36	3,36	3,36	3,36
	1,13	1,02	1,26	1,56	2,03	2,75	3,07	3,36	4,09	4,09	4,09
	1,25	1,02	1,26	1,56	2,03	2,75	3,07	3,36	4,09	4,77	4,77
$N_{R,k}$ [kN]	0,40	0,50	0,66	0,80	1,01	1,34	1,64	1,74	1,74	1,74	1,74
	0,50	0,50	0,66	0,80	1,01	1,34	1,64	1,80	1,80	1,80	1,80
	0,55	0,50	0,66	0,80	1,01	1,34	1,64	1,91	2,27	2,27	2,27
	0,63	0,50	0,66	0,80	1,01	1,34	1,64	1,91	2,36	2,78	3,02
	0,75	0,50	0,66	0,80	1,01	1,34	1,64	1,91	2,36	2,78	3,64
	0,88	0,50	0,66	0,80	1,01	1,34	1,64	1,91	2,36	2,78	3,64
	1,00	0,50	0,66	0,80	1,01	1,34	1,64	1,91	2,36	2,78	3,64
	1,13	0,50	0,66	0,80	1,01	1,34	1,64	1,91	2,36	2,78	3,64
	1,25	0,50	0,66	0,80	1,01	1,34	1,64	1,91	2,36	2,78	3,64

„Self drilling Screws“	Annex 10
Self drilling screws 6,3 x L – BP1, washer size Ø 14,0 mm	

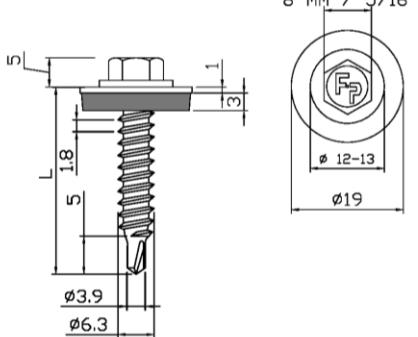
	<u>Materials</u>
	Screw: Stainless steel 1.4301 (A2) – EN ISO 3506
	Washer: Stainless steel 1.4301 (A2) – EN ISO 3506
Component I: S280GD, S320GD and S350GD - EN 10346 Component II: S235 – EN 10025-2 S280GD, S320GD and S350GD - EN 10346	Component I: S280GD, S320GD and S350GD - EN 10346
	Component II: S235 – EN 10025-2
Drill capacity: $\Sigma t_i \leq 2,75$ mm	Drill capacity: $\Sigma t_i \leq 2,75$ mm
	<u>Timber substructures:</u> No performance determined

t_{N1} [mm]	t_{II} [mm]										-
	0,40	0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	1,50	
$V_{R,k}$ [kN]	0,40	1,02	1,02	1,02	1,02	1,02	1,02	1,02	1,02	1,02	-
	0,50	1,02	1,26	1,26	1,26	1,26	1,26	1,26	1,26	1,26	-
	0,55	1,02	1,26	1,56	1,56	1,56	1,56	1,56	1,56	1,56	-
	0,63	1,02	1,26	1,56	2,03	2,03	2,03	2,03	2,03	2,03	-
	0,75	1,02	1,26	1,56	2,03	2,75	2,75	2,75	2,75	2,75	-
	0,88	1,02	1,26	1,56	2,03	2,75	3,07	3,07	3,07	3,07	-
	1,00	1,02	1,26	1,56	2,03	2,75	3,07	3,36	3,36	3,36	-
	1,13	1,02	1,26	1,56	2,03	2,75	3,07	3,36	4,09	4,09	-
	1,25	1,02	1,26	1,56	2,03	2,75	3,07	3,36	4,09	4,77	-
$N_{R,k}$ [kN]	0,40	0,50	0,66	0,80	1,01	1,34	1,62	1,62	1,62	1,62	-
	0,50	0,50	0,66	0,80	1,01	1,34	1,64	1,89	1,89	1,89	-
	0,55	0,50	0,66	0,80	1,01	1,34	1,64	1,91	2,16	2,16	-
	0,63	0,50	0,66	0,80	1,01	1,34	1,64	1,91	2,36	2,60	-
	0,75	0,50	0,66	0,80	1,01	1,34	1,64	1,91	2,36	2,78	-
	0,88	0,50	0,66	0,80	1,01	1,34	1,64	1,91	2,36	2,78	-
	1,00	0,50	0,66	0,80	1,01	1,34	1,64	1,91	2,36	2,78	-
	1,13	0,50	0,66	0,80	1,01	1,34	1,64	1,91	2,36	2,78	-
	1,25	0,50	0,66	0,80	1,01	1,34	1,64	1,91	2,36	2,78	-

„Self drilling Screws“

Self drilling screws 6,3 x L – BP1, washer size Ø 16,0 mm

Annex 11

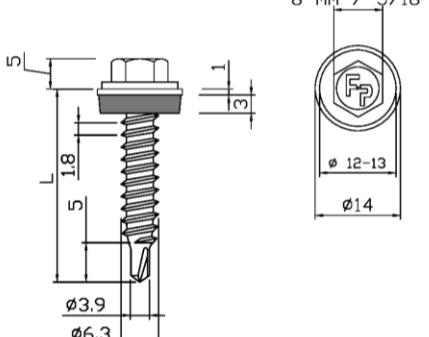
	<u>Materials</u>
	Screw: Stainless steel 1.4301 (A2) – EN ISO 3506
	Washer: Stainless steel 1.4301 (A2) – EN ISO 3506
Component I: S280GD, S320GD and S350GD - EN 10346	
Component II: S235 – EN 10025-2	
S280GD, S320GD and S350GD - EN 10346	
Drill capacity: $\Sigma t_i \leq 2,75$ mm	
<u>Timber substructures:</u> No performance determined	

t_{N1} [mm]	t_{II} [mm]										-
	0,40	0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	1,50	
$V_{R,k}$ [kN]	0,40	1,02	1,02	1,02	1,02	1,02	1,02	1,02	1,02	1,02	-
	0,50	1,02	1,26	1,26	1,26	1,26	1,26	1,26	1,26	1,26	-
	0,55	1,02	1,26	1,56	1,56	1,56	1,56	1,56	1,56	1,56	-
	0,63	1,02	1,26	1,56	2,03	2,03	2,03	2,03	2,03	2,03	-
	0,75	1,02	1,26	1,56	2,03	2,75	2,75	2,75	2,75	2,75	-
	0,88	1,02	1,26	1,56	2,03	2,75	3,07	3,07	3,07	3,07	-
	1,00	1,02	1,26	1,56	2,03	2,75	3,07	3,36	3,36	3,36	-
	1,13	1,02	1,26	1,56	2,03	2,75	3,07	3,36	4,09	4,09	-
	1,25	1,02	1,26	1,56	2,03	2,75	3,07	3,36	4,09	4,77	-
$N_{R,k}$ [kN]	0,40	0,50	0,66	0,80	1,01	1,34	1,64	1,91	1,91	1,91	-
	0,50	0,50	0,66	0,80	1,01	1,34	1,64	1,91	2,25	2,25	-
	0,55	0,50	0,66	0,80	1,01	1,34	1,64	1,91	2,36	2,60	-
	0,63	0,50	0,66	0,80	1,01	1,34	1,64	1,91	2,36	2,78	3,17
	0,75	0,50	0,66	0,80	1,01	1,34	1,64	1,91	2,36	2,78	3,64
	0,88	0,50	0,66	0,80	1,01	1,34	1,64	1,91	2,36	2,78	3,64
	1,00	0,50	0,66	0,80	1,01	1,34	1,64	1,91	2,36	2,78	3,64
	1,13	0,50	0,66	0,80	1,01	1,34	1,64	1,91	2,36	2,78	3,64
	1,25	0,50	0,66	0,80	1,01	1,34	1,64	1,91	2,36	2,78	3,64

„Self drilling Screws“

Self drilling screws 6,3 x L – BP1, washer size Ø 19,0 mm

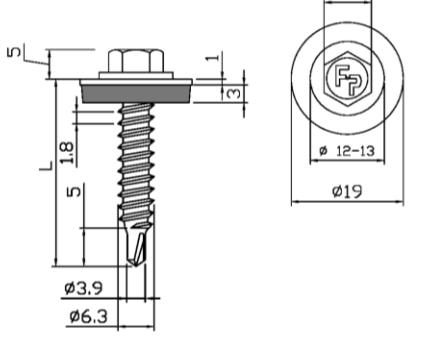
Annex 12

	<u>Materials</u>
	<p>Screw: Stainless steel 1.4301 (A2) – EN ISO 3506 Washer: Stainless steel 1.4301 (A2) – EN ISO 3506 Component I: S280GD, S320GD and S350GD - EN 10346 Component II: Timber substructure according to DIN EN 338 $\rho = 350 \text{ kg/m}^2$ (min. C24)</p>
Drill capacity: $\Sigma t_i \leq 1,25 \text{ mm}$	
<u>Timber substructures:</u> Performance determined with $M_{y,Rk} = 10,7 \text{ Nm}$ $f_{ax,k} = 9,864 \text{ N/mm}^2$ for $l_{eff} \geq 35,0 \text{ mm}$	

$t_{N1} [\text{mm}]$	$l_{eff} [\text{mm}]$
	35
0,40	1,17
0,50	1,42
0,55	1,58
0,63	1,83
0,75	2,20
0,88	2,20
1,00	2,20
1,13	2,20
1,25	2,20
0,40	1,74
0,50	1,80
0,55	2,18
0,63	2,18
0,75	2,18
0,88	2,18
1,00	2,18
1,13	2,18
1,25	2,18

	<u>Materials</u>
	<p>Screw: Stainless steel 1.4301 (A2) – EN ISO 3506 Washer: Stainless steel 1.4301 (A2) – EN ISO 3506 Component I: S280GD, S320GD and S350GD - EN 10346 Component II: Timber substructure according to DIN EN 338 $\rho = 350 \text{ kg/m}^2$ (min. C24)</p>
Drill capacity: $\Sigma t_i \leq 1,25 \text{ mm}$	
<u>Timber substructures:</u> Performance determined with $M_{y,Rk} = 10,7 \text{ Nm}$ $f_{ax,k} = 9,864 \text{ N/mm}^2$ for $l_{eff} \geq 35,0 \text{ mm}$	

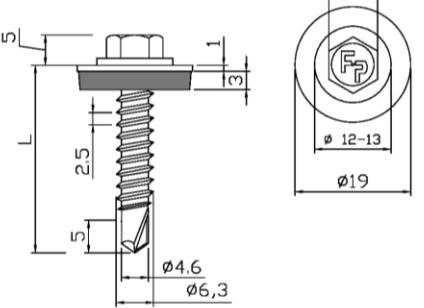
$t_{N1} [\text{mm}]$	$l_{eff} [\text{mm}]$
	35
$V_{R,k} [\text{kN}]$	0,40
	0,50
	0,55
	0,63
	0,75
	0,88
	1,00
	1,13
	1,25
$N_{R,k} [\text{kN}]$	0,40
	0,50
	0,55
	0,63
	0,75
	0,88
	1,00
	1,13
	1,25

	<u>Materials</u>
	<p>Screw: Stainless steel 1.4301 (A2) – EN ISO 3506 Washer: Stainless steel 1.4301 (A2) – EN ISO 3506 Component I: S280GD, S320GD and S350GD - EN 10346 Component II: Timber substructure according to DIN EN 338 $\rho = 350 \text{ kg/m}^2$ (min. C24)</p>
Drill capacity: $\sum t_i \leq 1,25 \text{ mm}$	
<u>Timber substructures:</u> Performance determined with $M_{y,Rk} = 10,7 \text{ Nm}$ $f_{ax,k} = 9,864 \text{ N/mm}^2$ for $l_{eff} \geq 35,0 \text{ mm}$	

$t_{N1} [\text{mm}]$	$l_{eff} [\text{mm}]$
	35
$V_{R,k} [\text{kN}]$	0,40
	0,50
	0,55
	0,63
	0,75
	0,88
	1,00
	1,13
	1,25
$N_{R,k} [\text{kN}]$	0,40
	0,50
	0,55
	0,63
	0,75
	0,88
	1,00
	1,13
	1,25

	<u>Materials</u>
	Screw: Stainless steel 1.4301 (A2) – EN ISO 3506
	Washer: Stainless steel 1.4301 (A2) – EN ISO 3506
Component I: S280GD, S320GD and S350GD - EN 10346 Component II: S235 – EN 10025-2 S280GD, S320GD and S350GD - EN 10346	Component I: S280GD, S320GD and S350GD - EN 10346
	Component II: S235 – EN 10025-2 S280GD, S320GD and S350GD - EN 10346
Drill capacity: $\Sigma t_i \leq 2,75 \text{ mm}$	
<u>Timber substructures:</u> No performance determined	

$t_{N1} [\text{mm}]$	$t_{II} [\text{mm}]$									
	0,40	0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	1,50
$V_{R,k} [\text{kN}]$	0,40	0,66	0,66	0,66	0,66	0,66	0,66	0,66	0,66	0,66
	0,50	0,66	0,97	0,97	0,97	0,97	0,97	0,97	0,97	0,97
	0,55	0,66	0,97	1,16	1,16	1,16	1,16	1,16	1,16	1,16
	0,63	0,66	0,97	1,16	1,46	1,46	1,46	1,46	1,46	1,46
	0,75	0,66	0,97	1,16	1,46	1,91	1,91	1,91	1,91	1,91
	0,88	0,66	0,97	1,16	1,46	1,91	2,52	2,52	2,52	2,52
	1,00	0,66	0,97	1,16	1,46	1,91	2,52	3,09	3,09	3,09
	1,13	0,66	0,97	1,16	1,46	1,91	2,52	3,09	3,09	3,09
	1,25	0,66	0,97	1,16	1,46	1,91	2,52	3,09	3,09	3,09
$N_{R,k} [\text{kN}]$	0,40	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,31	1,31
	0,50	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69
	0,55	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69
	0,63	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69
	0,75	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69
	0,88	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69
	1,00	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69
	1,13	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69
	1,25	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69

	<u>Materials</u>
	Screw: Stainless steel 1.4301 (A2) – EN ISO 3506
	Washer: Stainless steel 1.4301 (A2) – EN ISO 3506
Component I: S280GD, S320GD and S350GD - EN 10346 Component II: S235 – EN 10025-2 S280GD, S320GD and S350GD - EN 10346	Component I: S280GD, S320GD and S350GD - EN 10346
	Drill capacity: $\Sigma t_i \leq 2,75$ mm
<u>Timber substructures:</u> No performance determined	

t_{N1} [mm]	t_{II} [mm]										
	0,40	0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	1,50	
$V_{R,k}$ [kN]	0,40	0,66	0,66	0,66	0,66	0,66	0,66	0,66	0,66	0,66	
	0,50	0,66	0,97	0,97	0,97	0,97	0,97	0,97	0,97	0,97	
	0,55	0,66	0,97	1,16	1,16	1,16	1,16	1,16	1,16	1,16	
	0,63	0,66	0,97	1,16	1,46	1,46	1,46	1,46	1,46	1,46	
	0,75	0,66	0,97	1,16	1,46	1,91	1,91	1,91	1,91	1,91	
	0,88	0,66	0,97	1,16	1,46	1,91	2,52	2,52	2,52	2,52	
	1,00	0,66	0,97	1,16	1,46	1,91	2,52	3,09	3,09	3,09	
	1,13	0,66	0,97	1,16	1,46	1,91	2,52	3,09	3,09	3,09	
	1,25	0,66	0,97	1,16	1,46	1,91	2,52	3,09	3,09	3,09	
$N_{R,k}$ [kN]	0,40	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69	1,70
	0,50	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69	2,05
	0,55	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69	2,08
	0,63	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69	2,08
	0,75	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69	2,08
	0,88	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69	2,08
	1,00	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69	2,08
	1,13	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69	2,08
	1,25	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69	2,08

	<u>Materials</u>
	Screw: Stainless steel 1.4301 (A2) – EN ISO 3506
	Washer: Stainless steel 1.4301 (A2) – EN ISO 3506
Component I: S280GD, S320GD and S350GD - EN 10346 Component II: S235 – EN 10025-2 S280GD, S320GD and S350GD - EN 10346	Drill capacity: $\Sigma t_i \leq 2,75 \text{ mm}$
	<u>Timber substructures:</u> No performance determined

$t_{N1} [\text{mm}]$	$t_{\parallel} [\text{mm}]$										
	0,40	0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	1,50	
$V_{R,k} [\text{kN}]$	0,40	0,66	0,66	0,66	0,66	0,66	0,66	0,66	0,66	0,66	
	0,50	0,66	0,97	0,97	0,97	0,97	0,97	0,97	0,97	0,97	
	0,55	0,66	0,97	1,16	1,16	1,16	1,16	1,16	1,16	1,16	
	0,63	0,66	0,97	1,16	1,46	1,46	1,46	1,46	1,46	1,46	
	0,75	0,66	0,97	1,16	1,46	1,91	1,91	1,91	1,91	1,91	
	0,88	0,66	0,97	1,16	1,46	1,91	2,52	2,52	2,52	2,52	
	1,00	0,66	0,97	1,16	1,46	1,91	2,52	3,09	3,09	3,09	
	1,13	0,66	0,97	1,16	1,46	1,91	2,52	3,09	3,09	3,09	
	1,25	0,66	0,97	1,16	1,46	1,91	2,52	3,09	3,09	3,09	
$N_{R,k} [\text{kN}]$	0,40	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69	1,91
	0,50	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69	2,08
	0,55	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69	2,08
	0,63	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69	2,08
	0,75	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69	2,08
	0,88	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69	2,08
	1,00	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69	2,08
	1,13	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69	2,08
	1,25	0,45	0,67	0,73	0,84	0,99	1,15	1,29	1,50	1,69	2,08

	<u>Materials</u>
	<p>Screw: Stainless steel 1.4301 (A2) – EN ISO 3506 Washer: Stainless steel 1.4301 (A2) – EN ISO 3506 Component I: S280GD, S320GD and S350GD - EN 10346 Component II: Timber substructure according to DIN EN 338 $\rho = 350 \text{ kg/m}^2$ (min. C24)</p>
Drill capacity: $\Sigma t_i \leq 1,50 \text{ mm}$	
<u>Timber substructures:</u> Performance determined with $M_{y,Rk} = 10,7 \text{ Nm}$ $f_{ax,k} = 8,041 \text{ N/mm}^2$ for $l_{eff} \geq 40,0 \text{ mm}$	

$t_{N1} [\text{mm}]$	$L_{eff} [\text{mm}]$	
	40	
$V_{R,k} [\text{kN}]$	0,40	1,16
	0,50	1,33
	0,55	1,53
	0,63	1,84
	0,75	2,32
	0,88	2,32
	1,00	2,32
	1,13	2,32
	1,25	2,32
$N_{R,k} [\text{kN}]$	0,40	1,31
	0,50	1,97
	0,55	2,03
	0,63	2,03
	0,75	2,03
	0,88	2,03
	1,00	2,03
	1,13	2,03
	1,25	2,03

„Self drilling Screws“

Self drilling screws 6,3 x L – BP2, washer size Ø 16,0 mm

Annex 19

	<u>Materials</u>
	<p>Screw: Stainless steel 1.4301 (A2) – EN ISO 3506 Washer: Stainless steel 1.4301 (A2) – EN ISO 3506 Component I: S280GD, S320GD and S350GD - EN 10346 Component II: Timber substructure according to DIN EN 338 $\rho = 350 \text{ kg/m}^2$ (min. C24)</p>
Drill capacity: $\Sigma t_i \leq 1,50 \text{ mm}$	
<u>Timber substructures:</u> Performance determined with $M_{y,Rk} = 10,7 \text{ Nm}$ $f_{ax,k} = 8,041 \text{ N/mm}^2$ for $l_{eff} \geq 40,0 \text{ mm}$	

$t_{N1} [\text{mm}]$	$L_{eff} [\text{mm}]$	
	40	
$V_{R,k} [\text{kN}]$	0,40	1,16
	0,50	1,33
	0,55	1,53
	0,63	1,84
	0,75	2,32
	0,88	2,32
	1,00	2,32
	1,13	2,32
	1,25	2,32
$N_{R,k} [\text{kN}]$	0,40	1,70
	0,50	2,03
	0,55	2,03
	0,63	2,03
	0,75	2,03
	0,88	2,03
	1,00	2,03
	1,13	2,03
	1,25	2,03

„Self drilling Screws“

Self drilling screws 6,3 x L – BP2, washer size $\varnothing 19,0 \text{ mm}$

Annex 20

	<u>Materials</u>
	<p>Screw: Stainless steel 1.4301 (A2) – EN ISO 3506 Washer: Stainless steel 1.4301 (A2) – EN ISO 3506 Component I: S280GD, S320GD and S350GD - EN 10346 Component II: Timber substructure according to DIN EN 338 $\rho = 350 \text{ kg/m}^2$ (min. C24)</p>
Drill capacity: $\Sigma t_i \leq 1,50 \text{ mm}$	
<u>Timber substructures:</u> Performance determined with $M_{y,Rk} = 10,7 \text{ Nm}$ $f_{ax,k} = 8,041 \text{ N/mm}^2$ for $l_{eff} \geq 40,0 \text{ mm}$	

$t_{N1} [\text{mm}]$	$L_{eff} [\text{mm}]$	
	40	
$V_{R,k} [\text{kN}]$	0,40	1,16
	0,50	1,33
	0,55	1,53
	0,63	1,84
	0,75	2,32
	0,88	2,32
	1,00	2,32
	1,13	2,32
	1,25	2,32
$N_{R,k} [\text{kN}]$	0,40	1,91
	0,50	2,03
	0,55	2,03
	0,63	2,03
	0,75	2,03
	0,88	2,03
	1,00	2,03
	1,13	2,03
	1,25	2,03

„Self drilling Screws“

Self drilling screws 6,3 x L – BP2, washer size Ø 22,0 mm

Annex 21

	<u>Materials</u>
	Screw: Stainless steel 1.4301 (A2) – EN ISO 3506
	Washer: Stainless steel 1.4301 (A2) – EN ISO 3506
Component I: S280GD, S320GD and S350GD - EN 10346 Component II: S235 – EN 10025-2 S280GD, S320GD and S350GD - EN 10346	
Drill capacity: $\Sigma t_i \leq 7,25 \text{ mm}$	
<u>Timber substructures:</u> No performance determined	

$t_{N1} [\text{mm}]$	$t_{II} [\text{mm}]$						
	0,75	1,00	1,50	2,00	3,00	4,00	6,00
$V_{R,k} [\text{kN}]$	0,40	0,86	0,86	0,86	0,86	0,86	0,86
	0,50	0,87	0,87	0,87	0,87	0,87	0,87
	0,55	1,03	1,03	1,03	1,03	1,03	1,03
	0,63	1,28	1,28	1,28	1,28	1,28	1,28
	0,75	1,66	1,66	1,66	1,66	1,66	1,66
	0,88	1,66	1,92	1,92	1,92	1,92	1,92
	1,00	1,66	2,16	2,86	3,55	3,55	3,55
	1,13	1,66	2,16	2,86	3,55	3,55	3,55
	1,25	1,66	2,16	2,86	3,55	3,55	3,55
$N_{R,k} [\text{kN}]$	0,40	0,60	0,66	1,22	1,22	1,22	1,22
	0,50	0,60	0,66	1,76	1,76	1,76	1,76
	0,55	0,60	0,66	1,77	2,10	2,10	2,10
	0,63	0,60	0,66	1,77	2,65	2,65	2,65
	0,75	0,60	0,66	1,77	2,87	3,48	3,48
	0,88	0,60	0,66	1,77	2,87	3,48	3,48
	1,00	0,60	0,66	1,77	2,87	3,48	3,48
	1,13	0,60	0,66	1,77	2,87	3,48	3,48
	1,25	0,60	0,66	1,77	2,87	3,48	3,48

„Self drilling Screws“

Self drilling screws 5,5 x L – BP3, washer size Ø 16,0 mm

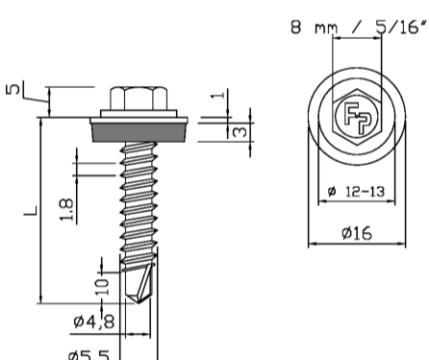
Annex 22

	<u>Materials</u>
	Screw: Stainless steel 1.4301 (A2) – EN ISO 3506
	Washer: Stainless steel 1.4301 (A2) – EN ISO 3506
Component I: S280GD, S320GD and S350GD - EN 10346 Component II: S235 – EN 10025-2 S280GD, S320GD and S350GD - EN 10346	Component I: S280GD, S320GD and S350GD - EN 10346
	Component II: S235 – EN 10025-2 S280GD, S320GD and S350GD - EN 10346
Drill capacity: $\sum t_i \leq 7,25 \text{ mm}$	
<u>Timber substructures:</u> No performance determined	

$t_{N1} [\text{mm}]$	$t_{II} [\text{mm}]$						
	0,75	1,00	1,50	2,00	3,00	4,00	6,00
$V_{R,k} [\text{kN}]$	0,40	0,86	0,86	0,86	0,86	0,86	0,86
	0,50	0,87	0,87	0,87	0,87	0,87	0,87
	0,55	1,03	1,03	1,03	1,03	1,03	1,03
	0,63	1,28	1,28	1,28	1,28	1,28	1,28
	0,75	1,66	1,66	1,66	1,66	1,66	1,66
	0,88	1,66	1,92	1,92	1,92	1,92	1,92
	1,00	1,66	2,16	2,86	3,55	3,55	3,55
	1,13	1,66	2,16	2,86	3,55	3,55	3,55
	1,25	1,66	2,16	2,86	3,55	3,55	3,55
$N_{R,k} [\text{kN}]$	0,40	0,60	0,66	1,77	1,78	1,78	1,78
	0,50	0,60	0,66	1,77	1,97	1,97	1,97
	0,55	0,60	0,66	1,77	2,34	2,34	2,34
	0,63	0,60	0,66	1,77	2,87	2,93	2,93
	0,75	0,60	0,66	1,77	2,87	3,55	3,82
	0,88	0,60	0,66	1,77	2,87	3,55	3,82
	1,00	0,60	0,66	1,77	2,87	3,55	3,82
	1,13	0,60	0,66	1,77	2,87	3,55	3,82
	1,25	0,60	0,66	1,77	2,87	3,55	3,82

	<u>Materials</u>
	Screw: Stainless steel 1.4301 (A2) – EN ISO 3506
	Washer: Stainless steel 1.4301 (A2) – EN ISO 3506
Component I: S280GD, S320GD and S350GD - EN 10346 Component II: S235 – EN 10025-2 S280GD, S320GD and S350GD - EN 10346	Drill capacity: $\sum t_i \leq 7,25 \text{ mm}$
	<u>Timber substructures:</u> No performance determined

$t_{N1} [\text{mm}]$	$t_{II} [\text{mm}]$						
	0,75	1,00	1,50	2,00	3,00	4,00	6,00
$V_{R,k} [\text{kN}]$	0,40	0,86	0,86	0,86	0,86	0,86	0,86
	0,50	0,87	0,87	0,87	0,87	0,87	0,87
	0,55	1,03	1,03	1,03	1,03	1,03	1,03
	0,63	1,28	1,28	1,28	1,28	1,28	1,28
	0,75	1,66	1,66	1,66	1,66	1,66	1,66
	0,88	1,66	1,92	1,92	1,92	1,92	1,92
	1,00	1,66	2,16	2,86	3,55	3,55	3,55
	1,13	1,66	2,16	2,86	3,55	3,55	3,55
	1,25	1,66	2,16	2,86	3,55	3,55	3,55
$N_{R,k} [\text{kN}]$	0,40	0,60	0,66	1,77	1,91	1,91	1,91
	0,50	0,60	0,66	1,77	1,97	1,97	1,97
	0,55	0,60	0,66	1,77	2,34	2,34	2,34
	0,63	0,60	0,66	1,77	2,87	2,94	2,94
	0,75	0,60	0,66	1,77	2,87	3,55	3,84
	0,88	0,60	0,66	1,77	2,87	3,55	3,84
	1,00	0,60	0,66	1,77	2,87	3,55	3,84
	1,13	0,60	0,66	1,77	2,87	3,55	3,84
	1,25	0,60	0,66	1,77	2,87	3,55	3,84

	<u>Materials</u>
	Screw: Stainless steel 1.4301 (A2) – EN ISO 3506
	Washer: Stainless steel 1.4301 (A2) – EN ISO 3506
Component I: S280GD, S320GD and S350GD - EN 10346	
Component II: Aluminium AlMg3 with $R_m \geq 165 \text{ N/mm}^2$	
Drill capacity: $\Sigma t_i \leq 7,25 \text{ mm}$	
<u>Timber substructures:</u> No performance determined	

$t_{N1} [\text{mm}]$	$t_{II} [\text{mm}]$						
	0,80	1,00	1,50	2,00	3,00	4,00	6,00
$V_{R,k} [\text{kN}]$	0,40	0,49	0,49	0,49	0,49	0,49	0,49
	0,50	0,65	0,65	0,65	0,65	0,65	0,65
	0,55	0,67	0,67	0,67	0,67	0,67	0,67
	0,63	0,70	0,70	0,70	0,70	0,70	0,70
	0,75	0,74	0,74	0,74	0,74	0,74	0,74
	0,88	0,74	1,12	1,12	1,12	1,12	1,12
	1,00	0,74	1,47	1,81	2,14	2,14	2,14
	1,13	0,74	1,47	1,81	2,14	2,14	2,14
	1,25	0,74	1,47	1,81	2,14	2,14	2,14
$N_{R,k} [\text{kN}]$	0,40	0,29	0,37	0,62	0,87	1,22	1,22
	0,50	0,29	0,37	0,62	0,87	1,76	1,76
	0,55	0,29	0,37	0,62	0,87	1,85	2,10
	0,63	0,29	0,37	0,62	0,87	1,85	2,65
	0,75	0,29	0,37	0,62	0,87	1,85	2,82
	0,88	0,29	0,37	0,62	0,87	1,85	3,48
	1,00	0,29	0,37	0,62	0,87	1,85	3,48
	1,13	0,29	0,37	0,62	0,87	1,85	3,48
	1,25	0,29	0,37	0,62	0,87	1,85	3,48

„Self drilling Screws“

Self drilling screws 5,5 x L – BP3, washer size Ø 16,0 mm

Annex 25

	<u>Materials</u>
	Screw: Stainless steel 1.4301 (A2) – EN ISO 3506
	Washer: Stainless steel 1.4301 (A2) – EN ISO 3506
Component I: S280GD, S320GD and S350GD - EN 10346	
Component II: Aluminium AlMg3 with $R_m \geq 165 \text{ N/mm}^2$	
Drill capacity: $\Sigma t_i \leq 7,25 \text{ mm}$	
<u>Timber substructures:</u> No performance determined	

$t_{N1} [\text{mm}]$	$t_{II} [\text{mm}]$						
	0,80	1,00	1,50	2,00	3,00	4,00	6,00
$V_{R,k} [\text{kN}]$	0,40	0,49	0,49	0,49	0,49	0,49	0,49
	0,50	0,65	0,65	0,65	0,65	0,65	0,65
	0,55	0,67	0,67	0,67	0,67	0,67	0,67
	0,63	0,70	0,70	0,70	0,70	0,70	0,70
	0,75	0,74	0,74	0,74	0,74	0,74	0,74
	0,88	0,74	1,12	1,12	1,12	1,12	1,12
	1,00	0,74	1,47	1,81	2,14	2,14	2,14
	1,13	0,74	1,47	1,81	2,14	2,14	2,14
	1,25	0,74	1,47	1,81	2,14	2,14	2,14
$N_{R,k} [\text{kN}]$	0,40	0,29	0,37	0,62	0,87	1,78	1,78
	0,50	0,29	0,37	0,62	0,87	1,85	1,97
	0,55	0,29	0,37	0,62	0,87	1,85	2,34
	0,63	0,29	0,37	0,62	0,87	1,85	2,82
	0,75	0,29	0,37	0,62	0,87	1,85	3,82
	0,88	0,29	0,37	0,62	0,87	1,85	3,82
	1,00	0,29	0,37	0,62	0,87	1,85	3,82
	1,13	0,29	0,37	0,62	0,87	1,85	3,82
	1,25	0,29	0,37	0,62	0,87	1,85	3,82

„Self drilling Screws“

Self drilling screws 5,5 x L – BP3, washer size Ø 19,0 mm

Annex 26

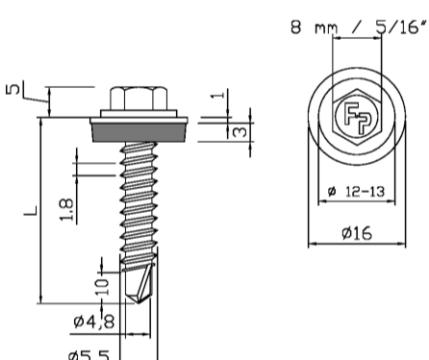
	<u>Materials</u>
	Screw: Stainless steel 1.4301 (A2) – EN ISO 3506
	Washer: Stainless steel 1.4301 (A2) – EN ISO 3506
Component I: S280GD, S320GD and S350GD - EN 10346 Component II: Aluminium AlMg3 with $R_m \geq 165 \text{ N/mm}^2$	Drill capacity: $\Sigma t_i \leq 7,25 \text{ mm}$
	<u>Timber substructures:</u> No performance determined

$t_{N1} [\text{mm}]$	$t_{II} [\text{mm}]$						
	0,80	1,00	1,50	2,00	3,00	4,00	6,00
$V_{R,k} [\text{kN}]$	0,40	0,49	0,49	0,49	0,49	0,49	0,49
	0,50	0,65	0,65	0,65	0,65	0,65	0,65
	0,55	0,67	0,67	0,67	0,67	0,67	0,67
	0,63	0,70	0,70	0,70	0,70	0,70	0,70
	0,75	0,74	0,74	0,74	0,74	0,74	0,74
	0,88	0,74	1,12	1,12	1,12	1,12	1,12
	1,00	0,74	1,47	1,81	2,14	2,14	2,14
	1,13	0,74	1,47	1,81	2,14	2,14	2,14
	1,25	0,74	1,47	1,81	2,14	2,14	2,14
$N_{R,k} [\text{kN}]$	0,40	0,29	0,37	0,62	0,87	1,85	1,91
	0,50	0,29	0,37	0,62	0,87	1,85	1,97
	0,55	0,29	0,37	0,62	0,87	1,85	2,34
	0,63	0,29	0,37	0,62	0,87	1,85	2,82
	0,75	0,29	0,37	0,62	0,87	1,85	3,84
	0,88	0,29	0,37	0,62	0,87	1,85	2,82
	1,00	0,29	0,37	0,62	0,87	1,85	3,84
	1,13	0,29	0,37	0,62	0,87	1,85	3,84
	1,25	0,29	0,37	0,62	0,87	1,85	3,84

„Self drilling Screws“

Self drilling screws 5,5 x L – BP3, washer size Ø 22,0 mm

Annex 27

	<u>Materials</u>
	Screw: Stainless steel 1.4301 (A2) – EN ISO 3506
	Washer: Stainless steel 1.4301 (A2) – EN ISO 3506
Component I: S280GD, S320GD and S350GD - EN 10346	
Component II: Aluminium AlMg3 with $R_m \geq 215 \text{ N/mm}^2$	
Drill capacity: $\Sigma t_i \leq 7,25 \text{ mm}$	
<u>Timber substructures:</u> No performance determined	

$t_{N1} [\text{mm}]$	$t_{II} [\text{mm}]$						
	0,80	1,00	1,50	2,00	3,00	4,00	6,00
$V_{R,k} [\text{kN}]$	0,40	0,64	0,64	0,64	0,64	0,64	0,64
	0,50	0,84	0,84	0,84	0,84	0,84	0,84
	0,55	0,87	0,87	0,87	0,87	0,87	0,87
	0,63	0,91	0,91	0,91	0,91	0,91	0,91
	0,75	0,97	0,97	0,97	0,97	0,97	0,97
	0,88	0,97	1,46	1,46	1,46	1,46	1,46
	1,00	0,97	1,92	2,36	2,79	2,79	2,79
	1,13	0,97	1,92	2,36	2,79	2,79	2,79
	1,25	0,97	1,92	2,36	2,79	2,79	2,79
$N_{R,k} [\text{kN}]$	0,40	0,38	0,48	0,81	1,14	1,22	1,22
	0,50	0,38	0,48	0,81	1,14	1,76	1,76
	0,55	0,38	0,48	0,81	1,14	2,10	2,10
	0,63	0,38	0,48	0,81	1,14	2,41	2,65
	0,75	0,38	0,48	0,81	1,14	2,41	3,48
	0,88	0,38	0,48	0,81	1,14	2,41	3,48
	1,00	0,38	0,48	0,81	1,14	2,41	3,48
	1,13	0,38	0,48	0,81	1,14	2,41	3,48
	1,25	0,38	0,48	0,81	1,14	2,41	3,48

„Self drilling Screws“

Self drilling screws 5,5 x L – BP3, washer size Ø 16,0 mm

Annex 28

	<u>Materials</u>
	Screw: Stainless steel 1.4301 (A2) – EN ISO 3506
	Washer: Stainless steel 1.4301 (A2) – EN ISO 3506
Component I: S280GD, S320GD and S350GD - EN 10346 Component II: Aluminium AlMg3 with $R_m \geq 215 \text{ N/mm}^2$	Drill capacity: $\Sigma t_i \leq 7,25 \text{ mm}$
	<u>Timber substructures:</u> No performance determined

$t_{N1} [\text{mm}]$	$t_{\parallel} [\text{mm}]$						
	0,80	1,00	1,50	2,00	3,00	4,00	6,00
$V_{R,k} [\text{kN}]$	0,40	0,64	0,64	0,64	0,64	0,64	0,64
	0,50	0,84	0,84	0,84	0,84	0,84	0,84
	0,55	0,87	0,87	0,87	0,87	0,87	0,87
	0,63	0,91	0,91	0,91	0,91	0,91	0,91
	0,75	0,97	0,97	0,97	0,97	0,97	0,97
	0,88	0,97	1,46	1,46	1,46	1,46	1,46
	1,00	0,97	1,92	2,36	2,79	2,79	2,79
	1,13	0,97	1,92	2,36	2,79	2,79	2,79
	1,25	0,97	1,92	2,36	2,79	2,79	2,79
$N_{R,k} [\text{kN}]$	0,40	0,38	0,48	0,81	1,14	1,78	1,78
	0,50	0,38	0,48	0,81	1,14	1,97	1,97
	0,55	0,38	0,48	0,81	1,14	2,34	2,34
	0,63	0,38	0,48	0,81	1,14	2,41	2,93
	0,75	0,38	0,48	0,81	1,14	2,41	3,68
	0,88	0,38	0,48	0,81	1,14	2,41	3,68
	1,00	0,38	0,48	0,81	1,14	2,41	3,68
	1,13	0,38	0,48	0,81	1,14	2,41	3,68
	1,25	0,38	0,48	0,81	1,14	2,41	3,68

„Self drilling Screws“

Self drilling screws 5,5 x L – BP3, washer size Ø 19,0 mm

Annex 29

	<u>Materials</u>
	Screw: Stainless steel 1.4301 (A2) – EN ISO 3506
	Washer: Stainless steel 1.4301 (A2) – EN ISO 3506
Component I: S280GD, S320GD and S350GD - EN 10346	
Component II: Aluminium AlMg3 with $R_m \geq 215 \text{ N/mm}^2$	
Drill capacity: $\Sigma t_i \leq 7,25 \text{ mm}$	
<u>Timber substructures:</u> No performance determined	

$t_{N1} [\text{mm}]$	$t_{\parallel} [\text{mm}]$						
	0,80	1,00	1,50	2,00	3,00	4,00	6,00
$V_{R,k} [\text{kN}]$	0,40	0,64	0,64	0,64	0,64	0,64	0,64
	0,50	0,84	0,84	0,84	0,84	0,84	0,84
	0,55	0,87	0,87	0,87	0,87	0,87	0,87
	0,63	0,91	0,91	0,91	0,91	0,91	0,91
	0,75	0,97	0,97	0,97	0,97	0,97	0,97
	0,88	0,97	1,46	1,46	1,46	1,46	1,46
	1,00	0,97	1,92	2,36	2,79	2,79	2,79
	1,13	0,97	1,92	2,36	2,79	2,79	2,79
	1,25	0,97	1,92	2,36	2,79	2,79	2,79
$N_{R,k} [\text{kN}]$	0,40	0,38	0,48	0,81	1,14	1,91	1,91
	0,50	0,38	0,48	0,81	1,14	1,97	1,97
	0,55	0,38	0,48	0,81	1,14	2,34	2,34
	0,63	0,38	0,48	0,81	1,14	2,41	2,94
	0,75	0,38	0,48	0,81	1,14	2,41	3,68
	0,88	0,38	0,48	0,81	1,14	2,41	3,68
	1,00	0,38	0,48	0,81	1,14	2,41	3,68
	1,13	0,38	0,48	0,81	1,14	2,41	3,68
	1,25	0,38	0,48	0,81	1,14	2,41	3,68

„Self drilling Screws“

Self drilling screws 5,5 x L – BP3, washer size Ø 22,0 mm

Annex 30

	<u>Materials</u>																		
	Screw:	Stainless steel 1.4301 (A2) – EN ISO 3506																	
	Washer:	Stainless steel 1.4301 (A2) – EN ISO 3506																	
	Component I:	S280GD, S320GD and S350GD - EN 10346																	
	Component II:	S235 – EN 10025-2 S280GD, S320GD and S350GD - EN 10346																	
	Drill capacity: ≤ 12 mm																		
	<u>Timber substructures:</u> No performance determined																		
t_l [mm]	t_{ll} [mm]																		
	0,75	0,88	1,00	1,13	1,25	1,50	2,00	3,00	4,00	≥ 6,00									
$V_{R,k}$ [kN]	0,40	1,08	1,08	1,08	1,08	1,08	1,08	1,08	1,08	1,08									
	0,50	1,10	1,10	1,10	1,10	1,10	1,10	1,10	1,10	1,10									
	0,55	1,20	1,20	1,20	1,20	1,20	1,20	1,20	1,20	1,20									
	0,63	1,37	1,37	1,37	1,37	1,37	1,37	1,37	1,37	1,37									
	0,75	1,62	1,62	1,62	1,62	1,62	1,62	1,62	1,62	1,62									
	0,88	1,62	2,16	2,16	2,16	2,16	2,16	2,16	2,16	2,16									
	1,00	1,62	2,16	2,65	2,65	2,65	2,65	2,65	2,65	2,65									
$N_{R,k}$ [kN]	0,40	0,60	0,74	0,86	1,09	1,30	1,43	1,43	1,43	1,43									
	0,50	0,60	0,74	0,86	1,09	1,30	1,74	1,74	1,74	1,74									
	0,55	0,60	0,74	0,86	1,09	1,30	1,74	2,17	2,17	2,17									
	0,63	0,60	0,74	0,86	1,09	1,30	1,74	2,62	2,85	2,85									
	0,75	0,60	0,74	0,86	1,09	1,30	1,74	2,62	3,65	3,88									
	0,88	0,60	0,74	0,86	1,09	1,30	1,74	2,62	3,65	3,88									
	1,00	0,60	0,74	0,86	1,09	1,30	1,74	2,62	3,65	3,88									
„Self drilling Screws“																			
Self drilling screws 5,5 x L – BP5, washer size Ø 16,0 mm										Annex 31									

	<u>Materials</u>
	Screw: Stainless steel 1.4301 (A2) – EN ISO 3506
	Washer: Stainless steel 1.4301 (A2) – EN ISO 3506
Component I: S280GD, S320GD and S350GD - EN 10346 Component II: S235 – EN 10025-2 S280GD, S320GD and S350GD - EN 10346	Component I: S280GD, S320GD and S350GD - EN 10346
	Component II: S235 – EN 10025-2 S280GD, S320GD and S350GD - EN 10346
Drill capacity: ≤ 12 mm	
<u>Timber substructures:</u> No performance determined	

t_l [mm]	t_{ll} [mm]									
	0,75	0,88	1,00	1,13	1,25	1,50	2,00	3,00	4,00	≥ 6,00
$V_{R,k}$ [kN]	0,40	1,08	1,08	1,08	1,08	1,08	1,08	1,08	1,08	1,08
	0,50	1,10	1,10	1,10	1,10	1,10	1,10	1,10	1,10	1,10
	0,55	1,20	1,20	1,20	1,20	1,20	1,20	1,20	1,20	1,20
	0,63	1,37	1,37	1,37	1,37	1,37	1,37	1,37	1,37	1,37
	0,75	1,62	1,62	1,62	1,62	1,62	1,62	1,62	1,62	1,62
	0,88	1,62	2,16	2,16	2,16	2,16	2,16	2,16	2,16	2,16
	1,00	1,62	2,16	2,65	2,65	2,65	2,65	2,65	2,65	2,65
$N_{R,k}$ [kN]	0,40	0,60	0,74	0,86	1,09	1,30	1,74	1,74	1,74	1,74
	0,50	0,60	0,74	0,86	1,09	1,30	1,74	2,26	2,26	2,26
	0,55	0,60	0,74	0,86	1,09	1,30	1,74	2,62	2,66	2,66
	0,63	0,60	0,74	0,86	1,09	1,30	1,74	2,62	3,29	3,29
	0,75	0,60	0,74	0,86	1,09	1,30	1,74	2,62	3,65	4,24
	0,88	0,60	0,74	0,86	1,09	1,30	1,74	2,62	3,65	4,24
	1,00	0,60	0,74	0,86	1,09	1,30	1,74	2,62	3,65	4,24

„Self drilling Screws“

Self drilling screws 5,5 x L – BP5, washer size Ø 19,0 mm

Annex 32

	<u>Materials</u>																		
	Screw:	Stainless steel 1.4301 (A2) – EN ISO 3506																	
	Washer:	Stainless steel 1.4301 (A2) – EN ISO 3506																	
	Component I:	S280GD, S320GD and S350GD - EN 10346																	
	Component II:	S235 – EN 10025-2 S280GD, S320GD and S350GD - EN 10346																	
	Drill capacity: ≤ 12 mm																		
	<u>Timber substructures:</u> No performance determined																		
t_l [mm]	t_{ll} [mm]																		
	0,75	0,88	1,00	1,13	1,25	1,50	2,00	3,00	4,00	≥ 6,00									
$V_{R,k}$ [kN]	0,40	1,08	1,08	1,08	1,08	1,08	1,08	1,08	1,08	1,08									
	0,50	1,10	1,10	1,10	1,10	1,10	1,10	1,10	1,10	1,10									
	0,55	1,20	1,20	1,20	1,20	1,20	1,20	1,20	1,20	1,20									
	0,63	1,37	1,37	1,37	1,37	1,37	1,37	1,37	1,37	1,37									
	0,75	1,62	1,62	1,62	1,62	1,62	1,62	1,62	1,62	1,62									
	0,88	1,62	2,16	2,16	2,16	2,16	2,16	2,16	2,16	2,16									
	1,00	1,62	2,16	2,65	2,65	2,65	2,65	2,65	2,65	2,65									
$N_{R,k}$ [kN]	0,40	0,60	0,74	0,86	1,09	1,30	1,72	1,72	1,72	1,72									
	0,50	0,60	0,74	0,86	1,09	1,30	1,74	2,17	2,17	2,17									
	0,55	0,60	0,74	0,86	1,09	1,30	1,74	2,54	2,54	2,54									
	0,63	0,60	0,74	0,86	1,09	1,30	1,74	2,62	3,12	3,12									
	0,75	0,60	0,74	0,86	1,09	1,30	1,74	2,62	3,65	4,00									
	0,88	0,60	0,74	0,86	1,09	1,30	1,74	2,62	3,65	4,00									
	1,00	0,60	0,74	0,86	1,09	1,30	1,74	2,62	3,65	4,00									
„Self drilling Screws“																			
Self drilling screws 5,5 x L – BP5, washer size Ø 22,0 mm										Annex 33									