Deutsches Institut für Bautechnik

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Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments

Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment)

European Technical Assessment ETA-13/0183 of 25 January 2019

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the European Technical Assessment:	Deutsches Institut für Bautechnik
Trade name of the construction product	SX, SXC, SXCW, SDT, SDTW, SXW, TDA, TDB, CXCW
Product family to which the construction product belongs	Fastening screws for sandwichpanels
Manufacturer	SFS intec AG Rosenbergsaustraße 10 9435 HEERBRUGG SCHWEIZ
Manufacturing plant	SFS plants 1, 5, 7, 16, 18
This European Technical Assessment contains	43 pages including 38 annexes which form an integral part of this assessment
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	EAD 330047-01-0602
This version replaces	ETA-13/0183 issued on 29 June 2017

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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 completed with sealing washers consisting of metal washer and EPDM-seal.

Table 1 – Fastening screws for sandwich panels

Annex	Fastening screw	Description	Fastener material	Application
3	SXC5-S16-5.5 x L SXC5-L12-S16-5.5 x L	Self-drilling screw with sealing washer Ø 16 mm	Stainless steel	Steel
4	SXC5-S19-5,5 x L SXC5-L12-S19-5,5 x L	Self-drilling screw with sealing washer ≥ Ø 19 mm	Stainless steel	Steel
5 / 6	SXC5-S16-6,3 x L SXC5-L12-S16-6,3 x L	Self-drilling screw with sealing washer Ø 16 mm	Stainless steel	Steel
7 / 8	SXC5-S19-6,3 x L SXC5-L12-S19-6,3 x L	Self-drilling screw with sealing washer ≥ Ø 19 mm	Stainless steel	Steel
9	SXC14-S16-5,5 x L SXC14-L12-S16-5,5 x L	Self-drilling screw with sealing washer Ø 16 mm	Stainless steel	Steel
10	SXC14-S19-5,5 x L SXC14-L12-S19-5,5 x L	Self-drilling screw with sealing washer ≥ Ø 19 mm	Stainless steel	Steel
11	SXC16-S16-5,8 x L SXC16-L12-S16-5,8 x L	Self-drilling screw with sealing washer Ø 16 mm	Stainless steel	Steel
12	SXC16-S19-5,8 x L SXC16-L12-S19-5,8 x L	Self-drilling screw with sealing washer ≥ Ø 19 mm	Stainless steel	Steel
13	SX5-S16-5,5 x L SX5-L12-S16-5,5 x L	Self-drilling screw with sealing washer Ø 16 mm	Stainless steel	Steel
14	SX5-S19-5,5 x L SX5-L12-S19-5,5 x L	Self-drilling screw with sealing washer ≥ Ø 19 mm	Stainless steel	Steel
15	SX14-S16-5,5 x L SX14-L12-S16-5,5 x L	Self-drilling screw with sealing washer Ø 16 mm	Stainless steel	Steel
16	SX14-S19-5,5 x L SX14-L12-S19-5,5 x L	Self-drilling screw with sealing washer ≥ Ø 19 mm	Stainless steel	Steel
17	TDB-S-S16-6,3 x L	Self-tapping screw with sealing washer Ø 16 mm	Stainless steel	Steel
18	TDB-S-S19-6,3 x L	Self-tapping screw with sealing washer ≥ Ø 19 mm	Stainless steel	Steel
19	SXCW-S16-6,5 x L SXCW-L12-S16-6,5 x L	Self-drilling screw with sealing washer Ø 16 mm	Stainless steel	Timber
20	SXCW-S19-6,5 x L SXCW-L12-S19-6,5 x L	Self-drilling screw with sealing washer ≥ Ø 19 mm	Stainless steel	Timber
21	CXCW-S16-6,8 x L CXCW-L12-S16-6,8 x L	Self-drilling screw with sealing washer Ø 16 mm	Stainless steel	Timber
22	CXCW-S19-6,8 x L CXCW-L12-S19-6,8 x L	Self-drilling screw with sealing washer ≥ Ø 19 mm	Stainless steel	Timber
23	SXC5-S16-6,3 x L SXC5-L12-S16-6,3 x L	Self-drilling screw with sealing washer Ø 16 mm	Stainless steel	Timber
24	SXC5-S19-6,3 x L SXC5-L12-S19-6,3 x L	Self-drilling screw with sealing washer ≥ Ø 19 mm	Stainless steel	Timber

Table 1 - continued

Annex	Fastening screw	Description	Fastener material	Application
25	SXW-S16-6,5 x L SXW-L12-S16-6,5 x L	Self-drilling screw with sealing washer Ø 16 mm	Stainless steel	Timber
26	SXW-S19-6,5 x L SXW-L12-S19-6,5 x L	Self-drilling screw with sealing washer ≥ Ø 19 mm	Stainless steel	Timber
27	TDA-S-S16-6,5 x L	Self-tapping screw with sealing washer Ø 16 mm	Stainless steel	Timber
28	TDA-S-S19-6,5 x L	Self-tapping screw with sealing washer ≥ Ø 19 mm	Stainless steel	Timber
29	SDT5-S16-5,5 x L SDT5-L12-S16-5,5 x L	Self-drilling screw with sealing washer Ø 16 mm	Carbon steel	Steel
30	SDT5-S19-5,5 x L SDT5-L12-S19-5,5 x L	Self-drilling screw with sealing washer ≥ Ø 19 mm	Carbon steel	Steel
31	SDT5-A16-5,5 x L SDT5-L12-A16-5,5 x L	Self-drilling screw with sealing washer Ø 16 mm	Carbon steel	Steel
32	SDT5-A19-5,5 x L SDT5-L12-A19-5,5 x L	Self-drilling screw with sealing washer Ø 19 mm	Carbon steel	Steel
33	SDT14-S16-5,5 x L SDT14-L12-S16-5,5 x L	Self-drilling screw with sealing washer Ø 16 mm	Carbon steel	Steel
34	SDT14-S19-5,5 x L SDT14-L12-S19-5,5 x L	Self-drilling screw with sealing washer ≥ Ø 19 mm	Carbon steel	Steel
35	SDT14-A16-5,5 x L SDT14-L12-A16-5,5 x L	Self-drilling screw with sealing washer Ø 16 mm	Carbon steel	Steel
36	SDT14-A19-5,5 x L SDT14-L12-A19-5,5 x L	Self-drilling screw with sealing washer Ø 19 mm	Carbon steel	Steel
37	SDTW-S16-6,5 x L SDTW-L12-S16-6,5 x L	Self-drilling screw with sealing washer Ø 16 mm	Carbon steel	Timber
38	SDTW-S19-6,5 x L SDTW-L12-S19-6,5 x L	Self-drilling screw with sealing washer ≥ Ø 19 mm	Carbon steel	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 sandwich panels to metal or timber substructures. The sandwich panel can either be used as wall or roof cladding or as load bearing wall and roof element. 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 ≥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 (1-38).

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.

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 Bending Capacity in case of constraining forces due to temperature	see Annexes to this ETA
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 330047-01-0602, the applicable European legal act is: Commission Decision 98/214/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.

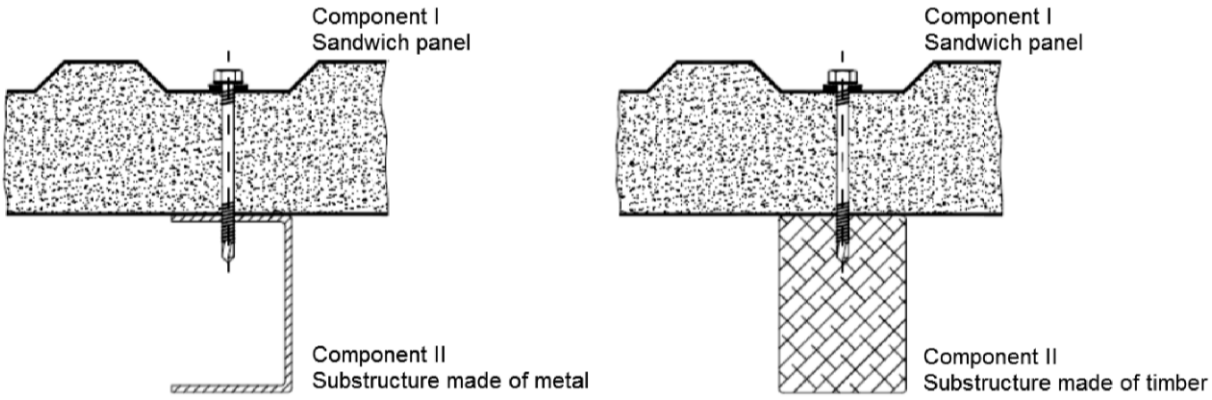
Issued in Berlin on 25 January 2019 by Deutsches Institut für Bautechnik

BD Dipl.-Ing. Andreas Kummerow
Head of Department

beglaubigt:
Hahn

Deutsches Institut für Bautechnik DIBt

Exemplary execution of a connection



Dimensions

Design relevant dimensions are indicated as follows:

t_I	Thickness of component I at the fastening position
t_{N1}	Thickness of the outer skin of component I
t_{N2}	Thickness of the inner skin of component I
t_{II}	Thickness of component II made of metal
l_p	Screw-in length in component II made of timber
l_{ef}	Effective screw-in length in component II made of timber (without drill point)
d_{dp}	Pre-drill diameter of the connection

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

Resistance values

The resistance values of a connection are indicated as follows:

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

In some cases component-specific resistance values are indicated:

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

Additionally indicated values for component II made of timber:

$M_{y,Rk}$	Characteristic yield moment of the fastening screw
$f_{ax,k}$	Characteristic withdrawal strength of timber

Terms and explanations	**Annex 1**
Fastening screws for sandwich panels	

Design values

The design values of a connection have to be determined as follows:

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

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

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

Special conditions

If the thickness of component I (t_{N1} or t_{N2}) or component II (t_{II}) is between two indicated thicknesses, the resistance values $N_{R,k}$ and $V_{R,k}$ can be determined by linear interpolation. The same applies to screw-in lengths l_{ef} and l_p.

If component II made of metal with thickness $t_{II} < 3$ mm leads to an asymmetric loading of the connection (e.g. Z-profile), the resistance values $N_{R,k}$ have to be reduced to 70%.

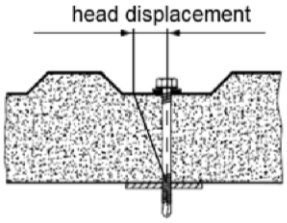
In case of combined loading of a connection by tension and shear forces the following interaction equation has to be taken into account:

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

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

Head displacement

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



Installation conditions

The installation is carried out according to manufacturer's instruction.

The load-bearing screw-in length of the fastening screw specified by the manufacturer has to be taken into account.

The fastening screws have to be processed with suitable drill driver (e.g. cordless drill driver with depth stop).

The fastening screws have to be fixed rectangular to the surface of the component.

Component I and component II have to be in direct contact to each other. The use of compression resistant thermal insulation strips up to a thickness of 3 mm is allowed.

Design and installation	Annex 2
Fastening screws for sandwich panels	

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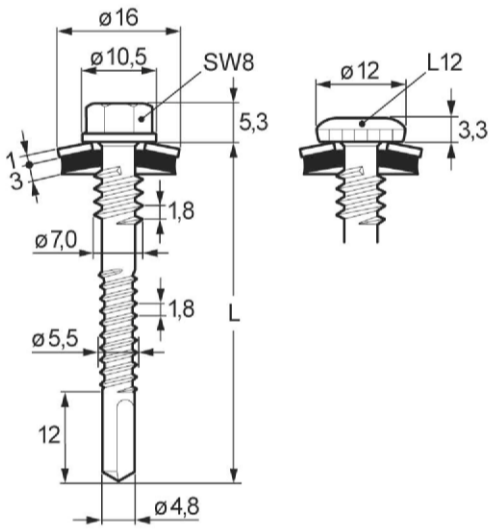


Materials

Fastener:	Stainless steel A2 or A4 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346 HX300LAD to HX460LAD - EN 10346

Drilling-capacity $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 6.00$ mm

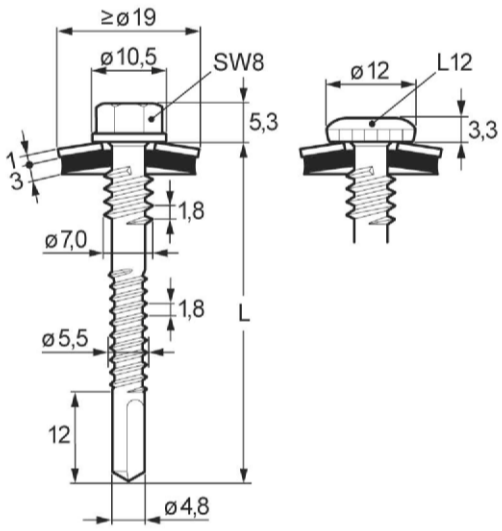
		t_{II} [mm]						
		1.25	1.50	1.75	2.00	2.50	3.00	4.00
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	0.96	0.96	0.96	0.96	0.96	0.96	0.96
	0.45	1.26	1.26	1.26	1.26	1.26	1.26	1.26
	0.50	1.56	1.56	1.56	1.56	1.56	1.56	1.56
	0.55	1.67	1.67	1.67	1.67	1.67	1.67	1.67
	0.60	1.78	1.78	1.78	1.78	1.78	1.78	1.78
	0.63	1.85	1.85	1.85	1.85	1.85	1.85	1.85
	0.70	2.00	2.00	2.00	2.00	2.00	2.00	2.00
	≥ 0.75	2.11	2.11	2.11	2.11	2.11	2.11	2.11
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	1.26	1.27	1.27	1.27	1.27	1.27	1.27
	0.45	1.26	1.42	1.42	1.42	1.42	1.42	1.42
	0.50	1.26	1.56	1.56	1.56	1.56	1.56	1.56
	0.55	1.26	1.82	1.86	1.86	1.86	1.86	1.86
	0.60	1.26	1.82	2.16	2.16	2.16	2.16	2.16
	0.63	1.26	1.82	2.34	2.34	2.34	2.34	2.34
	0.70	1.26	1.82	2.41	2.76	2.76	2.76	2.76
	≥ 0.75	1.26	1.82	2.41	3.00	3.06	3.06	3.06
$N_{R,II,k}$ [kN]		1.26	1.82	2.41	3.00	4.31	5.61	10.77
u [mm] t_I [mm]	40	3.0						
	60	4.5						
	80	6.0						
	≥ 100	7.5						

Additional definitions

Self-drilling screw with sealing washer Ø 16 mm

SXC5-S16-5,5 x L, SXC5-L12-S16-5,5 x L

Annex 3



Materials

Fastener:	Stainless steel A2 or A4 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346 HX300LAD to HX460LAD - EN 10346

Drilling-capacity $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 6.00$ mm

		t_{II} [mm]						
		1.25	1.50	1.75	2.00	2.50	3.00	4.00
$V_{R,k}$ [kN] / t_{N2} [mm]	0.40	0.96	0.96	0.96	0.96	0.96	0.96	0.96
	0.45	1.26	1.26	1.26	1.26	1.26	1.26	1.26
	0.50	1.56	1.56	1.56	1.56	1.56	1.56	1.56
	0.55	1.67	1.67	1.67	1.67	1.67	1.67	1.67
	0.60	1.78	1.78	1.78	1.78	1.78	1.78	1.78
	0.63	1.85	1.85	1.85	1.85	1.85	1.85	1.85
	0.70	2.00	2.00	2.00	2.00	2.00	2.00	2.00
	≥ 0.75	2.11	2.11	2.11	2.11	2.11	2.11	2.11
$N_{R,k}$ [kN] / t_{N1} [mm]	0.40	1.26	1.56	1.56	1.56	1.56	1.56	1.56
	0.45	1.26	1.77	1.77	1.77	1.77	1.77	1.77
	0.50	1.26	1.82	1.98	1.98	1.98	1.98	1.98
	0.55	1.26	1.82	2.35	2.35	2.35	2.35	2.35
	0.60	1.26	1.82	2.41	2.72	2.72	2.72	2.72
	0.63	1.26	1.82	2.41	2.95	2.95	2.95	2.95
	0.70	1.26	1.82	2.41	3.00	3.47	3.47	3.47
	≥ 0.75	1.26	1.82	2.41	3.00	3.85	3.85	3.85
$N_{R,II,k}$ [kN]		1.26	1.82	2.41	3.00	4.31	5.61	10.77
u [mm] / t_I [mm]	40	3.0						
	60	4.5						
	80	6.0						
	≥ 100	7.5						

Additional definitions

Self-drilling screw with sealing washer ≥ Ø 19 mm

SXC5-S19-5,5 x L, SXC5-L12-S19-5,5 x L

Annex 4

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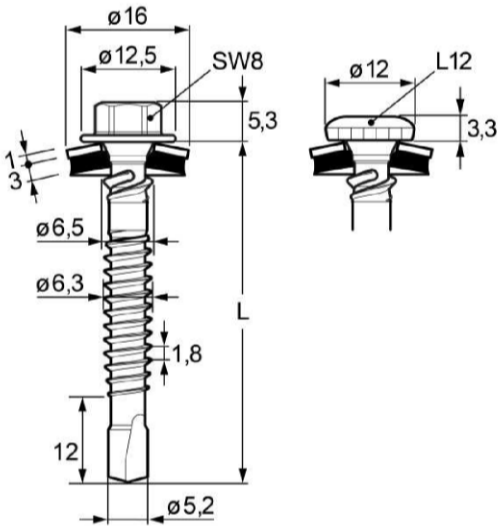

Materials

Fastener:	Stainless steel A2 or A4 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346 HX300LAD to HX460LAD - EN 10346

Drilling-capacity $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 6.00$ mm

		t_{II} [mm]						
		1.00	1.25	1.50	2.00	2.50	3.00	4.00
$V_{R,k}$ [kN] / t_{N2} [mm]	0.40	1.18	1.18	1.18	1.18	1.18	1.18	1.18
	0.45	1.32	1.32	1.32	1.32	1.32	1.32	1.32
	0.50	1.46	1.46	1.46	1.46	1.46	1.46	1.46
	0.55	1.69	1.69	1.69	1.69	1.69	1.69	1.69
	0.60	1.91	1.91	1.91	1.91	1.91	1.91	1.91
	0.63	2.05	2.05	2.05	2.05	2.05	2.05	2.05
	0.70	2.32	2.32	2.32	2.32	2.32	2.32	2.32
	≥ 0.75	2.51	2.51	2.51	2.51	2.51	2.51	2.51
$N_{R,k}$ [kN] / t_{N1} [mm]	0.40	1.46	1.73	1.73	1.73	1.73	1.73	1.73
	0.45	1.46	1.92	1.92	1.92	1.92	1.92	1.92
	0.50	1.46	2.11	2.11	2.11	2.11	2.11	2.11
	0.55	1.46	2.15	2.58	2.58	2.58	2.58	2.58
	0.60	1.46	2.15	2.84	3.04	3.04	3.04	3.04
	0.63	1.46	2.15	2.84	3.32	3.32	3.32	3.32
	0.70	1.46	2.15	2.84	3.82	3.82	3.82	3.82
	≥ 0.75	1.46	2.15	2.84	4.09	4.17	4.17	4.17
$N_{R,II,k}$ [kN]		1.46	2.15	2.84	4.09	6.00	7.91	9.45
u [mm] / t_I [mm]	40	3.0						
	60	4.5						
	80	6.0						
	≥ 100	7.5						

Additional definitions

Self-drilling screw with sealing washer Ø 16 mm

SXC5-S16-6,3 x L, SXC5-L12-S16-6,3 x L

Annex 5

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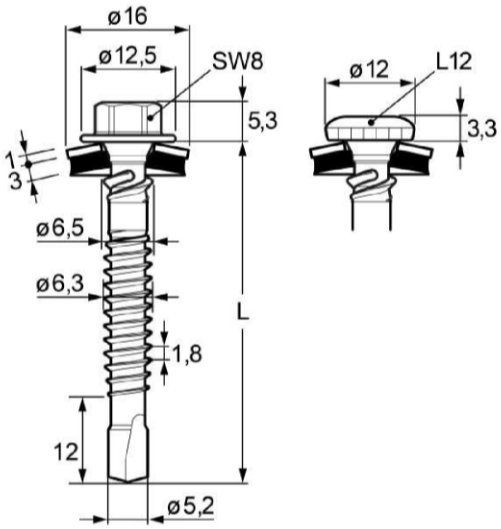


Materials

Fastener:	Stainless steel A2 or A4 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346 HX300LAD to HX460LAD - EN 10346

Drilling-capacity $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 6.00$ mm

		t_{II} [mm]					
		2x0.75	2x0.88	2x1.00	2x1.25	2x1.50	2x2.00
$V_{R,k}$ [kN] / t_{N2} [mm]	0.40	0.94	0.94	0.94	0.94	0.94	0.94
	0.45	1.13	1.13	1.13	1.13	1.13	1.13
	0.50	1.32	1.32	1.32	1.32	1.32	1.32
	0.55	1.33	1.33	1.33	1.33	1.33	1.33
	0.60	1.34	1.34	1.34	1.34	1.34	1.34
	0.63	1.35	1.35	1.35	1.35	1.35	1.35
	0.70	2.20	2.20	2.20	2.20	2.20	2.20
	≥ 0.75	2.80	2.80	2.80	2.80	2.80	2.80
$N_{R,k}$ [kN] / t_{N1} [mm]	0.40	1.73	1.73	1.73	1.73	1.73	1.73
	0.45	1.92	1.92	1.92	1.92	1.92	1.92
	0.50	1.92	2.11	2.11	2.11	2.11	2.11
	0.55	1.92	2.58	2.58	2.58	2.58	2.58
	0.60	1.92	2.59	2.99	3.04	3.04	3.04
	0.63	1.92	2.59	2.99	3.32	3.32	3.32
	0.70	1.92	2.59	2.99	3.82	3.82	3.82
	≥ 0.75	1.92	2.59	2.99	3.92	4.17	4.17
$N_{R,II,k}$ [kN]		1.92	2.59	2.99	3.92	5.60	5.60
u [mm] / t_I [mm]	40	3.0					
	60	4.5					
	80	6.0					
	≥ 100	7.5					

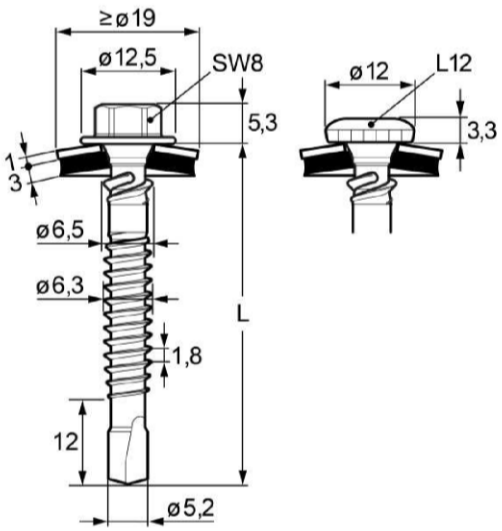
Additional definitions

Self-drilling screw with sealing washer Ø 16 mm

SXC5-S16-6,3 x L, SXC5-L12-S16-6,3 x L

Annex 6

Deutsches Institut für Bautechnik DIBt



Materials

Fastener:	Stainless steel A2 or A4 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346 HX300LAD to HX460LAD - EN 10346

Drilling-capacity $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 6.00$ mm

		t_{II} [mm]						
		1.00	1.25	1.50	2.00	2.50	3.00	4.00
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	1.18	1.18	1.18	1.18	1.18	1.18	1.18
	0.45	1.32	1.32	1.32	1.32	1.32	1.32	1.32
	0.50	1.46	1.46	1.46	1.46	1.46	1.46	1.46
	0.55	1.69	1.69	1.69	1.69	1.69	1.69	1.69
	0.60	1.91	1.91	1.91	1.91	1.91	1.91	1.91
	0.63	2.05	2.05	2.05	2.05	2.05	2.05	2.05
	0.70	2.32	2.32	2.32	2.32	2.32	2.32	2.32
	≥ 0.75	2.51	2.51	2.51	2.51	2.51	2.51	2.51
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	1,46	2.08	2.08	2.08	2.08	2.08	2.08
	0.45	1.46	2.08	2.08	2.08	2.08	2.08	2.08
	0.50	1.46	2.08	2.08	2.08	2.08	2.08	2.08
	0.55	1.46	2.15	2.53	2.53	2.53	2.53	2.53
	0.60	1.46	2.15	2.84	2.97	2.97	2.97	2.97
	0.63	1.46	2.15	2.84	3.24	3.24	3.24	3.24
	0.70	1.46	2.15	2.84	3.99	3.99	3.99	3.99
	≥ 0.75	1.46	2.15	2.84	4.09	4.53	4.53	4.53
$N_{R,II,k}$ [kN]		1.46	2.15	2.84	4.09	6.00	7.91	9.45
u [mm] t_I [mm]	40	3.0						
	60	4.5						
	80	6.0						
	≥ 100	7.5						

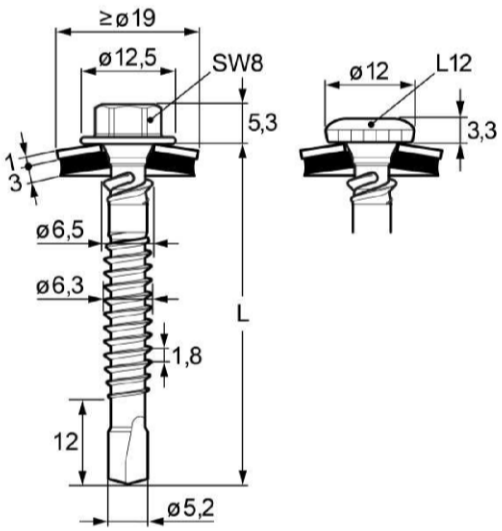
Additional definitions

Self-drilling screw with sealing washer ≥ Ø 19 mm

SXC5-S19-6,3 x L, SXC5-L12-S19-6,3 x L

Annex 7

Deutsches Institut für Bautechnik DIBt



Materials

Fastener:	Stainless steel A2 or A4 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346 HX300LAD to HX460LAD - EN 10346

Drilling-capacity $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 6.00$ mm

		t_{II} [mm]					
		2x0.75	2x0.88	2x1.00	2x1.25	2x1.50	2x2.00
$V_{R,k}$ [kN] / t_{N2} [mm]	0.40	0.94	0.94	0.94	0.94	0.94	0.94
	0.45	1.13	1.13	1.13	1.13	1.13	1.13
	0.50	1.32	1.32	1.32	1.32	1.32	1.32
	0.55	1.33	1.33	1.33	1.33	1.33	1.33
	0.60	1.34	1.34	1.34	1.34	1.34	1.34
	0.63	1.35	1.35	1.35	1.35	1.35	1.35
	0.70	2.20	2.20	2.20	2.20	2.20	2.20
	≥ 0.75	2.80	2.80	2.80	2.80	2.80	2.80
$N_{R,k}$ [kN] / t_{N1} [mm]	0.40	1.92	2.08	2.08	2.08	2.08	2.08
	0.45	1.92	2.08	2.08	2.08	2.08	2.08
	0.50	1.92	2.08	2.08	2.08	2.08	2.08
	0.55	1.92	2.53	2.53	2.53	2.53	2.53
	0.60	1.92	2.59	2.97	2.97	2.97	2.97
	0.63	1.92	2.59	2.99	3.24	3.24	3.24
	0.70	1.92	2.59	2.99	3.92	3.99	3.99
	≥ 0.75	1.92	2.59	2.99	3.92	4.53	4.53
$N_{R,II,k}$ [kN]		1.92	2.59	2.99	3.92	5.60	5.60
u [mm] / t_I [mm]	40	3.0					
	60	4.5					
	80	6.0					
	≥ 100	7.5					

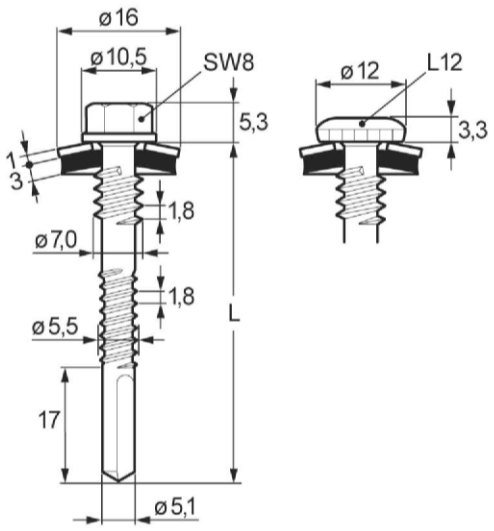
Additional definitions

Self-drilling screw with sealing washer ≥ Ø 19 mm

SXC5-S19-6,3 x L, SXC5-L12-S19-6,3 x L

Annex 8

Deutsches Institut für Bautechnik DIBt



Materials

Fastener:	Stainless steel A2 or A4 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346 HX300LAD to HX460LAD - EN 10346

Drilling-capacity $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 14.00$ mm

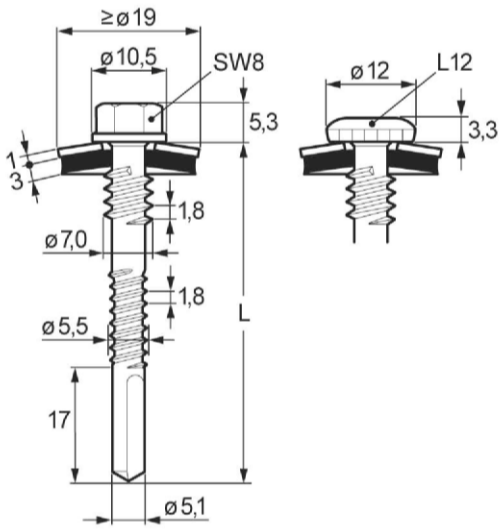
		t_{II} [mm]					
		4.00	5.00	6.00	8.00	10.00	12.00
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	0.74	0.74	0.74	0.74	0.74	0.74
	0.45	0.95	0.95	0.95	0.95	0.95	0.95
	0.50	1.16	1.16	1.16	1.16	1.16	1.16
	0.55	1.36	1.36	1.36	1.36	1.36	1.36
	0.60	1.56	1.56	1.56	1.56	1.56	1.56
	0.63	1.69	1.69	1.69	1.69	1.69	1.69
	0.70	1.97	1.97	1.97	1.97	1.97	1.97
	≥ 0.75	2.17	2.17	2.17	2.17	2.17	2.17
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	1.39	1.39	1.39	1.39	1.39	1.39
	0.45	1.53	1.53	1.53	1.53	1.53	1.53
	0.50	1.66	1.66	1.66	1.66	1.66	1.66
	0.55	2.02	2.02	2.02	2.02	2.02	2.02
	0.60	2.37	2.37	2.37	2.37	2.37	2.37
	0.63	2.59	2.59	2.59	2.59	2.59	2.59
	0.70	3.09	3.09	3.09	3.09	3.09	3.09
	≥ 0.75	3.45	3.45	3.45	3.45	3.45	3.45
$N_{R,II,k}$ [kN]		4.97	6.41	7.84	10.71	10.71	10.71
u [mm] t_I [mm]	40	3.0					
	60	4.5					
	80	6.0					
	≥ 100	7.5					

Additional definitions

Self-drilling screw with sealing washer Ø 16 mm

SXC14-S16-5,5 x L, SXC14-L12-S16-5,5 x L

Annex 9



Materials

Fastener:	Stainless steel A2 or A4 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346 HX300LAD to HX460LAD - EN 10346

Drilling-capacity $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 14.00$ mm

		t_{II} [mm]					
		4.00	5.00	6.00	8.00	10.00	12.00
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	0.74	0.74	0.74	0.74	0.74	0.74
	0.45	0.95	0.95	0.95	0.95	0.95	0.95
	0.50	1.16	1.16	1.16	1.16	1.16	1.16
	0.55	1.36	1.36	1.36	1.36	1.36	1.36
	0.60	1.56	1.56	1.56	1.56	1.56	1.56
	0.63	1.69	1.69	1.69	1.69	1.69	1.69
	0.70	1.97	1.97	1.97	1.97	1.97	1.97
	≥ 0.75	2.17	2.17	2.17	2.17	2.17	2.17
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	1.73	1.73	1.73	1.73	1.73	1.73
	0.45	1.83	1.83	1.83	1.83	1.83	1.83
	0.50	1.92	1.92	1.92	1.92	1.92	1.92
	0.55	2.27	2.27	2.27	2.27	2.27	2.27
	0.60	2.61	2.61	2.61	2.61	2.61	2.61
	0.63	2.82	2.82	2.82	2.82	2.82	2.82
	0.70	3.30	3.30	3.30	3.30	3.30	3.30
	≥ 0.75	3.65	3.65	3.65	3.65	3.65	3.65
$N_{R,II,k}$ [kN]		4.97	6.41	7.84	10.71	10.71	10.71
u [mm] t_I [mm]	40	3.0					
	60	4.5					
	80	6.0					
	≥ 100	7.5					

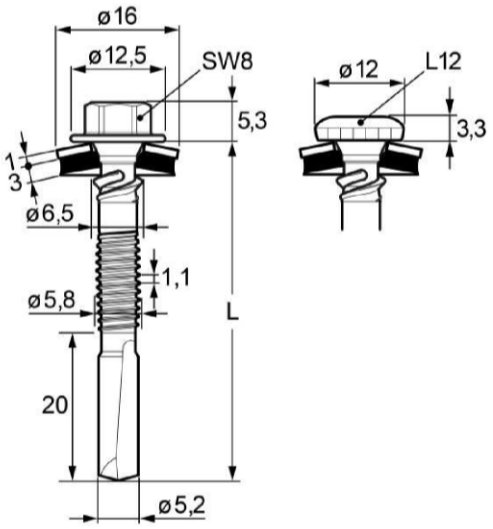
Additional definitions

Self-drilling screw with sealing washer ≥ Ø 19 mm

SXC14-S19-5,5 x L, SXC14-L12-S19-5,5 x L

Annex 10

Deutsches Institut für Bautechnik DIBt



Materials

Fastener:	Stainless steel A2 or A4 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346 HX300LAD to HX460LAD - EN 10346

Drilling-capacity $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 16.00$ mm

		t_{II} [mm]						
		3.00	4.00	6.00	8.00	10.00	12.00	14.00
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	1.18	1.18	1.18	1.18	1.18	1.18	1.18
	0.45	1.32	1.32	1.32	1.32	1.32	1.32	1.32
	0.50	1.46	1.46	1.46	1.46	1.46	1.46	1.46
	0.55	1.69	1.69	1.69	1.69	1.69	1.69	1.69
	0.60	1.91	1.91	1.91	1.91	1.91	1.91	1.91
	0.63	2.05	2.05	2.05	2.05	2.05	2.05	2.05
	0.70	2.32	2.32	2.32	2.32	2.32	2.32	2.32
	≥ 0.75	2.51	2.51	2.51	2.51	2.51	2.51	2.51
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	1.73	1.73	1.73	1.73	1.73	1.73	1.73
	0.45	1.92	1.92	1.92	1.92	1.92	1.92	1.92
	0.50	2.11	2.11	2.11	2.11	2.11	2.11	2.11
	0.55	2.58	2.58	2.58	2.58	2.58	2.58	2.58
	0.60	3.04	3.04	3.04	3.04	3.04	3.04	3.04
	0.63	3.32	3.32	3.32	3.32	3.32	3.32	3.32
	0.70	3.82	3.82	3.82	3.82	3.82	3.82	3.82
	≥ 0.75	4.17	4.17	4.17	4.17	4.17	4.17	4.17
$N_{R,II,k}$ [kN]		6.76	7.01	9.60	11.01	11.01	11.01	11.01
u [mm] t_I [mm]	40	3.0						
	60	4.5						
	80	6.0						
	≥ 100	7.5						

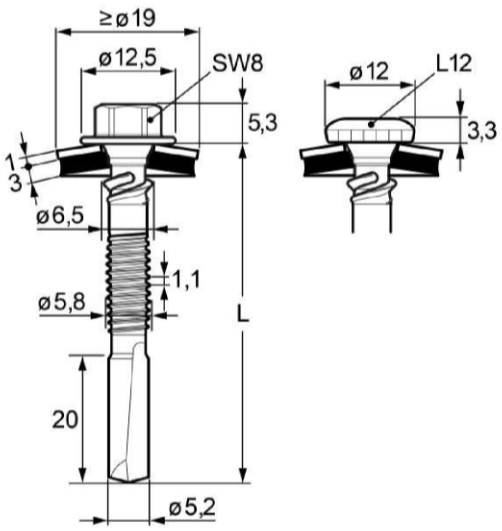
Additional definitions

Self-drilling screw with sealing washer Ø 16 mm

SXC16-S16-5,8 x L, SXC16-L12-S16-5,8 x L

Annex 11

Deutsches Institut für Bautechnik DIBt



Materials

Fastener:	Stainless steel A2 or A4 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346 HX300LAD to HX460LAD - EN 10346

Drilling-capacity $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 16.00$ mm

		t_{II} [mm]						
		3.00	4.00	6.00	8.00	10.00	12.00	14.00
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	1.18	1.18	1.18	1.18	1.18	1.18	1.18
	0.45	1.32	1.32	1.32	1.32	1.32	1.32	1.32
	0.50	1.46	1.46	1.46	1.46	1.46	1.46	1.46
	0.55	1.69	1.69	1.69	1.69	1.69	1.69	1.69
	0.60	1.91	1.91	1.91	1.91	1.91	1.91	1.91
	0.63	2.05	2.05	2.05	2.05	2.05	2.05	2.05
	0.70	2.32	2.32	2.32	2.32	2.32	2.32	2.32
	≥ 0.75	2.51	2.51	2.51	2.51	2.51	2.51	2.51
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	2.08	2.08	2.08	2.08	2.08	2.08	2.08
	0.45	2.08	2.08	2.08	2.08	2.08	2.08	2.08
	0.50	2,08	2,08	2,08	2,08	2,08	2,08	2,08
	0.55	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.60	2.97	2.97	2.97	2.97	2.97	2.97	2.97
	0.63	3.24	3.24	3.24	3.24	3.24	3.24	3.24
	0.70	3.99	3.99	3.99	3.99	3.99	3.99	3.99
	≥ 0.75	4.53	4.53	4.53	4.53	4.53	4.53	4.53
$N_{R,II,k}$ [kN]		6.76	7.01	9.60	11.01	11.01	11.01	11.01
u [mm] t_I [mm]	40	3.0						
	60	4.5						
	80	6.0						
	≥ 100	7.5						

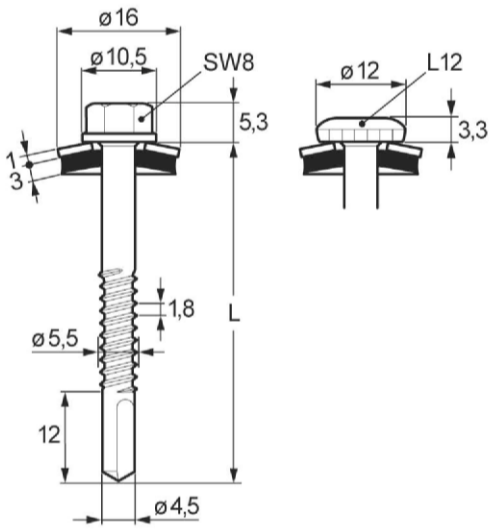
Additional definitions

Self-drilling screw with sealing washer ≥ Ø 19 mm

SXC16-S19-5,8 x L, SXC16-L12-S19-5,8 x L

Annex 12

Deutsches Institut für Bautechnik DIBt



Materials

Fastener:	Stainless steel A2 or A4 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346 HX300LAD to HX460LAD - EN 10346

Drilling-capacity $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 6.00$ mm

		t_{II} [mm]					
		1.50	1.75	2.00	2.50	3.00	4.00
$V_{R,k}$ [kN] / t_{N2} [mm]	0.40	0.81[a]	0.81[a]	0.81[a]	0.81[a]	0.81[a]	0.81[a]
	0.45	0.98[a]	0.98[a]	0.98[a]	0.98[a]	0.98[a]	0.98[a]
	0.50	1.14[a]	1.14[a]	1.14[a]	1.14[a]	1.14[a]	1.14[a]
	0.55	1.29[a]	1.31[a]	1.32[a]	1.35[a]	1.38[a]	1.38[a]
	0.60	1.44[a]	1.47[a]	1.50[a]	1.56[a]	1.63[a]	1.63[a]
	0.63	1.53[a]	1.57[a]	1.61[a]	1.69[a]	1.77[a]	1.77[a]
	0.70	1.74[a]	1.80[a]	1.87[a]	1.99[a]	2.11[a]	2.11[a]
	≥ 0.75	1.89[a]	1.97[a]	2.05[a]	2.20[a]	2.36[a]	2.36[a]
$N_{R,k}$ [kN] / t_{N1} [mm]	0.40	1.15[a]	1.15[a]	1.15[a]	1.15[a]	1.15[a]	1.15[a]
	0.45	1.34[a]	1.34[a]	1.34[a]	1.34[a]	1.34[a]	1.34[a]
	0.50	1.52[a]	1.52[a]	1.52[a]	1.52[a]	1.52[a]	1.52[a]
	0.55	1.88	1.91[a]	1.91[a]	1.91[a]	1.91[a]	1.91[a]
	0.60	1.88	2.31	2.31[a]	2.31[a]	2.31[a]	2.31[a]
	0.63	1.88	2.38	2.55[a]	2.55[a]	2.55[a]	2.55[a]
	0.70	1.88	2.38	2.87	3.10[a]	3.10[a]	3.10[a]
	≥ 0.75	1.88	2.38	2.87	3.50[a]	3.50[a]	3.50[a]
$N_{R,II,k}$ [kN]		1.88	2.38	2.87	4.34	5.81	7.28
u [mm] / t_I [mm]	40	3.0					
	60	4.5					
	80	6.0					
	≥ 100	7.5					

Additional definitions

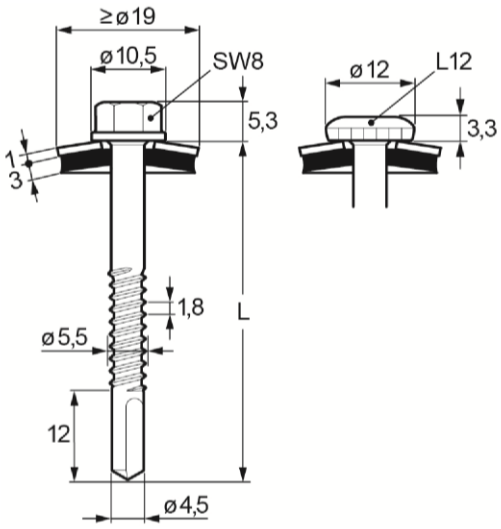
Index [a]: For component I made of S320GD to S450GD the resistance value may be increased by 8.3%.

Self-drilling screw with sealing washer Ø 16 mm

SX5-S16-5,5 x L, SX5-L12-S16-5,5 x L

Annex 13

Deutsches Institut für Bautechnik DIBt



Materials

Fastener:	Stainless steel A2 or A4 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346 HX300LAD to HX460LAD - EN 10346

Drilling-capacity $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 6.00$ mm

		t_{II} [mm]					
		1.50	1.75	2.00	2.50	3.00	4.00
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	0.81[a]	0.81[a]	0.81[a]	0.81[a]	0.81[a]	0.81[a]
	0.45	0.98[a]	0.98[a]	0.98[a]	0.98[a]	0.98[a]	0.98[a]
	0.50	1.14[a]	1.14[a]	1.14[a]	1.14[a]	1.14[a]	1.14[a]
	0.55	1.29[a]	1.31[a]	1.32[a]	1.35[a]	1.38[a]	1.38[a]
	0.60	1.44[a]	1.47[a]	1.50[a]	1.56[a]	1.63[a]	1.63[a]
	0.63	1.53[a]	1.57[a]	1.61[a]	1.69[a]	1.77[a]	1.77[a]
	0.70	1.74[a]	1.80[a]	1.87[a]	1.99[a]	2.11[a]	2.11[a]
	≥0.75	1.89[a]	1.97[a]	2.05[a]	2.20[a]	2.36[a]	2.36[a]
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	1.43[a]	1.43[a]	1.43[a]	1.43[a]	1.43[a]	1.43[a]
	0.45	1.65[a]	1.65[a]	1.65[a]	1.65[a]	1.65[a]	1.65[a]
	0.50	1.87	1.87[a]	1.87[a]	1.87[a]	1.87[a]	1.87[a]
	0.55	1.88	2.36	2.36[a]	2.36[a]	2.36[a]	2.36[a]
	0.60	1.88	2.38	2.38[a]	2.38[a]	2.38[a]	2.38[a]
	0.63	1.88	2.38	2.87	3.14[a]	3.14[a]	3.14[a]
	0.70	1.88	2.38	2.87	3.82	3.82	3.82
	≥0.75	1.88	2.38	2.87	4.31	4.31	4.31
$N_{R,II,k}$ [kN]		1.88	2.38	2.87	4.34	5.81	7.28
u [mm] t_I [mm]	40	3.0					
	60	4.5					
	80	6.0					
	≥100	7.5					

Additional definitions

Index [a]: For component I made of S320GD to S450GD the resistance value may be increased by 8.3%.

Self-drilling screw with sealing washer ≥ Ø 19 mm

SX5-S19-5,5 x L, SX5-L12-S19-5,5 x L

Annex 14

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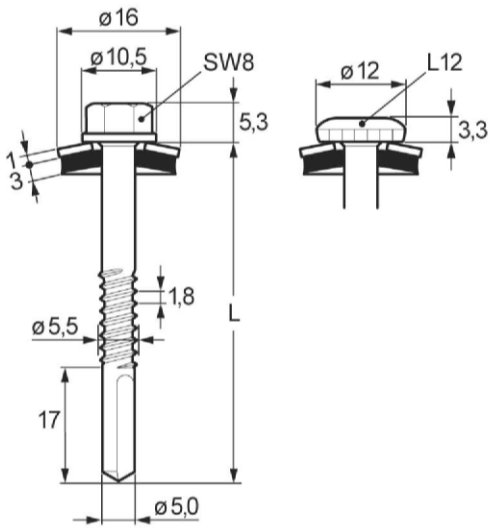


Materials

Fastener:	Stainless steel A2 or A4 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346 HX300LAD to HX460LAD - EN 10346

Drilling-capacity $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 14.00$ mm

		t_{II} [mm]					
		4.00	5.00	6.00	8.00	10.00	12.00
$V_{R,k}$ [kN] / t_{N2} [mm]	0.40	0.86[a]	0.86[a]	0.86[a]	0.86[a]	0.86[a]	0.86[a]
	0.45	1.02[a]	1.02[a]	1.02[a]	1.02[a]	1.02[a]	1.02[a]
	0.50	1.18[a]	1.18[a]	1.18[a]	1.18[a]	1.18[a]	1.18[a]
	0.55	1.32[a]	1.32[a]	1.32[a]	1.32[a]	1.32[a]	1.32[a]
	0.60	1.45[a]	1.45[a]	1.45[a]	1.45[a]	1.45[a]	1.45[a]
	0.63	1.52[a]	1.52[a]	1.52[a]	1.52[a]	1.52[a]	1.52[a]
	0.70	1.91[a]	1.91[a]	1.91[a]	1.91[a]	1.91[a]	1.91[a]
	≥ 0.75	2.18[a]	2.18[a]	2.18[a]	2.18[a]	2.18[a]	2.18[a]
$N_{R,k}$ [kN] / t_{N1} [mm]	0.40	1.16[a]	1.16[a]	1.16[a]	1.16[a]	1.16[a]	1.16[a]
	0.45	1.41[a]	1.41[a]	1.41[a]	1.41[a]	1.41[a]	1.41[a]
	0.50	1.65[a]	1.65[a]	1.65[a]	1.65[a]	1.65[a]	1.65[a]
	0.55	1.96[a]	1.96[a]	1.96[a]	1.96[a]	1.96[a]	1.96[a]
	0.60	2.25[a]	2.25[a]	2.25[a]	2.25[a]	2.25[a]	2.25[a]
	0.63	2.43[a]	2.43[a]	2.43[a]	2.43[a]	2.43[a]	2.43[a]
	0.70	2.89[a]	2.89[a]	2.89[a]	2.89[a]	2.89[a]	2.89[a]
	≥ 0.75	3.21[a]	3.21[a]	3.21[a]	3.21[a]	3.21[a]	3.21[a]
$N_{R,II,k}$ [kN]		4.97	6.41	7.84	10.71	10.71	10.71
u [mm] / t_I [mm]	40	3.0					
	60	4.5					
	80	6.0					
	≥ 100	7.5					

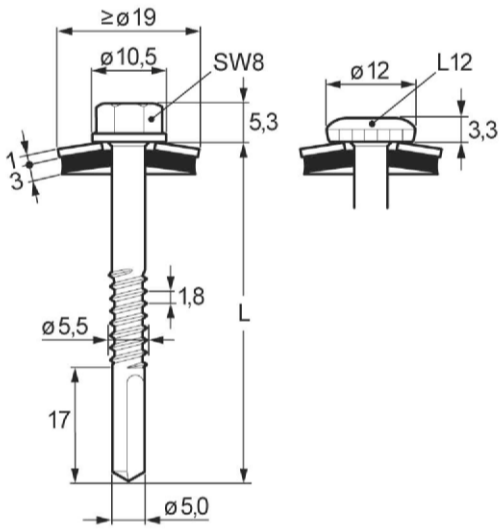
Additional definitions

Index [a]: For component I made of S320GD to S450GD the resistance value may be increased by 8.3%.

Self-drilling screw with sealing washer Ø 16 mm

SX14-S16-5,5 x L, SX14-L12-S16-5,5 x L

Annex 15



Materials

Fastener:	Stainless steel A2 or A4 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346 HX300LAD to HX460LAD - EN 10346

Drilling-capacity $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 14.00$ mm

		t_{II} [mm]					
		4.00	5.00	6.00	8.00	10.00	12.00
$V_{R,k}$ [kN] / t_{N2} [mm]	0.40	0.86[a]	0.86[a]	0.86[a]	0.86[a]	0.86[a]	0.86[a]
	0.45	1.02[a]	1.02[a]	1.02[a]	1.02[a]	1.02[a]	1.02[a]
	0.50	1.18[a]	1.18[a]	1.18[a]	1.18[a]	1.18[a]	1.18[a]
	0.55	1.32[a]	1.32[a]	1.32[a]	1.32[a]	1.32[a]	1.32[a]
	0.60	1.45[a]	1.45[a]	1.45[a]	1.45[a]	1.45[a]	1.45[a]
	0.63	1.52[a]	1.52[a]	1.52[a]	1.52[a]	1.52[a]	1.52[a]
	0.70	1.91[a]	1.91[a]	1.91[a]	1.91[a]	1.91[a]	1.91[a]
	≥ 0.75	2.18[a]	2.18[a]	2.18[a]	2.18[a]	2.18[a]	2.18[a]
$N_{R,k}$ [kN] / t_{N1} [mm]	0.40	1.24[a]	1.24[a]	1.24[a]	1.24[a]	1.24[a]	1.24[a]
	0.45	1.64[a]	1.64[a]	1.64[a]	1.64[a]	1.64[a]	1.64[a]
	0.50	2.04[a]	2.04[a]	2.04[a]	2.04[a]	2.04[a]	2.04[a]
	0.55	2.34[a]	2.34[a]	2.34[a]	2.34[a]	2.34[a]	2.34[a]
	0.60	2.64[a]	2.64[a]	2.64[a]	2.64[a]	2.64[a]	2.64[a]
	0.63	2.82[a]	2.82[a]	2.82[a]	2.82[a]	2.82[a]	2.82[a]
	0.70	3.23[a]	3.23[a]	3.23[a]	3.23[a]	3.23[a]	3.23[a]
	≥ 0.75	3.52[a]	3.52[a]	3.52[a]	3.52[a]	3.52[a]	3.52[a]
$N_{R,II,k}$ [kN]		4.97	6.41	7.84	10.71	10.71	10.71
u [mm] / t_I [mm]	40	3.0					
	60	4.5					
	80	6.0					
	≥ 100	7.5					

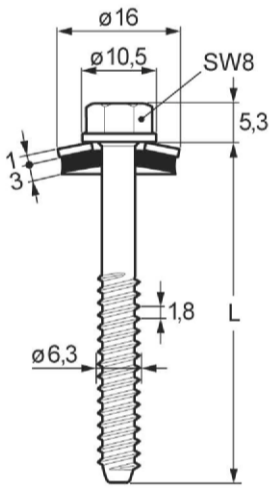
Additional definitions

Index [a]: For component I made of S320GD to S450GD the resistance value may be increased by 8.3%.

Self-drilling screw with sealing washer ≥ Ø 19 mm

SX14-S19-5,5 x L, SX14-L12-S19-5,5 x L

Annex 16



Materials

Fastener:	Stainless steel A2, A4 or 1.4547 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346 HX300LAD to HX460LAD - EN 10346

Drilling-capacity -

		t_{II} [mm]								
		1.50	2.00	2.50	3.00	4.00	6.00	8.00	10.00	> 10.00[a]
d_{pd} [mm][b]		5.00	5.30				5.50	5.70		5.80
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
	0.45	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
	0.50	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
	0.55	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37
	0.60	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66
	0.63	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84
	0.70	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25
	≥ 0.75	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68
	0.45	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85
	0.50	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01
	0.55	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39
	0.60	2.57	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.63	2.57	3.01	3.01	3.01	3.01	3.01	3.01	3.01	3.01
	0.70	2.57	3.44	3.55	3.55	3.55	3.55	3.55	3.55	3.55
	≥ 0.75	2.57	3.44	3.93	3.93	3.93	3.93	3.93	3.93	3.93
$N_{R,II,k}$ [kN]		2.57	3.44	4.96	6.48	9.19	12.22	15.24	15.24	15.24
u [mm] t_I [mm]	40	3.0								
	60	4.5								
	80	6.0								
	≥ 100	7.5								

Additional definitions

Index [a]: Only valid for component II made of S235, S280GD or HX300LAD.

Index [b]: The pre-drill diameter d_{pd} for not indicated thicknesses t_{II} is defined as follows:
d_{pd} = 5.3 mm for t_{II} = 1.6 - 4.0 mm, d_{pd} = 5.5 mm for t_{II} = 4.1 - 6.0 mm, d_{pd} = 5.7 mm for t_{II} = 6.1 - 10.0 mm

Self-tapping screw with sealing washer Ø 16 mm

TDB-S-S16-6,3 x L

Annex 17

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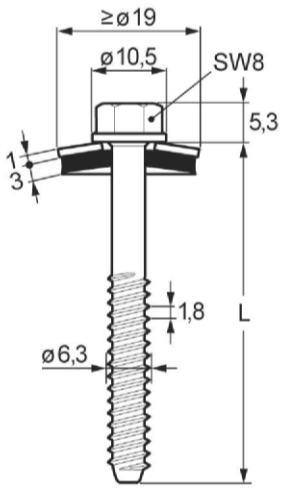


Materials

Fastener:	Stainless steel A2, A4 or 1.4547 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346 HX300LAD to HX460LAD - EN 10346

Drilling-capacity -

		t_{II} [mm]								
		1.50	2.00	2.50	3.00	4.00	6.00	8.00	10.00	> 10.00[a]
d_{pd} [mm][b]		5.00	5.30				5.50	5.70		5.80
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
	0.45	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
	0.50	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
	0.55	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37
	0.60	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66
	0.63	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84
	0.70	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25
	≥ 0.75	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75
	0.45	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
	0.50	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25
	0.55	2.57	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72
	0.60	2.57	3.19	3.19	3.19	3.19	3.19	3.19	3.19	3.19
	0.63	2.57	3.44	3.48	3.48	3.48	3.48	3.48	3.48	3.48
	0.70	2.57	3.44	4.13	4.13	4.13	4.13	4.13	4.13	4.13
	≥ 0.75	2.57	3.44	4.61	4.61	4.61	4.61	4.61	4.61	4.61
$N_{R,II,k}$ [kN]		2.57	3.44	4.96	6.48	9.19	12.22	15.24	15.24	15.24
u [mm] t_I [mm]	40	3.0								
	60	4.5								
	80	6.0								
	≥ 100	7.5								

Additional definitions

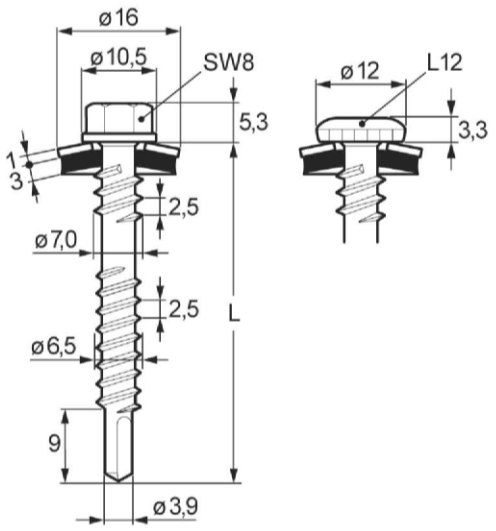
Index [a]: Only valid for component II made of S235, S280GD or HX300LAD.

Index [b]: The pre-drill diameter d_{pd} for not indicated thicknesses t_{II} is defined as follows:
d_{pd} = 5.3 mm for t_{II} = 1.6 - 4.0 mm, d_{pd} = 5.5 mm for t_{II} = 4.1 - 6.0 mm, d_{pd} = 5.7 mm for t_{II} = 6.1 - 10.0 mm

Self-tapping screw with sealing washer ≥ Ø 19 mm

TDB-S-S19-6,3 x L

Annex 18



Materials

Fastener:	Stainless steel A2 or A4 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	Timber (coniferous timber) - EN 14081

Drilling-capacity $\Sigma(t_{N1} + t_{N2}) \leq 2.00$ mm

Characteristics

$M_{y,Rk}$ = 12.1 Nm

$f_{ax,k}$ = 13.2 N/mm² (l_{ef} = 35 mm, ρ_a = 350 kg/m³)

		l_{ef} [mm] 35	45	55	65	75		
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	0.81	0.81	0.81	0.81	0.81	0.81	$V_{R,I,k}$ [kN]
	0.45	0.98	0.98	0.98	0.98	0.98	0.98	
	0.50	1.15	1.15	1.15	1.15	1.15	1.15	
	0.55	1.24	1.24	1.24	1.24	1.24	1.24	
	0.60	1.33	1.33	1.33	1.33	1.33	1.33	
	0.63	1.39	1.39	1.39	1.39	1.39	1.39	
	0.70	1.51	1.51	1.51	1.51	1.51	1.51	
	≥ 0.75	1.61	1.61	1.61	1.61	1.61	1.61	
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	1.56	1.56	1.56	1.56	1.56	1.56	$N_{R,I,k}$ [kN]
	0.45	1.61	1.61	1.61	1.61	1.61	1.61	
	0.50	1.66	1.66	1.66	1.66	1.66	1.66	
	0.55	1.96	1.96	1.96	1.96	1.96	1.96	
	0.60	2.26	2.26	2.26	2.26	2.26	2.26	
	0.63	2.45	2.45	2.45	2.45	2.45	2.45	
	0.70	2.70	2.87	2.87	2.87	2.87	2.87	
	≥ 0.75	2.70	3.18	3.18	3.18	3.18	3.18	
$N_{R,II,k}$ [kN]		2.70	3.47	4.25	5.02	5.79		
u [mm] t_I [mm]	40	3.0						
	60	4.5						
	80	6.0						
	≥ 100	7.5						

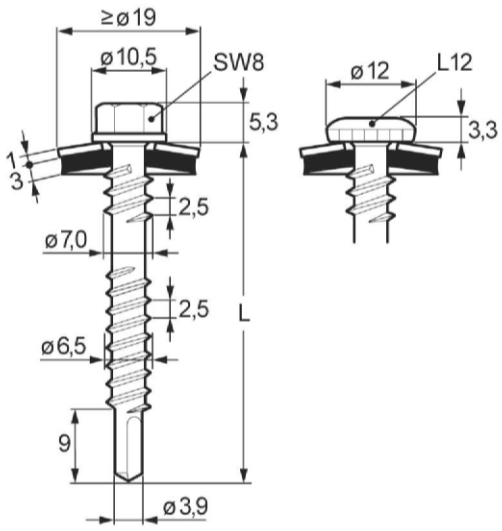
Additional definitions

The indicated resistance values $N_{R,k}$ (and $N_{R,II,k}$) applies to component II with k_{mod} = 0.9 and ρ_k = 350 kg/m³. $N_{R,k}$ for other k_{mod} or ρ_k can be determined as follows: $N_{R,k}(k_{mod}, \rho_k) = \min \left\{ N_{R,I,k} \mid N_{R,II,k} * \frac{k_{mod}}{0.9} * \frac{\rho_k}{350} \right\}$.

Self-drilling screw with sealing washer Ø 16 mm

SXCW-S16-6,5 x L, SXCW-L12-S16-6,5 x L

Annex 19



Materials

Fastener:	Stainless steel A2 or A4 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	Timber (coniferous timber) - EN 14081

Drilling-capacity $\Sigma(t_{N1} + t_{N2}) \leq 2.00$ mm

Characteristics

$M_{y,Rk}$ = 12.1 Nm

$f_{ax,k}$ = 13.2 N/mm² (l_{ef} = 35 mm, ρ_a = 350 kg/m³)

		l_{ef} [mm] 35	45	55	65	75		
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	0.81	0.81	0.81	0.81	0.81	0.81	$V_{R,I,k}$ [kN]
	0.45	0.98	0.98	0.98	0.98	0.98	0.98	
	0.50	1.15	1.15	1.15	1.15	1.15	1.15	
	0.55	1.24	1.24	1.24	1.24	1.24	1.24	
	0.60	1.33	1.33	1.33	1.33	1.33	1.33	
	0.63	1.39	1.39	1.39	1.39	1.39	1.39	
	0.70	1.51	1.51	1.51	1.51	1.51	1.51	
	≥ 0.75	1.61	1.61	1.61	1.61	1.61	1.61	
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	1.62	1.62	1.62	1.62	1.62	1.62	$N_{R,I,k}$ [kN]
	0.45	1.86	1.86	1.86	1.86	1.86	1.86	
	0.50	2.10	2.10	2.10	2.10	2.10	2.10	
	0.55	2.37	2.37	2.37	2.37	2.37	2.37	
	0.60	2.64	2.64	2.64	2.64	2.64	2.64	
	0.63	2.70	2.81	2.81	2.81	2.81	2.81	
	0.70	2.70	3.18	3.18	3.18	3.18	3.18	
	≥ 0.75	2.70	3.46	3.46	3.46	3.46	3.46	
$N_{R,II,k}$ [kN]		2.70	3.47	4.25	5.02	5.79		
u [mm] t_I [mm]	40	3.0						
	60	4.5						
	80	6.0						
	≥ 100	7.5						

Additional definitions

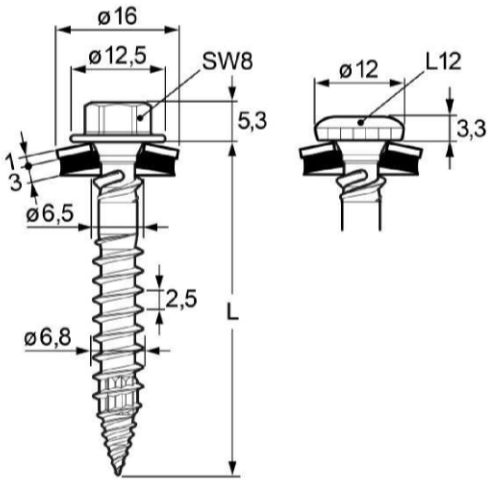
The indicated resistance values $N_{R,k}$ (and $N_{R,II,k}$) applies to component II with k_{mod} = 0.9 and ρ_k = 350 kg/m³. $N_{R,k}$ for other k_{mod} or ρ_k can be determined as follows: $N_{R,k}(k_{mod}, \rho_k) = \min \left\{ N_{R,I,k} \;\middle|\; N_{R,II,k} * \frac{k_{mod}}{0.9} * \frac{\rho_k}{350} \right\}$.

Self-drilling screw with sealing washer ≥ Ø 19 mm

SXCW-S19-6,5 x L, SXCW-L12-S19-6,5 x L

Annex 20

Deutsches Institut für Bautechnik DIBt



Materials

Fastener:	Stainless steel A2 or A4 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	Timber (coniferous timber) - EN 14081

Drilling-capacity $\Sigma(t_{N1} + t_{N2}) \leq 2.00$ mm

Characteristics

$M_{y,Rk}$	=	10.2 Nm
$f_{ax,k}$	=	18.2 N/mm² (l_{ef} = 27 mm, ρ_a = 350 kg/m³)

		l_p [mm] 35	45	55	65	75		
$V_{R,k}$ [kN] / t_{N2} [mm]	0.40	0.92	0.92	0.92	0.92	0.92	0.92	$V_{R,I,k}$ [kN]
	0.45	1.02	1.02	1.02	1.02	1.02	1.02	
	0.50	1.11	1.11	1.11	1.11	1.11	1.11	
	0.55	1.22	1.22	1.22	1.22	1.22	1.22	
	0.60	1.33	1.33	1.33	1.33	1.33	1.33	
	0.63	1.40	1.40	1.40	1.40	1.40	1.40	
	0.70	1.41	1.41	1.41	1.41	1.41	1.41	
	≥ 0.75	1.42	1.42	1.42	1.42	1.42	1.42	
$N_{R,k}$ [kN] / t_{N1} [mm]	0.40	1.73	1.73	1.73	1.73	1.73	1.73	$N_{R,I,k}$ [kN]
	0.45	1.92	1.92	1.92	1.92	1.92	1.92	
	0.50	2.11	2.11	2.11	2.11	2.11	2.11	
	0.55	2.58	2.58	2.58	2.58	2.58	2.58	
	0.60	3.01	3.04	3.04	3.04	3.04	3.04	
	0.63	3.01	3.32	3.32	3.32	3.32	3.32	
	0.70	3.01	3.82	3.82	3.82	3.82	3.82	
	≥ 0.75	3.01	4.12	4.17	4.17	4.17	4.17	
$N_{R,II,k}$ [kN]		3.01	4.12	5.23	6.35	7.46		
u [mm] / t_I [mm]	40	3.0						
	60	4.5						
	80	6.0						
	≥ 100	7.5						

Additional definitions

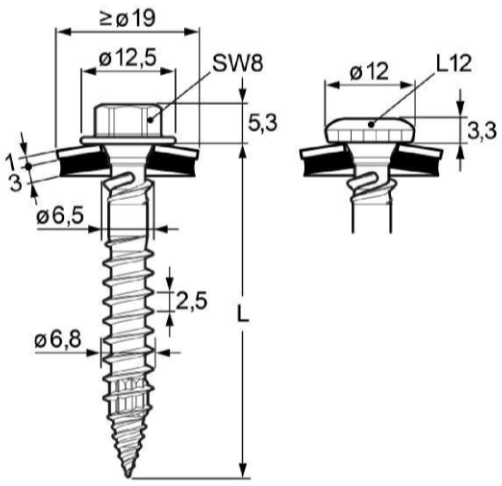
The fastening screw is to be use without pre-drilling of the connection.

The indicated resistance values $N_{R,k}$ (and $N_{R,II,k}$) applies to component II with k_{mod} = 0.9 and ρ_k = 350 kg/m³. $N_{R,k}$ for other k_{mod} or ρ_k can be determined as follows: $N_{R,k}(k_{mod}, \rho_k) = \min \left\{ N_{R,I,k} \mid N_{R,II,k} * \frac{k_{mod}}{0.9} * \frac{\rho_k}{350} \right\}$.

Self-drilling screw with sealing washer Ø 16 mm

CXCW-S16-6,8 x L, CXCW-L12-S16-6,8 x L

Annex 21



Materials

Fastener:	Stainless steel A2 or A4 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	Timber (coniferous timber) - EN 14081

Drilling-capacity $\Sigma(t_{N1} + t_{N2}) \leq 2.00$ mm

Characteristics

$M_{y,Rk}$ = 10.2 Nm

$f_{ax,k}$ = 18.2 N/mm² (l_{ef} = 27 mm, ρ_a = 350 kg/m³)

		l_p [mm] 35	45	55	65	75		
$V_{R,k}$ [kN] / t_{N2} [mm]	0.40	0.92	0.92	0.92	0.92	0.92	0.92	$V_{R,I,k}$ [kN]
	0.45	1.02	1.02	1.02	1.02	1.02	1.02	
	0.50	1.11	1.11	1.11	1.11	1.11	1.11	
	0.55	1.22	1.22	1.22	1.22	1.22	1.22	
	0.60	1.33	1.33	1.33	1.33	1.33	1.33	
	0.63	1.40	1.40	1.40	1.40	1.40	1.40	
	0.70	1.41	1.41	1.41	1.41	1.41	1.41	
	≥ 0.75	1.42	1.42	1.42	1.42	1.42	1.42	
$N_{R,k}$ [kN] / t_{N1} [mm]	0.40	2.08	2.08	2.08	2.08	2.08	2.08	$N_{R,I,k}$ [kN]
	0.45	2.08	2.08	2.08	2.08	2.08	2.08	
	0.50	2.08	2.08	2.08	2.08	2.08	2.08	
	0.55	2.53	2.53	2.53	2.53	2.53	2.53	
	0.60	2.97	2.97	2.97	2.97	2.97	2.97	
	0.63	3.01	3.24	3.24	3.24	3.24	3.24	
	0.70	3.01	3.99	3.99	3.99	3.99	3.99	
	≥ 0.75	3.01	4.12	4.53	4.53	4.53	4.53	
$N_{R,II,k}$ [kN]		3.01	4.12	5.23	6.35	7.46		
u [mm] / t_I [mm]	40	3.0						
	60	4.5						
	80	6.0						
	≥ 100	7.5						

Additional definitions

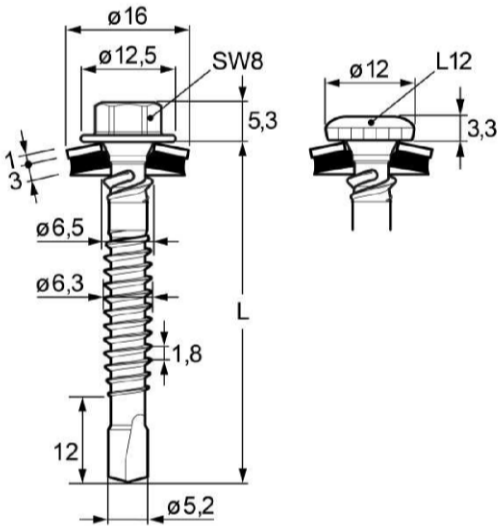
The fastening screw is to be use without pre-drilling of the connection.

The indicated resistance values $N_{R,k}$ (and $N_{R,II,k}$) applies to component II with k_{mod} = 0.9 and ρ_k = 350 kg/m³. $N_{R,k}$ for other k_{mod} or ρ_k can be determined as follows: $N_{R,k}(k_{mod}, \rho_k) = \min \left\{ N_{R,I,k} \mid N_{R,II,k} * \frac{k_{mod}}{0.9} * \frac{\rho_k}{350} \right\}$.

Self-drilling screw with sealing washer ≥ Ø 19 mm

CXCW-S19-6,8 x L, CXCW-L12-S19-6,8 x L

Annex 22



Materials

Fastener:	Stainless steel A2 or A4 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	Timber (coniferous timber) - EN 14081

Drilling-capacity $\Sigma(t_{N1} + t_{N2}) \leq 2.00$ mm

Characteristics

$M_{y,Rk}$ = 11.2 Nm

$f_{ax,k}$ = 10.4 N/mm² (l_{ef} = 35 mm, ρ_a = 350 kg/m³)

		l_{ef} [mm]						
		35	45	55	65	75		
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	0.81	0.81	0.81	0.81	0.81	0.81	**$V_{R,I,k}$ [kN]**
	0.45	0.99	0.99	0.99	0.99	0.99	0.99	
	0.50	1.17	1.17	1.17	1.17	1.17	1.17	
	0.55	1.26	1.26	1.26	1.26	1.26	1.26	
	0.60	1.35	1.35	1.35	1.35	1.35	1.35	
	0.63	1.40	1.40	1.40	1.40	1.40	1.40	
	0.70	1.53	1.53	1.53	1.53	1.53	1.53	
	≥ 0.75	1.62	1.62	1.62	1.62	1.62	1.62	
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	1.73	1.73	1.73	1.73	1.73	1.73	**$N_{R,I,k}$ [kN]**
	0.45	1.92	1.92	1.92	1.92	1.92	1.92	
	0.50	2.07	2.11	2.11	2.11	2.11	2.11	
	0.55	2.07	2.58	2.58	2.58	2.58	2.58	
	0.60	2.07	2.66	3.04	3.04	3.04	3.04	
	0.63	2.07	2.66	3.25	3.32	3.32	3.32	
	0.70	2.07	2.66	3.25	3.82	3.82	3.82	
	≥ 0.75	2.07	2.66	3.25	3.84	4.17	4.17	
$N_{R,II,k}$ [kN]		2.07	2.66	3.25	3.84	4.43		
u [mm] t_I [mm]	40	3.0						
	60	4.5						
	80	6.0						
	≥ 100	7.5						

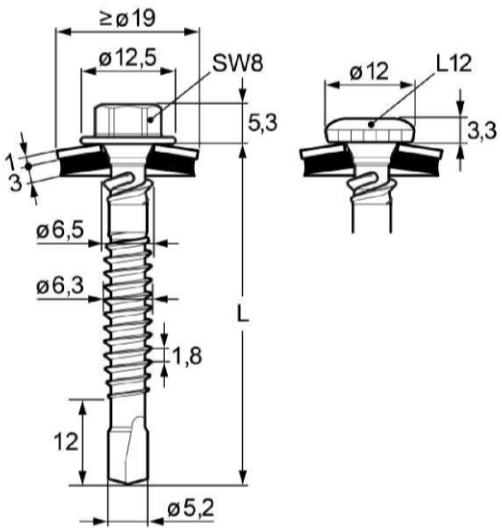
Additional definitions

The indicated resistance values $N_{R,k}$ (and $N_{R,II,k}$) applies to component II with k_{mod} = 0.9 and ρ_k = 350 kg/m³. $N_{R,k}$ for other k_{mod} or ρ_k can be determined as follows: $N_{R,k}(k_{mod}, \rho_k) = \min \left\{ N_{R,I,k} \mid N_{R,II,k} * \frac{k_{mod}}{0.9} * \frac{\rho_k}{350} \right\}$.

Self-drilling screw with sealing washer Ø 16 mm

SXC5-S16-6,3 x L, SXC5-L12-S16-6,3 x L

Annex 23



Materials

Fastener:	Stainless steel A2 or A4 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	Timber (coniferous timber) - EN 14081

Drilling-capacity $\Sigma(t_{N1} + t_{N2}) \leq 2.00$ mm

Characteristics

$M_{y,Rk}$ = 11.2 Nm

$f_{ax,k}$ = 10.4 N/mm² (l_{ef} = 35 mm, ρ_a = 350 kg/m³)

		l_{ef} [mm] 35	45	55	65	75		
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	0.81	0.81	0.81	0.81	0.81	0.81	**$V_{R,I,k}$ [kN]**
	0.45	0.99	0.99	0.99	0.99	0.99	0.99	
	0.50	1.17	1.17	1.17	1.17	1.17	1.17	
	0.55	1.26	1.26	1.26	1.26	1.26	1.26	
	0.60	1.35	1.35	1.35	1.35	1.35	1.35	
	0.63	1.40	1.40	1.40	1.40	1.40	1.40	
	0.70	1.53	1.53	1.53	1.53	1.53	1.53	
	≥ 0.75	1.62	1.62	1.62	1.62	1.62	1.62	
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	2.07	2.08	2.08	2.08	2.08	2.08	**$N_{R,I,k}$ [kN]**
	0.45	2.07	2.08	2.08	2.08	2.08	2.08	
	0.50	2.07	2.08	2.08	2.08	2.08	2.08	
	0.55	2.07	2.53	2.53	2.53	2.53	2.53	
	0.60	2.07	2.66	2.97	2.97	2.97	2.97	
	0.63	2.07	2.66	3.24	3.24	3.24	3.24	
	0.70	2.07	2.66	3.25	3.84	3.99	3.99	
	≥ 0.75	2.07	2.66	3.25	3.84	4.43	4.53	
$N_{R,II,k}$ [kN]		2.07	2.66	3.25	3.84	4.43		
u [mm] t_I [mm]	40	3.0						
	60	4.5						
	80	6.0						
	≥ 100	7.5						

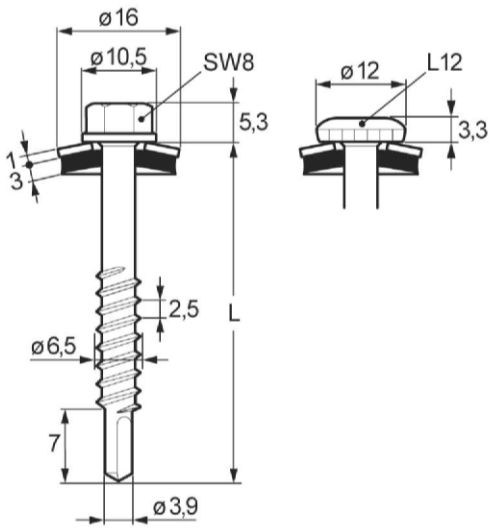
Additional definitions

The indicated resistance values $N_{R,k}$ (and $N_{R,II,k}$) applies to component II with k_{mod} = 0.9 and ρ_k = 350 kg/m³. $N_{R,k}$ for other k_{mod} or ρ_k can be determined as follows: $N_{R,k}(k_{mod}, \rho_k) = \min \left\{ N_{R,I,k} \mid N_{R,II,k} * \frac{k_{mod}}{0.9} * \frac{\rho_k}{350} \right\}$.

Self-drilling screw with sealing washer ≥ Ø 19 mm

SXC5-S19-6,3 x L, SXC5-L12-S19-6,3 x L

Annex 24



Materials

Fastener:	Stainless steel A2 or A4 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	Timber (coniferous timber) - EN 14081

Drilling-capacity $\Sigma(t_{N1} + t_{N2}) \leq 2.00$ mm

Characteristics

$M_{y,Rk}$ = 12.1 Nm

$f_{ax,k}$ = 13.2 N/mm² (l_{ef} = 35 mm, ρ_a = 350 kg/m³)

		l_{ef} [mm] 35	45	55	65	75		
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	0.81	0.81	0.81	0.81	0.81	0.81	$V_{R,I,k}$ [kN]
	0.45	0.98	0.98	0.98	0.98	0.98	0.98	
	0.50	1.15	1.15	1.15	1.15	1.15	1.15	
	0.55	1.24	1.24	1.24	1.24	1.24	1.24	
	0.60	1.33	1.33	1.33	1.33	1.33	1.33	
	0.63	1.39	1.39	1.39	1.39	1.39	1.39	
	0.70	1.51	1.51	1.51	1.51	1.51	1.51	
	≥ 0.75	1.61	1.61	1.61	1.61	1.61	1.61	
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	1.56	1.56	1.56	1.56	1.56	1.56	$N_{R,I,k}$ [kN]
	0.45	1.61	1.61	1.61	1.61	1.61	1.61	
	0.50	1.66	1.66	1.66	1.66	1.66	1.66	
	0.55	1.96	1.96	1.96	1.96	1.96	1.96	
	0.60	2.26	2.26	2.26	2.26	2.26	2.26	
	0.63	2.45	2.45	2.45	2.45	2.45	2.45	
	0.70	2.70	2.87	2.87	2.87	2.87	2.87	
	≥ 0.75	2.70	3.18	3.18	3.18	3.18	3.18	
$N_{R,II,k}$ [kN]		2.70	3.47	4.25	5.02	5.79		
u [mm] t_I [mm]	40	3.0						
	60	4.5						
	80	6.0						
	≥ 100	7.5						

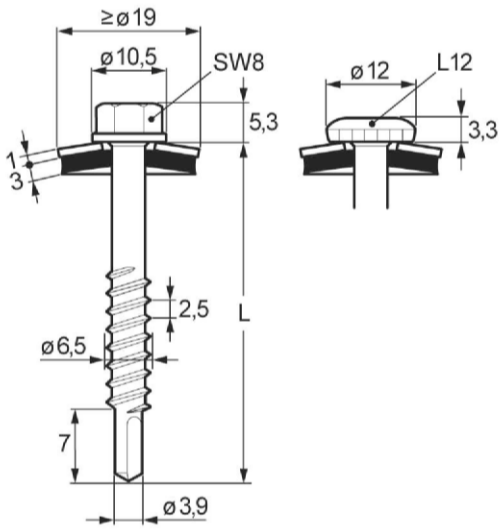
Additional definitions

The indicated resistance values $N_{R,k}$ (and $N_{R,II,k}$) applies to component II with k_{mod} = 0.9 and ρ_k = 350 kg/m³. $N_{R,k}$ for other k_{mod} or ρ_k can be determined as follows: $N_{R,k}(k_{mod}, \rho_k) = \min \left\{ N_{R,I,k} \mid N_{R,II,k} * \frac{k_{mod}}{0.9} * \frac{\rho_k}{350} \right\}$.

Self-drilling screw with sealing washer Ø 16 mm

SXW-S16-6,5 x L, SXW-L12-S16-6,5 x L

Annex 25



Materials

Fastener:	Stainless steel A2 or A4 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	Timber (coniferous timber) - EN 14081

Drilling-capacity $\Sigma(t_{N1} + t_{N2}) \leq 2.00$ mm

Characteristics

$M_{y,Rk}$ = 12.1 Nm

$f_{ax,k}$ = 13.2 N/mm² (l_{ef} = 35 mm, ρ_a = 350 kg/m³)

		l_{ef} [mm] 35	45	55	65	75		
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	0.81	0.81	0.81	0.81	0.81	0.81	$V_{R,I,k}$ [kN]
	0.45	0.98	0.98	0.98	0.98	0.98	0.98	
	0.50	1.15	1.15	1.15	1.15	1.15	1.15	
	0.55	1.24	1.24	1.24	1.24	1.24	1.24	
	0.60	1.33	1.33	1.33	1.33	1.33	1.33	
	0.63	1.39	1.39	1.39	1.39	1.39	1.39	
	0.70	1.51	1.51	1.51	1.51	1.51	1.51	
	≥ 0.75	1.61	1.61	1.61	1.61	1.61	1.61	
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	1.62	1.62	1.62	1.62	1.62	1.62	$N_{R,I,k}$ [kN]
	0.45	1.86	1.86	1.86	1.86	1.86	1.86	
	0.50	2.10	2.10	2.10	2.10	2.10	2.10	
	0.55	2.37	2.37	2.37	2.37	2.37	2.37	
	0.60	2.64	2.64	2.64	2.64	2.64	2.64	
	0.63	2.70	2.81	2.81	2.81	2.81	2.81	
	0.70	2.70	3.18	3.18	3.18	3.18	3.18	
	≥ 0.75	2.70	3.46	3.46	3.46	3.46	3.46	
$N_{R,II,k}$ [kN]		2.70	3.47	4.25	5.02	5.79		
u [mm] t_I [mm]	40	3.0						
	60	4.5						
	80	6.0						
	≥ 100	7.5						

Additional definitions

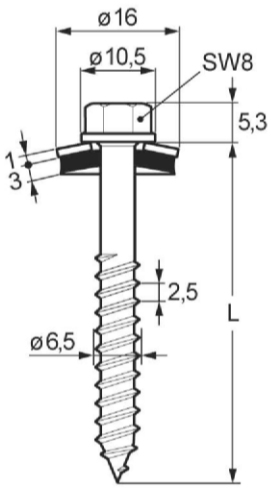
The indicated resistance values $N_{R,k}$ (and $N_{R,II,k}$) applies to component II with k_{mod} = 0.9 and ρ_k = 350 kg/m³. $N_{R,k}$ for other k_{mod} or ρ_k can be determined as follows: $N_{R,k}(k_{mod}, \rho_k) = \min \left\{ N_{R,I,k} \;\middle|\; N_{R,II,k} * \frac{k_{mod}}{0.9} * \frac{\rho_k}{350} \right\}$.

Self-drilling screw with sealing washer ≥ Ø 19 mm

SXW-S19-6,5 x L, SXW-L12-S19-6,5 x L

Annex 26

Deutsches Institut für Bautechnik DIBt



Materials

Fastener:	Stainless steel A2, A4 or 1.4547 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	Timber (coniferous timber) - EN 14081

Drilling-capacity -

Characteristics

$M_{y,Rk}$	=	13.9 Nm
$f_{ax,k}$	=	13.2 N/mm² (l_{ef} = 29 mm, ρ_a = 350 kg/m³)

		l_p [mm] 35	45	55	65	75		
d_{pd} [mm]		4.00						
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	0.81	0.81	0.81	0.81	0.81	0.81	**$V_{R,I,k}$ [kN]**
	0.45	0.98	0.98	0.98	0.98	0.98	0.98	
	0.50	1.15	1.15	1.15	1.15	1.15	1.15	
	0.55	1.24	1.24	1.24	1.24	1.24	1.24	
	0.60	1.33	1.33	1.33	1.33	1.33	1.33	
	0.63	1.39	1.39	1.39	1.39	1.39	1.39	
	0.70	1.51	1.51	1.51	1.51	1.51	1.51	
	≥ 0.75	1.61	1.61	1.61	1.61	1.61	1.61	
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	1.56	1.56	1.56	1.56	1.56	1.56	**$N_{R,I,k}$ [kN]**
	0.45	1.61	1.61	1.61	1.61	1.61	1.61	
	0.50	1.66	1.66	1.66	1.66	1.66	1.66	
	0.55	1.96	1.96	1.96	1.96	1.96	1.96	
	0.60	2.24	2.26	2.26	2.26	2.26	2.26	
	0.63	2.24	2.45	2.45	2.45	2.45	2.45	
	0.70	2.24	2.87	2.87	2.87	2.87	2.87	
	≥ 0.75	2.24	3.01	3.18	3.18	3.18	3.18	
$N_{R,II,k}$ [kN]		2.24	3.01	3.78	4.56	5.33		
u [mm] t_I [mm]	40	3.0						
	60	4.5						
	80	6.0						
	≥ 100	7.5						

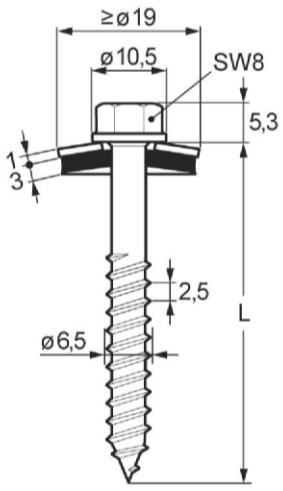
Additional definitions

The indicated resistance values $N_{R,k}$ (and $N_{R,II,k}$) applies to component II with k_{mod} = 0.9 and ρ_k = 350 kg/m³. $N_{R,k}$ for other k_{mod} or ρ_k can be determined as follows: $N_{R,k}(k_{mod}, \rho_k) = \min \left\{ N_{R,I,k} \mid N_{R,II,k} * \frac{k_{mod}}{0.9} * \frac{\rho_k}{350} \right\}$.

Self-tapping screw with sealing washer Ø 16 mm

TDA-S-S16-6,5 x L

Annex 27



Materials

Fastener:	Stainless steel A2, A2 or 1.4547 - EN ISO 3506
Washer:	Stainless steel A2 or A4 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	Timber (coniferous timber) - EN 14081

Drilling-capacity -

Characteristics

$M_{y,Rk}$ = 13.9 Nm

$f_{ax,k}$ = 13.2 N/mm² (l_{ef} = 29 mm, ρ_a = 350 kg/m³)

		l_p [mm] 35	45	55	65	75		
d_{pd} [mm]		4.00						
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	0.81	0.81	0.81	0.81	0.81	0.81	**$V_{R,I,k}$ [kN]**
	0.45	0.98	0.98	0.98	0.98	0.98	0.98	
	0.50	1.15	1.15	1.15	1.15	1.15	1.15	
	0.55	1.24	1.24	1.24	1.24	1.24	1.24	
	0.60	1.33	1.33	1.33	1.33	1.33	1.33	
	0.63	1.39	1.39	1.39	1.39	1.39	1.39	
	0.70	1.51	1.51	1.51	1.51	1.51	1.51	
	≥ 0.75	1.61	1.61	1.61	1.61	1.61	1.61	
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	1.62	1.62	1.62	1.62	1.62	1.62	**$N_{R,I,k}$ [kN]**
	0.45	1.86	1.86	1.86	1.86	1.86	1.86	
	0.50	2.10	2.10	2.10	2.10	2.10	2.10	
	0.55	2.24	2.37	2.37	2.37	2.37	2.37	
	0.60	2.24	2.64	2.64	2.64	2.64	2.64	
	0.63	2.24	2.81	2.81	2.81	2.81	2.81	
	0.70	2.24	3.01	3.18	3.18	3.18	3.18	
	≥ 0.75	2.24	3.01	3.46	3.46	3.46	3.46	
$N_{R,II,k}$ [kN]		2.24	3.01	3.78	4.56	5.33		
u [mm] t_I [mm]	40	3.0						
	60	4.5						
	80	6.0						
	≥ 100	7.5						

Additional definitions

The indicated resistance values $N_{R,k}$ (and $N_{R,II,k}$) applies to component II with k_{mod} = 0.9 and ρ_k = 350 kg/m³. $N_{R,k}$ for other k_{mod} or ρ_k can be determined as follows: $N_{R,k}(k_{mod}, \rho_k) = \min \left\{ N_{R,I,k} \mid N_{R,II,k} * \frac{k_{mod}}{0.9} * \frac{\rho_k}{350} \right\}$.

Self-tapping screw with sealing washer ≥ Ø 19 mm

TDA-S-S19-6,5 x L

Annex 28

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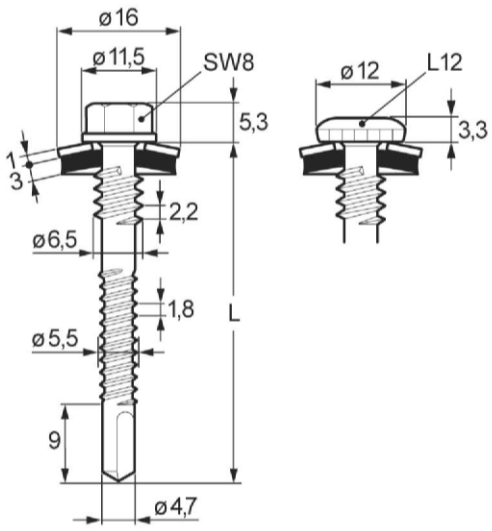


Materials

Fastener:	Carbon steel with anticorrosion coating
Washer:	Stainless steel A2 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346 HX300LAD to HX460LAD - EN 10346

Drilling-capacity $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 6.00$ mm

		t_{II} [mm]					
		1.50	1.75	2.00	2.50	3.00	4.00
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	0.67[a]	0.85[a]	0.85[a]	0.85[a]	0.85[a]	0.85[a]
	0.45	0.90[a]	0.90[a]	0.90[a]	0.90[a]	0.90[a]	0.90[a]
	0.50	1.12[a]	1.25[a]	1.25[a]	1.25[a]	1.25[a]	1.25[a]
	0.55	1.34[a]	1.50[a]	1.50[a]	1.50[a]	1.50[a]	1.50[a]
	0.60	1.57[a]	1.69[a]	1.69[a]	1.69[a]	1.69[a]	1.69[a]
	0.63	1.70[a]	1.84[a]	1.84[a]	1.84[a]	1.84[a]	1.84[a]
	0.70	1.70[a]	1.93[a]	1.93[a]	1.93[a]	1.93[a]	1.93[a]
	≥ 0.75	1.70[a]	1.99[a]	1.99[a]	1.99[a]	1.99[a]	1.99[a]
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	1.48[a]	1.48[a]	1.48[a]	1.48[a]	1.48[a]	1.48[a]
	0.45	1.64[a]	1.64[a]	1.64[a]	1.64[a]	1.64[a]	1.64[a]
	0.50	1.79	1.79[a]	1.79[a]	1.79[a]	1.79[a]	1.79[a]
	0.55	1.82	2.04[a]	2.04[a]	2.04[a]	2.04[a]	2.04[a]
	0.60	1.82	2.29	2.29[a]	2.29[a]	2.29[a]	2.29[a]
	0.63	1.82	2.41	2.46[a]	2.46[a]	2.46[a]	2.46[a]
	0.70	1.82	2.41	2.82	2.82[a]	2.82[a]	2.82[a]
	≥ 0.75	1.82	2.41	3.00	3.07[a]	3.07[a]	3.07[a]
$N_{R,II,k}$ [kN]		1.82	2.41	3.00	4.31	5.61	10.77
u [mm] t_I [mm]	40	2.0					
	60	4.0					
	80	5.7					
	≥ 100	7.1					

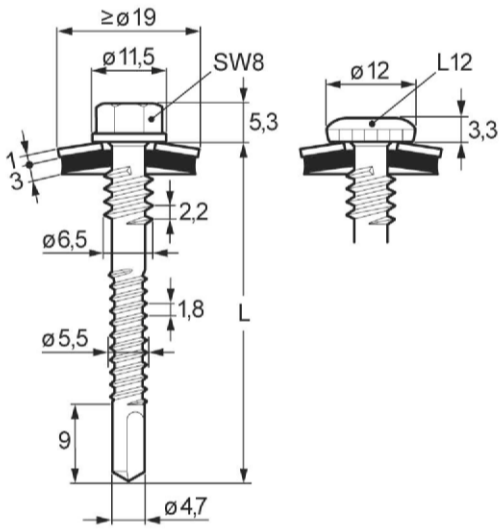
Additional definitions

Index [a]: For component I made of S320GD to S450GD the resistance value may be increased by 8.3%.

Self-drilling screw with sealing washer Ø 16 mm

SDT5-S16-5,5 x L, SDT5-L12-S16-5,5 x L

Annex 29



Materials

Fastener:	Carbon steel with anticorrosion coating
Washer:	Stainless steel A2 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346 HX300LAD to HX460LAD - EN 10346

Drilling-capacity $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 6.00$ mm

		t_{II} [mm]					
		1.50	1.75	2.00	2.50	3.00	4.00
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	0.67[a]	0.85[a]	0.85[a]	0.85[a]	0.85[a]	0.85[a]
	0.45	0.90[a]	0.90[a]	0.90[a]	0.90[a]	0.90[a]	0.90[a]
	0.50	1.12[a]	1.25[a]	1.25[a]	1.25[a]	1.25[a]	1.25[a]
	0.55	1.34[a]	1.50[a]	1.50[a]	1.50[a]	1.50[a]	1.50[a]
	0.60	1.57[a]	1.69[a]	1.69[a]	1.69[a]	1.69[a]	1.69[a]
	0.63	1.70[a]	1.84[a]	1.84[a]	1.84[a]	1.84[a]	1.84[a]
	0.70	1.70[a]	1.93[a]	1.93[a]	1.93[a]	1.93[a]	1.93[a]
	≥ 0.75	1.70[a]	1.99[a]	1.99[a]	1.99[a]	1.99[a]	1.99[a]
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	1.53[a]	1.53[a]	1.53[a]	1.53[a]	1.53[a]	1.53[a]
	0.45	1.69	1.69[a]	1.69[a]	1.69[a]	1.69[a]	1.69[a]
	0.50	1.82	1.84[a]	1.84[a]	1.84[a]	1.84[a]	1.84[a]
	0.55	1.82	2.10[a]	2.10[a]	2.10[a]	2.10[a]	2.10[a]
	0.60	1.82	2.37	2.37[a]	2.37[a]	2.37[a]	2.37[a]
	0.63	1.82	2.41	2.53[a]	2.53[a]	2.53[a]	2.53[a]
	0.70	1.82	2.41	2.90	2.90[a]	2.90[a]	2.90[a]
	≥ 0.75	1.82	2.41	3.00	3.17[a]	3.17[a]	3.17[a]
$N_{R,II,k}$ [kN]		1.82	2.41	3.00	4.31	5.61	10.77
u [mm] t_I [mm]	40	2.0					
	60	4.0					
	80	5.7					
	≥ 100	7.1					

Additional definitions

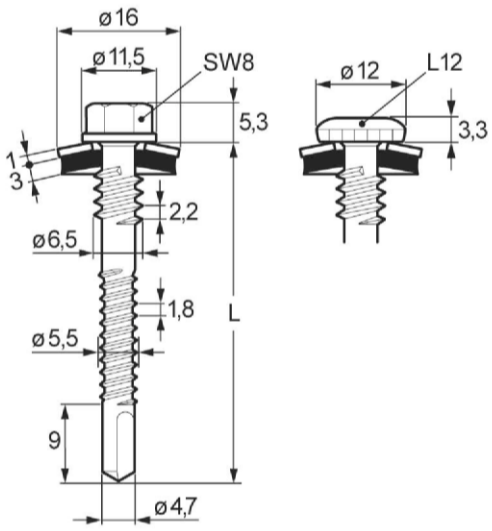
Index [a]: For component I made of S320GD to S450GD the resistance value may be increased by 8.3%.

Self-drilling screw with sealing washer ≥ Ø 19 mm

SDT5-S19-5,5 x L, SDT5-L12-S19-5,5 x L

Annex 30

Deutsches Institut für Bautechnik DIBt



Materials

Fastener:	Carbon steel with anticorrosion coating
Washer:	Aluminum alloy - EN 573 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346 HX300LAD to HX460LAD - EN 10346

Drilling-capacity $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 6.00$ mm

		t_{II} [mm]					
		1.50	1.75	2.00	2.50	3.00	4.00
$V_{R,k}$ [kN] / t_{N2} [mm]	0.40	0.67[a]	0.85[a]	0.85[a]	0.85[a]	0.85[a]	0.85[a]
	0.45	0.90[a]	0.90[a]	0.90[a]	0.90[a]	0.90[a]	0.90[a]
	0.50	1.12[a]	1.25[a]	1.25[a]	1.25[a]	1.25[a]	1.25[a]
	0.55	1.34[a]	1.50[a]	1.50[a]	1.50[a]	1.50[a]	1.50[a]
	0.60	1.57[a]	1.69[a]	1.69[a]	1.69[a]	1.69[a]	1.69[a]
	0.63	1.70[a]	1.84[a]	1.84[a]	1.84[a]	1.84[a]	1.84[a]
	0.70	1.70[a]	1.93[a]	1.93[a]	1.93[a]	1.93[a]	1.93[a]
	≥ 0.75	1.70[a]	1.99[a]	1.99[a]	1.99[a]	1.99[a]	1.99[a]
$N_{R,k}$ [kN] / t_{N1} [mm]	0.40	0.78[a]	0.78[a]	0.78[a]	0.78[a]	0.78[a]	0.78[a]
	0.45	1.12[a]	1.12[a]	1.12[a]	1.12[a]	1.12[a]	1.12[a]
	0.50	1.46[a]	1.46[a]	1.46[a]	1.46[a]	1.46[a]	1.46[a]
	0.55	1.70	1.70[a]	1.70[a]	1.70[a]	1.70[a]	1.70[a]
	0.60	1.82	1.94[a]	1.94[a]	1.94[a]	1.94[a]	1.94[a]
	0.63	1.82	2.08[a]	2.08[a]	2.08[a]	2.08[a]	2.08[a]
	0.70	1.82	2.41	2.42[a]	2.42[a]	2.42[a]	2.42[a]
	≥ 0.75	1.82	2.41	2.66[a]	2.66[a]	2.66[a]	2.66[a]
$N_{R,II,k}$ [kN]		1.82	2.41	3.00	4.31	5.61	10.77
u [mm] / t_I [mm]	40	2.0					
	60	4.0					
	80	5.7					
	≥ 100	7.1					

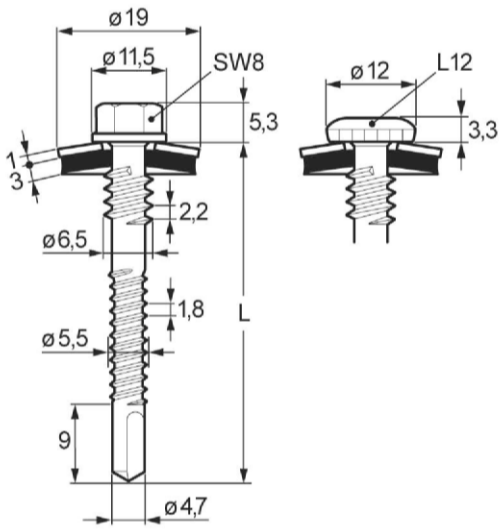
Additional definitions

Index [a]: For component I made of S320GD to S450GD the resistance value may be increased by 8.3%.

Self-drilling screw with sealing washer Ø 16 mm

SDT5-A16-5,5 x L, SDT5-L12-A16-5,5 x L

Annex 31



Materials

Fastener:	Carbon steel with anticorrosion coating
Washer:	Aluminum alloy - EN 573 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346 HX300LAD to HX460LAD - EN 10346

Drilling-capacity $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 6.00$ mm

		t_{II} [mm]					
		1.50	1.75	2.00	2.50	3.00	4.00
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	0.67[a]	0.85[a]	0.85[a]	0.85[a]	0.85[a]	0.85[a]
	0.45	0.90[a]	0.90[a]	0.90[a]	0.90[a]	0.90[a]	0.90[a]
	0.50	1.12[a]	1.25[a]	1.25[a]	1.25[a]	1.25[a]	1.25[a]
	0.55	1.34[a]	1.50[a]	1.50[a]	1.50[a]	1.50[a]	1.50[a]
	0.60	1.57[a]	1.69[a]	1.69[a]	1.69[a]	1.69[a]	1.69[a]
	0.63	1.70[a]	1.84[a]	1.84[a]	1.84[a]	1.84[a]	1.84[a]
	0.70	1.70[a]	1.93[a]	1.93[a]	1.93[a]	1.93[a]	1.93[a]
	≥ 0.75	1.70[a]	1.99[a]	1.99[a]	1.99[a]	1.99[a]	1.99[a]
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	1.18[a]	1.18[a]	1.18[a]	1.18[a]	1.18[a]	1.18[a]
	0.45	1.32[a]	1.32[a]	1.32[a]	1.32[a]	1.32[a]	1.32[a]
	0.50	1.46[a]	1.46[a]	1.46[a]	1.46[a]	1.46[a]	1.46[a]
	0.55	1.70	1.70[a]	1.70[a]	1.70[a]	1.70[a]	1.70[a]
	0.60	1.82	1.94[a]	1.94[a]	1.94[a]	1.94[a]	1.94[a]
	0.63	1.82	2.08[a]	2.08[a]	2.08[a]	2.08[a]	2.08[a]
	0.70	1.82	2.41	2.42[a]	2.42[a]	2.42[a]	2.42[a]
	≥ 0.75	1.82	2.41	2.66[a]	2.66[a]	2.66[a]	2.66[a]
$N_{R,II,k}$ [kN]		1.82	2.41	3.00	4.31	5.61	10.77
u [mm] t_I [mm]	40	2.0					
	60	4.0					
	80	5.7					
	≥ 100	7.1					

Additional definitions

Index [a]: For component I made of S320GD to S450GD the resistance value may be increased by 8.3%.

Self-drilling screw with sealing washer Ø 19 mm

SDT5-A19-5,5 x L, SDT5-L12-A19-5,5 x L

Annex 32

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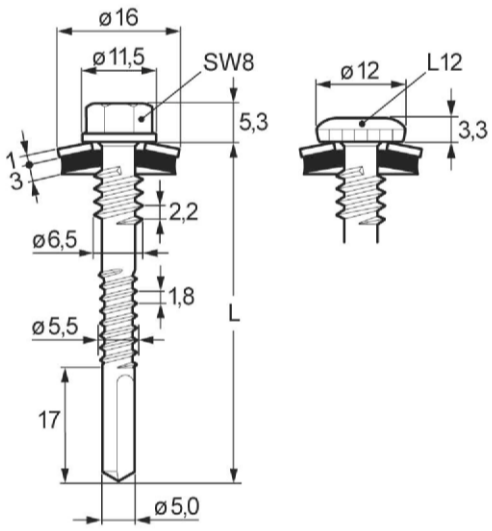


Materials

Fastener:	Carbon steel with anticorrosion coating
Washer:	Stainless steel A2 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346 HX300LAD to HX460LAD - EN 10346

Drilling-capacity $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 14.00$ mm

		t_{II} [mm]					
		4.00	5.00	6.00	8.00	10.00	12.00
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	0.86[a]	0.86[a]	0.86[a]	0.86[a]	0.86[a]	0.86[a]
	0.45	1.02[a]	1.02[a]	1.02[a]	1.02[a]	1.02[a]	1.02[a]
	0.50	1.18[a]	1.18[a]	1.18[a]	1.18[a]	1.18[a]	1.18[a]
	0.55	1.32[a]	1.32[a]	1.32[a]	1.32[a]	1.32[a]	1.32[a]
	0.60	1.45[a]	1.45[a]	1.45[a]	1.45[a]	1.45[a]	1.45[a]
	0.63	1.52[a]	1.52[a]	1.52[a]	1.52[a]	1.52[a]	1.52[a]
	0.70	1.91[a]	1.91[a]	1.91[a]	1.91[a]	1.91[a]	1.91[a]
	≥ 0.75	2.18[a]	2.18[a]	2.18[a]	2.18[a]	2.18[a]	2.18[a]
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	1.16[a]	1.16[a]	1.16[a]	1.16[a]	1.16[a]	1.16[a]
	0.45	1.41[a]	1.41[a]	1.41[a]	1.41[a]	1.41[a]	1.41[a]
	0.50	1.65[a]	1.65[a]	1.65[a]	1.65[a]	1.65[a]	1.65[a]
	0.55	1.96[a]	1.96[a]	1.96[a]	1.96[a]	1.96[a]	1.96[a]
	0.60	2.25[a]	2.25[a]	2.25[a]	2.25[a]	2.25[a]	2.25[a]
	0.63	2.43[a]	2.43[a]	2.43[a]	2.43[a]	2.43[a]	2.43[a]
	0.70	2.89[a]	2.89[a]	2.89[a]	2.89[a]	2.89[a]	2.89[a]
	≥ 0.75	3.21[a]	3.21[a]	3.21[a]	3.21[a]	3.21[a]	3.21[a]
$N_{R,II,k}$ [kN]		4.97	6.41	7.84	10.71	10.71	10.71
u [mm] t_I [mm]	40	1.8					
	60	3.3					
	80	4.6					
	≥ 100	5.7					

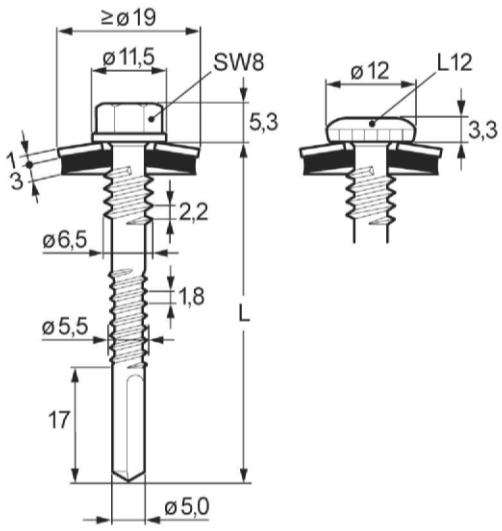
Additional definitions

Index [a]: For component I made of S320GD to S450GD the resistance value may be increased by 8.3%.

Self-drilling screw with sealing washer Ø 16 mm

SDT14-S16-5,5 x L, SDT14-L12-S16-5,5 x L

Annex 33



Materials

Fastener:	Carbon steel with anticorrosion coating
Washer:	Stainless steel A2 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346 HX300LAD to HX460LAD - EN 10346

Drilling-capacity $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 14.00$ mm

		t_{II} [mm]					
		4.00	5.00	6.00	8.00	10.00	12.00
$V_{R,k}$ [kN] / t_{N2} [mm]	0.40	0.86[a]	0.86[a]	0.86[a]	0.86[a]	0.86[a]	0.86[a]
	0.45	1.02[a]	1.02[a]	1.02[a]	1.02[a]	1.02[a]	1.02[a]
	0.50	1.18[a]	1.18[a]	1.18[a]	1.18[a]	1.18[a]	1.18[a]
	0.55	1.32[a]	1.32[a]	1.32[a]	1.32[a]	1.32[a]	1.32[a]
	0.60	1.45[a]	1.45[a]	1.45[a]	1.45[a]	1.45[a]	1.45[a]
	0.63	1.52[a]	1.52[a]	1.52[a]	1.52[a]	1.52[a]	1.52[a]
	0.70	1.91[a]	1.91[a]	1.91[a]	1.91[a]	1.91[a]	1.91[a]
	≥ 0.75	2.18[a]	2.18[a]	2.18[a]	2.18[a]	2.18[a]	2.18[a]
$N_{R,k}$ [kN] / t_{N1} [mm]	0.40	1.24[a]	1.24[a]	1.24[a]	1.24[a]	1.24[a]	1.24[a]
	0.45	1.64[a]	1.64[a]	1.64[a]	1.64[a]	1.64[a]	1.64[a]
	0.50	2.04[a]	2.04[a]	2.04[a]	2.04[a]	2.04[a]	2.04[a]
	0.55	2.34[a]	2.34[a]	2.34[a]	2.34[a]	2.34[a]	2.34[a]
	0.60	2.64[a]	2.64[a]	2.64[a]	2.64[a]	2.64[a]	2.64[a]
	0.63	2.82[a]	2.82[a]	2.82[a]	2.82[a]	2.82[a]	2.82[a]
	0.70	2.89[a]	2.89[a]	2.89[a]	2.89[a]	2.89[a]	2.89[a]
	≥ 0.75	3.52[a]	3.52[a]	3.52[a]	3.52[a]	3.52[a]	3.52[a]
$N_{R,II,k}$ [kN]		4.97	6.41	7.84	10.71	10.71	10.71
u [mm] / t_I [mm]	40	1.8					
	60	3.3					
	80	4.6					
	≥ 100	5.7					

Additional definitions

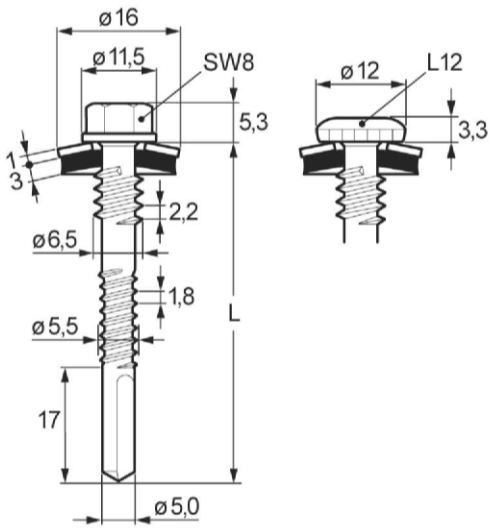
Index [a]: For component I made of S320GD to S450GD the resistance value may be increased by 8.3%.

Self-drilling screw with sealing washer ≥ Ø 19 mm

SDT14-S19-5,5 x L, SDT14-L12-S19-5,5 x L

Annex 34

Deutsches Institut für Bautechnik DIBt



Materials

Fastener:	Carbon steel with anticorrosion coating
Washer:	Aluminum alloy - EN 573 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346 HX300LAD to HX460LAD - EN 10346

Drilling-capacity $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 14.00$ mm

		t_{II} [mm]					
		4.00	5.00	6.00	8.00	10.00	12.00
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	0.86[a]	0.86[a]	0.86[a]	0.86[a]	0.86[a]	0.86[a]
	0.45	1.02[a]	1.02[a]	1.02[a]	1.02[a]	1.02[a]	1.02[a]
	0.50	1.18[a]	1.18[a]	1.18[a]	1.18[a]	1.18[a]	1.18[a]
	0.55	1.32[a]	1.32[a]	1.32[a]	1.32[a]	1.32[a]	1.32[a]
	0.60	1.45[a]	1.45[a]	1.45[a]	1.45[a]	1.45[a]	1.45[a]
	0.63	1.52[a]	1.52[a]	1.52[a]	1.52[a]	1.52[a]	1.52[a]
	0.70	1.91[a]	1.91[a]	1.91[a]	1.91[a]	1.91[a]	1.91[a]
	≥ 0.75	2.18[a]	2.18[a]	2.18[a]	2.18[a]	2.18[a]	2.18[a]
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	0.62[a]	0.62[a]	0.62[a]	0.62[a]	0.62[a]	0.62[a]
	0.45	0.98[a]	0.98[a]	0.98[a]	0.98[a]	0.98[a]	0.98[a]
	0.50	1.34[a]	1.34[a]	1.34[a]	1.34[a]	1.34[a]	1.34[a]
	0.55	1.60[a]	1.60[a]	1.60[a]	1.60[a]	1.60[a]	1.60[a]
	0.60	1.87[a]	1.87[a]	1.87[a]	1.87[a]	1.87[a]	1.87[a]
	0.63	2.03[a]	2.03[a]	2.03[a]	2.03[a]	2.03[a]	2.03[a]
	0.70	2.40[a]	2.40[a]	2.40[a]	2.40[a]	2.40[a]	2.40[a]
	≥ 0.75	2.66[a]	2.66[a]	2.66[a]	2.66[a]	2.66[a]	2.66[a]
$N_{R,II,k}$ [kN]		4.97	6.41	7.84	10.71	10.71	10.71
u [mm] t_I [mm]	40	1.8					
	60	3.3					
	80	4.6					
	≥ 100	5.7					

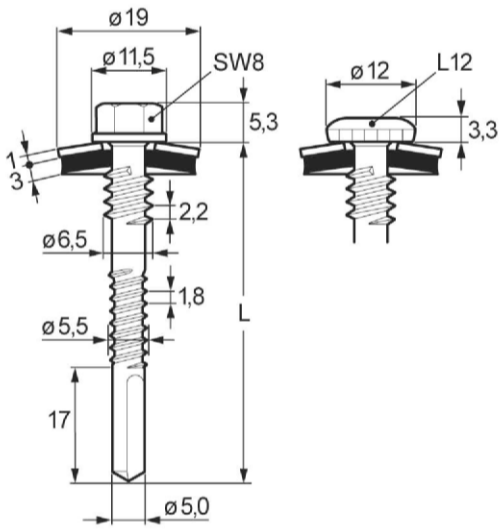
Additional definitions

Index [a]: For component I made of S320GD to S450GD the resistance value may be increased by 8.3%.

Self-drilling screw with sealing washer Ø 16 mm

SDT14-A16-5,5 x L, SDT14-L12-A16-5,5 x L

Annex 35



Materials

Fastener:	Carbon steel with anticorrosion coating
Washer:	Aluminum alloy - EN 573 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346 HX300LAD to HX460LAD - EN 10346

Drilling-capacity $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 14.00$ mm

		t_{II} [mm]					
		4.00	5.00	6.00	8.00	10.00	12.00
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	0.86[a]	0.86[a]	0.86[a]	0.86[a]	0.86[a]	0.86[a]
	0.45	1.02[a]	1.02[a]	1.02[a]	1.02[a]	1.02[a]	1.02[a]
	0.50	1.18[a]	1.18[a]	1.18[a]	1.18[a]	1.18[a]	1.18[a]
	0.55	1.32[a]	1.32[a]	1.32[a]	1.32[a]	1.32[a]	1.32[a]
	0.60	1.45[a]	1.45[a]	1.45[a]	1.45[a]	1.45[a]	1.45[a]
	0.63	1.52[a]	1.52[a]	1.52[a]	1.52[a]	1.52[a]	1.52[a]
	0.70	1.91[a]	1.91[a]	1.91[a]	1.91[a]	1.91[a]	1.91[a]
	≥ 0.75	2.18[a]	2.18[a]	2.18[a]	2.18[a]	2.18[a]	2.18[a]
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	0.94[a]	0.94[a]	0.94[a]	0.94[a]	0.94[a]	0.94[a]
	0.45	1.14[a]	1.14[a]	1.14[a]	1.14[a]	1.14[a]	1.14[a]
	0.50	1.34[a]	1.34[a]	1.34[a]	1.34[a]	1.34[a]	1.34[a]
	0.55	1.60[a]	1.60[a]	1.60[a]	1.60[a]	1.60[a]	1.60[a]
	0.60	1.87[a]	1.87[a]	1.87[a]	1.87[a]	1.87[a]	1.87[a]
	0.63	2.03[a]	2.03[a]	2.03[a]	2.03[a]	2.03[a]	2.03[a]
	0.70	2.40[a]	2.40[a]	2.40[a]	2.40[a]	2.40[a]	2.40[a]
	≥ 0.75	2.66[a]	2.66[a]	2.66[a]	2.66[a]	2.66[a]	2.66[a]
$N_{R,II,k}$ [kN]		4.97	6.41	7.84	10.71	10.71	10.71
u [mm] t_I [mm]	40	1.8					
	60	3.3					
	80	4.6					
	≥ 100	5.7					

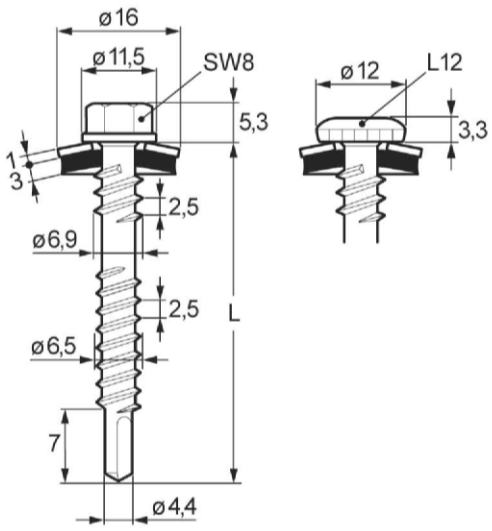
Additional definitions

Index [a]: For component I made of S320GD to S450GD the resistance value may be increased by 8.3%.

Self-drilling screw with sealing washer Ø 19 mm

SDT14-A19-5,5 x L, SDT14-L12-A19-5,5 x L

Annex 36



Materials

Fastener:	Carbon steel with anticorrosion coating
Washer:	Stainless steel A2 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	Timber (coniferous timber) - EN 14081

Drilling-capacity $\Sigma(t_{N1} + t_{N2}) \leq 2.00$ mm

Characteristics

$M_{y,Rk}$ = 15.4 Nm

$f_{ax,k}$ = 13.2 N/mm² (l_{ef} = 35 mm, ρ_a = 350 kg/m³)

		l_{ef} [mm] 35	45	55	65	75		
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	n/a	n/a	n/a	n/a	n/a	n/a	$V_{R,I,k}$ [kN]
	0.45	n/a	n/a	n/a	n/a	n/a	n/a	
	0.50	1.00[a]	1.00[a]	1.00[a]	1.00[a]	1.00[a]	1.00[a]	
	0.55	1.20[a]	1.20[a]	1.20[a]	1.20[a]	1.20[a]	1.20[a]	
	0.60	1.39[a]	1.39[a]	1.39[a]	1.39[a]	1.39[a]	1.39[a]	
	0.63	1.50[a]	1.50[a]	1.50[a]	1.50[a]	1.50[a]	1.50[a]	
	0.70	1.50[a]	1.50[a]	1.50[a]	1.50[a]	1.50[a]	1.50[a]	
	≥ 0.75	1.50[a]	1.50[a]	1.50[a]	1.50[a]	1.50[a]	1.50[a]	
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	n/a	n/a	n/a	n/a	n/a	n/a	$N_{R,I,k}$ [kN]
	0.45	n/a	n/a	n/a	n/a	n/a	n/a	
	0.50	1.33[a]	1.33[a]	1.33[a]	1.33[a]	1.33[a]	1.33[a]	
	0.55	1.67[a]	1.67[a]	1.67[a]	1.67[a]	1.67[a]	1.67[a]	
	0.60	1.72[a]	1.72[a]	1.72[a]	1.72[a]	1.72[a]	1.72[a]	
	0.63	1.75[a]	1.75[a]	1.75[a]	1.75[a]	1.75[a]	1.75[a]	
	0.70	1.75[a]	1.75[a]	1.75[a]	1.75[a]	1.75[a]	1.75[a]	
	≥ 0.75	1.75[a]	1.75[a]	1.75[a]	1.75[a]	1.75[a]	1.75[a]	
$N_{R,II,k}$ [kN]		2.70	3.47	4.25	5.02	5.79		
u [mm] t_I [mm]	40	2.8						
	60	4.3						
	80	5.7						
	≥ 100	7.1						

Additional definitions

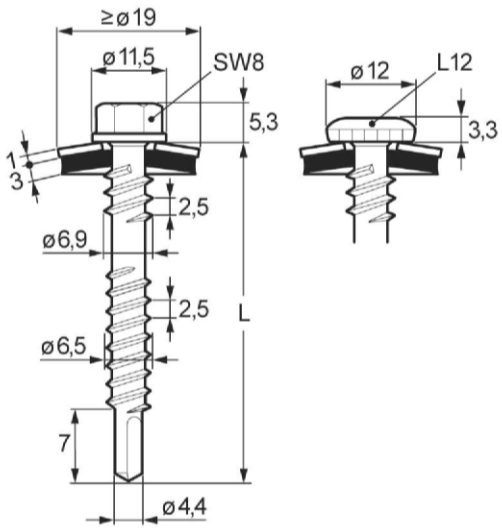
Index [a]: For component I made of S320GD to S450GD the resistance value may be increased by 8.3%.

The indicated resistance values $N_{R,k}$ (and $N_{R,II,k}$) applies to component II with k_{mod} = 0.9 and ρ_k = 350 kg/m³. $N_{R,k}$ for other k_{mod} or ρ_k can be determined as follows: $N_{R,k}(k_{mod}, \rho_k) = \min \left\{ N_{R,I,k} \mid N_{R,II,k} * \frac{k_{mod}}{0.9} * \frac{\rho_k}{350} \right\}$.

Self-drilling screw with sealing washer Ø 16 mm

SDTW-S16-6,5 x L, SDTW-L12-S16-6,5 x L

Annex 37



Materials

Fastener:	Carbon steel with anticorrosion coating
Washer:	Stainless steel A2 - EN ISO 3506 with EPDM-seal
Component I:	S280GD to S450GD - EN 10346
Component II:	Timber (coniferous timber) - EN 14081

Drilling-capacity $\Sigma(t_{N1} + t_{N2}) \leq 2.00$ mm

Characteristics

$M_{y,Rk}$ = 15.4 Nm

$f_{ax,k}$ = 13.2 N/mm² (l_{ef} = 35 mm, ρ_a = 350 kg/m³)

		l_{ef} [mm] 35	45	55	65	75		
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	n/a	n/a	n/a	n/a	n/a	n/a	$V_{R,I,k}$ [kN]
	0.45	n/a	n/a	n/a	n/a	n/a	n/a	
	0.50	1.00[a]	1.00[a]	1.00[a]	1.00[a]	1.00[a]	1.00[a]	
	0.55	1.20[a]	1.20[a]	1.20[a]	1.20[a]	1.20[a]	1.20[a]	
	0.60	1.39[a]	1.39[a]	1.39[a]	1.39[a]	1.39[a]	1.39[a]	
	0.63	1.50[a]	1.50[a]	1.50[a]	1.50[a]	1.50[a]	1.50[a]	
	0.70	1.50[a]	1.50[a]	1.50[a]	1.50[a]	1.50[a]	1.50[a]	
	≥ 0.75	1.50[a]	1.50[a]	1.50[a]	1.50[a]	1.50[a]	1.50[a]	
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	n/a	n/a	n/a	n/a	n/a	n/a	$N_{R,I,k}$ [kN]
	0.45	n/a	n/a	n/a	n/a	n/a	n/a	
	0.50	1.60[a]	1.60[a]	1.60[a]	1.60[a]	1.60[a]	1.60[a]	
	0.55	2.00[a]	2.00[a]	2.00[a]	2.00[a]	2.00[a]	2.00[a]	
	0.60	2.06[a]	2.06[a]	2.06[a]	2.06[a]	2.06[a]	2.06[a]	
	0.63	2.10[a]	2.10[a]	2.10[a]	2.10[a]	2.10[a]	2.10[a]	
	0.70	2.10[a]	2.10[a]	2.10[a]	2.10[a]	2.10[a]	2.10[a]	
	≥ 0.75	2.10[a]	2.10[a]	2.10[a]	2.10[a]	2.10[a]	2.10[a]	
$N_{R,II,k}$ [kN]		2.70	3.47	4.25	5.02	5.79		
u [mm] t_I [mm]	40	2.8						
	60	4.3						
	80	5.7						
	≥ 100	7.1						

Additional definitions

Index [a]: For component I made of S320GD to S450GD the resistance value may be increased by 8.3%.

The indicated resistance values $N_{R,k}$ (and $N_{R,II,k}$) applies to component II with k_{mod} = 0.9 and ρ_k = 350 kg/m³. $N_{R,k}$ for other k_{mod} or ρ_k can be determined as follows: $N_{R,k}(k_{mod}, \rho_k) = \min \left\{ N_{R,I,k} \mid N_{R,II,k} * \frac{k_{mod}}{0.9} * \frac{\rho_k}{350} \right\}$.

Self-drilling screw with sealing washer ≥ Ø 19 mm

SDTW-S19-6,5 x L, SDTW-L12-S19-6,5 x L

Annex 38