Deutsches Institut für Bautechnik

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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-17/0322 of 19 June 2017

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	KDF 4.8, KDH1 4.8, KDH2 4.2, KDH2 4.8, KDH2 5.5, KDH3 5.5, KDH5 5.5, KDT1 4.8, KDT2 5.5
Product family to which the construction product belongs	Fastening Screws for Metal Members and Sheeting
Manufacturer	ROSETER INFO TRADE CO., LTD 11F., No.213, Fu-Nong Rd. Gu-Shan Dist. KAOHSIUNG CITY 80454 TAIWAN R.O.C
Manufacturing plant	Plant 1 Plant 2 Plant 3 Plant 4 Plant 5
This European Technical Assessment contains	22 pages including 17 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	European Assessment Document (EAD) 330046-01-0602 "Fastening Screws for Metal Members and Sheeting", Edition 01

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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.

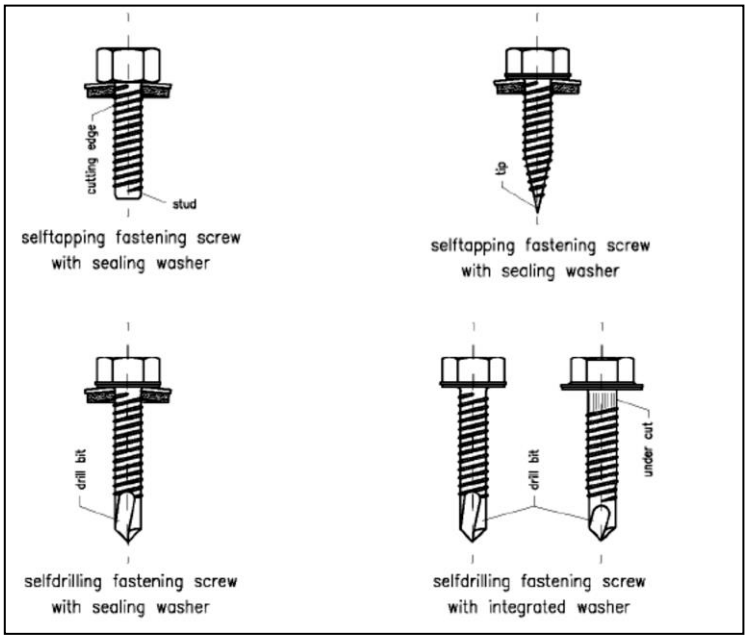


Figure 1: Fastening screws

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

The components and the system setup of the product are given in Annex (1-17).

Table 1 Summary of the fastenings screws for metal members and sheeting

Annex	Fastening screw
4	KDF 4,8 xL
5	KDH1 4,8
6	KDH2 4,2
7	KDH2 4,8
8	KDH2 5,5

Table 1 - Continuation

Annex	Fastening screw
9	KDH3 5,5
10	KDH5 5,5
11	KDT1 4,8
12	KDT2 5,5
13	KDT2 5,5
14	KDH2 5,5 KDT2 5,5
15	KDH2 5,5 KDT2 5,5
16	KDH3 5,5
17	KDH3 5,5

2 Specification of the intended use in accordance with the applicable European Assessment Document 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 ≥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 1-17.

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.

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.

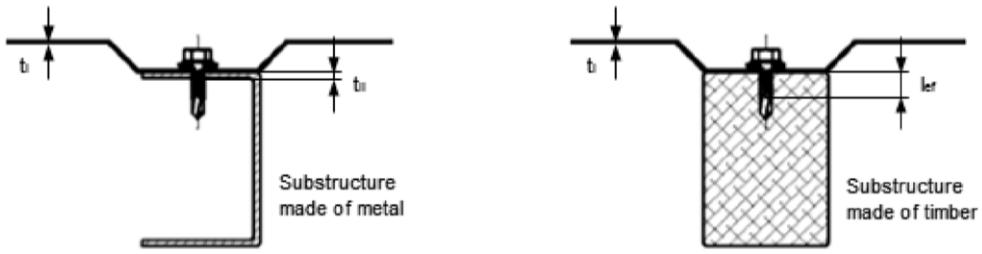
Issued in Berlin on 19 June 2017 by Deutsches Institut für Bautechnik

BD Dipl.-Ing. Andreas Kummerow
Head of Department

beglaubigt:
Schult

Deutsches Institut für Bautechnik DIBt

Examples of execution of a connection



Materials and dimensions

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

Fastener	Material of the fastening screw
Washer	Material of the sealing washer
Component I	Material of the metal member or sheeting
Component II	Material of the substructure

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

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.

Performance characteristics

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

$N_{R,k}$	Characteristic value of tension resistance
$V_{R,k}$	Characteristic value of shear resistance

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

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

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

Terms and explanations	Annex 1
Fastening screws for metal members and sheeting	

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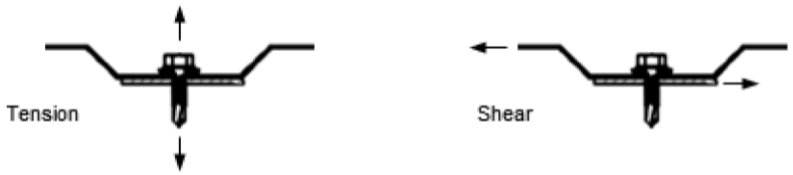
Occurred loadings of a connection



Design values

The design values of tension and shear resistance 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 component thickness t_I or t_{II} lies in between two indicated component thicknesses, the characteristic value may be calculated by linear interpolation.

For asymmetric components II made of metal (e.g. Z- or C-shaped profiles) with component thickness $t_{II} < 5$ mm, the characteristic value $N_{R,k}$ has to be reduced to 70%.

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

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

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

Types of connection

For the types of connection (a, b, c, d) given in the Annexes of the fastening screws, it is not necessary to take into account the effect of constraints due to temperature. For other types of connection the effect of constraints have to be taken into account, unless they do not occur or are not significant (e.g. sufficient flexibility of the substructure).

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 use of impact wrench is not allowed.

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

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

Design and installation	**Annex 2**
Fastening screws for metal members and sheeting	

Component I made of perforated sheeting

The characteristic values of tension and shear resistance are determined as follows:

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

$N_{R,I,k}$ and $V_{R,I,k}$ are given in Annex 4 and 5.

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

Component I made of aluminium alloy

The characteristic value of tension resistance is determined as follows:

$$N_{R,k} = \min \begin{cases} N_{R,I,k} \\ N_{R,II,k} \end{cases}$$

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

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

Component II made of timber

The characteristic values of tension and shear resistance for other k_{mod} or ρ_k as indicated in the Annex of the fastening screw can be determined as follows:

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

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

$N_{R,II,k}$ is determined according to EN 1995-1-1:2004 + A1:2008, equation (8.40a), with $f_{ax,k}$ given in the Annex of the fastening screw.

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

Additional provisions	Annex 3
Fastening screws for metal members and sheeting	

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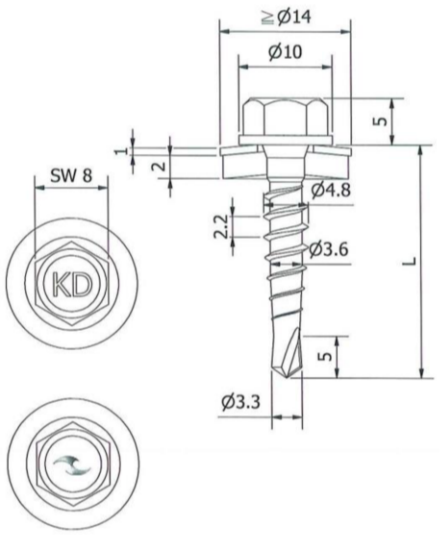

Materials

Fastener:	Stainless steel 1.4301- EN 10088
Washer:	Stainless steel 1.4301- EN 10088 with vulcanized EPDM-seal
Component I:	S280GD to S350GD - EN 10346
Component II:	S280GD to S350GD - EN 10346 Timber – EN 14081

Drilling-capacity $\Sigma(t_I + t_{II}) \leq 1.50$ mm

Characteristics

$M_{y,Rk}$	=	5.46 Nm
$f_{ax,k}$	=	10.56 N/mm² (l_{ef} = 29 mm, ρ_a = 350 kg/m³)
$f_{h,0,k}$	=	31.6 N/mm² (ρ_a = 350 kg/m³)
$f_{h,90,k}$	=	17.3 N/mm² (ρ_a = 350 kg/m³)

Component I S280 GD to S350 GD - 10346 t I [mm]		Component II S280 GD to S350 GD - 10346 t II [mm] 0,40	0,50	0,55	0,63	0,75	0,88	1,00	Timber ≥ C24 L_g ≥ 29 mm	
0,40	$V_{R,k}$ [kN]	0,60 -	0,60 -	0,60 -	0,60 -	0,60 -	0,60 -	0,60 -	1,15	Failure of component I
0,50	$V_{R,k}$ [kN]	0,60 -	0,86[1] -	0,86[1] -	0,86[1] -	0,86[1] -	0,86[1] -	0,86[1] -	1,15	
0,55	$V_{R,k}$ [kN]	0,60 -	0,86[1] -	1,01 -	1,01 -	1,01 -	1,01 -	- -	1,24	
0,63	$V_{R,k}$ [kN]	0,60 -	0,86[1] -	1,01 -	1,26 -	1,26 -	- -	- -	1,37	
0,75	$V_{R,k}$ [kN]	0,60 -	0,86[1] -	1,01 -	1,26 -	1,62 -	- -	- -	1,58	
0,88	$V_{R,k}$ [kN]	0,60 -	0,86[1] -	1,01 -	- -	- -	- -	- -	1,58	
1,00	$V_{R,k}$ [kN]	0,60 -	0,86[1] -	- -	- -	- -	- -	- -	1,58	
0,40	$N_{R,k}$ [kN]	0,38 -	0,54[1] -	0,61 -	0,73 -	0,91 -	1,12 -	1,31 -	1,38	Failure of component I
0,50	$N_{R,k}$ [kN]	0,38 -	0,54[1] -	0,61 -	0,73 -	0,91 -	1,12 -	1,31 -	1,85	
0,55	$N_{R,k}$ [kN]	0,38 -	0,54[1] -	0,61 -	0,73 -	0,91 -	1,12 -	- -	2,08	
0,63	$N_{R,k}$ [kN]	0,38 -	0,54[1] -	0,61 -	0,73 -	0,91 -	- -	- -	2,44	
0,75	$N_{R,k}$ [kN]	0,38 -	0,54[1] -	0,61 -	0,73 -	0,91 -	- -	- -	2,99	
0,88	$N_{R,k}$ [kN]	0,38 -	0,54[1] -	0,61 -	- -	- -	- -	- -	2,99	
1,00	$N_{R,k}$ [kN]	0,38 -	0,54[1] -	- -	- -	- -	- -	- -	2,99	
	$N_{R,k,II}$	0,38 -	0,54[1] -	0,61 -	0,73 -	0,91 -	1,12 -	1,31 -		

[1] if component I and component II are made of S320GD to S350GD the values may be increased by 8.3%.

Self-drilling screw

KDF 4,8 x L

Annex 4

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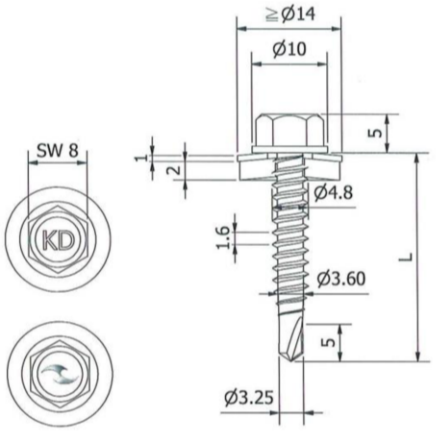

Materials

Fastener:	Stainless steel 1.4301- EN 10088
Washer:	Stainless steel 1.4301- EN 10088 with vulcanized EPDM-seal
Component I:	S280GD to S350GD - EN 10346
Component II:	S280GD to S350GD - EN 10346 S235 – EN 10025-2

Drilling-capacity $\Sigma(t_I + t_{II}) \leq 2.20$ mm

Component I S280 GD to S350 GD - 10346 t I [mm]		Component II S280 GD to S350 GD – EN 10346, S235 – EN 10025-2 t II [mm]										
		0,40	0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	1,50	1,75
$V_{R,k}$ [kN]	0,40	0,65 -	0,65 -	0,65 -	0,65 -	0,65 -	0,65 -	0,65 -	0,65 -	0,65 -	0,65 -	0,65 -
	0,50	0,65 -	1,04[1] -	1,04[1] -	1,04[1] -	1,04[1] -	1,04[1] -	1,04[1] -	1,04[1] -	1,04[1] -	1,04[1] -	- -
	0,55	0,65 -	1,04[1] -	1,22 -	1,22 -	1,22 -	1,22 -	1,22 -	1,22 -	1,22 -	1,22 -	- -
	0,63	0,65 -	1,04[1] -	1,22 -	1,51 -	1,51 -	1,51 -	1,51 -	1,51 -	1,51 -	1,51 -	- -
	0,75	0,65 -	1,04[1] -	1,22 -	1,51 -	1,95 -	1,95 -	1,95 -	1,95 -	1,95 -	- -	- -
	0,88	0,65 -	1,04[1] -	1,22 -	1,51 -	1,95 -	2,40 -	2,40 -	2,40 -	2,40 -	- -	- -
	1,00	0,65 -	1,04[1] -	1,22 -	1,51 -	1,95 -	2,40 -	2,82[1] -	2,82[1] -	- -	- -	- -
	1,13	0,65 -	1,04[1] -	1,22 -	1,51 -	1,95 -	2,40 -	2,82[1] -	- -	- -	- -	- -
	1,25	0,65 -	1,04[1] -	1,22 -	1,51 -	1,95 -	2,40 -	- -	- -	- -	- -	- -
	1,50	0,65 -	1,04[1] -	1,22 -	1,51 -	- -	- -	- -	- -	- -	- -	- -
	1,75	0,65 -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
$N_{R,k}$ [kN]	0,40	0,40 -	0,61[1] -	0,70 -	0,84 -	1,06 -	1,33 -	1,55 -	1,55 -	1,55 -	1,55 -	1,55 -
	0,50	0,40 -	0,61[1] -	0,70 -	0,84 -	1,06 -	1,33 -	1,57[1] -	1,57[1] -	1,57[1] -	1,57[1] -	- -
	0,55	0,40 -	0,61[1] -	0,70 -	0,84 -	1,06 -	1,33 -	1,57[1] -	1,57[1] -	1,57[1] -	1,57[1] -	- -
	0,63	0,40 -	0,61[1] -	0,70 -	0,84 -	1,06 -	1,33 -	1,57[1] -	1,57[1] -	1,57[1] -	1,57[1] -	- -
	0,75	0,40 -	0,61[1] -	0,70 -	0,84 -	1,06 -	1,33 -	1,57[1] -	1,57[1] -	1,57[1] -	- -	- -
	0,88	0,40 -	0,61[1] -	0,70 -	0,84 -	1,06 -	1,33 -	1,57[1] -	1,57[1] -	1,57[1] -	- -	- -
	1,00	0,40 -	0,61[1] -	0,70 -	0,84 -	1,06 -	1,33 -	1,57[1] -	1,57[1] -	- -	- -	- -
	1,13	0,40 -	0,61[1] -	0,70 -	0,84 -	1,06 -	1,33 -	1,57[1] -	- -	- -	- -	- -
	1,25	0,40 -	0,61[1] -	0,70 -	0,84 -	1,06 -	1,33 -	- -	- -	- -	- -	- -
	1,50	0,40 -	0,61[1] -	0,70 -	0,84 -	- -	- -	- -	- -	- -	- -	- -
	1,75	0,40 -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
$N_{R,k,II}$		0,40 -	0,61[1] -	0,70 -	0,84 -	1,06 -	1,33 -	1,57[1] -	1,57[1] -	1,57[1] -	1,57[1] -	1,57[1] -

[1] if component I and component II are made of S320GD to S350GD the values may be increased by 8.3%.

Self-drilling screw

KDH1 4,8 x L

Annex 5

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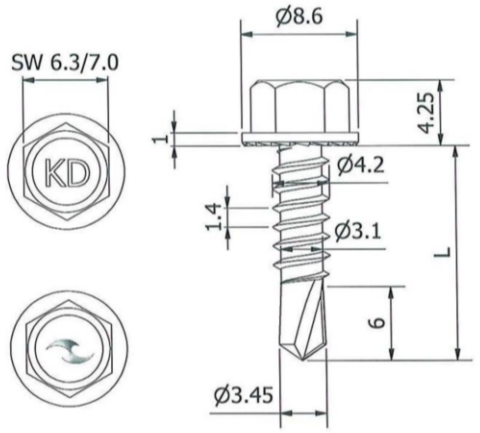


Materials

Fastener:	Stainless steel 1.4301- EN 10088
Washer:	no washer
Component I:	S280GD to S350GD - EN 10346
Component II:	S280GD to S350GD - EN 10346 S235 – EN 10025-2

Drilling-capacity $\Sigma(t_I + t_{II}) \leq 3.50$ mm

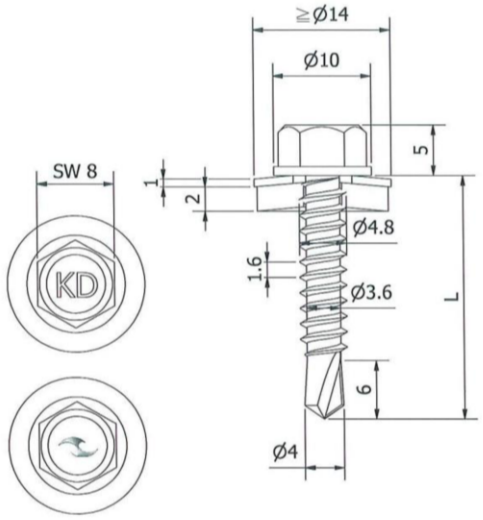
Component I S280 GD to S350 GD - 10346 t I [mm]		Component II S280 GD to S350 GD – EN 10346, S235 – EN 10025-2 t II [mm]										
		0,40	0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	1,50	2,00
$V_{R,k}$ [kN]	0,40	0,58 -	0,58 -	0,58 -	0,58 -	0,58 -	0,58 -	0,58 -	0,58 -	0,58 -	0,58 -	0,58 -
	0,50	0,58 -	0,96 -	0,96 -	0,96 -	0,96 -	0,96 -	0,96 -	0,96 -	0,96 -	0,96 -	0,96 -
	0,55	0,58 -	0,96 -	1,10 -	1,10 -	1,10 -	1,10 -	1,10 -	1,10 -	1,10 -	1,10 -	1,10 -
	0,63	0,58 -	0,96 -	1,10 -	1,33 -	1,33 -	1,33 -	1,33 -	1,33 -	1,33 -	1,33 -	1,33 -
	0,75	0,58 -	0,96 -	1,10 -	1,33 -	1,67 -	1,67 -	1,67 -	1,67 -	1,67 -	1,67 -	1,67 -
	0,88	0,58 -	0,96 -	1,10 -	1,33 -	1,67 -	2,11 -	2,11 -	2,11 -	2,11 -	2,11 -	2,11 -
	1,00	0,58 -	0,96 -	1,10 -	1,33 -	1,67 -	2,11 -	2,52 -	2,52 -	2,52 -	2,52 -	2,52 -
	1,13	0,58 -	0,96 -	1,10 -	1,33 -	1,67 -	2,11 -	2,52 -	2,95 -	2,95 -	2,95 -	2,95 -
	1,25	0,58 -	0,96 -	1,10 -	1,33 -	1,67 -	2,11 -	2,52 -	2,95 -	3,34 -	3,34 -	3,34 -
	1,50	0,58 -	0,96 -	1,10 -	1,33 -	1,67 -	2,11 -	2,52 -	2,95 -	3,34 -	4,16 -	4,16 -
	1,75	0,58 -	0,96 -	1,10 -	1,33 -	1,67 -	2,11 -	2,52 -	2,95 -	3,34 -	4,16 -	- -
	2,00	0,58 -	0,96 -	1,10 -	1,33 -	1,67 -	2,11 -	2,52 -	2,95 -	3,34 -	4,16 -	- -
$N_{R,k}$ [kN]	0,40	0,31 -	0,40 -	0,45 -	0,54 -	0,67 -	0,85 -	1,01 -	1,01 -	1,01 -	1,01 -	1,01 -
	0,50	0,31 -	0,40 -	0,45 -	0,54 -	0,67 -	0,85 -	1,01 -	1,01 -	1,01 -	1,01 -	1,01 -
	0,55	0,31 -	0,40 -	0,45 -	0,54 -	0,67 -	0,85 -	1,01 -	1,01 -	1,01 -	1,01 -	1,01 -
	0,63	0,31 -	0,40 -	0,45 -	0,54 -	0,67 -	0,85 -	1,01 -	1,01 -	1,01 -	1,01 -	1,01 -
	0,75	0,31 -	0,40 -	0,45 -	0,54 -	0,67 -	0,85 -	1,01 -	1,01 -	1,01 -	1,01 -	1,01 -
	0,88	0,31 -	0,40 -	0,45 -	0,54 -	0,67 -	0,85 -	1,01 -	1,01 -	1,01 -	1,01 -	1,01 -
	1,00	0,31 -	0,40 -	0,45 -	0,54 -	0,67 -	0,85 -	1,01 -	1,01 -	1,01 -	1,01 -	1,01 -
	1,13	0,31 -	0,40 -	0,45 -	0,54 -	0,67 -	0,85 -	1,01 -	1,01 -	1,01 -	1,01 -	1,01 -
	1,25	0,31 -	0,40 -	0,45 -	0,54 -	0,67 -	0,85 -	1,01 -	1,01 -	1,01 -	1,01 -	1,01 -
	1,50	0,31 -	0,40 -	0,45 -	0,54 -	0,67 -	0,85 -	1,01 -	1,01 -	1,01 -	1,01 -	1,01 -
	1,75	0,31 -	0,40 -	0,45 -	0,54 -	0,67 -	0,85 -	1,01 -	1,01 -	1,01 -	1,01 -	- -
	2,00	0,31 -	0,40 -	0,45 -	0,54 -	0,67 -	0,85 -	1,01 -	1,01 -	1,01 -	1,01 -	- -
	$N_{R,k,II}$	0,31 -	0,40 -	0,45 -	0,54 -	0,67 -	0,85 -	1,01 -	1,01 -	1,01 -	1,01 -	1,01 -

Self-drilling screw

KDH2 4,2 x L

Annex 6

Deutsches Institut für Bautechnik DIBt



Materials

Fastener:	Stainless steel 1.4301- EN 10088
Washer:	Stainless steel 1.4301- EN 10088 with vulcanized EPDM-seal
Component I:	S280GD to S350GD - EN 10346
Component II:	S280GD to S350GD - EN 10346 S235 – EN 10025-2

Drilling-capacity $\Sigma(t_I + t_{II}) \leq 3.50$ mm

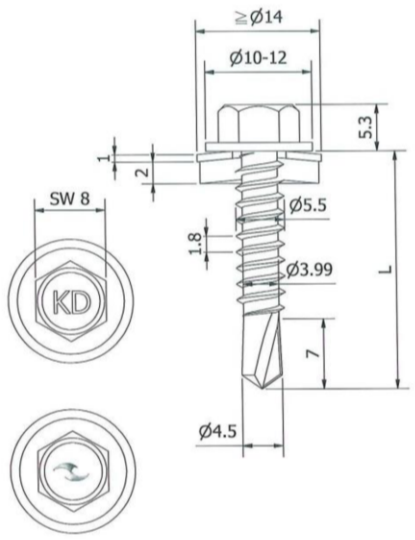
Component I S280 GD to S350 GD - 10346 t I [mm]		Component II S280 GD to S350 GD – EN 10346, S235 – EN 10025-2 t II [mm]										
		0,40	0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	1,50	2,00
$V_{R,k}$ [kN]	0,40	0,56 -	0,56 -	0,56 -	0,56 -	0,56 -	0,56 -	0,56 -	0,56 -	0,56 -	0,56 -	0,56 -
	0,50	0,56 -	0,85 -	0,85 -	0,85 -	0,85 -	0,85 -	0,85 -	0,85 -	0,85 -	0,85 -	0,85 -
	0,55	0,56 -	0,85 -	0,97 -	0,97 -	0,97 -	0,97 -	0,97 -	0,97 -	0,97 -	0,97 -	0,97 -
	0,63	0,56 -	0,85 -	0,97 -	1,17 -	1,17 -	1,17 -	1,17 -	1,17 -	1,17 -	1,17 -	1,17 -
	0,75	0,56 -	0,85 -	0,97 -	1,17 -	1,47 -	1,47 -	1,47 -	1,47 -	1,47 -	1,47 -	1,47 -
	0,88	0,56 -	0,85 -	0,97 -	1,17 -	1,47 -	2,13 -	2,13 -	2,13 -	2,13 -	2,13 -	2,13 -
	1,00	0,56 -	0,85 -	0,97 -	1,17 -	1,47 -	2,13 -	2,74 -	2,74 -	2,74 -	2,74 -	2,74 -
	1,13	0,56 -	0,85 -	0,97 -	1,17 -	1,47 -	2,13 -	2,74 -	3,30 -	3,30 -	3,30 -	3,30 -
	1,25	0,56 -	0,85 -	0,97 -	1,17 -	1,47 -	2,13 -	2,74 -	3,30 -	3,82 -	3,82 -	3,82 -
	1,50	0,56 -	0,85 -	0,97 -	1,17 -	1,47 -	2,13 -	2,74 -	3,30 -	3,82 -	4,90 -	4,90 -
	1,75	0,56 -	0,85 -	0,97 -	1,17 -	1,47 -	2,13 -	2,74 -	3,30 -	3,82 -	4,90 -	- -
	2,00	0,56 -	0,85 -	0,97 -	1,17 -	1,47 -	2,13 -	2,74 -	3,30 -	3,82 -	4,90 -	- -
$N_{R,k}$ [kN]	0,40	0,31 -	0,33 -	0,41 -	0,47 -	0,57 -	0,82 -	1,06 -	1,06 -	1,06 -	1,06 -	1,06 -
	0,50	0,31 -	0,33 -	0,41 -	0,47 -	0,57 -	0,82 -	1,06 -	1,06 -	1,06 -	1,06 -	1,06 -
	0,55	0,31 -	0,33 -	0,41 -	0,47 -	0,57 -	0,82 -	1,06 -	1,06 -	1,06 -	1,06 -	1,06 -
	0,63	0,31 -	0,33 -	0,41 -	0,47 -	0,57 -	0,82 -	1,06 -	1,06 -	1,06 -	1,06 -	1,06 -
	0,75	0,31 -	0,33 -	0,41 -	0,47 -	0,57 -	0,82 -	1,06 -	1,06 -	1,06 -	1,06 -	1,06 -
	0,88	0,31 -	0,33 -	0,41 -	0,47 -	0,57 -	0,82 -	1,06 -	1,06 -	1,06 -	1,06 -	1,06 -
	1,00	0,31 -	0,33 -	0,41 -	0,47 -	0,57 -	0,82 -	1,06 -	1,06 -	1,06 -	1,06 -	1,06 -
	1,13	0,31 -	0,33 -	0,41 -	0,47 -	0,57 -	0,82 -	1,06 -	1,06 -	1,06 -	1,06 -	1,06 -
	1,25	0,31 -	0,33 -	0,41 -	0,47 -	0,57 -	0,82 -	1,06 -	1,06 -	1,06 -	1,06 -	1,06 -
	1,50	0,31 -	0,33 -	0,41 -	0,47 -	0,57 -	0,82 -	1,06 -	1,06 -	1,06 -	1,06 -	1,06 -
	1,75	0,31 -	0,33 -	0,41 -	0,47 -	0,57 -	0,82 -	1,06 -	1,06 -	1,06 -	1,06 -	- -
	2,00	0,31 -	0,33 -	0,41 -	0,47 -	0,57 -	0,82 -	1,06 -	1,06 -	1,06 -	1,06 -	- -
	$N_{R,k,II}$	0,31 -	0,33 -	0,41 -	0,47 -	0,57 -	0,82 -	1,06 -	1,06 -	1,06 -	1,06 -	1,06 -

Self-drilling screw

KDH2 4,8 x L

Annex 7

Deutsches Institut für Bautechnik DIBt



Materials

Fastener:	Stainless steel 1.4301- EN 10088
Washer:	Stainless steel 1.4301- EN 10088 with vulcanized EPDM-seal
Component I:	S280GD to S350GD - EN 10346
Component II:	S280GD to S350GD - EN 10346 S235 to S355 – EN 10025-2

Drilling-capacity $\Sigma(t_I + t_{II}) \leq 3.50$ mm

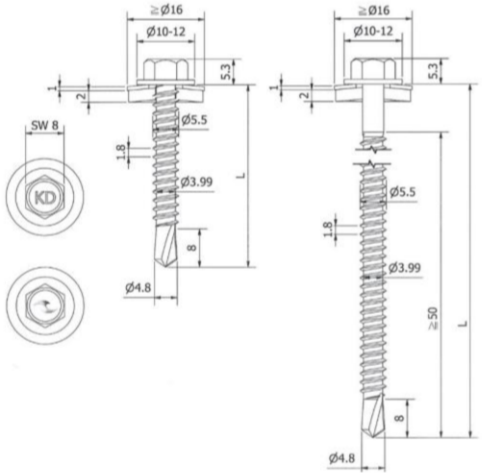
Component I S280 GD to S350 GD - 10346 t I [mm]		Component II S280 GD to S350 GD – EN 10346, S235 – EN 10025-2 t II [mm]										
		0,40	0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	1,50	≥ 2,00
$V_{R,k}$ [kN]	0,40	0,59 -	0,59 -	0,59 -	0,59 -	0,59 -	0,59 -	0,59 -	0,59 -	0,59 -	0,59 -	0,59 -
	0,50	0,59 -	0,77 -	0,77 -	0,77 -	0,77 -	0,77 -	0,77 -	0,77 -	0,77 -	0,77 -	0,77 -
	0,55	0,59 -	0,77 -	0,92 -	0,92 -	0,92 -	0,92 -	0,92 -	0,92 -	0,92 -	0,92 -	0,92 -
	0,63	0,59 -	0,77 -	0,92 -	1,16 -	1,16 -	1,16 -	1,16 -	1,16 -	1,16 -	1,16 -	1,16 -
	0,75	0,59 -	0,77 -	0,92 -	1,16 -	1,52 -	1,52 -	1,52 -	1,52 -	1,52 -	1,52 -	1,52 -
	0,88	0,59 -	0,77 -	0,92 -	1,16 -	1,52 -	2,03 -	2,03 -	2,03 -	2,03 -	2,03 -	2,03 -
	1,00	0,59 -	0,77 -	0,92 -	1,16 -	1,52 -	2,03 -	2,50 -	2,50 -	2,50 -	2,50 -	2,50 -
	1,13	0,59 -	0,77 -	0,92 -	1,16 -	1,52 -	2,03 -	2,50 -	3,03 -	3,03 -	3,03 -	3,03 -
	1,25	0,59 -	0,77 -	0,92 -	1,16 -	1,52 -	2,03 -	2,50 -	3,03 -	3,52 -	3,52 -	3,52 -
	1,50	0,59 -	0,77 -	0,92 -	1,16 -	1,52 -	2,03 -	2,50 -	3,03 -	3,52 -	4,54 -	4,54 -
	1,75	0,59 -	0,77 -	0,92 -	1,16 -	1,52 -	2,03 -	2,50 -	3,03 -	3,52 -	4,54 -	- -
	2,00	0,59 -	0,77 -	0,92 -	1,16 -	1,52 -	2,03 -	2,50 -	3,03 -	3,52 -	4,54 -	- -
$N_{R,k}$ [kN]	0,40	0,34 -	0,47 -	0,52 -	0,60 -	0,72 -	0,95 -	1,16 -	1,45 -	1,52 -	1,52 -	1,52 -
	0,50	0,34 -	0,47 -	0,52 -	0,60 -	0,72 -	0,95 -	1,16 -	1,45 -	1,73 -	1,86 -	1,86 -
	0,55	0,34 -	0,47 -	0,52 -	0,60 -	0,72 -	0,95 -	1,16 -	1,45 -	1,73 -	2,21 -	2,21 -
	0,63	0,34 -	0,47 -	0,52 -	0,60 -	0,72 -	0,95 -	1,16 -	1,45 -	1,73 -	2,29 -	2,76 -
	0,75	0,34 -	0,47 -	0,52 -	0,60 -	0,72 -	0,95 -	1,16 -	1,45 -	1,73 -	2,29 -	3,13 -
	0,88	0,34 -	0,47 -	0,52 -	0,60 -	0,72 -	0,95 -	1,16 -	1,45 -	1,73 -	2,29 -	3,13 -
	1,00	0,34 -	0,47 -	0,52 -	0,60 -	0,72 -	0,95 -	1,16 -	1,45 -	1,73 -	2,29 -	3,13 -
	1,13	0,34 -	0,47 -	0,52 -	0,60 -	0,72 -	0,95 -	1,16 -	1,45 -	1,73 -	2,29 -	3,13 -
	1,25	0,34 -	0,47 -	0,52 -	0,60 -	0,72 -	0,95 -	1,16 -	1,45 -	1,73 -	2,29 -	3,13 -
	1,50	0,34 -	0,47 -	0,52 -	0,60 -	0,72 -	0,95 -	1,16 -	1,45 -	1,73 -	2,29 -	3,13 -
	1,75	0,34 -	0,47 -	0,52 -	0,60 -	0,72 -	0,95 -	1,16 -	1,45 -	1,73 -	2,29 -	- -
	2,00	0,34 -	0,47 -	0,52 -	0,60 -	0,72 -	0,95 -	1,16 -	1,45 -	1,73 -	2,29 -	- -
	$N_{R,k,II}$	0,34 -	0,47 -	0,52 -	0,60 -	0,72 -	0,95 -	1,16 -	1,45 -	1,73 -	2,29 -	3,13 -

Self-drilling screw

KDH2 5,5 x L

Annex 8

Deutsches Institut für Bautechnik DIBt



Materials

Fastener:	Stainless steel 1.4301- EN 10088
Washer:	Stainless steel 1.4301- EN 10088 with vulcanized EPDM-seal
Component I:	S280GD to S350GD - EN 10346
Component II:	S280GD to S350GD - EN 10346 S235 – EN 10025-2

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

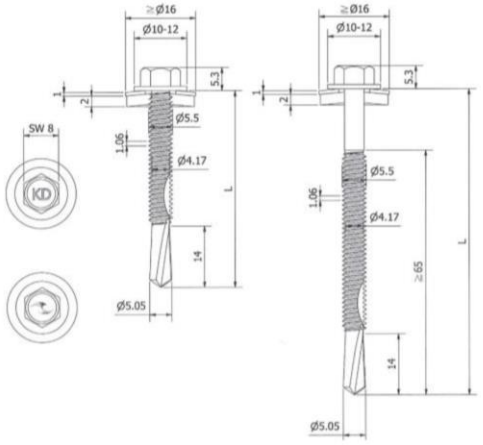
		Component II					
		S280 GD to S350 GD – EN 10346, S235 – EN 10025-2 t II [mm]					
		1,50	2,00	2,50	3,00	4,00	2x1,50
Component I S280 GD to S350 GD - 10346 t I [mm]	$V_{R,k}$ [kN]						
	0,40	1,36 ac	1,36 ac	1,36 ac	1,36 ac	1,36 ac	1,36 ac
	0,50	1,76 ac	1,76 ac	1,76 ac	1,76 ac	1,76 ac	1,76 ac
	0,55	1,96 ac	1,96 ac	1,96 ac	1,96 ac	1,96 ac	1,96 ac
	0,63	2,28 ac	2,28 ac	2,28 ac	2,28 ac	2,28 ac	2,28 ac
	0,75	2,76 ac	2,76 ac	2,76 ac	2,76 ac	2,76 ac	2,76 ac
	0,88	2,96 ac	2,96 ac	2,96 ac	2,96 ac	2,96 ac	3,24 ac
	1,00	3,15 ac	3,15 ac	3,15 ac	3,15 ac	3,15 ac	3,68 ac
	1,13	3,15 -	3,15 -	3,15 -	3,15 -	3,15 -	3,68 -
	1,25	3,15 -	3,15 -	3,15 -	3,15 -	3,15 -	3,68 -
	1,50	3,15 -	3,15 -	3,15 -	3,15 -	3,15 -	3,68 -
	1,75	3,15 -	3,15 -	3,15 -	3,15 -	3,15 -	3,68 -
	2,00	3,15 -	3,15 -	3,15 -	3,15 -	3,15 -	3,68 -
	$N_{R,k}$ [kN]						
	0,40	1,91 ac	1,92 ac	1,92 ac	1,92 ac	1,92 ac	1,92 ac
	0,50	1,91 ac	1,95 ac	1,95 ac	1,95 ac	1,95 ac	1,95 ac
	0,55	1,91 ac	2,36 ac	2,36 ac	2,36 ac	2,36 ac	2,36 ac
	0,63	1,91 ac	3,02 ac	3,02 ac	3,02 ac	3,02 ac	3,02 ac
	0,75	1,91 ac	3,07 ac	4,01 ac	4,01 ac	4,01 ac	4,01 ac
	0,88	1,91 ac	3,07 ac	4,01 ac	4,01 ac	4,01 ac	4,01 ac
	1,00	1,91 ac	3,07 ac	4,01 ac	4,01 ac	4,01 ac	4,01 ac
	1,13	1,91 -	3,07 -	4,01 -	4,01 -	4,01 -	4,01 -
	1,25	1,91 -	3,07 -	4,01 -	4,01 -	4,01 -	4,01 -
	1,50	1,91 -	3,07 -	4,01 -	4,01 -	4,01 -	4,01 -
	1,75	1,91 -	3,07 -	4,01 -	4,01 -	4,01 -	4,01 -
	2,00	1,91 -	3,07 -	4,01 -	4,01 -	4,01 -	4,01 -
	$N_{R,k,II}$	1,91 -	3,07 -	4,09 -	5,10 -	5,10 -	4,26 -

Self-drilling screw

KDH3 5,5 x L

Annex 9

Deutsches Institut für Bautechnik DIBt



Materials

Fastener:	Stainless steel 1.4301- EN 10088
Washer:	Stainless steel 1.4301- EN 10088 with vulcanized EPDM-seal
Component I:	S280GD to S350GD - EN 10346
Component II:	S280GD to S350GD - EN 10346 S235 – EN 10025-2

Drilling-capacity $\Sigma(t_I + t_{II}) \leq 12.50$ mm

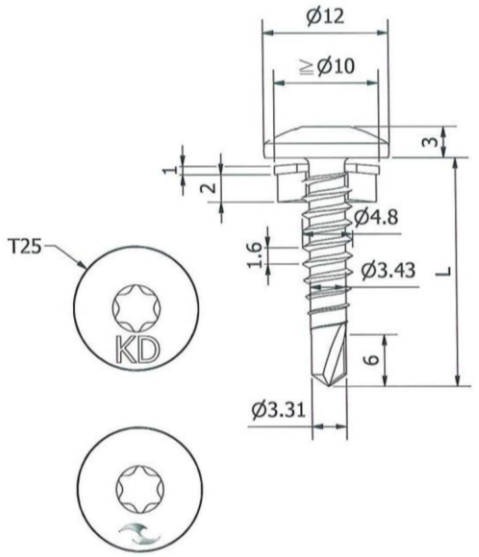
Component I S280 GD to S350 GD - 10346 t I [mm]		Component II S280 GD to S350 GD – EN 10346, S235 – EN 10025-2 t II [mm] 4,00	6,00	8,00	10,00
$V_{R,k}$ [kN]	0,40	1,10 abcd	1,10 abcd	1,10 abcd	1,10 abcd
	0,50	2,04 abcd	2,04 abcd	2,04 abcd	2,04 abcd
	0,55	2,24 abcd	2,24 abcd	2,24 abcd	2,24 abcd
	0,63	2,55 abcd	2,55 abcd	2,55 abcd	2,55 abcd
	0,75	3,02 abcd	3,02 abcd	3,02 abcd	3,02 abcd
	0,88	3,88 abcd	3,88 abcd	3,88 abcd	3,88 abcd
	1,00	4,68 abcd	4,68 abcd	4,68 abcd	4,68 abcd
	1,13	4,68 -	4,68 -	4,68 -	4,68 -
	1,25	4,68 -	4,68 -	4,68 -	4,68 -
	1,50	4,68 -	4,68 -	4,68 -	4,68 -
	1,75	4,68 -	4,68 -	4,68 -	4,68 -
	2,00	4,68 -	4,68 -	4,68 -	4,68 -
$N_{R,k}$ [kN]	0,40	1,55 abcd	1,55 abcd	1,55 abcd	1,55 abcd
	0,50	1,78 abcd	1,78 abcd	1,78 abcd	1,78 abcd
	0,55	2,26 abcd	2,26 abcd	2,26 abcd	2,26 abcd
	0,63	3,03 abcd	3,03 abcd	3,03 abcd	3,03 abcd
	0,75	4,19 abcd	4,19 abcd	4,19 abcd	4,19 abcd
	0,88	4,19 abcd	4,19 abcd	4,19 abcd	4,19 abcd
	1,00	4,19 abcd	4,19 abcd	4,19 abcd	4,19 abcd
	1,13	4,19 -	4,19 -	4,19 -	4,19 -
	1,25	4,19 -	4,19 -	4,19 -	4,19 -
	1,50	4,19 -	4,19 -	4,19 -	4,19 -
	1,75	4,19 -	4,19 -	4,19 -	4,19 -
	2,00	4,19 -	4,19 -	4,19 -	4,19 -
	$N_{R,k,II}$	5,42 -	5,42 -	5,42 -	5,42 -

Self-drilling screw

KDH5 5,5 x L

Annex 10

Deutsches Institut für Bautechnik DIBt



Materials

Fastener:	Stainless steel 1.4567- EN 10088
Washer:	Stainless steel 1.4301- EN 10088 with vulcanized EPDM-seal
Component I:	S280GD to S350GD - EN 10346
Component II:	S280GD to S350GD - EN 10346 S235 – EN 10025-2

Drilling-capacity $\Sigma(t_I + t_{II}) \leq 2.20$ mm

Component I S280 GD to S350 GD - 10346 t I [mm]		Component II S280 GD to S350 GD – EN 10346, S235 – EN 10025-2 t II [mm]										
		0,40	0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	1,50	1,75
$V_{R,k}$ [kN]	0,40	0,71 -	0,71 -	0,71 -	0,71 -	0,71 -	0,71 -	0,71 -	0,71 -	0,71 -	0,71 -	0,71 -
	0,50	0,71 -	0,81[1] -	0,81[1] -	0,81[1] -	0,81[1] -	0,81[1] -	0,81[1] -	0,81[1] -	0,81[1] -	0,81[1] -	- -
	0,55	0,71 -	0,81[1] -	0,95 -	0,95 -	0,95 -	0,95 -	0,95 -	0,95 -	0,95 -	0,95 -	- -
	0,63	0,71 -	0,81[1] -	0,95 -	1,17 -	1,17 -	1,17 -	1,17 -	1,17 -	1,17 -	- -	- -
	0,75	0,71 -	0,81[1] -	0,95 -	1,17 -	1,51 -	1,51 -	1,51 -	1,51 -	1,51 -	- -	- -
	0,88	0,71 -	0,81[1] -	0,95 -	1,17 -	1,51 -	2,20 -	2,20 -	2,20 -	2,20 -	- -	- -
	1,00	0,71 -	0,81[1] -	0,95 -	1,17 -	1,51 -	2,20 -	2,84[1] -	2,84[1] -	- -	- -	- -
	1,13	0,71 -	0,81[1] -	0,95 -	1,17 -	1,51 -	2,20 -	2,84[1] -	- -	- -	- -	- -
	1,25	0,71 -	0,81[1] -	0,95 -	1,17 -	1,51 -	2,20 -	- -	- -	- -	- -	- -
	1,50	0,71 -	0,81[1] -	0,95 -	1,17 -	- -	- -	- -	- -	- -	- -	- -
	1,75	0,71 -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
$N_{R,k}$ [kN]	0,40	0,41 -	0,59[1] -	0,68 -	0,81 -	1,02 -	1,28 -	1,28 -	1,28 -	1,28 -	1,28 -	1,28 -
	0,50	0,41 -	0,59[1] -	0,68 -	0,81 -	1,02 -	1,30 -	1,56[1] -	1,56[1] -	1,56[1] -	1,56[1] -	- -
	0,55	0,41 -	0,59[1] -	0,68 -	0,81 -	1,02 -	1,30 -	1,56[1] -	1,56[1] -	1,56[1] -	1,56[1] -	- -
	0,63	0,41 -	0,59[1] -	0,68 -	0,81 -	1,02 -	1,30 -	1,56[1] -	1,56[1] -	1,56[1] -	- -	- -
	0,75	0,41 -	0,59[1] -	0,68 -	0,81 -	1,02 -	1,30 -	1,56[1] -	1,56[1] -	1,56[1] -	- -	- -
	0,88	0,41 -	0,59[1] -	0,68 -	0,81 -	1,02 -	1,30 -	1,56[1] -	1,56[1] -	1,56[1] -	- -	- -
	1,00	0,41 -	0,59[1] -	0,68 -	0,81 -	1,02 -	1,30 -	1,56[1] -	1,56[1] -	- -	- -	- -
	1,13	0,41 -	0,59[1] -	0,68 -	0,81 -	1,02 -	1,30 -	1,56[1] -	- -	- -	- -	- -
	1,25	0,41 -	0,59[1] -	0,68 -	0,81 -	1,02 -	1,30 -	- -	- -	- -	- -	- -
	1,50	0,41 -	0,59[1] -	0,68 -	0,81 -	- -	- -	- -	- -	- -	- -	- -
	1,75	0,41 -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	$N_{R,k,II}$	0,41 -	0,59[1] -	0,68 -	0,81 -	1,02 -	1,30 -	1,56[1] -	1,56[1] -	1,56[1] -	1,56[1] -	1,56[1] -

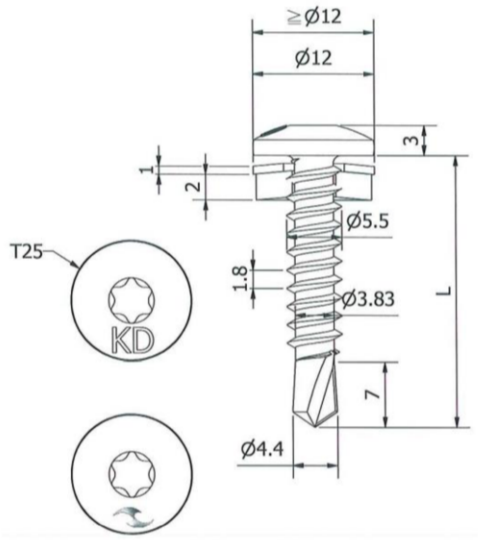
[1] if component I and component II are made of S320GD S350GD the values may be increased by 8.3%.

Self-drilling screw

KDT1 4,8 x L

Annex 11

Deutsches Institut für Bautechnik DIBt



Materials

Fastener:	Stainless steel 1.4567- EN 10088
Washer:	Stainless steel 1.4301- EN 10088 with vulcanized EPDM-seal
Component I:	S280GD to S350GD - EN 10346
Component II:	S280GD to S350GD - EN 10346 S235 to S355 – EN 10025-2

Drilling-capacity $\Sigma(t_I + t_{II}) \leq 3.50$ mm

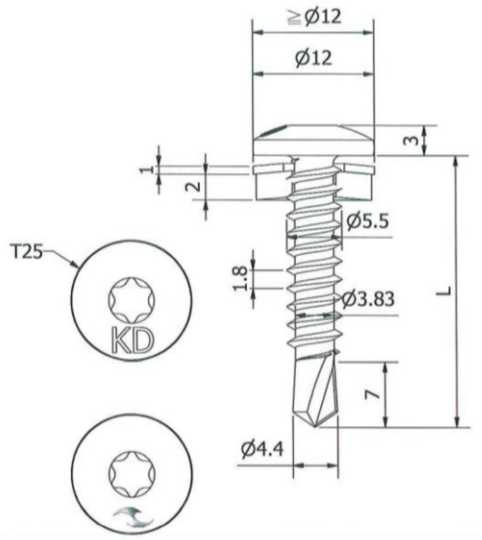
Component I S280 GD to S350 GD - 10346 t I [mm]		Component II S280 GD to S350 GD – EN 10346, S235 – EN 10025-2 t II [mm]										
		0,40	0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	1,50	2,00
$V_{R,k}$ [kN]	0,40	0,64 -	0,64 -	0,64 -	0,64 -	0,64 -	0,64 -	0,64 -	0,64 -	0,64 -	0,64 -	0,64 -
	0,50	0,64 -	0,87 -	0,87 -	0,87 -	0,87 -	0,87 -	0,87 -	0,87 -	0,87 -	0,87 -	0,87 -
	0,55	0,64 -	0,87 -	1,02 -	1,02 -	1,02 -	1,02 -	1,02 -	1,02 -	1,02 -	1,02 -	1,02 -
	0,63	0,64 -	0,87 -	1,02 -	1,27 -	1,27 -	1,27 -	1,27 -	1,27 -	1,27 -	1,27 -	1,27 -
	0,75	0,64 -	0,87 -	1,02 -	1,27 -	1,63 -	1,63 -	1,63 -	1,63 -	1,63 -	1,63 -	1,63 -
	0,88	0,64 -	0,87 -	1,02 -	1,27 -	1,63 -	2,03 -	2,03 -	2,03 -	2,03 -	2,03 -	2,03 -
	1,00	0,64 -	0,87 -	1,02 -	1,27 -	1,63 -	2,03 -	2,40 -	2,40 -	2,40 -	2,40 -	2,40 -
	1,13	0,64 -	0,87 -	1,02 -	1,27 -	1,63 -	2,03 -	2,40 -	2,40 -	2,40 -	2,40 -	2,40 -
	1,25	0,64 -	0,87 -	1,02 -	1,27 -	1,63 -	2,03 -	2,40 -	2,40 -	2,40 -	2,40 -	2,40 -
	1,50	0,64 -	0,87 -	1,02 -	1,27 -	1,63 -	2,03 -	2,40 -	2,40 -	2,40 -	2,40 -	2,40 -
	1,75	0,64 -	0,87 -	1,02 -	1,27 -	1,63 -	2,03 -	2,40 -	2,40 -	2,40 -	2,40 -	- -
	2,00	0,64 -	0,87 -	1,02 -	1,27 -	1,63 -	2,03 -	2,40 -	2,40 -	2,40 -	2,40 -	- -
$N_{R,k}$ [kN]	0,40	0,37 -	0,49 -	0,56 -	0,66 -	0,82 -	1,05 -	1,27 -	1,27 -	1,27 -	1,27 -	1,27 -
	0,50	0,37 -	0,49 -	0,56 -	0,66 -	0,82 -	1,05 -	1,27 -	1,27 -	1,27 -	1,27 -	1,27 -
	0,55	0,37 -	0,49 -	0,56 -	0,66 -	0,82 -	1,05 -	1,27 -	1,27 -	1,27 -	1,27 -	1,27 -
	0,63	0,37 -	0,49 -	0,56 -	0,66 -	0,82 -	1,05 -	1,27 -	1,27 -	1,27 -	1,27 -	1,27 -
	0,75	0,37 -	0,49 -	0,56 -	0,66 -	0,82 -	1,05 -	1,27 -	1,27 -	1,27 -	1,27 -	1,27 -
	0,88	0,37 -	0,49 -	0,56 -	0,66 -	0,82 -	1,05 -	1,27 -	1,27 -	1,27 -	1,27 -	1,27 -
	1,00	0,37 -	0,49 -	0,56 -	0,66 -	0,82 -	1,05 -	1,27 -	1,27 -	1,27 -	1,27 -	1,27 -
	1,13	0,37 -	0,49 -	0,56 -	0,66 -	0,82 -	1,05 -	1,27 -	1,27 -	1,27 -	1,27 -	1,27 -
	1,25	0,37 -	0,49 -	0,56 -	0,66 -	0,82 -	1,05 -	1,27 -	1,27 -	1,27 -	1,27 -	1,27 -
	1,50	0,37 -	0,49 -	0,56 -	0,66 -	0,82 -	1,05 -	1,27 -	1,27 -	1,27 -	1,27 -	1,27 -
	1,75	0,37 -	0,49 -	0,56 -	0,66 -	0,82 -	1,05 -	1,27 -	1,27 -	1,27 -	1,27 -	- -
	2,00	0,37 -	0,49 -	0,56 -	0,66 -	0,82 -	1,05 -	1,27 -	1,27 -	1,27 -	1,27 -	- -
	$N_{R,k,II}$	0,37 -	0,49 -	0,56 -	0,66 -	0,82 -	1,05 -	1,27 -	1,27 -	1,27 -	1,27 -	1,27 -

Self-drilling screw

KDT2 5,5 x L

Annex 12

Deutsches Institut für Bautechnik DIBt



Materials

Fastener:	Stainless steel 1.4567- EN 10088
Washer:	Stainless steel 1.4301- EN 10088 with vulcanized EPDM-seal
Component I:	S280GD to S350GD - EN 10346
Component II:	S280GD to S350GD - EN 10346 S235 – EN 10025-2

Drilling-capacity $\Sigma(t_I + t_{II}) \leq 3.50$ mm

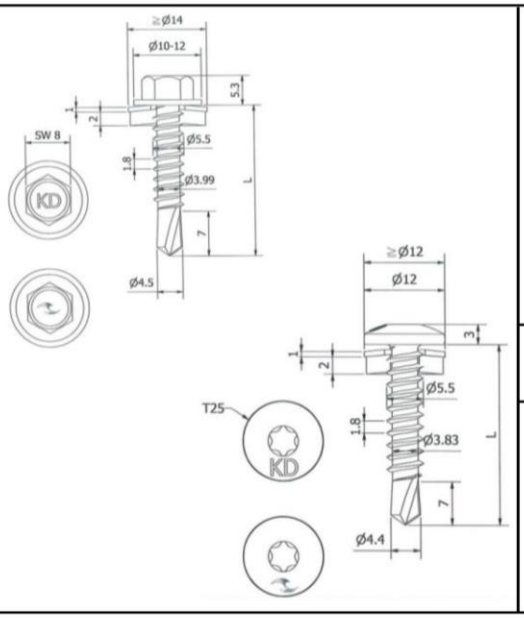
		Component II: S280 GD to S350 GD – EN 10346, S235 – EN 10025-2, t II [mm]								
		2x0,50	2x0,55	2x0,63	2x0,75	2x0,88	2x1,00	2x1,13	2x1,25	2x1,50
Component I: S280 GD to S350 GD - 10346, t I [mm]	$V_{R,k}$ [kN]									
	0,40	1,19 -	1,19 -	1,19 -	1,19 -	1,19 -	1,19 -	1,19 -	1,19 -	1,19 -
	0,50	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -
	0,55	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	- -
	0,63	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	- -
	0,75	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	- -
	0,88	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	- -
	1,00	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	- -
	1,13	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	- -	- -
	1,25	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	- -	- -
	1,50	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	1,62 -	- -	- -	- -
	1,75	1,62 -	1,62 -	1,62 -	1,62 -	- -	- -	- -	- -	- -
	2,00	1,62 -	1,62 -	1,62 -	1,62 -	- -	- -	- -	- -	- -
	$N_{R,k}$ [kN]									
	0,40	1,03 -	1,19 -	1,46 -	1,51 -	1,51 -	1,51 -	1,51 -	1,51 -	1,51 -
	0,50	1,03 -	1,19 -	1,46 -	1,55 -	1,55 -	1,55 -	1,55 -	1,55 -	1,55 -
	0,55	1,03 -	1,19 -	1,46 -	1,85 -	2,04 -	2,04 -	2,04 -	2,04 -	- -
	0,63	1,03 -	1,19 -	1,46 -	1,85 -	2,29 -	2,69 -	2,69 -	2,69 -	- -
	0,75	1,03 -	1,19 -	1,46 -	1,85 -	2,29 -	2,69 -	2,69 -	2,69 -	- -
	0,88	1,03 -	1,19 -	1,46 -	1,85 -	2,29 -	2,69 -	2,69 -	2,69 -	- -
	1,00	1,03 -	1,19 -	1,46 -	1,85 -	2,29 -	2,69 -	2,69 -	2,69 -	- -
	1,13	1,03 -	1,19 -	1,46 -	1,85 -	2,29 -	2,69 -	2,69 -	- -	- -
	1,25	1,03 -	1,19 -	1,46 -	1,85 -	2,29 -	2,69 -	2,69 -	- -	- -
	1,50	1,03 -	1,19 -	1,46 -	1,85 -	2,29 -	2,69 -	- -	- -	- -
	1,75	1,03 -	1,19 -	1,46 -	1,85 -	- -	- -	- -	- -	- -
	2,00	1,03 -	1,19 -	1,46 -	1,85 -	- -	- -	- -	- -	- -
	$N_{R,k,II}$	1,03 -	1,19 -	1,46 -	1,85 -	2,29 -	2,69 -	2,69 -	2,69 -	2,69 -

Self-drilling screw

KDT2 5,5 x L

Annex 13

Deutsches Institut für Bautechnik DIBt



Materials

Fastener:	Stainless steel 1.4301 or 1.4567- EN 10088
Washer:	Stainless steel 1.4301- EN 10088 with vulcanized EPDM-seal
Component I:	Aluminum alloy – EN 573 $R_m \geq 165$ N/mm²
Component II:	Aluminum alloy – EN 573 $R_m \geq 165$ N/mm²

Drilling-capacity $\Sigma(t_I + t_{II}) \leq 4.20$ mm

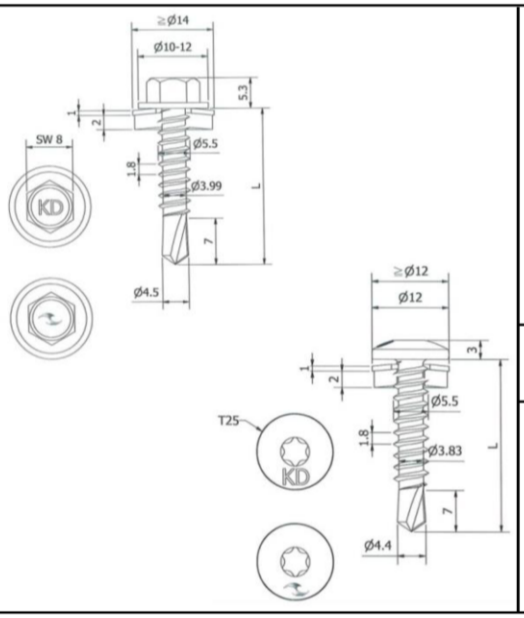
Component I: Aluminum alloy – EN 573, $R_m \geq 165$ N/mm², t I [mm]		Component II: Aluminum alloy – EN 573, $R_m \geq 165$ N/mm², t II [mm]							
		1,50		2,00		2,50		3,00	
$V_{R,k}$ [kN]	0,50	0,47	abcd	0,47	abcd	0,47	abc	0,47	abc
	0,60	0,57	abcd	0,57	abc	0,57	abc	0,57	abc
	0,70	0,68	abcd	0,68	abc	0,68	abc	0,68	a
	0,80	0,78	abcd	0,78	abc	0,78	abc	0,78	a
	0,90	0,92	abc	0,92	abc	0,92	a	0,92	a
	1,00	1,06	abc	1,06	abc	1,06	a	1,06	a
	1,20	1,31	abc	1,31	a	1,31	a	1,31	a
	1,50	1,69	abc	1,69	a	1,69	a	-	-
	2,00	1,69	-	2,64	a	-	-	-	-
$N_{R,k}$ [kN]	0,50	0,41	abcd	0,41	abcd	0,41	abc	0,41	abc
	0,60	0,49	abcd	0,49	abc	0,49	abc	0,49	abc
	0,70	0,56	abcd	0,56	abc	0,56	abc	0,56	a
	0,80	0,64	abcd	0,64	abc	0,64	abc	0,64	a
	0,90	0,68	abc	0,68	abc	0,68	a	0,68	a
	1,00	0,70	abc	0,71	abc	0,71	a	0,71	a
	1,20	0,70	abc	1,00	a	1,03	a	1,03	a
	1,50	0,70	abc	1,00	a	1,52	a	-	-
	2,00	0,70	-	1,00	a	-	-	-	-
	$N_{R,k,II}$	0,70	-	1,00	-	1,69	-	2,38	-

Self-drilling screw

KDH2 5,5 x L - Aluminum
KDT2 5,5 x L - Aluminum

Annex 14

Deutsches Institut für Bautechnik DIBt



Materials

Fastener:	Stainless steel 1.4301 or 1.4567- EN 10088
Washer:	Stainless steel 1.4301- EN 10088 with vulcanized EPDM-seal
Component I:	Aluminum alloy – EN 573 $R_m \geq 215$ N/mm²
Component II:	Aluminum alloy – EN 573 $R_m \geq 215$ N/mm²

Drilling-capacity $\Sigma(t_I + t_{II}) \leq 4.20$ mm

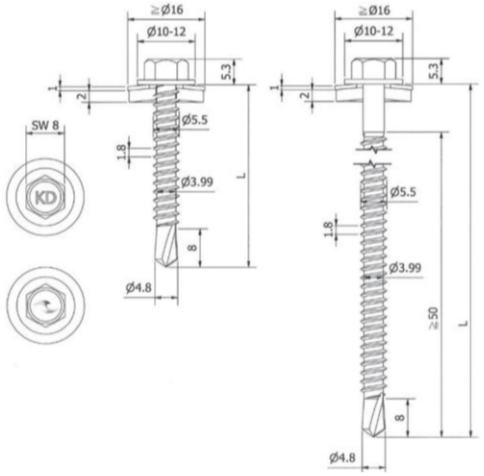
		Component II: Aluminum alloy – EN 573 $R_m \geq 215$ N/mm², t II [mm]							
		1,50		2,00		2,50		3,00	
Component I: Aluminum alloy – EN 573 $R_m \geq 215$ N/mm², t I [mm]	$V_{R,k}$ [kN]								
	0,50	0,62	abcd	0,62	abcd	0,62	abc	0,62	abc
	0,60	0,75	abcd	0,75	abc	0,75	abc	0,75	abc
	0,70	0,89	abcd	0,89	abc	0,89	abc	0,89	a
	0,80	1,02	abcd	1,02	abc	1,02	abc	1,02	a
	0,90	1,21	abc	1,21	abc	1,21	a	1,21	a
	1,00	1,39	abc	1,39	abc	1,39	a	1,39	a
	1,20	1,71	abc	1,71	a	1,71	a	1,71	a
	1,50	2,20	abc	2,20	a	2,20	a	-	-
	2,00	2,20	-	3,44	a	-	-	-	-
	$N_{R,k}$ [kN]								
	0,50	0,53	abcd	0,53	abcd	0,53	abc	0,53	abc
	0,60	0,63	abcd	0,63	abc	0,63	abc	0,63	abc
	0,70	0,73	abcd	0,73	abc	0,73	abc	0,73	a
	0,80	0,83	abcd	0,83	abc	0,83	abc	0,83	a
	0,90	0,87	abc	0,87	abc	0,87	a	0,87	a
	1,00	0,91	abc	0,91	abc	0,91	a	0,91	a
	1,20	0,91	abc	1,30	a	1,34	a	1,34	a
	1,50	0,91	abc	1,30	a	1,98	a	-	-
	2,00	0,91	-	1,30	a	-	-	-	-
	$N_{R,k,II}$	0,91	-	1,30	-	2,20	-	3,10	-

Self-drilling screw

KDH2 5,5 x L - Aluminum
KDT2 5,5 x L - Aluminum

Annex 15

Deutsches Institut für Bautechnik DIBt



Materials

Fastener:	Stainless steel 1.4301- EN 10088
Washer:	Stainless steel 1.4301- EN 10088 with vulcanized EPDM-seal
Component I:	Aluminum alloy – EN 573 $R_m \geq 165$ N/mm²
Component II:	Aluminum alloy – EN 573 $R_m \geq 165$ N/mm²

Drilling-capacity $\Sigma(t_I + t_{II}) \leq 6.50$ mm

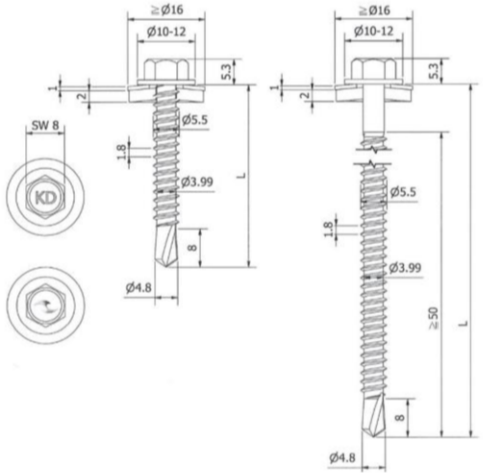
Component I: Aluminum alloy – EN 573, $R_m \geq 165$ N/mm², t I [mm]		Component II: Aluminum alloy – EN 573, $R_m \geq 165$ N/mm², t II [mm]			
		2,00	2,50	3,00	4,00
$V_{R,k}$ [kN]	0,50	0,44 -	0,44 -	0,44 -	0,44 -
	0,60	0,61 -	0,61 -	0,61 -	0,61 -
	0,70	0,78 -	0,78 -	0,78 -	0,78 -
	0,80	0,95 -	0,95 -	0,95 -	0,95 -
	0,90	1,12 -	1,12 -	1,12 -	1,12 -
	1,00	1,28 -	1,28 -	1,28 -	1,28 -
	1,20	1,52 -	1,52 -	1,52 -	1,52 -
	1,50	1,89 -	1,89 -	1,89 -	1,89 -
	2,00	2,35 -	2,35 -	2,35 -	2,35 -
$N_{R,k}$ [kN]	0,50	0,54 -	0,54 -	0,54 -	0,54 -
	0,60	0,71 -	0,71 -	0,71 -	0,71 -
	0,70	0,89 -	0,89 -	0,89 -	0,89 -
	0,80	0,91 -	1,06 -	1,06 -	1,06 -
	0,90	0,91 -	1,15 -	1,15 -	1,15 -
	1,00	0,91 -	1,23 -	1,23 -	1,23 -
	1,20	0,91 -	1,45 -	1,47 -	1,47 -
	1,50	0,91 -	1,45 -	1,83 -	1,83 -
	2,00	0,91 -	1,45 -	1,98 -	3,00 -
	$N_{R,k,II}$	0,91 -	1,45 -	1,98 -	3,24 -

Self-drilling screw

KDH3 5,5 x L - Aluminum

Annex 16

Deutsches Institut für Bautechnik DIBt



Materials

Fastener:	Stainless steel 1.4301- EN 10088
Washer:	Stainless steel 1.4301- EN 10088 with vulcanized EPDM-seal
Component I:	Aluminum alloy – EN 573 $R_m \geq 215$ N/mm²
Component II:	Aluminum alloy – EN 573 $R_m \geq 215$ N/mm²

Drilling-capacity $\Sigma(t_I + t_{II}) \leq 6.50$ mm

Component I: Aluminum alloy – EN 573, $R_m \geq 215$ N/mm², t I [mm]		Component II: Aluminum alloy – EN 573, $R_m \geq 215$ N/mm², t II [mm]			
		2,00	2,50	3,00	4,00
$V_{R,k}$ [kN]	0,50	0,57 -	0,57 -	0,57 -	0,57 -
	0,60	0,79 -	0,79 -	0,79 -	0,79 -
	0,70	1,01 -	1,01 -	1,01 -	1,01 -
	0,80	1,23 -	1,23 -	1,23 -	1,23 -
	0,90	1,45 -	1,45 -	1,45 -	1,45 -
	1,00	1,67 -	1,67 -	1,67 -	1,67 -
	1,20	1,99 -	1,99 -	1,99 -	1,99 -
	1,50	2,46 -	2,46 -	2,46 -	2,46 -
	2,00	3,06 -	3,06 -	3,06 -	3,06 -
$N_{R,k}$ [kN]	0,50	0,70 -	0,70 -	0,70 -	0,70 -
	0,60	0,93 -	0,93 -	0,93 -	0,93 -
	0,70	1,15 -	1,15 -	1,15 -	1,15 -
	0,80	1,19 -	1,38 -	1,38 -	1,38 -
	0,90	1,19 -	1,49 -	1,49 -	1,49 -
	1,00	1,19 -	1,60 -	1,60 -	1,60 -
	1,20	1,19 -	1,89 -	1,92 -	1,92 -
	1,50	1,19 -	1,89 -	2,39 -	2,39 -
	2,00	1,19 -	1,89 -	2,58 -	3,92 -
	$N_{R,k,II}$	1,19 -	1,89 -	2,58 -	4,22 -

Self-drilling screw

KDH3 5,5 x L - Aluminum

Annex 17