



Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments



European Technical Assessment

ETA-11/0191 of 1 June 2022

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	nonut®-TDBL-T-13.4xL, nonut®-TDNL-13.4xL, nonut®-TDBLF-T-13.4xL, nonut®-TDN-13.4xL, nonut®-TDBL-T-10.6xL, nonut®-TDNL-10.6xL, nonut®-TDBLF-T-10.6xL, nonut®-TDN-10.6xL nonut®-TDBL-T-8.6xL, nonut®-TDNL-8.6xL, nonut®-TDBLF-T-8.6xL, nonut®-TDN-8.6xL nonut®-TDBLF-T-F-8.6xL, nonut®-TDN-LH-8.6xL
Product family to which the construction product belongs	Self tapping screws
Manufacturer	SFS Group Schweiz AG Rosenbergsaustrasse 10 CH - 9435 Heerbrugg SCHWEIZ
Manufacturing plant	Plants of SFS Group Schweiz AG
This European Technical Assessment contains	39 pages including 35 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 330046-01-0602
This version replaces	ETA-11/0191 issued on 6 May 2021



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Specific part

1 Technical description of the product

The fastening screws are self-tapping screws made of carbon steel with anticorrosion coating (listed in Annex 1).

The components and the system setup of the product are given in Annex (1-34).

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 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 applications. 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 (1-35).

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 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)



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

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

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

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

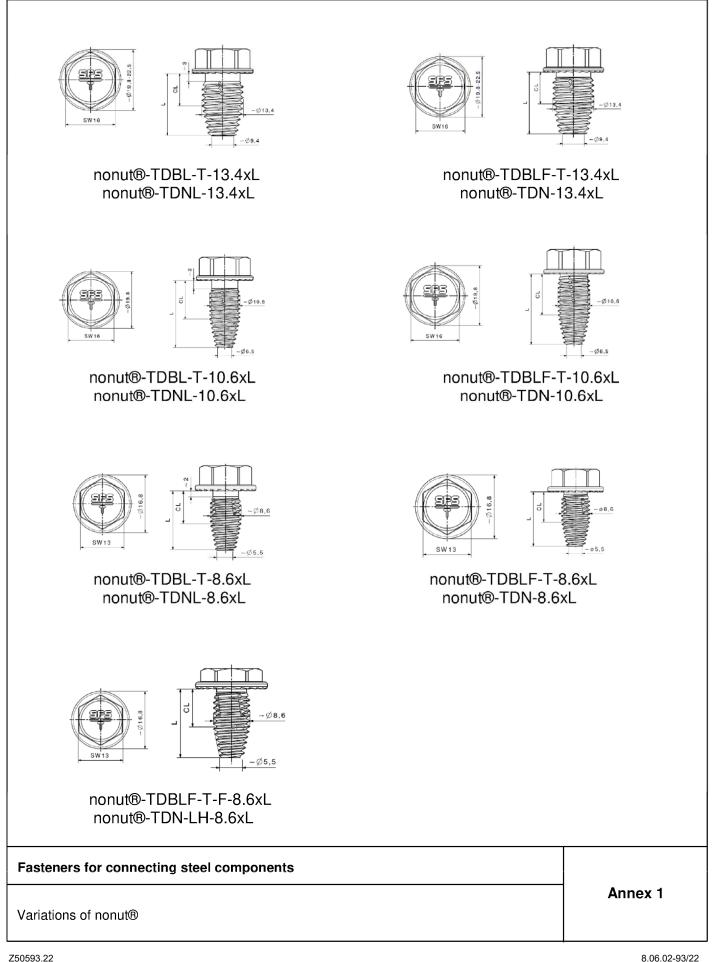
Issued in Berlin on 1 June 2022 by the Deutsches Institut für Bautechnik

BD Dr.-Ing. Ronald Schwuchow Head of Section

beglaubigt: Stojanovic

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Designations a	nd abbreviations used in the Annexes	
Materials and o		
Relevant materi	als and dimensions specified in the nonut® annexes:	
Screw	Material of the nonut®	
Component I	Material of component I (component adjacent to the screw head)	
Component II	Material of component II (substructure)	
I	Thickness of component I	
ill.	Thickness of component II	
dqp	Pre-drill diameter of component I and component II	
d _{dp,I}	Pre-drill diameter of component I	
d _{dp,II}	Pre-drill diameter of component II	
CL	Load bearing thread area of the nonut $\ensuremath{\mathbb{B}}$ that can be used for design (CL see annex 1)	
Thickness t _{ll} col does not cover	rresponds to the load-bearing screw-in length of the nonut® in component II, if the load-b the entire thickness of component II. The area CL of the nonut® is load-bearing (CL see	pearing screw-in length annex 1).
Performances		
The relevant pe	rformances for design are given in the annexes:	
N _{R,k}	Characteristic value of longitudinal tensile strength	
V _{R,k}	Characteristic value of the transverse tensile strength	
	inimum edge and center distances apply $p_1 \qquad e_1 \qquad e_2$ load direction e_2 d_{dp} p_2	
Fasteners for	$p_1 \ge 50,0 \text{ mm}$ $e_1 \ge 25,0 \text{ mm}$ $p_2 \ge 50,0 \text{ mm}$ $e_2 \ge 25,0 \text{ mm}$ $d_{pd} \text{ see Annexes}$ T connecting steel components	
	abbreviations and edge distances	Annex 2

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Determination of Design Values

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

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

The characteristic values $N_{B,k}$ and $V_{B,k}$ are given in the Annexes. For intermediate dimension of metal member or sheeting or substructure the characteristic value may be determined by linear interpolation.

The recommended partial safety factor $\gamma_M = 1,33$ is used, if no partial safety factor is given in national regulations or national Annexes to Eurocode 3.

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

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

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

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

Installation conditions

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

The nonut® are fixed rectangular to the surface of the metal member or sheeting.

The metal member or sheeting and substructure are in contact to each other.

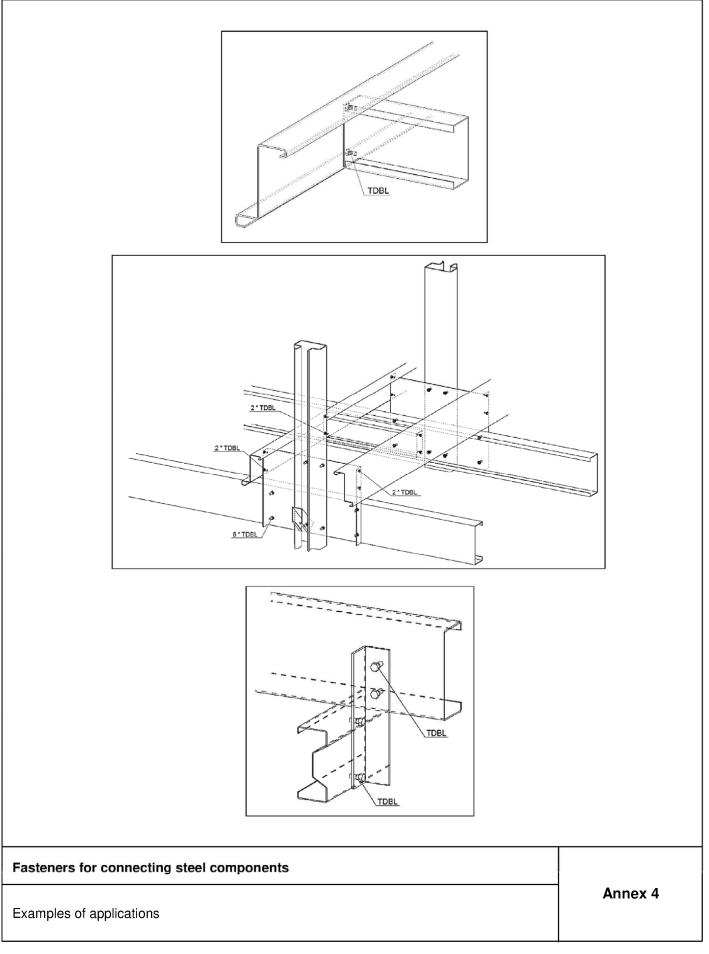
The nonut® may be used in the deep-freeze areas up to a temperature of -35 degrees Celsius.

Fasteners for connecting steel components

Basics for design

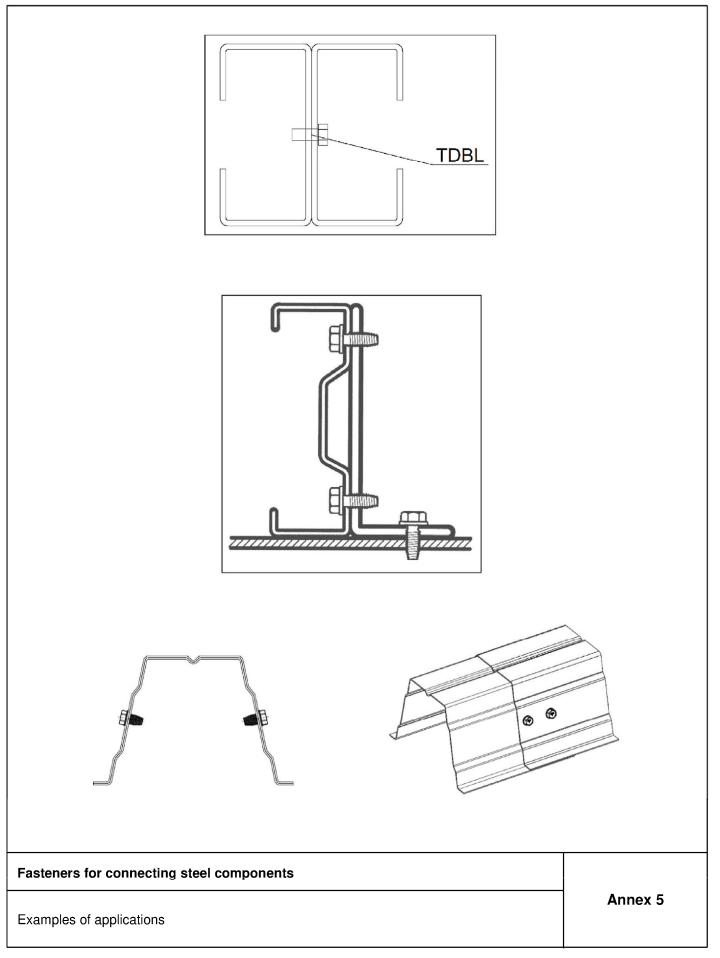
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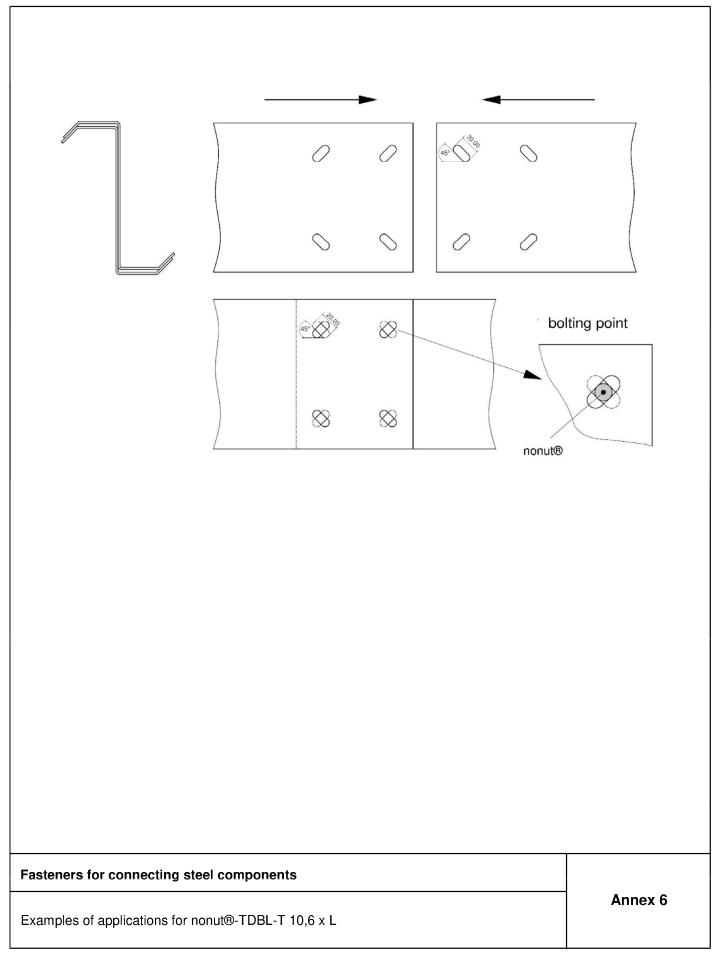
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	ner nonut®-TDBL 13,4 x prce or exclusive shear fo	L, Application in connectior	ions with combined	
	Component I (component to be fixed)	Component II (Substructure)		
Screw	S280GD to S450GD and	ding DIN EN 10025-2, HX300LAD to HX460LAD IN EN 10346	Boundary conditions	Annex
TDBL-T-13,4xL or	5,00 mm ≤ t _l ≤ 17,00 mm	3,00 mm < t⊮ ≤ 5,00 mm Pre-drill diameter: 12,5 mm	tı + tıı ≤ 20,0 mm	10
TDBLF-T-13,4xL	Pre-drill diameter: 15,0 mm	5,00 mm < t⊫ ≤ 15,00 mm Pre-drill diameter: 13,0 mm		11
TDBL-T-13,4xL TDBLF-T-13,4xL	1,00 mm ≤ t _l ≤ 4,00 mm Pre-drill diameter: 12,5 mm	1,50 mm ≤ t _{ll} ≤ 6,00 mm Pre-drill diameter: 12,5 mm	$3,0 \le t_1 + t_{11} \le 8,0 \text{ mm}$ $t_1 \le t_{11} \text{ for } t_{11} > 2,0 \text{ mm}$	12 13
TDBL-T-13,4xL	1,00 mm ≤ t⊧ ≤ 4,00 mm Pre-drill diameter: 13,0 mm	5,00 mm ≤ t⊫ ≤ 19,00 mm Pre-drill diameter: 13,0 mm	$t_{i} \le t_{ii}$ 6,0 $\le t_{i} + t_{ii} \le$ 20,0 mm	14 15

Fasteners for connecting steel components

TDBL-T-13,4xL and TDBLF-T-13,4xL



	ner nonut®-TDBL 10,6 x L, A rce or exclusive shear force		with combined	
	Component I (component to be fixed)	Component II (Substructure)	Boundary	
Screw	S235 to S355 accordi S280GD to S450GD and H according DI	conditions	Annex	
TDBL-T-10,6xL or TDBLF-T-10,6xL	5,00 mm ≤ t _l ≤ 17,00 mm Pre-drill diameter: 12,0 mm	3,00 mm ≤ t _{ll} ≤ 15,00 mm Pre-drill diameter: 10,0 mm		16 17
	2 x 0,88 mm ≤ t _l ≤ 2 x 2,00 mm Pre-drill diameter: 10,0 mm	tıı ≥ 3,00 mm Pre-drill diameter: 10,0 mm	$t_i \leq t_{ii}$	18 19
	$2 \times 0,88 \text{ mm} \le t_1 \le 2 \times 2,00 \text{ mm}$ elongated hole 8,5 mm x 28,5 mm	tıı ≥ 3,00 mm Pre-drill diameter: 10,0 mm	tı ≤ tıı	20
	0,88 mm ≤ t⊧ ≤ 4,00 mm	1,00 mm ≤ t _{ll} < 3,00 mm Pre-drill diameter: 9,0 mm	tı ≤ tıı	21
TDBL-T-10,6xL	elongated hole 8,5 mm x 28,5 mm	tıı ≥ 3,00 mm Pre-drill diameter: 10,0 mm	t₁ ≤ t ₁₁	22
	1,00 mm ≤ tı ≤ 4,00 mm Pre-drill diameter: 9,0 mm	1,00 mm ≤ t⊫ ≤ 3,00 mm Pre-drill diameter: 9,0 mm	$t_{i} \leq t_{ii}$	23
	1,00 mm ≤ t _l ≤ 4,00 mm Pre-drill diameter: 10,0 mm	3,00 mm ≤ t _{ll} ≤ 15,00 mm Pre-drill diameter: 10,0 mm	tı ≤ tıı	24
	1,00 mm ≤ t⊧ ≤ 3,00 mm see Annex	1,00 mm ≤ t⊫ ≤ 3,00 mm see Annex	tı ≤ tıı	25 26

Fasteners for connecting steel components

TDBL-T-10,6xL and TDBLF-T-10,6xL



	Component I (component to be fixed)	Component II (Substructure)	Boundary	
Screw	S235 to S355 accordi S280GD to S450GD and I according DI	conditions	Annex	
	0,88 mm ≤ tı ≤ 3,00 mm Pre-drill diameter: 7,5 mm	0,88 mm ≤ t⊫ < 3,00 mm Pre-drill diameter: 7,5 mm		27
	0,88 mm ≤ tı ≤ 3,00 mm Pre-drill diameter: 8,0 mm	t⊫ ≥ 3,00 mm Pre-drill diameter: 8,0 mm	tı ≤ tıı	28
	2 x 0,88 mm ≤ t _l ≤ 2 x 2,00 mm Pre-drill diameter: 8,0 mm	tıı ≥ 3,00 mm Pre-drill diameter: 8,0 mm	-	29
	0,88 mm ≤ tı ≤ 2,00 mm	0,88 mm ≤ t _{il} < 3,00 mm Pre-drill diameter: 7,5 mm		30
TDBL-T-8,6xL	elongated hole 6,5 mm x 10,0 mm	tıı ≥ 3,00 mm Pre-drill diameter: 8,0 mm	tı ≤ tıı	31
	$2 \ge 0.88 \text{ mm} \le t_l \le 2 \ge 2.00 \text{ mm}$ elongated hole 6,5 mm x 10,0 mm	tıı ≥ 3,00 mm Pre-drill diameter: 8,0 mm	-	32
	0,88 mm \leq t _l \leq 2,00 mm elongated hole 6,5 mm x 10,0 mm	t _{II} ≥ 0,88 mm elongated hole 6,5 mm x 10,0 mm	tı ≤ tıı	33 34
	2 x 0,88 mm \leq t _l \leq 2 x 2,00 mm elongated hole 6,5 mm x 10,0 mm	t _{II} ≥ 3,00 mm elongated hole 6,5 mm x 10,0 mm	-	35

Fasteners for connecting steel components

TDBL-T-8,6xL and TDBLF-T-8,6xL

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23,26

24,40

25,54

29,40

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25,54

34,78

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				1									
					Material	<u>s</u>							
AR	0.1				Screw:		Carbon s tempered		ited				
	3W16 − ∅13.4				Component I: S235 to S275 – EN 10025-2 S280GD to S350GD – EN 10346 HX300LAD to HX380LAD – EN 10346								
			\$9,4		Compor		S235 to 8 S280GD HX300LA	to S3500	D – EN	10346	346		
SW16	~ Ø19.8-22.6		- Ø13	<u>3.4</u>	<u>Pre-drill</u> Compor		<u>er</u> d _{pd,l} = 15	0 mm					
		-	~ (0 9,4				dpd,II see						
							t ₁₁ [mm]						
		3.00	3.50	4.00	4.50	5.00		7.00	8.00	10.00	12.00	15.00	
		3.00		4.00 2.5 mm			t ₁₁ [mm]		8.00 d _{pd,II} = 1		12.00	15.00	
	5.00	3.00					t ₁₁ [mm]				12.00	15.00	
	5.00		d _{pd,II} = 1	2.5 mm	4.50	5.00	tıı [mm] 6.00	7.00	$d_{pd,II} = 1$	3.0 mm			
VR,k	6.00 7.00	10,83 10,83 10,83	d _{pd,II} = 1 16,12	2.5 mm 21,41	4.50	5.00	t _{II} [mm] 6.00 22,48	7.00	d _{pd,II} = 1 22,48	3.0 mm 22,48	22,48	22,48	
V _{R,k} [kN]	6.00	10,83 10,83	d _{pd,II} = 1 16,12 16,12	2.5 mm 21,41 21,41	4.50 21,95 21,95	5.00 22,48 22,48	tıı [mm] 6.00 22,48 23,58	7.00 22,48 23,58	d _{pd,II} = 1 22,48 23,58	3.0 mm 22,48 23,58	22,48 23,58	22,48	
	6.00 7.00 8.00 10.00	10,83 10,83 10,83 10,83 10,83	$d_{pd,ll} = 1$ $16,12$ $16,12$ $16,12$ $16,12$ $16,12$ $16,12$	2.5 mm 21,41 21,41 21,41 21,41 21,41 21,41	4.50 21,95 21,95 21,95 21,95 21,95	5.00 22,48 22,48 22,48 22,48 22,48 22,48	t⊫ [mm] 6.00 22,48 23,58 23,58 23,58 23,58 23,58	7.00 22,48 23,58 24,00 24,00 24,00	d _{pd,II} = 1 22,48 23,58 24,00 24,43 24,43	3.0 mm 22,48 23,58 24,00	22,48 23,58 24,00	22,48 - -	
[kN]	6.00 7.00 8.00	10,83 10,83 10,83 10,83 10,83 10,83	d _{pd,II} = 1 16,12 16,12 16,12 16,12	2.5 mm 21,41 21,41 21,41 21,41	4.50 21,95 21,95 21,95 21,95	5.00 22,48 22,48 22,48 22,48	t _{II} [mm] 6.00 22,48 23,58 23,58 23,58	7.00 22,48 23,58 24,00 24,00	d _{pd,II} = 1 22,48 23,58 24,00 24,43	3.0 mm 22,48 23,58 24,00 24,43	22,48 23,58 24,00 24,43	22,48 - - -	
[kN]	6.00 7.00 8.00 10.00	10,83 10,83 10,83 10,83 10,83	$d_{pd,ll} = 1$ $16,12$ $16,12$ $16,12$ $16,12$ $16,12$ $16,12$	2.5 mm 21,41 21,41 21,41 21,41 21,41 21,41	4.50 21,95 21,95 21,95 21,95 21,95	5.00 22,48 22,48 22,48 22,48 22,48 22,48	t⊫ [mm] 6.00 22,48 23,58 23,58 23,58 23,58 23,58	7.00 22,48 23,58 24,00 24,00 24,00	d _{pd,II} = 1 22,48 23,58 24,00 24,43 24,43	3.0 mm 22,48 23,58 24,00 24,43 32,33	22,48 23,58 24,00 24,43 -	22,48 - - - -	

- If t_1 and t_{11} are made of S275 or S320GD the values can be increased by 8.3%.

- If t_1 and t_{11} are made of S350GD or HX340LAD the values can be increased by 16,0 %.

Fasteners for connecting steel components

6.00

7.00

8.00

10.00

12.00

17.00

N_{R,k}

[kN]

t_i [mm]

9,32

9,32

9,32

9,32

9,32

9,32

11,21

11,21

11,21

11,21

11,21

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13,10

13,10

13,10

13,10

13,10

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15,61

15,61

15,61

15,61

15,61

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18,12

18,12

18,12

18,12

18,12

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23,26

23,30

23,30

23,30

23,30

-

nonut®-TDBL-T-13,4 x L nonut®-TDBLF-T-13,4 x L

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					Material	<u>s</u>						
					Screw:		Carbon s tempered		ted			
SW16					Component I: S355 – EN 10025-2 S390GD to S450GD – EN 10346 HX420LAD to HX460LAD – EN 10346							
ļ.							S355 – E S390GD HX420LA	to S4500	D – EN		346	
595 5W16	-(019.8-22.5		-Ø13		<u>Pre-drill</u> Compon Compon	ient I:	<u>r</u> d _{pd,I} = 15. d _{pd,II} see t					
							4. [mmm]					
		3.00	3.50	4.00	4.50	5.00	tıı [mm] 6.00	7.00	8.00	10.00	12.00	15.00
		3.00	3.50 d _{pd,ll} = 1	4.00 2.5 mm	4.50	5.00	tıı [mm] 6.00	7.00	8.00 d _{pd,II} = 1	10.00 3.0 mm	12.00	15.00
	5.00	3.00			4.50	5.00		7.00			12.00	28,73
	5.00		d _{pd,II} = 1	2.5 mm	1		6.00		d _{pd,II} = 1	3.0 mm		
V _{R,k}		13,84	d _{pd,II} = 1 20,60	2.5 mm 27,36	28,05	28,73	6.00 28,73	28,73	d _{pd,II} = 1 28,73	3.0 mm 28,73	28,73	28,73
V _{R,k} [kN]	6.00	13,84 13,84	d _{pd,II} = 1 20,60 20,60	2.5 mm 27,36 27,36	28,05 28,05	28,73 28,73	6.00 28,73 30,12	28,73 30,12	d _{pd,II} = 1 28,73 30,12	3.0 mm 28,73 30,12	28,73 30,12	28,73
	6.00 7.00 8.00 10.00	13,84 13,84 13,84 13,84 13,84	d _{pd,II} = 1 20,60 20,60 20,60 20,60 20,60	2.5 mm 27,36 27,36 27,36 27,36 27,36	28,05 28,05 28,05 28,05 28,05	28,73 28,73 28,73 28,73 28,73 28,73	6.00 28,73 30,12 30,12 30,12 30,12	28,73 30,12 30,67 30,67 30,67	d _{pd,II} = 1 28,73 30,12 30,67 31,22 31,22	3.0 mm 28,73 30,12 30,67	28,73 30,12 30,67	28,73 - -
[kN]	6.00 7.00 8.00 10.00 12.00	13,84 13,84 13,84 13,84 13,84 13,84	d _{pd,II} = 1 20,60 20,60 20,60 20,60	2.5 mm 27,36 27,36 27,36 27,36	28,05 28,05 28,05 28,05	28,73 28,73 28,73 28,73	6.00 28,73 30,12 30,12 30,12	28,73 30,12 30,67 30,67	d _{pd,II} = 1 28,73 30,12 30,67 31,22	3.0 mm 28,73 30,12 30,67 31,22	28,73 30,12 30,67 31,22	28,73 - - -
[kN]	6.00 7.00 8.00 10.00 12.00 17.00	13,84 13,84 13,84 13,84 13,84 13,84 13,84	d _{pd,II} = 1 20,60 20,60 20,60 20,60 20,60 20,60	2.5 mm 27,36 27,36 27,36 27,36 27,36 27,36 -	28,05 28,05 28,05 28,05 28,05 28,05	28,73 28,73 28,73 28,73 28,73 28,73 28,73 -	6.00 28,73 30,12 30,12 30,12 30,12 30,12	28,73 30,12 30,67 30,67 30,67 30,67	d _{pd,II} = 1 28,73 30,12 30,67 31,22 31,22 31,22 -	3.0 mm 28,73 30,12 30,67 31,22 41,32 -	28,73 30,12 30,67 31,22 - - -	28,73 - - - - - -
[kN]	6.00 7.00 8.00 10.00 12.00	13,84 13,84 13,84 13,84 13,84 13,84	d _{pd,II} = 1 20,60 20,60 20,60 20,60 20,60	2.5 mm 27,36 27,36 27,36 27,36 27,36	28,05 28,05 28,05 28,05 28,05 28,05	28,73 28,73 28,73 28,73 28,73 28,73	6.00 28,73 30,12 30,12 30,12 30,12	28,73 30,12 30,67 30,67 30,67	d _{pd,II} = 1 28,73 30,12 30,67 31,22 31,22	3.0 mm 28,73 30,12 30,67 31,22 41,32	28,73 30,12 30,67 31,22	28,73 - - -

No further specifications.

N_{R,k}

[kN]

tı [mm]

7.00

8.00

10.00

12.00

17.00

11,91

11,91

11,91

11,91

11,91

14,32

14,32

14,32

14,32

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16,73

16,73

16,73

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19,94

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23,15

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31,18

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31,18

32,64

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37,56

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31,18

32,64

44,44

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32,64

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Fasteners for connecting steel components

nonut®-TDBL-T-13,4 x L nonut®-TDBLF-T-13,4 x L

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				Mot	oriale						
					<u>erials</u>						
		° Ti	\square	Scr	ew:	Carbon tempere	steel d and coat	ted			
	~\$19.8-22.	1		Con	nponent I:	S280GE	S275 – EN to S350G	iD – EN 10			
SW16			-Ø13.4			HX300L	AD to HX3	180LAD - 1	EN 10346		
• <u> </u>				Con	nponent II:	S280GE	S275 – EN to S350G AD to HX3	iD – EN 10			
	T		\square			TIXOUUL			_11 10040		
573	52.5										
	\$19.8		~Ø13,4								
				Pre-	drill diame	ter					
SW16	4		-Ø9.4	Con	ponent I:	$d_{pd,l} = 12$	2.5 mm				
		-1			ponent II:						
			1	1	1	-	nm]	1	1 4 50		
		1.50	1.75	2.00	2.50	3.00	3.50	4.00	4.50	5.00	6.00
							2.5 mm				
	1.00	-	-	6,26 ^{a)}	6,26 ^{a)}	6,26 ^{a)}	6,26 ^{a)}	6,55	6,55	6,55	6,55
	1.13	-	-	6,26 ^{a)}	6,26 ^{a)}	6,26 ^{a)}	6,26 ^{a)}	7,62	7,62	7,62	7,62
	1.25	5,41 ^{a)}	5,84 ^{a)}	6,26 ^{a)}	6,26 ^{a)}	6,26 ^{a)}	6,26 ^{a)}	8,62	8,62	8,62	8,62
	1.50	5,56 ^{a)}	6,65 ^{a)}	7,75 ^{a)}	7,75 ^{a)}	7,75 ^{a)}	10,69	10,69	10,69	10,69	10,69
V _{R,k} [kN]	1.75	5,56 ^{a)}	8,14 ^{a)}	9,23 ^{a)}	9,23 ^{a)}	9,23 ^{a)}	11,31	11,31	11,31	11,31	11,31
t _i [mm] .	2.00	5,56 ^{a)}	8,14 ^{a)}	10,72 ^{a)}	10,72 ^{a)}	11,93	11,93	11,93	11,93	11,93	11,93
ation .	2.50	-	-	-	12,92	13,99	13,99	13,99	13,99	13,99	13,99
	3.00	-	-	-	-	16,06	16,06	16,06	16,06	16,06	-
	3.50	-	-	-	-	-	18,86	18,86	18,86	-	-
	4.00	-	-	-	-	-	-	21,66	-	-	-
	1.00	-	-	4.64 ^{a)}	5,19 ^{a)}	5,19 ^{a)}	5,19 ^{a)}	5,19	5,19	5,19	5,19
	1.13	-	-	4,64 ^{a)}	6,75 ^{a)}	6,75 ^{a)}	6,75 ^{a)}	6,75	6,75	6,75	6,75
	1.25	3,12 ^{a)}	3,88 ^{a)}	4,64 ^{a)}	7,56 ^{a)}	8,19 ^{a)}	8,19 ^{a)}	8,19	8,19	8,19	8,19
	1.50	3,12 ^{a)}	3,88 ^{a)}	4,64 ^{a)}	7,56 ^{a)}	9,32 ^{a)}	11,20	11,20	11,20	11,20	11,20
N _{R,k} [kN]	1.75	3,12 ^{a)}	3,88 ^{a)}	4,64 ^{a)}	7,56 ^{a)}	9,32 ^{a)}	11,21	12,23	12,23	12,23	12,23
	2.00	3,12 ^{a)}	3,88 ^{a)}	4,64 ^{a)}	7,56 ^{a)}	9,32	11,21	13,10	13,27	13,27	13,27
t _i [mm]	2.50				7,56	9,32	11,21	13,10	13,30	13,30	
	3.00		-	-	-	9,32	11,21	13,10	13,34	13,34	
	5.00	-	-	-		9,52	1,21	10,10	10,04	10,04	-

11,21

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13,10

13,10

14,85

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- If t_1 and t_{11} are made of S275 or S320GD the values can be increased by 8.3%.

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- If t_1 and t_{11} are made of S350GD or HX340LAD the values can be increased by 16,0 %.

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- Connections marked with ^{a)} must be executed with nonut®-TDBLF-T-13,4 x L.

Fasteners for connecting steel components

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3.50

4.00

nonut®-TDBL-T-13,4 x L nonut®-TDBLF-T-13,4 x L Annex 12

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				Mat	<u>erials</u>						
			\square	Scre	ew:	Carbon s tempere	steel d and coat	ed			
			Con	Component I: S355 – EN 10025-2 S390GD to S450GD – EN 10346 HX420LAD to HX460LAD – EN 10346							
SW16		1		Con	Component II: S355 – EN 10025-2						
	Ť		-Ø9,4		iponent ii.	S390GD	to S450G	D – EN 10			
			HX420L/	AD to HX4	60LAD – E	N 10346					
GBG											
	19,8										
	SW16 - ∅13.4		Pre-	drill diame	<u>ter</u>						
\$W16	ļ		~ Ø9,4		nponent I:	$d_{\text{pd},\text{I}} = 12$					
		-1		Con	nponent II:	d _{pd,II} see	table				
						tıı [r	nml				
		1.50	1.75	2.00	2.50	3.00	3.50	4.00	4.50	5.00	6.00
						$d_{pd,II} = 1$					
	1.00	-	-	8,00 ^{a)}	8,00 ^{a)}	8,00 ^{a)}	8,00 ^{a)}	8,37	8,37	8,37	8,37
-	1.13	-	-	8,00 ^{a)}	8,00 ^{a)}	8,00 ^{a)}	8,00 ^{a)}	9,74	9,74	9,74	9,74
	1.25	6,91 ^{a)}	7,46 ^{a)}	8,00 ^{a)}	8,00 ^{a)}	8,00 ^{a)}	8,00 ^{a)}	11,01	11,01	11,01	1 1 1 0 1
-						0,00	0,00			, = .	11,01
-	1.50	7,10 ^{a)}	8,50 ^{a)}	9,90 ^{a)}	9,90 ^{a)}	9,90 ^{a)}	13,65	13,65	13,65	13,65	
- V _{R,k} [kN]	1.50 1.75	7,10 ^{a)} 7,10 ^{a)}	8,50 ^{a)} 10,40 ^{a)}	9,90 ^{a)} 11,79 ^{a)}	9,90 ^{a)} 11,79 ^{a)}				13,65 14,45		13,65
				-		9,90 ^{a)}	13,65	13,65	-	13,65	13,65 14,45
- V _{R,k} [kN] - t _i [mm] -	1.75	7,10 ^{a)}	10,40 ^{a)}	11,79 ^{a)}	11,79 ^{a)}	9,90 ^{a)} 11,79 ^{a)}	13,65 14,45	13,65 14,45	14,45	13,65 14,45	13,65 14,45 15,25
	1.75 2.00	7,10 ^{a)}	10,40 ^{a)}	11,79 ^{a)} 13,69 ^{a)}	11,79 ^{a)} 13,69 ^{a)}	9,90 ^{a)} 11,79 ^{a)} 15,25	13,65 14,45 15,25	13,65 14,45 15,25	14,45 15,25	13,65 14,45 15,25	13,65 14,45 15,25
	1.75 2.00 2.50	7,10 ^{a)} 7,10 ^{a)} -	10,40 ^{a)}	11,79 ^{a)} 13,69 ^{a)} -	11,79 ^{a)} 13,69 ^{a)} 16,51	9,90 ^{a)} 11,79 ^{a)} 15,25 17,88	13,65 14,45 15,25 17,88	13,65 14,45 15,25 17,88	14,45 15,25 17,88	13,65 14,45 15,25 17,88	13,65 14,45 15,25
	1.75 2.00 2.50 3.00	7,10 ^{a)} 7,10 ^{a)} - -	10,40 ^{a)} 10,40 ^{a)} - -	11,79 ^{a)} 13,69 ^{a)} - -	11,79 ^{a)} 13,69 ^{a)} 16,51 -	9,90 ^{a)} 11,79 ^{a)} 15,25 17,88 20,52	13,65 14,45 15,25 17,88 20,52	13,65 14,45 15,25 17,88 20,52	14,45 15,25 17,88 20,52	13,65 14,45 15,25 17,88 20,52	13,65 14,45 15,25 17,88
	1.75 2.00 2.50 3.00 3.50	7,10 ^{a)} 7,10 ^{a)} - - -	10,40 ^{a)} 10,40 ^{a)} - - -	11,79 ^{a)} 13,69 ^{a)} - -	11,79 ^{a)} 13,69 ^{a)} 16,51 - -	9,90 ^{a)} 11,79 ^{a)} 15,25 17,88 20,52 -	13,65 14,45 15,25 17,88 20,52	13,65 14,45 15,25 17,88 20,52 24,10	14,45 15,25 17,88 20,52	13,65 14,45 15,25 17,88 20,52 -	13,65 14,45 15,25 17,88 - -
	1.75 2.00 2.50 3.00 3.50 4.00	7,10 ^{a)} 7,10 ^{a)} - - - - -	10,40 ^{a)} 10,40 ^{a)} - - - - - - - - -	11,79 ^{a)} 13,69 ^{a)} - - - - -	11,79 ^{a)} 13,69 ^{a)} 16,51 - - -	9,90 ^{a)} 11,79 ^{a)} 15,25 17,88 20,52 - -	13,65 14,45 15,25 17,88 20,52 24,10 -	13,65 14,45 15,25 17,88 20,52 24,10 27,67	14,45 15,25 17,88 20,52 24,10	13,65 14,45 15,25 17,88 20,52 -	13,65 14,45 15,25 17,88 - - -
	1.75 2.00 2.50 3.00 3.50 4.00 1.00	7,10 ^{a)} 7,10 ^{a)} - - - - - - -	10,40 ^{a)} 10,40 ^{a)} - - - - - - - - -	11,79 ^{a)} 13,69 ^{a)} - - - 5,93 ^{a)} 5,93 ^{a)}	11,79 ^{a)} 13,69 ^{a)} 16,51 - - - 6,63 ^{a)} 8,63 ^{a)}	9,90 ^{a)} 11,79 ^{a)} 15,25 17,88 20,52 - - 6,63 ^{a)} 8,63 ^{a)}	13,65 14,45 15,25 17,88 20,52 24,10 - 6,63 ^{a)} 8,63 ^{a)}	13,65 14,45 15,25 17,88 20,52 24,10 27,67 6,63	14,45 15,25 17,88 20,52 24,10 - 6,63	13,65 14,45 15,25 17,88 20,52 - - 6,63	13,65 14,45 15,25 17,88 - - - - 6,63 8,63
t, [mm] - - - - - - -	1.75 2.00 2.50 3.00 3.50 4.00 1.00 1.13	7,10 ^{a)} 7,10 ^{a)} - - - - -	10,40 ^{a)} 10,40 ^{a)} - - - -	11,79 ^{a)} 13,69 ^{a)} - - - - 5,93 ^{a)}	11,79 ^{a)} 13,69 ^{a)} 16,51 - - 6,63 ^{a)} 8,63 ^{a)} 9,66 ^{a)}	9,90 ^{a)} 11,79 ^{a)} 15,25 17,88 20,52 - - 6,63 ^{a)} 8,63 ^{a)} 10,47 ^{a)}	13,65 14,45 15,25 17,88 20,52 24,10 - 6,63 ^{a)}	13,65 14,45 15,25 17,88 20,52 24,10 27,67 6,63 8,63	14,45 15,25 17,88 20,52 24,10 - 6,63 8,63	13,65 14,45 15,25 17,88 20,52 - - - 6,63 8,63	13,65 14,45 15,25 17,88 - - - - 6,63 8,63 10,47
	1.75 2.00 2.50 3.00 3.50 4.00 1.00 1.13 1.25	7,10 ^{a)} 7,10 ^{a)} - - - - 3,98 ^{a)}	10,40 ^{a)} 10,40 ^{a)} - - - - - 4,95 ^{a)}	11,79 ^{a)} 13,69 ^{a)} - - - 5,93 ^{a)} 5,93 ^{a)} 5,93 ^{a)} 5,93 ^{a)}	11,79 ^{a)} 13,69 ^{a)} 16,51 - - - 6,63 ^{a)} 8,63 ^{a)}	9,90 ^{a)} 11,79 ^{a)} 15,25 17,88 20,52 - - 6,63 ^{a)} 8,63 ^{a)} 10,47 ^{a)} 11,91 ^{a)}	13,65 14,45 15,25 17,88 20,52 24,10 - 6,63 ^{a)} 8,63 ^{a)} 10,47 ^{a)}	13,65 14,45 15,25 17,88 20,52 24,10 27,67 6,63 8,63 10,47	14,45 15,25 17,88 20,52 24,10 - 6,63 8,63 10,47	13,65 14,45 15,25 17,88 20,52 - - 6,63 8,63 10,47	13,65 14,45 15,25 17,88 - - - - 6,63 8,63 10,47 14,31
t, [mm] - - - - - - - - - - - - - - - - - - -	1.75 2.00 2.50 3.00 3.50 4.00 1.00 1.13 1.25 1.50	7,10 ^{a)} 7,10 ^{a)} - - - - 3,98 ^{a)} 3,98 ^{a)}	10,40 ^{a)} 10,40 ^{a)} - - - - 4,95 ^{a)}	11,79 ^{a)} 13,69 ^{a)} - - - 5,93 ^{a)} 5,93 ^{a)} 5,93 ^{a)}	11,79 ^{a)} 13,69 ^{a)} 16,51 - - 6,63 ^{a)} 8,63 ^{a)} 9,66 ^{a)} 9,66 ^{a)}	9,90 ^{a)} 11,79 ^{a)} 15,25 17,88 20,52 - - 6,63 ^{a)} 8,63 ^{a)} 10,47 ^{a)}	13,65 14,45 15,25 17,88 20,52 24,10 - 6,63 ^{a)} 8,63 ^{a)} 10,47 ^{a)} 14,31	13,65 14,45 15,25 17,88 20,52 24,10 27,67 6,63 8,63 10,47 14,31	14,45 15,25 17,88 20,52 24,10 - - 6,63 8,63 10,47 14,31	13,65 14,45 15,25 17,88 20,52 - - - 6,63 8,63 10,47 14,31	13,65 14,45 15,25 17,88 - - - - 6,63 8,63 10,47 14,31 15,63
t, [mm] - - - - - - -	1.75 2.00 2.50 3.00 3.50 4.00 1.00 1.13 1.25 1.50 1.75	7,10 ^{a)} 7,10 ^{a)} - - - - 3,98 ^{a)} 3,98 ^{a)} 3,98 ^{a)}	10,40 ^{a)} 10,40 ^{a)} - - - - - 4,95 ^{a)} 4,95 ^{a)} 4,95 ^{a)}	11,79 ^{a)} 13,69 ^{a)} - - - 5,93 ^{a)} 5,93 ^{a)} 5,93 ^{a)} 5,93 ^{a)} 5,93 ^{a)}	$\begin{array}{c} 11,79^{\ a)} \\ 13,69^{\ a)} \\ 16,51 \\ - \\ - \\ - \\ 6,63^{\ a)} \\ 8,63^{\ a)} \\ 9,66^{\ a)} \end{array}$	9,90 ^{a)} 11,79 ^{a)} 15,25 17,88 20,52 - - 6,63 ^{a)} 8,63 ^{a)} 10,47 ^{a)} 11,91 ^{a)} 11,91 ^{a)}	13,65 14,45 15,25 17,88 20,52 24,10 - 6,63 ^{a)} 8,63 ^{a)} 10,47 ^{a)} 14,31 14,32 14,32	13,65 14,45 15,25 17,88 20,52 24,10 27,67 6,63 8,63 10,47 14,31 15,63 16,73	14,45 15,25 17,88 20,52 24,10 - 6,63 8,63 10,47 14,31 15,63 16,95	13,65 14,45 15,25 17,88 20,52 - - - 6,63 8,63 10,47 14,31 15,63	13,65 14,45 15,25 17,88 - - - - 6,63 8,63 10,47 14,31 15,63
t, [mm] - - - - - - - - - - - - - - - - - - -	1.75 2.00 2.50 3.00 3.50 4.00 1.00 1.13 1.25 1.50 1.75 2.00 2.50	7,10 ^{a)} 7,10 ^{a)} - - - - 3,98 ^{a)} 3,98 ^{a)} 3,98 ^{a)}	10,40 ^{a)} 10,40 ^{a)} - - - - - 4,95 ^{a)} 4,95 ^{a)} 4,95 ^{a)}	11,79 ^{a)} 13,69 ^{a)} - - - 5,93 ^{a)} 5,93 ^{a)} 5,93 ^{a)} 5,93 ^{a)} 5,93 ^{a)} 5,93 ^{a)} 5,93 ^{a)}	11,79 ^{a)} 13,69 ^{a)} 16,51 - - 6,63 ^{a)} 8,63 ^{a)} 9,66 ^{a)} 9,66 ^{a)} 9,66 ^{a)}	9,90 ^{a)} 11,79 ^{a)} 15,25 17,88 20,52 - - 6,63 ^{a)} 8,63 ^{a)} 10,47 ^{a)} 11,91 ^{a)} 11,91 11,91	13,65 14,45 15,25 17,88 20,52 24,10 - 6,63 ^{a)} 8,63 ^{a)} 10,47 ^{a)} 14,31 14,32 14,32 14,32	13,65 14,45 15,25 17,88 20,52 24,10 27,67 6,63 8,63 10,47 14,31 15,63 16,73 16,73	14,45 15,25 17,88 20,52 24,10 - 6,63 8,63 10,47 14,31 15,63 16,95 17,00	13,65 14,45 15,25 17,88 20,52 - - - 6,63 8,63 10,47 14,31 15,63 16,95 17,00	13,65 14,45 15,25 17,88 - - - - 6,63 8,63 10,47 14,31 15,63
t, [mm] - - - - - - - - - - - - - - - - - - -	1.75 2.00 2.50 3.00 3.50 4.00 1.00 1.13 1.25 1.50 1.75 2.00	7,10 ^{a)} 7,10 ^{a)} - - - 3,98 ^{a)} 3,98 ^{a)} 3,98 ^{a)} 3,98 ^{a)} 3,98 ^{a)} -	10,40 ^{a)} 10,40 ^{a)} - - - - 4,95 ^{a)} 4,95 ^{a)} 4,95 ^{a)} 4,95 ^{a)} 4,95 ^{a)}	11,79 ^{a)} 13,69 ^{a)} - - - 5,93 ^{a)} 5,93 ^{a)} 5,93 ^{a)} 5,93 ^{a)} 5,93 ^{a)} 5,93 ^{a)} 5,93 ^{a)}	$\begin{array}{c} 11,79^{\ a)} \\ 13,69^{\ a)} \\ 16,51 \\ - \\ - \\ - \\ 6,63^{\ a)} \\ 8,63^{\ a)} \\ 9,66^{\ a)} \end{array}$	9,90 ^{a)} 11,79 ^{a)} 15,25 17,88 20,52 - - 6,63 ^{a)} 8,63 ^{a)} 10,47 ^{a)} 11,91 ^{a)} 11,91 ^{a)}	13,65 14,45 15,25 17,88 20,52 24,10 - 6,63 ^{a)} 8,63 ^{a)} 10,47 ^{a)} 14,31 14,32 14,32	13,65 14,45 15,25 17,88 20,52 24,10 27,67 6,63 8,63 10,47 14,31 15,63 16,73	14,45 15,25 17,88 20,52 24,10 - 6,63 8,63 10,47 14,31 15,63 16,95	13,65 14,45 15,25 17,88 20,52 - - - 6,63 8,63 10,47 14,31 15,63 16,95	- 6,63 8,63 10,47 14,31 15,63 16,95 -

- Connections marked with ^{a)} must be executed with nonut®-TDBLF-T-13,4 x L.

Fasteners for connecting steel components

nonut®-TDBL-T-13,4 x L nonut®-TDBLF-T-13,4 x L

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				Materia	ls						
				Screw:	-	arbon steel mpered and	coated				
		∽أ−ਜ਼⊃∣	Π	Compo	Component I: S235 to S275 – EN 10025-2 S280GD to S350GD – EN 10346 HX300LAD to HX380LAD – EN 10346						
SW16	972-6 6 (0 5 W 16			Compo	Component II: S235 to S275 – EN 10025-2 S280GD to S350GD – EN 10346 HX300LAD to HX380LAD – EN 10346						
.			Ø9.4	<u>Pre-dril</u>	l diameter						
				Compo	nent I: dr	_{od,I} = 13.0 mn	n				
						_{od,II} see table					
		1				t _{II} [mm]					
		5.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	19.00	
		0.00	0.00	0.00		l _{pd,II} = 13.0 m		10.00	10.00	13.00	
	1.00	7,94	7,94	7,94	7,94	7,94	7,94	7,94	7,94	7,94	
-	1.13	8,85	8,85	8,85	8,85	8,85	8,85	8,85	8,85	-	
-	1.25	9,69	9,69	9,69	9,69	9,69	9,69	9,69	9,69	-	
-	1.50	11,44	11,44	11,44	11,44	11,44	11,44	11,44	11,44	-	
V _{R,k} [kN]	1.75	12,97	12,97	12,97	12,97	12,97	12,97	12,97	12,97	-	
- tı [mm]	2.00	14,51	14,51	14,51	14,51	14,51	14,51	14,51	14,51	-	
a [i i i i i j -	2.50	14,96	14,96	14,96	14,96	14,96	14,96	14,96	-	-	
-	3.00	15,41	15,41	15,41	15,41	15,41	15,41	15,41	-	-	
-	3.50	18,32	18,32	18,32	18,32	18,32	18,32	18,32	-	-	
-	4.00	21,23	21,23	21,23	21,23	21,23	21,23	21,23	-	-	
	1.00	6.06	6.06	6.06	6.06	6.06	6.06	6.06	6.06	6.06	
-	1.13	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05	-	
-	1.25	7.96	7.96	7.96	7.96	7.96	7.96	7.96	7.96	-	
		9.85	9.85	9.85	9.85	9.85	9.85	9.85	9.85	-	
-	1.50		11.09	11.09	11.09	11.09	11.09	11.09	11.09	-	
- N _{R,k} [kN]	1.50	11.09	11.09			10.00	12.33	12.33	12.33	-	
		11.09 12.33	12.33	12.33	12.33	12.33	12.00	12.00	12.00		
- N _{R,k} [kN] - tı [mm] -	1.75		1		12.33 12.59	12.53	12.59	12.59	-	-	
	1.75 2.00	12.33	12.33	12.33					-	-	
	1.75 2.00 2.50	12.33 12.59	12.33 12.59	12.33 12.59	12.59	12.59	12.59	12.59	-	-	

- If t₁ and t₁₁ are made of S275 or S320GD the values can be increased by 8.3%.

- If t_I and t_{II} are made of S350GD or HX340LAD the values can be increased by 16,0 %.

Fasteners for connecting steel components

nonut®-TDBL-T-13,4 x L

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				Materia	ls								
				Screw:	-	arbon steel mpered and	coated						
	1			Compo	S	355 – EN 10 390GD to S4 X420LAD to	50GD – EN		6				
SIP5 SW16	- Ø19.8-22.5		-Ø13.4	Compo	Component II: S355 – EN 10025-2 S390GD to S450GD – EN 10346 HX420LAD to HX460LAD – EN 10346								
, ,			₩ <u>-Ø9,4</u>										
				Pre-dril	<u>l diameter</u>								
				Compo Compo		_{bd,I} = 13.0 mr _{bd,II} see table							
				I		t⊫[mm]	1	1		ı			
		5.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	19.00			
						_{pd,II} = 13.0 m							
	1.00	10,14	10,14	10,14	10,14	10,14	10,14	10,14	10,14	10,14			
	1.13	11,31	11,31	11,31	11,31	11,31	11,31	11,31	11,31	-			
	1.25	12,38	12,38	12,38	12,38	12,38	12,38	12,38	12,38	-			
V _{R,k} [kN]	1.50	14,62	14,62	14,62	14,62	14,62	14,62	14,62	14,62	-			
V R,K [KIN]	1.75	16,58	16,58	16,58	16,58	16,58	16,58	16,58	16,58	-			
t _l [mm] .	2.00	18,54	18,54	18,54	18,54	18,54	18,54	18,54	18,54	-			
	2.50	19,12	19,12	19,12	19,12	19,12	19,12	19,12	-	-			
	3.00	19,69	19,69	19,69	19,69	19,69	19,69	19,69	-	-			
	3.50	23,41	23,41	23,41	23,41	23,41	23,41	23,41	-	-			
	4.00	27,13	27,13	27,13	27,13	27,13	27,13	27,13	-	-			
	1.00	7,80	7,80	7,80	7,80	7,80	7,80	7,80	7,80	7,80			
	1.13	9,05	9,05	9,05	9,05	9,05	9,05	9,05	9,05	-			
-	1.25	10,21	10,21	10,21	10,21	10,21	10,21	10,21	10,21	-			
N _{R,k} [kN]	1.50	12,61	12,61	12,61	12,61	12,61	12,61	12,61	12,61	-			
-	1.75	13,90	13,90	13,90	13,90	13,90	13,90	13,90	13,90	-			
tı [mm]	2.00	15,19	15,19	15,19	15,19	15,19	15,19	15,19	15,19	-			
	2.50	15,78	15,78	15,78	15,78	15,78	15,78	15,78	-	-			
	3.00	16,37	16,37	16,37	16,37	16,37	16,37	16,37	-	-			
	3.50	18,10	18,10	18,10	18,10	18,10	18,10	18,10	-	-			
	4.00	19,84	19,84	19,84	19,84	19,84	19,84	19,84	-	-			

No further specifications.

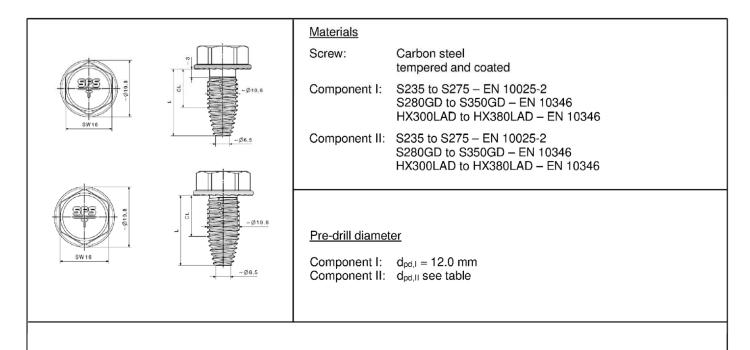
Fasteners for connecting steel components

nonut®-TDBL-T-13,4 x L

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						tıı [mm]						
		3.00	4.00	5.00	6.00	8.00	10.00	12.00	14.00	15.00		
			d _{pd,II} = 10.0 mm									
	5.00	11,68 ^{a)}	15,86 ^{a)}	20,04 ^{a)}	20,04 ^{a)}	20,04 ^{a)}	20,04 ^{a)}	20,04 ^{a)}	20,04 ^{a)}	20,04 ^{a)}		
V _{R,k} [kN]	6.00	11,68 ^{a)}	15,86 ^{a)}	20,04 ^{a)}	22,01 ^{a)}	-						
	8.00	11,68 ^{a)}	15,86 ^{a)}	20,04 ^{a)}	22,01 ^{a)}	32,39	32,39	32,39	-	-		
tı [mm]	10.00	11,68 ^{a)}	15,86 ^{a)}	20,04 ^{a)}	22,01 ^{a)}	32,39	32,39	-	-	-		
	12.00	11,68 ^{a)}	15,86 ^{a)}	20,04 ^{a)}	22,01 ^{a)}	32,39	-	-	-	-		
	5.00	7,25 ^{a)}	11,29 ^{a)}	15,76 ^{a)}	22,47 ^{a)}	22,70 ^{a)}						
N _{R,k} [kN]	6.00	7,25 ^{a)}	11,29 ^{a)}	15,76 ^{a)}	22,47 ^{a)}	28,74 ^{a)}	28,74 ^{a)}	28,74 ^{a)}	28,74 ^{a)}	-		
	8.00	7,25 ^{a)}	11,29 ^{a)}	15,76 ^{a)}	22,47 ^{a)}	29,65 ^{a)}	29,76 ^{a)}	29,76 ^{a)}	-	-		
tı [mm]	10.00	7,25 ^{a)}	11,29 ^{a)}	15,76 ^{a)}	22,47 ^{a)}	29,65 ^{a)}	40,61	-	-	-		
	12.00	7,25 ^{a)}	11,29 ^{a)}	15,76 ^{a)}	22,47 ^{a)}	29,65 ^{a)}	-	-	-	-		

- If t_I and t_{II} are made of S275 or S320GD the values marked with ^{a)} can be increased by 8.3%

- If t₁ and t₁₁ are made of S350GD or HX340LAD the values marked with ^{a)} can be increased by 16,0 %.

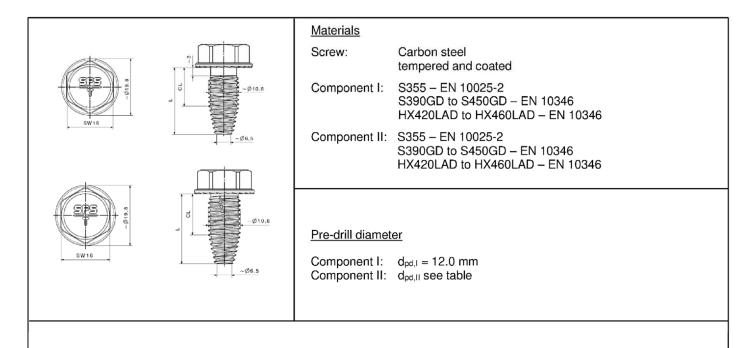
Fasteners for connecting steel components

nonut®-TDBL-T-10,6 x L nonut®-TDBLF-T-10,6 x L

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						tıı [mm]							
		3.00	4.00	5.00	6.00	8.00	10.00	12.00	14.00	15.00			
			d _{pd,II} = 10.0 mm										
	5.00	14,92	20,26	25,60	25,60	25,60	25,60	25,60	25,60	25,60			
V _{R,k} [kN]	6.00	14,92	20,26	25,60	28,12	28,12	28,12	28,12	28,12	-			
	8.00	14,92	20,26	25,60	28,12	32,39	32,39	32,39	-	-			
tı [mm]	10.00	14,92	20,26	25,60	28,12	32,39	32,39	-	-	-			
	12.00	14,92	20,26	25,60	28,12	32,39	-	-	-	-			
	5.00	9,26	14,43	20,14	28,71	29,01	29,01	29,01	29,01	29,01			
NR,k [kN]	6.00	9,26	14,43	20,14	28,71	36,72	36,72	36,72	36,72	-			
	8.00	9,26	14,43	20,14	28,71	37,89	38,03	38,03	-	-			
tı [mm]	10.00	9,26	14,43	20,14	28,71	37,89	41,48	-	-	-			
	12.00	9,26	14,43	20,14	28,71	37,89	-	-	-	-			

No further specifications.

Fasteners for connecting steel components

nonut®-TDBL-T-10,6 x L nonut®-TDBLF-T-10,6 x L

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			Materials			
			Screw:	Carbon steel tempered and	coated	
	8.61	J J J Z ∞Ø10,6	Component I:			
	a a		Component 1.	S280GD to S3	50GD – EN 10346	
SW16				HX300LAD to	HX380LAD – EN 1	0346
		~Ø6.5	Component II:	S235 to S275 -		
					50GD – EN 10346 HX380LAD – EN 1	
585						
		J U	Des skill slises st			
			Pre-drill diamet	ter		
SW16	-	~Ø6.5		$d_{\text{pd},\text{I}} = 10.0 \text{ mm}$	I	
			Component II:	d _{pd,II} see table		
				t _{ii} [mm]		
		3.00	4.00		5.00	≥ 6.00
				d _{pd,II} = 10.0 m	m	
	2 x 0.88	10,31	10,31		10,31	10,31
	2 x 0.90	10,39	10,39		10,39	10,39
V _{R,k} [kN]	2 x 1.00	10,79	10,79		10,79	10,79
VR,K [KIN]	2 x 1.13	10,89	10,89		10,89	10,89
tı [mm]	2 x 1.25	10,98	10,98		10,98	10,98
	2 x 1.50	13,11	13,11		13,11	13,11
	2 x 1.75	13,42	13,42		13,42	13,42
	2 x 2.00	13,74	14,39		14,39	14,39
	2 x 0.88	7,25	8,01		8,01	8,01
	2 x 0.90	7,25	8,14		8,14	8,14
NI 71-1-1	2 x 1.00	7,25	8,79		8,79	8,79
N _{R,k} [kN]	2 x 1.13	7,25	10,74		10,74	10,74
tı [mm]	2 x 1.25	7,25	11,29		12,54	12,54
	2 x 1.50	7,25	11,29		15,76	17,44
	2 x 1.75	7,25	11,29		15,76	19,59

11,29

15,76

- If t_l and t_{ll} are made of S275 or S320GD the values can be increased by 8.3%.

7,25

- If t_I and t_{II} are made of S350GD or HX340LAD the values can be increased by 16,0 %.

Fasteners for connecting steel component

2 x 2.00

nonut®-TDBL-T-10,6 x L nonut®-TDBLF-T-10,6 x L Annex 18

21,74

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			Materials						
			Screw:	Carbon steel tempered and coated					
385	- ¢19.8	J → ∞Ø10.6	Component I:	S355 – EN 10025-2 S390GD to S450GD – EN 10346 HX420LAD to HX460LAD – EN 10	0346				
SW16		- #6.5	Component II:	S355 – EN 10025-2 S390GD to S450GD – EN 10346 HX420LAD to HX460LAD – EN 10					
SPS U SW10	Ø19, 8		<u>Pre-drill diameter</u> Component I: $d_{pd,I} = 10.0 \text{ mm}$ Component II: $d_{pd,II}$ see table						
		3.00	4 00	t _{ii} [mm]	> 6 00				
		3.00	4.00	5.00	≥ 6.00				
	2 x 0.88		1	d _{pd,II} = 10.0 mm					
	2 x 0.88 2 x 0.90	11,97	11,97	5.00 d _{pd,II} = 10.0 mm 11,97	11,97				
	2 x 0.90	11,97 12,28	11,97 12,28	5.00 d _{pd,II} = 10.0 mm 11,97 12,28	11,97 12,28				
V _{R,k} [kN]	2 x 0.90 2 x 1.00	11,97 12,28 13,78	11,97 12,28 13,78	5.00 d _{pd,II} = 10.0 mm 11,97 12,28 13,78	11,97 12,28 13,78				
	2 x 0.90 2 x 1.00 2 x 1.13	11,97 12,28 13,78 13,91	11,97 12,28 13,78 13,91	5.00 d _{pd,II} = 10.0 mm 11,97 12,28 13,78 13,91	11,97 12,28 13,78 13,91				
V_{R,k} [kN] tı [mm]	2 x 0.90 2 x 1.00	11,97 12,28 13,78	11,97 12,28 13,78	5.00 d _{pd,II} = 10.0 mm 11,97 12,28 13,78	11,97 12,28 13,78				
	2 x 0.90 2 x 1.00 2 x 1.13 2 x 1.25	11,97 12,28 13,78 13,91 14,03 16,75	11,97 12,28 13,78 13,91 14,03	5.00 dpd,II = 10.0 mm 11,97 12,28 13,78 13,91 14,03	11,97 12,28 13,78 13,91 14,03				
	2 x 0.90 2 x 1.00 2 x 1.13 2 x 1.25 2 x 1.50	11,97 12,28 13,78 13,91 14,03	11,97 12,28 13,78 13,91 14,03 16,75	5.00 dpd,II = 10.0 mm 11,97 12,28 13,78 13,91 14,03 16,75	11,97 12,28 13,78 13,91 14,03 16,75				
	2 x 0.90 2 x 1.00 2 x 1.13 2 x 1.25 2 x 1.50 2 x 1.75	11,97 12,28 13,78 13,91 14,03 16,75 17,15	11,97 12,28 13,78 13,91 14,03 16,75 17,15	5.00 dpd,II = 10.0 mm 11,97 12,28 13,78 13,91 14,03 16,75 17,15	11,97 12,28 13,78 13,91 14,03 16,75 17,15				
	$ \begin{array}{r} 2 \times 0.90 \\ 2 \times 1.00 \\ 2 \times 1.13 \\ 2 \times 1.25 \\ 2 \times 1.50 \\ 2 \times 1.75 \\ 2 \times 2.00 \\ \end{array} $	11,97 12,28 13,78 13,91 14,03 16,75 17,15 17,56	11,97 12,28 13,78 13,91 14,03 16,75 17,15 18,39	5.00 d _{pd,II} = 10.0 mm 11,97 12,28 13,78 13,91 14,03 16,75 17,15 18,39	11,97 12,28 13,78 13,91 14,03 16,75 17,15 18,39				
tı (mm)	2 x 0.90 2 x 1.00 2 x 1.13 2 x 1.25 2 x 1.50 2 x 1.75 2 x 2.00 2 x 0.88	11,97 12,28 13,78 13,91 14,03 16,75 17,15 17,56 9,20	11,97 12,28 13,78 13,91 14,03 16,75 17,15 18,39 9,20	5.00 d _{pd,II} = 10.0 mm 11,97 12,28 13,78 13,91 14,03 16,75 17,15 18,39 9,20	11,97 12,28 13,78 13,91 14,03 16,75 17,15 18,39 9,20				
	$\begin{array}{r} 2 \times 0.90 \\ 2 \times 1.00 \\ 2 \times 1.13 \\ 2 \times 1.25 \\ 2 \times 1.50 \\ 2 \times 1.75 \\ 2 \times 2.00 \\ 2 \times 0.88 \\ 2 \times 0.90 \end{array}$	11,97 12,28 13,78 13,91 14,03 16,75 17,15 17,56 9,20 9,26	11,97 12,28 13,78 13,91 14,03 16,75 17,15 18,39 9,20 9,44	5.00 dpd,II = 10.0 mm 11,97 12,28 13,78 13,91 14,03 16,75 17,15 18,39 9,20 9,44 10,68	11,97 12,28 13,78 13,91 14,03 16,75 17,15 18,39 9,20 9,44				
tı [mm] N _{R,k} [kN]	$\begin{array}{r} 2 \times 0.90 \\ 2 \times 1.00 \\ 2 \times 1.13 \\ 2 \times 1.25 \\ 2 \times 1.50 \\ 2 \times 1.75 \\ 2 \times 2.00 \\ 2 \times 0.88 \\ 2 \times 0.90 \\ 2 \times 1.00 \end{array}$	11,97 12,28 13,78 13,91 14,03 16,75 17,15 17,56 9,20 9,26 9,26 9,26	11,97 12,28 13,78 13,91 14,03 16,75 17,15 18,39 9,20 9,44 10,68	5.00 dpd,II = 10.0 mm 11,97 12,28 13,78 13,91 14,03 16,75 17,15 18,39 9,20 9,44 10,68 12,95	11,97 12,28 13,78 13,91 14,03 16,75 17,15 18,39 9,20 9,44 10,68				
tı (mm)	$\begin{array}{r} 2 \times 0.90 \\ 2 \times 1.00 \\ 2 \times 1.13 \\ 2 \times 1.25 \\ 2 \times 1.50 \\ 2 \times 1.75 \\ 2 \times 2.00 \\ 2 \times 0.88 \\ 2 \times 0.90 \\ 2 \times 1.00 \\ 2 \times 1.13 \end{array}$	11,97 12,28 13,78 13,91 14,03 16,75 17,15 17,15 17,56 9,20 9,26 9,26 9,26 9,26	11,97 12,28 13,78 13,91 14,03 16,75 17,15 18,39 9,20 9,44 10,68 12,95	5.00 dpd,II = 10.0 mm 11,97 12,28 13,78 13,91 14,03 16,75 17,15 9,20 9,44 10,68 12,95 15,05	11,97 12,28 13,78 13,91 14,03 16,75 17,15 18,39 9,20 9,44 10,68 12,95				
tı [mm] N _{R,k} [kN]	$\begin{array}{r} 2 \times 0.90 \\ 2 \times 1.00 \\ 2 \times 1.13 \\ 2 \times 1.25 \\ 2 \times 1.50 \\ 2 \times 1.75 \\ 2 \times 2.00 \\ 2 \times 0.88 \\ 2 \times 0.90 \\ 2 \times 1.00 \\ 2 \times 1.13 \\ 2 \times 1.25 \end{array}$	11,97 12,28 13,78 13,91 14,03 16,75 17,15 17,56 9,20 9,26 9,26 9,26 9,26 9,26	11,97 12,28 13,78 13,91 14,03 16,75 17,15 18,39 9,20 9,44 10,68 12,95 14,43	5.00 dpd,II = 10.0 mm 11,97 12,28 13,78 13,91 14,03 16,75 17,15 18,39 9,20 9,44 10,68 12,95 15,05 20,14	11,97 12,28 13,78 13,91 14,03 16,75 17,15 18,39 9,20 9,44 10,68 12,95 15,05				

No further specifications.

Fasteners for connecting steel components

nonut®-TDBL-T-10,6 x L nonut®-TDBLF-T-10,6 x L

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			<u>Materials</u>				
			Screw:	Carbon stempere	steel d and coated		
	-019.8	v v ∞Ø10.6	Component I:	S280GD	S355 – EN 10025-2) to S450GD – EN 10346 AD to HX460LAD – EN 103	346	
SW16	•	~Ø6.5	Component II:		S355 – EN 10025-2		
				S280GD	to S450GD – EN 10346 AD to HX460LAD – EN 103	346	
SP5 SW10		-Ø10,6	5 x 28.5 mm (elongated hol table	le)			
					1		
			3.00	tıı (m 	nmj ≥ 4.(00	
			5.00	d _{pd,II} = 1			
	2 x 0.88		6,27		6,2	7	
	2 x 0.90		6,82		6,8		
	2 x 1.00		,54 ^{a)}				
V _{R,k} [kN]	2 x 1.13		, <u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>		9,54 ^{a)} 9,61		
					9,6		
tı [mm]	2 x 1.25		9,68				
	2 x 1.50),75 ^{a)}		10,75		
	2 x 1.75		2,32 ^{a)}		12,32		
	2 x 2.00		3,90 ^{a)}		13,90		
	2 x 0.88		4,28		4,2		
	2 x 0.90		4,33		4,3		
	2 x 1.00		,61 ^{a)}		4,61		
N _{R,k} [kN]	2 x 1.13		6,23		6,2		
t _i [mm]	2 x 1.25	7	,25 ^{a)}		7,7	2	
	2 x 1.50	7	,25 ^{a)}		8,05	; a)	
	2 x 1.75	7	,25 ^{a)}		8,57	, a)	
	2 x 2.00	7	,25 ^{a)}		9,09	a)	
					28,5 mm	ction of shear e 	
10		-1.0075 - 0000000			2.00/		
		of S275 or S320GD the		-			
If ti and ti	are made	of S350GD or HX340LA	D the values can be	e increase	ed by 16,0 %.		
	₁ are made d by 27,8 %		450GD or HX420L/	AD to HX	460LAD the values marked	l with ^{a)} can be	
Fasteners	for conne	cting steel compone	ents				
nonut®-TDB nonut®-TDB						Annex 20	

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				<u>Mat</u>	erials								
				Scre	ew:	Carbon tempere	steel d and coat	ed					
SP3 SW16	- \$19,8		~Ø10.6	Con	nponent I:	S235 to S280GE	S275 – EN to S350G AD to HX3	N 10025-2 D – EN 10					
- Sw10			-¢6.5	Con	Component II: S235 to S275 – EN 10025-2 S280GD to S350GD – EN 10346 HX300LAD to HX380LAD – EN 10346								
SP5 V SW10			-Ø10.6	Con	$\begin{tabular}{ll} \hline Pre-drill \ diameter \\ Component \ I: & d_{pd,l} = 8.5 \times 28.5 \ mm \ (elongated \ hole) \\ Component \ II: & d_{pd,ll} \ see \ table \end{tabular}$								
		-				t., [t	mm]						
		1.00	1.13	1.25	1.50	1.75	2.00	3.00	4.00	6.00	≥ 8.00		
				d _{pd,II} =	9.0 mm				d _p	a,ii = 10.0 r	nm		
	0.88	1,98	1,98	1,98	1,98	1,98	1,98	1,98	1,98	1,98	1,98		
-	0.90	2,02	2,02	2,02	2,02	2,02	2,02	2,02	2,02	2,02	2,02		
-	1.00	2,20	2,20	2,20	2,20	2,20	2,20	2,20	2,20	2,20	2,20		
	1.13	2,20	2,94	2,94	2,94	2,94	2,94	2,94	2,94	2,94	2,94		
V _{R,k} [kN] ⁻	1.25	2,20	2,94	3,63	3,63	3,63	3,63	3,63	3,63	3,63	3,63		
- tı [mm] _	1.50	2,20	2,94	3,63	5,06	5,06	5,06	5,06	5,06	5,06	5,06		
	1.75	2,20	2,94	3,63	5,06	6,77	6,77	6,77	6,77	6,77	6,77		
	2.00	2,20	2,94	3,63	5,06	6,77	8,47	8,47	8,47	8,47	8,47		
-	3.00	2,20	2,94	3,63	5,06	6,77	8,47	13,52	13,52	13,52	13,52		
_	4.00	2,20	2,94	3,63	5,06	6,77	8,47	13,52	16,07	16,07	16,07		
_	0.88	1,66	1,66	1,66	1,66	1,66	1,66	1,66	1,66	1,66	1,66		
	0.90	1,74	1,74	1,74	1,74	1,74	1,74	1,74	1,74	1,74	1,74		
_	1.00	1,75	2,12	2,12	2,12	2,12	2,12	2,12	2,12	2,12	2,12		
NI 11-NII -	1.13	1,75	2,19	2,60	2,76	2,76	2,76	2,76	2,76	2,76	2,76		
N _{R,k} [kN] -	1.25	1,75	2,19	2,60	3,36	3,36	3,36	3,36	3,36	3,36	3,36		
tı [mm] _	1.50	1,75	2,19	2,60	3,44	4,26	4,60	4,60	4,60	4,60	4,60		
-	1.75	1,75	2,19	2,60	3,44	4,26	5,08	5,53	5,53	5,53	5,53		
-	2.00	1,75	2,19	2,60	3,44	4,26	5,08	6,46	6,46	6,46	6,46		
-	3.00	1,75	2,19	2,60	3,44	4,26	5,08	7,25	9,28	9,28	9,28		
	4.00	1,75	2,19	2,60	3,44	4,26	5,08	7,25	11,29	11,54	11,54		
If tլ and tլլ If tլ and tլլ can be inc	are made					reased by	8.3%.	28,5 mr		force	n of shear		
									8,5 mi	n			
asteners f	or conne	ecting ste	el compo	onents									
onut®-TDBL	T 10.0									Anne	x 21		

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				Mat	<u>erials</u>							
				Scre	ew:	Carbon tempere	steel d and coat	ed				
	- \$19.8		~Ø10.6	Con	nponent I:	S390GE	EN 10025-) to S450G AD to HX4	D – EN 10				
SW16	-		-ø6.5	Con	nponent II:	S390GD	EN 10025-2 to S450G AD to HX4	D – EN 10				
SW16	- Ø19,8		-ø10,6	Con	-drill diame nponent I: nponent II:	d _{pd,I} = 8.		m (elongat	ed hole)			
		1				4. [·						
		1.00	1.13	1.25	1.50	նոլ 1.75	mm] 2.00	3.00	4.00	6.00	≥ 8.00	
		1.00	1.10		9.0 mm	1.70	2.00	0.00		4.00 6.00 ≥ 8.00 d _{pd,II} = 10.0 mm		
	0.88	2,53	2,53	2,53	2,53	2,53	2,53	2,53	2,53	2,53	2,53	
	0.90	2,58	2,58	2,58	2,58	2,58	2,58	2,58	2,58	2,58	2,58	
	1.00	2,81	2,81	2,81	2,81	2,81	2,81	2,81	2,81	2,81	2,81	
	1.13	2,81	3,76	3,76	3,76	3,76	3,76	3,76	3,76	3,76	3,76	
V _{R,k} [kN]	1.25	2,81	3,76	4,64	4,64	4,64	4,64	4,64	4,64	4,64	4,64	
tı [mm]	1.50	2,81	3,76	4,64	6,46	6,46	6,46	6,46	6,46	6,46	6,46	
	1.75	2,81	3,76	4,64	6,46	8,64	8,64	8,64	8,64	8,64	8,64	
	2.00	2,81	3,76	4,64	6,46	8,64	10,83	10,83	10,83	10,83	10,83	
	3.00	2,81	3,76	4,64	6,46	8,64	10,83	17,27	17,27	17,27	17,27	
	3.00						10.00	17,27	18,71	18,71	18,71	
	4.00	2,81	3,76	4,64	6,46	8,64	10,83	-	-	1	1 1 0 0	
· ·	4.00 0.88	1,96	1,96	1,96	1,96	1,96	1,96	1,96	1,96	1,96	1,96	
	4.00 0.88 0.90	1,96 2,08	1,96 2,08	1,96 2,08	1,96 2,08	1,96 2,08	1,96 2,08	1,96 2,08	1,96 2,08	2,08	2,08	
	4.00 0.88 0.90 1.00	1,96 2,08 2,23	1,96 2,08 2,71	1,96 2,08 2,71	1,96 2,08 2,71	1,96 2,08 2,71	1,96 2,08 2,71	1,96 2,08 2,71	1,96 2,08 2,71	2,08 2,71	2,08 2,71	
	4.00 0.88 0.90 1.00 1.13	1,96 2,08 2,23 2,23	1,96 2,08 2,71 2,80	1,96 2,08 2,71 3,32	1,96 2,08 2,71 3,53	1,96 2,08 2,71 3,53	1,96 2,08 2,71 3,53	1,96 2,08 2,71 3,53	1,96 2,08 2,71 3,53	2,08 2,71 3,53	2,08 2,71 3,53	
N _{R,k} [kN]	4.00 0.88 0.90 1.00 1.13 1.25	1,96 2,08 2,23 2,23 2,23 2,23	1,96 2,08 2,71 2,80 2,80	1,96 2,08 2,71 3,32 3,32	1,96 2,08 2,71 3,53 4,29	1,96 2,08 2,71 3,53 4,29	1,96 2,08 2,71 3,53 4,29	1,96 2,08 2,71 3,53 4,29	1,96 2,08 2,71 3,53 4,29	2,08 2,71 3,53 4,29	2,08 2,71 3,53 4,29	
N_{R,k} [kN] tı [mm]	4.00 0.88 0.90 1.00 1.13 1.25 1.50	1,96 2,08 2,23 2,23 2,23 2,23 2,23	1,96 2,08 2,71 2,80 2,80 2,80	1,96 2,08 2,71 3,32 3,32 3,32	1,96 2,08 2,71 3,53 4,29 4,40	1,96 2,08 2,71 3,53 4,29 5,44	1,96 2,08 2,71 3,53 4,29 5,87	1,96 2,08 2,71 3,53 4,29 5,87	1,96 2,08 2,71 3,53 4,29 5,87	2,08 2,71 3,53 4,29 5,87	2,08 2,71 3,53 4,29 5,87	
	4.00 0.88 0.90 1.00 1.13 1.25 1.50 1.75	1,96 2,08 2,23 2,23 2,23 2,23 2,23 2,23	1,96 2,08 2,71 2,80 2,80 2,80 2,80	1,96 2,08 2,71 3,32 3,32 3,32 3,32 3,32	1,96 2,08 2,71 3,53 4,29 4,40 4,40	1,96 2,08 2,71 3,53 4,29 5,44 5,44	1,96 2,08 2,71 3,53 4,29 5,87 6,48	1,96 2,08 2,71 3,53 4,29 5,87 7,06	1,96 2,08 2,71 3,53 4,29 5,87 7,06	2,08 2,71 3,53 4,29 5,87 7,06	2,08 2,71 3,53 4,29 5,87 7,06	
	4.00 0.88 0.90 1.00 1.13 1.25 1.50 1.75 2.00	1,96 2,08 2,23 2,23 2,23 2,23 2,23 2,23 2,23 2,2	1,96 2,08 2,71 2,80 2,80 2,80 2,80 2,80	1,96 2,08 2,71 3,32 3,32 3,32 3,32 3,32 3,32	1,96 2,08 2,71 3,53 4,29 4,40 4,40 4,40	1,96 2,08 2,71 3,53 4,29 5,44 5,44 5,44	1,96 2,08 2,71 3,53 4,29 5,87 6,48 6,48	1,96 2,08 2,71 3,53 4,29 5,87 7,06 8,25	1,96 2,08 2,71 3,53 4,29 5,87 7,06 8,25	2,08 2,71 3,53 4,29 5,87 7,06 8,25	2,08 2,71 3,53 4,29 5,87 7,06 8,25	
	4.00 0.88 0.90 1.00 1.13 1.25 1.50 1.75	1,96 2,08 2,23 2,23 2,23 2,23 2,23 2,23	1,96 2,08 2,71 2,80 2,80 2,80 2,80	1,96 2,08 2,71 3,32 3,32 3,32 3,32 3,32	1,96 2,08 2,71 3,53 4,29 4,40 4,40	1,96 2,08 2,71 3,53 4,29 5,44 5,44	1,96 2,08 2,71 3,53 4,29 5,87 6,48	1,96 2,08 2,71 3,53 4,29 5,87 7,06	1,96 2,08 2,71 3,53 4,29 5,87 7,06	2,08 2,71 3,53 4,29 5,87 7,06	2,08 2,71 3,53 4,29 5,87 7,06	

No further specifications.

28,5 mm

8,5 mm

Fasteners for connecting steel components

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			Mat	<u>erials</u>						
			Scr	ew:	Carbon tempere	steel d and coa	ted			
SW 16	L CL	~\$10.6	Cor	nponent I:	S280GD to S320GD – EN 10346 HX300LAD – EN 10346					
30110		₽ -¢6.5	Component II: S235 – EN 10025-2 S280GD to S320GD – EN 10346 HX300LAD – EN 10346							
B C L G SW 16		-ø10.6	Cor	-drill diame nponent I: nponent II:	$d_{pd,I} = d_p$	^{od,}				
	1.00	1.25	1.50	2.00	tıı [r 3.00	nm] 4.00	5.00	6.00	8.00	≥ 10.00
	1.00				3.00	4.00				2 10.00
			⊫ = 9.0 mm				1	= d _{pd.II} = 10		
1.00	3,04	3,31	3,58	3,96	5,47	5,47	5,47	5,47	5,47	5,47
1.13	-	4,34	4,47	4,65	6,24	6,24	6,24	6,24	6,24	6,24
1.25	- 1	5.30	5.30	5.30	6.95	7.59	7.59	7.59	7.59	7.59

	1.13	-	4,34	4,47	4,65	6,24	6,24	6,24	6,24	6,24	6,24
	1.25	-	5,30	5,30	5,30	6,95	7,59	7,59	7,59	7,59	7,59
V _{R.k} [kN]	1.50	-	-	6,46	6,46	8,43	10,41	10,41	10,41	10,41	10,41
t _i [mm]	1.75	-	-	-	8,43	9,49	10,41	11,86	12,88	12,88	12,88
	2.00	-	-	-	10,40	10,54	11,28	13,32	15,36	15,36	15,36
	3.00	-	-	-	-	14,76	14,76	16,42	18,08	24,56	24,56
	4.00	-	-	-	-	-	20,81	20,81	20,81	24,56	24,56
	1.00	1,75	2,60	3,44	4,41	4,41	4,41	4,41	4,41	4,41	4,41
	1.13	-	2,60	3,44	5,08	5,85	5,85	5,85	5,85	5,85	5,85
	1.25	-	2,60	3,44	5,08	7,18	7,18	7,18	7,18	7,18	7,18
N _{R.k} [kN]	1.50	-	-	3,44	5,08	7,25	9,95	9,95	9,95	9,95	9,95
t _i [mm]	1.75	-	-	-	5,08	7,25	11,29	12,46	12,46	12,46	12,46
• []	2.00	-	-	-	5,08	7,25	11,29	14,97	14,97	14,97	14,97
	3.00	-	-	-	-	7,25	11,29	14,97	14,97	14,97	14,97
	4.00	-	-	-	-	-	11,29	14,97	14,97	14,97	14,97

No further specifications.

Fasteners for connecting steel components

nonut®-TDBL-T-10,6 x L nonut®-TDBLF-T-10,6 x L

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		<u>Materials</u> Screw:	Carbon steel tempered and coated
	-0/10.6	Component I:	S275 to S355 – EN 10025-2 S350GD to S450GD – EN 10346 HX340LAD to HX460LAD – EN 10346
	- ¢6.5	Component II:	S275 to S355 – EN 10025-2 S350GD to S450GD – EN 10346 HX340LAD to HX460LAD – EN 10346
SW16	-ø10.6	<u>Pre-drill diamet</u> Component I: Component II:	$\mathbf{d}_{pd,l} = \mathbf{d}_{pd,ll}$
			tu [mm]

						tıı (r	nm]					
		1.00	1.25	1.50	2.00	3.00	4.00	5.00	6.00	8.00	≥ 10.00	
			$d_{\text{pd.I}} = d_{\text{pd.I}}$	u = 9.0 mm			$d_{pd.I} = d_{pd.II} = 10.0 \text{ mm}$					
	1.00	3,46	3,52	3,58	4,11	6,23	6,23	6,23	6,23	6,23	6,23	
	1.13	-	4,83	4,85	5,11	7,06	7,06	7,06	7,06	7,06	7,06	
	1.25	-	6,03	6,03	6,03	7,83	8,62	8,62	8,62	8,62	8,62	
V _{R.k} [kN]	1.50	-	-	7,00	7,00	9,43	11,85	11,85	11,85	11,85	11,85	
t _i [mm]	1.75	-	-	-	8,90	10,32	11,85	13,02	13,90	13,90	13,90	
	2.00	-	-	-	10,80	11,21	12,44	14,19	15,95	15,95	15,95	
	3.00	-	-	-	-	14,76	14,76	17,29	19,83	24,56	24,56	
	4.00	-	-	-	-	-	23,70	23,70	23,70	24,56	24,56	
	1.00	2,04	3,03	4,02	5,02	5,02	5,02	5,02	5,02	5,02	5,02	
	1.13	-	3,03	4,02	5,92	6,52	6,52	6,52	6,52	6,52	6,52	
	1.25	-	3,03	4,02	5,92	7,91	7,91	7,91	7,91	7,91	7,91	
N _{R.k} [kN]	1.50	-	-	4,02	5,92	8,46	10,79	10,79	10,79	10,79	10,79	
t _i [mm]	1.75	-	-	-	5,92	8,46	13,17	13,17	13,17	13,17	13,17	
	2.00	-	-	-	5,92	8,46	13,18	15,55	15,55	15,55	15,55	
	3.00	-	-	-	-	8,46	13,18	15,55	15,55	15,55	15,55	
	4.00	-	-	-	-	-	13,18	15,55	15,55	15,55	15,55	

No further specifications.

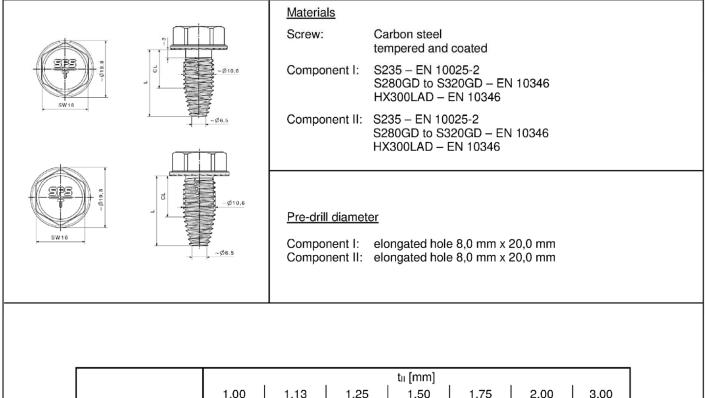
Fasteners for connecting steel components

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					tii [mm]			
		1,00	1,13	1,25	1,50	1,75	2,00	3,00
				$d_{pd,l} = dp$	od,ii = 8.0 x 2	20.0 mm		
	1.00	1,45	1,45	1,45	1,45	1,45	1,45	1,45
	1.13	-	1,78	1,78	1,78	1,78	1,78	1,78
V _{R,k} [kN]	1.25	-	-	2,09	2,09	2,09	2,09	2,09
	1.50	-	-	-	2,74	2,74	2,74	2,74
t _i [mm]	1.75	-	-	-	-	3,39	3,39	3,39
	2.00	-	-	-	-	-	4,04	4,04
	3.00	-	-	-	-	-	-	10,41
	1.00	-	-	-	-	-	-	-
	1.13	-	-	-	-	-	-	-
N _{R,k} [kN]	1.25	-	-	-	-	-	-	-
	1.50	-	-	-	-	-	-	-
tı [mm]	1.75	-	-	-	-	-	-	-
	2.00	-	-	-	-	-	-	-
	3.00	-	-	-	-	-	-	-

Further specifications:

direction of shear force

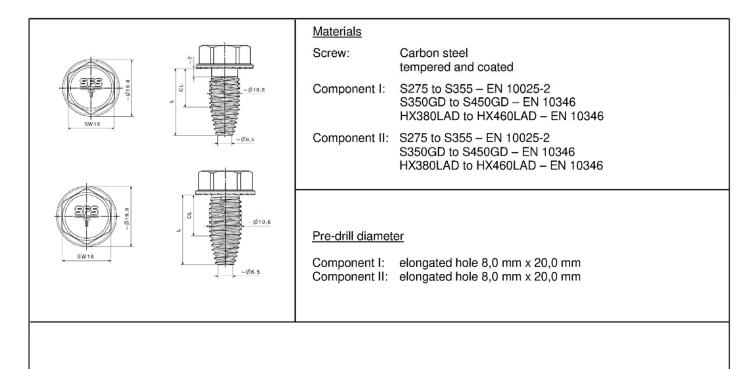
Fasteners for connecting steel components

nonut®-TDBL-T-10,6 x L nonut®-TDBLF-T-10,6 x L

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					tıı [mm]			
		1,00	1,13	1,25	1,50	1,75	2,00	3,00
				$d_{pd,l} = dp$	od,ii = 8.0 x 2	20.0 mm		
	1.00	1,65	1,65	1,65	1,65	1,65	1,65	1,65
	1.13	-	2,03	2,03	2,03	2,03	2,03	2,03
V _{R,k} [kN]	1.25	-	-	2,39	2,39	2,39	2,39	2,39
	1.50	-	-	-	3,13	3,13	3,13	3,13
tı [mm]	1.75	-	-	-	-	3,86	3,86	3,86
	2.00	-	-	-	-	-	4,60	4,60
	3.00	-	-	-	-	-	-	11,85
	1.00	-	-	-	-	-	-	-
	1.13	-	-	-	-	-	-	-
NR,k [kN]	1.25	-	-	-	-	-	-	-
	1.50	-	-	-	-	-	-	-
tı [mm]	1.75	-	-	-	-	-	-	-
	2.00	-	-	-	-	-	-	-
	3.00	-	-	-	-	-	-	-

Further specifications:

direction of shear force

Fasteners for connecting steel components

nonut®-TDBL-T-10,6 x L nonut®-TDBLF-T-10,6 x L

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						Materials	<u>s</u>							
		F N		\square		Screw:		Carbon s tempered		ated				
G	· ((=	1				Compon		S235 – E						
	- 2/16.8	CL L		~Ø8,6		Compon	S280GD to S320GD – EN 10346 HX300LAD – EN 10346							
sw	13			Mma.		Component II: S235 – EN 10025-2								
			-	~Ø5,5				S280GD HX300LA	to S3200	GD – EN	10346			
A		1												
SW	Ð	0		~ 08,6			ent I:	r d _{pd,I} = d _{pd} see table						
								tıı [mm]						
		0.88	0.90	1.00	1.13	1.25	1.50	1.75	2.00	3.00	4.00	6.00	8.00	≥ 10.00
				d	$d_{pd.I} = d_{pd.I}$	ıı = 7.5 m	im				d _{pd.I} =	$d_{pd.II} = 8$.0 mm	
-	0.88	2,46	2,49	2,64	2,82	2,99	3,35	3,70	4,06	4,06	4,06	4,06	4,06	4,06
-	0.90	-	2,54	2,68	2,88	3,05	3,35	3,70	4,06	4,24	4,24	4,24	4,24	4,24
-	1.00	-	-	2,91	3,17	3,37	3,37	3,70	4,06	5,15	6,00	6,00	6,00	6,00
V _{R.k} [kN]_	1.13	-	-	-	3,56	3,77	3,92	3,92	4,06	6,33	8,29	8,29	8,29	8,29
	1.25	-	-	-	-	4,15	4,44	4,44	4,44	7,42	10,40	10,40	10,40	10,40
t _I [mm]	1.50	-	-	-	-	-	5,51	6,19	6,19	7,42	10,40	11,23	11,23	11,23
-	1.75	-	-	-	-	-	-	7,94	8,28	8,28	10,40	11,94	11,94	11,94
-	2.00	-	-	-	-	-	-	-	10,37	9,63	10,40	12,64	14,88	14,88
	3.00	-	-	-	-	-	-	-	-	15,03	15,03	16,57	18,10	26,30
											0.10	0 10	3,18	3,18
	0.88	1,12	1,16	1,33	1,59	1,83	2,59	3,18	3,18	3,18	3,18	3,18		
-	0.90	1,12 -	1,16 1,16	1,33	1,59	1,83	2,59	3,24	3,24	3,24	3,24	3,24	3,24	3,24
-								-	-					
- - N _{R.k} [kN]	0.90	-	1,16	1,33	1,59	1,83	2,59	3,24	3,24	3,24	3,24	3,24	3,24	3,24
	0.90 1.00	-	1,16 -	1,33 1,33	1,59 1,59	1,83 1,83	2,59 2,59	3,24 3,24	3,24 3,55	3,24 3,55	3,24 3,55	3,24 3,55	3,24 3,55	3,24 3,55
- - NR.k [kN] tı [mm]	0.90 1.00 1.13	-	1,16 - -	1,33 1,33 -	1,59 1,59 1,59	1,83 1,83 1,83	2,59 2,59 2,59	3,24 3,24 3,24	3,24 3,55 3,89	3,24 3,55 4,37	3,24 3,55 4,37	3,24 3,55 4,37	3,24 3,55 4,37	3,24 3,55 4,37
- - NR.k [kN] t _i [mm]	0.90 1.00 1.13 1.25	-	1,16 - - -	1,33 1,33 - -	1,59 1,59 1,59 -	1,83 1,83 1,83 1,83	2,59 2,59 2,59 2,59	3,24 3,24 3,24 3,24 3,24	3,24 3,55 3,89 3,89	3,24 3,55 4,37 5,12	3,24 3,55 4,37 5,12	3,24 3,55 4,37 5,12	3,24 3,55 4,37 5,12	3,24 3,55 4,37 5,12
	0.90 1.00 1.13 1.25 1.50	-	1,16 - - - -	1,33 1,33 - - -	1,59 1,59 1,59 - -	1,83 1,83 1,83 1,83 -	2,59 2,59 2,59 2,59 2,59 2,59	3,24 3,24 3,24 3,24 3,24 3,24	3,24 3,55 3,89 3,89 3,89 3,89	3,24 3,55 4,37 5,12 7,88	3,24 3,55 4,37 5,12 9,07	3,24 3,55 4,37 5,12 9,07	3,24 3,55 4,37 5,12 9,07	3,24 3,55 4,37 5,12 9,07

No further specifications.

Fasteners for connecting steel components

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						Materials	<u>5</u>							
一末		۲ _۵		\square		Screw:		Carbon s tempered		ated				
	2016.8 ∼Ø16.8			~Ø8,6		Compon		S275 to S S350GD HX380LA	to S4500	GD – EN	10346	346		
SW1	3		TUTUM.	~Ø5,5		Compon	ent II:	S275 to 8 S350GD HX380LA	6355 – E to S4500	N 10025 GD – EN	-2 10346			
				\Box			3				21110			
$\frac{1}{1} + \frac{1}{1} + \frac{1}$														
								tıı [mm]						
		0.88	0.90	1.00	1.13	1.25	1.50	1.75	2.00	3.00	4.00	6.00	8.00	≥ 10.00
				d	$pd.I = d_{pd}$	u = 7.5 m	Im				d _{pd.I} =	$d_{pd.II} = 8$.0 mm	
_	0.88	2,81	2,84	3,00	3,21	3,41	3,81	4,22	4,62	4,62	4,62	4,62	4,62	4,62
-	0.90	-	2,89	3,05	3,28	3,47	3,81	4,22	4,62	4,81	4,81	4,81	4,81	4,81
_	1.00	-	-	3,32	3,60	3,81	3,81	4,22	4,62	5,74	6,61	6,61	6,61	6,61
V _{R.k} [kN]_	1.13	-	-	-	4,02	4,25	4,42	4,42	4,62	6,94	8,96	8,96	8,96	8,96
	1.25	-	-	-	-	4,66	4,98	4,98	4,98	8,06	11,13	11,13	11,13	11,13
t _I [mm]	1.50	-	-	-	-	-	6,16	6,74	6,74	8,06	11,13	12,79	12,79	12,79
-	1.75	-	-	-	-	-	-	8,49	8,78	8,78	11,13	13,06	13,06	13,06
-	2.00	-	-	-	-	-	-	-	10,83	10,03	11,13	13,33	15,54	15,54
	3.00	-	-	-	-	-	-	-	-	15,03	15,03	17,01	18,99	26,30
	0.00		4.07	4.50	1,72	1 01	2,76	3,52	3,52	3,52	3,52	3,52	3,52	3,52
	0.88	1,23	1,27	1,52	1,72	1,91		0,02			-,	,		0,02
-	0.90	1,23 -	1,27	1,52	1,72	1,91	2,76	3,59	3,61	3,61	3,61	3,61	3,61	3,61
-		1,23 - -			1,72 1,72			-						
- N _{R.k} [kN]_	0.90 1.00 1.13	1,23 - - -		1,52	1,72	1,91	2,76 2,76 2,76	3,59	3,61	3,61 4,05 4,77	3,61	3,61	3,61	3,61
	0.90 1.00 1.13 1.25	-	1,27 -	1,52 1,52	1,72 1,72	1,91 1,91	2,76 2,76	3,59 3,59	3,61 4,05	3,61 4,05	3,61 4,05	3,61 4,05	3,61 4,05 4,77 5,43	3,61 4,05
- N _{R.k} [kN] tı [mm]	0.90 1.00 1.13	-	1,27 - -	1,52 1,52 -	1,72 1,72	1,91 1,91 1,91	2,76 2,76 2,76	3,59 3,59 3,59	3,61 4,05 4,43	3,61 4,05 4,77	3,61 4,05 4,77	3,61 4,05 4,77	3,61 4,05 4,77	3,61 4,05 4,77
	0.90 1.00 1.13 1.25	-	1,27 - - -	1,52 1,52 - -	1,72 1,72 1,72 -	1,91 1,91 1,91 1,91 1,91	2,76 2,76 2,76 2,76 2,76	3,59 3,59 3,59 3,59 3,59	3,61 4,05 4,43 4,43	3,61 4,05 4,77 5,43	3,61 4,05 4,77 5,43	3,61 4,05 4,77 5,43	3,61 4,05 4,77 5,43	3,61 4,05 4,77 5,43
	0.90 1.00 1.13 1.25 1.50	-	1,27 - - - -	1,52 1,52 - - -	1,72 1,72 1,72 - -	1,91 1,91 1,91 1,91 -	2,76 2,76 2,76 2,76 2,76 2,76	3,59 3,59 3,59 3,59 3,59 3,59	3,61 4,05 4,43 4,43 4,43	3,61 4,05 4,77 5,43 8,97	3,61 4,05 4,77 5,43 9,78	3,61 4,05 4,77 5,43 9,78	3,61 4,05 4,77 5,43 9,78	3,61 4,05 4,77 5,43 9,78

No further specifications.

Fasteners for connecting steel components

nonut®-TDBL-T-8,6 x L nonut®-TDBLF-T-F-8,6 x L

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991.0- 5W13		<u>Materials</u> Screw: Componer Componer	tem nt I: S27 S35 HX3 nt II: S27 S35	75 to S355 50GD to S4	– EN 100 450GD – I HX460LA – EN 100 450GD – I	EN 10346 AD – EN 10346 25-2
		<u>Pre-drill di</u> Componer Componer	ntl: d _{pd,}	ı = d _{pd,li} table		
			3.00 d _{pd.1} =	t _{II} [mm] 4.00 = d _{pd.II} = 8.0	≥ 6.00 0 mm	
	- V _{R.k} [kN] - t _i [mm] -	2 x 0.88 2 x 0.90 2 x 1.00 2 x 1.13 2 x 1.25 2 x 1.50 2 x 1.75	10,17 10,42 11,69 11,69 11,69 11,69 11,69	10,17 10,42 11,69 15,90 19,79 19,79 19,79	10,17 10,42 11,69 15,90 19,79 24,59 24,59	

2 x 2.00

2 x 0.88

2 x 0.90

2 x 1.00

2 x 1.13

2 x 1.25

2 x 1.50

2 x 1.75

2 x 2.00

NR.k [KN]

tı [mm]

19,79

3,52

3,61

4,05

4,77

5,43

9,78

10,87

11,96

11,69

3,52

3,61

4,05

4,77

5,43

8,97

8,97

8,97

24,59

3,52

3,61

4,05

4,77

5,43

9,78

10,87

11,96

No further specifications.

Fasteners for connecting steel components

nonut®-TDBL-T-8,6 x L nonut®-TDBLF-T-F-8,6 x L

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English translation prepared by DIBt



					Materials	<u>s</u>						
	CI.		\square		Screw:		Carbon s temperec		ated			
-0/16.8			-Ø8,6		Compon		S235 – E S280GD HX300LA	to S320	GD – EN	10346		
SW13		-	~Ø5.5		Component II: S235 – EN 10025-2 S280GD to S320GD – EN 10346 HX300LAD – EN 10346							
8 0 1 S			~Ø8,6		Pre-drill Compon Compon	nent I:	elongated see table	d hole 6,	.5 mm x ⁻	10,0 mm		
							tıı [mm]					
		0.88	0.90	1.00	1.13	1.25	1.50	1.75	2.00	3.00	4.00	≥ 6.00
						7.5 mm					a.u = 8.0 i	
	0.88	1,52	1,55	1,64	1,81	1,95	2,24	2,53	2,82	2,82	2,82	2,82
			1,54	1,64	1,82		-		2,82	3,10	3,10	3,10
-	0.90	-	1,54	.,	1,02	1,97	2,24	2,53	2,02	3,10	3,10	0,10
-	1.00	-	-	1,64	1,88	2,04	2,24	2,53	2,82	4,49	4,49	4,49
- - V _{R.k} [kN]												
۔ - V _{R.k} [kN] - t _i [mm]	1.00 1.13 1.25	-	-		1,88	2,04	2,24 2,33 2,41	2,53 2,53 2,53	2,92 2,92 2,92	4,49 4,49 4,49	4,49 4,66 4,82	4,49 4,66 5,08
-	1.00 1.13 1.25 1.50	-	-	1,64 -	1,88 1,95	2,04 2,15	2,24 2,33	2,53 2,53 2,53 2,59	2,92 2,92 2,92 2,92 2,92	4,49 4,49 4,49 4,49 4,49	4,49 4,66 4,82 4,82	4,49 4,66 5,08 5,94
-	1.00 1.13 1.25 1.50 1.75		-	1,64 - -	1,88 1,95 -	2,04 2,15	2,24 2,33 2,41	2,53 2,53 2,53	2,92 2,92 2,92 2,92 2,92 2,92	4,49 4,49 4,49 4,49 4,49 4,49	4,49 4,66 4,82 4,82 4,82 4,82	4,49 4,66 5,08 5,94 5,94
	1.00 1.13 1.25 1.50 1.75 2.00			1,64 - - - - -	1,88 1,95 - - - - -	2,04 2,15 2,24 - - -	2,24 2,33 2,41 2,59 - -	2,53 2,53 2,53 2,59	2,92 2,92 2,92 2,92 2,92 2,92 2,92	4,49 4,49 4,49 4,49 4,49 4,49 4,49	4,49 4,66 4,82 4,82 4,82 4,82 4,82	4,49 4,66 5,08 5,94 5,94 5,94
-	1.00 1.13 1.25 1.50 1.75 2.00 0.88		- - - - - 1,16	1,64 - - - - 1,33	1,88 1,95 - - - - - 1,59	2,04 2,15 2,24 - - - 1,83	2,24 2,33 2,41 2,59 - - 2,59	2,53 2,53 2,53 2,59 2,59 2,59 - 3,24	2,92 2,92 2,92 2,92 2,92 2,92 2,92 3,52	4,49 4,49 4,49 4,49 4,49 4,49 4,49 3,52	4,49 4,66 4,82 4,82 4,82 4,82 4,82 3,52	4,49 4,66 5,08 5,94 5,94 5,94 3,52
	1.00 1.13 1.25 1.50 1.75 2.00 0.88 0.90	- - - - - 1,12 -		1,64 - - - 1,33 1,33	1,88 1,95 - - - 1,59 1,59	2,04 2,15 2,24 - - 1,83 1,83	2,24 2,33 2,41 2,59 - - 2,59 2,59	2,53 2,53 2,59 2,59 2,59 - 3,24 3,24	2,92 2,92 2,92 2,92 2,92 2,92 2,92 3,52 3,54	4,49 4,49 4,49 4,49 4,49 4,49 4,49 3,52 3,54	4,49 4,66 4,82 4,82 4,82 4,82 4,82 3,52 3,54	4,49 4,66 5,08 5,94 5,94 5,94 3,52 3,54
- tı [mm] _ - - -	1.00 1.13 1.25 1.50 1.75 2.00 0.88 0.90 1.00	- - - - - 1,12	- - - - - 1,16	1,64 - - - 1,33 1,33 1,33	1,88 1,95 - - - 1,59 1,59 1,59	2,04 2,15 2,24 - - 1,83 1,83 1,83	2,24 2,33 2,41 2,59 - 2,59 2,59 2,59 2,59	2,53 2,53 2,59 2,59 2,59 - 3,24 3,24 3,24	2,92 2,92 2,92 2,92 2,92 2,92 2,92 3,52 3,54 3,62	4,49 4,49 4,49 4,49 4,49 4,49 3,52 3,54 3,54 3,62	4,49 4,66 4,82 4,82 4,82 4,82 4,82 3,52 3,52 3,54 3,62	4,49 4,66 5,08 5,94 5,94 5,94 3,52 3,54 3,62
-	1.00 1.13 1.25 1.50 1.75 2.00 0.88 0.90 1.00 1.13	- - - - - 1,12 -	- - - - - 1,16	1,64 - - - 1,33 1,33	1,88 1,95 - - - 1,59 1,59	2,04 2,15 2,24 - - 1,83 1,83 1,83 1,83	2,24 2,33 2,41 2,59 - 2,59 2,59 2,59 2,59 2,59	2,53 2,53 2,59 2,59 2,59 - 3,24 3,24 3,24 3,24	2,92 2,92 2,92 2,92 2,92 2,92 3,52 3,54 3,62 3,89	4,49 4,49 4,49 4,49 4,49 4,49 3,52 3,54 3,62 4,65	4,49 4,66 4,82 4,82 4,82 4,82 3,52 3,54 3,62 4,65	4,49 4,66 5,08 5,94 5,94 5,94 3,52 3,54 3,62 4,65
- tı [mm] _ - - -	1.00 1.13 1.25 1.50 1.75 2.00 0.88 0.90 1.00 1.13 1.25	- - - - - - 1,12 - - - - - -	- - - - - 1,16 1,16 - - - - -	1,64 - - - 1,33 1,33 1,33 - -	1,88 1,95 - - - 1,59 1,59 1,59 1,59 1,59 -	2,04 2,15 2,24 - - 1,83 1,83 1,83 1,83 1,83	2,24 2,33 2,41 2,59 - 2,59 2,59 2,59 2,59 2,59 2,59	2,53 2,53 2,59 2,59 - 3,24 3,24 3,24 3,24 3,24 3,24	2,92 2,92 2,92 2,92 2,92 2,92 3,52 3,52 3,54 3,62 3,89 3,89	4,49 4,49 4,49 4,49 4,49 4,49 3,52 3,54 3,62 4,65 5,60	4,49 4,66 4,82 4,82 4,82 4,82 3,52 3,52 3,54 3,62 4,65 5,60	4,49 4,66 5,08 5,94 5,94 3,52 3,54 3,62 4,65 5,60
t _i [mm] _ - - N _{R.k} [kN] -	1.00 1.13 1.25 1.50 1.75 2.00 0.88 0.90 1.00 1.13 1.25 1.50	- - - - - - 1,12 - - - - - - -	- - - - - - - 1,16 1,16 - - - - - -	1,64 - - - 1,33 1,33 1,33 - - - -	1,88 1,95 - - - 1,59 1,59 1,59 1,59 1,59 - - -	2,04 2,15 2,24 - - 1,83 1,83 1,83 1,83 1,83 1,83 -	2,24 2,33 2,41 2,59 - 2,59 2,59 2,59 2,59 2,59 2,59 2,59 2,59	2,53 2,53 2,59 2,59 - 3,24 3,24 3,24 3,24 3,24 3,24 3,24	2,92 2,92 2,92 2,92 2,92 2,92 3,52 3,52 3,54 3,62 3,89 3,89 3,89	4,49 4,49 4,49 4,49 4,49 4,49 3,52 3,54 3,52 3,54 3,62 4,65 5,60 7,63	4,49 4,66 4,82 4,82 4,82 4,82 3,52 3,52 3,54 3,62 4,65 5,60 7,63	4,49 4,66 5,08 5,94 5,94 3,52 3,54 3,62 4,65 5,60 7,63
t _i [mm] _ - - N _{R.k} [kN] -	1.00 1.13 1.25 1.50 1.75 2.00 0.88 0.90 1.00 1.13 1.25	- - - - - - 1,12 - - - - - -	- - - - - 1,16 1,16 - - - - -	1,64 - - - 1,33 1,33 1,33 - -	1,88 1,95 - - - 1,59 1,59 1,59 1,59 1,59 -	2,04 2,15 2,24 - - 1,83 1,83 1,83 1,83 1,83	2,24 2,33 2,41 2,59 - 2,59 2,59 2,59 2,59 2,59 2,59	2,53 2,53 2,59 2,59 - 3,24 3,24 3,24 3,24 3,24 3,24	2,92 2,92 2,92 2,92 2,92 2,92 3,52 3,52 3,54 3,62 3,89 3,89	4,49 4,49 4,49 4,49 4,49 4,49 3,52 3,54 3,62 4,65 5,60	4,49 4,66 4,82 4,82 4,82 4,82 3,52 3,52 3,54 3,62 4,65 5,60	4,49 4,66 5,08 5,94 5,94 3,52 3,54 3,62 4,65 5,60

nonut®-TDBL-T-8,6 x L nonut®-TDBLF-T-F-8,6 x L

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			_		<u>Materials</u> Screw:		Carbon s	teel				
	2						tempered		ated			
-916.8			-Ø8,6		Compon		S350GD	to S450	EN 10025-2 IGD – EN 10346 K460LAD – EN 10346			
W13	_	-	-Ø5.5		Component II: S275 to S355 – EN 10025-2 S350GD to S450GD – EN 10346 HX380LAD to HX460LAD – EN 10346							
	 €											
~ Ø16.8			~Ø8,6		Pre-drill	diamete	<u>r</u>					
Bauteil I: elongated hole 6,5 mm x 10,0 mm Bauteil II: see table												
[tıı [mm]					
		0.88	0.90	1.00	1.13	1.25	t⊫[mm] 1.50	1.75	2.00	3.00	4.00	≥ 6.00
		0.88	0.90	1.00		1.25 7.5 mm		1.75	2.00		4.00	
	0.88	0.88	0.90	1.00				1.75 2,88	2.00 3,21			≥ 6.00 nm 3,21
	0.88				d _{pd.II} = '	7.5 mm	1.50			d _{pd}	= 8.0 r	nm
	0.90 1.00	1,74	1,76	1,64	d _{pd.II} = 2,06	7.5 mm 2,22	1.50 2,55	2,88	3,21	d _{pd} 3,21	.⊪ = 8.0 r 3,21	nm 3,21
V _{R.k} [kN]	0.90 1.00 1.13	1,74	1,76 1,76	1,64 1,64	d _{pd.II} = 2,06 2,08	7.5 mm 2,22 2,24 2,33 2,44	1.50 2,55 2,55 2,55 2,65	2,88 2,88 2,88 2,88 2,88	3,21 3,21 3,33 3,33	dpd 3,21 3,53 5,12 5,12	3,21 3,53 5,12 5,31	nm 3,21 3,53 5,12 5,31
V.B.k [KN] t. [mm]	0.90 1.00 1.13 1.25	1,74	1,76 1,76 -	1,64 1,64 1,87	d _{pd.II} = 2,06 2,08 2,14	7.5 mm 2,22 2,24 2,33	1.50 2,55 2,55 2,55 2,65 2,75	2,88 2,88 2,88 2,88 2,88 2,88	3,21 3,21 3,33 3,33 3,33	dpc 3,21 3,53 5,12 5,12 5,12	3,21 3,53 5,12 5,31 5,48	nm 3,21 3,53 5,12 5,31 5,78
· · ·	0.90 1.00 1.13 1.25 1.50	1,74 - - -	1,76 1,76 - -	1,64 1,64 1,87 -	d _{pd.II} = 2,06 2,08 2,14 2,22	7.5 mm 2,22 2,24 2,33 2,44	1.50 2,55 2,55 2,55 2,65	2,88 2,88 2,88 2,88 2,88 2,88 2,95	3,21 3,21 3,33 3,33 3,33 3,33 3,33	dpc 3,21 3,53 5,12 5,12 5,12 5,12 5,12	3,21 3,53 5,12 5,31 5,48 5,48	mm 3,21 3,53 5,12 5,31 5,78 6,77
· · ·	0.90 1.00 1.13 1.25 1.50 1.75	1,74 - - -	1,76 1,76 - -	1,64 1,64 1,87 - -	d _{pd.II} = 2,06 2,08 2,14 2,22 -	7.5 mm 2,22 2,24 2,33 2,44 2,55	1.50 2,55 2,55 2,55 2,65 2,75	2,88 2,88 2,88 2,88 2,88 2,88	3,21 3,21 3,33 3,33 3,33 3,33 3,33 3,33	dpc 3,21 3,53 5,12 5,12 5,12 5,12 5,12 5,12	3,21 3,53 5,12 5,31 5,48 5,48 5,48	mm 3,21 3,53 5,12 5,31 5,78 6,77 6,77
· ·	0.90 1.00 1.13 1.25 1.50	1,74 - - - -	1,76 1,76 - - -	1,64 1,64 1,87 - - -	d _{pd.II} = 2,06 2,08 2,14 2,22 - -	7.5 mm 2,22 2,24 2,33 2,44 2,55 -	1.50 2,55 2,55 2,55 2,65 2,75 2,95	2,88 2,88 2,88 2,88 2,88 2,88 2,95	3,21 3,21 3,33 3,33 3,33 3,33 3,33	dpc 3,21 3,53 5,12 5,12 5,12 5,12 5,12	3,21 3,53 5,12 5,31 5,48 5,48	mm 3,21 3,53 5,12 5,31 5,78 6,77
· ·	0.90 1.00 1.13 1.25 1.50 1.75 2.00 0.88	1,74 - - - -	1,76 1,76 - - - - - 1,27	1,64 1,64 1,87 - - - - 1,52	d _{pd.II} = ' 2,06 2,08 2,14 2,22 - - - - 1,72	7.5 mm 2,22 2,24 2,33 2,44 2,55 - - - - 1,91	1.50 2,55 2,55 2,55 2,65 2,75 2,95 - - 2,76	2,88 2,88 2,88 2,88 2,88 2,95 2,95 2,95 - 3,59	3,21 3,21 3,33 3,33 3,33 3,33 3,33 3,33	dpc 3,21 3,53 5,12 5,12 5,12 5,12 5,12 5,12 5,12 5,12	3,21 3,53 5,12 5,31 5,48 5,48 5,48 5,48 5,48 4,01	nm 3,21 3,53 5,12 5,31 5,78 6,77 6,77 6,77 4,01
· ·	0.90 1.00 1.13 1.25 1.50 1.75 2.00 0.88 0.90	1,74 - - - - - - -	1,76 1,76 - - - - - -	1,64 1,64 1,87 - - - - -	d _{pd.II} = ' 2,06 2,08 2,14 2,22 - - - - - -	7.5 mm 2,22 2,24 2,33 2,44 2,55 - - - -	1.50 2,55 2,55 2,65 2,75 2,95 - -	2,88 2,88 2,88 2,88 2,88 2,88 2,95 2,95 -	3,21 3,21 3,33 3,33 3,33 3,33 3,33 3,33	dpc 3,21 3,53 5,12 5,12 5,12 5,12 5,12 5,12 5,12 5,12	3,21 3,53 5,12 5,31 5,48 5,48 5,48 5,48 5,48	nm 3,21 3,53 5,12 5,31 5,78 6,77 6,77 6,77
tı [mm] .	0.90 1.00 1.13 1.25 1.50 1.75 2.00 0.88 0.90 1.00	1,74 - - - - - - - 1,23	1,76 1,76 - - - - - 1,27	1,64 1,64 1,87 - - - - 1,52	d _{pd.II} = ' 2,06 2,08 2,14 2,22 - - - 1,72 1,72 1,72	7.5 mm 2,22 2,24 2,33 2,44 2,55 - - - - 1,91	1.50 2,55 2,55 2,55 2,65 2,75 2,95 - - 2,76	2,88 2,88 2,88 2,88 2,88 2,95 2,95 2,95 - 3,59	3,21 3,21 3,33 3,33 3,33 3,33 3,33 3,33	dpc 3,21 3,53 5,12 5,12 5,12 5,12 5,12 5,12 5,12 5,12	3,21 3,53 5,12 5,31 5,48 5,48 5,48 5,48 5,48 4,01	nm 3,21 3,53 5,12 5,31 5,78 6,77 6,77 6,77 4,01
· · ·	0.90 1.00 1.13 1.25 1.50 1.75 2.00 0.88 0.90 1.00 1.13	1,74 - - - - - - 1,23 -	1,76 1,76 - - - - - 1,27 1,27	1,64 1,64 1,87 - - - - 1,52 1,52	d _{pd.II} = ' 2,06 2,08 2,14 2,22 - - - - 1,72 1,72	7.5 mm 2,22 2,24 2,33 2,44 2,55 - - - 1,91 1,91	1.50 2,55 2,55 2,55 2,65 2,75 2,95 - - 2,76 2,76 2,76	2,88 2,88 2,88 2,88 2,88 2,95 2,95 2,95 - 3,59 3,59 3,59 3,59	3,21 3,21 3,33 3,33 3,33 3,33 3,33 3,33	dpc 3,21 3,53 5,12 5,12 5,12 5,12 5,12 5,12 5,12 4,01 4,03	3,21 3,53 5,12 5,31 5,48 5,48 5,48 5,48 5,48 4,01 4,03	nm 3,21 3,53 5,12 5,31 5,78 6,77 6,77 6,77 4,01 4,03 4,13 5,30
tı [mm]	0.90 1.00 1.13 1.25 1.50 1.75 2.00 0.88 0.90 1.00 1.13 1.25	1,74 - - - - - - - - - - 1,23 - -	1,76 1,76 - - - - - 1,27 1,27 -	1,64 1,64 1,87 - - - - 1,52 1,52 1,52	d _{pd.II} = ' 2,06 2,08 2,14 2,22 - - - 1,72 1,72 1,72	7.5 mm 2,22 2,24 2,33 2,44 2,55 - - 1,91 1,91 1,91	1.50 2,55 2,55 2,55 2,65 2,75 2,95 - - 2,76 2,76 2,76 2,76	2,88 2,88 2,88 2,88 2,95 2,95 2,95 - 3,59 3,59 3,59	3,21 3,33 3,33 3,33 3,33 3,33 3,33 3,33	dpc 3,21 3,53 5,12 5,12 5,12 5,12 5,12 5,12 5,12 5,12	3,21 3,53 5,12 5,31 5,48 5,48 5,48 5,48 5,48 5,48 4,01 4,03 4,13	nm 3,21 3,53 5,12 5,31 5,78 6,77 6,77 6,77 6,77 4,01 4,03 4,13
ti [mm] .	0.90 1.00 1.13 1.25 1.50 1.75 2.00 0.88 0.90 1.00 1.13	1,74 - - - - - - 1,23 - - - - - - - - - - - - - - - - - - -	1,76 1,76 - - - - - 1,27 1,27 - - - - - -	1,64 1,64 1,87 - - - 1,52 1,52 1,52 -	d _{pd.II} = ' 2,06 2,08 2,14 2,22 - - - 1,72 1,72 1,72 1,72	7.5 mm 2,22 2,24 2,33 2,44 2,55 - - 1,91 1,91 1,91 1,91	1.50 2,55 2,55 2,55 2,75 2,75 2,95 - - 2,76 2,76 2,76 2,76 2,76	2,88 2,88 2,88 2,88 2,88 2,95 2,95 2,95 - 3,59 3,59 3,59 3,59	3,21 3,21 3,33 3,33 3,33 3,33 3,33 3,33	dpc 3,21 3,53 5,12 5,12 5,12 5,12 5,12 5,12 5,12 5,12	3,21 3,53 5,12 5,31 5,48 5,48 5,48 5,48 5,48 5,48 4,01 4,03 4,13 5,30	nm 3,21 3,53 5,12 5,31 5,78 6,77 6,77 6,77 4,01 4,03 4,13 5,30
tı [mm]	0.90 1.00 1.13 1.25 1.50 1.75 2.00 0.88 0.90 1.00 1.13 1.25	1,74 - - - - - - 1,23 - - - - - - - - - - - -	1,76 1,76 - - - - 1,27 1,27 - - - - - - - - - - - - - - - - - - -	1,64 1,64 1,87 - - - - 1,52 1,52 1,52 - - -	d _{pd.II} = ' 2,06 2,08 2,14 2,22 - - - 1,72 1,72 1,72 1,72 1,72 1,72	7.5 mm 2,22 2,24 2,33 2,44 2,55 - - 1,91 1,91 1,91 1,91 1,91 1,91	1.50 2,55 2,55 2,55 2,65 2,75 2,95 - 2,76 2,76 2,76 2,76 2,76 2,76 2,76	2,88 2,88 2,88 2,88 2,95 2,95 2,95 - 3,59 3,59 3,59 3,59 3,59	3,21 3,33 3,33 3,33 3,33 3,33 3,33 3,33	dpc 3,21 3,53 5,12 5,12 5,12 5,12 5,12 5,12 5,12 4,01 4,03 4,13 5,30 6,37	= 8.0 r 3,21 3,53 5,12 5,31 5,48 5,48 5,48 5,48 4,01 4,03 4,13 5,30 6,37	nm 3,21 3,53 5,12 5,31 5,78 6,77 6,77 6,77 4,01 4,03 4,13 5,30 6,37

Further specifications:

10,0 mm

6,5 mm

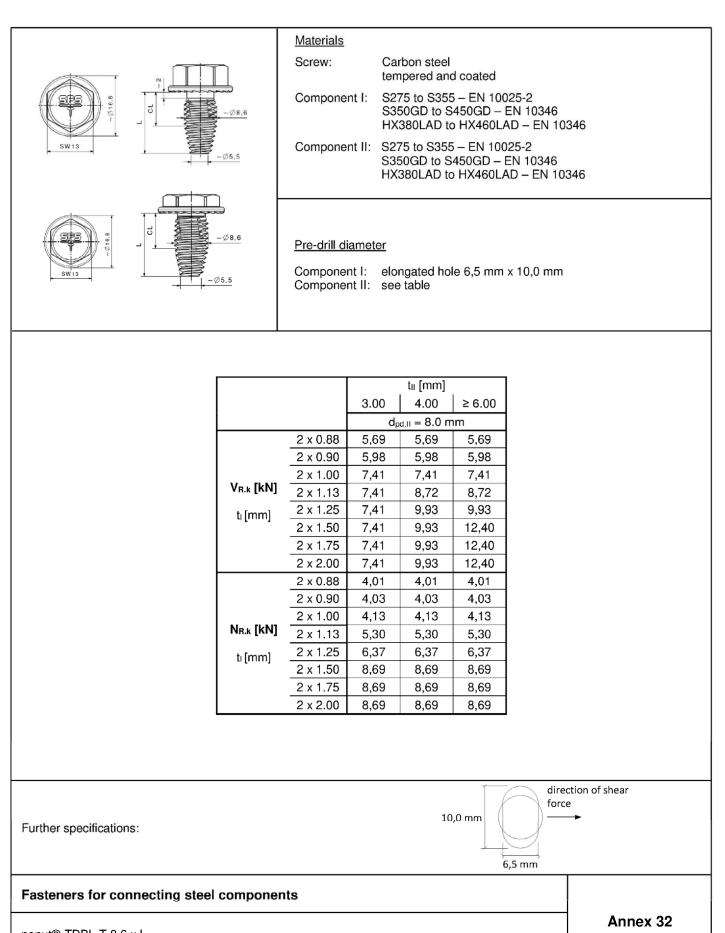
Fasteners for connecting steel components

nonut®-TDBL-T-8,6 x L nonut®-TDBLF-T-F-8,6 x L

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nonut®-TDBL-T-8,6 x L nonut®-TDBLF-T-F-8,6 x L

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8191.0-					ew:	Cart	on steel				
4.	-		L_				pered and				
13			-Ø8,6	Com	nponent	S28	5 – EN 1 0GD to S 00LAD –	320GD -		346	
	Ļ			Com	nponent	II: S23	5 – EN 10	0025-2			
	-	Ø	5,5)GD to S 00LAD -			346	
	,										
3. :	CL	~2	8,6	Due	ما برايا ما ا						
	- WW				drill dian						
13	, <u>ş</u>	₽ _~ø5,	5		nponent		gated ho gated ho	le 6,5 mi	n x 10,0	mm	
	-1	1.			iponent	II. EIUII	yaleu no	ie 0,5 mi	11 X 10,0	11111	
						tıı (mm]				
		0.88	0.90	1.00	1.13	1.25	1.50	1.75	2.00	3.00	4.00
				d _{pd.1} =	$d_{pd.II} = e$	longated	hole 6.5	mm x 1	0.0 mm		
	0.88	1,52	1,52	1,52	1,52	1,52	1,52	1,52	1,52	1,52	1,52
	0.90	-	1,54	1,54	1,54	1,54	1,54	1,54	1,54	1,54	1,54
V _{R.k} [kN]⁻	1.00	-	-	1,64	1,64	1,64	1,64	1,64	1,64	1,64	1,64
-	1.13	-	-	-	1,95	1,95	1,95	1,95	1,95	1,95	1,95
tı [mm]	1.25 1.50	-	-	-	-	2,24 -	2,24 2,59	2,24 2,59	2,24 2,59	2,24 2,59	2,24 2,59
-	1.75	-	-	-	-	-	2,59	2,59	2,59	2,59	2,59
-	2.00	-	-	-	-	-	-	-	2,59	2,59	2,59
	0.88	-	-	_	_	-	-	-	-	-	-
-	0.90	-	-	-	-	-	-	-	-	-	-
-	1.00	-	-	-	-	-	-	-	-	-	-
N _{R.k} [kN] ⁻	1.13	-	-	-	-	-	-	-	-	-	-
tı [mm] _	1.25	-	-	-	-	-	-	-	-	-	-
"["""""	1.50	-	-	-	-	-	-	-	-	-	-
	1.75	-	-	-	-	-	-	-	-	-	-
	2.00	-	-	-	-	-	-	-	-	-	-
					-1		direction	ofchaar			
						\square	direction force	n of shear			

Further specifications:

6,5 mm

Fasteners for connecting steel components

nonut®-TDBL-T-8,6 x L nonut®-TDBLF-T-F-8,6 x L

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			Scr	ew:						
		3				oon steel bered an				
		-Ø8,6	Cor	nponent	S35	5 to S35 0GD to S 80LAD te	450GD	– EN 10	346 N 10346	i
Sw 13 Component II: S275 to S355 – EN 10025-2 S350GD to S450GD – EN 10346 HX380LAD to HX460LAD – EN 103										
		Ø Ø8,6				gated ho	le 6 5 m	m x 10 0	mm	
	<u>,</u> ~Ø5		Cor	nponent	II: elon	gated ho	le 6,5 m	m x 10,0	mm	
					ب آن					
	0.88	0.90	1 00	1 13	-	-	1 75	2 00	3 00	4.00
	0.00	0.00							0.00	4.00
0.88	1,74	1,74	1,74	1,74	1,74	1,74	1,74	1,74	1,74	1,74
0.90	-	1,76	1,76	1,76	1,76	1,76	1,76	1,76	1,76	1,76
1.00	-	-	1,87	1,87	1,87	1,87	1,87	1,87	1,87	1,87
N] 1.13	-	-	-	2,22	2,22	2,22	2,22	2,22	2,22	2,22
1.25	-	-	-	-	2,55	2,55	2,55	2,55	2,55	2,55
1.50	-	-	-	-	-	2,95	2,95	2,95	2,95	2,95
	-	-	-	-	-	-	2,95			2,95
	-	-	-	-	-	-	-	2,95	2,95	2,95
	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
1.10	-	-	-	-	-	-	-	-	-	-
·]										-
										-
		-		-	-		-			-
	0.88 0.90 1.00 1.13 1.25	0.88 0.88 0.88 0.88 0.88 0.88 0.90 - 1.00 - 1.00 - 1.75 - 2.00 - 0.88 - 0.90 - 1.75 - 2.00 - 1.75 - 1.50 - 1.13 - 1.75 - 1.00 - 1.13 - 1.75 - 1.75 - 1.50 - 1.75 - 1.75 - 1.75 - 1.75 - 1.75 - 1.75 - 1.75 - 1.75 - 1.75 - 1.75 - 1.75 - 1.75 - 1.75 - 1.75 - 1.75 - 1.75 - 1.75 - 1.75 - - 1.50 - 1.75 - - 1.50 - 1.75 - - 1.50 - - 1.75 - -	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $

nonut®-TDBLF-T-F-8,6 x L

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		Matar	ala			
		Mater				
		Screw		Carbon steel	coated	
						, ,
	-Ø8,6	Comp		S275 to S355 - S350GD to S4		
Ť -				HX380LAD to		
SW13		Comp	onent II: S	S275 to S355 -	- EN 10025-2	2
	~Ø5,5		5	6350GD to S4	50GD – EN 10	0346
			ŀ	HX380LAD to I	HX460LAD -	EN 10346
Ĺ						
	~Ø8,6	Pre-di	rill diameter	1		
Ĩ					0 = 10	
SW13	~Ø5,5	Comp		elongated hole elongated hole		
				siongatoa noio		,
		1				
				tıı [mm]		
			3.00	4.00	≥ 6.00	
				$d_{pd.I} = d_{pd.II} =$		
			elongated	d hole 6,5 mm	x 10,0 mm	
		2 x 0.88	2,19	2,19	2,19	
		2 x 0.90	2,19	2,19	2,19	
	V _{R.k} [kN]	2 x 1.00	2,19	2,19	2,19	
		2 x 1.13	2,78	2,78	2,78	
	tı [mm]	2 x 1.25	3,33	3,33	3,33	
		2 x 1.50 2 x 1.75	3,48	3,48	3,48	
		2 x 1.75 2 x 2.00	3,48 3,48	3,48 3,48	3,48 3,48	
		2 x 0.88			-	
		2 x 0.90	-	-	-	
		2 x 1.00	-	-	-	
	N _{R.k} [kN]	2 x 1.13	-	-	-	
	tı [mm]	2 x 1.25	-	-	-	
		2 x 1.50	-	-	-	
		2 x 1.75	-	-	-	
		2 x 2.00	-	-	-	
				····L		
			(force	on of shear	
Eurthor oppolitiontions			10 mm			
Further specifications:						
			+	5,5 mm		
			t	ווווו נ,נ		
Fasteners for connecti	ng steel compor	nents				
						Annex 35
nonut®-TDBL-T-8,6 x L						
nonut®-TDBLF-T-F-8,6 x L						