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European Technical Assessment

ETA 22/0103
of 08/11/2023

General Part

Technical Assessment Body issuing the European Technical Assessment	Research Institute for Construction Equipment and Technology – ICECON SA
Trade name of the construction product	Fastening screws EVO, EVO+, EvoShield, Bi-Metal, TEK and TEK 3 screws for light gauge applications
Product family to which the construction product belongs	Fastening screws for metal members and sheeting
Manufacturer	Evolution Fasteners UK Ltd Clyde Gateway Trade Park, Dalmarnock Road Glasgow G73-1AN United Kingdom
Manufacturing plant(s)	Evolution Fasteners Plant 01 Evolution Fasteners Plant 02 Evolution Fasteners Plant 03 Evolution Fasteners Plant 04 Evolution Fasteners Plant 05
This European Technical Assessment contains	21 pages including 16 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
This version replaces	ETA 22/0103 issued on 10.10.2022

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Specific Parts

1. Technical description of the product

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

Table 1 – Fastening screws for metal members and sheeting

Annex	Product	Component I	Component II	Description
A4	TSHW5.5-L-3	Steel S320GD	Steel S320GD	Self-drilling screw with hexagonal head, EvoShield® Organic Coated fasteners
A4	HWZP5.5-L-3	Steel S320GD	Steel S320GD	Self-drilling screw with hexagonal head, Electroplated Zinc (w/passivation) Coated fasteners
A5	BMHH5.5-L-3	Steel S320GD	Steel S320GD	Self-drilling screw with hexagonal head, Bi-Metal™ A2 Stainless Steel Fasteners
A6	A4BMHH5.5-L-3	Steel S320GD	Steel S320GD	Self-drilling screw with hexagonal head, Bi-Metal™ A4 Stainless Steel Fasteners
A7	TSBW5.5-L-3	Steel S320GD	Steel S320GD	Self-drilling screw with hexagonal head, EvoShield® Organic Coated fasteners, supplied with EPDM washer $\geq \varnothing 16\text{mm}$
A7	BWZP5.5-L-3	Steel S320GD	Steel S320GD	Self-drilling screw with hexagonal head, Electroplated Zinc (w/passivation) Coated fasteners, supplied with EPDM washer $\geq \varnothing 16\text{mm}$
A8	BMBW5.5-L-3	Steel S320GD	Steel S320GD	Self-drilling screw with hexagonal head, Bi-Metal™ A2 Stainless Steel Fasteners supplied with EPDM washer $\geq \varnothing 16\text{mm}$
A9	A4BM5.5-L-3	Steel S320GD	Steel S320GD	Self-drilling screw with hexagonal head, Bi-Metal™ A4 Stainless Steel Fasteners, supplied with EPDM washer $\geq \varnothing 16\text{mm}$

Table 1 – Fastening screws for metal members and sheeting (continuing)

Annex	Product	Component I	Component II	Description
A9	A5BMBW5.5-L-3	Steel S320GD	Steel S320GD	Self-drilling screw with hexagonal head Bi-Metal™ A5 Stainless Steel Fasteners, supplied with EPDM washer $\geq \varnothing 16\text{mm}$
A10	TSPH5.5-L-3	Steel S320GD	Steel S320GD	Self-drilling screw with pancake head, EvoShield® Organic Coated fasteners
A10	ZPH5.5-L-3	Steel S320GD	Steel S320GD	Self-drilling screw with pancake head, Electroplated Zinc (w/passivation) Coated fasteners
A11	BMTSPH5.5-L-3	Steel S320GD	Steel S320GD	Self-drilling screw with pancake head, Bi-Metal™ A2 Stainless Steel Fasteners
A12	TSPH4.8-L-3	Steel S320GD	Steel S320GD	Self-drilling screw with pancake head, EvoShield® Organic Coated fasteners
A13	TSLP4.8-L-3	Steel S320GD	Steel S320GD	Self-drilling screw with low-profile head, EvoShield® Organic Coated fasteners
A14	TSHW6.3-L-3	Steel S320GD	Steel S320GD	Self-drilling screw with hexagonal head, EvoShield® Organic Coated fasteners
A15	BMHH6.3-L-3	Steel S320GD	Steel S320GD	Self-drilling screw with hexagonal head, Bi-Metal™ A2 Stainless Steel Fasteners

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

The fastening screws are intended to be used for fastening metal sheets and metal sections to metal structures. The sheeting can either be used as wall or roof cladding or as load bearing wall and roof element. The fastening screws can also be used for the fastening of any other thin gauge metal members. The intended use comprises fastening screws and connections for indoor and outdoor applications. Fastening screws which are intended to be used in external environments with $\geq \text{C2}$ corrosion according to the standard EN ISO 12944-2 are made of stainless steel. Furthermore, the intended use comprises connections with predominantly static loads (e.g., wind loads, dead loads). The fastening screws are not intended for re-use. The performances given in Section 3 are only valid if the fastening screws are used in compliance with the specifications and conditions given in Annex (1-15).

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 60 years when designed and specified within the Manufacturers' scope of application as well as installed pursuant to the Manufacturers' instructions. The indications given as to the working life of the construction product cannot be interpreted as a guarantee neither given by the product Manufacturer, or his representative nor by the Technical Assessment Body, but are to be regarded only as a means for expressing the expected economically reasonable working life of the product.

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

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Product performance
Shear Resistance of the Connection	See Annexes A4...A15 to this ETA
Tension Resistance of the Connection	See Annexes A4...A15 to this ETA
Design Resistance in case of combined Tension and Shear Forces (interaction)	See Annexes A4...A15 to this ETA
Check of Deformation Capacity in case of constraining forces due to temperature	See Annexes A4...A15 to this ETA
Durability	See Annexes A4...A15 to this ETA

3.2 Safety in case of fire (BWR 2)

Reaction to fire	Class A1*
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*Annex A of European Commission Decision 96/603/EC (amount of homogeneously distributed organic materials contained in the coating does not exceed 1,0% of the weight or volume of the fasteners/small components).

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

In accordance with the European Assessment Document EAD No. 330046-01-0602, the applicable European legal act is the Commission Decision 1998/214/EC, amended by 2001/596/EC.

The system to be applied: 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 "CP-EAD-TEK01-A" revision A, deposited at ICECON S.A.

The notified certification body shall inspect the factory once a year for the continuing surveillance, assessment and evaluation of factory production control.

Issued in Bucharest on 18/10/2023

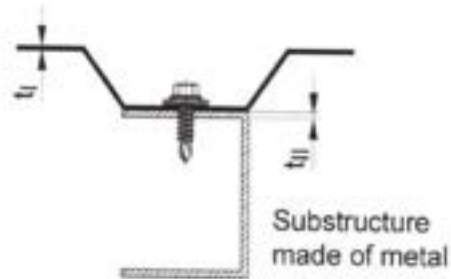
by Research Institute for Construction Equipment and Technology ICECON SA

President - General Manager

Ury ICECON Polgar Bratu

PRESEDINTE -
DIRECTOR GENERAL

Examples of execution and 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

The thickness t_{ii} corresponds to the load-bearing screw in 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:

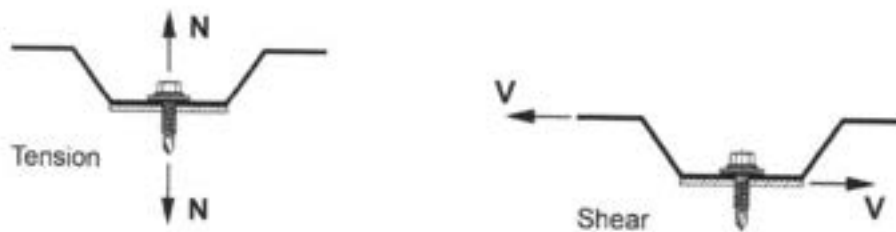
$N_{R,k}$	Characteristic value of tension resistance
$V_{R,k}$	Characteristic value of shear resistance

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 tension resistance for component I
$N_{R,II,k}$	Characteristic value of pull-out tension 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

Terms and explanations	Annex A1
Fastening screws for metal members and sheeting	

Occurred loadings of a connection



Design values

The design values of tension and shear resistance of a connection have to be determined as follows:

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

- $N_{R,d}$ 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_1 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 $t_{II} < 5\text{mm}$, 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:

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

- $N_{S,d}$ 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 screw, it is not necessary to take into account the effect of constraints due to temperature. For other types of connection, the effect is constraints have to be taken into account, unless they do not occur or are not significant (e.g. sufficient flexibility of the structure).



Single connection



Single lap connection



End overlap connection



Side lap+end overlap connection

Design	Annex A2
Fastening screws for metal members and sheeting	

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.

Component I made of aluminum alloy

The characteristic value of tension resistance is given in the Annex of the fastening screw.

If not, the characteristic value of tension resistance can be determined as follows.

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

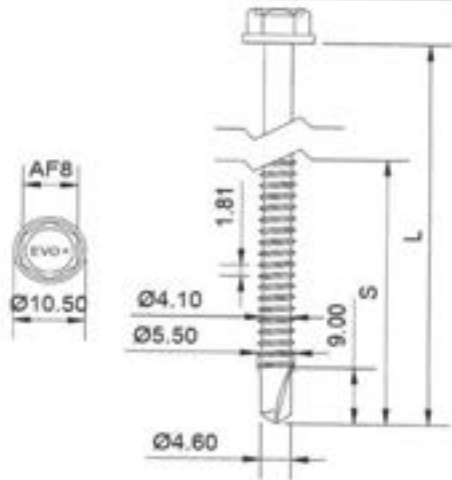
$N_{R,I,k}$ is determined according to EN 1999-1-4+A1:2011, equation (8.13)

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

Installation and additional provisions

Fastening screws for metal members and sheeting

Annex A3



Material

Carbon steel (1.7220 (34CrMo4) – hardened) acc to EN 10263-4

Washer: none

Component I: S320GD - acc. to EN 10346

Component II: S320GD - acc. to EN 10346

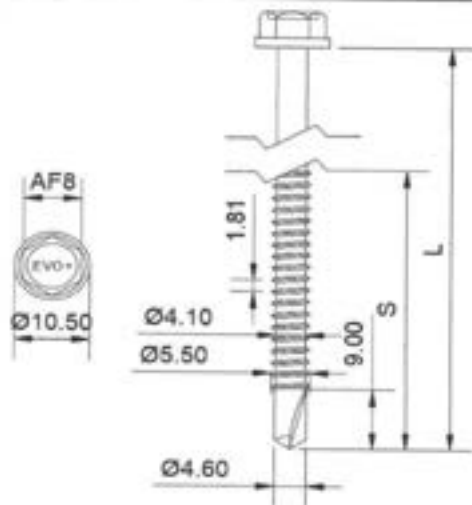
Drilling capacity ≥ 1,00 ≤ 4,00 mm

Setting torque, $M_{L,nom} \leq 2.00$ [Nm]		Component II (Substrate), t_i [mm]						Characteristic Pull-Through Resistance, N_{head} [kN]			
		0.60	1.00	1.20	1.50	2.00	-				
Component I (Fixture), t_i [mm]	Characteristic Shear Resistance, V_{sk} [kN]	0.60	0.51	1.39	1.44	1.49	1.50	-	Component I (Fixture), t_i [mm]	0.60	4.64
		1.00	0.79	1.85	2.44	2.47	2.87	-		1.00	6.80
		1.20	0.85	2.99	3.01	3.10	4.16	-		1.20	7.98
		1.50	0.98	3.09	3.87	4.98	5.13	-		1.50	10.64
		2.00	1.27	3.29	4.83	5.04	5.79	-		2.00	14.63
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-	-	-	
	Characteristic Pull-out Resistance, N_{tk} [kN]	0.60	1.29	1.91	2.15	2.95	4.30	-			
		1.00	1.91	2.42	2.93	3.78	5.06	-			
		1.20	2.32	3.10	3.22	4.04	5.63	-			
		1.50	3.36	3.75	3.87	5.01	6.55	-			
		2.00	4.38	4.89	5.59	7.05	7.68	-			
		-	-	-	-	-	-	-			
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Self-drilling screw with hexagonal head

Annex A4

HWZP5.5-L-3, Electroplated Zinc (w/passivation) Coated fasteners
TSHW5.5-L-3, EvoShield® Organic Coated fasteners



Material

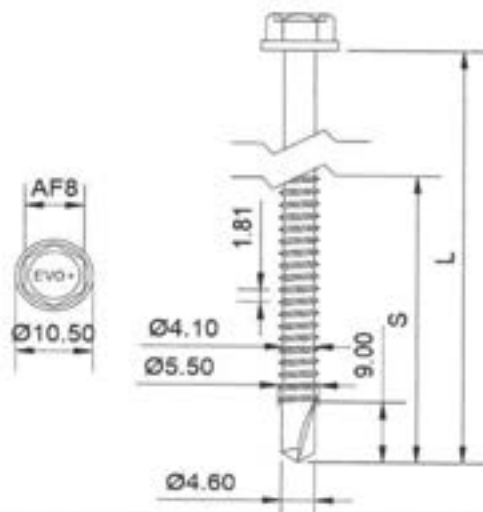
Carbon steel (1.7220 (34CrMo4) – hardened) acc to EN 10263-4

Stainless steel (1.4301) - acc to EN 10088
Washer: none

Component I: S320GD- acc to EN 10346
Component II: S320GD- acc to EN 10346

Drilling capacity $\geq 1.00 \leq 4.00$ mm

Setting torque, $M_{t, nom} \leq 2.00$ [Nm]		Component II (Substrate), t_{II} [mm]						Characteristic Pull-Through Resistance, N_{head} [kN]			
		0.60	1.00	1.20	1.50	2.00	-				
Component I (Fixture), t_I [mm]	Characteristic Shear Resistance, V_{rs} [kN]	0.60	0.86	1.34	1.55	1.73	2.07	-	Component I (Fixture), t_I [mm]	0.60	5.12
		1.00	0.89	2.50	2.73	3.02	3.37	-		1.00	6.38
		1.20	1.34	2.59	2.84	3.04	3.64	-		1.20	7.51
		1.50	1.40	2.96	3.34	3.80	4.61	-		1.50	10.05
		2.00	1.64	3.26	3.85	3.89	6.24	-		2.00	10.95
	-	-	-	-	-	-	-	-		-	-
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	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	Characteristic Pull-out Resistance, N_{rs} [kN]	0.60	1.25	1.57	1.66	2.63	3.78	-			
		1.00	1.71	2.43	2.69	3.05	4.26	-			
		1.20	1.81	2.45	2.71	3.63	4.44	-			
		1.50	2.53	3.14	3.51	3.85	4.62	-			
		2.00	3.47	4.31	4.44	5.06	6.44	-			
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Self-drilling screw with hexagonal head									Annex A5		
BMHH5.5-L-3, Bi-Metal™ A2 Stainless steel fasteners											



Material

Carbon steel (1.7220 (34CrMo4) – hardened) acc to EN 10263-4

Stainless steel (1.4401) - acc to EN 10088.

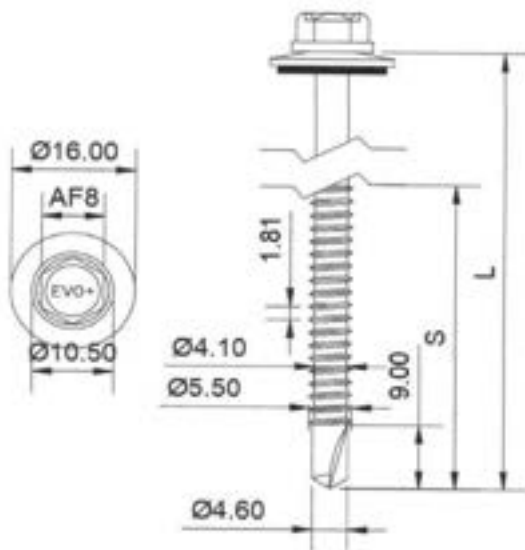
Washer: -

Component I: S320GD- acc to EN 10346

Component II: S320GD- acc to EN 10346

Drilling capacity ≥ 1.00 ≤ 4.00 mm

Setting torque, $M_{t, nom} \leq 2.00$ [Nm]		Component II (Substrate), t_{II} [mm]						Characteristic Pull-Through Resistance, N_{head} [kN]			
		0.60	1.00	1.20	1.50	2.00	-				
Component I (Fixture), t_I [mm]	Characteristic Shear Resistance, V_{rk} [kN]	0.60	1.16	1.60	1.94	2.09	2.34	-	Component I (Fixture), t_I [mm]	0.60	4.03
		1.00	1.50	2.59	2.64	3.21	3.38	-		1.00	6.57
		1.20	1.51	2.65	2.94	3.24	3.98	-		1.20	8.22
		1.50	1.57	3.17	3.12	3.92	4.42	-		1.50	10.24
		2.00	1.68	3.19	4.03	4.15	4.63	-		2.00	10.40
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
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	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-	-	-	
	Characteristic Pull-out Resistance, N_{ix} [kN]	0.60	1.06	1.60	1.83	2.22	3.76	-			
		1.00	1.35	1.86	2.43	2.69	4.39	-			
		1.20	1.79	2.40	2.71	2.94	4.43	-			
		1.50	2.32	2.75	2.92	3.61	4.52	-			
		2.00	3.77	3.93	4.70	4.75	7.19	-			
		-	-	-	-	-	-	-			
		-	-	-	-	-	-	-			
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Self-drilling screw with hexagonal head Bi-Metal™ A4 Stainless Steel Fasteners									Annex A6		
A4BMHH5.5-L-3 (no washer)											



Material

Carbon steel (1.7220 (34CrMo4) – hardened) acc to EN 10263-4

Washer: EPDM washer $\geq \varnothing 16$ mm.

Component I: S320GD- acc to EN 10346

Component II: S320GD- acc to EN 10346

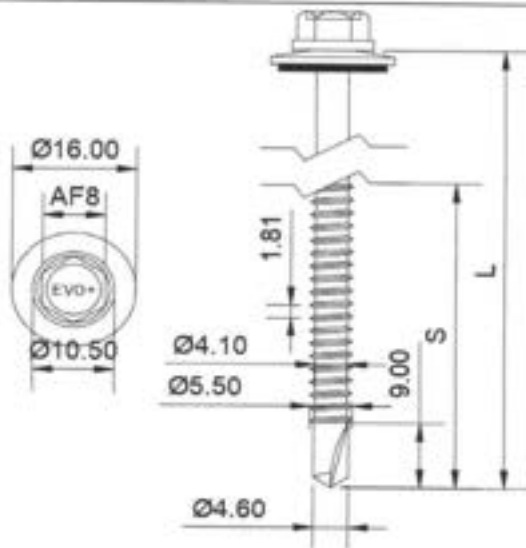
Drilling capacity $\geq 1.00 \leq 4.00$ mm

Setting torque, $M_{t, nom} \leq 2.00$ [Nm]		Component II (Substrate), t_i [mm]						Characteristic Pull-Through Resistance, N_{head} [kN]		
		0.60	1.00	1.20	1.50	2.00	-	Component I (Fixture), t_i [mm]	0.60	5.74
Component I (Fixture), t_i [mm]	Characteristic Shear Resistance, V_{rk} [kN]	0.60	0.51	1.39	1.44	1.49	1.50			
		1.00	0.79	1.85	2.44	2.47	2.87	-	1.20	8.43
		1.20	0.85	2.99	3.01	3.10	4.16	-	1.50	10.41
		1.50	0.98	3.09	3.87	4.98	5.13	-	2.00	13.15
		2.00	1.27	3.29	4.83	5.04	5.79	-	-	-
		-	-	-	-	-	-	-	-	-
	Characteristic Pull-out Resistance, N_{rx} [kN]	0.60	1.06	1.60	1.83	2.22	3.76	-	-	-
		1.00	1.35	1.86	2.43	2.69	4.39	-	-	-
		1.20	1.79	2.40	2.71	2.94	4.43	-	-	-
		1.50	2.32	2.75	2.92	3.61	4.52	-	-	-
		2.00	3.77	3.93	4.70	4.75	7.19	-	-	-
		-	-	-	-	-	-	-	-	-
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Self-drilling screw with hexagonal head

BWZP5.5-L-3, Electroplated Zinc (w/ passivation) Coated fasteners
TSBW5.5-L-3, EvoShield® Organic Coated fasteners

Annex A7



Material

Carbon steel (1.7220 (34CrMo4) – hardened) acc to EN 10263-4

Stainless steel (1.4401) – acc to EN 10088

Stainless steel (1.4529) – acc to EN 10088

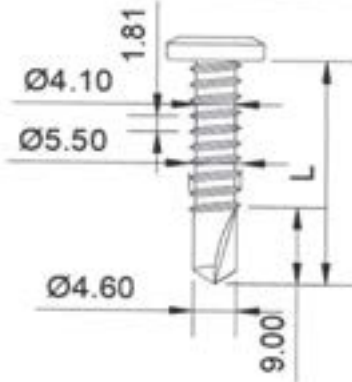
Washer: EPDM $\geq \varnothing 16$ mm

Component I: S320GD - acc to EN 10346

Component II: S320GD - acc to EN 10346

Drilling capacity $\geq 1.00 \leq 4.00$ mm

Setting torque, $M_{t, nom} \leq 2.00$ [Nm]		Component II (Substrate), t_{II} [mm]						Characteristic Pull-Through Resistance, N_{head} [kN]			
		0.60	1.00	1.20	1.50	2.00	-				
Component I (Fixture), t_I [mm]	Characteristic Shear Resistance, V_{rk} [kN]	0.60	1.16	1.60	1.94	2.09	2.34	-	Component I (Fixture), t_I [mm]	0.60	5.96
		1.00	1.50	2.59	2.64	3.21	3.38	-		1.00	7.89
		1.20	1.51	2.65	2.94	3.24	3.98	-		1.20	9.27
		1.50	1.57	3.17	3.12	3.92	4.42	-		1.50	10.40
		2.00	1.68	3.19	4.03	4.15	4.63	-		2.00	10.40
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
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	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	Characteristic Pull-out Resistance, N_{rk} [kN]	0.60	1.06	1.60	1.83	2.22	3.76	-			
		1.00	1.35	1.86	2.43	2.69	4.39	-			
		1.20	1.79	2.40	2.71	2.94	4.43	-			
		1.50	2.32	2.75	2.92	3.61	4.52	-			
		2.00	3.77	3.93	4.70	4.75	7.19	-			
		-	-	-	-	-	-	-			
		-	-	-	-	-	-	-			
-		-	-	-	-	-	-				
-		-	-	-	-	-	-				
-		-	-	-	-	-	-				
-		-	-	-	-	-	-				
-		-	-	-	-	-	-				
Self-drilling screw with hexagonal head Bi-Metal™ A4 Stainless Steel Fasteners										Annex A9	
A4BM5.5-L-3 , supplied with EPDM washer $\geq \varnothing 16$ mm A5BMBW5.5-L-3, supplied with EPDM washer $\geq \varnothing 16$ mm											



Material

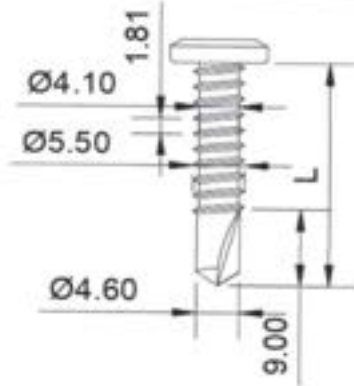
Carbon steel (1.7220 (34CrMo4) – hardened) acc to EN 10263-4

Component I: S320GB- acc to EN 10346

Component II: S320GD - acc to EN 10346

Drilling capacity ≥ 1.00 ≤ 4.00 mm

Setting torque, $M_{t, nom} \leq 2.00$ [Nm]		Component II (Substrate), t_{II} [mm]						Characteristic Pull-Through Resistance, N_{head} [kN]			
		0.60	1.00	1.20	1.50	2.00	-				
Component I (Fixture), t_I [mm]	Characteristic Shear Resistance, V_{rk} [kN]	0.60	0.51	1.39	1.44	1.49	1.50	-	Component I (Fixture), t_I [mm]	0.60	5.23
		1.00	0.79	1.85	2.44	2.47	2.87	-		1.00	7.78
		1.20	0.85	2.99	3.01	3.10	4.16	-		1.20	9.27
		1.50	0.98	3.09	3.87	4.98	5.13	-		1.50	9.30
		2.00	1.27	3.29	4.83	5.04	5.79	-		2.00	9.57
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
Characteristic Pull-out Resistance, N_{ix} [kN]	0.60	1.29	1.91	2.15	2.95	4.30	-	Component I (Fixture), t_I [mm]	-	-	
	1.00	1.91	2.42	2.93	3.78	5.06	-		-	-	
	1.20	2.32	3.10	3.22	4.04	5.63	-		-	-	
	1.50	3.36	3.75	3.87	5.01	6.55	-		-	-	
	2.00	4.38	4.89	5.59	7.05	7.68	-		-	-	
	-	-	-	-	-	-	-		-	-	-
	-	-	-	-	-	-	-		-	-	-
	-	-	-	-	-	-	-		-	-	-
	-	-	-	-	-	-	-		-	-	-
	-	-	-	-	-	-	-		-	-	-
Self-drilling screw with pancake head									Annex A10		
ZPH5.5-L-3, Electroplated Zinc (w/passivation) Coated fasteners TSPH5.5-L-3, EvoShield® Organic Coated fasteners											



Material

Carbon steel (1.7220 (34CrMo4) – hardened) acc to EN 10263-4

Stainless steel (1.4301) - acc to EN 10088

Component I: S320GD - acc to EN 10346

Component II: S320GD - acc to EN 10346

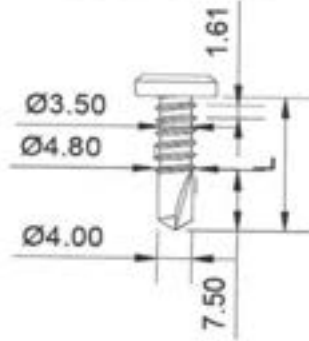
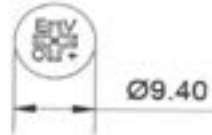
Drilling capacity ≥ 1.00 ≤ 4.00 mm

Setting torque, $M_{t,nom} \leq 2.00$ [Nm]		Component II (Substrate), t_{II} [mm]						Characteristic Pull-Through Resistance, N_{head} [kN]			
		0.60	1.00	1.20	1.50	2.00	-				
Component I (Fixture), t_I [mm]	Characteristic Shear Resistance, V_{ik} [kN]	0.60	0.86	1.34	1.55	1.73	2.07	-	Component I (Fixture), t_I [mm]	0.60	4.71
		1.00	0.89	2.50	2.73	3.02	3.37	-		1.00	6.65
		1.20	1.34	2.59	2.84	3.04	3.64	-		1.20	8.73
		1.50	1.40	2.96	3.34	3.80	4.61	-		1.50	9.21
		2.00	1.64	3.26	3.85	3.89	6.24	-		2.00	9.25
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	Characteristic Pull-out Resistance, N_{ik} [kN]	0.60	1.25	1.57	1.66	2.63	3.78	-			
		1.00	1.71	2.43	2.69	3.05	4.26	-			
		1.20	1.81	2.45	2.71	3.63	4.44	-			
		1.50	2.53	3.14	3.51	3.85	4.62	-			
		2.00	3.47	4.31	4.44	5.06	6.44	-			
		-	-	-	-	-	-	-			
		-	-	-	-	-	-	-			
-		-	-	-	-	-	-				
-		-	-	-	-	-	-				
-		-	-	-	-	-	-				
-		-	-	-	-	-	-				
-		-	-	-	-	-	-				
-		-	-	-	-	-	-				

Self-drilling screw with pancake head

BMTSPH5.5-L-3, Bi-Metal™ A2 stainless steel fasteners

Annex A11



Material

Carbon steel (1.7220 (34CrMo4) – hardened) acc to EN 10263-4

Component I: S320GD - acc to EN 10346
Component II: S320GD - acc to EN 10346

Drilling capacity ≥ 1.00 ≤ 4.00 mm

Setting torque, $M_{t, nom} \leq 2.00$ [Nm]		Component II (Substrate), t_{II} [mm]						Characteristic Pull-Through Resistance, N_{head} [kN]				
		0.60	1.00	1.20	1.50	2.00	-					
Component I (Fixture), t_I [mm]	Characteristic Shear Resistance, V_{rk} [kN]	0.60	0.64	1.12	1.53	1.53	1.65	-	Component I (Fixture), t_I [mm]	0.60	5.23	
		1.00	1.34	1.73	1.92	2.06	2.34	-		1.00	7.78	
		1.20	1.49	2.17	2.26	2.82	3.01	-		1.20	9.27	
		1.50	2.02	2.77	2.80	3.83	4.38	-		1.50	9.30	
		2.00	2.58	3.39	3.77	4.27	5.78	-		2.00	9.57	
		-	-	-	-	-	-	-		-	-	-
		-	-	-	-	-	-	-		-	-	-
		-	-	-	-	-	-	-		-	-	-
		-	-	-	-	-	-	-		-	-	-
		-	-	-	-	-	-	-		-	-	-
	Characteristic Pull-out Resistance, N_{tk} [kN]	0.60	1.62	2.11	2.64	3.09	4.53	-				
		1.00	2.29	2.94	3.32	3.68	4.80	-				
		1.20	2.40	3.25	3.41	4.10	5.22	-				
		1.50	2.88	3.81	4.01	4.70	5.90	-				
		2.00	4.33	5.09	5.30	5.84	7.35	-				
		-	-	-	-	-	-	-				
		-	-	-	-	-	-	-				
		-	-	-	-	-	-	-				

Self-drilling screw with pancake head

TSPH4.8-L-3, EvoShield® organic coated fasteners

Annex A12



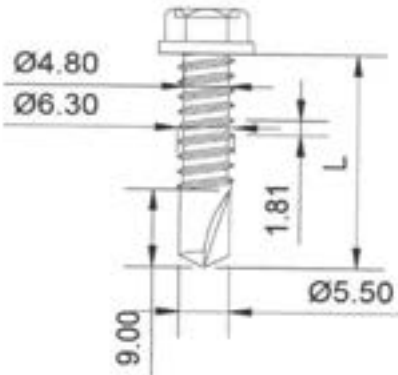
Material

Carbon steel (1.7220 (34CrMo4) – hardened) acc to EN 10263-4

Component I: S320GB - acc to EN 10346
Component II: S320GD - acc to EN 10346

Drilling capacity ≥ 1.00 ≤ 4.00 mm

Setting torque, $M_{t, nom} \leq 2.00$ [Nm]		Component II (Substrate), t_{II} [mm]						Characteristic Pull-Through Resistance, N_{head} [kN]			
		0.60	1.00	1.20	1.50	2.00	-				
Component I (Fixture), t_I [mm]	Characteristic Shear Resistance, V_{sk} [kN]	0.60	0.64	1.12	1.53	1.53	1.65	-	Component I (Fixture), t_I [mm]	0.60	5.07
		1.00	1.34	1.73	1.92	2.06	2.34	-		1.00	7.78
		1.20	1.49	2.17	2.26	2.82	3.01	-		1.20	8.88
		1.50	2.02	2.77	2.80	3.83	4.38	-		1.50	11.24
		2.00	2.58	3.39	3.77	4.27	5.78	-		2.00	12.07
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
Component I (Fixture), t_I [mm]	Characteristic Pull-out Resistance, N_{pk} [kN]	0.60	1.62	2.11	2.64	3.09	4.53	-	Component I (Fixture), t_I [mm]	-	-
		1.00	2.29	2.94	3.32	3.68	4.80	-		-	-
		1.20	2.40	3.25	3.41	4.10	5.22	-		-	-
		1.50	2.88	3.81	4.01	4.70	5.90	-		-	-
		2.00	4.33	5.09	5.30	5.84	7.35	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
Self-drilling screw with Low-Profile Headed									Annex A13		
TSLP4.8-L-3, EvoShield® organic coated fasteners											



Material

Carbon steel (1.7220 (34CrMo4) – hardened) acc to EN 10263-4

Washer: -

Component I: S320GD - acc to EN 10346

Component II: S320GD - acc to EN 10346

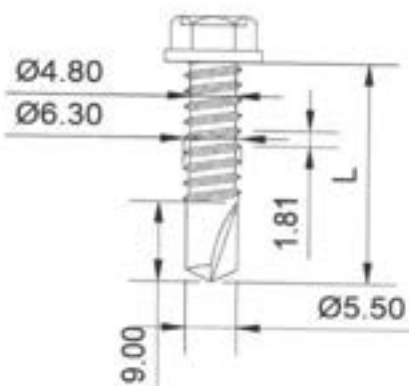
Drilling capacity ≥ 1.00 ≤ 4.00 mm

Setting torque, $M_{t, nom} \leq 2.00$ [Nm]		Component II (Substrate), t_i [mm]						Characteristic Pull-Through Resistance, N_{head} [kN]			
		0.60	1.00	1.20	1.50	2.00	-				
Component I (Fixture), t_i [mm]	Characteristic Shear Resistance, V_{ix} [kN]	0.60	0.64	1.57	1.85	2.06	2.59	-	Component I (Fixture), t_i [mm]	0.60	4.64
		1.00	1.76	1.88	2.03	2.75	3.03	-		1.00	6.80
		1.20	1.78	2.45	2.60	2.90	4.01	-		1.20	7.98
		1.50	1.80	2.86	3.07	3.49	4.31	-		1.50	10.64
		2.00	2.04	2.91	4.33	4.99	6.99	-		2.00	14.63
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	Characteristic Pull-out Resistance, N_{ix} [kN]	0.60	1.33	1.77	2.12	2.73	4.07	-			
1.00		1.82	2.18	2.51	3.39	4.49	-				
1.20		2.36	2.57	2.91	3.52	4.79	-				
1.50		3.18	3.64	3.73	4.46	5.50	-				
2.00		4.23	4.49	4.80	5.44	6.81	-				
-		-	-	-	-	-	-				
-		-	-	-	-	-	-				
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Self-drilling screw with hexagonal head

TSHW6.3-L-3, EvoShield® organic coated fasteners

Annex A14



Material

Carbon steel (1.7220 (34CrMo4) – hardened) acc to EN 10263-4

Stainless steel (1.4301) - acc to EN 10088
Washer: -

Component I: S320GD - acc to EN 10346
Component II: S320GD - acc to EN 10346

Drilling capacity ≥ 1.00 ≤ 4.00 mm

Setting torque, $M_{L,nom} \leq 2.00$ [Nm]		Component II (Substrate), t_{II} [mm]						Characteristic Pull-Through Resistance, N_{head} [kN]			
		0.60	1.00	1.20	1.50	2.00	-				
Component I (Fixture), t_I [mm]	Characteristic Shear Resistance, V_{II} [kN]	0.60	1.21	1.26	1.41	1.52	1.56	-	Component I (Fixture), t_I [mm]	0.60	5.12
		1.00	1.40	1.76	1.87	2.48	2.65	-		1.00	6.38
		1.20	1.65	2.46	2.59	3.05	3.09	-		1.20	7.51
		1.50	1.97	2.55	3.37	3.93	4.28	-		1.50	10.05
		2.00	2.15	3.42	4.15	4.55	5.54	-		2.00	10.95
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	-	-	-	-	-	-	-	-		-	-
	Characteristic Pull-out Resistance, N_{II} [kN]	0.60	1.17	1.66	2.12	2.95	4.14	-			
		1.00	1.75	2.25	2.42	3.23	4.57	-			
		1.20	1.94	2.66	3.07	3.34	4.70	-			
		1.50	2.58	3.10	3.28	3.96	4.78	-			
		2.00	3.57	4.17	5.32	5.50	7.02	-			
		-	-	-	-	-	-	-			
		-	-	-	-	-	-	-			
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Self-drilling screw with hexagonal head									Annex A15		
BMHH6.3-L-3, Bi-Metal™ A2 stainless steel fasteners											

Reference documents

EAD-330046-01-0602	Fastening screws for metal members and sheeting
EN ISO 12944-2	Corrosion protection of steel structures by protective paint systems - Part 2: Classification of environments
EN 10346	Continuously hot-dip coated steel strip and sheet products- Technical delivery conditions
EN 10088	Stainless steels technical delivery conditions
EN 10263-4	Steel rod, bars and wire for cold heading and cold extrusion-Part 4: Technical delivery conditions for steels for quenching and tempering

Reference documents

Annex A16