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Member of



European Technical Assessment

**ETA 23/0118
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General part

Technical Assessment Body issuing the European Technical Assessment:
Techický a zkušební ústav stavební Praha, s.p.

Trade name of the construction product

TCC and TCF

**Product family to which the construction
product belongs**

Product area code: 13
Screws for use in timber constructions

Manufacturer

TOP KRAFT SK a.s.
Priemyselna 9050/1, 90701 Myjava
Slovak Republic

Manufacturing plant

Plant 1

**This European Technical Assessment
contains**

12 pages, including Annexes A and B, which form an integral part of this assessment. Annex C contains the Control Plan with confidential information and is not included in the European Technical Assessment in its public dissemination

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

EAD 130118-01-0603 - Screws and threaded rods for use in timber constructions

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Annex A

Dimensions and tolerances of construction screws – refer to Annex A of ETA 23/0118.

Annex B

Essential characteristics of construction screws – refer to Annex B of ETA 23/0118.

Annex C

Control plan – refer to Annex C of ETA 23/0118

Specific parts

1 Technical description of the product

TCC and **TCF** screws are self-tapping screws to be used in timber structures. They can be threaded over a part or over the full length. The screws are produced from carbon steel 10B21 wire for nominal diameters of 6.0 mm, 8.0 mm. Characteristic values of screws for the characteristic density of wooden elements of 350-480 kg/m³. No breaking shall be observed at a bending angle of $\alpha \leq (45/d^{0.7} + 20)^\circ$. The screws are in the following coatings: White + yellow zinc, phosphate, Delta tone, Delta seal, Magni Silver, Ruspert, EcoGrePert, Protect 1000.

1.1 Shape and dimensions

Dimensions are shown in Annex A.

The screws are threaded over a minimum length $l_g \geq 4 \cdot d$.

1.2 Screw types

TCC and **TCF** approached TZÚS Praha, s. p., for an assessment of the suitability of their screws, namely:

TCC		TCF	
Ø 6mm	Ø 8mm	Ø 6mm	Ø 8mm
6 x 40 mm	8 x 40 mm	6 x 40 mm	8 x 40 mm
6 x 50 mm	8 x 50 mm	6 x 50 mm	8 x 50 mm
6 x 70 mm	8 x 70 mm	6 x 70 mm	8 x 70 mm
6 x 80 mm	8 x 80 mm	6 x 80 mm	8 x 80 mm
6 x 90 mm	8 x 90 mm	6 x 90 mm	8 x 90 mm
6 x 100 mm	8 x 100 mm	6 x 100 mm	8 x 100 mm
	8 x 110 mm		8 x 110 mm
	8 x 120 mm		8 x 120 mm
	8 x 130 mm		8 x 130 mm
	8 x 140 mm		8 x 140 mm
	8 x 150 mm		8 x 150 mm
	8 x 160 mm		8 x 160 mm
	8 x 180 mm		8 x 180 mm
	8 x 200 mm		8 x 200 mm
	8 x 220 mm		8 x 220 mm
	8 x 240 mm		8 x 240 mm
	8 x 260 mm		8 x 260 mm
	8 x 280 mm		8 x 280 mm
	8 x 300 mm		8 x 300 mm
	8 x 320 mm		8 x 320 mm
	8 x 340 mm		8 x 340 mm
	8 x 360 mm		8 x 360 mm
	8 x 380 mm		8 x 380 mm
	8 x 400 mm		8 x 400 mm

2 Specification of the intended use(s) in accordance with the applicable European Assessment Document (hereinafter EAD):

The screws are intended to be used for connecting wood-based members where requirements for mechanical resistance and stability and safety in use shall be fulfilled. The screws are used for connections in load bearing timber structures between wood-based members.

These requirements can be met by using the following materials:

- Solid timber classified to C14-C40 according to EN 338 / EN 14081
- Glued members of timber classified to C14-C40 according to EN 338 / EN 14081 when structural adhesives are used.
- Glued laminated timber classified to GL24c/GL24h or better according to EN 14080.
- Solid Wood Panels, SWP according to EN 13353.
- Laminated Veneer Lumber LVL according to EN 14374

The screws may be used for connecting the following wood-based panels to the timber members mentioned above:

- plywood according to EN 636 and EN 13986
- oriented strand board, OSB according to EN 300 and EN 13986
- particleboard according to EN 312 and EN 13986
- fibreboards according to EN 622-2, EN 622-3 and EN 13986
- cement-bonded particle boards according to EN 634-2 and EN 13986
- solid-wood panels according to EN 13353 and EN 13986

With thickness of more than 20 mm.

For wood-based panels a maximum characteristic density of 380 kg/m³ and for LVL a maximum characteristic density 500 kg/m³ shall be calculated according EN 1995-1-1:2006/A1+A2.

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

Essential characteristic of the product and methods used to assess:

No.	Essential characteristic and method of verification and assessment	Expression of product performance	clause
Basic Works Requirement 1: Mechanical resistance and stability			
1	Dimensions (Cl.2.2.1 of EAD 130118-01-0603)	See table A1	For details on the assessment procedure, see Clause 3.1 of this ETA. See also Annex A to this ETA
2	Characteristic yield moment (Cl.2.2.2 of EAD 130118-01-0603)	No performance assessed	-
3	Bending angle (Cl.2.2.3 of EAD 130118-01-0603)	See table B1	For details on the assessment procedure, see Clause 3.2 of this ETA. See also Annex A to this ETA
4	Characteristic withdrawal parameter (Cl.2.2.4 of EAD 130118-01-0603)	No performance assessed	-
5	Characteristic head pull-through parameter of screws (Cl.2.2.5 of EAD 130118-01-0603)	See table B1	For details on the assessment procedure, see Clause 3.3 of this ETA. See also Annex A to this ETA
6	Characteristic tensile strength (Cl.2.2.6 of EAD 130118-01-0603)	See table B1	For details on the assessment procedure, see Clause 3.4 of this ETA. See also Annex B to this ETA
7	Characteristic yield strength (Cl.2.2.7 of EAD 130118-01-0603)	No performance assessed	-
8	Characteristic torsional strength (Cl.2.2.8 of EAD 130118-01-0603)	See table B1	For details on the assessment procedure, see Clause 3.5 of this ETA. See also Annex B to this ETA
9	Insertion moment (Cl.2.2.9 of EAD 130118-01-0603)	See table B1	For details on the assessment procedure, see Clause 3.6 of this ETA. See also Annex B to this ETA
10	Spacing, end and edge distances of the screws or threaded rods and minimum thickness of the timber material (Cl.2.2.10 of EAD 130118-01-0603)	No performance assessed	-
11	Slip modulus for mainly axially loaded screws and threaded rods (Cl.2.2.11 of EAD 130118-01-0603)	No performance assessed	-
12	Durability against corrosion (Cl.2.2.12 of EAD 130118-01-0603)	No performance assessed	-
Basic Works Requirement 2: Safety in case of fire			
13	Reaction to fire (Cl.2.2.13 of EAD 130186-00-0603)	class A1	For details on the assessment procedure, see Clause 3.7 of this ETA. See also Annex B to this ETA
Basic Works Requirement 4: Safety and accessibility in use			
15	Same as BWR 1	See BWR 1	-

3.1 Mechanical resistance and stability - Dimensions

The dimensions of screws were determined by the technical documentations with verification by tests according to EAD 130118-01-0603 clause 2.2.1.

3.2 Mechanical resistance and stability – Bending angle

The characteristic of Bending angle were determined by the technical documentations with verification by tests according to EAD 130118-01-0603 clause 2.2.3.

3.3 Mechanical resistance and stability - Characteristic head pull-through parameter

The characteristic head pull-through parameter of screws were determined by the technical documentations with verification by tests according to EAD 130118-01-0603 clause 2.2.5.2

3.4 Mechanical resistance and stability - Characteristic tensile strength

The characteristic of tensile strength parameter of the **TCC** and **TCF** screws is determined by EAD 130118-01-0603 article 2.2.6.

3.5 Mechanical resistance and stability - Characteristic torsional strength

The characteristic of torsional strength parameter of the **TCC** and **TCF** screws is determined by tests according to EN ISO 10666.

3.6 Mechanical resistance and stability – insertion moment

The characteristic insertion moment $R_{tor,k}$ has been determined by tests according to EN 15737. The characteristic torsional ratio $f_{tor,k}/R_{tor,k} \geq 1.5$ has been fulfilled for all types of screws. The test results are stated in tables B1.

3.7 Safety in case of fire - Reaction to fire

The reaction to fire of the **TCC** and **TCF** screws were determined by the EAD 130118-01-0603 clause 2.2.1.3. The screws and threaded rods are considered to satisfy the requirements for performance class A1 of the characteristic reaction to fire in accordance with the EC Decision 96/603/EC (as amended) without the need for testing on the basis of it fulfilling the conditions set out in that Decision and its intended use being covered by that Decision.

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

According to the Decision 1997/0176/EC, of the European Commission the system(s) of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011 and Commission delegated Regulation (EU) No 568/2014) given in the following table applies:

Product(s)	Intended use(s)	Level(s) or class(es)	Attestation of conformity system(s)
Fasteners for structural timber products	Structural timber products		3

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

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at the Technický a zkušební ústav stavební Praha, s.p.

Issued in Prague on 20/07/2023

By

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Head of the TAB

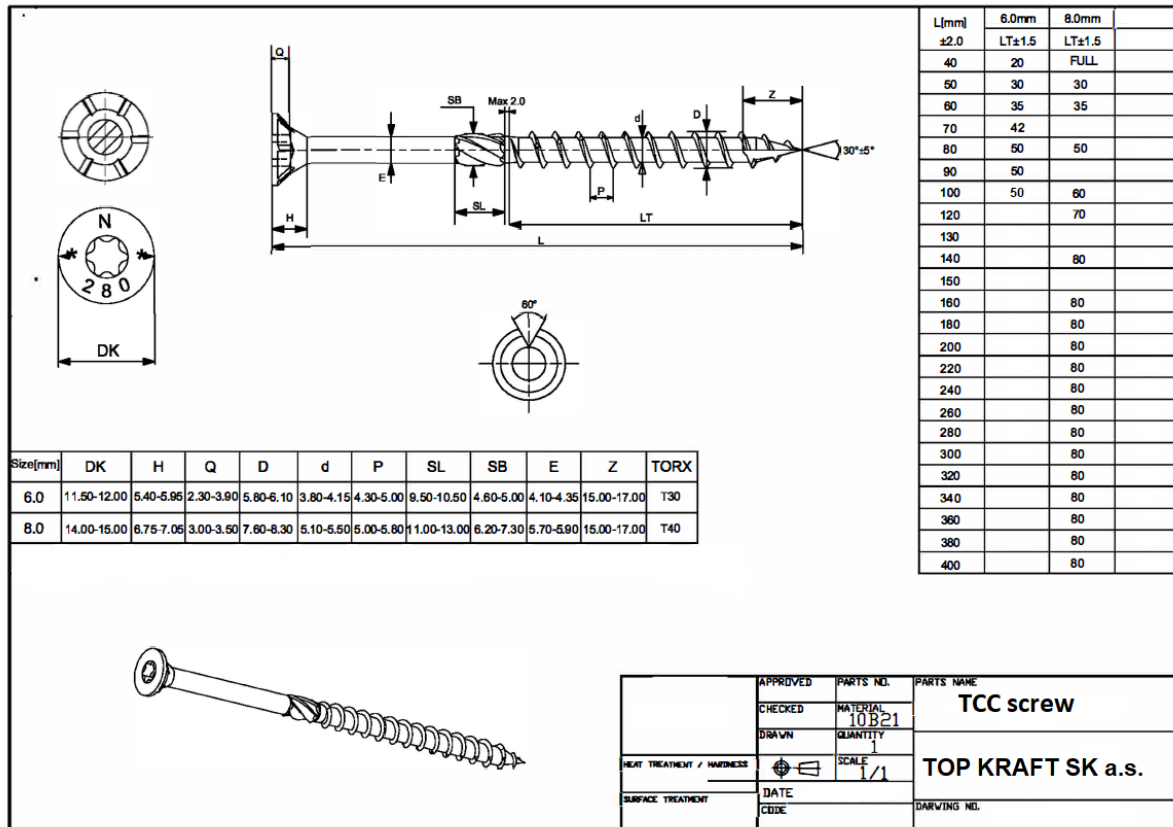
Annexes:

Annex A	Dimensions and tolerances of construction screws
Annex B	Essential characteristics of construction screws
Annex C	Control plan

Annex A

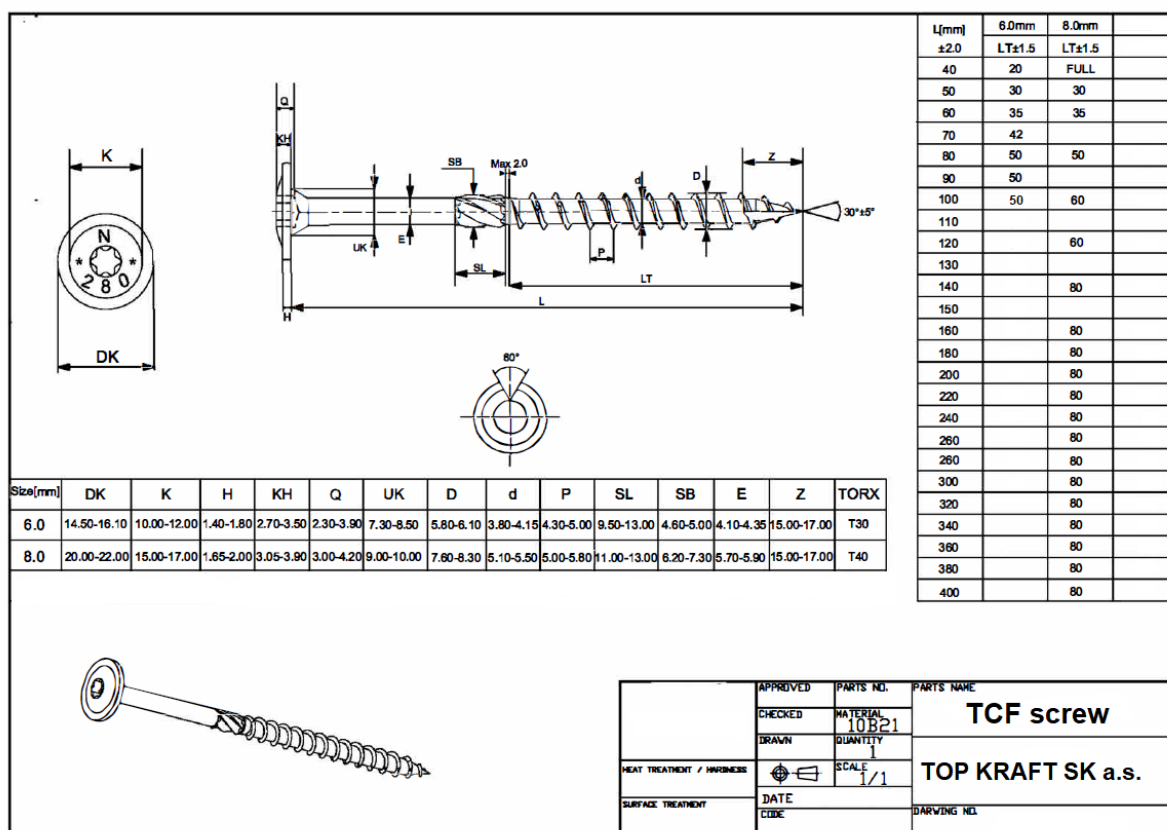
Dimensions and tolerances of construction screws

Screw type: TCC



Picture 1 : Screw type: TCC, diameter: 6 mm, 8 mm

Screw type: TCF



Picture. 2 : Screw type: TCF, diameter: 6 mm, 8 mm

Characteristic / screw		Identification of the test method	6.0x100	8.0x160	8.0x400
Nominal diameter (d)	mm	EN 14592+A1, p. 5	6.086	7.926	-
Thread root diameter (d ₁)	mm	EN 14592+A1, p. 5	3.914	5.478	-
Shank diameter of the screw (d _s)	mm	EAD 130118-07-0603 chapter 2.2.1	4.190	5.750	-
Length (l)	mm	EN 14592+A1, p. 5	99.880	159.730	-
Length of threaded part (l _g)	mm	EN 14592+A1, p. 5	50.160	59.780	-
Diameter of head (d _h)	mm	EAD 130118-07-0603 chapter 2.2.1	11.718	14.482	-
pitch of the screw (p)	mm	EAD 130118-07-0603 chapter 2.2.1	4.360	5.550	-

Table A1: Dimensions

Annex B

Essential characteristics of construction screws

Characteristic values. are determined in Table B1. It applies provided that:

- the possibility of splitting of wooden elements must be assessed. see 8.1.4 in EN 1995-1-1
- The design and installation of the products follow the further instructions according this ETA.

Characteristic / screw	unit	Identification of the test method	6.0x100	8.0x160	8.0x400
Bending angle (α) - THREADED PART	[Nmm]	EAD 130118-07-0603 chapter 2.2.3	11462.83	31146.52	-
Bending angle (α) - SMOOTH PART	[Nmm]	EAD 130118-07-0603 chapter 2.2.3	10841.79	33337.17	-
Characteristic head pull-through parameter of screw ($f_{head,k}$)*	[N/mm ²]	EAD 130118-07-0603 chapter 2.2.5.2	8.13	12.46	-
Characteristic tensile capacity ($f_{tens,k}$)	[kN]	ČSN EN 1383	11.39	23.68	-
Characteristic torsional strength ($f_{tor,k}$)	[Nm]	ČSN EN ISO 10666, p. 4.2.3	11.49	47.07	34.47
Characteristic torsional resistance ($R_{tor,k}$)**	[Nm]	ČSN EN 15737	7.15	12.59	15.74
Characteristic torsional ratio ($f_{tor,k}/R_{tor,k}$)	-	ČSN EN 14592+A1, p. 6.3.4.6	1.61	3.74	2.19

Table B1: Results of essential characteristics. Screw type: TCC and TC

*) the result of Characteristic head pull-through parameter of screw ($f_{head,k}$) is for wood with density : $\rho_k = 400 \text{ kg/m}^3$

**) the result of Characteristic torsional resistance ($R_{tor,k}$) is for wood with density : $\rho_k = 480 \text{ kg/m}^3$

Installation provisions

- EN 1995-1-1 in conjunction with the respective national annex applies for the installation.
- The screws are driven into the wood-based member made of softwood without pre-drilling or in pre-drilled holes with a diameter non exceeding the inner thread diameter d_1 .
- By fastening screw in wood-based members the head of the screws shall be flush with the surface of the wood-based member.
- Wooden members the strength class C14 as a minimum. see above.
- The screws connections shall comply with 8.7 in EN 1995-1-1:2006/A1+A2.
- The screws shall comply with 10.4.5. in EN 1995-1-1:2006/A1+A2.
- For wood with a density greater than 500 kg/m^3 . the pre-drilling diameter shall be determined by a test.

Expected service life

The verifications and assessment methods on which this Technical Assessment is based lead to the assumption of a working life of the screws of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

Annex C Control plan

The Control plan "TOP KRAFT SK a.s. Control plan for CE marking of screws for use in timber constructions" is stored in the archive of the Technical and Test Institute for Construction Prague, SOE.