Member of

www.eota.eu

Designated according to Article 29 of Regulation (EU) No 305/2011

1.1.1.1

Technical and Test Institute for Construction Prague
Prosecká 811/76a
190 00 Prague
Czech Republic
eota@tzus.cz

European Technical Assessment

ETA 22/0721 of 25/10/2022

General part

Technical Assessment Body issuing the European Technical Assessment: Techický a zkušební ústav stavební Praha, s.p.	
Trade name of the construction product	**Heco Italia EFG s.r.l.**
Product family to which the construction product belongs	Product area code: 13 Screws for use in timber constructions
Manufacturer	**Heco Italia EFG s.r.l.** Largo Parolini, 117, 36061 Bassano Del Grappa (VI), Italy
Manufacturing plant	Heco Italia EFG s.r.l. Manufacturing plant 1
This European Technical Assessment contains	13 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

CONTENTS:

Summary of Assessment

Annex A
Dimensions and tolerances of construction screws – refer to Annex A of ETA 22/0721.

Annex B
Essential characteristics of construction screws – refer to Annex B of ETA 22/0721.

Annex C
Reference documents – refer to Annex C of ETA 22/0721.

Specific part

1 Technical description of the product

EFG PowerCut-plus 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 35B2 wire for nominal diameters of 6.0 mm, 8.0 mm and 10.0 mm. Characteristic values of screws for the characteristic density of wooden elements of 350-480 kg/m^3. No breaking shall be observed at a bending angle of $\alpha \leq (45/d^{0.7} + 20)°$.

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

Heco Italia EFG s.r.l. approached TZÚS Praha, s. p., for an assessment of the suitability of their screws, namely:

screw : EFG PowerCut-plus

Screw type :

1) EFG PowerCut-plus 6x240mm
2) EFG PowerCut-plus 6x200mm
3) EFG PowerCut-plus 8x240mm
4) EFG PowerCut-plus 8x220mm
5) EFG PowerCut-plus 10x300mm
6) EFG PowerCut-plus 10x200mm

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/m^3 and for LVL a maximum characteristic density 500 kg/m^3 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 characteristics of the products 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)	No performance assessed	-
4	Characteristic withdrawal parameter (Cl.2.2.4 of EAD 130118-01-0603)	See table B1	For details on the assessment procedure, see Clause 3.2 of this ETA. See also Annex B to this ETA
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 B 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 - Characteristic withdrawal parameter

The characteristic of withdrawal parameter of the EFG PowerCut-plus screws at an angle $\alpha = 90^{\circ}$ to the grain based on a characteristic density of the wood-based members $\rho_a = 350$ kg/m³. For LVL a maximum characteristic density of 500 kg/m^3, the pre-drilling diameter shall be determined and the withdrawal parametr calculated according EN 1995-1-1:2006/A1+A2.

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

The characteristic of head pull-through parameter of the EFG PowerCut-plus screws for a characteristic density $\rho_a = 350$ kg/m³ of the timber and for wood-based panels like:

- 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/m^3 and for LVL a maximum characteristic density 500 kg/m^3 shall be calculated according EN 1995-1-1:2006/A1+A2.

3.4 Mechanical resistance and stability - Characteristic tensile strength

The characteristic of tensile strength parameter of the EFG PowerCut-plus 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 EFG PowerCut-plus 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 table B1.

3.7 Safety in case of fire - Reaction to fire

The reaction to fire of the EFG PowerCut-plus 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 25/10/2022
By

Ing. Jiří Studnička, Ph.D.
Head of the TAB

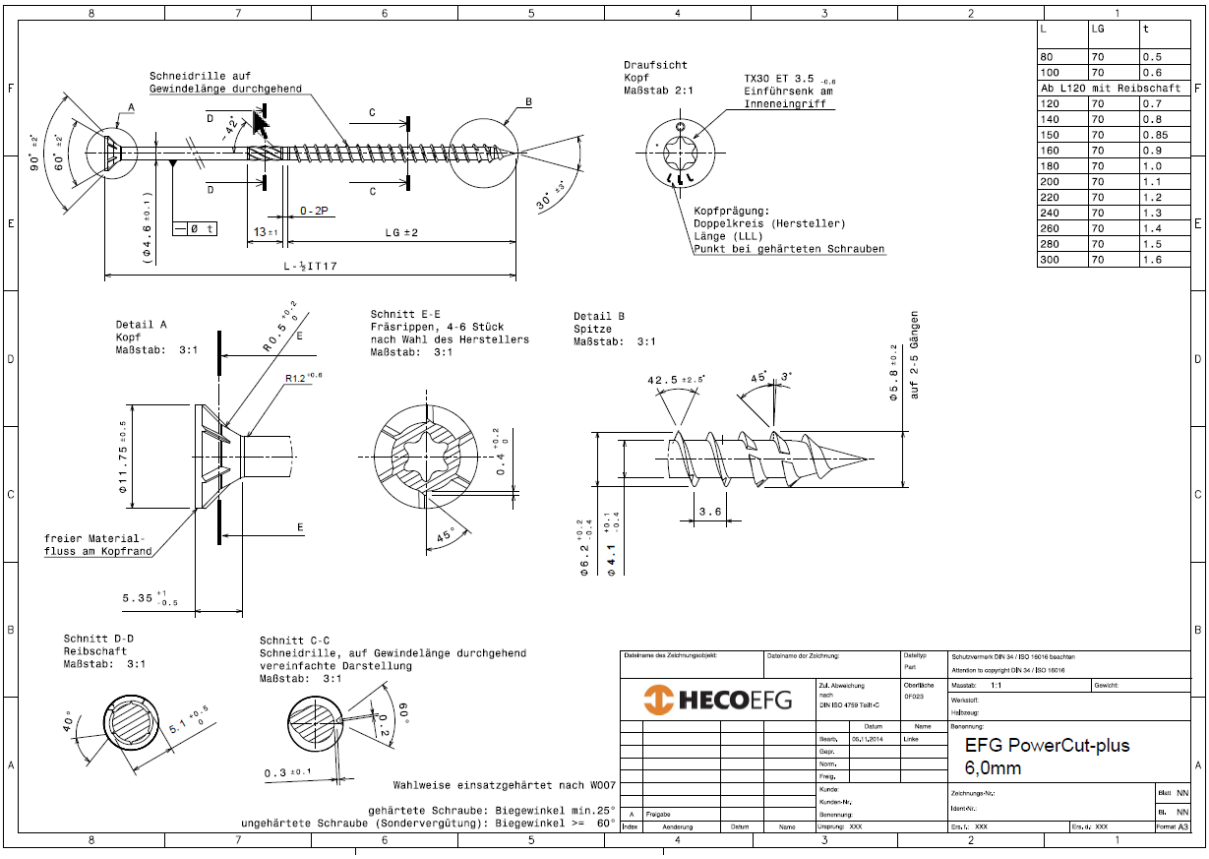
Annexes:

Annex A	Dimensions and tolerances of construction screws
Annex B	Essential characteristics of construction screws
Annex C	Reference documents

Annex A

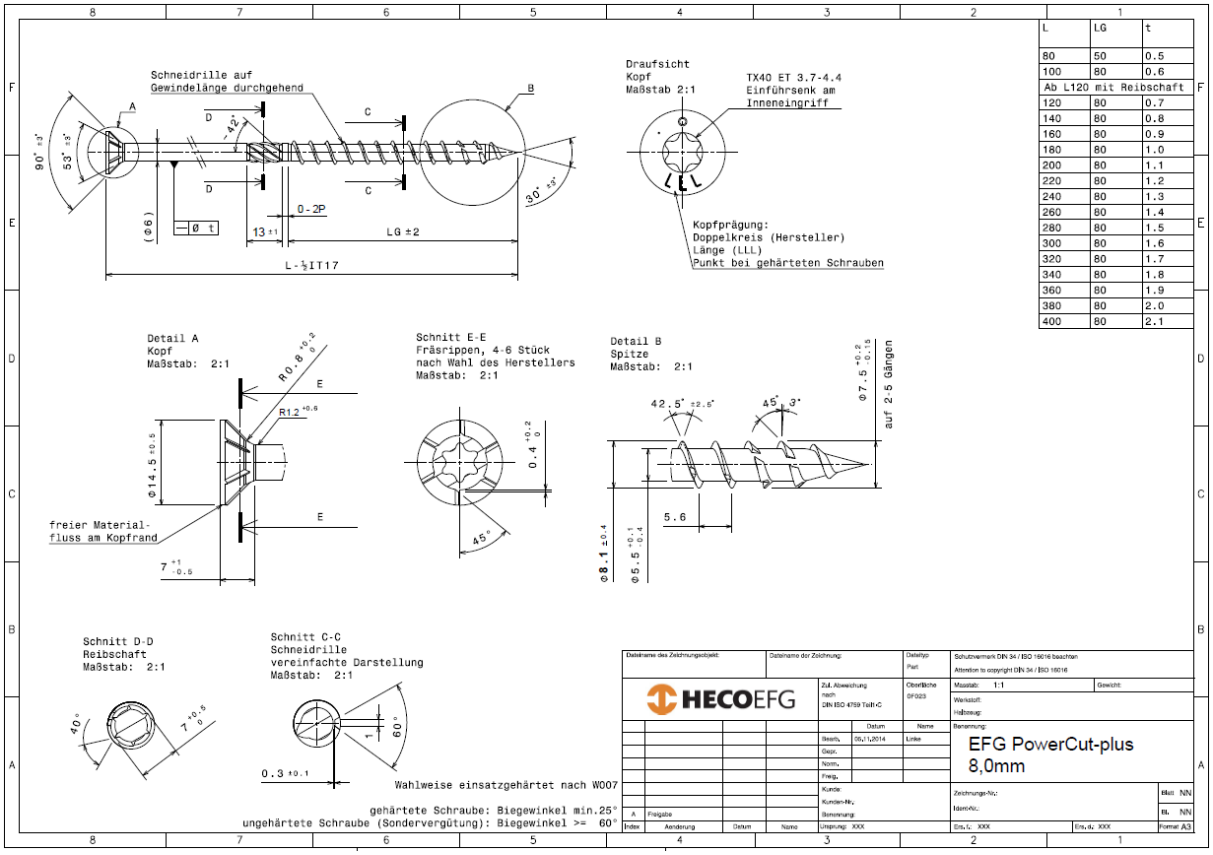
Dimensions and tolerances of construction screws

Screw type: EFG PowerCut-plus



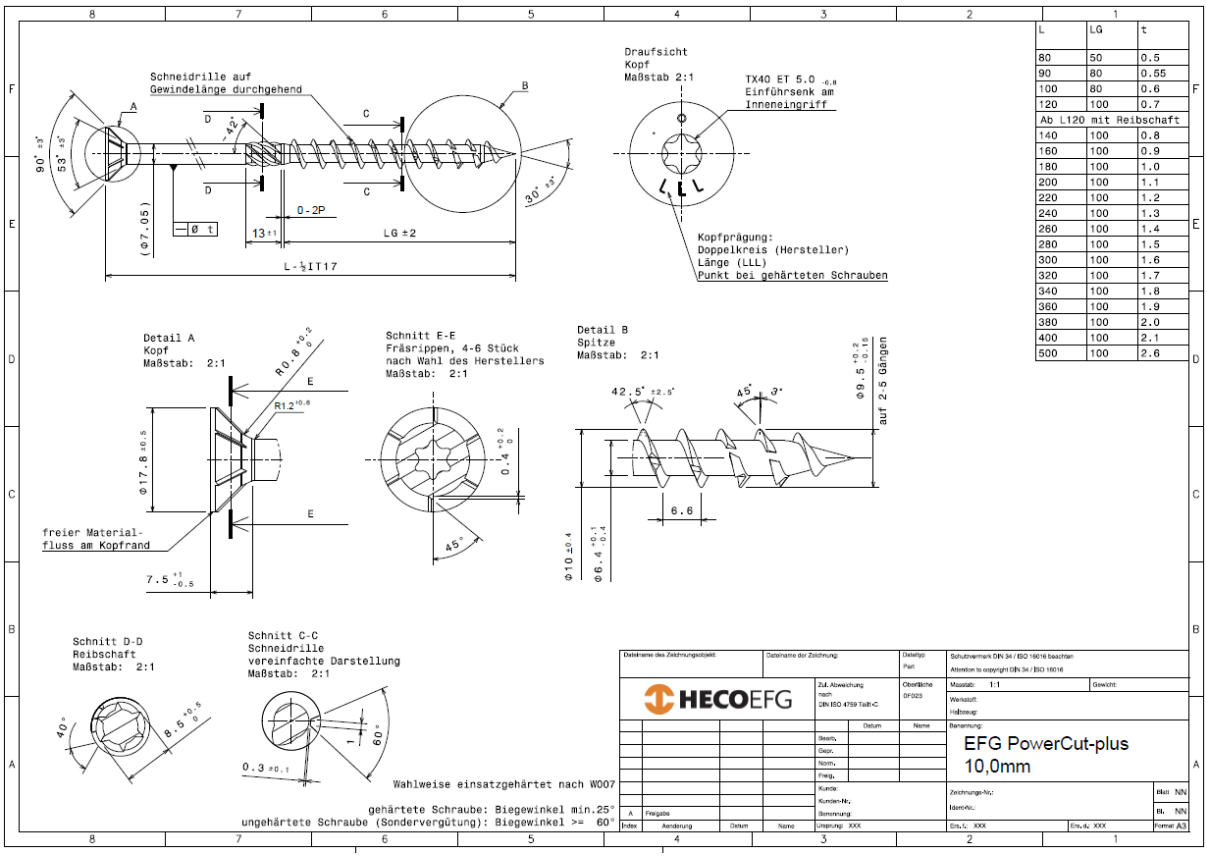
L	LG	t
80	70	0.5
100	70	0.6
Ab L120 mit Reibschaft		
120	70	0.7
140	70	0.8
150	70	0.85
160	70	0.9
180	70	1.0
200	70	1.1
220	70	1.2
240	70	1.3
260	70	1.4
280	70	1.5
300	70	1.6

Picture 1 : Screw type: EFG PowerCut-plus 6,0 mm



L	LG	t
80	50	0.5
100	80	0.6
Ab L120 mit Reibschaft		
120	80	0.7
140	80	0.8
160	80	0.9
180	80	1.0
200	80	1.1
220	80	1.2
240	80	1.3
260	80	1.4
280	80	1.5
300	80	1.6
320	80	1.7
340	80	1.8
360	80	1.9
380	80	2.0
400	80	2.1

Picture 2 : Screw type: EFG PowerCut-plus 8,0 mm



L	LG	t
80	50	0.5
90	80	0.55
100	80	0.6
120	100	0.7
Ab L120 mit Reibschaft		
140	100	0.8
160	100	0.9
180	100	1.0
200	100	1.1
220	100	1.2
240	100	1.3
260	100	1.4
280	100	1.5
300	100	1.6
320	100	1.7
340	100	1.8
360	100	1.9
380	100	2.0
400	100	2.1
500	100	2.6

Picture 3 : Screw type: EFG PowerCut-plus 10,0 mm

Screw

Table A1 Dimensions

Types of screws:	Nominal diameter (d) (mm)	Length of threaded part (l_g) (mm)	Diameter of head (d_h) (mm)	Steel specification
EFG PowerCut-plus				
EFG PowerCut-plus, 6x240 mm	5.87	66.90	11.60	35B2
EFG PowerCut-plus, 6x200 mm	5.87	66.90	11.60	35B2
EFG PowerCut-plus, 8x240 mm	7.70	77.60	14.40	35B2
EFG PowerCut-plus, 8x220 mm	7.70	77.60	14.40	35B2
EFG PowerCut-plus, 10x300 mm	9.71	98.30	17.90	35B2
EFG PowerCut-plus, 10x200 mm	9.71	98.30	17.90	35B2

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		EAD 130118-01-0603 Essential characteristic No.	EFG PowerCut-plus					
			EFG PowerCut-plus Ø 6mm		EFG PowerCut-plus Ø 8mm		EFG PowerCut-plus Ø 10mm	
			6x240 mm	6x200 mm	8x240 mm	8x220 mm	10x300 mm	10x200 mm
Nominal diameter (d)	mm	1	5.87	5.87	7.70	7.70	9.71	9.71
Length of threaded part (l_g)	mm	1	66.90	66.90	77.60	77.60	98.30	98.30
Diameter of head (d_h)	mm	1	11.60	11.60	14.40	14.40	17.90	17.90
Characteristic withdrawal parameter ($f_{ax,k}$)	MPa	4	9.10	9.10	7.50	7.50	11.50	11.50
Characteristic head pull-through parameter ($f_{head,k}$)	MPa	5	24.10	24.10	24.20	24.20	19.40	19.40
Characteristic tensile strength ($f_{tens,k}$)	kN	6	10.393	10.393	17.778	17.778	20.783	20.783
Characteristic torsional strength ($f_{tor,k}$)	Nm	8	9.40	9.40	21.00	21.00	30.20	30.20
Characteristic torsional resistance ($R_{tor,k}$)	Nm	9	3.43	3.43	7.67	7.67	13.09	13.09
Characteristic torsional ratio ($f_{tor,k}/R_{tor,k}$)	-	9	2.74	2.74	2.74	2.74	2.31	2.31
test reports:		Ess. Char. : 4-9	Test report, No.: 311002403/1/2016		Test report, No.: 311002382/1/2016		Test report, No.: 311002414/1/2016	
		Ess. Char. : 1	Test report, No.: 106262/1		Test report, No.: 106262/2		Test report, No.: 106262/3	

Table B1: Results of essential characteristics. Screw type: EFG PowerCut-plus

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. Pre-drilling is required for screws in coniferous wood with a smooth shank diameter d ≤ 6 mm. For all screws in deciduous wood and for screws in coniferous wood with a diameter d > 6 mm. pre-drilling required according to the following requirements:

  1) The guide hole for the shaft has the same diameter as the shaft and the same depth as the length of the shaft.

  2) The guide hole for the threaded part should have a diameter of approximately 70% of the stem content.

  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 guaranteen given by the produce. but are to be ragraded only as a means for choosing the rights products in ralation to the expected economically reasonable working life of the works.

Annex C
Reference documents

[1] European Assessment Document EAD 130118-01-0603 Screws and threaded rods for use in timber constructions (edition February 2019)