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General Part

Technical Assessment Body issuing the European Technical Assessment

Technický a zkušební ústav stavební Praha, s.p.

Trade name of the construction product	CT, CK, CS, WKT, WKV
Product family to which the construction product belongs	Product area code: 13 Screws for use in timber constructions
Manufacturer	DOMAX Sp. z o.o. Aleja Parku Krajobrazowego 109 Łężyce PL-84-207 Koleczkowo Republic of Poland
Manufacturing plant	Plant 1
This European Technical Assessment contains	24 pages including 4 Annexes, which form an integral part of this European Technical Assessment
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	European Assessment Document 130118-00-0603
This ETA replaces	ETA-13/0393, version 02, issued on 12/07/2018

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1 Technical description of the product

DOMAX screws with a mark CK, CS, CT, WKT and WKV are self-tapping screws made from hardened carbon steel grade C10B21 or 19MnB4. The screws are electro-galvanized zinc.

1.1 Shape and dimensions

The outer thread diameter is not less than 5.0 mm and not greater than 12.0 mm. The overall length of the screws is ranging from 40 mm to 600 mm. Further dimensions are shown in Annex 1.

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:

- Solid timber (softwood) of strength classes C14 - C 40 according to EN 338¹ / EN 14081-1²
- Glued laminated timber (softwood) of at least strength class GL24c/GL24h according to EN 14080³
- Laminated veneer lumber LVL according to EN 14374⁴, arrangement of the screws only perpendicular to the plane of the veneers
- Glued laminated solid timber according to EN 14080³
- Cross laminated timber according to European Technical Assessments or national provisions that apply at the installation site

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

- Plywood according to EN 636+A1⁵ and EN 13986+A1⁶
- Oriented Strand Board, OSB according to EN 300⁷ and EN 13986+A1⁶
- Particleboard according to EN 312⁸ and EN 13986+A1⁶
- Fibreboards according to EN 622-2⁹, EN 622-3¹⁰ and EN 13986+A1⁶

¹ EN 338 Timber structures - Strength classes

² EN 14081-1 Timber structures - Strength graded structural timber with rectangular cross section - Part 1: General requirements

³ EN 14080 Timber structures - Glued laminated timber and glued solid timber - Requirements

⁴ EN 14374 Timber structures - Structural laminated veneer lumber - Requirements

⁵ EN 636 Plywood - Specification

⁶ EN 13986 Wood-based panels for use in construction - Characteristics, evaluation of conformity and marking

⁷ EN 300 Oriented strand boards (OSB) - Definition, classification and specifications

⁸ EN 312 Particleboards - Specifications

⁹ EN 622-2 Fibreboards - Specifications - Part 2: Requirements for hardboards

¹⁰ EN 622-3 Fibreboards - Specifications - Part 3: Requirements for medium boards

- Cement-bonded particle boards according to national provisions that apply at the building site
- Solid-wood panels according to national provisions that apply at the building site

Wood-based panels shall only be arranged on the side of the screw head. DOMAX screws with an outer thread diameter of at least 6 mm may be used for the fixing of thermal insulation material on top of rafters.

According to EN 1995-1-1+A2¹¹ the screws made from special stainless or carbon steel with $d > 4$ mm may be used in timber structures subject to climate conditions defined by service classes 1 and 2. According to EN 1995-1-1+A2 the screws made from special stainless or carbon steel with $d \leq 4$ mm may be used in timber structures subject to climate conditions defined by service class 1. Regarding environmental conditions national provisions shall apply at the building site.

Corrosive categories according to EN ISO 12944-2 shall be taken into account.

The use of the screws shall be limited to static and quasi/static actions.

The provisions made in this European Technical Assessment are based on an assumed minimum working life of 50 years, provided that the screws are subject to appropriate use and maintenance.

The indications given as to the working life cannot be interpreted as a guarantee given by the producer or Technical Assessment Body but are regarded only as a mean 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

The assessment of the fitness for use of the DOMAX screws according to the basic work requirements (BWR) were carried out in compliance with EAD 130118-00-0603.

The European Technical Assessment is issued for the screws on the basis of agreed data and information, deposited at Technický a zkušební ústav stavební Praha, s.p., which identifies screws that has been assessed and judged. Changes to the screws or production process which could result in this deposited data and information being incorrect should be notified to Technický a zkušební ústav stavební Praha, s.p. before the changes are introduced. Technický a zkušební ústav stavební Praha, s.p. will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment or alternations to the ETA shall be necessary.

¹¹ EN 1995-1-1+A2 Design of timber structures - Part 1-1: General - Common rules and rules for buildings

Table 1 Essential characteristics of the product

	Essential characteristic	Performance
3.1 BWR 1: Mechanical resistance and stability		
3.1.1	Dimensions	See Annex 1
3.1.2	Characteristic yield moment	See Annex 2
3.1.3	Characteristic withdrawal parameter	See Annex 2
3.1.4	Characteristic head pull-through parameter	See Annex 2
3.1.5	Characteristic tensile strength	See Annex 2
3.1.6	Characteristic yield strength	See Annex 2
3.1.7	Characteristic torsional strength	See Annex 2
3.1.8	Insertion moment	See Annex 2
3.1.9	Bending angle	See Annex 2
3.1.10	Durability against corrosion	See Annex 2
3.1.11	Spacing, end and edge distances of the screws and minimum thickness of the wood-based material	Point 3.1.11
3.1.12	Slip modulus for mainly axially loaded screws	No performance assessed
3.2 BWR 2: Safety in case of fire		
3.2.1	Reaction to fire	Self-tapping screws are made of carbon steel classified as Euroclass A1 in accordance with EC decision 96/603/EC, as amended by EC
3.3 BWR 3: Hygiene, health and the environment		
3.3.1	Content, emission and/or release of dangerous substances	The product does not contain cadmium or any other dangerous substances.
BWR 4: Safety and accessibility in use		
Same as BWR 1		

3.1 Mechanical resistance and stability (BWR 1)

Annex 2 contains essential characteristics for DOMAX screws. The design and construction shall be carried out according to national provisions that apply at the installation site in line with the partial safety factor format, e.g. in accordance with EN 1995-1-1+A2.

3.1.1 Dimensions

The dimensions have been measured according to provisions in EN 14592+A1. The dimensions are documented in tables under Annex 1.

3.1.2 Characteristic yield moment

The characteristic yield moment $M_{y,k}$ has been determined by tests according to EN 409. The test results are documented in tables under Annex 2.

3.1.3 Characteristic withdrawal parameter

The characteristic withdrawal parameters $f_{ax,0,k}$ and $f_{ax,90,k}$ have been determined by tests according to EN 1382. Density of used timber is mentioned in tables under Annex 2. The test results are documented in tables under Annex 2 and relevant test reports.

For angles α between screw axis and grain direction $15^\circ \leq \alpha < 45^\circ$ the characteristic withdrawal capacity $F_{ax,\alpha,Rk}$ shall be determined according to equation:

$$F_{ax,\alpha,Rk} = k_{ax} \cdot f_{ax,90,k} \cdot d \cdot l_{ef} \cdot (\rho_k/350)^{0,8}$$

where

k_{ax} factor to consider the influence of the angle between screw axis and grain direction and the long-term behaviour

$$k_{ax} = 0,3 + (0,7 \cdot \alpha) / 45^\circ$$

$f_{ax,90,k}$ short-term characteristic withdrawal parameter for an angle α between screw axis and grain direction of 90° in N/mm^2

d outer thread diameter of the screw in mm

l_{ef} penetration length of the threaded part of the screw in the timber member in mm

ρ_k characteristic density of the wood-based member in kg/m^3

For angle α between screw axis and grain direction $0^\circ \leq \alpha < 15^\circ$ the following requirements were fulfilled and relevant equations can be used:

1. $f_{ax,0,k} / f_{ax,90,k} \geq 0.6$
2. The penetration length of the threaded part of the screws shall be

$$l_{ef,req} = \min \left\{ \begin{array}{l} \frac{4 \cdot d}{\sin \alpha} \\ 20 \cdot d \end{array} \right.$$

3. At least four screws shall be used in a connection with screws inserted in the timber member with an angle between screw axis and grain direction of less than 15° .

3.1.4 Characteristic head pull-through parameter

The characteristic head pull-through parameter $f_{head,k}$ has been determined by tests according to EN 1383. Density of used timber is mentioned in tables under Annex 2. The test results are documented in tables under Annex 2.

3.1.5 Characteristic tensile strength

The characteristic tensile strength $f_{tens,k}$ has been determined by tests according to EN 1383. The test results are documented in tables under Annex 2.

3.1.6 Characteristic yield strength

The characteristic yield strength has been determined by tests according to EN 1383. The test results are documented in tables under Annex 2.

3.1.7 Characteristic torsional strength

The characteristic torsional strength $f_{tor,k}$ has been determined by tests according to EN ISO 10666. The test results are documented in tables under Annex 2.

3.1.8 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 documented in tables under Annex 2.

3.1.9 Bending angle

The bending angle has been determined for each specimen. The test results are documented in tables under Annex 2.

3.1.10 Durability against corrosion

The screws are made from hardened carbon steel with corrosion protection layer. The screws are electro-galvanized zinc. The thickness of the zinc coating was measured for each specimen in accordance with ISO 2178. The test results are documented in tables under Annex 2.

3.1.11 Spacing, end and edge distances of the screws and minimum thickness of the wood-based material

Laterally loaded screws

For DOMAX screws the minimum spacing, end and edge distances are given in EN 1995-1-1+A2, clause 8.7.1.

Axially loaded screws

For DOMAX screws the minimum spacing, end and edge distances are given in EN 1995-1-1, clause 8.7.2 and Table 8.6.

3.1.12 Slip modulus for mainly axially loaded screws

No performance assessed.

3.2 Safety in case of fire (BWR 2)

3.2.1 Reaction to fire

Self-tapping screws are made of carbon steel classified as Euroclass A1 in accordance with EC decision 96/603/EC, as amended by EC.

3.3 Hygiene, health and the environment (BWR 3)

3.3.1 Content, emission and/or release of dangerous substances

The manufacturer submitted a written declaration the product does not contain cadmium or any other dangerous substances.

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

According to the decision 97/176/EC¹², of the European Commission the system(s) of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) 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

¹² 97/176/EC - European Commission decision of 17/2/1997, published in the Official Journal of the European Communities No L 73/19

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 12/11/2018

By

Ing. Mária Schaan
Head of the TAB

Annexes:

- Annex 1 Dimensions and tolerances of DOMAX screws
- Annex 2 Essential characteristics of DOMAX screws
- Annex 3 Manufacturing, installation, storage and maintenance
- Annex 4 Reference documents

Annex 1 Dimensions and tolerances of DOMAX screws

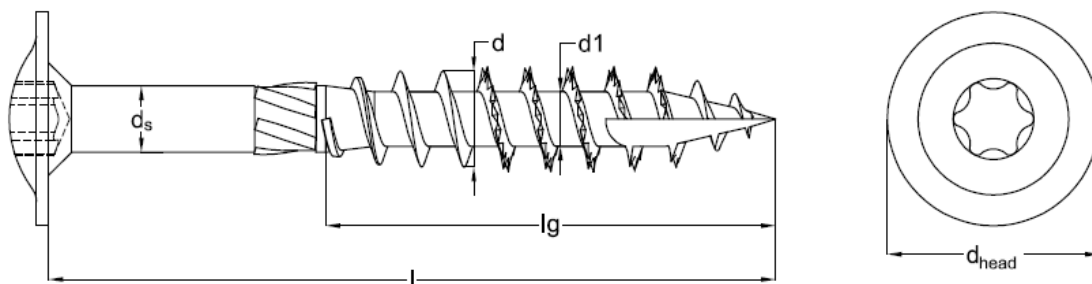


Figure 1: Screw, type CT

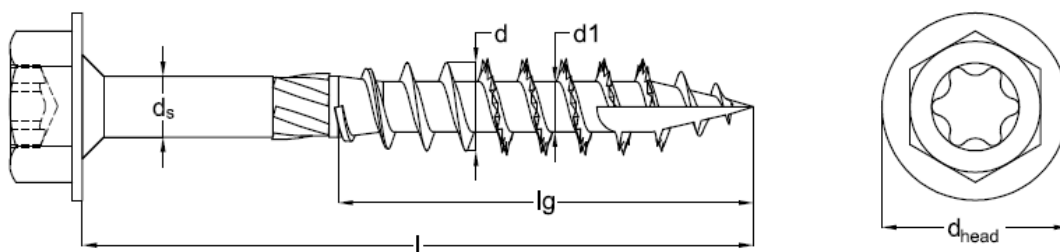


Figure 2: Screw, type CK

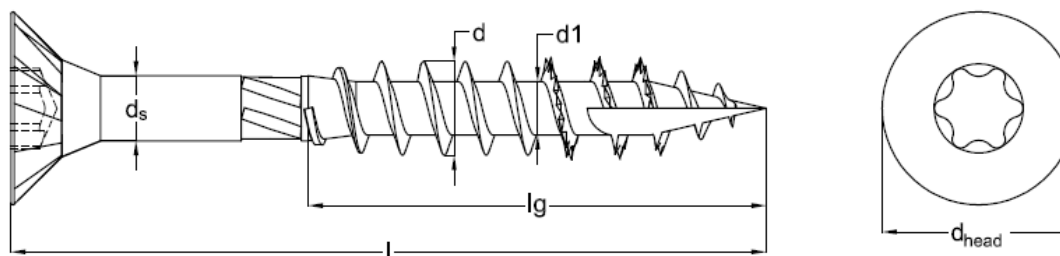


Figure 3: Screw, type CS

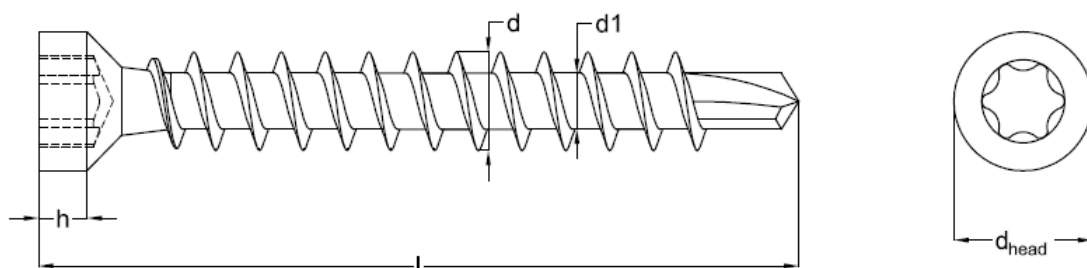


Figure 4: Screw, type WKV

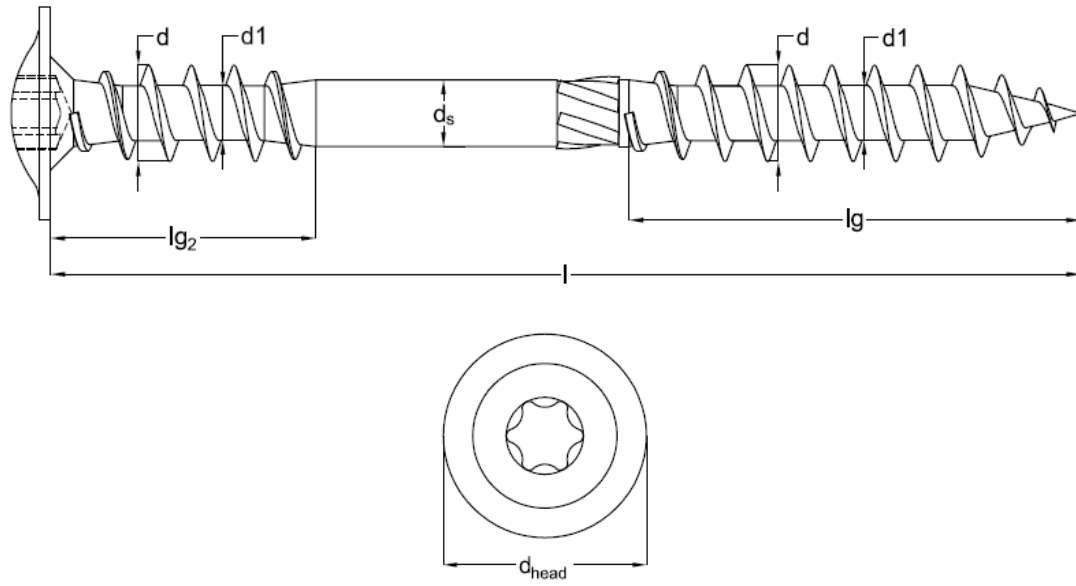


Figure 5: Screw, type WKT

Type	Nominal		l [mm]		l _g [mm]		d [mm]		d ₁ [mm]		d _{head} [mm]		d _s [mm]		
	Diameter	Length	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance	
CT	8	80	80	±4	40	±2	8	±0.4	5.4	±0.25	21	±1	5.8	±0.25	
		100	100	±5											
		120	120	±6											
		140	140	±7											
		160	160	±8											
		180	180	±9											
		200	200	±10											
		220	220	±11											
		240	240	±12											
		260	260	±13											
		280	280	±14											
		300	300	±15											
		320	320	±16											
		340	340	±17											
	360	360	±18												
	380	380	±19												
	400	400	±20												
	10	10	120	120	±6	80	±4	10	±0.5	6.4	±0.32	24	±1	7	±0.35
			140	140	±7										
			160	160	±8										
			180	180	±9										
			200	200	±10										
			220	220	±11										
			240	240	±12										
			260	260	±13										
			280	280	±14										
			300	300	±15										
			320	320	±16										
360			360	±18											
380			380	±19											
400			400	±20											

Type	Nominal		l [mm]		l _g [mm]		d [mm]		d ₁ [mm]		d _{head} [mm]		d _s [mm]			
	Diameter	Length	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance		
CK	8	140	140	±7	80	±4	8	±0.4	5.4	±0.25	18	±0.9	5.8	±0.25		
		160	160	±8												
		180	180	±9												
		200	200	±10												
		220	220	±11												
		240	240	±12												
		260	260	±13												
		280	280	±14												
	300	300	±15													
	10	160	160	±8												
		180	180	±9												
		200	200	±10												
		220	220	±11												
		240	240	±12												
		260	260	±13												
		280	280	±14												
		300	300	±15												
		320	320	±16												
		340	340	±17												
		360	360	±18												
		380	380	±19												
	400	400	±20													
	12	160	160	±8			100	±5	12	±0.6	7.7	±0.35	23	±1	8.4	±0.4
		180	180	±9												
		200	200	±10												
		220	220	±11												
		240	240	±12												
		260	260	±13												
		280	280	±14												
		300	300	±15												
		320	320	±16												
		340	340	±17												
		360	360	±18												
		380	380	±19												
	400	400	±20													

Type	Nominal		l [mm]		l _g [mm]		d [mm]		d ₁ [mm]		d _{head} [mm]		d _s [mm]	
	Diameter	Length	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance
CS	5	40	40	±2	30	±1.5	5.2	±0.25	3.3	±0.15	9.5	±0.45	3.6	±0.15
		45	45											
		50	50											
		60	60	±3	40	±2								
		70	70											
		80	80	±4	60	±3								
		90	90											
		100	100											
	120	120	±6											
	6	70	70	±3	40	±2	6.1	±0.3	4	±2	11	±0.55	4.4	±0.2
		80	80	±4										
		100	100	±5	70	±3.5								
		120	120	±6										
		140	140	±7										
		160	160	±8										
		180	180	±9										
		200	200	±10										
		220	220	±11										
		240	240	±12										
		260	260	±13										
		280	280	±14										
	300	300	±15											
	8	80	80	±4	40	±2	8	±0.4	5.4	±0.25	14.5	±0.7	5.8	±0.25
		100	100	±5										
		120	120	±6	80	±4								
		140	140	±7										
		160	160	±8										
		180	180	±9										
200		200	±10											
220		220	±11											
240	240	±12												

Type	Nominal		l [mm]		d [mm]		d ₁ [mm]		d _{head} [mm]		h [mm]	
	Diameter	Length	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance
WKV	6.5	120	120	±6	6.5	±0.3	4.6	±0.2	8	±0.4	5.5	±0.25
		140	140	±7								
		160	160	±8								
		195	195	±9								
	8	155	155	±7	8	±0.4	5.4	±0.25	10	±0.5	6.5	±0.3
		195	195	±9								
		220	220	±11								
		245	245	±12								
		295	295	±14								
		330	330	±16								
		375	375	±18								
		400	400	±20								
	10	300	300	±15	10	±0.5	6.4	±0.3	13	±0.6	7	±0.35
		330	330	±16								
		360	360	±18								
		400	400	±20								
		450	450	±22								
		500	500	±25								
		550	550	±27								
		600	600	±30								

Type	Nominal		l [mm]		l _g [mm]		l _{g2} [mm]		d [mm]		d ₁ [mm]		d _{head} [mm]		d _s [mm]	
	Diameter	Length	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance
WKT	8	165	165	±8	80	±4	65	±3	8	±0.4	5.4	±0.25	16	±0.8	5.8	±0.25
		195	195	±9	100	±5										
		225	225	±11												
		235	235													
		255	255	±12												
		275	275	±13												
		302	302	±15												
		335	335	±16												
		365	365	±18												
		397	397	±19												
		435	435	±21												

Annex 2 Essential characteristics of DOMAX screws

3.1 Mechanical resistance and stability (BWR 1)

Table 2 DOMAX CT screw

3.1.2	Characteristic yield moment			
$M_{y,k}$ (Nmm)		\varnothing [mm]	threaded part	smoothed part
		8.0 (at 20°)	22 600	–
		10.0 (at 18°)	36 000	72 200
3.1.3	Characteristic withdrawal parameter			
$f_{ax,90,k}$ (N/mm ²)		\varnothing [mm]	loading perpendicular to the grain ($\alpha=90^\circ$)	
		8.0	14.70 (density 480 kg/m ³)	
		10.0	14.55 (density 500 kg/m ³)	
3.1.4	Characteristic head pull-through parameter			
$f_{head,k}$ (N/mm ²)		\varnothing [mm]		
		8.0	21.85 (density 530 kg/m ³)	
		10.0	22.85 (density 515 kg/m ³)	
3.1.5	Characteristic tensile capacity			
$f_{tens,k}$ (kN)		\varnothing [mm]		
		8.0	24.40	
		10.0	32.00	
3.1.6	Characteristic yield strength			
$R_{p0.2}$ (MPa)		\varnothing [mm]		
		8.0	1111.0	
		10.0	923.0	
3.1.7 3.1.8	Characteristic torsional ratio (Characteristic torsional strength/Characteristic torsional resistance into timber)			
$f_{tor,k} / R_{tor,k}$ (Nm) / (Nm)		\varnothing [mm]		
		8.0	28.65/6.50 = 4.40	
		10.0	46.55/16.64 = 2.80	
3.1.9	Bending angle			
Bending angle (°)		\varnothing [mm]		
		8.0	22°08'	
		10.0	23°10'	
3.1.10	Durability against corrosion (protective layer thickness)			
Protective layer thickness (µm)		\varnothing [mm]		
		8.0	14.20	
		10.0	17.50	

Table 3 DOMAX CK screw

3.1.2	Characteristic yield moment		
$M_{y,k}$ (Nmm)	\varnothing [mm]	threaded part	smoothed part
	8.0 (at 20°)	22 600	50 100
	10.0 (at 19°)	29 400	77 350
	12.0 (at 18°)	56 800	131 950
3.1.3	Characteristic withdrawal parameter		
$f_{ax,90,k}$ (N/mm ²)	\varnothing [mm]	loading perpendicular to the grain ($\alpha=90^\circ$)	
	8.0	15.35 (density 440 kg/m ³)	
	10.0	17.20 (density 505 kg/m ³)	
	12.0	20.00 (density 450 kg/m ³)	
3.1.4	Characteristic head pull-through parameter		
$f_{head,k}$ (N/mm ²)	\varnothing [mm]		
	8.0	17.80 (density 445 kg/m ³)	
	10.0	23.30 (density 445 kg/m ³)	
	12.0	22.40 (density 445 kg/m ³)	
3.1.5	Characteristic tensile capacity		
$f_{tens,k}$ (kN)	\varnothing [mm]		
	8.0	25.25	
	10.0	34.70	
	12.0	47.30	
3.1.6	Characteristic yield strength		
$R_{p0.2}$ (MPa)	\varnothing [mm]		
	8.0	1164.5	
	10.0	1115.5	
	12.0	1048.0	
3.1.7	Characteristic torsional ratio (Characteristic torsional strength/Characteristic torsional		
3.1.8	resistance into timber)		
$f_{tor,k} / R_{tor,k}$ (Nm) / (Nm)	\varnothing [mm]		
	8.0	29.65/9.44 = 3.15	
	10.0	33.50/11.09 = 3.00	
	12.0	53.50/15.23 = 3.50	
3.1.9	Bending angle		
Bending angle (°)	\varnothing [mm]		
	8.0	22°08'	
	10.0	23°10'	
3.1.10	Durability against corrosion (protective layer thickness)		
Protective layer thickness (µm)	\varnothing [mm]		
	8.0	14.25	
	10.0	13.00	
	12.0	13.05	

Table 4 DOMAX CS screw

3.1.2	Characteristic yield moment		
$M_{y,k}$ (Nmm)	\varnothing [mm]	threaded part	smoothed part
	5.0 (at 24°)	6 500	10 600
	6.0 (at 22°)	10 100	22 550
	8.0 (at 20°)	22 600	–
	10.0 (at 19°)	36 000	–
3.1.3	Characteristic withdrawal parameter		
$f_{ax,90,k}$ (N/mm ²)	\varnothing [mm]	loading perpendicular to the grain ($\alpha=90^\circ$)	
	5.0	17.85 (density 450 kg/m ³)	
	6.0	15.00 (density 450 kg/m ³)	
	8.0	13.45 (density 450 kg/m ³)	
	10.0	12.15 (density 450 kg/m ³)	
3.1.4	Characteristic head pull-through parameter		
$f_{head,k}$ (N/mm ²)	\varnothing [mm]		
	5.0	14.15 (density 450 kg/m ³)	
	6.0	17.30 (density 450 kg/m ³)	
	8.0	21.05 (density 450 kg/m ³)	
	10.0	17.60 (density 450 kg/m ³)	
3.1.5	Characteristic tensile capacity		
$f_{tens,k}$ (kN)	\varnothing [mm]		
	5.0	8.40	
	6.0	10.90	
	8.0	18.20	
	10.0	23.80	
3.1.6	Characteristic yield strength		
$R_{p0.2}$ (MPa)	\varnothing [mm]		
	5.0	973.5	
	6.0	1010.0	
	8.0	1083.5	
	10.0	1034.0	
3.1.7	Characteristic torsional ratio (Characteristic torsional strength/Characteristic torsional		
3.1.8	resistance into timber)		
$f_{tor,k} / R_{tor,k}$ (Nm) / (Nm)	\varnothing [mm]		
	5.0	5.85/1.70 = 3.45	
	6.0	11.60/3.73 = 3.10	
	8.0	22.45/6.11 = 3.65	
	10.0	32.05/15.12 = 2.10	
3.1.9	Bending angle		
Bending angle (°)	\varnothing [mm]		
	5.0	27°36'	
	6.0	26°06'	
	8.0	22°08'	
	10.0	23°10'	
3.1.10	Durability against corrosion (protective layer thickness)		
Protective layer thickness (µm)	\varnothing [mm]		
	5.0	23.70	
	6.0	29.20	
	8.0	15.65	
	10.0	14.65	

Table 5 DOMAX WKT screw

3.1.2	Characteristic yield moment		
$M_{y,k}$ (Nmm)		\varnothing [mm]	threaded part
		8.0 (at 20°)	22 600
smoothed part			
-			
3.1.3	Characteristic withdrawal parameter		
$f_{ax,90,k}$ (N/mm ²)		\varnothing [mm]	loading perpendicular to the grain ($\alpha=90^\circ$)
		8.0	14.30 (density 440 kg/m ³)
3.1.4	Characteristic head pull-through parameter		
$f_{head,k}$ (N/mm ²)		\varnothing [mm]	
		8.0	23.20 (density 445 kg/m ³)
3.1.5	Characteristic tensile capacity		
$f_{tens,k}$ (kN)		\varnothing [mm]	
		8.0	23.20
3.1.6	Characteristic yield strength		
$R_{p0.2}$ (MPa)		\varnothing [mm]	
		8.0	1153.5
3.1.7	Characteristic torsional ratio (Characteristic torsional strength/Characteristic torsional		
3.1.8	resistance into timber)		
$f_{tor,k} / R_{tor,k}$ (Nm) / (Nm)		\varnothing [mm]	
		8.0	26.90/9.31 = 2.85
3.1.9	Bending angle		
Bending angle (°)		\varnothing [mm]	
		8.0	22°08'
3.1.10	Durability against corrosion (protective layer thickness)		
Protective layer thickness (µm)		\varnothing [mm]	
		8.0	14.45

Table 6 DOMAX WKV screw

3.1.2	Characteristic yield moment		
$M_{y,k}$ (Nmm)	\varnothing [mm]	threaded part	smoothed part
	6.5 (at 22°)	13 000	–
	8.0 (at 20°)	22 600	–
	10.0 (at 19°)	36 000	–
3.1.3	Characteristic withdrawal parameter		
$f_{ax,90,k}$ (N/mm ²)	\varnothing [mm]	loading perpendicular to the grain ($\alpha=90^\circ$)	
	6.5	16.55 (density 440 kg/m ³)	
	8.0	15.45 (density 440 kg/m ³)	
	10.0	16.45 (density 505 kg/m ³)	
3.1.4	Characteristic head pull-through parameter		
$f_{head,k}$ (N/mm ²)	\varnothing [mm]		
	6.5	35.70 (density 470 kg/m ³)	
	8.0	29.20 (density 445 kg/m ³)	
	10.0	19.75 (density 445 kg/m ³)	
3.1.5	Characteristic tensile capacity		
$f_{tens,k}$ (kN)	\varnothing [mm]		
	6.5	16.30	
	8.0	19.65	
	10.0	24.10	
3.1.6	Characteristic yield strength		
$R_{p0.2}$ (MPa)	\varnothing [mm]		
	6.5	1069.5	
	8.0	1211.5	
	10.0	1186.0	
3.1.7	Characteristic torsional ratio (Characteristic torsional strength/Characteristic torsional		
3.1.8	resistance into timber)		
$f_{tor,k} / R_{tor,k}$ (Nm) / (Nm)	\varnothing [mm]		
	6.5	12.95/8.31 = 1.55	
	8.0	21.50/7.81 = 2.75	
	10.0	45.30/9.99 = 4.50	
3.1.9	Bending angle		
Bending angle (°)	\varnothing [mm]		
	8.0	22°08'	
	10.0	23°10'	
3.1.10	Durability against corrosion (protective layer thickness)		
Protective layer thickness (µm)	\varnothing [mm]		
	6.5	12.65	
	8.0	14.50	
	10.0	13.10	

Annex 3 Manufacturing, installation, storage and maintenance

Manufacture

This European Technical Assessment is issued for screws for use in timber constructions produced by the DOMAX on the basis of agreed data, deposited with the Technický a zkušební ústav stavební Praha, s.p., which identifies the screws that has been assessed and evaluated. Changes to the screws or production process which could result in this deposited data being incorrect, shall be notified to the Technický a zkušební ústav stavební Praha, s.p., before the changes are introduced. Technický a zkušební ústav stavební Praha, s.p. will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA, and if so, whether further assessment or alterations to the ETA shall be necessary.

Design and installation

The installation instructions including special installation techniques and provisions for the qualification of the personnel are given in the manufacturer's technical documentation.

Design, installation and execution of DOMAX screws must confirm with national documents. Such documents and the level of their implementation in member states' legislation are different. Therefore, the assessment and declaration of performance are done taking into account the general assumptions included in EAD 130118-00-0603, which summarizes how information included in the ETA and related documents are intended to be used in the construction process and gives advice to all parties interested when normative documents are missing.

The screws are driven into the wood-based member without pre-drilling or in pre-drilled holes with a diameter not exceeding the inner thread diameter d_1 . The tolerances stated in drawings and tables of Annex 1 may be permissible. The screw holes in steel members shall be pre-drilled with an adequate diameter greater than the outer thread diameter.

A minimum of two screws shall be used for connections in load bearing timber structures. If screws with an outer thread diameter $d \geq 8$ mm are driven into the wood-based member without pre-drilling, the structural solid or glued laminated timber, laminated veneer lumber and similar glued members shall be from spruce, pine or fir.

In the case of fastening battens on thermal insulation material on top of rafters the screws shall be driven in the rafter through the battens and the thermal insulation material without pre-drilling in one sequence.

By fastening screws in wood-based members the head of the screws shall be flush with the surface of the wood-based member.

The minimum penetration length of screws in the load-bearing wood-based members shall be $4 \cdot d$. The outer thread diameter of screws inserted in cross-laminated timber shall be at least 6 mm. To connect cross-laminated timber in the inner thread diameter d_1 of the screws shall be greater than the maximal width of the gaps in the layer.

Packaging, transport and storage

Information on packaging, transport and storage is given in the manufacturer's technical documentation. It is the responsibility of the manufacturer to ensure that this information is made known to the people concerned.

DOMAX screws must be stored indoors and protected from the weather, damage and/or breakage.

DOMAX screws should be transported in such a way as to protect against damage or breakage.

Use, maintenance and repair

Information on use, maintenance and repair is given in the manufacturer's technical documentation. It is the responsibility of the manufacturer to ensure that this information is made known to the people concerned.

Annex 4 Reference documents

- [1] European Assessment Document EAD 130118-00-0603 Screws for use in timber constructions (edition October 2016)
- [2] Test Reports No. 39-10938/1-13 on date 04/04/2013, regarding tests of mechanical resistance and stability of screws, issued by Strojírenský zkušební ústav, s.p., workplace Jablonec nad Nisou, Czech Republic
- [3] Test Report No. 070-045189 on date 09/04/2013, regarding tests of determination dimensions, issued by Technický a zkušební ústav stavební Praha, s.p., branch Ostrava, Czech Republic
- [4] Declaration about dangerous substances issued by DOMAX sp. z o.o. on date 11/03/2013