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European Technical Assessment

ETA 19/0474
of 30/05/2022

General Part

Technical Assessment Body issuing the European Technical Assessment	Technický a zkušební ústav stavební Praha, s.p.
Trade name of the construction product	CS, CT, WKT, WKW, CPW, CPS
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 84-207 Koleczkowo Republic of Poland
Manufacturing plant	DOMAX Sp. z o.o. Aleja Parku Krajobrazowego 109 Łężyce 84-207 Koleczkowo Republic of Poland
This European Technical Assessment contains	18 pages including 3 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	EAD 130118-01-0603 Screws and threaded rods for use in timber constructions
This version replaces	ETA 19/0474, version 01 issued on 10/02/2020

Specific Parts

1 Technical description of the product

Screws CS, CT, WKT, WKW, CPW and CPS are self-tapping screws made from hardened carbon steel. The screws are covered by corrosive protection layer Fe/Zn 12c. Type of head is Countersunk, Cylinder and Platter. The screws are fully or partially threaded. Dimensions, tolerances, shapes and other description is shown in Annex 1. All screws fulfill the requirement for a minimum bending angle of $\alpha = (45/d^{0.7} + 20)$. The screws are used for connections in load bearing timber structures between wood-based members.

1.1 Shape and dimensions

The outer thread diameter is not less than 6.0 mm and not greater than 8.0 mm. The overall length of the screws is ranging from 80 mm to 450 mm. Further dimensions are shown in Annex 1.

The ratio of inner thread diameter to outer thread diameter d_1/d ranges for all screws from 0.65 to 0.66.

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

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 338[1] / EN 14081-1[2]
- Glued laminated timber (softwood) of at least strength class GL24c/GL24h according to EN 14080[3]
- Laminated veneer lumber LVL according to EN 14374[4], arrangement of the screws only perpendicular to the plane of the veneers
- Glued laminated solid timber according to EN 14080[3]
- 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+A1[5] and EN 13986+A1[6]
- Oriented Strand Board, OSB according to EN 300[7] and EN 13986+A1[6]
- Particleboard according to EN 312[8] and EN 13986+A1[6]
- Fibreboards according to EN 622-2[9], EN 622-3[10] and EN 13986+A1[6]

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1 EN 338 Timber structures - Strength classes
2 EN 14081-1+A1 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+A1 Plywood - Specification
6 EN 13986+A1 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

- 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.
According to EN 1995-1-1[11] 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 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 CS, CT, WKT, WKW, CPW and CPS screws according to the basic work requirements (BWR) were carried out in compliance with EAD 130118-01-0603.

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.

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

9 EN 622-2 Fibreboards - Specifications - Part 2: Requirements for hardboards
10 EN 622-3 Fibreboards - Specifications - Part 3: Requirements for medium boards
11 EN 1995-1-1 Design of timber structures - Part 1-1: General - Common rules and rules for buildings

	Essential characteristic	Performance
3.1.10	Durability against corrosion	The screws are electro-galvanized zinc
3.1.11	Spacing, end and edge distances of the screws and minimum thickness of the wood-based material	Point 3.1.11 No performance assessed
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
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 CS, CT, WKT, WKW, CPW and CPS 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.

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.

For angles α between screw axis and grain direction $15° \leq \alpha < 45°$ 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
$k_{ax} = 0,3+(0,7 \cdot \alpha)/45°$

$f_{ax,90,k}$ short-term characteristic withdrawal parameter for an angle α between screw axis and grain direction of 90° in N/mm²

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/m³

For angle α between screw axis and grain direction $0° \leq \alpha < 15°$ 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 screws in the timber member shall be

$$l_{pen,req} = \min \begin{cases} \dfrac{4 \cdot d}{\sin \alpha} \\ 20 \cdot d \end{cases}$$

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 α has been determined for each diameter of the screw. All screws fulfill the requirement for a minimum bending angle of $\alpha = (45/d^{0.7} + 20)$. The test results are stated in tables at Annex 2.

3.1.10 Durability against corrosion

The screws are made from hardened carbon steel with corrosion protection layer. The screws are covered by corrosive protection layer Fe/Zn 12c.

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

No performance assessed.

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

Axially loaded screws
For 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.

The axial slip modulus K_{ser} of the threaded part of a screw for the serviceability limit state shall be taken independent of angle α to the grain as:
$K_{ser} = 25 \cdot d \cdot l_{ef}$ [N/mm] for screws in members made from softwood
$K_{ser} = 30 \cdot d \cdot l_{ef}$ [N/mm] for screws in members made from hardwood

where
d outer thread diameter of the screw [mm]
l_{ef} penetration length of the threaded part of the screw in the wood-based member [mm]

3.2 Safety in case of fire (BWR 2)

3.2.1 Reaction to fire

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

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

According to the Decision 1997/176/EC[12], 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

[12] 1997/176/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 30/05/2022

By

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

TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p.
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Technical Assessment Body
Subjekt pro technické posuzování

Annexes:

Annex 1	Dimensions and tolerances of DOMAX screws
Annex 2	Essential characteristics of DOMAX screws
Annex 3	Reference documents

Annex 1 Dimensions and tolerances of DOMAX screws

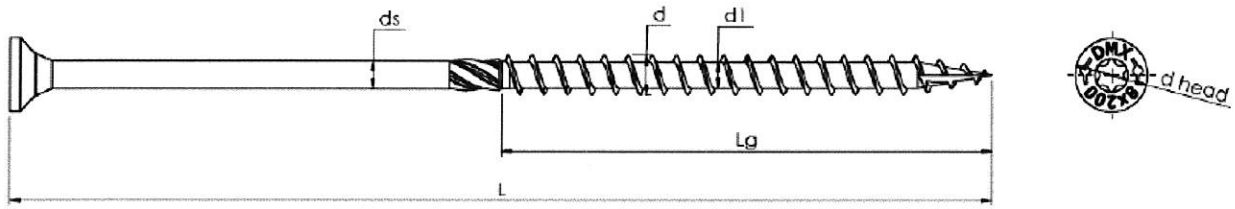

Figure 1: Screw, type CS

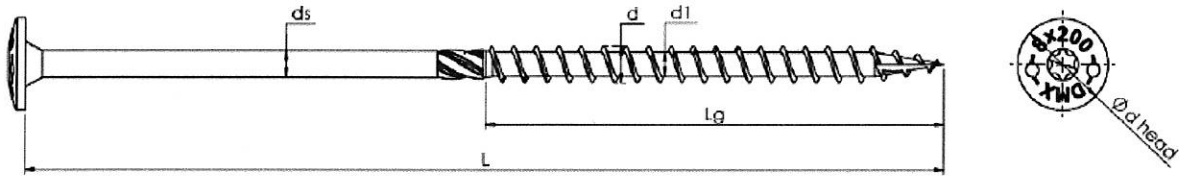

Figure 2: Screw, type CT

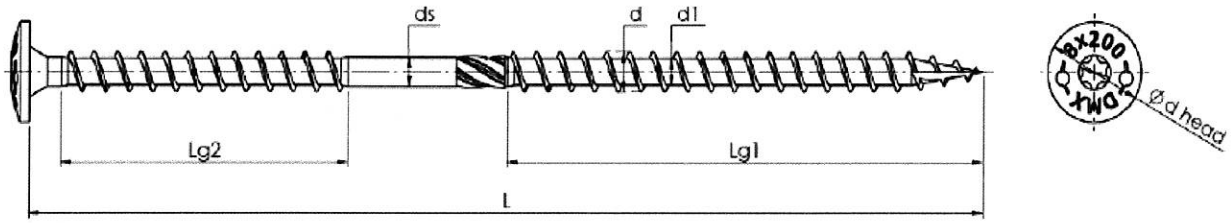

Figure 3: Screw, type WKT

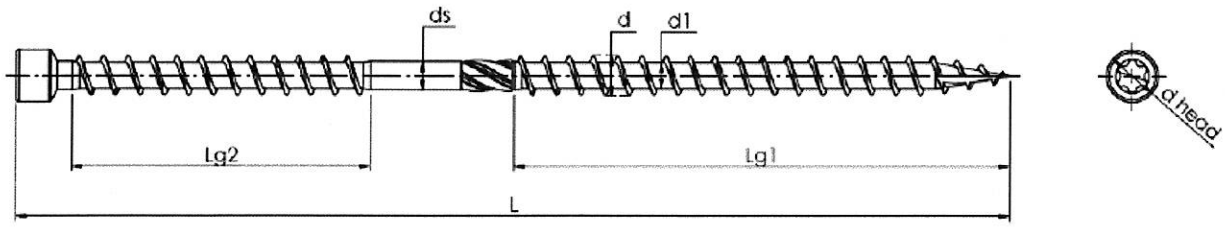

Figure 4: Screw, type WKW

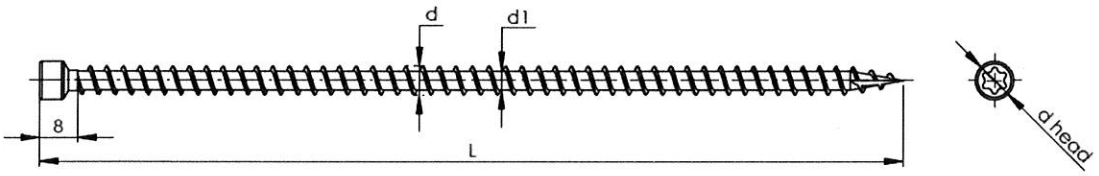

Figure 5: Screw, type CPW

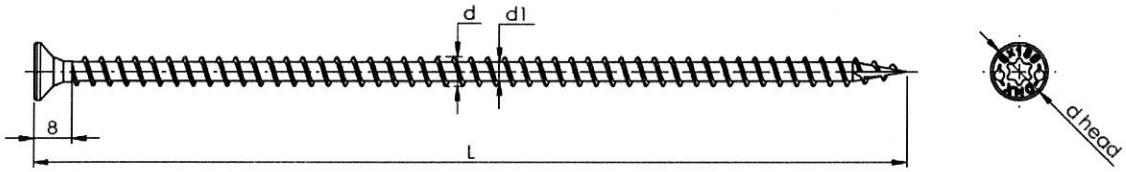

Figure 6: Screw, type CPS

Type	Nominal		L [mm]		L_g [mm]		d [mm]		d_{head} [mm]		d_s [mm]		d_1 [mm]	
	Diameter	Length	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance
CS	6.0	80	80	±2.0	50	±2.5	6.1	±0.2	12	±0.5	4.35	+0 -0.05	4	±0.1
		90	90	±2.0										
		100	100	±2.5	60	±3								
		120	120	± 3	80	±4								
		140	140	±3.5										
		160	160	± 4										
		180	180	±4.5										
		200	200	± 5										
		220	220	±5.5										
		240	240	± 6										
		260	260	±6.5										
		280	280	± 7										
		300	300	±7.5										
	8.0	80	80	± 2	50	±2.5	8.0	±0.2	15	±0.5	5.75	+0 -0.05	5.3	±0.13
		90	90											
		100	100	±2.5	60	±3								
		120	120	± 3	80	±4								
		140	140	±3.5										
		160	160	± 4										
		180	180	±4.5	100	± 5								
		200	200	± 5										
		220	220	±5.5										
		240	240	± 6										
		260	260	±6.5										
		280	280	± 7										
		300	300	±7.5										
		320	320	± 8										
		340	340	±8.5										
		360	360	± 9										
		380	380	±9.5										
		400	400	± 10										

Type	Nominal		L [mm]		L_g [mm]		d [mm]		d_{head} [mm]		d_s [mm]		d_1 [mm]	
	Diameter	Length	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance
CT	6.0	80	80	±2.0	50	±2.5	6.1	±0.2	15	±0.5	4.35	+0 -0.05	4	±0.1
		90	90											
		100	100	±2.5	60	±3								
		120	120	±3	80	±4								
		140	140	±3.5										
		160	160	±4										
		180	180	±4.5										
		200	200	±5										
		220	220	±5.5										
		240	240	±6										
		260	260	±6.5										
		280	280	±7										
		300	300	±7.5										
	8.0	80	80	±2	50	±2.5	8.0	±0.2	20	±0.5	5.75	+0 -0.05	5.3	±0.13
		90	90											
		100	100	±2.5	60	±3								
		120	120	±3	80	±4								
		140	140	±3.5										
		160	160	±4										
		180	180	±4.5	100	±5								
		200	200	±5										
		220	220	±5.5										
		240	240	±6										
		260	260	±6.5										
		280	280	±7										
		300	300	±7.5										
		320	320	±8										
		340	340	±8.5										
		360	360	±9										
		380	380	±9.5										
		400	400	±10										

Type	Nominal		L [mm]		L_{g1} [mm]		L_{g2} [mm]		d [mm]		d_{head} [mm]		d_s [mm]		d_1 [mm]	
	Diameter	Length	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance
WKT	8.0	180	180	±4.5	100	± 5	60	± 2	8.0	±0.2	20	±0.5	5.75	+0 -0.05	5.3	±0.13
		200	200	±5												
		220	220	±5.5												
		240	240	±6												
		260	260	±6.5												
		280	280	±7												
		300	300	±7.5												
		330	330	±8.5												
		360	360	±9												
		400	400	±9.5												
		450	450	±10.5												
WKW	8.0	180	180	±4.5	100	± 5	60	± 2	8.0	±0.2	10.5	+0.5 -0.25	5.75	+0 -0.05	5.3	±0.13
		200	200	±5												
		220	220	±5.5												
		240	240	±6												
		260	260	±6.5												
		280	280	±7												
		300	300	±7.5												
		330	330	±8.5												
		360	360	±9												
		400	400	±9.5												
		450	450	±10.5												

Type	Nominal		L [mm]		d [mm]		d_{head} [mm]		d_1 [mm]	
	Diameter	Length	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance
CPW	6.0	100	100	±2.5	6.1	±0.2	8.1	+0.5 -0.25	4	±0.1
		120	120	±3						
		140	140	±3.5						
		160	160	±4						
		180	180	±4.5						
		200	200	±5						
		220	220	±5.5						
		240	240	±6.0						
		260	260	±6.5						
		280	280	±7.0						
CPS	6.0	100	100	±2.5	6.1	±0.2	12	±0.5	4	±0.1
		120	120	±3						
		140	140	±3.5						
		160	160	±4						
		180	180	±4.5						
		200	200	±5						
		220	220	±5.5						
		240	240	±6.0						
		260	260	±6.5						
		280	280	±7.0						

Annex 2 Essential characteristics of DOMAX screws

3.1 Mechanical resistance and stability (BWR 1)

Table 2 DOMAX CS screw

3.1.2	Characteristic yield moment				
$M_{y,k}$ (Nmm)	ø [mm]		threaded part		smoothed part
	6.0		8540		15930
	8.0		20840		39220
3.1.3	Characteristic withdrawal parameter				
$f_{ax,k}$ (N/mm²)	ø [mm]	Length [mm]	Rad.	Tag.	Alongside
	6.0	80	17.80(*)	18.64(*)	14.40(*)
		100	17.82(*)	18.82(*)	12.56(*)
		180	17.85(*)	19.18(*)	8.88(*)
	8.0	80	15.97(*)	16.69(*)	14.59(*)
		100	16.80(*)	16.50(*)	14.55(*)
		160	18.45(*)	16.10(*)	14.48(*)
		240	22.05(*)	22.17(*)	11.28(*)
3.1.4	Characteristic head pull-through parameter				
$f_{head,k}$ (N/mm²)	ø [mm]		Rad.		Tag.
	6.0		17.52 (**)		10.41 (**)
	8.0		11.90 (**)		17.78 (**)
3.1.5	Characteristic tensile capacity				
$f_{tens,k}$ (kN)	ø [mm]				
	6.0		13.31		
	8.0		23.17		
3.1.6	Characteristic yield strength				
$R_{p0.2}$ (MPa)	ø [mm]				
	6.0		1053.71		
	8.0		1067.11		
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)	ø [mm]				
	6.0		11.11/2.81 = 3.95		
	8.0		25.65/5.40 = 4.75		
3.1.9	Bending angle				
Bending angle (°)	ø [mm]				
	6.0		50.70°		
	8.0		42.70°		

* density of timber 350 kg/m³
** density of timber 380 kg/m³

Table 3 DOMAX CT screw

3.1.2	Characteristic yield moment					
$M_{y,k}$ (Nmm)	ø [mm]	threaded part		smoothed part		
	6.0	8540		15930		
	8.0	20840		39220		
3.1.3	Characteristic withdrawal parameter					
$f_{ax,k}$ (N/mm²)	ø [mm]	Length [mm]	Rad.	Tag.	Alongside	
	6.0	80	17.80(*)	18.64(*)	14.40(*)	
		100	17.82(*)	18.82(*)	12.56(*)	
		180	17.85(*)	19.18(*)	8.88(*)	
	8.0	80	15.97(*)	16.69(*)	14.59(*)	
		100	16.80(*)	16.50(*)	14.55(*)	
		160	18.45(*)	16.10(*)	14.48(*)	
		240	22.05(*)	22.17(*)	11.28(*)	
3.1.4	Characteristic head pull-through parameter					
$f_{head,k}$ (N/mm²)	ø [mm]	Rad.		Tag.		
	6.0	24.74 (**)		23.83 (**)		
	8.0	16.31 (**)		31.56 (**)		
3.1.5	Characteristic tensile capacity					
$f_{tens,k}$ (kN)	ø [mm]					
	6.0	13.31				
	8.0	23.17				
3.1.6	Characteristic yield strength					
$R_{p0.2}$ (MPa)	ø [mm]					
	6.0	1053.71				
	8.0	1067.11				
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)	ø [mm]					
	6.0	11.11/2.81 = 3.95				
	8.0	25.65/5.40 = 4.75				
3.1.9	Bending angle					
Bending angle (°)	ø [mm]					
	6.0	50.70°				
	8.0	42.70°				

* density of used timber 350 kg/m³
** density of used timber 380 kg/m³

Table 4 DOMAX WKT screw

3.1.2	Characteristic yield moment					
$M_{y,k}$ (Nmm)	ø [mm]	threaded part		smoothed part		
	8.0	20840		39220		
3.1.3	Characteristic withdrawal parameter					
$f_{ax,k}$ (N/mm²)	ø [mm]	Length [mm]	Rad.	Tag.	Alongside	
	8.0	240	22.05(*)	22.17(*)	11.28(*)	
3.1.4	Characteristic head pull-through parameter					
$f_{head,k}$ (N/mm²)	ø [mm]	Rad.		Tag.		
	8.0	15.85 (**)		23.78 (**)		
3.1.5	Characteristic tensile capacity					
$f_{tens,k}$ (kN)	ø [mm]					
	8.0	23.17				
3.1.6	Characteristic yield strength					
$R_{p0.2}$ (MPa)	ø [mm]					
	8.0	1067.11				
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)	ø [mm]					
	8.0	25.65/5.40 = 4.75				
3.1.9	Bending angle					
Bending angle (°)	ø [mm]					
	8.0	42.70°				

* density of used timber 350 kg/m³
** density of used timber 380 kg/m³

Table 5 DOMAX WKW screw

3.1.2	Characteristic yield moment					
$M_{y,k}$ (Nmm)	ø [mm]	threaded part		smoothed part		
	8.0	20840		39220		
3.1.3	Characteristic withdrawal parameter					
$f_{ax,k}$ (N/mm²)	ø [mm]	Length [mm]	Rad.	Tag.	Alongside	
	8.0	240	22.05(*)	22.17(*)	11.28(*)	
3.1.4	Characteristic head pull-through parameter					
$f_{head,k}$ (N/mm²)	ø [mm]	Rad.		Tag.		
	8.0	38.86 (**)		37.11 (**)		
3.1.5	Characteristic tensile capacity					
$f_{tens,k}$ (kN)	ø [mm]					
	8.0	23.17				
3.1.6	Characteristic yield strength					
$R_{p0.2}$ (MPa)	ø [mm]					
	8.0	1067.11				
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)	ø [mm]					
	8.0	25.65/5.40 = 4.75				
3.1.9	Bending angle					
Bending angle (°)	ø [mm]					
	8.0	42.70°				

* density of used timber 350 kg/m³
** density of used timber 380 kg/m³

Table 6 DOMAX CPW screw

3.1.2	Characteristic yield moment				
$M_{y,k}$ (Nmm)	ø [mm]	threaded part	smoothed part		
	6.0	11370	--		
3.1.3	Characteristic withdrawal parameter				
$f_{ax,k}$ (N/mm²)	ø [mm]	Rad.	Tag.	Alongside	
	6.0	16.95(*)	13.96(*)	17.47(*)	
3.1.4	Characteristic head pull-through parameter				
$f_{head,k}$ (N/mm²)	ø [mm]	Rad.	Tag.		
	6.0	60.98 (**)	53.43 (**)		
3.1.5	Characteristic tensile capacity				
$f_{tens,k}$ (kN)	ø [mm]				
	6.0	12.80			
3.1.6	Characteristic yield strength				
$R_{p0.2}$ (MPa)	ø [mm]				
	6.0	1002.50			
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)	ø [mm]				
	6.0	12.65/2.30 = 5.50			
3.1.9	Bending angle				
Bending angle (°)	ø [mm]				
	6.0	41.40°			

* density of used timber 350 kg/m³
** density of used timber 380 kg/m³

Table 7 DOMAX CPS screw

3.1.2	Characteristic yield moment			
$M_{y,k}$ (Nmm)	ø [mm]	threaded part	smoothed part	
	6.0	11370	--	
3.1.3	Characteristic withdrawal parameter			
$f_{ax,k}$ (N/mm²)	ø [mm]	Rad.	Tag.	Alongside
	6.0	16.95(*)	13.96(*)	17.47(*)
3.1.4	Characteristic head pull-through parameter			
$f_{head,k}$ (N/mm²)	ø [mm]	Rad.	Tag.	
	6.0	27.16 (**)	30.7 (**)	
3.1.5	Characteristic tensile capacity			
$f_{tens,k}$ (kN)	ø [mm]			
	6.0	12.80		
3.1.6	Characteristic yield strength			
$R_{p0.2}$ (MPa)	ø [mm]			
	6.0	1002.50		
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)	ø [mm]			
	6.0	12.65/2.30 = 5.50		
3.1.9	Bending angle			
Bending angle (°)	ø [mm]			
	6.0	41.40°		

* density of used timber 350 kg/m³
** density of used timber 380 kg/m³

Annex 3 Reference documents

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