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Authorised and notified according to Article 10 of the Council Directive of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products (89/106/EEC)

Member of EOTA

European Technical Approval ETA-13/0393

(English translation prepared by TZÚS - Original version in Czech language)

Obchodní název *Trade name*	**CT, CK, CS, WKT, WKV**
Držitel schválení *Holder of approval*	**DOMAX Sp. z o.o.** Aleja Parku Krajobrazowego 109 Łężyce PL-84-207 Koleczkowo Republic of Poland
Typ a použití výrobku *Generic type and use of construction product*	Samořezné vruty pro použití v dřevěných konstrukcích *Self-tapping screws for use in timber construction*
Platnost od do *Validity from* *to*	20.06.2013 19.06.2018
Výrobna *Manufacturing plant*	Výrobna 1 *Plant 1*
Toto Evropské technické schválení obsahuje *This European Technical Approval contents*	28 stran včetně 2 příloh *28 pages including 2 annexes*

European Organisation for Technical Approvals
Evropská organizace pro technické schvalování

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I LEGAL BASES AND GENERAL CONDITIONS

1 This European Technical Approval is issued by Technický a zkušební ústav stavební Praha in accordance with:

- Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products[1], modified by Council Directive 93/68/EEC[2] and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council[3];
- The Government Decree No. 190/2002 of the Collection of Law[4];
- Common procedural rules for requesting, preparing and the granting of European Technical Approvals set out in the Annex to Commission Decision 94/23/EC[5].

2 Technický a zkušební ústav stavební Praha is authorized to check whether the provisions of this European Technical Approval are met. Checking may take place in the manufacturing plant. Nevertheless, the responsibility for the conformity of the products to the European Technical Approval and for their fitness for the intended use remains with the holder of the European Technical Approval.

3 This European Technical Approval is not to be transferred to manufacturers or agents of manufacturers other than those indicated on page 1, or manufacturing plants other than those indicated on page 1 of this European Technical Approval.

4 This European Technical Approval may be withdrawn by Technický a zkušební ústav stavební Praha, in particular pursuant to information by the Commission according to Article 5(1) of Council Directive 89/106/EEC.

5 Reproduction of this European Technical Approval including transmission by electronic means shall be in full. However, partial reproduction can be made with the written consent of Technický a zkušební ústav stavební Praha. In this case partial reproduction has to be designated as such. Texts and drawings of advertising brochures shall not contradict or misuse the European Technical Approval.

6 The European Technical Approval is issued by the approval body in its official language. This version corresponds fully to the version circulated within EOTA. Translations into other languages have to be designated as such.

[1] Journal of the European Communities N° L 40, 11 February 1986, p. 12
[2] Official Journal of the European Communities N° L 220, 30 August 1993, p. 1
[3] Official Journal of the European Union N° L 284, 31 October 2003, p. 25
[4] Governmental Decree No. 190/2002 of the Collection of Law of the Czech Republic, 10 April 2002
[5] Official Journal of the European Communities N° L 17, 20 January 1994, p. 34

II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

1 Definition of product and intended use

1.1 Definition of the construction product

DOMAX screws with a mark CK, CS, CT, WKT and WKV are self-tapping screws made from hardened carbon steel. They have a corrosion protection according to Annex 1. 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 2.

1.2 Intended use

The screws are intended to be used for connecting wood based members, where requirements for mechanical resistance and stability and safety in use in the sense of the essential requirements N 1 and N 4 of Council Directive 89/106/EEC 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[6] / EN 14081-1+A1[7]
- Glued laminated timber (softwood) of at least strength class GL24c/GL24h according to EN 1194[8] / EN 14080[9]
- Laminated veneer lumber LVL according to EN 14374[10], arrangement of the screws only perpendicular to the plane of the veneers
- Glued laminated solid timber according to prEN 14080[11]:2008 or national provisions that apply at the installation site
- Cross laminated timber according to European Technical Approvals or national provisions that apply at the installation site

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

- Plywood according to EN 636[12] and EN 13986[13]
- Oriented Strand Board, OSB according to EN 300[14] and EN 13986
- Particleboard according to EN 312[15] and EN 13986
- Fibreboards according to EN 622-2[16], EN 622-3[17] and EN 13986
- Cement-bonded particle boards according to national provisions that apply at the building site

6 EN 338: 2009 Timber structures – Strength classes
7 EN 14081-1+A1 Timber structures - strength graded structural timber with rectangular cross section - Part 1: General requirements
8 EN 1194:1999 Timber structures - Glued laminated timber - Strength classes and determination of characteristics values
9 EN 14080:2005 Timber structures - Glued laminated timber – Requirements
10 EN 14374:2004 Timber structures - Structural laminated veneer lumber – Requirements
11 prEN 14080:2008 Timber structures - Glued laminated timber and glued solid timber - Requirements
12 EN 636:2003 Plywood - Specifications
13 EN 13986:2004 Wood-based panels for use in construction - Characteristics, evaluation of conformity and marking
14 EN 300:2006 Oriented strand boards (OSB) - Definition, classification and specifications
15 EN 312:2003 Particleboards – Specifications
16 EN 622-2:2005 Fibreboards – Specifications – Part 2: Requirements for hardboards
17 EN 622-3:2005 Fibreboards – Specifications – Part 3: Requirements for medium boards

– 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[18] the screws made from 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 carbon steel with d ≤ 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 screws may be used for connections subject to static or quasi static loading.

The provisions made in this European Technical Approval are based on an assumed working life of the screws of 50 years, provided that the conditions laid down in section 4.2 for the installation are met. 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.

[18] EN 1995-1-1:2004+A1:2008 Design of timber structures – Part 1-1: General – Common rules and rules for buildings

2 Characteristics of product

	Characteristic	Assessment of characteristic
2.1 Mechanical resistance and stability*)		
2.1.1	Dimensions	See Annex 2
2.1.2	Characteristic yield moment	See Annex 1
2.1.3	Characteristic withdrawal parameter	See Annex 1
2.1.4	Characteristic head pull-through parameter	See Annex 1
2.1.5	Characteristic tensile strength	See Annex 1
2.1.6	Characteristic yield strength	No performance determined
2.1.7	Characteristic torsional strength	See Annex 1
2.1.8	Insertion moment	See Annex 1
2.1.9	Spacing, end and edge distances of the screws and minimum thickness of the wood based material	See Annex 1
2.1.10	Slip modulus for mainly axially loaded screws	No performance determined
2.2 Safety in case of fire		
2.2.1	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 See Annex 1
2.3 Hygiene, health and the environment		
2.3.1	Content and/or release of dangerous substances	The product does not contain cadmium or any other dangerous sub-stances. There is no risk that chrome VI - contained in the chromated carbon steel screws - will be released by consideration of all possible release scenarios.**) See Annex 1
2.4 Safety in use		
2.4.1	Dimensions	See Annex 2
2.4.2	Characteristic yield moment	See Annex 1
2.4.3	Characteristic withdrawal parameter	See Annex 1
2.4.4	Characteristic head pull-through parameter	See Annex 1

*) See section 2.1 of this ETA

**) In accordance with http://eurocodes.jrc.ec.europa.eu/doc/gph.pdf. In addition to the specific clauses relating to dangerous substances contained in this European Technical Approval, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the EU Construction Products Directive, these requirements need also to be complied with, when and where they apply.

	Characteristic	Assessment of characteristic
2.4.5	Characteristic tensile strength	See Annex 1
2.4.6	Characteristic yield strength	No performance determined
2.4.7	Characteristic torsional strength	See Annex 1
2.4.8	Insertion moment	See Annex 1
2.4.9	Spacing, end and edge distances of the screws and minimum thickness of the wood based material	See Annex 1
2.4.10	Slip modulus for mainly axially loaded screws	No performance determined
Protection against noise		Not relevant
Energy economy and heat retention		Not relevant
2.5 General aspects relating to fitness for use		
2.5.1	Durability against corrosion	See Annex 1
2.5.2	Serviceability	The assessment for mechanical resistance and stability as well as durability against corrosion covers this property.

2.1 Mechanical resistance and stability

Annexes 1 and 2 contain load-carrying capacities 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+A1.

3 Evaluation and attestation of conformity and CE marking

3.1 System of attestation of conformity

According to the decision 97/638/EC of the European Commission[19] the system 2+ of attestation of conformity applies.
This system of attestation of conformity is defined as follows:

System 2+: Declaration of Conformity of the product by the manufacturer on the basis of:
(a) Tasks for the manufacturer:
(1) Initial Type Testing of the product;
(2) Factory Production Control;
(3) Testing of samples taken at the factory in accordance with a prescribed test plan

(b) Tasks for the Notified Body:
(4) Certification of Factory Production Control on the basis of:
- initial inspection of factory and of Factory Production Control;
- continuous surveillance, assessment and approval of Factory Production Control

3.2 Responsibilities

3.2.1 Tasks for the manufacturer

3.2.1.1 Factory Production Control

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall insure that the product is in conformity with this European Technical Approval.

The manufacturer may only use raw materials stated in the technical documentation of this European Technical Approval supplied with the relevant inspection documents as laid down in the control plan.
The Factory Production Control shall be in accordance with the "control plan" relating to the European Technical Approval" which is part of the technical documentation of this European Technical Approval. The control plan is laid down in the context of the factory production control system operated by the manufacturer and deposited with Technický a zkušební ústav stavební Praha[20].
The incoming raw materials shall be subject to controls and tests by the manufacturer before acceptance. Check of materials, such as steel rods or wire, shall include control of the inspection documents presented by suppliers (comparison with nominal values) by verifying dimension and determining material properties, e.g. chemical composition, mechanical properties and corrosion protection.

[19] Official Journal of the European Communities N° L 268/36 of 19 September 1997
[20] The "control plan" is a confidential part of the European Technical Approval and only handed over to the notified body involved in the procedure of attestation of conformity. See section 3.2.5.

The manufactured components shall be checked visually and for dimensions. The control plan includes details of the extent, nature and frequency of testing and controls to be performed within the Factory Production Control.
The results of Factory Production Control shall be recorded and evaluated in accordance with the provisions of the control plan. The records shall include at least the following information:

- Designation of the product, basic material and components
- Type of control or testing
- Date of manufacture of the product and date of testing of the product or basic material and components
- Result of control and testing and, if appropriate, comparison with requirements
- Signature of person responsible for Factory Production Control

The records shall be presented to the Notified Body involved in the continuous surveillance and shall be presented to Technický a zkušební ústav stavební Praha on request.

3.2.1.2 Initial Type Testing

For Initial Type Testing the results of the tests performed as part of the assessment for the European Technical Approval may be used unless there are changes in the production line or plant. In such cases the necessary Initial Type Testing has to be agreed between Technický a zkušební ústav stavební Praha and the Notified Body.

3.2.1.3 Other tasks for the manufacturer

The manufacturer shall, on the basis of a contract, involve a body which is approved for the tasks referred to in section 3.1 in the field of screws in order to undertake the actions laid down in section 3.2.5. For this purpose, the control plan referred to in sections 3.2.2 and 3.2.5 shall be handed over by the manufacturer to the Notified Body involved.
The manufacturer shall make a Declaration of Conformity, stating that the construction product is in conformity with the provisions of the European Technical Approval.

3.2.2 Tasks for the Notified Bodies

The Notified body shall perform the

- Initial inspection of factory and of Factory Production Control
- Continuous surveillance, assessment and approval of Factory Production Control, in accordance with the provisions laid down in the control plan

3.2.2.1 Initial inspection of factory and Factory Production Control

The Notified Body shall ascertain that, in accordance with the control plan, the factory, in particular the staff and equipment, and the Factory Production Control, are suitable to ensure a continuous and orderly manufacturing of the screws with this European Technical Approval.

3.2.2.2 Continuous surveillance

The Notified Body shall control the documentation of the Factory Production Control (FPC) twice a year including an annual visit of the factory for routine

inspections. It shall be verified that the system of Factory Production Control and the specified manufacturing processes are maintained, taking account of the control plan.

3.2.2.3 Other tasks of the Notified Body

The Notified Body shall retain the essential points of its actions referred to above and state the results obtained and conclusions drawn in a written report.
The results of certification and continuous surveillance shall be made available on demand by the Certification Body to Technický a zkušební ústav stavební Praha.
The Notified Body involved by the manufacturer shall issue an EC certificate of conformity of the Factory Production Control stating the conformity with the provisions of this European Technical Approval.
In cases where the provisions of the European Technical Approval and its control plan are no longer fulfilled the Notified Body shall withdraw the certificate of conformity and inform Technický a zkušební ústav stavební Praha without delay.

3.3 CE marking

The CE marking shall be affixed on each packaging of the self-tapping screws. The letters "CE" shall be followed by the identification number of the Notified Body and be accompanied by the following additional information:

- The name and address of the producer (legal entity responsible for the manufacture)
- The last two digits of the year in which the CE marking was affixed
- The number of the EC certificate for the Factory Production Control
- The number of the European Technical Approval
- Name of the product
- Outer thread diameter and length of the self-tapping screws
- Type and mean thickness of the corrosion protection, if relevant

CE	Letters "CE"
1234	Identification number of notified body
Any Company Street 1, City, Country	Name and address of the producer (legal entity responsible for the manufacture)
04	Two last digits of year of affixing CE marking
1234-CPD-NNNNNN	Number of EC certificate of conformity
ETA-13/0393	ETA number
Self tapping screws for use in timber construction	Type, intended use
Outer diameter: 8 mm Length: 300 mm	
Durability (corrosion protection): Galvanized zinc coating, mean thickness = 7 μm	Type of the corrosion protection and mean thickness of the coating

Figure 1: CE marking and accompanying information (example)

4 Assumptions under which the fitness of the product for the intended use was favorably assessed

4.1 Manufacturing

DOMAX screws shall be manufactured in accordance with the provisions of this European Technical Approval using the manufacturing processes as identified at the inspection of the plant by the Notified Inspection Body and laid down in the technical documentation.
The European Technical Approval is issued for the product on the basis of agreed data, deposited with Technický a zkušební ústav stavební Praha, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data being incorrect, shall be notified to Technický a zkušební ústav stavební Praha before the changes are introduced. Technický a zkušební ústav stavební Praha will decide whether or not such changes affect the approval and consequently the validity of the CE marking on the basis of the approval and if so whether further assessment or alternations to the approval shall be necessary.

4.2 Installation

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. A tolerance of 5 % less of the inner thread diameter d_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.
Screws made from carbon steel shall be used with washers made from carbon steel. By fastening screws in wood-based members the head of the screws shall be flush with the surface of the wood-based member. For pan head, raised countersunk head, flange head and hexagonal head the head part remains unconsidered.

5 Indications to the manufacturer

5.1 Packaging, transport, storage of the product

No special recommendations or requirements for packaging, transport and storage are required for self-tapping screws.

5.2 Use, maintenance, repair

The assessment of the fitness for use is based on the assumption that no maintenance is required during the assumed intended working life.

The original document is signed by:

Jozef Pôbiš

Head of the Approval Body

Annex 1 Characteristics of product

2.1 Mechanical resistance and stability

All characteristic values are rounded down.

Table 1: Characteristic capacities of DOMAX self-tapping CT screws

Characteristic		Assessment of characteristic		
2.1.2	Characteristic yield moment	Characteristic value:		
$M_{y,k}$ (Nmm)		ø [mm]	threaded part	smoothed part
		8.0	22 600	–
		10.0	36 000	72 200
2.1.3	Characteristic withdrawal parameter	Characteristic withdrawal parameter		
$f_{ax,k}$ (N/mm^2)		ø [mm]	loading perpendicular to the grain	
		8.0	14.70 (at a density 480 kg/m^3)	
		10.0	14.55 (at a density 500 kg/m^3)	
2.1.4	Characteristic head pull-through parameter	Characteristic head pull-through parameter		
$f_{head,k}$ (N/mm^2)		ø [mm]	$f_{head,k}$	
		8.0	21.85 (at a density 530 kg/m^3)	
		10.0	22.85 (at a density 515 kg/m^3)	
2.1.5	Characteristic tensile capacity	Characteristic tensile capacity		
$f_{tens,k}$ (kN)		ø [mm]	$f_{tens,k}$	
		8.0	24.40	
		10.0	32.00	
2.1.8	Characteristic torsional ratio	Characteristic torsional ratio		
$f_{tor,k}$ / $R_{tor,k}$		ø [mm]	$f_{tor,k}$ / $R_{tor,k}$	
		8.0	4.40	
		10.0	2.80	
2.1.7	Characteristic torsional strength	Characteristic torsional strength		
$f_{tor,k}$ (Nm)		ø [mm]	$f_{tor,k}$	
		8.0	28.65	
		10.0	46.55	
2.1.7	Durability – Corrosion protection	Coating thickness		
(µm)		ø [mm]	*µm*	
		8.0	15.00	
		10.0	17.00	

Table 2: Characteristic capacities of DOMAX self-tapping CK screws

Characteristic		Assessment of characteristic		
2.1.1	Characteristic yield moment	Characteristic value:		
$M_{y,k}$ (Nmm)		ø [mm]	threaded part	smoothed part
		8.0	22 600	50 100
		10.0	29 400	77 350
		12.0	56 800	131 950
2.1.2	Characteristic withdrawal parameter	Characteristic withdrawal parameter		
$f_{ax,k}$ (N/mm^2)		ø [mm]	loading perpendicular to the grain	
		8.0	15.35 (at a density 440 kg/m^3)	
		10.0	17.20 (at a density 505 kg/m^3)	
		12.0	20.00 (at a density 450 kg/m^3)	
2.1.3	Characteristic head pull-through parameter	Characteristic head pull-through parameter		
$f_{head,k}$ (N/mm^2)		ø [mm]	$f_{head,k}$	
		8.0	17.80 (at a density 445 kg/m^3)	
		10.0	23.30 (at a density 445 kg/m^3)	
		12.0	22.40 (at a density 445 kg/m^3)	
2.1.4	Characteristic tensile capacity	Characteristic tensile capacity		
$f_{tens,k}$ (kN)		ø [mm]	$f_{tens,k}$	
		8.0	25.25	
		10.0	34.70	
		12.0	47.30	
2.1.5	Characteristic torsional ratio	Characteristic torsional ratio		
$f_{tor,k} / R_{tor,k}$		ø [mm]	$f_{tor,k} / R_{tor,k}$	
		8.0	3.15	
		10.0	3.00	
		12.0	3.50	
2.1.6	Characteristic torsional strength	Characteristic torsional strength		
$f_{tor,k}$ (Nm)		ø [mm]	$f_{tor,k}$	
		8.0	29.65	
		10.0	33.50	
		12.0	53.55	
2.1.7	Durability – Corrosion protection	Coating thickness		
μm		ø [mm]	μm	
		8.0	14.55	
		10.0	12.70	
		12.0	12.80	

Table 3: Characteristic capacities of DOMAX self-tapping CS screws

Characteristic		Assessment of characteristic		
2.1.1	Characteristic yield moment	Characteristic value:		
$M_{y,k}$ (Nmm)		ø [mm]	threaded part	smoothed part
		5.0	6 500	10 600
		6.0	10 100	22 550
		8.0	22 600	–
		10.0	36 000	–
2.1.2	Characteristic withdrawal parameter	Characteristic withdrawal parameter		
$f_{ax,k}$ (N/mm^2)		ø [mm]	loading perpendicular to the grain	
		5.0	17.85 (at a density 450 kg/m^3)	
		6.0	15.00 (at a density 450 kg/m^3)	
		8.0	13.45 (at a density 450 kg/m^3)	
		10.0	12.15 (at a density 450 kg/m^3)	
2.1.3	Characteristic head pull-through parameter	Characteristic head pull-through parameter		
$f_{head,k}$ (N/mm^2)		ø [mm]	$f_{head,k}$	
		5.0	14.15 (at a density 450 kg/m^3)	
		6.0	17.30 (at a density 450 kg/m^3)	
		8.0	21.05 (at a density 450 kg/m^3)	
		10.0	17.60 (at a density 450 kg/m^3)	
2.1.4	Characteristic tensile capacity	Characteristic tensile capacity		
$f_{tens,k}$ (kN)		ø [mm]	$f_{tens,k}$	
		5.0	8.40	
		6.0	10.90	
		8.0	18.20	
		10.0	23.80	
2.1.5	Characteristic torsional ratio	Characteristic torsional ratio		
$f_{tor,k}$ / $R_{tor,k}$		ø [mm]	$f_{tor,k}$ / $R_{tor,k}$	
		5.0	3.45	
		6.0	3.10	
		8.0	3.65	
		10.0	2.10	
2.1.6	Characteristic torsional strength	Characteristic torsional strength		
$f_{tor,k}$ (Nm)		ø [mm]	$f_{tor,k}$	
		5.0	5.85	
		6.0	11.60	
		8.0	22.45	
		10.0	32.05	
2.1.7	Durability – Corrosion protection	Coating thickness		
μm		ø [mm]	μm	
		5.0	24.00	
		6.0	29.25	
		8.0	22.80	
		10.0	13.70	

Table 4: Characteristic capacities of DOMAX self-tapping WKT screws

Characteristic		Assessment of characteristic		
2.1.2	Characteristic yield moment	Characteristic value:		
$M_{y,k}$ (Nmm)		ø [mm]	threaded part	smoothed part
		8.0	22 600	–
2.1.3	Characteristic withdrawal parameter	Characteristic withdrawal parameter		
$f_{ax,k}$ (N/mm^2)		ø [mm]	loading perpendicular to the grain	
		8.0	14.30 (at a density 440 kg/m^3)	
2.1.4	Characteristic head pull-through parameter	Characteristic head pull-through parameter		
$f_{head,k}$ (N/mm^2)		ø [mm]	$f_{head,k}$	
		8.0	23.20 (at a density 445 kg/m^3)	
2.1.5	Characteristic tensile capacity	Characteristic tensile capacity		
$f_{tens,k}$ (kN)		ø [mm]	$f_{tens,k}$	
		8.0	23.20	
2.1.8	Characteristic torsional ratio	Characteristic torsional ratio		
$f_{tor,k}$ / $R_{tor,k}$		ø [mm]	$f_{tor,k}$ / $R_{tor,k}$	
		8.0	2.85	
2.1.7	Characteristic torsional strength	Characteristic torsional strength		
$f_{tor,k}$ (Nm)		ø [mm]	$f_{tor,k}$	
		8.0	26.90	
2.1.7	Durability – Corrosion protection	Coating thickness		
(μm)		ø [mm]	μm	
		8.0	15.10	

Table 5: Characteristic capacities of DOMAX self-tapping WKV screws

Characteristic		Assessment of characteristic		
2.1.1	Characteristic yield moment	Characteristic value:		
$M_{y,k}$ (Nmm)		ø [mm]	threaded part	smoothed part
		6.5	13 000	–
		8.0	22 600	–
		10.0	36 000	–
2.1.2	Characteristic withdrawal parameter	Characteristic withdrawal parameter		
$f_{ax,k}$ (N/mm^2)		ø [mm]	loading perpendicular to the grain	
		6.5	16.55 (at a density 440 kg/m^3)	
		8.0	15.45 (at a density 440 kg/m^3)	
		10.0	16.45 (at a density 505 kg/m^3)	
2.1.3	Characteristic head pull-through parameter	Characteristic head pull-through parameter		
$f_{head,k}$ (N/mm^2)		ø [mm]	$f_{head,k}$	
		6.5	35.70 (at a density 470 kg/m^3)	
		8.0	29.20 (at a density 445 kg/m^3)	
		10.0	19.75 (at a density 445 kg/m^3)	
2.1.4	Characteristic tensile capacity	Characteristic tensile capacity		
$f_{tens,k}$ (kN)		ø [mm]	$f_{tens,k}$	
		6.5	16.30	
		8.0	19.65	
		10.0	24.10	
2.1.5	Characteristic torsional ratio	Characteristic torsional ratio		
$f_{tor,k}$ / $R_{tor,k}$		ø [mm]	$f_{tor,k}$ / $R_{tor,k}$	
		6.5	1.55	
		8.0	2.75	
		10.0	4.50	
2.1.6	Characteristic torsional strength	Characteristic torsional strength		
$f_{tor,k}$ (Nm)		ø [mm]	$f_{tor,k}$	
		6.5	12.95	
		8.0	21.50	
		10.0	45.30	
2.1.7	Durability – Corrosion protection	Coating thickness		
μm		ø [mm]	μm	
		6.5	11.65	
		8.0	14.15	
		10.0	13.00	

A compilation of the tested values (the minimum, maximum, mean value, standard deviation, variation coefficient) for each parameter is stated in Evaluation Report, clause 2.1.2

General

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.

Laterally loaded screws

The outer thread diameter d shall be used as effective diameter of the screw according to EN 1995-1-1+A1.

Axial withdrawal capacity

The characteristic withdrawal parameter to the grain based on a characteristic density of the wood-based member of (440, 450, 480, 505) kg/m^3 is stated in tables 1-5.

Head pull-through capacity

The characteristic value of the head pull-through parameter for DOMAX screws for a characteristic density of (445, 450, 470, 530) kg/m^3 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 board according to national provisions that apply at the building site
- Solid wood panel according to national provisions that apply at the building site

is stated in tables 1-5.

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

Laterally and/or axially loaded screws

Screws in pre-drilled holes
For DOMAX screws in pre-drilled holes the minimum spacing, end and edge distances are given in EN 1995-1-1:2004+A1:2009, clause 8.3.1.2 and Table 8.2 as for nails in pre-drilled holes. Here, the outer thread diameter d shall be considered.

Screws in non pre-drilled holes
For DOMAX screws minimum spacing and distances are given in EN 1995-1-1:2004+A1:2009, clause 8.3.1.2 and Table 8.2 as for nails in non-predrilled holes. Here, the outer thread diameter *d* shall be considered.

Only Axially loaded screws

For DOMAX screws the minimum spacing, end and edge distances are given in EN 1995-1-1:2004+A1:2009, clause 8.7.2 and Table 8.6.

Insertion moment

The ratio between the characteristic torsional strength $f_{tor,k}$ and the mean value of insertion moment $R_{tor,mean}$ fulfills the requirement for all screws.

Durability against corrosion

The DOMAX screws are produced from carbon steel and are hardened. Screws made from carbon steel are electro-galvanized zinc. The mean thickness of the zinc coating is 16.62 μm. Steel no. C10B21 or 19Mnb4 is used for screws made from carbon steel.

2.2	Safety in case of fire	
	Reaction to fire	The screws are made from carbon steel classified as Euroclass A1 in accordance with EN 1350-1+A1 and EC decision 96/603/EC, amended by EC Decision 2000/605/EC.
2.3	Hygiene, health and the environment	
	Content and/or release of dangerous substances	The product does not contain cadmium or any others dangerous substances. There is no risk that chrome VI - contained in the chromated carbon steel screws - will be released by consideration of all possible release scenarios.
2.4	Safety in use	Not relevant
2.5	Protection against noise	Not relevant
2.6	Energy economy and heat retention	Not relevant
2.7	Related aspects of serviceability	
	Durability	The screws have been assessed as having satisfactory durability and serviceability when used in timber structures using the timber species described in Eurocode 5 and subject to the conditions defined by service classes 1 and 2. Regarding the duration of the screws national provisions at the building site shall apply.
	Serviceability	
	Identification	

Annex 2 Screws dimensions

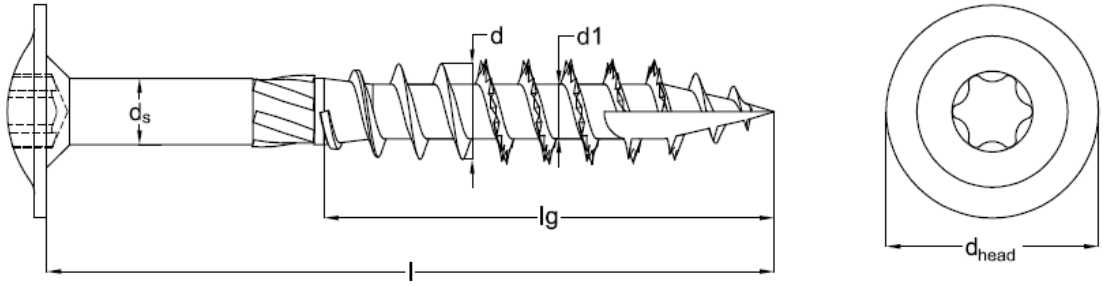

Figure 2.1: Screw, type CT

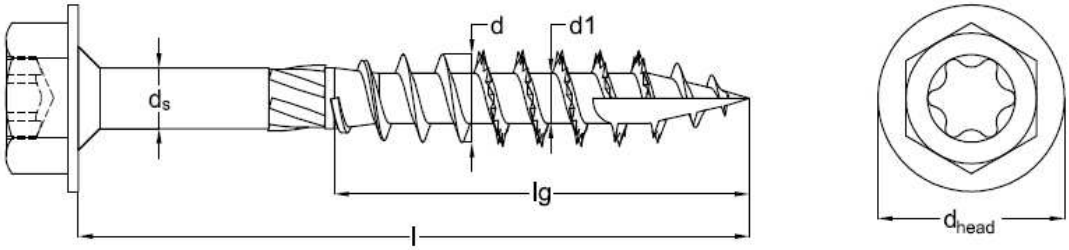

Figure 2.2: Screw, type CK

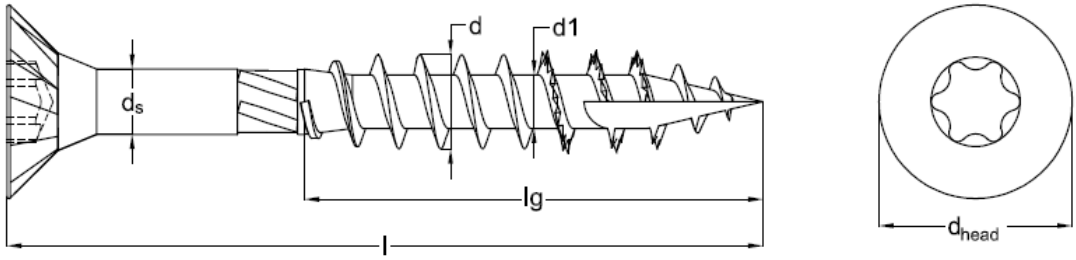

Figure 2.3: Screw, type CS

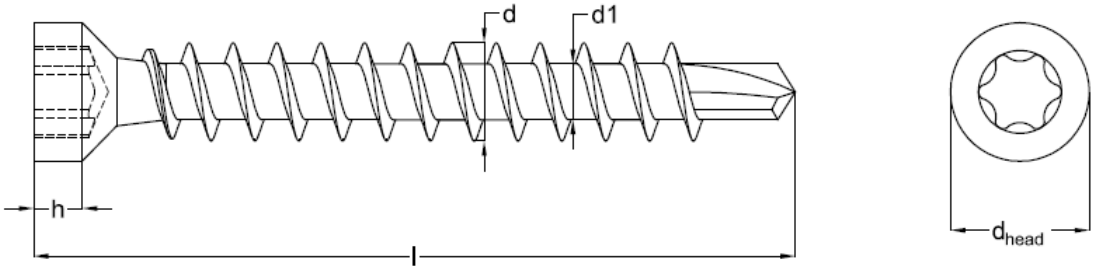

Figure 2.4: Screw, type WKV

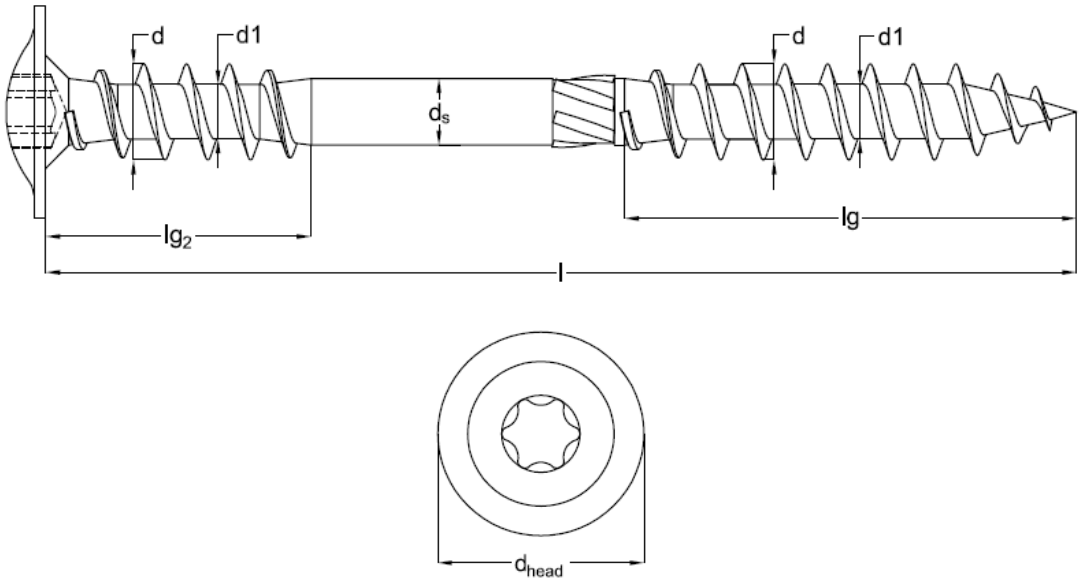

Figure 2.5: Screw, type WKT

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	80	±4								
		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	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			10	±0,5	6,4	±0,3	20	±1	7	±0,35
		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										
		90	90											
		100	100	±5	60	±3								
		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	80	±4								
		120	120	±6										
		140	140	±7										
		160	160	±8										
		180	180	±9										
		200	200	±10										
		220	220	±11										
		240	240	±12										

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
		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	120	120	±6			10	±0,5	6,4	±0,3	18	±0,9	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										
		340	340	±17										
		360	360	±18										
		380	380	±19										
		400	400	±20										

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												