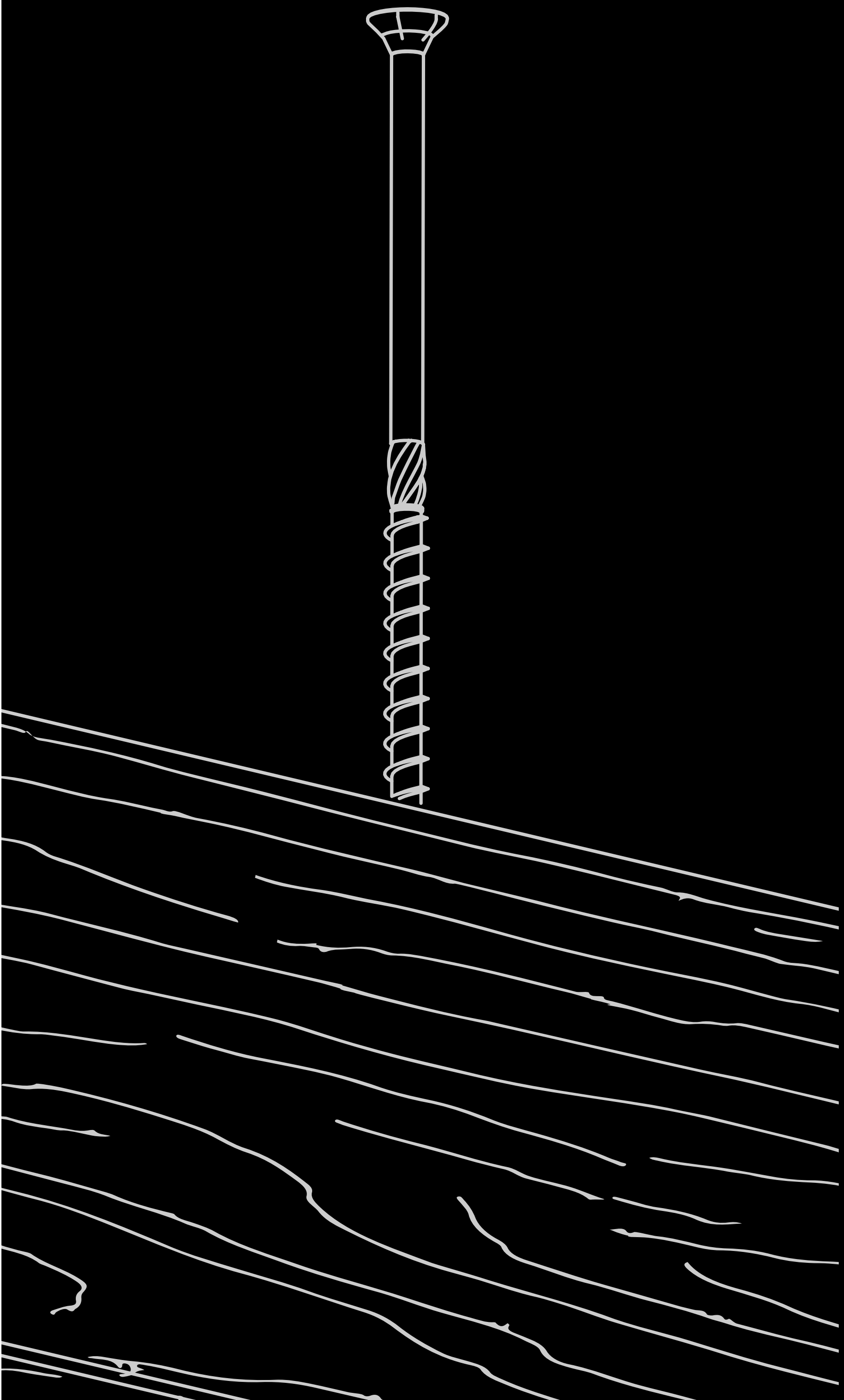
The specialist for fastening technology

OUR PRODUCT RANGE

WOOD CONSTRUCTION SCREWS



PANELTWISTEC

KONSTRUX FULLY THREADED SCREW

TOPDUO ROOFING SCREW

COLLATED SCREWS

OTHER WOOD CONSTRUCTION SCREWS

www.eurotec.team/en

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VERSATILE WOOD CONSTRUCTION SCREWS FOR CUSTOMISED WOOD CONSTRUCTION PROJECTS

Professional wood constructions require high-quality fastening solutions that meet the highest standards in terms of both quality and versatility. This is exactly where **wood construction screws for customised applications** from our extensive range excel. With our wide selection of screws, we offer our customers an ideal solution for any timber structure – whether for the **construction of complex multi-storey buildings, wooden houses, fences, industrial halls, ceiling cladding or roof structures.**

One outstanding feature of Eurotec wood construction screws is the **extensive range of available dimensions and screw types** to suit a wide range of wood construction applications. For example, whether you need chipboard screws for precise connections in wood panels, fully threaded screws for powerful and secure fastenings in attachment parts or specialist roofing screws – you will find the right screw for such projects in this catalogue. Collated wood screws are also available. Our screws are characterised by a range of special features that determine the corresponding performance and reliability. For example, you can choose from a **variety of dimensions, head shapes, screw tips or thread types**. In order to meet the individual requirements of wood construction projects, wood construction screws are available in a variety of **hardness options and with different surface coatings**.

Another important aspect is the **ETA certification,** which a large part of our screws have. This certification confirms the screws' compliance with the **highest European standards** for construction products and guarantees their outstanding performance and safety.
We focus on the highest quality and **tailor-made fastening solutions** for you and your projects. With our selected products, we provide you with a wide range of products to ensure that your constructions are safe, stable and durable thanks to the right wood construction screws.

OUR PRODUCTION CAPABILITIES

Whatever your requirements are, you can get everything from a single source from us. We use a variety of production processes such as **punching and stamping, cold forming, injection moulding and extrusion technologies**. **Screws in lengths of up to 3,000** mm are manufactured using **fully automatic machines**.

PRODUCTION POSSIBILITIES

- Screws from 40 mm – 3,000 mm, with diameters between 3 – 14 mm
- Single, double or reduced thread
- Milling tips
- A range of materials
- A variety of coatings
- Individual customer requirements

SURFACE TREATMENT PROCESSES

From zinc to blue galvanised for long-term resistance in weather-exposed areas (C4 – C5).

ENVIRONMENTAL AWARENESS

No oil on the floor, no exhaust fumes in the air and energy that is generated on our own roof. We are committed to compliance with the legal and regulatory requirements within an economic framework and the promotion of environmentally conscious behaviours.


OUR PRODUCTION

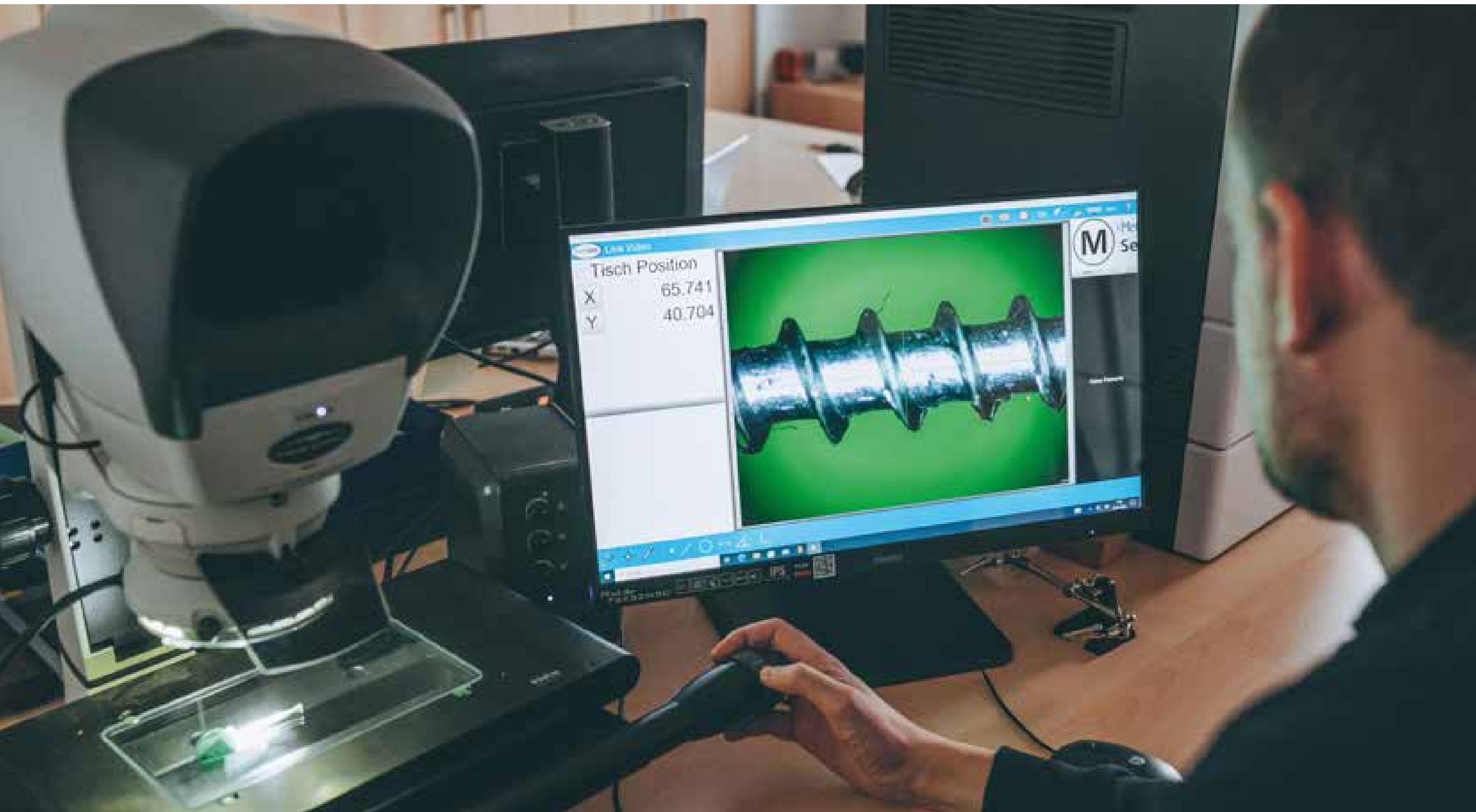
QUALITY ASSURANCE

Our top priority is to offer our customers impeccable products and services whilst guaranteeing 100% on-time deliveries. We expect each and everyone of our employees to be fully committed to quality. As part of this, we always put the training and further development of customer- and quality-oriented thinking and actions first and foremost.
We are committed to compliance with the legal and regulatory requirements within an economic framework and the promotion of environmentally conscious behaviours.

As a result, we are proud that almost all our products in the wood, façade and concrete segment come with ETA certification.
It goes without saying that our quality assurance performs daily checks on the produced batches to guarantee our standards, i.e. the products' conformity with the drawings, their functionality, appearance as well as compliance with customer specifications.

This is the only way we can be sure that we are providing our customers with the consistently high quality they have come to expect from us.

QUALITY FORMS THE BASIS OF ALL OUR ACTIVITIES.



DECLARATION OF APPROVAL

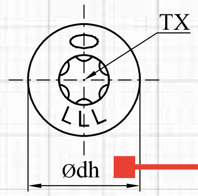
Page 20 of 58 of European Technical Assessment no. ETA-11/0024, issued on 2023-08-17

Paneltwistec countersunk head 90°
carbon steel[1]
stainless steel hardened[1]

Page X of Z / Approval type / Approval date

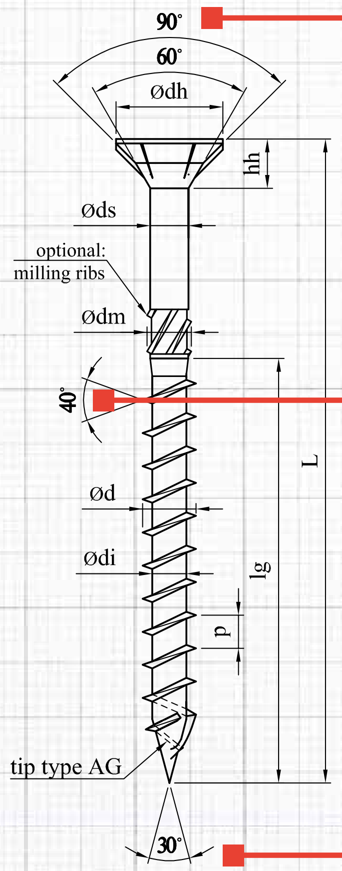
Name of the screw

Material quality

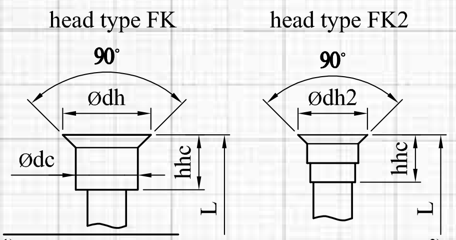


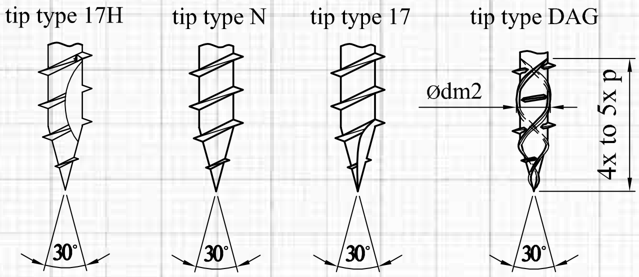
nominal size	Ø3,5	Ø4,0	Ø4,5	Ø5,0	Ø6,0	Ø8,0	Ø10,0	Ø12,0
d	3,5	4,0	4,5	5,0	6,0	8,0	10,0	12,0
di	2,1	2,5	2,7	3,3	4,0	5,3	6,3	7,1
dh	7,0	8,0	9,0	10,0	12,0	14,5	17,8	20,0
hh	3,5	4,0	4,4	4,8	5,7	7,0	8,7	9,3
p	2,25	2,5	2,8	3,1	4,9	5,6	6,6	6,6
ds	2,3	2,8	3,0	3,6	4,3	5,7	6,9	8,1
dm	2,7	2,9	3,4	3,9	4,8	6,5	7,9	9,6
dc	3,5	4,0	5,4	6,0	7,2	8,0	10,0	-
hhc	3,8	4,2	4,7	5,3	5,6	7,3	8,3	-
dh2	-	5,5	7,0	8,5	11,5	-	-	-
dm2	2,45	2,8	3,2	3,8	4,6	6,2	7,2	-
lg min	14	16	18	20	24	32	40	48
lg max	30	48	48	70	70	100	100	120
L min	18	20	23	25	30	39	49	57
L max	50	80	80	120	300	600	600	400

All dimensions in mm.[2]



Ø dh: Head diameter
hh: Head height of the screw
Ø ds: Shank diameter
Ø dm: Milling rib diameter
L: Screw length
lg: Thread length
Ø d: External diameter
Ø di: Core diameter
p: Thread pitch





[1] Material specification held on file by ETA Danmark.

[2] Tolerances according to EAD 130118-XX-0603.

Various applicable head geometries

Various applicable tip geometries

CERTIFICATIONS

The European Technical Assessment or ETA is a product performance certificate that leads to CE marking and which allows the marketing of products throughout the European Economic Area, Switzerland and Turkey. Often also on a global level.

ETA applications can be made for any construction product that is not or not fully covered by a harmonised standard. Unlike the harmonised standard, ETAs can be individually tailored to the product. Furthermore, performance features that are missing in the existing harmonised standards can also be documented in an ETA.

In contrast to national approvals, the greater geographic scope of ETAs has proven to be more advantageous. Nevertheless, with an ETA certificate, it is always necessary to check the declared performance against the national structural requirements.

ETA-11/0024 – Screws for load-bearing timber structures

Partially and fully threaded screws for timber-timber and steel-timber connections, the fastening of above-rafter insulation systems, joist doubling, main/secondary beam connections, transverse tension and transverse pressure reinforcements etc. in coniferous timber (sawn timber, solid structural timber [KVH], laminated timber, cross-laminated timber [CLT], laminated veneer timber), beech laminated veneer timber and various other timber-based materials.

ETA CE
Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

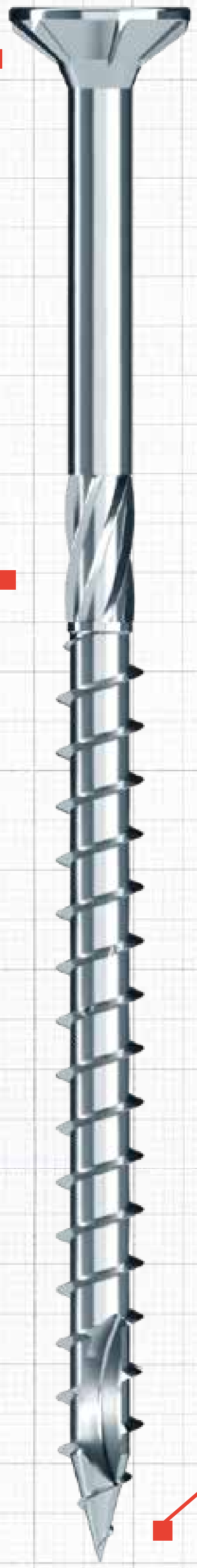
ETA-16/0864 – Screws for timber-concrete-connecting constructions

The timber-concrete connecting screws TCC-II 7.3 and TCC-II 9 are special partially threaded screws that are used for flexible connections between concrete slab structures and timber frame structures that are made of beams or slabs. The connecting screws are used for the renovation of wood-beamed ceilings and the construction of new timber-concrete hybrid framework structures.

ETA CE
Europ. Techn. Bewertung
European Technical Assessment
ETA-16/0864

STRUCTURE OF A WOOD CONSTRUCTION SCREW

From the drive to the tip



Milling ribs

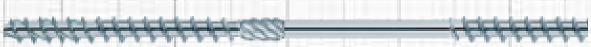
For easy countersinking into all types of timber

Ridged shank

For pre-milling the wood for the shank

Thread types

Double thread – maintains space between structural timber components



Full thread – for absorbing high tensile and compressive forces

Partial thread – for non-positive connectionsr between several structural timber components

TX drive

- No hitting of the screws during screwing in
- High torque transmission

Head types

Countersunk head

- Disappears into the timber
- Sits flush with the surface

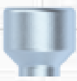
Washer head

- Increases the surface area, so higher head pull-through values are possible

Ornamental head

- Small inconspicuous head
- Ideal for visible screw fittings

Cylinder head



- Disappears into the timber
- Inconspicuous head for double and fully threaded screws

Screw tips

Self-clearing groove

- Quick and easy screwing in

AG

- Reduced screw-in torque
- Reduced splitting effect

DAG

- Reduced screw-in torque
- Reduced splitting effect
- The screw "grips" better

Drill tip

- Reduced screw-in torque
- No pre-drilling required

MATERIAL AND COATING

Overview

Eurotec invests in high-quality materials and surface coatings to ensure long-term durability and corrosion resistance. These properties are of critical importance as they extend the fasteners' service life and improve their performance in a variety of applications – for long-lasting connections in anything from wood construction projects to industrial use cases.

Hardened carbon steel + blue/yellow galvanised finishes

- Suitable for service classes 1 and 2 in accordance with DIN EN 1995 (Eurocode 5)
- Good resistance to mechanical stress
- Not suitable for timbers that contain tannins

Hardened carbon steel + special coating 1000

- Suitable for service classes 1 and 2 in accordance with DIN EN 1995 (Eurocode 5)
- Withstands up to 1,000 hours of salt-spray testing in accordance with DIN EN ISO 9227 NSS
- Corrosion category C4 long/C5-M long in accordance with DIN EN ISO 12944-6
- Good resistance to mechanical stress
- Not suitable for timbers that contain tannins

Hardened stainless steel

- Stainless steel in accordance with DIN 10088 (magnetisable)
- Limited acid resistance
- 10 years of experience without corrosion problems using suitable timbers
- 50% higher breaking torque than A2 and A4
- Suitable for service classes 1, 2 and 3
- Not suitable for timbers that are high in tannins such as cumaru, oak, Merbau, robinia etc.
- Not suitable for saline or chlorous atmospheres

Stainless steel A2

- Limited suitability for saline atmospheres
- Limited acid resistance
- Not suitable for chlorous atmospheres
- Suitable for service classes 1, 2 and 3
- Limited suitability for timbers that are high in tannins

Stainless steel A4

- Suitable for timbers that contain tannins
- Suitable for saline atmospheres
- Acid resistant
- Suitable for service class 1, 2 and 3
- Not suitable for chlorous atmospheres

PRACTICE-ORIENTED COATING SYSTEMS FOR WOOD CONSTRUCTION SCREWS

The estimated service life during which properly installed wood screws in structural wood construction must be resistant is 50 years. For constructions that are intended to have a shorter service life or for components that can be replaced, the additional categories T3 (15) and C4 (15) are available for an expected service life of 15 years, if alternative coatings are used.

In order to determine which screw is the right one to use in each situation, several factors must be considered.

The first factor are the services classes, which describe the wood moisture content (equilibrium moisture content) a structural timber component will have over a prolonged period of time under a particular environmental condition (outdoor weathering, dry interiors, etc.).

SERVICE CLASSES

The second factor is the C category, which describes the corrosiveness caused by different atmospheric environmental conditions (city, country, industry, proximity to the coast, etc.). For stainless steels, the CRC classes (corrosion resistance classes) apply instead of the C category.

C CATEGORY

The third factor is the T category, which describes the corrosion caused by the timber itself (timber type, preservative treatment, etc.).

T CATEGORY

SERVICE CLASSES – IN ACCORDANCE WITH EUROCODE 5 EN 1995-1-1:2010-12

The service classes (SC) indicate the position of the structural timber component within a construction with regard to its possible humidification or the equilibrium moisture content which will arise inside the structural timber component in this position over a prolonged period of time. The expected equilibrium moisture content is determined via the rel. humidity, temperature and exposure time.

Depending on the screw steel used, i.e. coated carbon steel or stainless steel, a particular wood screw in load-bearing constructions may only be used in service classes 1–2 or in all three service classes. In most cases, we indicate either SC 1–2, which means that the first service classes apply, or SC 1–3, which means that all three service classes apply.

With the help of the following table, you can determine the correct service class based on the factors mentioned and thereby select the right screw for each situation.

Service class	Place	Atmospheric moisture		Wood moisture	
		Annual average	Maximum value	Annual average	Maximum value
SC 1	Inside	50 %	65 %	10 %	12 %
SC 2	Outside, structurally protected	75 %	85 %	16 %	20 %
SC 3	Outside, unprotected	85 %	95 %	18 %	24 %

C CATEGORIES – IN ACCORDANCE WITH DIN EN 14592:2022

The C category describes the atmospheric corrosion category of screws with zinc coatings, hot-dip zinc coatings and alternative coatings. It is therefore decisive for the part of the screw that is not screwed into the wood, i.e. in most cases the head of the screw. The atmosphere's corrosion effect depends on the relative humidity, air pollution, chloride content (salt content of the air) and whether or not the joint is exposed to weathering. With the help of the following table, you can determine the correct C category based on the factors mentioned and thereby select the right screw for each situation.

Atmosphere category		Climate/humidity	Exposure to chlorides		Exposure to pollutants	
			Typical environment	Chloride deposition rate [mg/m² x d][1]	Typical environment	Degree of contamination SO2 content [µg/m³]
C1	Insignificant	Dry / low humidity	Regions far from the coastline	~ 0	Heated premises	~ 0
C2	Low	Moderate/rare condensation	> 10 km from the coastline	≤ 3	Low-pollution rural areas, small towns	< 5
C3	Indifferent	Moderate/occasional condensation	10 km – 3 km from the coastline	3 – 60	Moderately polluted urban and industrial areas	5 – 30
C4	Strong	Moderate/frequent condensation	3 km – 0,25 km from the coastline (without spray mist)	60 – 300	Heavily polluted urban and industrial areas	30 – 90
C5	Very strong	Moderate, subtropical / permanently very high frequency of condensation	< 0,25 km from the coastline, occasional spray mist, high frequency of condensation	300 – 1500	Environment with very high industrial pollution levels	90 – 250

CRC CATEGORIES IN ACCORDANCE WITH DIN EN 1993-1-4:2015-10

The CRC category describes the atmospheric corrosion resistance class for stainless steel. It is therefore decisive for the part of the screw that is not screwed into the timber, i.e. in most cases the head of the screw. It is based on the corrosion resistance factor CRF, which describes the risk of exposure and thus the distance to the coastline, based on the atmosphere's chloride content.

Our stainless steel screws have been assigned a C category in addition to the CRC category to allow for a direct comparison between the stainless and coated screws. In this case, this C value should only be considered with regard to the chloride content. Since our stainless steels fall into the categories CRC II and CRC III, we will explain the latter in the following table.

Corrosion resistance class CRC	Corrosion resistance class CRC	Risk of exposure	Distance from the sea
CRC I	1	Interiors	
CRC II	0 to -7	Low to high	> 0,25 km
CRC III	-7 to -15	High to very high	≤ 0,25 km
CRC IV	-15 to -20	Very high	≤ 0,25 km
CRC V	< - 20	Very high	≤ 0,25 km

INDOOR SWIMMING POOL ATMOSPHERE

Chlorine in the atmosphere can lead to stress corrosion cracking in metals. In order to avoid this risk, the load-bearing components must be made of stainless steel. You can see which CRC category is right for which situation in the following table:

Load-bearing components in an indoor swimming pool atmosphere	Required CRC class
Load-bearing components that are cleaned regularly [1)]	CRC III, CRC IV
Load-bearing components that are not cleaned regularly	CRC V
All fasteners, connectors and threaded parts	CRC V

[1)] The more frequent the cleaning, the greater the benefit. The period between cleanings should not exceed one week. A detailed cleaning and control plan must always be checked by an expert to check it suits the situation. If cleaning is specified, it should apply to all parts of the building and not just the easily accessible and easily visible components.

T CATEGORIES IN ACCORDANCE WITH DIN EN 14592:2022

The T category describes corrosion that is caused by the timber. It only affects the part of the screw that is screwed into the timber. The corrosion effect of the timber depends on the humidity, type of timber, pH value as well as preservative treatment. T classes can approximately be assigned to the service classes based on the humidity value. In most climates, the average annual humidity content in softwoods does not exceed the following values:
ω = 10 % in heated areas → T1 should approximately be assigned to service class 1
ω = 16 % in unheated areas that are structurally protected → T2 should approximately be assigned to service class 2
ω = 20 % in areas that are exposed to rain but are not in contact with the ground → T3 and T4 should approximately be assigned to service class 3
ω > 20% T5 applies to all other structures that are to be assigned to service class 3

With the help of the following table, you can determine the correct T category based on the factors mentioned and thereby choose the right screw for each situation.

Timber category	Average annual moisture content	Timber types according to their pH value	Examples of timber types	Preservative treatment
T1	ω < 10 %	All	All	Untreated and treated
T2	10 ≤ ω ≤16 %	All	All	Untreated and treated
T3	16 < ω ≤ 20 %	pH > 4	Larch, pine, birch, spruce, fir	Untreated
T4	16 < ω ≤ 20 %	pH ≤ 4	Oak, chestnut, red cedar, Douglas fir, beech	Untreated and treated
T5	Permanent ω> 20 %	All	All	Untreated and treated

MINIMUM DISTANCES BETWEEN SCREWS

These minimum distances between screws help to evenly distribute the load and prevent the screws from being placed too close to each other, which could affect the structural integrity. These rules may be prescribed in the various building standards, building codes or design guidelines. Compliance with these rules can reduce risks such as breakage, failure or unexpected deformations, which will lead to a safer and more reliable construction.

MINIMUM DISTANCE RULES FOR SHEAR LOADS

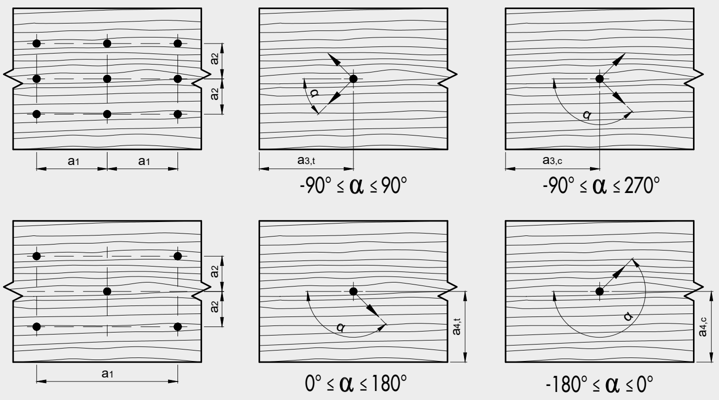
Minimum distances and edge distances between screws for shear and axial loads. The following minimum distances, based on EN 1995-1-1, refer to laterally loaded, non-predrilled screws with a particular nominal diameter for timber-timber connections where the timber has a maximum characteristic density of 420 kg/m³. In the following formulas, α is the angle between the force and the wood grain direction. In connections between steel and timber, the minimum distances a_1 and a_2 may be reduced by a multiplication factor of 0.7.

d ≥ 5 MM

$\alpha_1 \geq (5 + 7 \times \cos\alpha) \times d$
$\alpha_2 \geq 5 \times d$
$\alpha_{3,t} \geq (10 + 5 \times \cos\alpha) \times d$
$\alpha_{3,c} \geq 10 \times d$
$\alpha_{4,t} \geq (5 + 5 \times \sin\alpha) \times d$
$\alpha_{4,c} \geq 5 \times d$

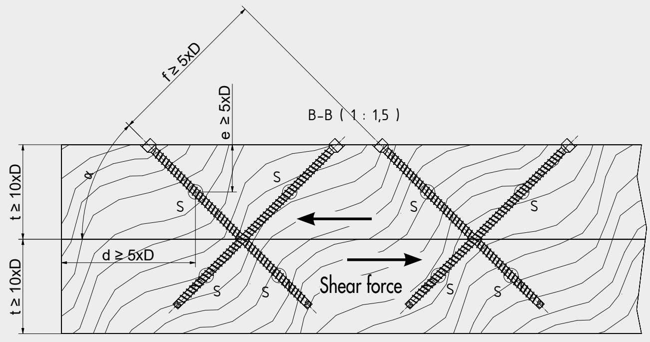
d < 5 MM

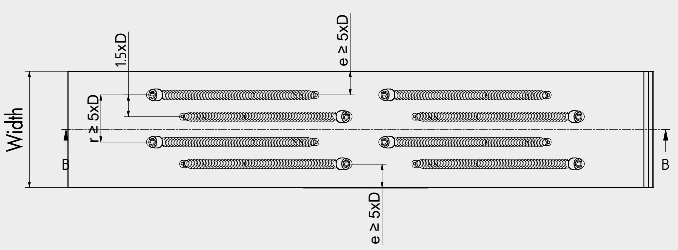
$\alpha_1 \geq (5 + 5 \times \cos\alpha) \times d$
$\alpha_2 \geq 5 \times d$
$\alpha_{3,t} \geq (10 + 5 \times \cos\alpha) \times d$
$\alpha_{3,c} \geq 10 \times d$
$\alpha_{4,t} \geq (5 + 2 \times \sin\alpha) \times d$
$\alpha_{4,c} \geq 5 \times d$



MINIMUM DISTANCE RULES FOR AXIAL LOADS

For exclusively axially loaded Eurotec screws in predrilled holes and for screws with a drill tip (KonstruX ST type), the following minimum distances apply according to ETA-11/0024, taking into account a minimum material thickness of t = 10 · d and a minimum width of w = max (8 · d; 60 mm). The distance between the cross-head screws must be at least 1.5 d.





MINIMUM DISTANCES FOR SHEAR LOADS IN PREDRILLED HOLES

α = 0, timber-timber connection											
Diameter	3	3,5	4	4,5	5	6	6,5	8	10	11,3	13
a1	15	17,5	20	22,5	25	30	33	40	50	57	65
a2	9	10,5	12	13,5	15	18	20	24	30	34	39
a3,t	36	42	48	54	60	72	78	96	120	136	156
a3,c	21	24,5	28	31,5	35	42	46	56	70	79	91
a4,t	9	10,5	12	13,5	15	18	20	24	30	34	39
a4,c	9	10,5	12	13,5	15	18	20	24	30	34	39

α = 90, timber-timber connection											
Diameter	3	3,5	4	4,5	5	6	6,5	8	10	11,3	13
a1	12	14	16	18	20	24	26	32	40	45	52
a2	12	14	16	18	20	24	26	32	40	45	52
a3,t	21	24,5	28	31,5	35	42	46	56	70	79	91
a3,c	21	24,5	28	31,5	35	42	46	56	70	79	91
a4,t	15	17,5	20	22,5	35	42	46	56	70	79	91
a4,c	9	10,5	12	13,5	15	18	20	24	30	34	39

Note: For a steel-timber connection, you only have to multiply the values by 0.7.

MINIMUM DISTANCES FOR SHEAR LOADS WITHOUT PREDRILLED HOLES

α = 0, timber-timber connection											
Diameter	3	3,5	4	4,5	5	6	6,5	8	10	11,3	13
a_1	30	35	40	45	60	72	78	96	120	136	156
a_2	15	17,5	20	22,5	25	30	33	40	50	57	65
$a_{3,t}$	45	52,5	60	67,5	75	90	98	120	150	170	195
$a_{3,c}$	30	35	40	45	50	60	65	80	100	113	130
$a_{4,t}$	15	17,5	20	22,5	25	30	33	40	50	57	65
$a_{4,c}$	15	17,5	20	22,5	25	30	33	40	50	57	65

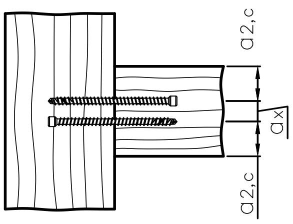
α = 90, timber-timber connection											
Diameter	3	3,5	4	4,5	5	6	6,5	8	10	11,3	13
a_1	15	17,5	20	22,5	25	30	33	40	50	57	65
a_2	15	17,5	20	22,5	25	30	33	40	50	57	65
$a_{3,t}$	30	35	40	45	50	60	65	80	100	113	130
$a_{3,c}$	30	35	40	45	50	60	65	80	100	113	130
$a_{4,t}$	21	24,5	28	31,5	50	60	65	80	100	113	130
$a_{4,c}$	15	17,5	20	22,5	25	30	33	40	50	57	65

Note: For a steel-timber connection, you only need to multiply the values by 0,7.

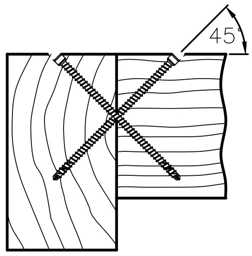
MINIMUM DISTANCES FOR AXIAL LOADS

	Drill tip				AG tip					
	With and without predrilled holes				Predrilled			Not predrilled		
Ø [mm]	Distance rules	6,5	8	10	Distance rules	11,3	13	Distance rules	11,3	13
a_1	5 · d	33	40	50	5 · d	57	65	5 · d	57	65
a_2	5 · d	33	40	50	5 · d	57	65	5 · d	57	65
a_{2red}	2.5 · d	16	20	25	2.5 · d	29	33	2.5 · d	29	33
$a_{1,c}$	5 · d	33	40	50	5 · d	57	65	5 · d	113	130
$a_{2,c}$	3 · d	20	24	30	3 · d	34	39	3 · d	46	52
a_{1x}	1,5 · d	10	12	15	1.5 · d	17	20	1.5 · d	17	20

SCREWS ARRANGED CROSSWISE UNDER TENSILE LOAD

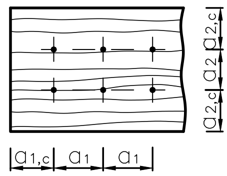


Top view

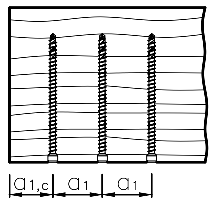


Cross-section

SCREWS USED AT AN ANGLE THAT RUNS PERPENDICULAR TO THE WOOD GRAIN

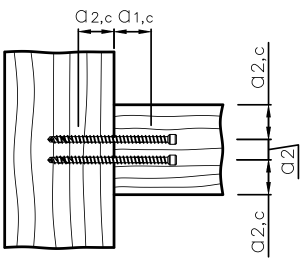


Top view

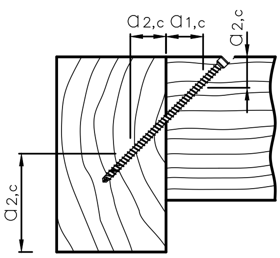


Cross-section

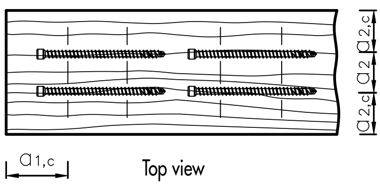
SCREWS UNDER TENSILE LOAD USED AT AN ANGLE α THAT RUNS OBLIQUELY TO THE WOOD GRAIN



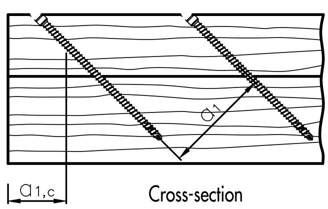
Top view



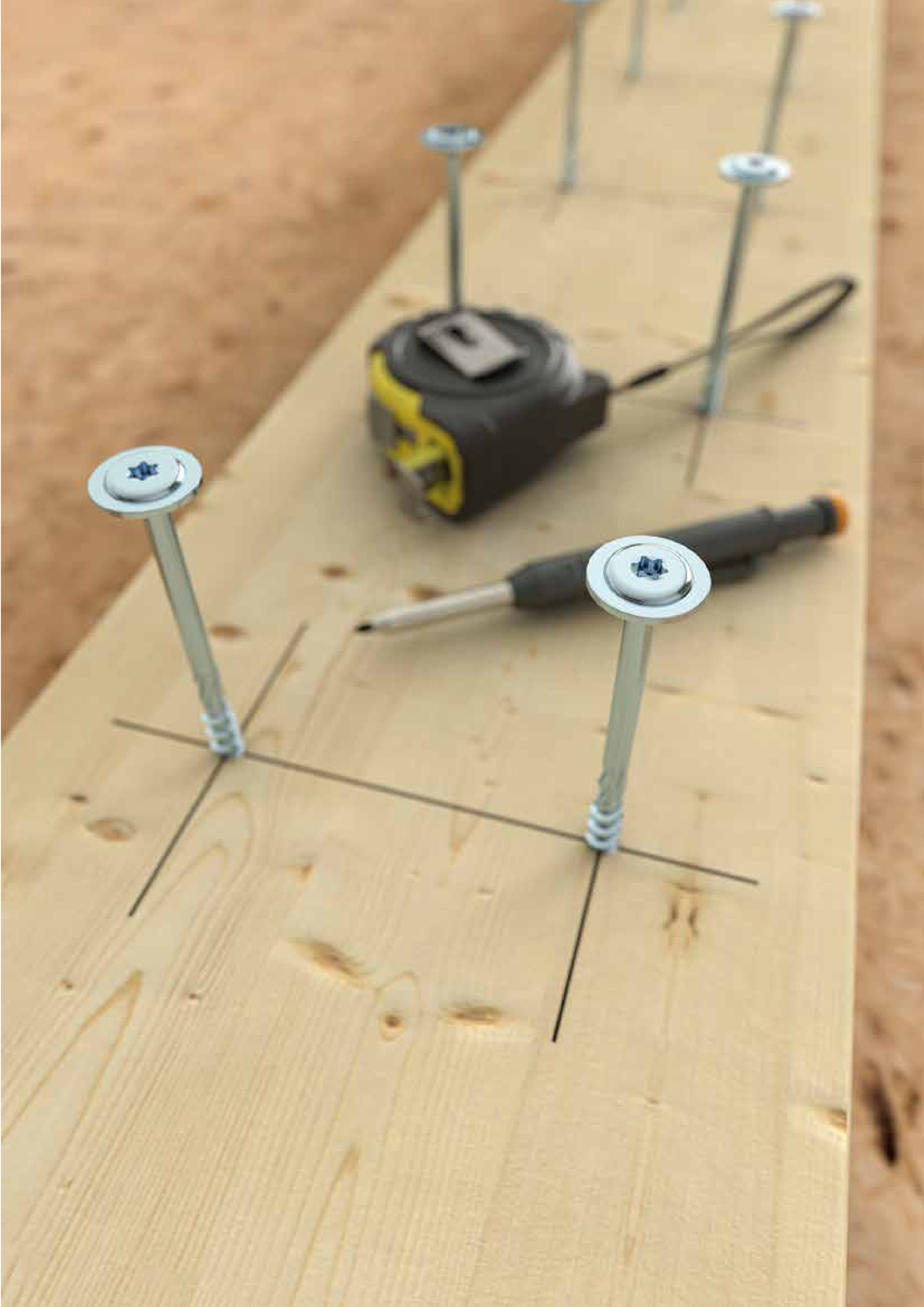
Cross-section



Top view

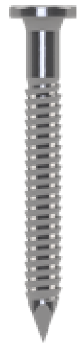


Cross-section



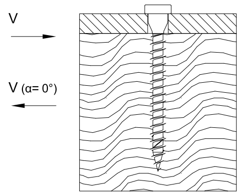
SPECIAL CASES

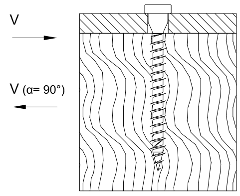
ANCHOR NAILS



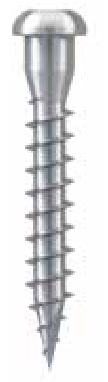
ST	Anchor nails		$\alpha = 0°$	
$\rho k \le 420\ kg/m^3$	Predrilled		Not predrilled	
	x d	4	x d	4
a_1	3.5	14	7	28
a_2	2.1	9	3.5	14
$a_{3,t}$	12	48	15	60
$a_{3,c}$	7	28	10	40
$a_{4,t}$	3	12	5	20
$a_{4,c}$	3	12	5	20

ST	Anchor nails		$\alpha = 90°$	
$\rho k \le 420\ kg/m^3$	Predrilled		Not predrilled	
	x d	4	x d	4
a_1	2.8	11	3.5	14
a_2	2.8	11	3.5	14
$a_{3,t}$	7	28	10	40
$a_{3,c}$	7	28	10	40
$a_{4,t}$	5	20	7	28
$a_{4,c}$	3	12	5	20



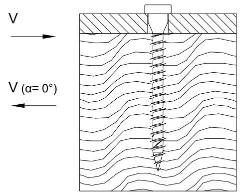


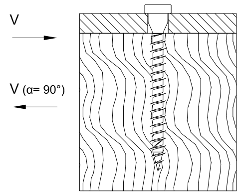
ANGLE-BRACKET SCREW



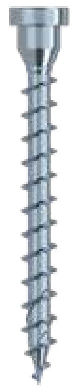
ST	ABS		$\alpha = 0°$	
$\rho k \le 420\ kg/m^3$	Predrilled		Not predrilled	
	x d	5	x d	5
a_1	3.5	18	8.4	42
a_2	2.1	11	3.5	18
$a_{3,t}$	12	60	15	75
$a_{3,c}$	7	35	10	50
$a_{4,t}$	3	15	5	25
$a_{4,c}$	3	15	5	25

ST	ABS		$\alpha = 90°$	
$\rho k \le 420\ kg/m^3$	Predrilled		Not predrilled	
	x d	5	x d	5
a_1	2.8	14	3.5	18
a_2	2.8	14	3.5	18
$a_{3,t}$	7	35	10	50
$a_{3,c}$	7	35	10	50
$a_{4,t}$	7	35	10	50
$a_{4,c}$	3	15	5	25



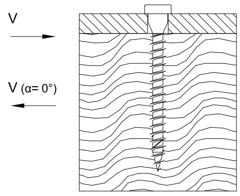


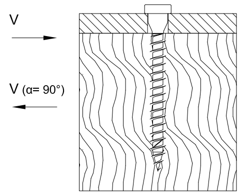
ANGLE-BRACKET SCREW STRONG



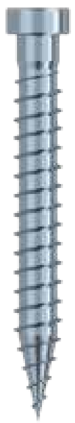
ST	ABS Strong				α = 0 °	
ρk ≤ 420 kg/m³	Predrilled			Not predrilled		
	x d	8	10	x d	8	10
a_1	3.5	28	35	8.4	67	84
a_2	2.1	17	21	3.5	28	35
$a_{3,t}$	12	96	120	15	120	150
$a_{3,c}$	7	56	70	10	80	100
$a_{4,t}$	3	24	30	5	40	50
$a_{4,c}$	3	24	30	5	40	50

ST	ABS Strong				α = 90 °	
ρk ≤ 420 kg/m³	Predrilled			Not predrilled		
	x d	8	10	x d	8	10
a_1	2.8	22	28	3.5	28	35
a_2	2.8	22	28	3.5	28	35
$a_{3,t}$	7	56	70	10	80	100
$a_{3,c}$	7	56	70	10	80	100
$a_{4,t}$	7	56	70	10	80	100
$a_{4,c}$	3	24	30	5	40	50



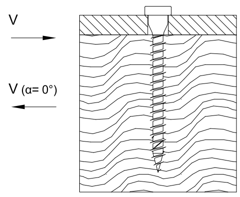


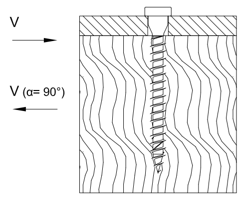
ANGLE-BRACKET SCREW ZK HARDWOOD



ST	ABS ZK Hardwood				α = 0 °	
ρk [kg/m³]	Predrilled		Not predrilled ρk ≤ 420		Not predrilled ρk ≤ 500	
	x d	5,6	x d	5,6	x d	5,6
a_1	3,5	20	8,4	47	10,5	59
a_2	2,1	12	3,5	20	4.9	27
$a_{3,t}$	12	67	15	84	20	112
$a_{3,c}$	7	39	10	56	15	84
$a_{4,t}$	3	17	5	28	7	39
$a_{4,c}$	3	17	5	28	7	39

ST	ABS ZK Hardwood				α = 90 °	
ρk [kg/m³]	Predrilled		Not predrilled ρk ≤ 420		Not predrilled ρk ≤ 500	
	x d	5,6	x d	5,6	x d	5,6
a_1	2,8	16	3,5	20	4,9	27
a_2	2,8	16	3,5	20	4,9	27
$a_{3,t}$	7	39	10	56	15	84
$a_{3,c}$	7	39	10	56	15	84
$a_{4,t}$	7	39	10	56	12	67
$a_{4,c}$	3	17	5	28	7	39





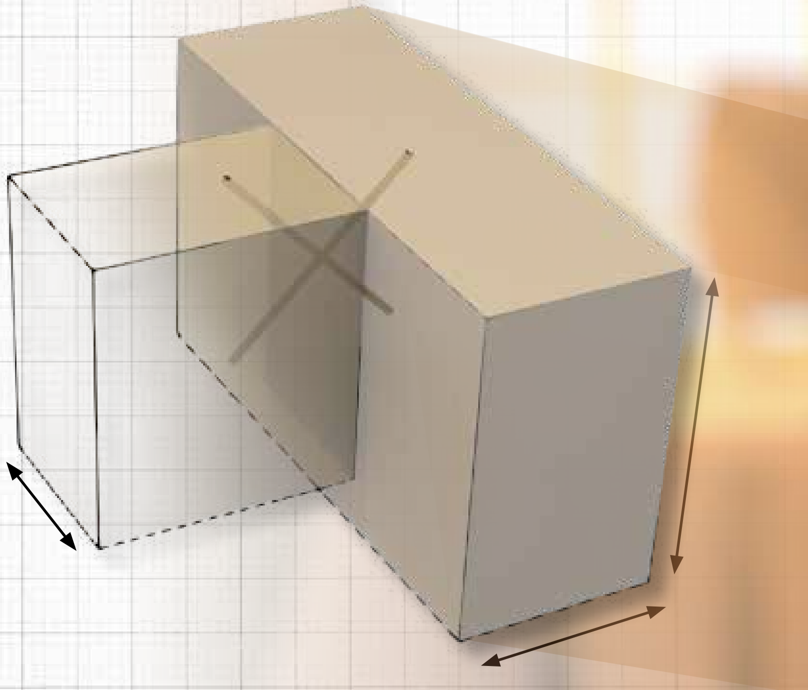
LEARN MORE ABOUT OUR ECS SOFTWARE

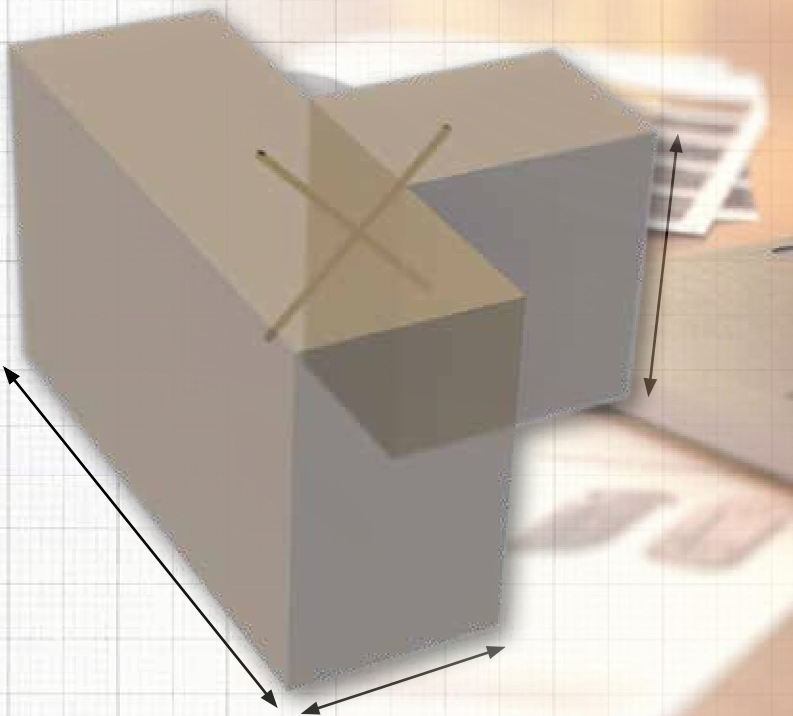
The ECS software is a free, user-friendly software for the pre-dimensioning of Eurotec wood construction screws. The modules include main and secondary beam connections, transverse tension and transverse pressure reinforcements, rafter-purlin connections, fastenings for roofing and façade insulation systems, and many other functions.

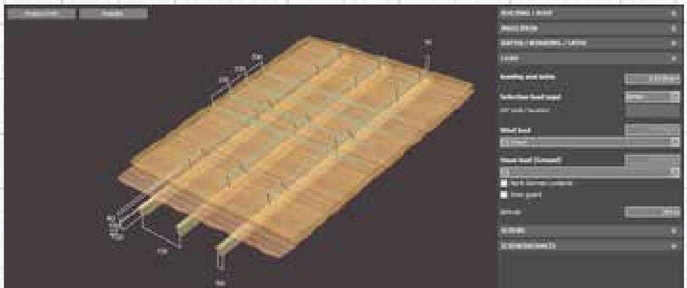
→ The program gives you the option to fully customise your individual connection application by modifying parameters such as the geometry, material type (e.g. beech laminated veneer timber and solid timber in different strength classes), load sizes (variable and permanent loads), the load class and more to suit your needs.

→ What's more, it makes it possible to optimise the fastening solution by adjusting the screw diameter and screw length as well as checking the strength utilisation factor, which is shown in the lower right corner of the screen.

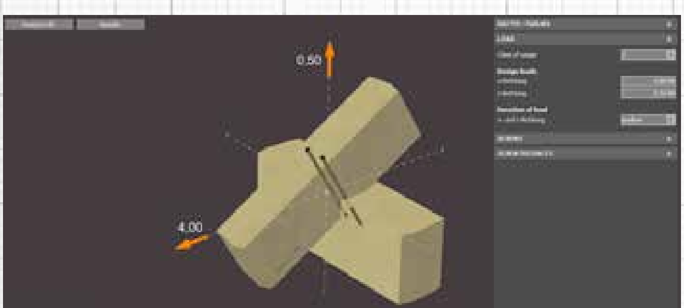
→ Once you have selected the connection solution, a calculation report according to ETA-11/0024 and EN 1995 (Eurocode 5) is available to you, including the associated drawings in PDF format.







Module for the fastening of insulation materials on rafters with Topduo



Module for rafter-purlin connections using Paneltwistec and KonstruX


260
220
140
160
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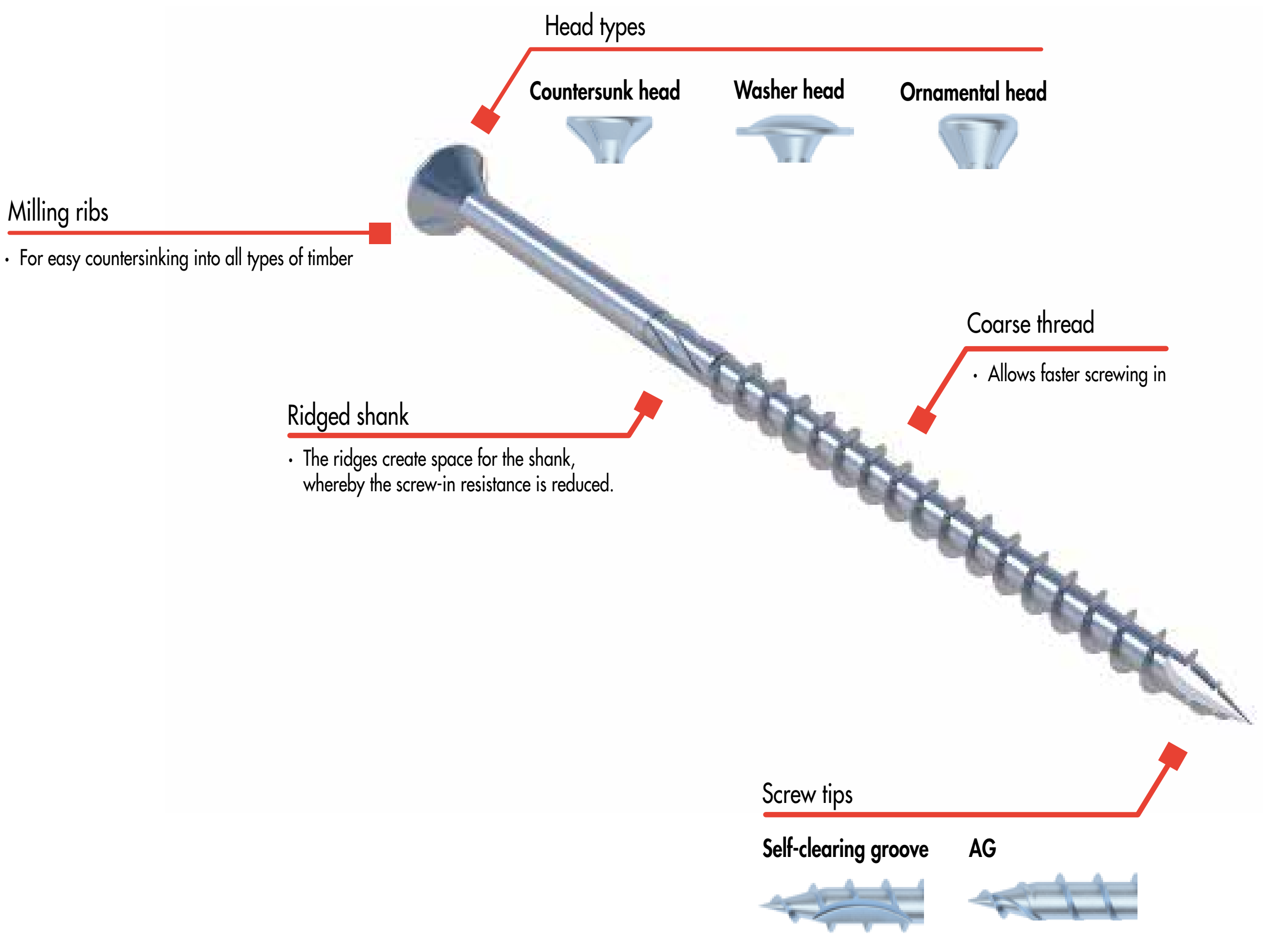
DISCOVER
THE ECS SOFTWARE!

PANELTWISTEC

Paneltwistec are **wood construction screws with a special screw tip and milling ribs** above the thread. The **cutting notch** on the screw tip ensures that it **grips quickly and reduces the splitting effect** during screwing in. **Paneltwistec AG** on the other hand features a **folded-down thread,** which **reduces the screw-in resistance.** Paneltwistec wood screws are available with countersunk, ornamental or washer heads as well as in coated carbon steel and a number of stainless steels.

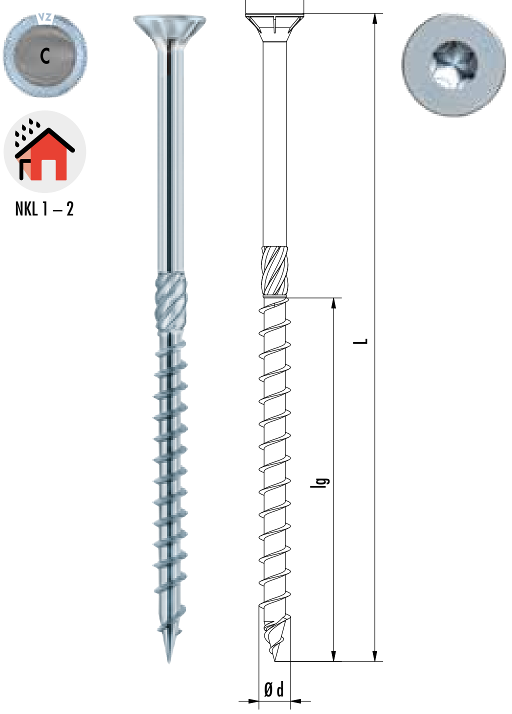



www.eurotec.team

PANELTWISTEC AG, COUNTERSUNK HEAD SCREW

Paneltwistec AG

Countersunk head, screw tip AG, blue galvanised



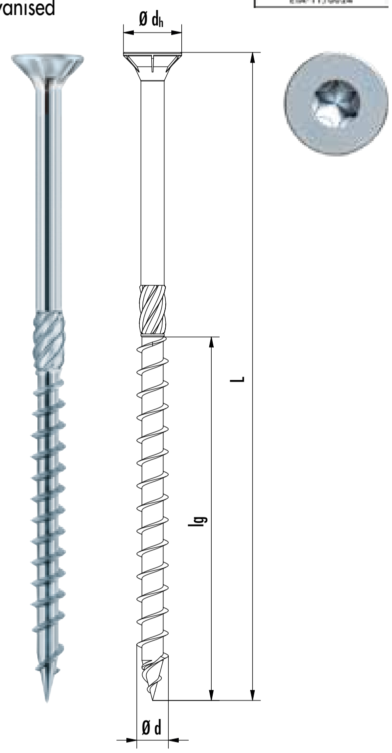
Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
945436	3,5	30	7.0	18	TX15 ●	1000
945838	3,5	35	7.0	21	TX15 ●	1000
945437	3,5	40	7.0	24	TX15 ●	1000
945490	3,5	50	7.0	30	TX15 ●	500
945491	4,0	30	8.0	18	TX20 ●	1000
945836	4,0	35	8.0	21	TX20 ●	1000
945492	4,0	40	8.0	24	TX20 ●	1000
945493	4,0	45	8.0	27	TX20 ●	500
945494	4,0	50	8.0	30	TX20 ●	500
945495	4,0	60	8.0	36	TX20 ●	200
945496	4,0	70	8.0	42	TX20 ●	200
945497	4,0	80	8.0	48	TX20 ●	200
945498	4,5	40	9.0	24	TX25 ●	500
945588	4,5	45	9.0	27	TX25 ●	500
945499	4,5	50	9.0	30	TX25 ●	500
945567	4,5	60	9.0	36	TX25 ●	200
945568	4,5	70	9.0	42	TX25 ●	200
945569	4,5	80	9.0	48	TX25 ●	200
945574	5,0	40	10.0	24	TX25 ●	200
945837	5,0	45	10.0	27	TX25 ●	200
945575	5,0	50	10.0	30	TX25 ●	200
945576	5,0	60	10.0	36	TX25 ●	200
945577	5,0	70	10.0	42	TX25 ●	200
945578	5,0	80	10.0	48	TX25 ●	200
945579	5,0	90	10.0	54	TX25 ●	200
945580	5,0	100	10.0	60	TX25 ●	200
945581	5,0	120	10,0	70	TX25 ●	200
945600	5,0	50	10,0	30	TX30 ●	200*
945601	5,0	60	10,0	36	TX30 ●	200*
945602	5,0	70	10,0	42	TX30 ●	200*
945603	5,0	80	10,0	48	TX30 ●	200*
945604	5,0	90	10,0	54	TX30 ●	200*
945605	5,0	100	10,0	60	TX30 ●	200*
945607	5,0	120	10,0	70	TX30 ●	200*
945583	6,0	60	12,0	36	TX30 ●	200
945584	6,0	70	12,0	42	TX30 ●	200
945632	6,0	80	12,0	48	TX30 ●	200
945633	6,0	90	12,0	54	TX30 ●	100
945634	6,0	100	12,0	60	TX30 ●	100
945635	6,0	110	12,0	70	TX30 ●	100
945636	6,0	120	12,0	70	TX30 ●	100
945637	6,0	130	12,0	70	TX30 ●	100
945638	6,0	140	12,0	70	TX30 ●	100
945639	6,0	150	12,0	70	TX30 ●	100
945640	6,0	160	12,0	70	TX30 ●	100
945641	6,0	180	12,0	70	TX30 ●	100
945642	6,0	200	12,0	70	TX30 ●	100
945643	6,0	220	12,0	70	TX30 ●	100
945644	6,0	240	12,0	70	TX30 ●	100
945645	6,0	260	12,0	70	TX30 ●	100
945646	6,0	280	12,0	70	TX30 ●	100
945647	6,0	300	12,0	70	TX30 ●	100

* incl. drill bit

Paneltwistec AG

Countersunk head, screw tip AG, steel blue galvanised

NKL 1 – 2



Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
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945634-TX40	6,0	100	12,0	60	TX40 ●	100
945636-TX40	6,0	120	12,0	70	TX40 ●	100
945638-TX40	6,0	140	12,0	70	TX40 ●	100
945640-TX40	6,0	160	12,0	70	TX40 ●	100
945641-TX40	6,0	180	12,0	70	TX40 ●	100
945642-TX40	6,0	200	12,0	70	TX40 ●	100
945643-TX40	6,0	220	12,0	70	TX40 ●	100
945644-TX40	6,0	240	12,0	70	TX40 ●	100
945648	6,0	320	12,0	70	TX40 ●	100
945649	6,0	340	12,0	70	TX40 ●	100
945650	6,0	360	12,0	70	TX40 ●	100
945651	6,0	380	12,0	70	TX40 ●	100
945652	6,0	400	12,0	70	TX40 ●	100
944715	8,0	80	14,5	50	TX40 ●	50
944716	8,0	100	14,5	60	TX40 ●	50
944717	8,0	120	14,5	70	TX40 ●	50
944718	8,0	140	14,5	100	TX40 ●	50
944719	8,0	160	14,5	100	TX40 ●	50
944720	8,0	180	14,5	100	TX40 ●	50
944721	8,0	200	14,5	100	TX40 ●	50
944722	8,0	220	14,5	100	TX40 ●	50
944723	8,0	240	14,5	100	TX40 ●	50
944724	8,0	260	14,5	100	TX40 ●	50
944725	8,0	280	14,5	100	TX40 ●	50
944726	8,0	300	14,5	100	TX40 ●	50
944727	8,0	320	14,5	100	TX40 ●	50
944728	8,0	340	14,5	100	TX40 ●	50
944729	8,0	360	14,5	100	TX40 ●	50
944730	8,0	380	14,5	100	TX40 ●	50
944731	8,0	400	14,5	100	TX40 ●	50
944732	8,0	420	14,5	100	TX40 ●	50
944733	8,0	440	14,5	100	TX40 ●	50
944734	8,0	460	14,5	100	TX40 ●	50
944735	8,0	480	14,5	100	TX40 ●	50
944736	8,0	500	14,5	100	TX40 ●	50
944737	8,0	550	14,5	100	TX40 ●	50
944739	8,0	600	14,5	100	TX40 ●	50
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945688	10,0	120	17,8	70	TX50 ●	50
945689	10,0	140	17,8	100	TX50 ●	50
945690	10,0	160	17,8	100	TX50 ●	50
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945692	10,0	200	17,8	100	TX50 ●	50
945693	10,0	220	17,8	100	TX50 ●	50
945694	10,0	240	17,8	100	TX50 ●	50
945695	10,0	260	17,8	100	TX50 ●	50
945696	10,0	280	17,8	100	TX50 ●	50
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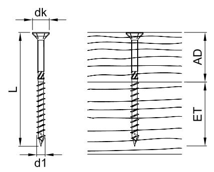
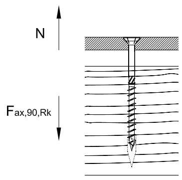
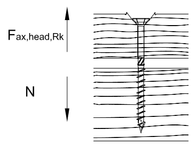
945709	10,0	380	17,8	100	TX50 ●	50
945711	10,0	400	17,8	100	TX50 ●	50

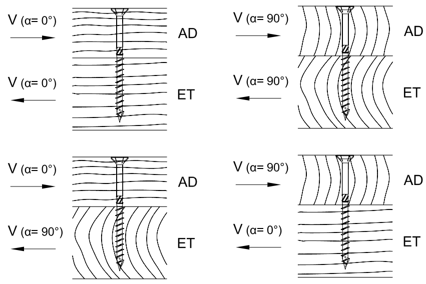
TECHNICAL INFORMATION
PANELTWISTEC AG, COUNTERSUNK HEAD, BLUE GALVANISED

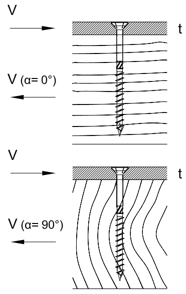
ETA
Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024











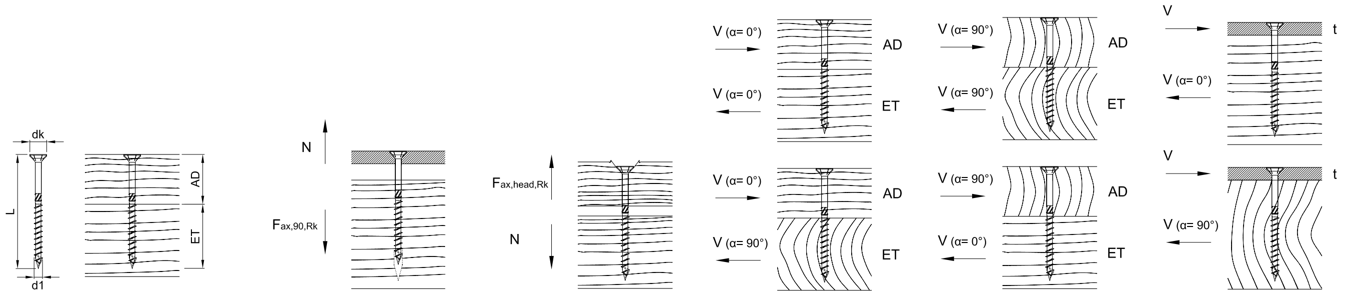
Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber				Shearing steel-timber		
d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								α_{AD}= 0°	α_{AD}= 90°			
						α= 0°	α=90°	α_{ET}= 90°	α_{ET}= 0°		α= 0°	α= 90°
3,5 x 30	7,0	12	18	0,84	0,59	0,62				1	0,86	
3,5 x 35	7,0	14	21	0,98	0,59	0,67				1	0,92	
3,5 x 40	7,0	16	24	1,12	0,59	0,70				1	0,95	
3,5 x 45	7,0	18	27	1,26	0,59	0,74				1	0,99	
3,5 x 50	7,0	20	30	1,40	0,59	0,78				1	1,02	
4,0 x 30	8,0	12	18	0,93	0,77	0,71				2	0,91	
4,0 x 35	8,0	14	21	1,08	0,77	0,80				2	1,07	
4,0 x 40	8,0	16	24	1,24	0,77	0,84				2	1,15	
4,0 x 45	8,0	18	27	1,39	0,77	0,88				2	1,19	
4,0 x 50	8,0	20	30	1,55	0,77	0,92				2	1,23	
4,0 x 60	8,0	24	36	1,86	0,77	1,01				2	1,31	
4,0 x 70	8,0	28	42	2,17	0,77	1,03				2	1,38	
4,0 x 80	8,0	32	48	2,48	0,77	1,03				2	1,46	
4,5 x 40	9,0	16	24	1,35	0,97	1,00				2	1,34	
4,5 x 45	9,0	18	27	1,52	0,97	1,03				2	1,40	
4,5 x 50	9,0	20	30	1,69	0,97	1,08				2	1,44	
4,5 x 60	9,0	24	36	2,03	0,97	1,17				2	1,53	
4,5 x 70	9,0	28	42	2,36	0,97	1,26				2	1,61	
4,5 x 80	9,0	32	48	2,70	0,97	1,26				2	1,70	
5,0 x 40	10,0	16	24	1,45	1,20	1,11				2	1,44	
5,0 x 45	10,0	18	27	1,63	1,20	1,20				2	1,62	
5,0 x 50	10,0	20	30	1,82	1,20	1,24				2	1,67	
5,0 x 60	10,0	24	36	2,18	1,20	1,34				2	1,76	
5,0 x 70	10,0	28	42	2,54	1,20	1,44				2	1,85	
5,0 x 80	10,0	32	48	2,90	1,20	1,52				2	1,94	
5,0 x 90	10,0	36	54	3,27	1,20	1,52				2	2,03	
5,0 x 100	10,0	40	60	3,63	1,20	1,52				2	2,12	
5,0 x 120	10,0	50	70	4,24	1,20	1,52				2	2,27	

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 350 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d= R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

Example:

Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1.3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k= R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k= R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

Attention: These are planning aids. The projects must always be designed by authorised persons.

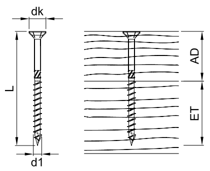
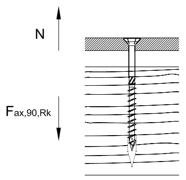
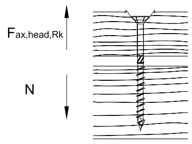
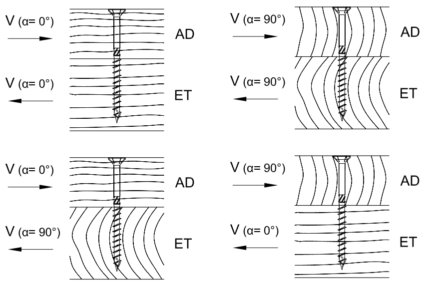
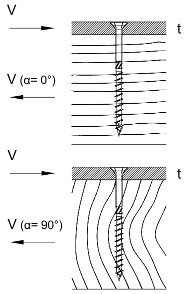


Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber				Shearing steel-timber		
d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								$\alpha_{AD}= 0°$	$\alpha_{AD}= 90°$			
						$\alpha= 0°$	$\alpha=90°$	$\alpha_{ET}= 90°$	$\alpha_{ET}= 0°$		$\alpha= 0°$	$\alpha= 90°$
6,0 x 60	12,0	24	36	2,46	1,73	1,71				2	2,26	
6,0 x 70	12,0	28	42	2,87	1,73	1,82				2	2,36	
6,0 x 80	12,0	32	48	3,28	1,73	1,93				2	2,46	
6,0 x 90	12,0	36	54	3,69	1,73	2,05				2	2,57	
6,0 x 100	12,0	40	60	4,10	1,73	2,07				2	2,67	
6,0 x 110	12,0	40	70	4,79	1,73	2,07				2	2,84	
6,0 x 120	12,0	50	70	4,79	1,73	2,07				2	2,84	
6,0 x 130	12,0	60	70	4,79	1,73	2,07				2	2,84	
6,0 x 140	12,0	70	70	4,79	1,73	2,07				2	2,84	
6,0 x 150	12,0	80	70	4,79	1,73	2,07				2	2,84	
6,0 x 160	12,0	90	70	4,79	1,73	2,07				2	2,84	
6,0 x 180	12,0	110	70	4,79	1,73	2,07				2	2,84	
6,0 x 200	12,0	130	70	4,79	1,73	2,07				2	2,84	
6,0 x 220	12,0	150	70	4,79	1,73	2,07				2	2,84	
6,0 x 240	12,0	170	70	4,79	1,73	2,07				2	2,84	
6,0 x 260	12,0	190	70	4,79	1,73	2,07				2	2,84	
6,0 x 280	12,0	210	70	4,79	1,73	2,07				2	2,84	
6,0 x 300	12,0	230	70	4,79	1,73	2,07				2	2,84	
6,0 x 320	12,0	250	70	4,79	1,73	2,07				2	2,84	
6,0 x 340	12,0	270	70	4,79	1,73	2,07				2	2,84	
6,0 x 360	12,0	290	70	4,79	1,73	2,07				2	2,84	
6,0 x 380	12,0	310	70	4,79	1,73	2,07				2	2,84	
6,0 x 400	12,0	330	70	4,79	1,73	2,07				2	2,84	
8,0 x 80	14,5	30	50	4,26	2,52	3,71	2,90	3,71	2,90	3	4,56	3,94
8,0 x 100	14,5	40	60	5,33	2,52	4,13	3,30	4,13	3,30	3	4,83	4,20
8,0 x 120	14,5	50	70	5,86	2,52	4,13	3,50	4,13	3,50	3	4,96	4,34
8,0 x 140	14,5	40	100	8,44	2,52	4,13	3,30	4,13	3,30	3	5,60	4,98
8,0 x 160	14,5	60	100	8,44	2,52	4,13	3,50	4,13	3,50	3	5,60	4,98
8,0 x 180	14,5	80	100	8,44	2,52	4,13	3,50	4,13	3,50	3	5,60	4,98
8,0 x 200	14,5	100	100	8,44	2,52	4,13	3,50	3,50	4,13	3	5,60	4,98
8,0 x 220	14,5	120	100	8,44	2,52	4,13	3,50	3,50	4,13	3	5,60	4,98
8,0 x 240	14,5	140	100	8,44	2,52	4,13	3,50	3,50	4,13	3	5,60	4,98
8,0 x 260	14,5	160	100	8,44	2,52	4,13	3,50	3,50	4,13	3	5,60	4,98
8,0 x 280	14,5	180	100	8,44	2,52	4,13	3,50	3,50	4,13	3	5,60	4,98
8,0 x 300	14,5	200	100	8,44	2,52	4,13	3,50	3,50	4,13	3	5,60	4,98
8,0 x 320	14,5	220	100	8,44	2,52	4,13	3,50	3,50	4,13	3	5,60	4,98
8,0 x 340	14,5	240	100	8,44	2,52	4,13	3,50	3,50	4,13	3	5,60	4,98
8,0 x 360	14,5	260	100	8,44	2,52	4,13	3,50	3,50	4,13	3	5,60	4,98
8,0 x 380	14,5	280	100	8,44	2,52	4,13	3,50	3,50	4,13	3	5,60	4,98
8,0 x 400	14,5	300	100	8,44	2,52	4,13	3,50	3,50	4,13	3	5,60	4,98

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 350 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
a) The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d = R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

TECHNICAL INFORMATION
PANELTWISTEC AG, COUNTERSUNK HEAD SCREW, BLUE GALVANISED

ETA
CE
Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber				Shearing steel-timber		
												
d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								α_{AD}= 0°	α_{AD}= 90°			
						α= 0°	α=90°	α_{ET}= 90°	α_{ET}= 0°		α= 0°	α= 90°
8,0 x 420	14,5	300	100	8,44	2,52	4,13	3,50	3,50	4,13	3	5,60	4,98
8,0 x 440	14,5	300	100	8,44	2,52	4,13	3,50	3,50	4,13	3	5,60	4,98
8,0 x 460	14,5	300	100	8,44	2,52	4,13	3,50	3,50	4,13	3	5,60	4,98
8,0 x 480	14,5	300	100	8,44	2,52	4,13	3,50	3,50	4,13	3	5,60	4,98
8,0 x 500	14,5	300	100	8,44	2,52	4,13	3,50	3,50	4,13	3	5,60	4,98
8,0 x 550	14,5	300	100	8,44	2,52	4,13	3,50	3,50	4,13	3	5,60	4,98
8,0 x 600	14,5	300	100	8,44	2,52	4,13	3,50	3,50	4,13	3	5,60	4,98
10,0 x 100	17,8	40	60	6,48	3,63	5,73	4,37	5,73	4,37	3	6,78	5,81
10,0 x 120	17,8	50	70	7,13	3,63	6,07	4,87	6,07	4,87	3	6,94	5,97
10,0 x 140	17,8	40	100	10,26	3,63	5,73	4,37	5,73	4,37	3	7,72	6,76
10,0 x 160	17,8	60	100	10,26	3,63	6,07	5,10	6,07	5,10	3	7,72	6,76
10,0 x 180	17,8	80	100	10,26	3,63	6,07	5,10	6,07	5,10	3	7,72	6,76
10,0 x 200	17,8	100	100	10,26	3,63	6,07	5,10	5,10	6,07	3	7,72	6,76
10,0 x 220	17,8	120	100	10,26	3,63	6,07	5,10	5,10	6,07	3	7,72	6,76
10,0 x 240	17,8	140	100	10,26	3,63	6,07	5,10	5,10	6,07	3	7,72	6,76
10,0 x 260	17,8	160	100	10,26	3,63	6,07	5,10	5,10	6,07	3	7,72	6,76
10,0 x 280	17,8	180	100	10,26	3,63	6,07	5,10	5,10	6,07	3	7,72	6,76
10,0 x 300	17,8	200	100	10,26	3,63	6,07	5,10	5,10	6,07	3	7,72	6,76
10,0 x 320	17,8	220	100	10,26	3,63	6,07	5,10	5,10	6,07	3	7,72	6,76
10,0 x 340	17,8	240	100	10,26	3,63	6,07	5,10	5,10	6,07	3	7,72	6,76
10,0 x 360	17,8	260	100	10,26	3,63	6,07	5,10	5,10	6,07	3	7,72	6,76
10,0 x 380	17,8	280	100	10,26	3,63	6,07	5,10	5,10	6,07	3	7,72	6,76
10,0 x 400	17,8	300	100	10,26	3,63	6,07	5,10	5,10	6,07	3	7,72	6,76

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 350 kg/m³. All stated mechanical values should be considered subject to the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d = R_k \cdot k_{mod} / \gamma_M$. The design values of the load-bearing capacity R_d must be compared with the design values the effects E_d ($R_d \geq E_d$).

Example:

Characteristic value for the continuous action (dead load) G_k= 2.00 kN and variable action, e.g. snow load Q_k= 3.00 kN. k_{mod}= 0.9. γ_M= 1.3.
→ Design value of the action E_d= 2.00 · 1.35 + 3.00 · 1.5= 7.20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k = R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k = R_d \cdot \gamma_M / k_{mod}$ → R_k= 7.20 kN · 1.3/0.9= 10.40 kN → Comparison with the table values.

Attention: These are planning aids. The projects must always be designed by authorised persons.

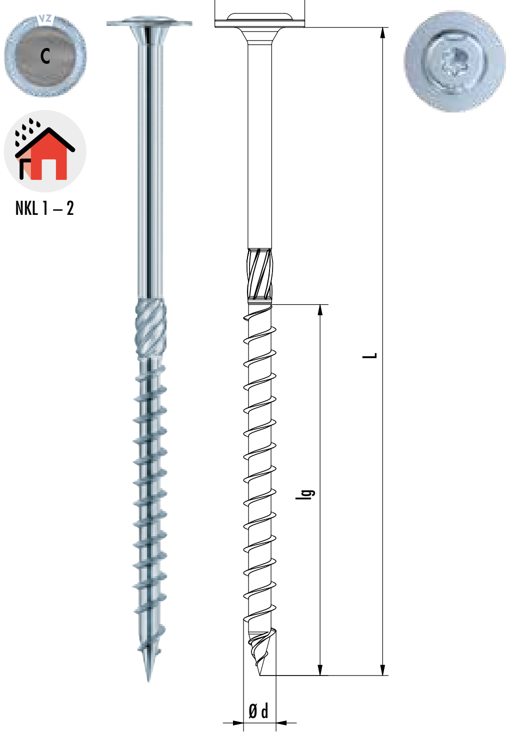
PANELTWISTEC AG, WASHER HEAD SCREW

Blue galvanised

Paneltwistec AG

Washer head screw, screw tip AG, blue galvanised

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024



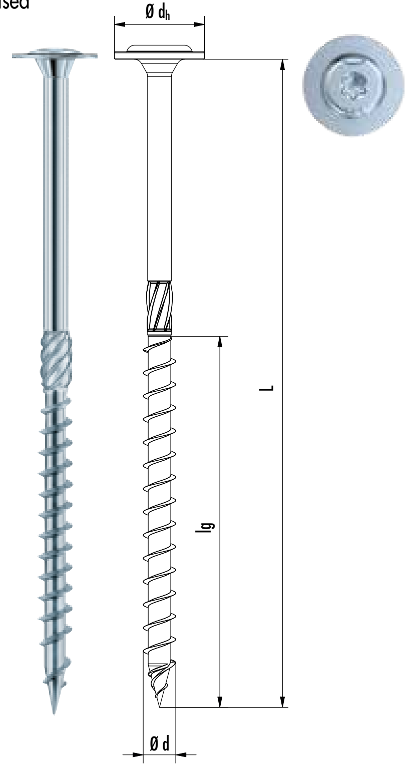
Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
946158	4,0	40	10,0	24	TX20	500
946159	4,0	50	10,0	30	TX20	500
946160	4,0	60	10,0	36	TX20	500
946161	4,5	50	11,0	30	TX20	200
946162	4,5	60	11,0	36	TX20	200
946163	4,5	70	11,0	42	TX20	200
946037	5,0	50	12,0	30	TX25	200
946038	5,0	60	12,0	36	TX25	200
946039	5,0	70	12,0	42	TX25	200
946040	5,0	80	12,0	48	TX25	200
946042	5,0	100	12,0	60	TX25	200
945947	6,0	30	14,0	24	TX30	100
945948	6,0	40	14,0	24	TX30	100
945712	6,0	50	14,0	30	TX30	100
945713	6,0	60	14,0	36	TX30	100
945716	6,0	70	14,0	42	TX30	100
945717	6,0	80	14,0	48	TX30	100
945718	6,0	90	14,0	54	TX30	100
945719	6,0	100	14,0	60	TX30	100
945720	6,0	110	14,0	66	TX30	100
945721	6,0	120	14,0	70	TX30	100
945722	6,0	130	14,0	70	TX30	100
945723	6,0	140	14,0	70	TX30	100
945724	6,0	150	14,0	70	TX30	100
945725	6,0	160	14,0	70	TX30	100
945726	6,0	180	14,0	70	TX30	100
945727	6,0	200	14,0	70	TX30	100
945728	6,0	220	14,0	70	TX30	100
945729	6,0	240	14,0	70	TX30	100
945730	6,0	260	14,0	70	TX30	100
945731	6,0	280	14,0	70	TX30	100
945732	6,0	300	14,0	70	TX30	100
945717-TX40	6,0	80	14,0	48	TX40	100
945719-TX40	6,0	100	14,0	60	TX40	100
945721-TX40	6,0	120	14,0	70	TX40	100
945723-TX40	6,0	140	14,0	70	TX40	100
945725-TX40	6,0	160	14,0	70	TX40	100
945726-TX40	6,0	180	14,0	70	TX40	100
945727-TX40	6,0	200	14,0	70	TX40	100
945728-TX40	6,0	220	14,0	70	TX40	100
945729-TX40	6,0	240	14,0	70	TX40	100
945733	6,0	320	14,0	70	TX40	100
945734	6,0	340	14,0	70	TX40	100
945735	6,0	360	14,0	70	TX40	100
945736	6,0	380	14,0	70	TX40	100
945737	6,0	400	14,0	70	TX40	100

PANELTWISTEC AG, WASHER HEAD SCREW

Paneltwistec AG

Washer head screw, screw tip AG, blue galvanised

NKL 1 – 2



Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
945806	8,0	60	22,0	50	TX40 ●	50
944588	8,0	80	22,0	60	TX40 ●	50
944589	8,0	100	22,0	70	TX40 ●	50
944590	8,0	120	22,0	100	TX40 ●	50
944591	8,0	140	22,0	100	TX40 ●	50
944592	8,0	160	22,0	100	TX40 ●	50
944593	8,0	180	22,0	100	TX40 ●	50
944594	8,0	200	22,0	100	TX40 ●	50
944595	8,0	220	22,0	100	TX40 ●	50
944596	8,0	240	22,0	100	TX40 ●	50
944597	8,0	260	22,0	100	TX40 ●	50
944598	8,0	280	22,0	100	TX40 ●	50
944599	8,0	300	22,0	100	TX40 ●	50
944600	8,0	320	22,0	100	TX40 ●	50
944601	8,0	340	22,0	100	TX40 ●	50
944602	8,0	360	22,0	100	TX40 ●	50
944603	8,0	380	22,0	100	TX40 ●	50
944604	8,0	400	22,0	100	TX40 ●	50
944605	8,0	420	22,0	100	TX40 ●	50
944606	8,0	440	22,0	100	TX40 ●	50
944607	8,0	460	22,0	100	TX40 ●	50
944608	8,0	480	22,0	100	TX40 ●	50
944609	8,0	500	22,0	100	TX40 ●	50
944610	8,0	550	22,0	100	TX40 ●	50
944611	8,0	600	22,0	100	TX40 ●	50
945750	10,0	80	25,0	48	TX50 ●	50
945751	10,0	100	25,0	60	TX50 ●	50
945752	10,0	120	25,0	70	TX50 ●	50
945753	10,0	140	25,0	100	TX50 ●	50
945754	10,0	160	25,0	100	TX50 ●	50
945755	10,0	180	25,0	100	TX50 ●	50
945756	10,0	200	25,0	100	TX50 ●	50
945757	10,0	220	25,0	100	TX50 ●	50
945758	10,0	240	25,0	100	TX50 ●	50
945759	10,0	260	25,0	100	TX50 ●	50
945760	10,0	280	25,0	100	TX50 ●	50
945761	10,0	300	25,0	100	TX50 ●	50
945762	10,0	320	25,0	100	TX50 ●	50
945763	10,0	340	25,0	100	TX50 ●	50
945764	10,0	360	25,0	100	TX50 ●	50
945765	10,0	380	25,0	100	TX50 ●	50
945766	10,0	400	25,0	100	TX50 ●	50

Paneltwistec washer head screw for wall screw connections

TECHNICAL INFORMATION
PANELTWISTEC AG, WASHER HEAD SCREW, BLUE GALVANISED

Europ. Techn. Bewertung
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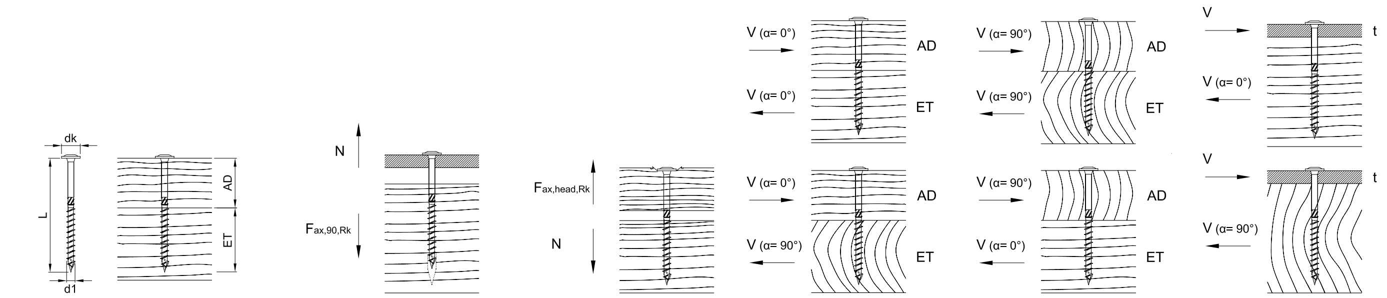
<table>
<tr><th colspan="4">Dimensions</th><th>Extraction resistance</th><th>Head pull-through resistance</th><th colspan="4">Shearing timber-timber</th><th colspan="3">Shearing steel-timber</th></tr>
<tr><td colspan="13">
</td></tr>
<tr><th>d1 x L [mm]</th><th>dk [mm]</th><th>AD [mm]</th><th>ET [mm]</th><th>$F_{ax,90,Rk}$ [kN]</th><th>$F_{ax,head,Rk}$ [kN]</th><th>$F_{la,Rk}$ [kN]</th><th>$F_{la,Rk}$ [kN]</th><th>$F_{la,Rk}$ [kN]</th><th>$F_{la,Rk}$ [kN]</th><th>t [mm]</th><th>$F_{la,Rk}$ [kN]</th><th>$F_{la,Rk}$ [kN]</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>α_{AD}= 0°</td><td>α_{AD}= 90°</td><td></td><td></td><td></td></tr>
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<tr><td>4,0 x 40</td><td>10,0</td><td>16</td><td>24</td><td>1,24</td><td>1,20</td><td colspan="4">0,95</td><td>2</td><td colspan="2">1,15</td></tr>
<tr><td>4,0 x 50</td><td>10,0</td><td>20</td><td>30</td><td>1,55</td><td>1,20</td><td colspan="4">1,03</td><td>2</td><td colspan="2">1,23</td></tr>
<tr><td>4,0 x 60</td><td>10,0</td><td>24</td><td>36</td><td>1,86</td><td>1,20</td><td colspan="4">1,12</td><td>2</td><td colspan="2">1,31</td></tr>
<tr><td>4,5 x 50</td><td>11,0</td><td>20</td><td>30</td><td>1,69</td><td>1,45</td><td colspan="4">1,20</td><td>2</td><td colspan="2">1,44</td></tr>
<tr><td>4,5 x 60</td><td>11,0</td><td>24</td><td>36</td><td>2,03</td><td>1,45</td><td colspan="4">1,29</td><td>2</td><td colspan="2">1,53</td></tr>
<tr><td>4,5 x 70</td><td>11,0</td><td>28</td><td>42</td><td>2,36</td><td>1,45</td><td colspan="4">1,38</td><td>2</td><td colspan="2">1,61</td></tr>
<tr><td>5,0 x 50</td><td>12,0</td><td>20</td><td>30</td><td>1,82</td><td>1,73</td><td colspan="4">1,37</td><td>2</td><td colspan="2">1,67</td></tr>
<tr><td>5,0 x 60</td><td>12,0</td><td>24</td><td>36</td><td>2,18</td><td>1,73</td><td colspan="4">1,47</td><td>2</td><td colspan="2">1,76</td></tr>
<tr><td>5,0 x 70</td><td>12,0</td><td>28</td><td>42</td><td>2,54</td><td>1,73</td><td colspan="4">1,57</td><td>2</td><td colspan="2">1,85</td></tr>
<tr><td>5,0 x 80</td><td>12,0</td><td>32</td><td>48</td><td>2,90</td><td>1,73</td><td colspan="4">1,65</td><td>2</td><td colspan="2">1,94</td></tr>
<tr><td>5,0 x 100</td><td>12,0</td><td>40</td><td>60</td><td>3,63</td><td>1,73</td><td colspan="4">1,65</td><td>2</td><td colspan="2">2,12</td></tr>
<tr><td>6,0 x 30</td><td>14,0</td><td>6</td><td>24</td><td>1,64</td><td>2,35</td><td colspan="4">0,65</td><td>2</td><td colspan="2">1,20</td></tr>
<tr><td>6,0 x 40</td><td>14,0</td><td>16</td><td>24</td><td>1,64</td><td>2,35</td><td colspan="4">1,33</td><td>2</td><td colspan="2">1,63</td></tr>
<tr><td>6,0 x 50</td><td>14,0</td><td>20</td><td>30</td><td>2,05</td><td>2,35</td><td colspan="4">1,66</td><td>2</td><td colspan="2">2,06</td></tr>
<tr><td>6,0 x 60</td><td>14,0</td><td>24</td><td>36</td><td>2,46</td><td>2,35</td><td colspan="4">1,87</td><td>2</td><td colspan="2">2,26</td></tr>
<tr><td>6,0 x 70</td><td>14,0</td><td>28</td><td>42</td><td>2,87</td><td>2,35</td><td colspan="4">1,97</td><td>2</td><td colspan="2">2,36</td></tr>
<tr><td>6,0 x 80</td><td>14,0</td><td>32</td><td>48</td><td>3,28</td><td>2,35</td><td colspan="4">2,09</td><td>2</td><td colspan="2">2,46</td></tr>
<tr><td>6,0 x 90</td><td>14,0</td><td>36</td><td>54</td><td>3,69</td><td>2,35</td><td colspan="4">2,21</td><td>2</td><td colspan="2">2,57</td></tr>
<tr><td>6,0 x 100</td><td>14,0</td><td>40</td><td>60</td><td>4,10</td><td>2,35</td><td colspan="4">2,23</td><td>2</td><td colspan="2">2,67</td></tr>
<tr><td>6,0 x 110</td><td>14,0</td><td>44</td><td>66</td><td>4,79</td><td>2,35</td><td colspan="4">2,23</td><td>2</td><td colspan="2">2,77</td></tr>
<tr><td>6,0 x 120</td><td>14,0</td><td>50</td><td>70</td><td>4,79</td><td>2,35</td><td colspan="4">2,23</td><td>2</td><td colspan="2">2,84</td></tr>
<tr><td>6,0 x 130</td><td>14,0</td><td>60</td><td>70</td><td>4,79</td><td>2,35</td><td colspan="4">2,23</td><td>2</td><td colspan="2">2,84</td></tr>
<tr><td>6,0 x 140</td><td>14,0</td><td>70</td><td>70</td><td>4,79</td><td>2,35</td><td colspan="4">2,23</td><td>2</td><td colspan="2">2,84</td></tr>
<tr><td>6,0 x 150</td><td>14,0</td><td>80</td><td>70</td><td>4,79</td><td>2,35</td><td colspan="4">2,23</td><td>2</td><td colspan="2">2,84</td></tr>
<tr><td>6,0 x 160</td><td>14,0</td><td>90</td><td>70</td><td>4,79</td><td>2,35</td><td colspan="4">2,23</td><td>2</td><td colspan="2">2,84</td></tr>
<tr><td>6,0 x 180</td><td>14,0</td><td>110</td><td>70</td><td>4,79</td><td>2,35</td><td colspan="4">2,23</td><td>2</td><td colspan="2">2,84</td></tr>
<tr><td>6,0 x 200</td><td>14,0</td><td>130</td><td>70</td><td>4,79</td><td>2,35</td><td colspan="4">2,23</td><td>2</td><td colspan="2">2,84</td></tr>
<tr><td>6,0 x 220</td><td>14,0</td><td>150</td><td>70</td><td>4,79</td><td>2,35</td><td colspan="4">2,23</td><td>2</td><td colspan="2">2,84</td></tr>
<tr><td>6,0 x 240</td><td>14,0</td><td>170</td><td>70</td><td>4,79</td><td>2,35</td><td colspan="4">2,23</td><td>2</td><td colspan="2">2,84</td></tr>
<tr><td>6,0 x 260</td><td>14,0</td><td>190</td><td>70</td><td>4,79</td><td>2,35</td><td colspan="4">2,23</td><td>2</td><td colspan="2">2,84</td></tr>
<tr><td>6,0 x 280</td><td>14,0</td><td>210</td><td>70</td><td>4,79</td><td>2,35</td><td colspan="4">2,23</td><td>2</td><td colspan="2">2,84</td></tr>
<tr><td>6,0 x 300</td><td>14,0</td><td>230</td><td>70</td><td>4,79</td><td>2,35</td><td colspan="4">2,23</td><td>2</td><td colspan="2">2,84</td></tr>
<tr><td>6,0 x 320</td><td>12,0</td><td>250</td><td>70</td><td>4,79</td><td>2,35</td><td colspan="4">2,23</td><td>2</td><td colspan="2">2,84</td></tr>
<tr><td>6,0 x 340</td><td>12,0</td><td>270</td><td>70</td><td>4,79</td><td>2,35</td><td colspan="4">2,23</td><td>2</td><td colspan="2">2,84</td></tr>
<tr><td>6,0 x 360</td><td>12,0</td><td>290</td><td>70</td><td>4,79</td><td>2,35</td><td colspan="4">2,23</td><td>2</td><td colspan="2">2,84</td></tr>
<tr><td>6,0 x 380</td><td>12,0</td><td>310</td><td>70</td><td>4,79</td><td>2,35</td><td colspan="4">2,23</td><td>2</td><td colspan="2">2,84</td></tr>
<tr><td>6,0 x 400</td><td>12,0</td><td>330</td><td>70</td><td>4,79</td><td>2,35</td><td colspan="4">2,23</td><td>2</td><td colspan="2">2,84</td></tr>
</table>

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 350 kg/m³. All stated mechanical values should be considered subject to the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d = R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

Example:

Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k = R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k = R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

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TECHNICAL INFORMATION
PANELTWISTEC AG, WASHER HEAD SCREW, BLUE GALVANISED

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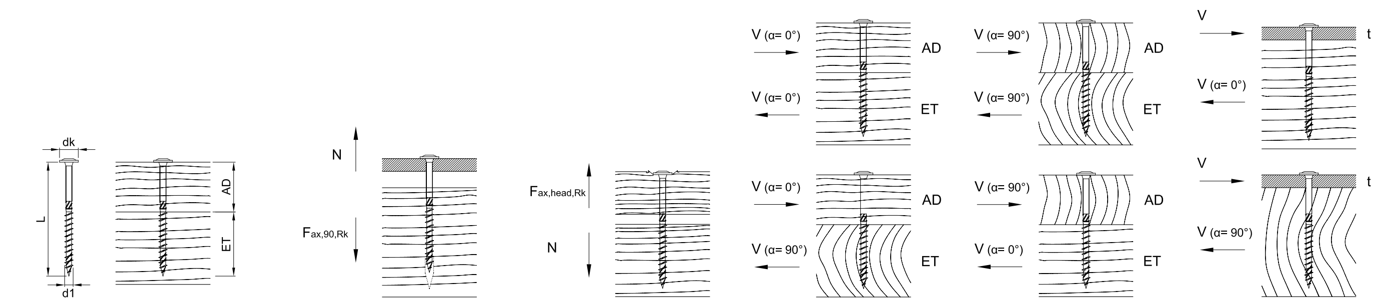

Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber				Shearing steel-timber		
d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								$\alpha_{AD}= 0°$	$\alpha_{AD}= 90°$			
						$\alpha= 0°$	$\alpha=90°$	$\alpha_{ET}= 90°$	$\alpha_{ET}= 0°$		$\alpha= 0°$	$\alpha= 90°$
8,0 x 80	22,0	30	50	4,26	5,81	4,14	3,34	4,14	3,34	3	4,56	3,94
8,0 x 100	22,0	40	60	5,33	5,81	4,83	4,01	4,83	4,01	3	4,83	4,20
8,0 x 120	22,0	50	70	5,86	5,81	4,95	4,32	4,95	4,32	3	4,96	4,34
8,0 x 140	22,0	40	100	8,44	5,81	4,95	4,13	4,95	4,13	3	5,60	4,98
8,0 x 160	22,0	60	100	8,44	5,81	4,95	4,32	4,95	4,32	3	5,60	4,98
8,0 x 180	22,0	80	100	8,44	5,81	4,95	4,32	4,95	4,32	3	5,60	4,98
8,0 x 200	22,0	100	100	8,44	5,81	4,95	4,32	4,32	4,95	3	5,60	4,98
8,0 x 220	22,0	120	100	8,44	5,81	4,95	4,32	4,32	4,95	3	5,60	4,98
8,0 x 240	22,0	140	100	8,44	5,81	4,95	4,32	4,32	4,95	3	5,60	4,98
8,0 x 260	22,0	160	100	8,44	5,81	4,95	4,32	4,32	4,95	3	5,60	4,98
8,0 x 280	22,0	180	100	8,44	5,81	4,95	4,32	4,32	4,95	3	5,60	4,98
8,0 x 300	22,0	200	100	8,44	5,81	4,95	4,32	4,32	4,95	3	5,60	4,98
8,0 x 320	22,0	220	100	8,44	5,81	4,95	4,32	4,32	4,95	3	5,60	4,98
8,0 x 340	22,0	240	100	8,44	5,81	4,95	4,32	4,32	4,95	3	5,60	4,98
8,0 x 360	22,0	260	100	8,44	5,81	4,95	4,32	4,32	4,95	3	5,60	4,98
8,0 x 380	22,0	280	100	8,44	5,81	4,95	4,32	4,32	4,95	3	5,60	4,98
8,0 x 400	22,0	300	100	8,44	5,81	4,95	4,32	4,32	4,95	3	5,60	4,98
8,0 x 420	22,0	300	100	8,44	5,81	4,95	4,32	4,32	4,95	3	5,60	4,98
8,0 x 440	22,0	300	100	8,44	5,81	4,95	4,32	4,32	4,95	3	5,60	4,98
8,0 x 460	22,0	300	100	8,44	5,81	4,95	4,32	4,32	4,95	3	5,60	4,98
8,0 x 480	22,0	300	100	8,44	5,81	4,95	4,32	4,32	4,95	3	5,60	4,98
8,0 x 500	22,0	300	100	8,44	5,81	4,95	4,32	4,32	4,95	3	5,60	4,98
8,0 x 550	22,0	300	100	8,44	5,81	4,95	4,32	4,32	4,95	3	5,60	4,98
8,0 x 600	22,0	300	100	8,44	5,81	4,95	4,32	4,32	4,95	3	5,60	4,98

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That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k = R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

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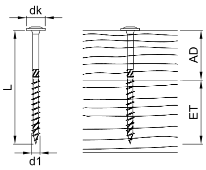
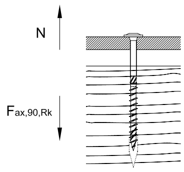
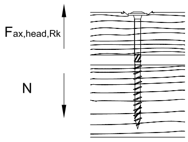
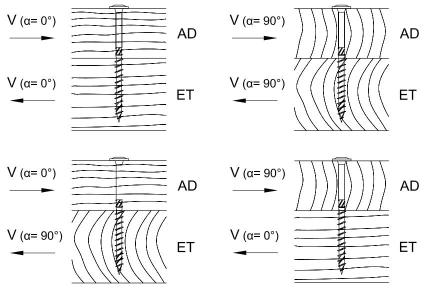
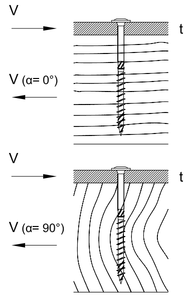
Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber				Shearing steel-timber		











d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								α_{AD}= 0°	α_{AD}= 90°			
						α= 0°	α=90°	α_{ET}= 90°	α_{ET}= 0°		α= 0°	α= 90°
10,0 x 100	25,0	40	60	6,48	7,50	6,44	5,08	6,44	5,08	3	6,78	5,81
10,0 x 120	25,0	50	70	7,13	7,50	6,94	5,74	6,94	5,74	3	6,94	5,97
10,0 x 140	25,0	40	100	10,26	7,50	6,70	5,34	6,70	5,34	3	7,72	6,76
10,0 x 160	25,0	60	100	10,26	7,50	7,03	6,07	7,03	6,07	3	7,72	6,76
10,0 x 180	25,0	80	100	10,26	7,50	7,03	6,07	7,03	6,07	3	7,72	6,76
10,0 x 200	25,0	100	100	10,26	7,50	7,03	6,07	6,07	7,03	3	7,72	6,76
10,0 x 220	25,0	120	100	10,26	7,50	7,03	6,07	6,07	7,03	3	7,72	6,76
10,0 x 240	25,0	140	100	10,26	7,50	7,03	6,07	6,07	7,03	3	7,72	6,76
10,0 x 260	25,0	160	100	10,26	7,50	7,03	6,07	6,07	7,03	3	7,72	6,76
10,0 x 280	25,0	180	100	10,26	7,50	7,03	6,07	6,07	7,03	3	7,72	6,76
10,0 x 300	25,0	200	100	10,26	7,50	7,03	6,07	6,07	7,03	3	7,72	6,76
10,0 x 320	25,0	220	100	10,26	7,50	7,03	6,07	6,07	7,03	3	7,72	6,76
10,0 x 340	25,0	240	100	10,26	7,50	7,03	6,07	6,07	7,03	3	7,72	6,76
10,0 x 360	25,0	260	100	10,26	7,50	7,03	6,07	6,07	7,03	3	7,72	6,76
10,0 x 380	25,0	280	100	10,26	7,50	7,03	6,07	6,07	7,03	3	7,72	6,76
10,0 x 400	25,0	300	100	10,26	7,50	7,03	6,07	6,07	7,03	3	7,72	6,76

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 350 kg/m³. All stated values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d= R_k \cdot k_{mod} / \gamma_M$. The design values of the load-bearing capacity R_d must be compared with the design values the effects E_d ($R_d \geq E_d$).

Example:

Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k= R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k= R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

Attention: These are planning aids. The projects must always be designed by authorised persons.

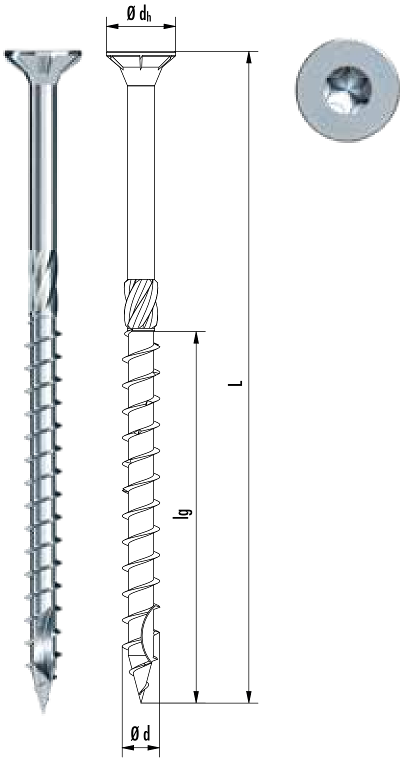
PANELTWISTEC

Steel blue galvanised

Paneltwistec

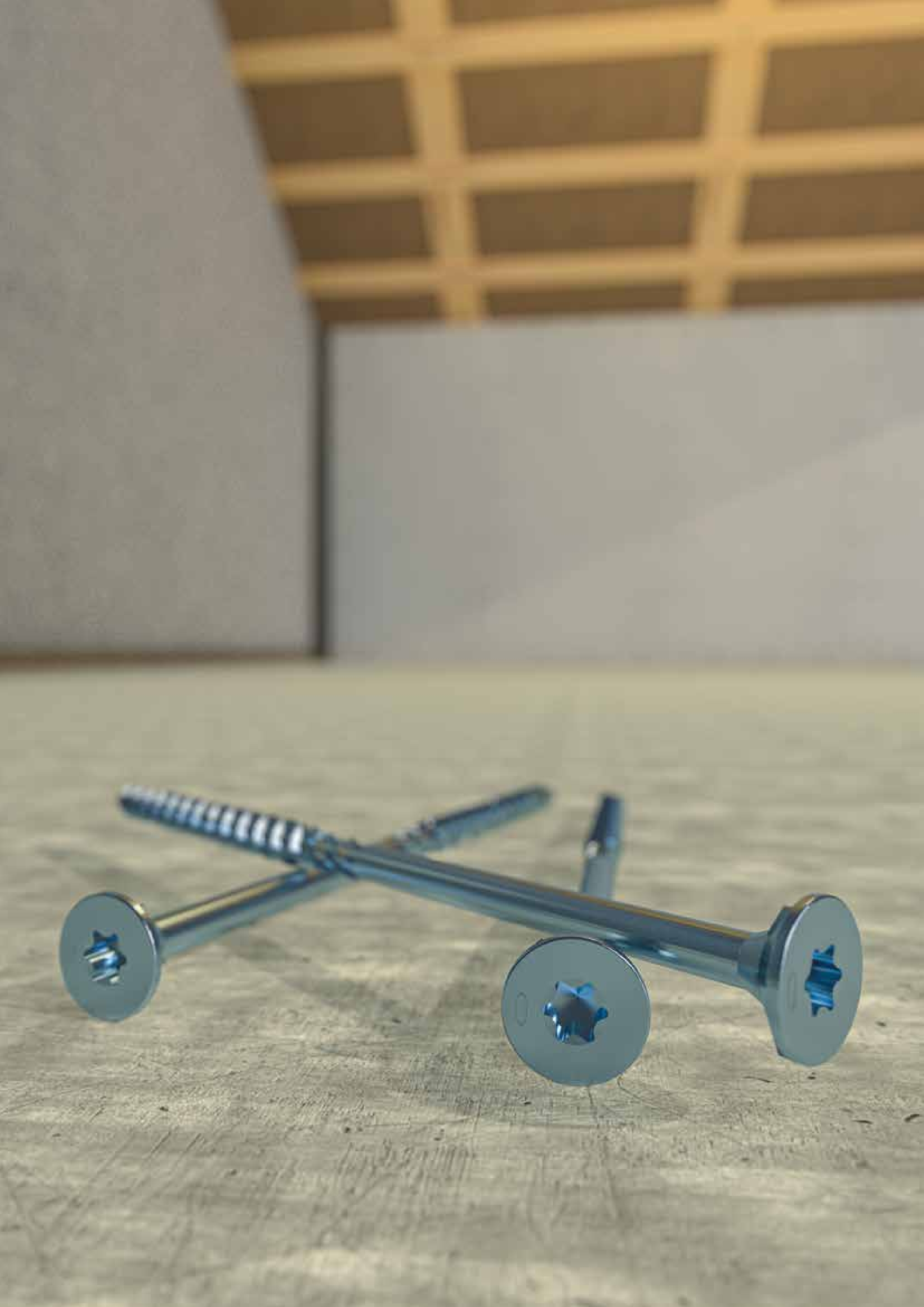
Countersunk head, screw tip with self-clearing groove, steel blue galvanised

NKL 1 – 2



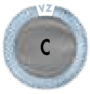
Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
8903045	3,5	30	7,0	18	TX15	1000
8903044	3,5	35	7,0	21	TX15	1000
8903001	3,5	40	7,0	24	TX15	1000
8903002	3,5	50	7,0	30	TX15	500
8903003	4,0	30	8,0	18	TX20	1000
8903603	4,0	35	8,0	21	TX20	1000
8903004	4,0	40	8,0	24	TX20	1000
8902089	4,0	45	8,0	27	TX20	500
8903005	4,0	50	8,0	30	TX20	500
8903006	4,0	60	8,0	36	TX20	200
8903007	4,0	70	8,0	42	TX20	200
8903008	4,0	80	8,0	48	TX20	200
8903009	4,5	40	9,0	24	TX25	500
8903087	4,5	45	9,0	27	TX25	500
8903010	4,5	50	9,0	30	TX25	500
8903088	4,5	55	9,0	36	TX25	500
8903011	4,5	60	9,0	36	TX25	200
8903012	4,5	70	9,0	42	TX25	200
8903013	4,5	80	9,0	48	TX25	200
8903014	5,0	40	10,0	24	TX25	200
8903015	5,0	50	10,0	30	TX25	200
8903016	5,0	60	10,0	36	TX25	200
8903017	5,0	70	10,0	42	TX25	200
8903018	5,0	80	10,0	48	TX25	200
8903578	5,0	90	10,0	54	TX25	200
8903019	5,0	100	10,0	60	TX25	200
8903020	5,0	120	10,0	70	TX25	200
8903021	6,0	60	12,0	36	TX30	200
8903022	6,0	70	12,0	42	TX30	200
8903023	6,0	80	12,0	48	TX30	200
8903163	6,0	90	12,0	54	TX30	100
8903024	6,0	100	12,0	60	TX30	100
8903025	6,0	120	12,0	70	TX30	100
8903026	6,0	130	12,0	70	TX30	100
8903027	6,0	140	12,0	70	TX30	100
8903030	6,0	150	12,0	70	TX30	100
8903029	6,0	160	12,0	70	TX30	100
8903031	6,0	180	12,0	70	TX30	100
8903032	6,0	200	12,0	70	TX30	100
8903033	6,0	220	12,0	70	TX30	100
8903034	6,0	240	12,0	70	TX30	100
8903035	6,0	260	12,0	70	TX30	100
8903036	6,0	280	12,0	70	TX30	100
8903037	6,0	300	12,0	70	TX30	100

other sizes on the next page

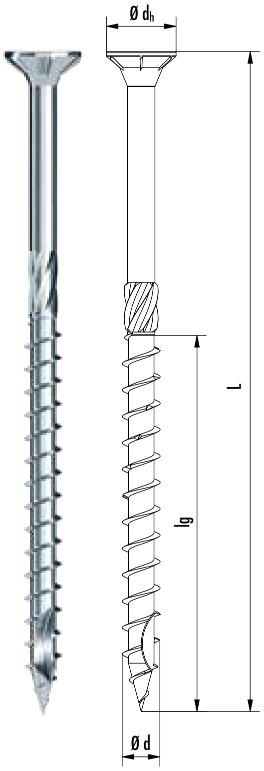


Paneltwistec

Countersunk head, screw tip with self-clearing groove, steel blue galvanised



NKL 1 – 2

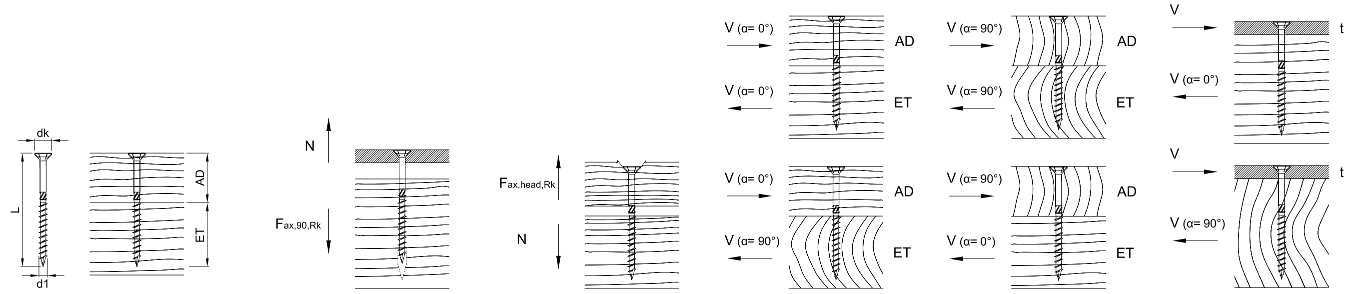


Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
903443	8,0	80	14,5	48	TX40 ●	1000
903435	8,0	100	14,5	60	TX40 ●	1000
903419	8,0	120	14,5	66	TX40 ●	1000
903420	8,0	140	14,5	95	TX40 ●	500
903421	8,0	160	14,5	95	TX40 ●	1000
903422	8,0	180	14,5	95	TX40 ●	1000
903423	8,0	200	14,5	95	TX40 ●	1000
903424	8,0	220	14,5	95	TX40 ●	500
903425	8,0	240	14,5	95	TX40 ●	1000
903426	8,0	260	14,5	95	TX40 ●	200
903427	8,0	280	14,5	95	TX40 ●	200
903428	8,0	300	14,5	95	TX40 ●	200
903429	8,0	320	14,5	95	TX40 ●	500
903430	8,0	340	14,5	95	TX40 ●	500
903431	8,0	360	14,5	95	TX40 ●	500
903432	8,0	380	14,5	95	TX40 ●	500
903433	8,0	400	14,5	95	TX40 ●	200
975780	12,0	120	20,0	80	TX50 ●	25
975781	12,0	140	20,0	80	TX50 ●	25
975782	12,0	160	20,0	80	TX50 ●	25
975783	12,0	180	20,0	80	TX50 ●	25
975784	12,0	200	20,0	80	TX50 ●	25
975785	12,0	220	20,0	100	TX50 ●	25
975786	12,0	240	20,0	100	TX50 ●	25
975787	12,0	260	20,0	100	TX50 ●	25
975788	12,0	280	20,0	100	TX50 ●	25
975789	12,0	300	20,0	100	TX50 ●	25
975790	12,0	320	20,0	100	TX50 ●	25
975791	12,0	340	20,0	120	TX50 ●	25
975792	12,0	360	20,0	120	TX50 ●	25
975793	12,0	380	20,0	120	TX50 ●	25
975794	12,0	400	20,0	120	TX50 ●	25
975795	12,0	500	20,0	120	TX50 ●	25
975796	12,0	600	20,0	120	TX50 ●	25

TECHNICAL INFORMATION
PANELTWISTEC, COUNTERSUNK HEAD, STEEL BLUE GALVANISED

ETA – Europ. Techn. Bewertung / European Technical Assessment ETA-11/0024 – CE

Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber				Shearing steel-timber		



d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								$\alpha_{AD}= 0°$	$\alpha_{AD}= 90°$			
						α= 0°	α=90°	$\alpha_{ET}= 90°$	$\alpha_{ET}= 0°$		α= 0°	α= 90°
3,5 x 30	7,0	12	18	0,84	0,59	0,62				1	0,86	
3,5 x 35	7,0	14	21	0,98	0,59	0,67				1	0,92	
3,5 x 40	7,0	16	24	1,12	0,59	0,70				1	0,95	
3,5 x 45	7,0	18	27	1,26	0,59	0,74				1	0,99	
3,5 x 50	7,0	20	30	1,40	0,59	0,78				1	1,02	
4,0 x 30	8,0	12	18	0,93	0,77	0,71				2	0,91	
4,0 x 35	8,0	14	21	1,08	0,77	0,80				2	1,07	
4,0 x 40	8,0	16	24	1,24	0,77	0,84				2	1,15	
4,0 x 45	8,0	18	27	1,39	0,77	0,88				2	1,19	
4,0 x 50	8,0	20	30	1,55	0,77	0,92				2	1,23	
4,0 x 60	8,0	24	36	1,86	0,77	1,01				2	1,31	
4,0 x 70	8,0	28	42	2,17	0,77	1,03				2	1,38	
4,0 x 80	8,0	32	48	2,48	0,77	1,03				2	1,46	
4,5 x 40	9,0	16	24	1,35	0,97	1,00				2	1,34	
4,5 x 45	9,0	18	27	1,52	0,97	1,03				2	1,40	
4,5 x 50	9,0	20	30	1,69	0,97	1,08				2	1,44	
4,5 x 55	9,0	19	36	2,03	0,97	1,05				2	1,53	
4,5 x 60	9,0	24	36	2,03	0,97	1,17				2	1,53	
4,5 x 70	9,0	28	42	2,36	0,97	1,26				2	1,61	
4,5 x 80	9,0	32	48	2,70	0,97	1,26				2	1,70	
5,0 x 40	10,0	16	24	1,45	1,20	1,11				2	1,44	
5,0 x 50	10,0	20	30	1,82	1,20	1,24				2	1,67	
5,0 x 60	10,0	24	36	2,18	1,20	1,34				2	1,76	
5,0 x 70	10,0	28	42	2,54	1,20	1,44				2	1,85	
5,0 x 80	10,0	32	48	2,90	1,20	1,52				2	1,94	
5,0 x 90	10,0	36	54	3,27	1,20	1,52				2	2,03	
5,0 x 100	10,0	40	60	3,63	1,20	1,52				2	2,12	
5,0 x 120	10,0	50	70	4,24	1,20	1,52				2	2,27	

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 350 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d= R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

Example:

Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k= R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k= R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

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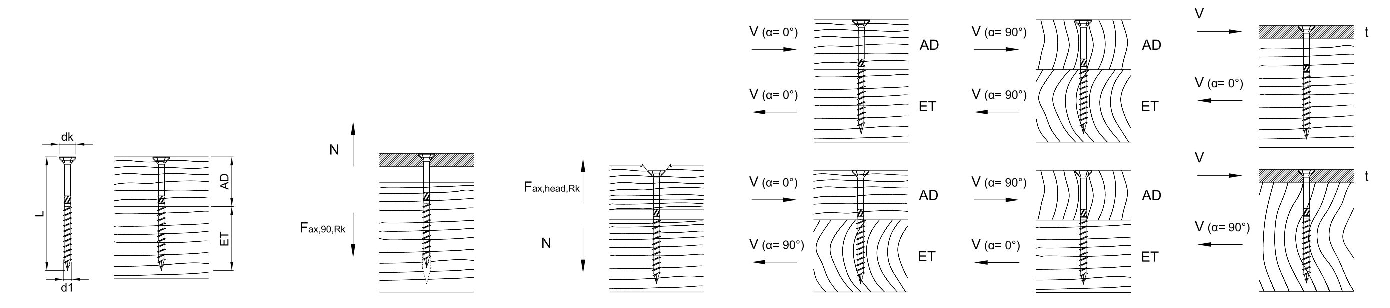
TECHNICAL INFORMATION
PANELTWISTEC, COUNTERSUNK HEAD, STEEL BLUE GALVANISED

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024



d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								α_{AD}= 0°	α_{AD}= 90°			
						α= 0°	α=90°	α_{ET}= 90°	α_{ET}= 0°		α= 0°	α= 90°
6,0 x 60	12,0	24	36	2,46	1,73	1,71				2	2,26	
6,0 x 70	12,0	28	42	2,87	1,73	1,82				2	2,36	
6,0 x 80	12,0	32	48	3,28	1,73	1,93				2	2,46	
6,0 x 90	12,0	36	54	3,69	1,73	2,05				2	2,57	
6,0 x 100	12,0	40	60	4,10	1,73	2,07				2	2,67	
6,0 x 110	12,0	40	70	4,79	1,73	2,07				2	2,84	
6,0 x 120	12,0	50	70	4,79	1,73	2,07				2	2,84	
6,0 x 130	12,0	60	70	4,79	1,73	2,07				2	2,84	
6,0 x 140	12,0	70	70	4,79	1,73	2,07				2	2,84	
6,0 x 150	12,0	80	70	4,79	1,73	2,07				2	2,84	
6,0 x 160	12,0	90	70	4,79	1,73	2,07				2	2,84	
6,0 x 180	12,0	110	70	4,79	1,73	2,07				2	2,84	
6,0 x 200	12,0	130	70	4,79	1,73	2,07				2	2,84	
6,0 x 220	12,0	150	70	4,79	1,73	2,07				2	2,84	
6,0 x 240	12,0	170	70	4,79	1,73	2,07				2	2,84	
6,0 x 260	12,0	190	70	4,79	1,73	2,07				2	2,84	
6,0 x 280	12,0	210	70	4,79	1,73	2,07				2	2,84	
6,0 x 300	12,0	230	70	4,79	1,73	2,07				2	2,84	

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 350 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
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Example:

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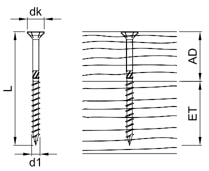
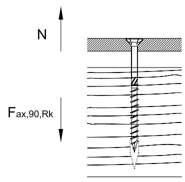
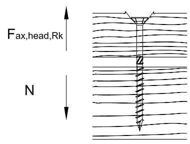
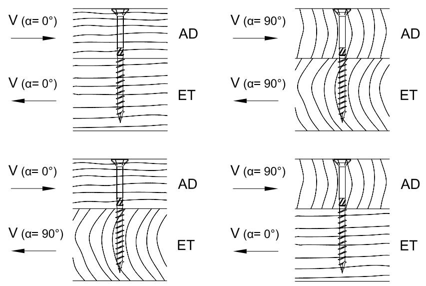
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= <u>7,20 kN.</u>
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k = R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k = R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= <u>10,40 kN</u> → Comparison with the table values.

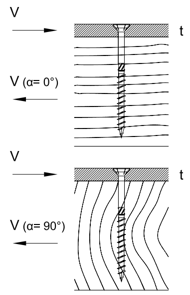
Attention: These are planning aids. The projects must always be designed by authorised persons.











Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber				Shearing steel-timber		
d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								α_{AD}= 0°	α_{AD}= 90°			
						α= 0°	α=90°	α_{ET}= 90°	α_{ET}= 0°		α= 0°	α= 90°
8,0 x 80	14,5	32	48	4,26	2,52	3,71	2,90	3,71	2,90	2	4,56	3,94
8,0 x 100	14,5	40	60	5,33	2,52	4,13	3,30	4,13	3,30	2	4,83	4,20
8,0 x 120	14,5	40	80	7,10	2,52	4,13	3,30	4,13	3,30	2	5,27	4,65
8,0 x 140	14,5	36	80	7,10	2,52	4,13	3,50	4,13	3,50	2	5,27	4,65
8,0 x 160	14,5	60	80	7,10	2,52	4,13	3,50	4,13	3,50	2	5,27	4,65
8,0 x 180	14,5	100	80	7,10	2,52	4,13	3,50	3,50	3,50	2	5,27	4,65
8,0 x 200	14,5	120	80	7,10	2,52	4,13	3,50	3,50	3,50	2	5,27	4,65
8,0 x 220	14,5	140	80	7,10	2,52	4,13	3,50	3,50	3,50	2	5,27	4,65
8,0 x 240	14,5	160	80	7,10	2,52	4,13	3,50	3,50	3,50	2	5,27	4,65
8,0 x 260	14,5	180	80	7,10	2,52	4,13	3,50	3,50	3,50	2	5,27	4,65
8,0 x 280	14,5	200	80	7,10	2,52	4,13	3,50	3,50	3,50	2	5,27	4,65
8,0 x 300	14,5	220	80	7,10	2,52	4,13	3,50	3,50	3,50	2	5,27	4,65
8,0 x 320	14,5	240	80	7,10	2,52	4,13	3,50	3,50	3,50	2	5,27	4,65
8,0 x 340	14,5	260	80	7,10	2,52	4,13	3,50	3,50	3,50	2	5,27	4,65
8,0 x 360	14,5	280	80	7,10	2,52	4,13	3,50	3,50	3,50	2	5,27	4,65
8,0 x 380	14,5	300	80	7,10	2,52	4,13	3,50	3,50	3,50	2	5,27	4,65
8,0 x 400	14,5	320	80	7,10	2,52	4,13	3,50	3,50	3,50	2	5,27	4,65
12,0 x 120	20,0	40	80	10,37	4,80	6,44	4,94	6,00	5,22	20	10,60	9,07
12,0 x 140	20,0	60	80	10,37	4,80	6,86	5,78	6,23	6,23	20	10,60	9,07
12,0 x 160	20,0	80	80	10,37	4,80	6,86	5,78	6,23	6,23	20	10,60	9,07
12,0 x 180	20,0	100	80	10,37	4,80	6,86	5,78	6,23	6,23	20	10,60	9,07
12,0 x 200	20,0	120	80	12,96	4,80	6,86	5,78	6,23	6,23	20	10,60	9,07
12,0 x 220	20,0	120	100	12,96	4,80	6,86	5,78	6,23	6,23	20	11,25	9,07
12,0 x 240	20,0	140	100	12,96	4,80	6,86	5,78	6,23	6,23	20	11,25	9,71
12,0 x 260	20,0	160	100	12,96	4,80	6,86	5,78	6,23	6,23	20	11,25	9,71
12,0 x 280	20,0	180	100	12,96	4,80	6,86	5,78	6,23	6,23	20	11,25	9,71
12,0 x 300	20,0	200	100	12,96	4,80	6,86	5,78	6,23	6,23	20	11,25	9,71
12,0 x 320	20,0	220	100	12,96	4,80	6,86	5,78	6,23	6,23	20	11,25	9,71
12,0 x 340	20,0	220	120	15,55	4,80	6,86	5,78	6,23	6,23	20	11,90	10,36
12,0 x 360	20,0	240	120	15,55	4,80	6,86	5,78	6,23	6,23	20	11,90	10,36
12,0 x 380	20,0	260	120	15,55	4,80	6,86	5,78	6,23	6,23	20	11,90	10,36
12,0 x 400	20,0	280	120	15,55	4,80	6,86	5,78	6,23	6,23	20	11,90	10,36
12,0 x 500	20,0	380	120	15,55	4,80	6,86	5,78	6,23	6,23	20	11,90	10,36
12,0 x 600	20,0	480	120	15,55	4,80	6,86	5,78	6,23	6,23	20	11,90	10,36

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 350 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity Rk must be reduced to the design values R_d with regard to the service and load duration class: $R_d = R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

Example:

Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k = R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k = R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0.9= 10,40 kN → Comparison with the table values.

Attention: These are planning aids. The projects must always be designed by authorised persons.

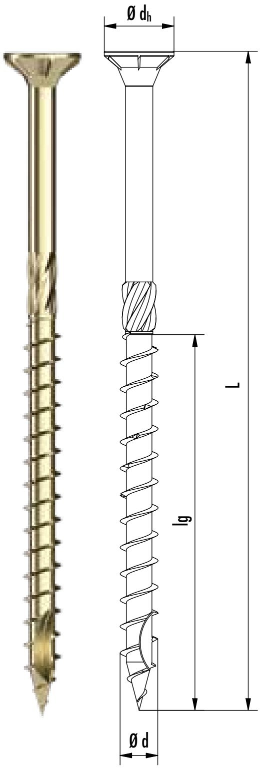
PANELTWISTEC

Steel yellow galvanised

Paneltwistec

Countersunk head, screw tip with self-clearing groove, steel yellow galvanised

ETA-11/0024



Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
903000	3,5	30	7,0	18	TX20	1000
903044	3,5	35	7,0	21	TX20	1000
903001	3,5	40	7,0	24	TX20	1000
903002	3,5	50	7,0	30	TX20	500
903003	4,0	30	8,0	18	TX20	1000
903603	4,0	35	8,0	21	TX20	1000
903004	4,0	40	8,0	24	TX20	1000
902089	4,0	45	8,0	27	TX20	500
903005	4,0	50	8,0	30	TX20	500
903006	4,0	60	8,0	36	TX20	200
903007	4,0	70	8,0	42	TX20	200
903008	4,0	80	8,0	48	TX20	200
903046	4,5	35	9,0	24	TX20	500
903009	4,5	40	9,0	27	TX20	500
903087	4,5	45	9,0	30	TX20	500
903010	4,5	50	9,0	36	TX20	500
903011	4,5	60	9,0	42	TX20	200
903012	4,5	70	9,0	48	TX20	200
903013	4,5	80	9,0	24	TX20	200
903014	5,0	40	10,0	27	TX20	200
903015	5,0	50	10,0	30	TX20	200
903016	5,0	60	10,0	36	TX20	200
903017	5,0	70	10,0	42	TX20	200
903018	5,0	80	10,0	48	TX20	200
903578	5,0	90	10,0	54	TX20	200
903019	5,0	100	10,0	60	TX20	200
903020	5,0	120	10,0	70	TX20	200
903071	5,0	40	10,0	24	TX25	200
903072	5,0	50	10,0	30	TX25	200
903073	5,0	60	10,0	36	TX25	200
903074	5,0	70	10,0	42	TX25	200
903075	5,0	80	10,0	48	TX25	200
903582	5,0	90	10,0	54	TX25	200
903076	5,0	100	10,0	60	TX25	200
903077	5,0	120	10,0	70	TX25	200
903021	6,0	60	12,0	36	TX30	200
903022	6,0	70	12,0	42	TX30	200
903023	6,0	80	12,0	48	TX30	200
903163	6,0	90	12,0	54	TX30	100
903024	6,0	100	12,0	60	TX30	100
903039	6,0	110	12,0	70	TX30	100
903025	6,0	120	12,0	70	TX30	100
903026	6,0	130	12,0	70	TX30	100
903027	6,0	140	12,0	70	TX30	100
903028	6,0	150	12,0	70	TX30	100
903029	6,0	160	12,0	70	TX30	100
903031	6,0	180	12,0	70	TX30	100
903032	6,0	200	12,0	70	TX30	100
903033	6,0	220	12,0	70	TX30	100
903034	6,0	240	12,0	70	TX30	100
903035	6,0	260	12,0	70	TX30	100
903036	6,0	280	12,0	70	TX30	100
903037	6,0	300	12,0	70	TX30	100
903550	8,0	80	14,5	48	TX40	50
903551	8,0	100	14,5	60	TX40	50
902920	8,0	120	14,5	80	TX40	50
902919	8,0	140	14,5	80	TX40	50
902921	8,0	160	14,5	80	TX40	50

other sizes on the next page

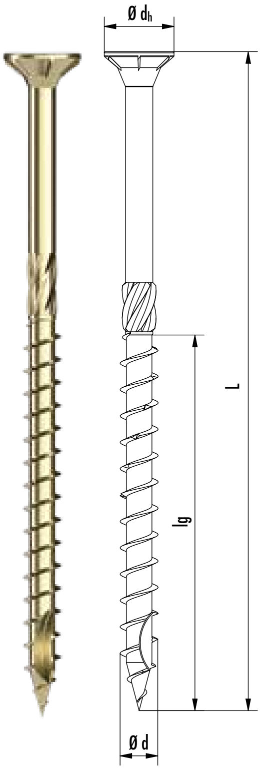
Paneltwistec

Countersunk head, screw tip with
self-clearing groove, steel yellow galvanised

ETA-11/0024

C

NKL 1 – 2

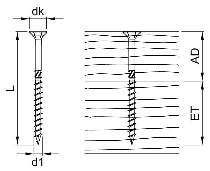
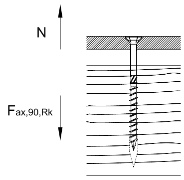
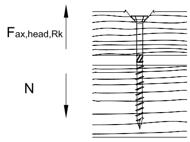
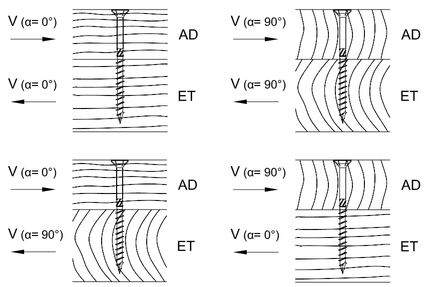
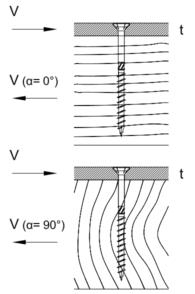


Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
902922	8,0	180	14,5	80	TX40 ●	50
902923	8,0	200	14,5	80	TX40 ●	50
902924	8,0	220	14,5	80	TX40 ●	50
902925	8,0	240	14,5	80	TX40 ●	50
902926	8,0	260	14,5	80	TX40 ●	50
902928	8,0	300	14,5	80	TX40 ●	50
902929	8,0	320	14,5	80	TX40 ●	50
902930	8,0	340	14,5	80	TX40 ●	50
902931	8,0	360	14,5	80	TX40 ●	50
902932	8,0	380	14,5	80	TX40 ●	50
903030	8,0	400	14,5	80	TX40 ●	50
903513	10,0	100	17,4	60	TX50 ●	50
903491	10,0	120	17,4	90	TX50 ●	50
903492	10,0	140	17,4	90	TX50 ●	50
903493	10,0	160	17,4	90	TX50 ●	50
903494	10,0	180	17,4	90	TX50 ●	50
903495	10,0	200	17,4	90	TX50 ●	50
903496	10,0	220	17,4	90	TX50 ●	50
903497	10,0	240	17,4	90	TX50 ●	50
903498	10,0	260	17,4	90	TX50 ●	50
903499	10,0	280	17,4	90	TX50 ●	50
903500	10,0	300	17,4	90	TX50 ●	50
903501	10,0	320	17,4	90	TX50 ●	50
903502	10,0	340	17,4	90	TX50 ●	50
903503	10,0	360	17,4	90	TX50 ●	50
903504	10,0	380	17,4	90	TX50 ●	50
903505	10,0	400	17,4	90	TX50 ●	50

Simple screw connection of a post and beam construction using our Paneltwistec countersunk head

TECHNICAL INFORMATION
PANELTWISTEC, COUNTERSUNK HEAD, STEEL YELLOW GALVANISED

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber				Shearing steel-timber		
												
d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								α_{AD}= 0°	α_{AD}= 90°			
						α= 0°	α=90°	α_{ET}= 90°	α_{ET}= 0°		α= 0°	α= 90°
3,5 x 30	7,0	12	18	0,84	0,59	0,62				1	0,86	
3,5 x 35	7,0	14	21	0,98	0,59	0,67				1	0,92	
3,5 x 40	7,0	16	24	1,12	0,59	0,70				1	0,95	
3,5 x 45	7,0	18	27	1,26	0,59	0,74				1	0,99	
3,5 x 50	7,0	20	30	1,40	0,59	0,78				1	1,02	
4,0 x 30	8,0	12	18	0,93	0,77	0,71				2	0,91	
4,0 x 35	8,0	14	21	1,08	0,77	0,80				2	1,07	
4,0 x 40	8,0	16	24	1,24	0,77	0,84				2	1,15	
4,0 x 45	8,0	18	27	1,39	0,77	0,88				2	1,19	
4,0 x 50	8,0	20	30	1,55	0,77	0,92				2	1,23	
4,0 x 60	8,0	24	36	1,86	0,77	1,01				2	1,31	
4,0 x 70	8,0	28	42	2,17	0,77	1,03				2	1,38	
4,0 x 80	8,0	32	48	2,48	0,77	1,03				2	1,46	
4,5 x 35	9,0	14	21	1,18	0,97	0,90				2	1,32	
4,5 x 40	9,0	16	24	1,35	0,97	1,00				2	1,34	
4,5 x 45	9,0	18	27	1,52	0,97	1,03				2	1,40	
4,5 x 50	9,0	20	30	1,69	0,97	1,08				2	1,44	
4,5 x 60	9,0	24	36	2,03	0,97	1,17				2	1,53	
4,5 x 70	9,0	28	42	2,36	0,97	1,26				2	1,61	
4,5 x 80	9,0	32	48	2,70	0,97	1,26				2	1,70	
5,0 x 40*	10,0	16	24	1,45	1,20	1,11				2	1,44	
5,0 x 50*	10,0	20	30	1,82	1,20	1,24				2	1,67	
5,0 x 60*	10,0	24	36	2,18	1,20	1,34				2	1,76	
5,0 x 70*	10,0	28	42	2,54	1,20	1,44				2	1,85	
5,0 x 80*	10,0	32	48	2,90	1,20	1,52				2	1,94	
5,0 x 90*	10,0	36	54	3,27	1,20	1,52				2	2,03	
5,0 x 100*	10,0	40	60	3,63	1,20	1,52				2	2,12	
5,0 x 120*	10,0	50	70	4,24	1,20	1,52				2	2,27	

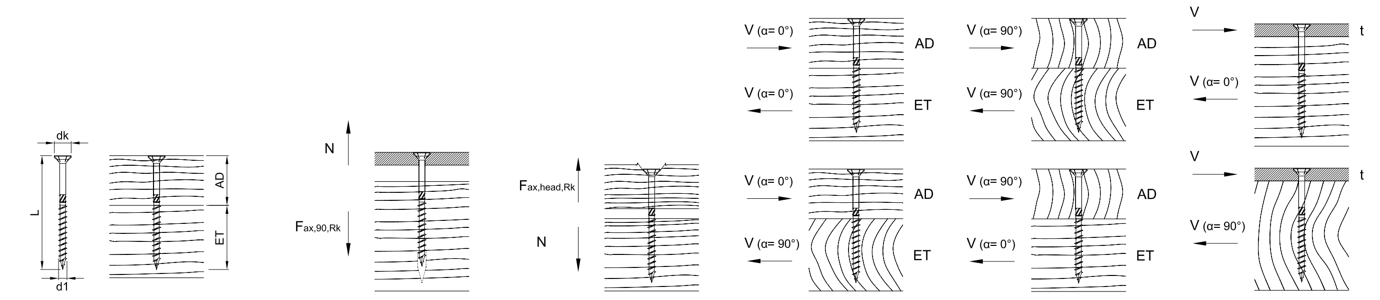
Dimensioning according to ETA-11/0024. Bulk density ρ_k= 350 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values $R_d$with regard to the service and load duration class: R_d= $R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

Example:

Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min R_k= $R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min R_k= $R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

Attention: These are planning aids. The projects must always be designed by authorised persons.

*Applies for TX20 and TX25



Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber				Shearing steel-timber		
d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								α_{AD}= 0°	α_{AD}= 90°			
						α= 0°	α=90°	α_{ET}= 90°	α_{ET}= 0°		α= 0°	α= 90°
6,0 x 60	12,0	24	36	2,46	1,73	1,71				2	2,26	
6,0 x 70	12,0	28	42	2,87	1,73	1,82				2	2,36	
6,0 x 80	12,0	32	48	3,28	1,73	1,93				2	2,46	
6,0 x 90	12,0	36	54	3,69	1,73	2,05				2	2,57	
6,0 x 100	12,0	40	60	4,10	1,73	2,07				2	2,67	
6,0 x 110	12,0	40	70	4,79	1,73	2,07				2	2,84	
6,0 x 120	12,0	50	70	4,79	1,73	2,07				2	2,84	
6,0 x 130	12,0	60	70	4,79	1,73	2,07				2	2,84	
6,0 x 140	12,0	70	70	4,79	1,73	2,07				2	2,84	
6,0 x 150	12,0	80	70	4,79	1,73	2,07				2	2,84	
6,0 x 160	12,0	90	70	4,79	1,73	2,07				2	2,84	
6,0 x 180	12,0	110	70	4,79	1,73	2,07				2	2,84	
6,0 x 200	12,0	130	70	4,79	1,73	2,07				2	2,84	
6,0 x 220	12,0	150	70	4,79	1,73	2,07				2	2,84	
6,0 x 240	12,0	170	70	4,79	1,73	2,07				2	2,84	
6,0 x 260	12,0	190	70	4,79	1,73	2,07				2	2,84	
6,0 x 280	12,0	210	70	4,79	1,73	2,07				2	2,84	
6,0 x 300	12,0	230	70	4,79	1,73	2,07				2	2,84	
8,0 x 80	14,5	30	48	4,26	2,52	3,71	2,90	3,71	2,90	3	4,56	3,94
8,0 x 100	14,5	40	60	5,33	2,52	4,13	3,30	4,13	3,30	3	4,83	4,20
8,0 x 120	14,5	40	90	7,10	2,52	4,13	3,30	4,13	3,30	3	5,27	4,65
8,0 x 140	14,5	60	90	7,10	2,52	4,13	3,50	4,13	3,50	3	5,27	4,65
8,0 x 160	14,5	80	90	7,10	2,52	4,13	3,50	4,13	3,50	3	5,27	4,65
8,0 x 180	14,5	100	90	7,10	2,52	4,13	3,50	3,50	4,13	3	5,27	4,65
8,0 x 200	14,5	120	90	7,10	2,52	4,13	3,50	3,50	4,13	3	5,27	4,65
8,0 x 220	14,5	140	90	7,10	2,52	4,13	3,50	3,50	4,13	3	5,27	4,65
8,0 x 240	14,5	160	90	7,10	2,52	4,13	3,50	3,50	4,13	3	5,27	4,65
8,0 x 260	14,5	180	90	7,10	2,52	4,13	3,50	3,50	4,13	3	5,27	4,65
8,0 x 280	14,5	200	90	7,10	2,52	4,13	3,50	3,50	4,13	3	5,27	4,65
8,0 x 300	14,5	220	90	7,10	2,52	4,13	3,50	3,50	4,13	3	5,27	4,65
8,0 x 320	14,5	240	90	7,10	2,52	4,13	3,50	3,50	4,13	3	5,27	4,65
8,0 x 340	14,5	260	90	7,10	2,52	4,13	3,50	3,50	4,13	3	5,27	4,65
8,0 x 360	14,5	280	90	7,10	2,52	4,13	3,50	3,50	4,13	3	5,27	4,65
8,0 x 380	14,5	300	90	7,10	2,52	4,13	3,50	3,50	4,13	3	5,27	4,65
8,0 x 400	14,5	320	90	7,10	2,52	4,13	3,50	3,50	4,13	3	5,27	4,65

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 350 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
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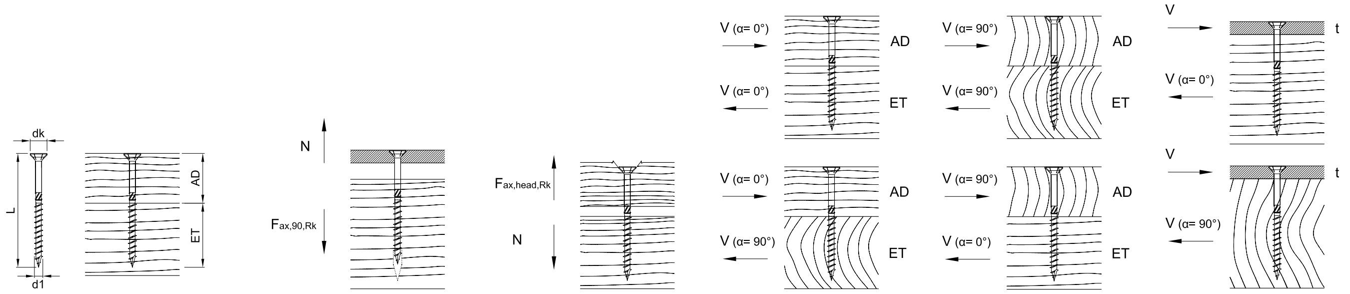
Example:

Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
⟶ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. ⟶ min $R_k = R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k = R_d \cdot \gamma_M / k_{mod}$ ⟶ R_k= 7,20 kN · 1,3/0,9= 10,40 kN ⟶ Comparison with the table values.

Attention: These are planning aids. The projects must always be designed by authorised persons.

TECHNICAL INFORMATION
PANELTWISTEC, COUNTERSUNK HEAD, STEEL YELLOW GALVANISED

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024



Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber				Shearing steel-timber		
d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								α_{AD}= 0°	α_{AD}= 90°			
						α= 0°	α=90°	α_{ET}= 90°	α_{ET}= 0°		α= 0°	α= 90°
10,0 x 100	17,4	40	60	6,48	3,63	5,73	4,37	5,73	4,37	3	6,78	5,81
10,0 x 120	17,4	20	90	9,72	3,63	4,44	3,67	3,71	3,67	3	7,59	6,62
10,0 x 140	17,4	40	90	9,72	3,63	5,73	4,37	5,73	4,37	3	7,59	6,62
10,0 x 160	17,4	60	90	9,72	3,63	6,07	5,10	6,07	5,10	3	7,59	6,62
10,0 x 180	17,4	80	90	9,72	3,63	6,07	5,10	6,07	5,10	3	7,59	6,62
10,0 x 200	17,4	100	90	9,72	3,63	6,07	5,10	5,10	6,07	3	7,59	6,62
10,0 x 220	17,4	120	90	9,72	3,63	6,07	5,10	5,10	6,07	3	7,59	6,62
10,0 x 240	17,4	140	90	9,72	3,63	6,07	5,10	5,10	6,07	3	7,59	6,62
10,0 x 260	17,4	160	90	9,72	3,63	6,07	5,10	5,10	6,07	3	7,59	6,62
10,0 x 280	17,4	180	90	9,72	3,63	6,07	5,10	5,10	6,07	3	7,59	6,62
10,0 x 300	17,4	200	90	9,72	3,63	6,07	5,10	5,10	6,07	3	7,59	6,62
10,0 x 320	17,4	220	90	9,72	3,63	6,07	5,10	5,10	6,07	3	7,59	6,62
10,0 x 340	17,4	240	90	9,72	3,63	6,07	5,10	5,10	6,07	3	7,59	6,62
10,0 x 360	17,4	260	90	9,72	3,63	6,07	5,10	5,10	6,07	3	7,59	6,62
10,0 x 380	17,4	280	90	9,72	3,63	6,07	5,10	5,10	6,07	3	7,59	6,62
10,0 x 400	17,4	300	90	9,72	3,63	6,07	5,10	5,10	6,07	3	7,59	6,62

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 350 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
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Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k = R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k = R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

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Paneltwistec

Washer head screw, screw tip with self-clearing groove, steel yellow galvanised

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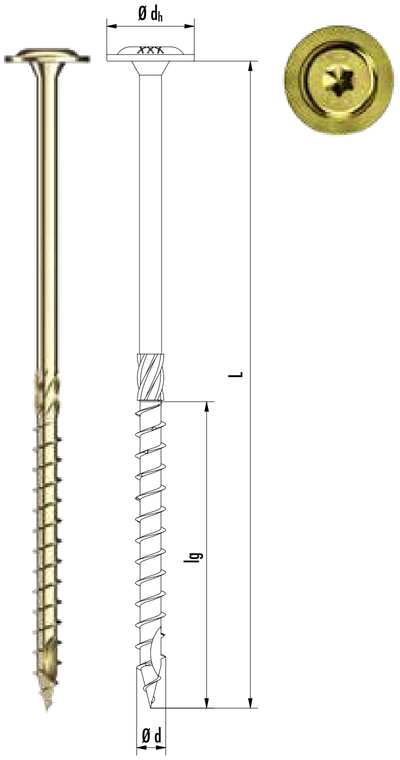
European Technical Assessment
ETA-11/0024

NKL 1 – 2

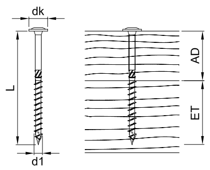
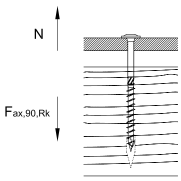
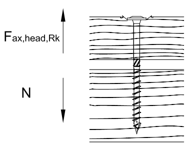
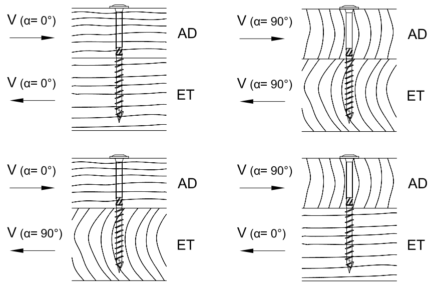
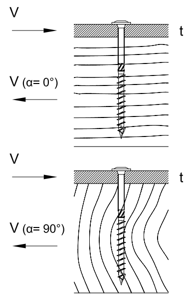


Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
G903204	8,0	80	22,0	48	TX40 ●	50
G903205	8,0	100	22,0	60	TX40 ●	50
G903466	8,0	120	22,0	80	TX40 ●	50
G903467	8,0	140	22,0	80	TX40 ●	50
G903468	8,0	160	22,0	80	TX40 ●	50
G903469	8,0	180	22,0	80	TX40 ●	50
G903470	8,0	200	22,0	80	TX40 ●	50
G903471	8,0	220	22,0	80	TX40 ●	50
G903472	8,0	240	22,0	80	TX40 ●	50
G903473	8,0	260	22,0	80	TX40 ●	50
G903474	8,0	280	22,0	80	TX40 ●	50
G903475	8,0	300	22,0	80	TX40 ●	50
G903476	8,0	320	22,0	80	TX40 ●	50
G903477	8,0	340	22,0	80	TX40 ●	50
G903478	8,0	360	22,0	80	TX40 ●	50
G904625	8,0	380	22,0	80	TX40 ●	50
G904626	8,0	400	22,0	80	TX40 ●	50

Simple screw connection of a post and beam construction using our Paneltwistec washer head screw

TECHNICAL INFORMATION
PANELTWISTEC, WASHER HEAD SCREW, STEEL YELLOW GALVANISED

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber				Shearing steel-timber		
												
d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								$\alpha_{AD}= 0°$	$\alpha_{AD}= 90°$			
						$\alpha= 0°$	$\alpha=90°$	$\alpha_{ET}= 90°$	$\alpha_{ET}= 0°$		$\alpha= 0°$	$\alpha= 90°$
8,0 x 80	22,0	30	50	4,26	5,81	4,27	3,41	4,27	3,41	3	4,56	3,94
8,0 x 100	22,0	40	60	5,33	5,81	4,83	4,01	4,83	4,01	3	4,83	4,20
8,0 x 120	22,0	40	80	7,10	5,81	4,95	4,13	4,95	4,13	3	5,27	4,65
8,0 x 140	22,0	60	80	7,10	5,81	4,95	4,32	4,95	4,32	3	5,27	4,65
8,0 x 160	22,0	80	80	7,10	5,81	4,95	4,32	4,95	4,32	3	5,27	4,65
8,0 x 180	22,0	100	80	7,10	5,81	4,95	4,32	4,32	4,95	3	5,27	4,65
8,0 x 200	22,0	120	80	7,10	5,81	4,95	4,32	4,32	4,95	3	5,27	4,65
8,0 x 220	22,0	140	80	7,10	5,81	4,95	4,32	4,32	4,95	3	5,27	4,65
8,0 x 240	22,0	160	80	7,10	5,81	4,95	4,32	4,32	4,95	3	5,27	4,65
8,0 x 260	22,0	180	80	7,10	5,81	4,95	4,32	4,32	4,95	3	5,27	4,65
8,0 x 280	22,0	200	80	7,10	5,81	4,95	4,32	4,32	4,95	3	5,27	4,65
8,0 x 300	22,0	220	80	7,10	5,81	4,95	4,32	4,32	4,95	3	5,27	4,65
8,0 x 320	22,0	240	80	7,10	5,81	4,95	4,32	4,32	4,95	3	5,27	4,65
8,0 x 340	22,0	260	80	7,10	5,81	4,95	4,32	4,32	4,95	3	5,27	4,65
8,0 x 360	22,0	280	80	7,10	5,81	4,95	4,32	4,32	4,95	3	5,27	4,65
8,0 x 380	22,0	300	80	7,10	5,81	4,95	4,32	4,32	4,95	3	5,27	4,65
8,0 x 400	22,0	320	80	7,10	5,81	4,95	4,32	4,32	4,95	3	5,27	4,65

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 350 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
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Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
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That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k= R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.
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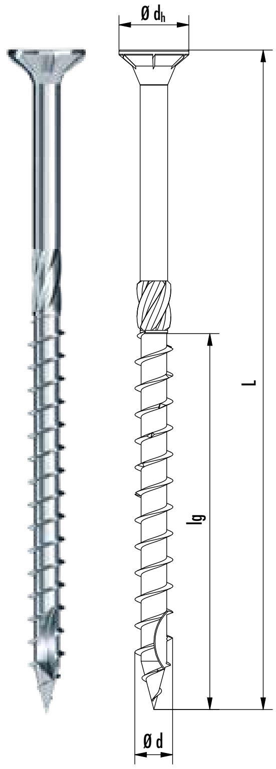
PANELTWISTEC, PANELTWISTEC AG

Hardened stainless steel

Paneltwistec

Countersunk head, screw tip with self-clearing groove, hardened stainless steel



Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
904494	4,0	30	7	21	TX20	500
904495	4,0	35	7	21	TX20	500
904474	4,0	40	7	24	TX20	500
904475	4,0	45	7	27	TX20	500
904476	4,0	50	7	30	TX20	500
904477	4,0	60	7	36	TX20	500
904478	4,5	45	9	27	TX20	200
904479	4,5	50	9	30	TX20	200
904480	4,5	60	9	36	TX20	200
904481	4,5	70	9	42	TX20	200
100981	4,5	80	9	48	TX20	200
904482	5,0	50	10	30	TX25	200
904483	5,0	60	10	36	TX25	200
904484	5,0	70	10	42	TX25	200
904485	5,0	80	10	48	TX25	200
904487	5,0	90	10	54	TX25	100
904011	5,0	100	10	60	TX25	100
904012	6,0	60	12	36	TX30	100
904013	6,0	70	12	42	TX30	100
904014	6,0	80	12	48	TX30	100
904015	6,0	90	12	54	TX30	100
904016	6,0	100	12	60	TX30	100
904017	6,0	120	12	70	TX30	100
904018	6,0	140	12	70	TX30	100
904019	6,0	160	12	70	TX30	100

Paneltwistec

Washer head screw, screw tip with self-clearing groove, hardened stainless steel

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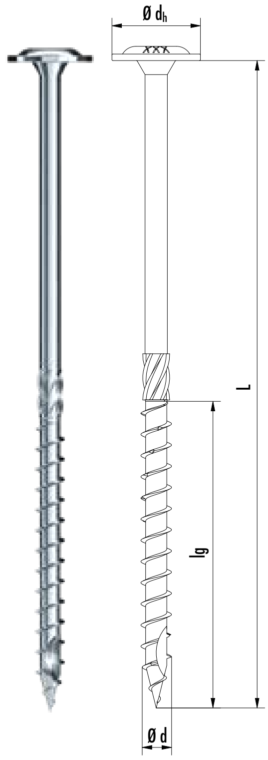
European Technical Assessment
ETA-11/0024



C1

NKL 1 – 3

C2

T3

EDELSTAHL Rost frei

Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
945278	8,0	80	16	48	TX40	50
945270	8,0	100	16	60	TX40	50
945271	8,0	120	16	80	TX40	50
945272	8,0	140	16	80	TX40	50
945364	8,0	160	16	80	TX40	50
945365	8,0	180	16	80	TX40	50
945366	8,0	200	16	80	TX40	50
945367	8,0	220	16	80	TX40	50
945368	8,0	240	16	80	TX40	50
945369	8,0	260	16	80	TX40	50
945370	8,0	280	16	80	TX40	50
945371	8,0	300	16	80	TX40	50
945372	8,0	320	16	80	TX40	50
945373	8,0	340	16	80	TX40	50
945374	8,0	360	16	80	TX40	50
945375	8,0	380	16	80	TX40	50
945376	8,0	400	16	80	TX40	50

Paneltwistec AG

Washer head screw, AG screw tip hardened stainless steel

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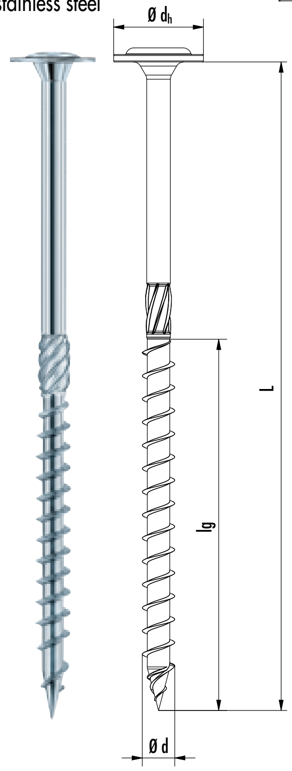
European Technical Assessment
ETA-11/0024



C1

NKL 1 – 3

C2

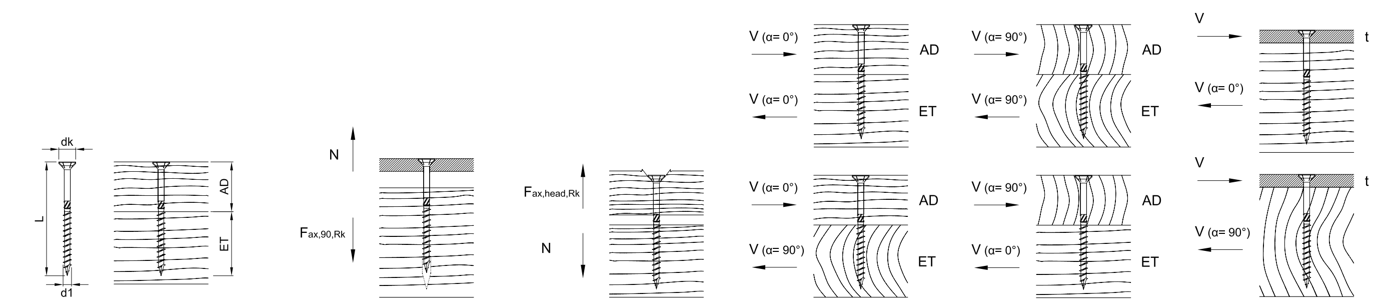
T3

EDELSTAHL Rost frei

Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
975772	6,0	60	14,0	36	TX30	100
975773	6,0	80	14,0	48	TX30	100
975774	6,0	100	14,0	60	TX30	100
975775	6,0	120	14,0	70	TX30	100
975776	6,0	140	14,0	70	TX30	100
975777	6,0	160	14,0	70	TX30	100

TECHNICAL INFORMATION
PANELTWISTEC, COUNTERSUNK HEAD, HARDENED STAINLESS STEEL

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024



Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber				Shearing steel-timber		
d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								α_{AD}= 0°	α_{AD}= 90°			
						α= 0°	α=90°	α_{ET}= 90°	α_{ET}= 0°		α= 0°	α= 90°
4,0 x 30	8,0	12	18	0,93	0,77	0,71				2	0,91	
4,0 x 35	8,0	14	21	1,08	0,77	0,80				2	1,07	
4,0 x 40	8,0	16	24	1,24	0,77	0,84				2	1,15	
4,0 x 45	8,0	18	27	1,39	0,77	0,88				2	1,19	
4,0 x 50	8,0	20	30	1,55	0,77	0,92				2	1,23	
4,0 x 60	8,0	24	36	1,86	0,77	1,01				2	1,31	
4,5 x 45	9,0	18	27	1,52	0,97	1,00				2	1,37	
4,5 x 50	9,0	20	30	1,69	0,97	1,08				2	1,44	
4,5 x 60	9,0	24	36	2,03	0,97	1,17				2	1,53	
4,5 x 70	9,0	28	42	2,36	0,97	1,23				2	1,61	
4,5 x 80	9,0	32	48	2,70	0,97	1,23				2	1,75	
5,0 x 50	10,0	20	30	1,82	1,20	1,24				2	1,67	
5,0 x 60	10,0	24	36	2,18	1,20	1,34				2	1,76	
5,0 x 70	10,0	28	42	2,54	1,20	1,44				2	1,85	
5,0 x 80	10,0	32	48	2,90	1,20	1,52				2	1,94	
5,0 x 90	10,0	36	54	3,27	1,20	1,52				2	2,03	
5,0 x 100	10,0	40	60	3,63	1,20	1,52				2	2,12	
6,0 x 60	12,0	24	36	2,46	1,73	1,65				2	2,21	
6,0 x 70	12,0	28	42	2,87	1,73	1,75				2	2,31	
6,0 x 80	12,0	32	48	3,28	1,73	1,85				2	2,41	
6,0 x 90	12,0	36	54	3,69	1,73	1,96				2	2,51	
6,0 x 100	12,0	40	60	4,10	1,73	2,02				2	2,62	
6,0 x 120	12,0	50	70	4,79	1,73	1,60				2	2,35	
6,0 x 140	12,0	70	70	4,79	1,73	2,02				2	2,80	
6,0 x 160	12,0	90	70	4,79	1,73	2,02				2	2,80	

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 350 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
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That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k = R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

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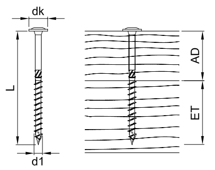
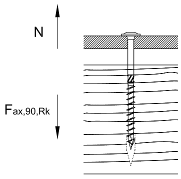
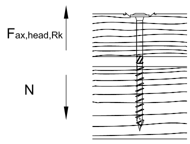
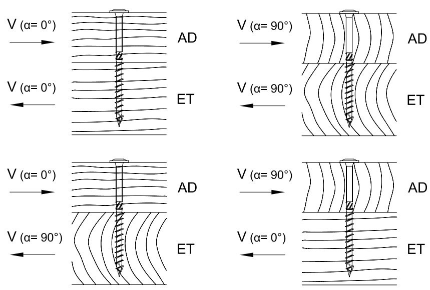
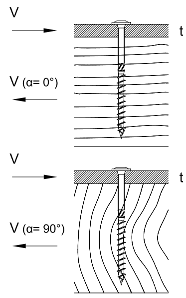
TECHNICAL INFORMATION
PANELTWISTEC, WASHER HEAD SCREW, HARDENED STAINLESS STEEL

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

Dimensions	Extraction resistance	Head pull-through resistance	Shearing timber-timber	Shearing steel-timber
				

d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								$\alpha_{AD}= 0°$	$\alpha_{AD}= 90°$			
						$\alpha= 0°$	$\alpha=90°$	$\alpha_{ET}= 90°$	$\alpha_{ET}= 0°$		$\alpha= 0°$	$\alpha= 90°$
6,0 x 60	14,0	24	36	2,46	2,35	1,81				2	2,21	
6,0 x 80	14,0	32	48	3,28	2,35	2,01				2	2,41	
6,0 x 100	14,0	40	60	4,10	2,35	1,74				2	2,18	
6,0 x 100	14,0	40	60	4,10	2,35	2,18				2	2,62	
6,0 x 120	14,0	50	70	4,80	2,35	2,18				2	2,80	
6,0 x 160	14,0	90	70	4,80	2,35	2,18				2	2,80	
8,0 x 80	22,0	30	50	4,26	5,81	3,94	3,21	3,72	3,36	3	4,41	3,83
8,0 x 100	22,0	40	60	4,80	5,81	4,55	3,71	4,21	3,87	3	4,55	3,96
8,0 x 120	22,0	60	60	5,33	5,81	4,68	4,10	4,34	4,34	3	4,68	4,10
8,0 x 140	22,0	60	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 160	22,0	80	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 180	22,0	100	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 200	22,0	120	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 220	22,0	140	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 240	22,0	160	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 260	22,0	180	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 280	22,0	200	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 300	22,0	220	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 320	22,0	240	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 340	22,0	260	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 360	22,0	280	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 380	22,0	300	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 400	22,0	320	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 350 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d= R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

Example:

Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1.5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k= R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k= R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

Attention: These are planning aids. The projects must always be designed by authorised persons.

PANELTWISTEC A4

Stainless steel A4

Paneltwistec

Countersunk head, stainless steel A4

ETA · CE
Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

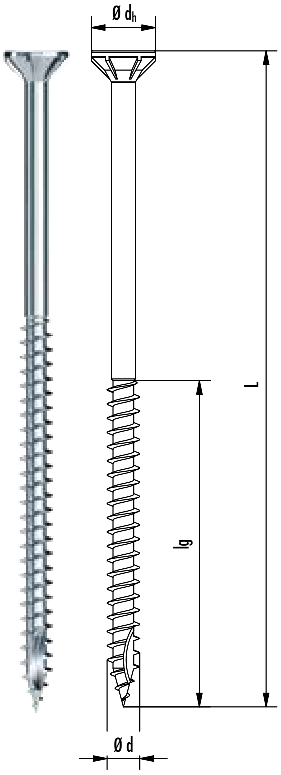
A4

NKL 1 – 3

CRC III

C5

T5



EDELSTAHL Rost frei®

Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
901476	4,0	25	7,75	15	TX20	500
111442	4,0	35	7,75	21	TX20	500
903202	4,0	40	7,75	24	TX20	500
111443	4,0	45	7,75	27	TX20	500
901109	4,0	55	7,75	33	TX20	500
111444	4,0	60	7,75	36	TX20	500
111445	4,0	70	7,75	42	TX20	200
111446	4,0	80	7,75	48	TX20	200
111447	4,5	45	8,75	27	TX25	200
111448	4,5	60	8,75	36	TX25	200
111449	4,5	70	8,75	42	TX25	200
111450	4,5	80	8,75	48	TX25	200
903990	5,0	40	9,75	24	TX25	200
111451	5,0	50	9,75	30	TX25	200
111452	5,0	60	9,75	36	TX25	200
111453	5,0	70	9,75	42	TX25	200
111454	5,0	80	9,75	48	TX25	200
903580	5,0	100	9,75	60	TX25	200
111459	6,0	60	11,75	36	TX30	100
944885	6,0	70	11,75	42	TX30	100
111460	6,0	80	11,75	48	TX30	100
111458	6,0	100	11,75	60	TX30	100
901478	6,0	120	11,75	60	TX30	100

Paneltwistec A4

Countersunk head, stainless steel A4

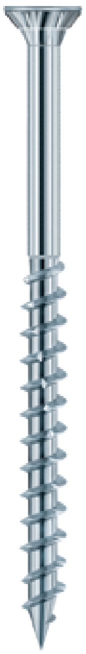
A4

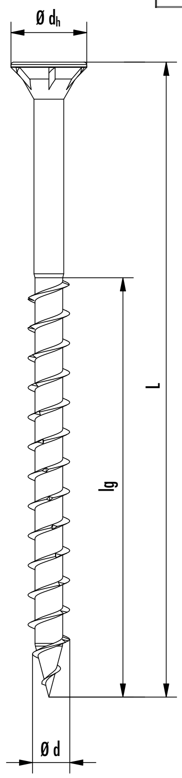
NKL 1 – 3

CRC III

C5

T5





Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
903280	8,0	80	14,50	48	TX40 ●	50
903281	8,0	100	14,50	60	TX40 ●	50
903282	8,0	120	14,50	80	TX40 ●	50
903283	8,0	140	14,50	80	TX40 ●	50
903284	8,0	160	14,50	80	TX40 ●	50
903285	8,0	180	14,50	80	TX40 ●	50
903286	8,0	200	14,50	80	TX40 ●	50
903287	8,0	220	14,50	80	TX40 ●	50
903288	8,0	240	14,50	80	TX40 ●	50
903289	8,0	260	14,50	80	TX40 ●	50
903290	8,0	280	14,50	80	TX40 ●	50
903291	8,0	300	14,50	80	TX40 ●	50
903292	8,0	320	14,50	80	TX40 ●	50
903293	8,0	340	14,50	80	TX40 ●	50
903294	8,0	360	14,50	80	TX40 ●	50
903295	8,0	380	14,50	80	TX40 ●	50
903296	8,0	400	14,50	80	TX40 ●	50

Paneltwistec A4

Ornamental head, stainless steel A4

EN 14592:2008+A1:2012

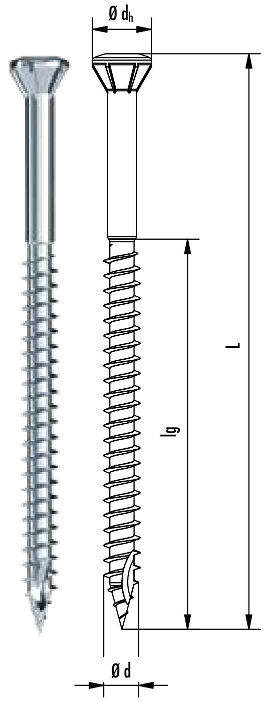
A4

NKL 1 – 3

CRC III

C5

T5



EDELSTAHL Rost frei ®

Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
901479	3,2	25	5,10	17,5	TX10 ○	1000
903038	3,2	30	5,10	21	TX10 ○	1000
901480	3,2	35	5,10	19	TX10 ○	1000
901481	3,2	40	5,10	24	TX10 ○	1000
903104	3,2	50	5,10	34	TX10 ○	1000

Paneltwistec A4

Washer head screw, stainless steel A4

ETA-11/0024

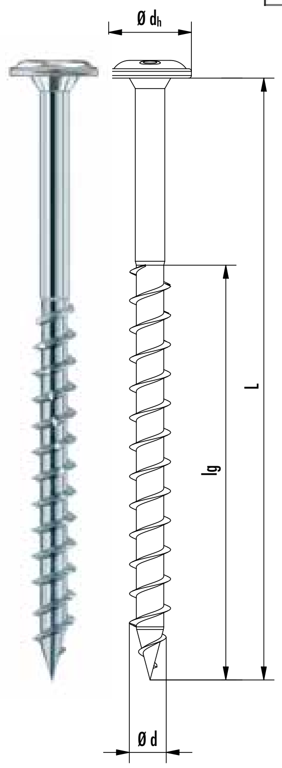
A4

NKL 1 – 3

CRC III

C5

T5



EDELSTAHL Rost frei ®

Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
903260	8,0	80	16	48	TX40 ●	50
903261	8,0	100	16	60	TX40 ●	50
903262	8,0	120	16	80	TX40 ●	50
903263	8,0	140	16	80	TX40 ●	50
903264	8,0	160	16	80	TX40 ●	50
903265	8,0	180	16	80	TX40 ●	50
903266	8,0	200	16	80	TX40 ●	50
903267	8,0	220	16	80	TX40 ●	50
903268	8,0	240	16	80	TX40 ●	50
903269	8,0	260	16	80	TX40 ●	50
903270	8,0	280	16	80	TX40 ●	50
903271	8,0	300	16	80	TX40 ●	50
903272	8,0	320	16	80	TX40 ●	50
903273	8,0	340	16	80	TX40 ●	50
903274	8,0	360	16	80	TX40 ●	50
903275	8,0	380	16	80	TX40 ●	50
903276	8,0	400	16	80	TX40 ●	50

PANELTWISTEC A2

Stainless steel A2

Paneltwistec A2

Countersunk head, stainless steel A2

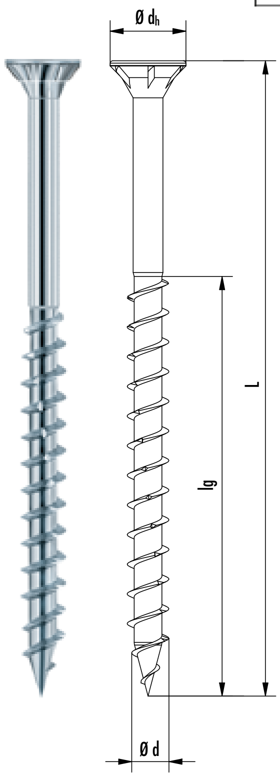
A2

NKL 1 – 3

CRC II

C4

T3



Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
903230	8,0	80	14,5	48	TX40 ●	50
903231	8,0	100	14,5	60	TX40 ●	50
903232	8,0	120	14,5	80	TX40 ●	50
903233	8,0	140	14,5	80	TX40 ●	50
903234	8,0	160	14,5	80	TX40 ●	50
903235	8,0	180	14,5	80	TX40 ●	50
903236	8,0	200	14,5	80	TX40 ●	50
903237	8,0	220	14,5	80	TX40 ●	50
903238	8,0	240	14,5	80	TX40 ●	50
903239	8,0	260	14,5	80	TX40 ●	50
903240	8,0	280	14,5	80	TX40 ●	50
903241	8,0	300	14,5	80	TX40 ●	50
903242	8,0	320	14,5	80	TX40 ●	50
903243	8,0	340	14,5	80	TX40 ●	50
903244	8,0	360	14,5	80	TX40 ●	50
903245	8,0	380	14,5	80	TX40 ●	50
903246	8,0	400	14,5	80	TX40 ●	50

Paneltwistec A2

Washer head screw, stainless steel A2

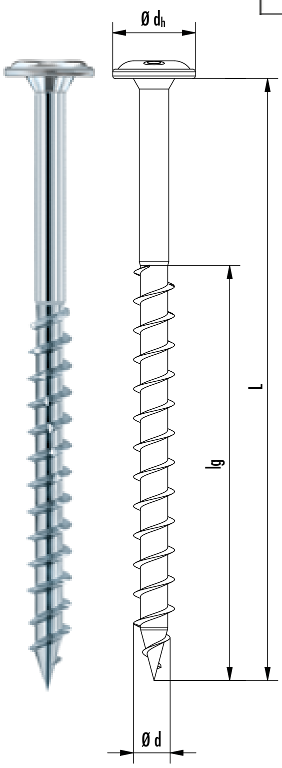
A2

NKL 1 – 3

CRC II

C4

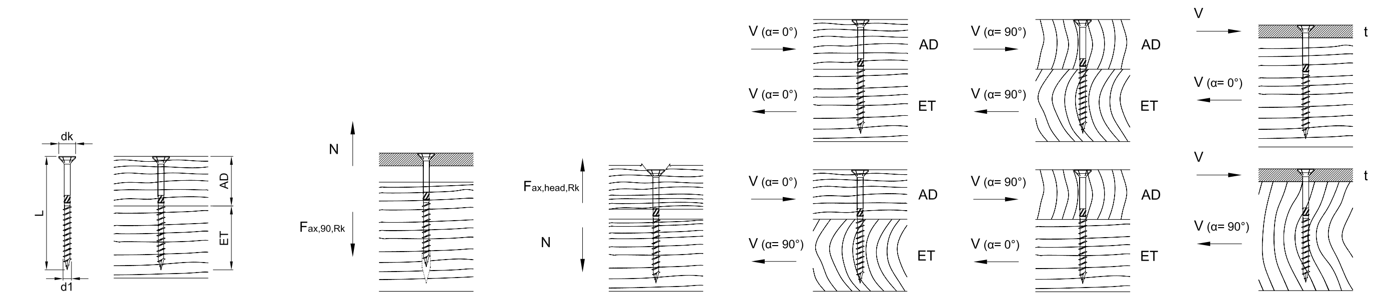
T3



Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
903211	8,0	80	16	48	TX40 ●	50
903212	8,0	100	16	60	TX40 ●	50
903213	8,0	120	16	80	TX40 ●	50
903214	8,0	140	16	80	TX40 ●	50
903215	8,0	160	16	80	TX40 ●	50
903216	8,0	180	16	80	TX40 ●	50
903217	8,0	200	16	80	TX40 ●	50
903218	8,0	220	16	80	TX40 ●	50
903219	8,0	240	16	80	TX40 ●	50
903220	8,0	260	16	80	TX40 ●	50
903221	8,0	280	16	80	TX40 ●	50
903222	8,0	300	16	80	TX40 ●	50
903223	8,0	320	16	80	TX40 ●	50
903224	8,0	340	16	80	TX40 ●	50
903225	8,0	360	16	80	TX40 ●	50
903226	8,0	380	16	80	TX40 ●	50
903227	8,0	400	16	80	TX40 ●	50

TECHNICAL INFORMATION
PANELTWISTEC, COUNTERSUNK HEAD SCREW, STAINLESS STEEL A4

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024



Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber				Shearing steel-timber		
d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								$\alpha_{AD}= 0^{\circ}$	$\alpha_{AD}= 90^{\circ}$			
						$\alpha= 0^{\circ}$	$\alpha=90^{\circ}$	$\alpha_{ET}= 90^{\circ}$	$\alpha_{ET}= 0^{\circ}$		$\alpha= 0^{\circ}$	$\alpha= 90^{\circ}$
4,0 x 25	8,0	10	15	0,77	0,77	0,60				2	0,70	
4,0 x 35	8,0	14	21	1,08	0,77	0,68				2	0,85	
4,0 x 40	8,0	16	24	1,24	0,77	0,72				2	0,90	
4,0 x 45	8,0	18	27	1,39	0,77	0,76				2	0,93	
4,0 x 55	8,0	22	33	1,55	0,77	0,78				2	1,01	
4,0 x 60	8,0	24	36	1,86	0,77	0,78				2	1,05	
4,0 x 70	8,0	28	42	2,17	0,77	0,78				2	1,13	
4,0 x 80	8,0	32	48	2,48	0,77	0,78				2	1,20	
4,5 x 45	9,0	18	27	1,69	0,97	0,90				2	1,10	
4,5 x 60	9,0	24	36	2,03	0,97	0,97				2	1,23	
4,5 x 70	9,0	28	42	2,36	0,97	0,97				2	1,31	
4,5 x 80	9,0	32	48	2,70	0,97	0,97				2	1,40	
5,0 x 40	10,0	16	24	1,45	1,20	0,98				2	1,22	
5,0 x 45	10,0	18	27	1,63	1,20	1,03				2	1,26	
5,0 x 50	10,0	20	30	1,82	1,20	1,07				2	1,31	
5,0 x 60	10,0	24	36	2,18	1,20	1,15				2	1,40	
5,0 x 70	10,0	28	42	2,54	1,20	1,15				2	1,50	
5,0 x 80	10,0	32	48	2,90	1,20	1,15				2	1,58	
5,0 x 90	10,0	36	54	3,27	1,20	1,15				2	1,67	
5,0 x 100	10,0	40	60	3,63	1,20	1,15				2	1,76	
6,0 x 60	12,0	24	36	2,46	1,73	1,48				2	1,77	
6,0 x 70	12,0	28	42	2,87	1,73	1,60				2	1,87	
6,0 x 80	12,0	32	48	3,28	1,73	1,60				2	1,97	
6,0 x 90	12,0	36	54	3,69	1,73	1,60				2	2,08	
6,0 x 100	12,0	40	60	4,10	1,73	1,60				2	2,18	
6,0 x 120	12,0	50	70	4,79	1,73	1,60				2	2,35	

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 350 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d= R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

Example:

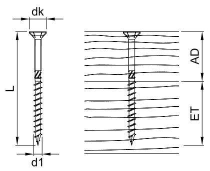
Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min R_k= $R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min R_k= $R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

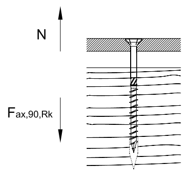
Attention: These are planning aids. The projects must always be designed by authorised persons.

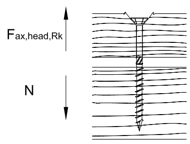
TECHNICAL INFORMATION
PANELTWISTEC, COUNTERSUNK HEAD SCREW, STAINLESS STEEL A2 AND A4

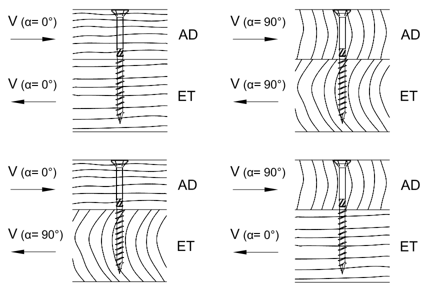
Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

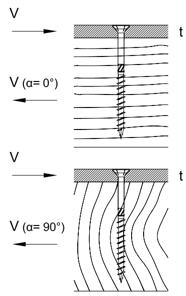
Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber				Shearing steel-timber		











d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								α_{AD}= 0°	α_{AD}= 90°			
						α= 0°	α=90°	α_{ET}= 90°	α_{ET}= 0°		α= 0°	α= 90°
8,0 x 80	14,5	30	50	4,26	2,52	3,08	2,50	2,83	2,62	3	3,51	3,08
8,0 x 100	14,5	40	60	5,33	2,52	3,08	2,65	2,83	2,83	3	3,78	3,35
8,0 x 120	14,5	40	80	7,10	2,52	3,08	2,65	2,83	2,83	3	4,22	3,80
8,0 x 140	14,5	60	80	7,10	2,52	3,08	2,65	2,83	2,83	3	4,22	3,80
8,0 x 160	14,5	80	80	7,10	2,52	3,08	2,65	2,83	2,83	3	4,22	3,80
8,0 x 180	14,5	100	80	7,10	2,52	3,08	2,65	2,83	2,83	3	4,22	3,80
8,0 x 200	14,5	120	80	7,10	2,52	3,08	2,65	2,83	2,83	3	4,22	3,80
8,0 x 220	14,5	140	80	7,10	2,52	3,08	2,65	2,83	2,83	3	4,22	3,80
8,0 x 240	14,5	160	80	7,10	2,52	3,08	2,65	2,83	2,83	3	4,22	3,80
8,0 x 260	14,5	180	80	7,10	2,52	3,08	2,65	2,83	2,83	3	4,22	3,80
8,0 x 280	14,5	200	80	7,10	2,52	3,08	2,65	2,83	2,83	3	4,22	3,80
8,0 x 300	14,5	220	80	7,10	2,52	3,08	2,65	2,83	2,83	3	4,22	3,80
8,0 x 320	14,5	240	80	7,10	2,52	3,08	2,65	2,83	2,83	3	4,22	3,80
8,0 x 340	14,5	260	80	7,10	2,52	3,08	2,65	2,83	2,83	3	4,22	3,80
8,0 x 360	14,5	280	80	7,10	2,52	3,08	2,65	2,83	2,83	3	4,22	3,80
8,0 x 380	14,5	300	80	7,10	2,52	3,08	2,65	2,83	2,83	3	4,22	3,80
8,0 x 400	14,5	320	80	7,10	2,52	3,08	2,65	2,83	2,83	3	4,22	3,80

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 350 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d = R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

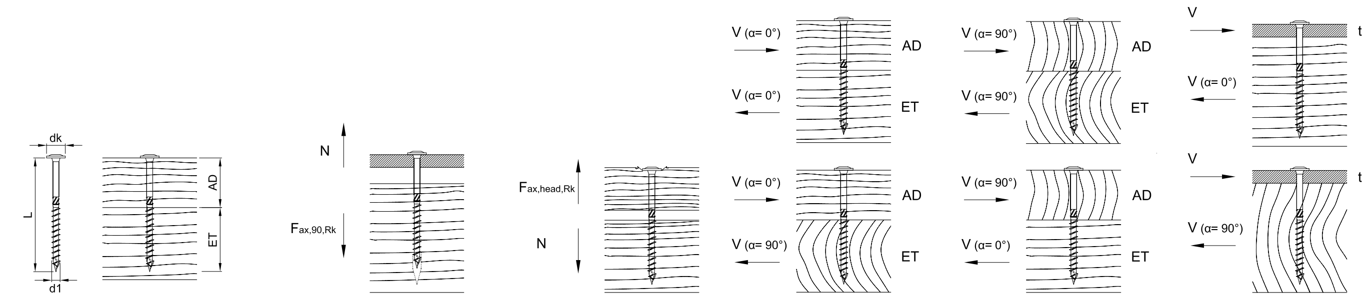
Example:

Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k = R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k = R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10.40 kN → Comparison with the table values.

Attention: These are planning aids. The projects must always be designed by authorised persons.

TECHNICAL INFORMATION
PANELTWISTEC, WASHER HEAD SCREW, STAINLESS STEEL A2 AND A4

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024



Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber				Shearing steel-timber		
d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								α_{AD}= 0°	α_{AD}= 90°			
						α= 0°	α=90°	α_{ET}= 90°	α_{ET}= 0°		α= 0°	α= 90°
8,0 x 80	16,0	30	50	4,26	3,07	3,21	2,63	2,97	2,75	3	3,51	3,08
8,0 x 100	16,0	40	60	5,33	3,07	3,21	2,78	2,97	2,97	3	3,78	3,35
8,0 x 120	16,0	40	80	7,10	3,07	3,21	2,78	2,97	2,97	3	4,22	3,80
8,0 x 140	16,0	60	80	7,10	3,07	3,21	2,78	2,97	2,97	3	4,22	3,80
8,0 x 160	16,0	80	80	7,10	3,07	3,21	2,78	2,97	2,97	3	4,22	3,80
8,0 x 180	16,0	100	80	7,10	3,07	3,21	2,78	2,97	2,97	3	4,22	3,80
8,0 x 200	16,0	120	80	7,10	3,07	3,21	2,78	2,97	2,97	3	4,22	3,80
8,0 x 220	16,0	140	80	7,10	3,07	3,21	2,78	2,97	2,97	3	4,22	3,80
8,0 x 240	16,0	160	80	7,10	3,07	3,21	2,78	2,97	2,97	3	4,22	3,80
8,0 x 260	16,0	180	80	7,10	3,07	3,21	2,78	2,97	2,97	3	4,22	3,80
8,0 x 280	16,0	200	80	7,10	3,07	3,21	2,78	2,97	2,97	3	4,22	3,80
8,0 x 300	16,0	220	80	7,10	3,07	3,21	2,78	2,97	2,97	3	4,22	3,80
8,0 x 320	16,0	240	80	7,10	3,07	3,21	2,78	2,97	2,97	3	4,22	3,80
8,0 x 340	16,0	260	80	7,10	3,07	3,21	2,78	2,97	2,97	3	4,22	3,80
8,0 x 360	16,0	280	80	7,10	3,07	3,21	2,78	2,97	2,97	3	4,22	3,80
8,0 x 380	16,0	300	80	7,10	3,07	3,21	2,78	2,97	2,97	3	4,22	3,80
8,0 x 400	16,0	320	80	7,10	3,07	3,21	2,78	2,97	2,97	3	4,22	3,80

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 350 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d = R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

Example:

Characteristic value for the continuous action (dead load) G_k= 2.00 kN and variable action, e.g. snow load Q_k= 3.00 kN. k_{mod}= 0.9. γ_M= 1.3.
→ Design value of the action E_d= 2.00 · 1.35 + 3.00 · 1.5= 7.20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k = R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k = R_d \cdot \gamma_M / k_{mod}$ → R_k= 7.20 kN · 1.3/0.9= 10.40 kN → Comparison with the table values.

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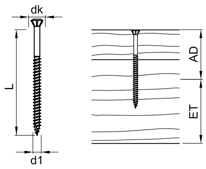
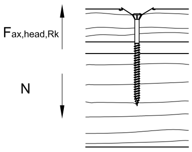
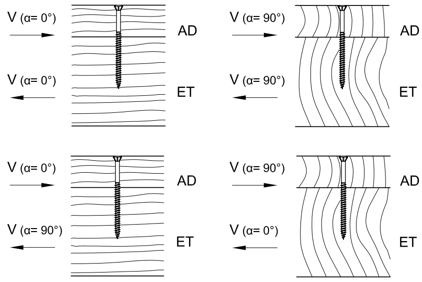
TECHNICAL INFORMATION
PANELTWISTEC, ORNAMENTAL HEAD SCREW, STAINLESS STEEL A4

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

Dimensions	Head pull-through resistance	Shearing timber-timber
		

d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
							α_{AD}= 0°	α_{AD}= 90°
					α= 0°	α=90°	α_{ET}= 90°	α_{ET}= 0°
3,2 x 25	5,1	7	18	0,31	0,34			
3,2 x 30	5,1	9	21	0,31	0,37			
3,2 x 35	5,1	16	19	0,31	0,45			
3,2 x 40	5,1	16	24	0,31	0,45			
3,2 x 50	5,1	16	34	0,31	0,45			

This value can be neglected because the Paneltwistec decorative head's head pull-through resistance is higher than the screw's extraction resistance.

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 350 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: R_d= $R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

Example:

Characteristic value for the continuous action (dead load) G_k= 2.00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min R_k= $R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min R_k= $R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

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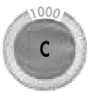
PANELTWISTEC 1000

Steel specially coated

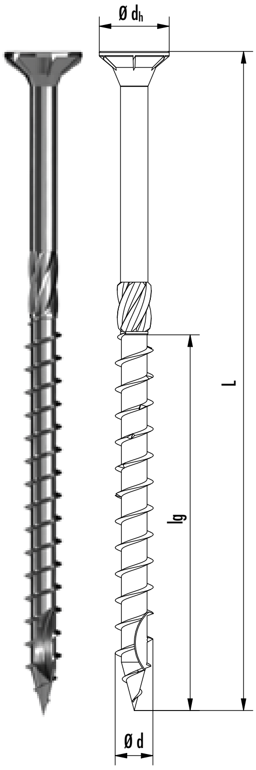
The Paneltwistec 1000 made of **specially coated and hardened carbon steel** is a connecting means for load-bearing timber structures between structural components made of solid timber (coniferous timber), laminated timber, laminated veneer timber or other similar laminated timber-based materials. The screw has a **self-clearing groove** at the screw tip and **milling ribs** above the thread. The screw is available in "countersunk head" and "washer head" versions. The screw's special geometry ensures a **reduced splitting effect during screwing in.** Thanks to the special coating **the screw-in resistance is also reduced,** i.e. the friction between the body of the screw and the wood is significantly reduced.

Paneltwistec 1000

Countersunk head, screw tip with self-clearing groove, steel specially coated



NKL 1 – 2



ETA-11/0024

Nur Schrauben mit Ø = 3,0 mm

EN 14592:2008+A1:2012

Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
R945034	3,0	12	5,6	Full thread	TX10 ○	1000
R945035	3,0	16	5,6	Full thread	TX10 ○	1000
R903038	3,0	20	5,6	Full thread	TX10 ○	1000
R903039	3,0	25	5,6	Full thread	TX10 ○	1000
R903040	3,0	30	5,6	18	TX10 ○	1000
R903041	3,0	35	5,6	21	TX10 ○	1000
R903042	3,0	40	5,6	24	TX10 ○	1000
R945036	3,5	12	7,0	Full thread	TX20 ●	1000
R945037	3,5	16	7,0	Full thread	TX20 ●	1000
R903043	3,5	20	7,0	Full thread	TX20 ●	1000
R903044	3,5	25	7,0	Full thread	TX20 ●	1000
R903045	3,5	30	7,0	18	TX20 ●	1000
R903046	3,5	35	7,0	21	TX20 ●	1000
R903047	3,5	40	7,0	24	TX20 ●	1000
R903048	3,5	50	7,0	27	TX20 ●	500
R945038	4,0	16	8,0	Full thread	TX20 ●	1000
R903001	4,0	20	8,0	Full thread	TX20 ●	1000
R903002	4,0	25	8,0	Full thread	TX20 ●	1000
R903003	4,0	30	8,0	18	TX20 ●	1000
R903049	4,0	35	8,0	21	TX20 ●	1000
R903004	4,0	40	8,0	24	TX20 ●	1000
R902089	4,0	45	8,0	27	TX20 ●	500
R903005	4,0	50	8,0	30	TX20 ●	500
R903006	4,0	60	8,0	36	TX20 ●	200
R903007	4,0	70	8,0	42	TX20 ●	200
R903008	4,0	80	8,0	48	TX20 ●	200
R945039	4,5	16	9,0	Full thread	TX20 ●	1000
R903050	4,5	25	9,0	Full thread	TX20 ●	500
R903051	4,5	30	9,0	18	TX20 ●	500
R903052	4,5	35	9,0	21	TX20 ●	500
R903009	4,5	40	9,0	24	TX20 ●	500
R903010	4,5	50	9,0	30	TX20 ●	500
R903011	4,5	60	9,0	36	TX20 ●	200
R903012	4,5	70	9,0	42	TX20 ●	200
R903013	4,5	80	9,0	48	TX20 ●	200
R903468	4,5	90	9,0	54	TX20 ●	200
R903063	4,5	100	9,0	60	TX20 ●	200
R903053	5,0	25	10,0	Full thread	TX20 ●	500
R903054	5,0	30	10,0	20	TX20 ●	500
R903055	5,0	35	10,0	21	TX20 ●	500
R903014	5,0	40	10,0	24	TX20 ●	200
R903579	5,0	45	10,0	27	TX20 ●	200
R903015	5,0	50	10,0	30	TX20 ●	200
R903016	5,0	60	10,0	36	TX20 ●	200
R903017	5,0	70	10,0	42	TX20 ●	200
R903018	5,0	80	10,0	48	TX20 ●	200
R903578	5,0	90	10,0	54	TX20 ●	200
R903019	5,0	100	10,0	60	TX20 ●	200
R903020	5,0	120	10,0	70	TX20 ●	200

other sizes on the next page

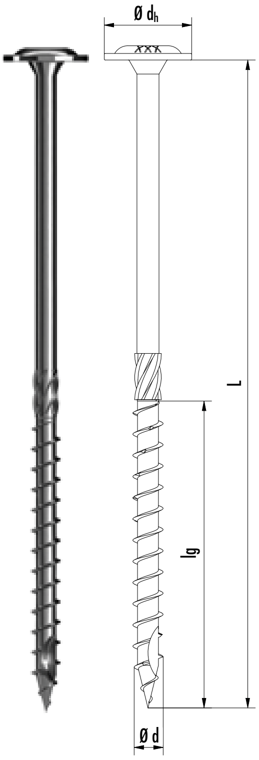
Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
R903581	6,0	40	12,0	24	TX30 ●	200
R903582	6,0	50	12,0	30	TX30 ●	200
R903021	6,0	60	12,0	36	TX30 ●	200
R903022	6,0	70	12,0	42	TX30 ●	200
R903023	6,0	80	12,0	48	TX30 ●	200
R903163	6,0	90	12,0	54	TX30 ●	100
R903024	6,0	100	12,0	60	TX30 ●	100
R903025	6,0	120	12,0	70	TX30 ●	100
R903026	6,0	130	12,0	70	TX30 ●	100
R903027	6,0	140	12,0	70	TX30 ●	100
R903029	6,0	160	12,0	70	TX30 ●	100
R903031	6,0	180	12,0	70	TX30 ●	100
R903032	6,0	200	12,0	70	TX30 ●	100
R903033	6,0	220	12,0	70	TX30 ●	100
R903034	6,0	240	12,0	70	TX30 ●	100
R903035	6,0	260	12,0	70	TX30 ●	100
R903036	6,0	280	12,0	70	TX30 ●	100
R903037	6,0	300	12,0	70	TX30 ●	100

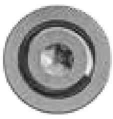
Paneltwistec 1000

Washer head screw, steel specially coated

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

NKL 1 – 2



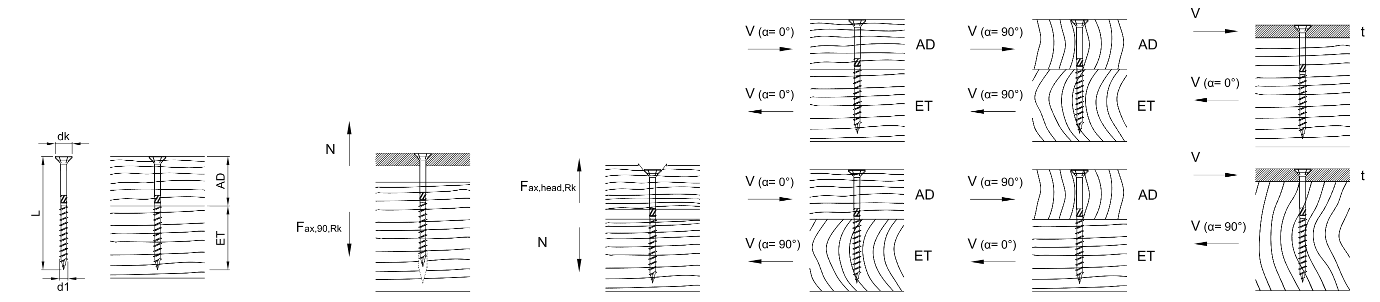


Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
R901357	6,0	100	14,0	60	TX30 ●	100
R901359	6,0	120	14,0	70	TX30 ●	100
R901361	6,0	140	14,0	70	TX30 ●	100
R901364	6,0	180	14,0	70	TX30 ●	100
R901365	6,0	200	14,0	70	TX30 ●	100
R903060	8,0	80	22,0	48	TX40 ●	50
R903062	8,0	100	22,0	54	TX40 ●	50
R903064	8,0	120	22,0	60	TX40 ●	50
R903066	8,0	140	22,0	80	TX40 ●	50
R903067	8,0	160	22,0	80	TX40 ●	50
R903470	8,0	180	22,0	80	TX40 ●	50
R903069	8,0	200	22,0	80	TX40 ●	50
R903472	8,0	220	22,0	80	TX40 ●	50
R903071	8,0	240	22,0	80	TX40 ●	50
R903072	8,0	260	22,0	80	TX40 ●	50
R903073	8,0	280	22,0	80	TX40 ●	50
R903074	8,0	300	22,0	80	TX40 ●	50
R903475	8,0	360	22,0	80	TX40 ●	50
R904625	8,0	380	22,0	80	TX40 ●	50
R903476	8,0	400	22,0	80	TX40 ●	50
R903077	10,0	60	25,0	36	TX40 ●	50
R903079	10,0	80	25,0	50	TX40 ●	50
R903081	10,0	100	25,0	60	TX40 ●	50
R903083	10,0	120	25,0	70	TX40 ●	50
R903085	10,0	160	25,0	90	TX40 ●	50
R903086	10,0	180	25,0	100	TX40 ●	50
R903087	10,0	200	25,0	100	TX40 ●	50
R903088	10,0	220	25,0	100	TX40 ●	50
R903089	10,0	240	25,0	100	TX40 ●	50

TECHNICAL INFORMATION
PANELTWISTEC, COUNTERSUNK HEAD, STEEL SPECIALLY COATED 1000

ETA – Europ. Techn. Bewertung – European Technical Assessment – ETA-11/0024

Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber	t	Shearing steel-timber



d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN] (α= 0° / α=90° / α_{AD}= 0°, α_{ET}= 90° / α_{AD}= 90°, α_{ET}= 0°)	t [mm]	$F_{la,Rk}$ [kN] (α= 0° / α= 90°)
3,0 x 12	5,6	6	6	0,21	0,38	0,21	1	0,27
3,0 x 16	5,6	8	8	0,28	0,38	0,28	1	0,37
3,0 x 20	5,6	10	10	0,35	0,38	0,35	1	0,47
3,0 x 25	5,6	10	15	0,53	0,38	0,42	1	0,60
3,0 x 30	5,6	12	18	0,64	0,38	0,45	1	0,60
3,0 x 35	5,6	14	21	0,74	0,38	0,48	1	0,63
3,0 x 40	5,6	16	24	0,85	0,38	0,52	1	0,66
3,5 x 12	7	6	6	0,28	0,59	0,24	1	0,30
3,5 x 16	7	8	8	0,37	0,59	0,32	1	0,41
3,5 x 20	7	10	10	0,47	0,59	0,40	1	0,52
3,5 x 25	7	10	15	0,70	0,59	0,52	1	0,66
3,5 x 30	7	12	18	0,84	0,59	0,62	1	0,86
3,5 x 35	7	14	21	0,98	0,59	0,67	1	0,92
3,5 x 40	7	16	24	1,12	0,59	0,70	1	0,95
3,5 x 50	7	20	30	1,40	0,59	0,78	1	1,02
4,0 x 16	8	8	8	0,41	0,77	0,35	2	0,42
4,0 x 20	8	10	10	0,52	0,77	0,44	2	0,55
4,0 x 25	8	10	15	0,77	0,77	0,60	2	0,70
4,0 x 30	8	12	18	0,93	0,77	0,71	2	0,91
4,0 x 35	8	14	21	1,08	0,77	0,80	2	1,07
4,0 x 40	8	16	24	1,24	0,77	0,84	2	1,15
4,0 x 45	8	18	27	1,39	0,77	0,88	2	1,19
4,0 x 50	8	20	30	1,55	0,77	0,92	2	1,23
4,0 x 60	8	24	36	1,86	0,77	1,01	2	1,31
4,0 x 70	8	28	42	2,17	0,77	1,03	2	1,38
4,0 x 80	8	32	48	2,48	0,77	1,03	2	1,46

Dimensioning according to ETA-11/0024. Bulk density ρk= 350 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
The characteristic values for the load-bearing capacity Rk must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity Rk must be reduced to the design values Rd with regard to the service and load duration class: Rd= Rk · kmod / γM. The design values for the load-bearing capacity Rd must be compared with the design values for the actions Ed (Rd ≥ Ed).

Example:

Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min R_k= $R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min R_k= $R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

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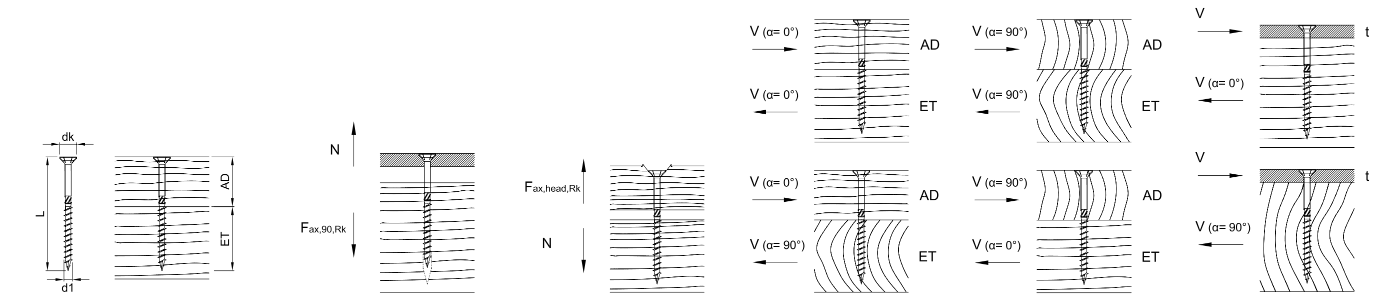
TECHNICAL INFORMATION
PANELTWISTEC, COUNTERSUNK HEAD, STEEL SPECIALLY COATED 1000

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024



Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber				Shearing steel-timber		
d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								α_{AD}= 0°	α_{AD}= 90°			
						α= 0°	α=90°	α_{ET}= 90°	α_{ET}= 0°		α= 0°	α= 90°
4,5 x 16	9	8	8	0,45	0,97	0,40				2	0,46	
4,5 x 25	9	10	15	0,84	0,97	0,65				2	0,76	
4,5 x 30	9	12	18	1,01	0,97	0,77				2	0,92	
4,5 x 35	9	14	21	1,18	0,97	0,86				2	1,09	
4,5 x 40	9	16	24	1,35	0,97	1,00				2	1,34	
4,5 x 50	9	20	30	1,69	0,97	1,08				2	1,44	
4,5 x 60	9	24	36	2,03	0,97	1,17				2	1,53	
4,5 x 70	9	28	42	2,36	0,97	1,23				2	1,61	
4,5 x 80	9	32	48	2,70	0,97	1,23				2	1,75	
4,5 x 90	9	36	54	3,04	0,97	1,23				2	1,75	
4,5 x 100	9	40	60	3,38	0,97	1,23				2	1,75	
5,0 x 25	10,0	10	15	0,91	1,20	0,70				2	0,81	
5,0 x 30	10,0	10	20	1,21	1,20	0,90				2	1,00	
5,0 x 35	10,0	14	21	1,27	1,20	0,96				2	1,17	
5,0 x 40	10,0	16	24	1,45	1,20	1,11				2	1,44	
5,0 x 45	10,0	18	27	1,63	1,20	1,20				2	1,62	
5,0 x 50	10,0	20	30	1,82	1,20	1,24				2	1,67	
5,0 x 60	10,0	24	36	2,18	1,20	1,34				2	1,76	
5,0 x 70	10,0	28	42	2,54	1,20	1,44				2	1,85	
5,0 x 80	10,0	32	48	2,90	1,20	1,52				2	1,94	
5,0 x 90	10,0	36	54	3,27	1,20	1,52				2	2,03	
5,0 x 100	10,0	40	60	3,63	1,20	1,52				2	2,12	
5,0 x 120	10,0	50	70	4,24	1,20	1,52				2	2,27	

Dimensioning according to ETA-11/0024. Bulk density ρk= 350 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
The characteristic values for the load-bearing capacity Rk must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity Rk must be reduced to the design values Rd with regard to the service class and load duration class: Rd= Rk · kmod / γM. The design values for the load-bearing capacity Rd must to be compared to the design values for the actions Ed (Rd ≥ Ed).

Example:

Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min R_k= $R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min R_k= $R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

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TECHNICAL INFORMATION
PANELTWISTEC, COUNTERSUNK HEAD, STEEL SPECIALLY COATED 1000

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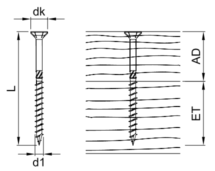
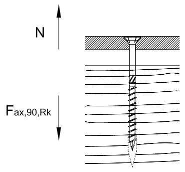
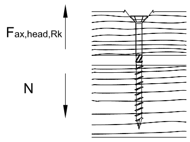
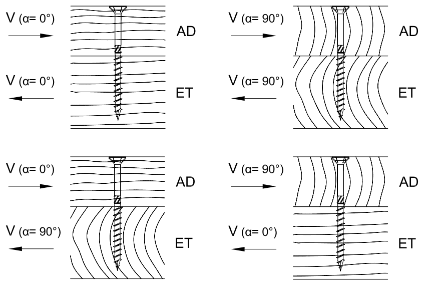
European Technical Assessment
ETA-11/0024

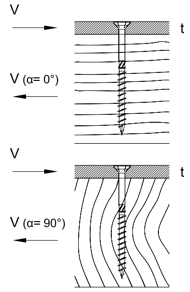
Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber				Shearing steel-timber		











d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								α_{AD}= 0°	α_{AD}= 90°			
						α= 0°	α=90°	α_{ET}= 90°	α_{ET}= 0°		α= 0°	α= 90°
6,0 x 40	12,0	16	24	1,64	1,73	1,27				2	1,53	
6,0 x 50	12,0	20	30	2,05	1,73	1,51				2	1,90	
6,0 x 60	12,0	24	36	2,46	1,73	1,65				2	2,21	
6,0 x 70	12,0	28	42	2,87	1,73	1,75				2	2,31	
6,0 x 80	12,0	32	48	3,28	1,73	1,85				2	2,41	
6,0 x 90	12,0	36	54	3,69	1,73	1,96				2	2,51	
6,0 x 100	12,0	40	60	4,10	1,73	2,02				2	2,62	
6,0 x 120	12,0	50	70	4,79	1,73	2,02				2	2,80	
6,0 x 130	12,0	60	70	4,79	1,73	2,02				2	2,80	
6,0 x 140	12,0	70	70	4,79	1,73	2,02				2	2,80	
6,0 x 160	12,0	90	70	4,79	1,73	2,02				2	2,80	
6,0 x 180	12,0	110	70	4,79	1,73	2,02				2	2,80	
6,0 x 200	12,0	130	70	4,79	1,73	2,02				2	2,80	
6,0 x 220	12,0	150	70	4,79	1,73	2,02				2	2,80	
6,0 x 240	12,0	170	70	4,79	1,73	2,02				2	2,80	
6,0 x 260	12,0	190	70	4,79	1,73	2,02				2	2,80	
6,0 x 280	12,0	210	70	4,79	1,73	2,02				2	2,80	
6,0 x 300	12,0	230	70	4,79	1,73	2,02				2	2,80	

Dimensioning according to ETA-11/0024. Bulk density ρk= 350 kg/m^3. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
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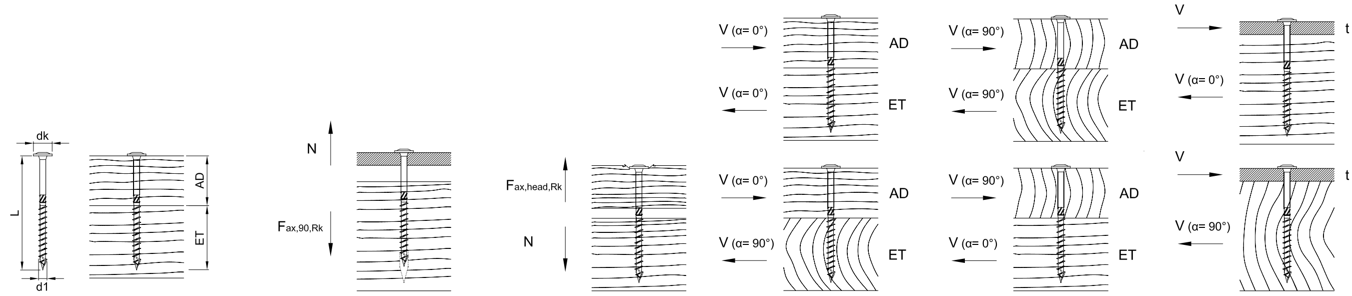
TECHNICAL INFORMATION
PANELTWISTEC, COUNTERSUNK HEAD, STEEL SPECIALLY COATED 1000

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024



Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber				Shearing steel-timber		
d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								$\alpha_{AD}= 0°$	$\alpha_{AD}= 90°$			
						$\alpha= 0°$	$\alpha=90°$	$\alpha_{ET}= 90°$	$\alpha_{ET}= 0°$		$\alpha= 0°$	$\alpha= 90°$
6,0 x 40	14,0	16	24	1,64	2,35	1,27				2	1,53	
6,0 x 50	14,0	20	30	2,05	2,35	1,60				2	1,90	
6,0 x 60	14,0	24	36	2,46	2,35	1,81				2	2,21	
6,0 x 80	14,0	32	48	3,28	2,35	2,01				2	2,41	
6,0 x 90	14,0	36	54	3,69	2,35	2,12				2	2,51	
6,0 x 100	14,0	40	60	4,10	2,35	2,18				2	2,62	
6,0 x 120	14,0	50	70	4,80	2,35	2,18				2	2,80	
6,0 x 140	14,0	70	70	4,80	2,35	2,18				2	2,80	
6,0 x 180	14,0	110	70	4,80	2,35	2,18				2	2,80	
6,0 x 200	14,0	130	70	4,80	2,35	2,18				2	2,80	
8,0 x 60	22,0	24	36	3,20	5,81	3,36	2,65	2,92	2,92	3	4,15	3,33
8,0 x 80	22,0	30	50	4,26	5,81	3,94	3,21	3,72	3,36	3	4,41	3,83
8,0 x 100	22,0	40	60	4,80	5,81	4,55	3,71	4,21	3,87	3	4,55	3,96
8,0 x 120	22,0	60	60	5,33	5,81	4,68	4,10	4,34	4,34	3	4,68	4,10
8,0 x 140	22,0	60	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 160	22,0	80	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 180	22,0	100	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 200	22,0	120	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 220	22,0	140	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 240	22,0	160	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 260	22,0	180	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 280	22,0	200	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 300	22,0	220	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 340	22,0	260	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 360	22,0	280	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 380	22,0	300	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
8,0 x 400	22,0	320	80	7,10	5,81	4,80	4,21	4,46	4,46	3	5,12	4,54
10,0 x 60	25,0	24	36	3,90	7,50	4,30	3,18	3,90	3,54	3	5,90	3,93
10,0 x 80	25,0	30	50	5,40	7,50	5,20	4,25	4,78	4,47	3	6,30	5,30
10,0 x 100	25,0	40	60	6,48	7,50	6,44	5,08	6,44	5,08	3	6,78	5,81
10,0 x 120	25,0	50	70	7,13	7,50	6,94	5,74	6,94	5,74	3	6,94	5,97
10,0 x 160	25,0	60	90	9,23	7,50	7,03	6,07	7,03	6,07	3	7,72	6,76
10,0 x 180	25,0	80	100	10,26	7,50	7,03	6,07	7,03	6,07	3	7,72	6,76
10,0 x 200	25,0	100	100	10,26	7,50	7,03	6,07	6,07	6,07	3	7,72	6,76
10,0 x 220	25,0	120	100	10,26	7,50	7,03	6,07	6,07	7,03	3	7,72	6,76
10,0 x 240	25,0	140	100	10,26	7,50	7,03	6,07	6,07	7,03	3	7,72	6,76

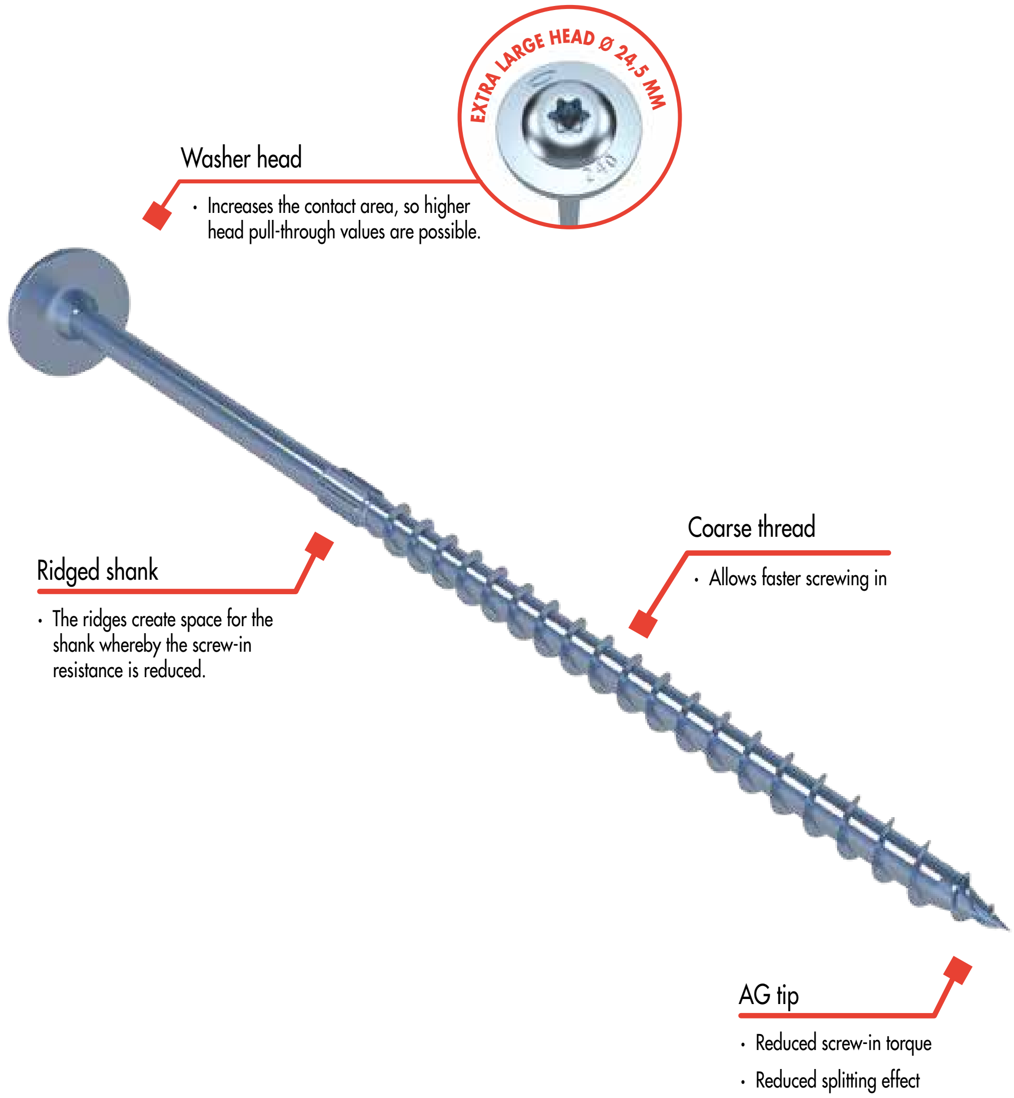
PANELTWISTEC TK AG STRONGHEAD

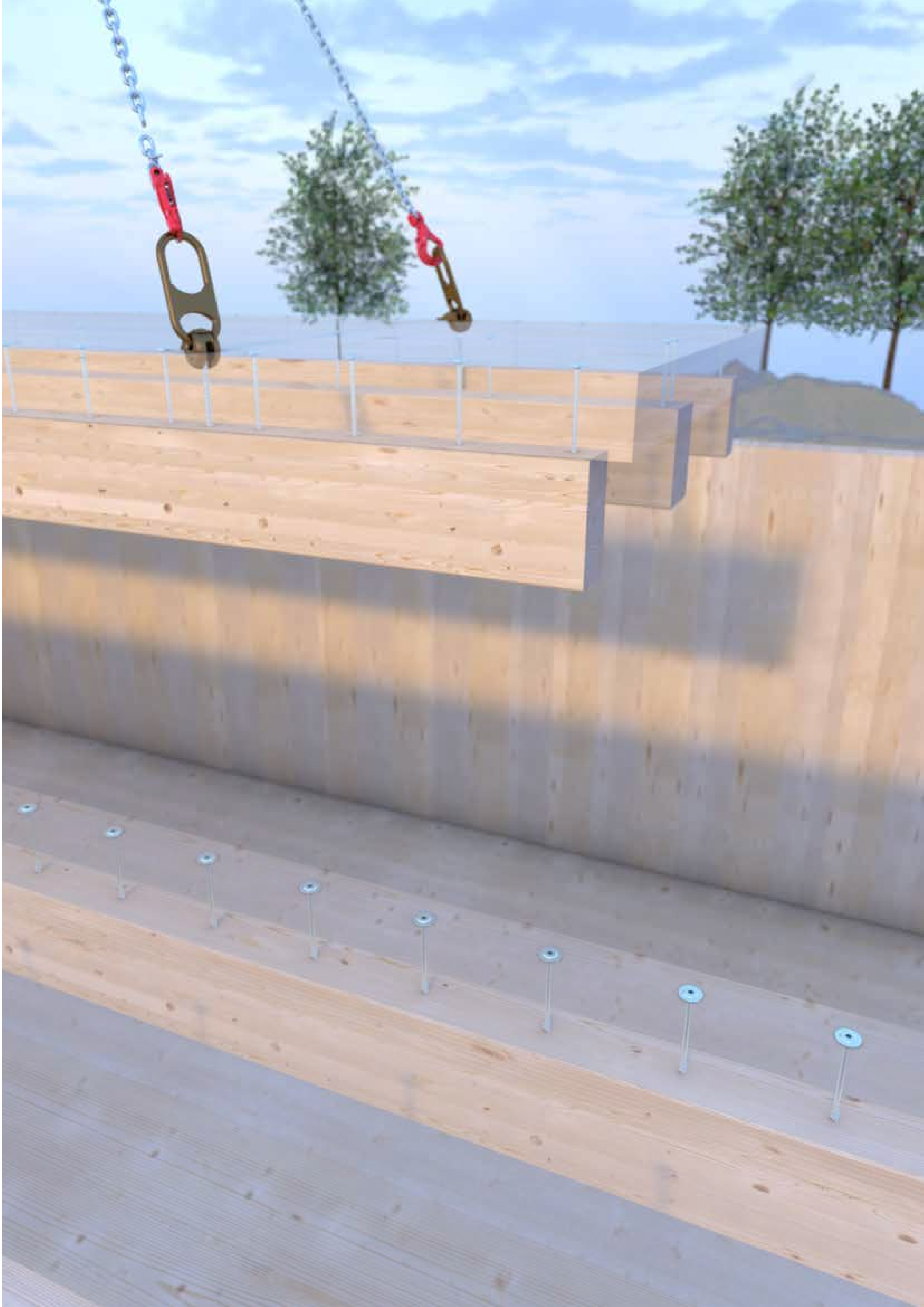
For the application of press-laminated structural timber components

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

NEU
in unserem Programm

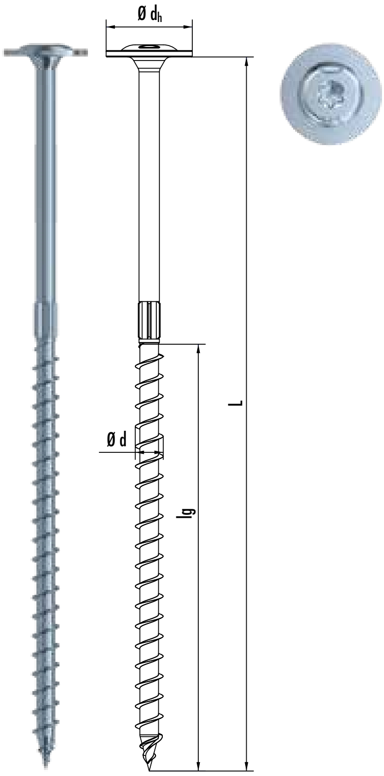
Paneltwistec wood construction screws can be installed **in CLT or laminated timber without pre-drilling**. Paneltwistec has a **special AG screw tip and milling ribs** above the thread, which ensures it grips quickly and has a reduced splitting effect when screwing in. What's more, the thread not only speeds up the assembly process but also **reduces** the **screw-in torque.** The washer head offers a **high head pull-through resistance** and ensures sufficient **pressure between the two surfaces to be connected**, which is very effective for adhesive bonding. If the press-gluing is carried out properly during the curing of the adhesives, it is possible to produce composite timber components. Furthermore, ribbed panel applications can be realised.



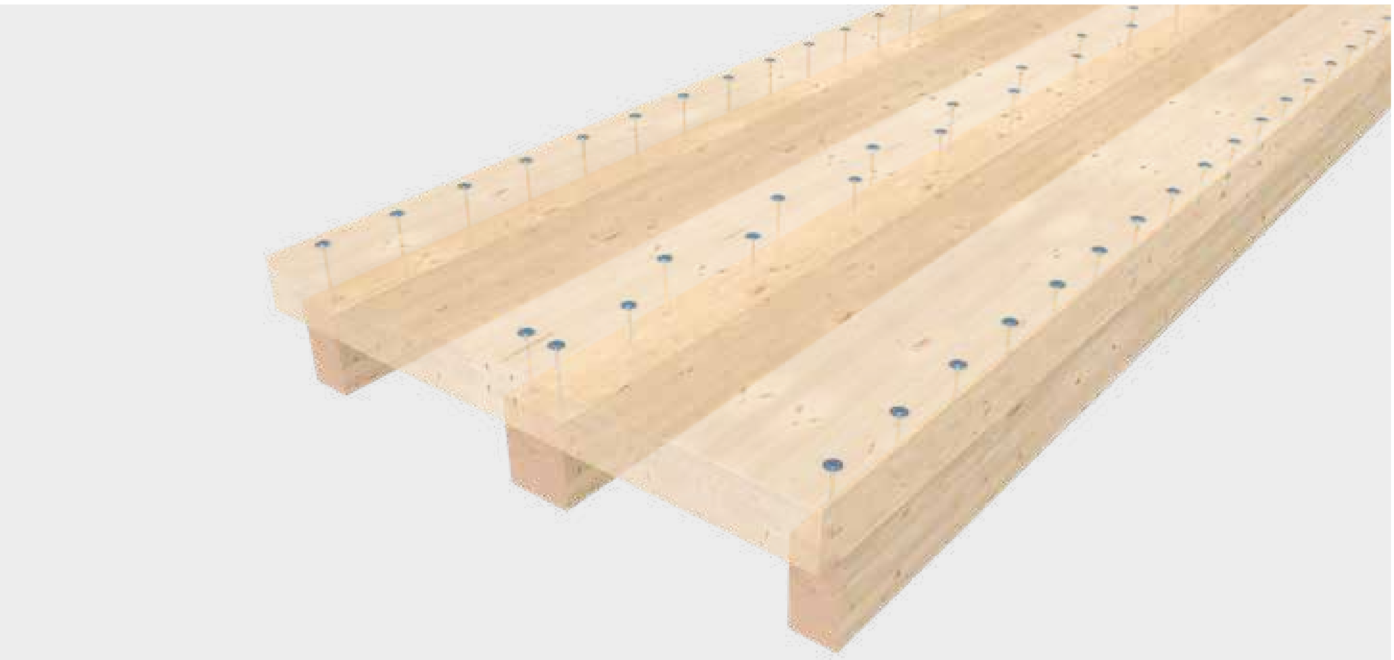


PANELTWISTEC TK AG STRONGHEAD

Washer head screw, blue galvanised

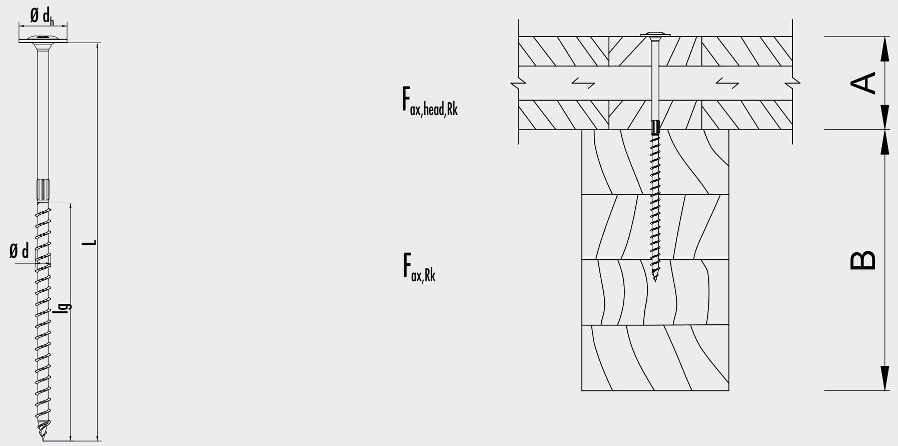


Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
903170	8,0	200	24,5	120	TX40 ●	50
903171	8,0	220	24,5	120	TX40 ●	50
903172	8,0	240	24,5	120	TX40 ●	50
903173	8,0	260	24,5	120	TX40 ●	50
903174	8,0	280	24,5	120	TX40 ●	50
903175	8,0	300	24,5	120	TX40 ●	50
903176	8,0	320	24,5	120	TX40 ●	50
903177	8,0	340	24,5	120	TX40 ●	50
903178	8,0	360	24,5	120	TX40 ●	50
903179	8,0	380	24,5	120	TX40 ●	50
903180	8,0	400	24,5	120	TX40 ●	50



Bonding pressure distribution in the screw press bonding of rib panel elements

PRESS-GLUING OF SCREWS WITH MINIMUM REQUIRED LENGTHS



Ø 8 mm			
		Extraction resistance	Head pull-through resistance
A [mm]	L [mm]	$F_{ax, Rk}$ [kN]	$F_{ax, head, Rk}$
80	200		
100	220		
120	240		
140	260		
160	280		
180	300	10.6	7.2
200	320		
220	340		
240	360		
260	380		
280	400		

The calculations are made according to ETA-11/0024 and EN 1995-1-1, without predrilled holes and with a wood density of $\rho k = 350$ kg/m³. The Fax,Rd design values must be calculated using kmod = 1 and $\gamma M = 1.3$. Fax,d is limited by the head pull-through resistance, where "L" is the minimum screw length needed to achieve the respective performance. Component A indicates the maximum panel thickness that can be pressed onto a ribbed beam with screws. Component B corresponds to the height of the ribbed beam: B ≥ [L - A].

GENERAL REQUIREMENTS FOR PRESS-GLUING WITH SCREWS (DIN 1052:2004; EN 1995-1-1)

- Materials: Solid timber, plywood, OSB, laminated veneer timber, laminated timber, cross laminated timber
- Adhesive: EN 301 and DIN 68141 for load-bearing structures and an adhesive joint thickness in accordance with DIN EN 302
- Application: The threaded part should be fully screwed into the element to be fixed. Before use, the surface should be smooth, clean and free of dust and dirt. Multiple layers should be glued individually. The maximum permissible thickness for solid timber and timber-based materials is 30 mm and 55 mm respectively. (For greater thicknesses, please contact the appropriate persons.)
- Room temperature ≥ 20°C
- Material temperature ≥ 20°C
- Moisture content ≤ 15 m % (maximum difference 4 m %)
- Fastener spacings ≤ 150 mm
- Area per fastener ≤ 15,000 mm2
- Vacuum press, 0.1 MPa ~ 1.5 kN (force required per fastener based on the area)
- Hydraulic press, 0.6 MPa ~ 9 kN (force required per fastener based on the area)

BRUTUS THREADED ROD

Fully threaded rod for the transverse tensile reinforcement of laminated wood

BRUTUS threaded rods are used both in **new constructions** (in the production of binders) and during **renovations**. While they enable **larger spans or slimmer wood cross-sections** in new constructions, during renovations, they help **to secure the existing structures**. This means that many binders do not have to be replaced or duplicated in a time-consuming manner, even though they are riddled with obvious cracks. However, an appraisal is required here in any case. BRUTUS threaded rods can be **shortened to any desired length** and are predrilled to 13 mm. When creating the drill holes, care must be taken to ensure that they do not go off centre. The BRUTUS threaded rod **is used for transverse tension reinforcements on notches and openings, on transverse connections and hall trusses.**

BRUTUS THREADED ROD

Steel 8.8, galvanised

NKL 1 – 2

Europ. Techn. Bewertung / European Technical Assessment ETA-11/0024

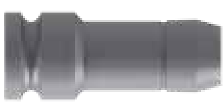
Item number	Ø d [mm]	L [mm]	PU
903170	16	3000	1

WHAT YOU NEED TO CONSIDER

- Pre-drill to Ø 13 mm
- In the case of long drill holes, the drill bit may go off centre

CUTTING SERVICE
We custom cut your threaded rods to length.

INSERTION TOOL



Suitable to this

Item number	PU
945318	1

APPLICATION EXAMPLES

Notch

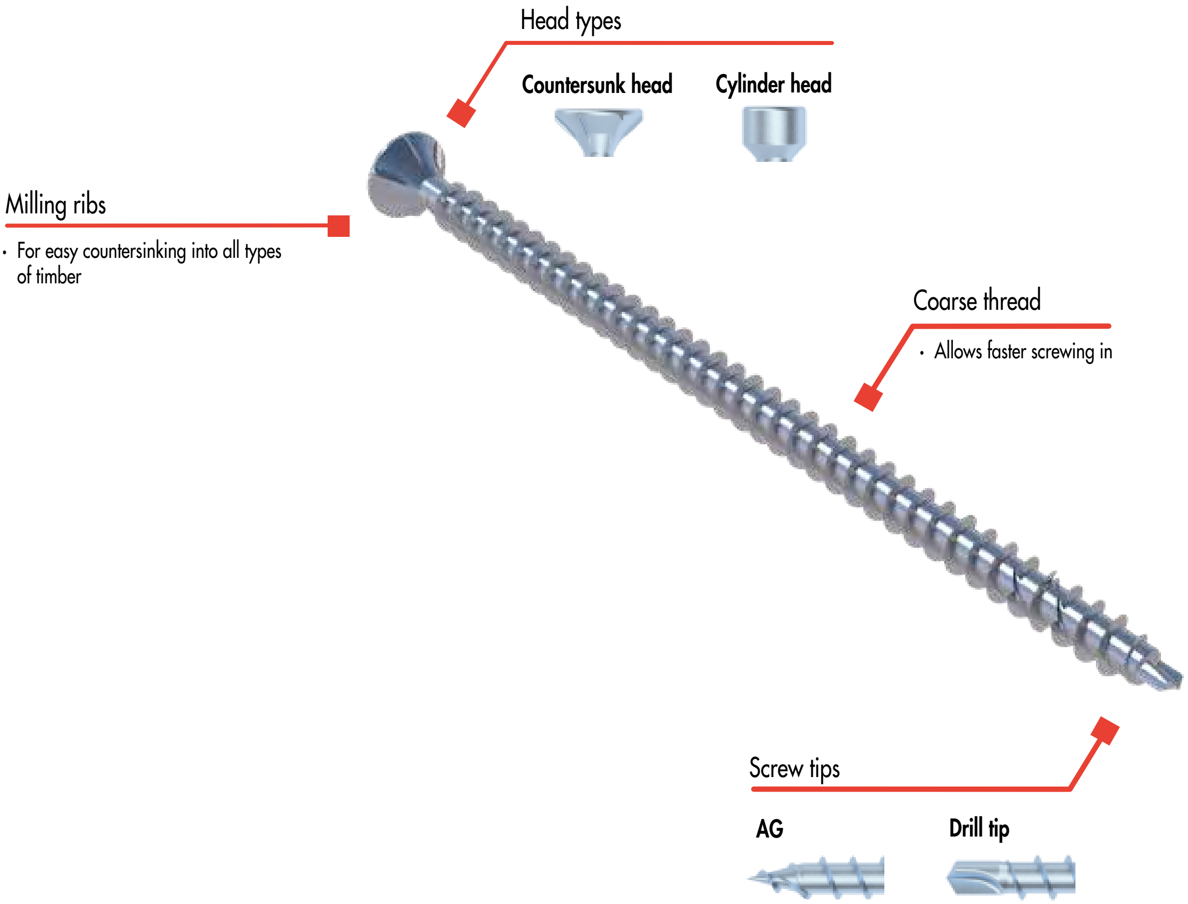
Opening

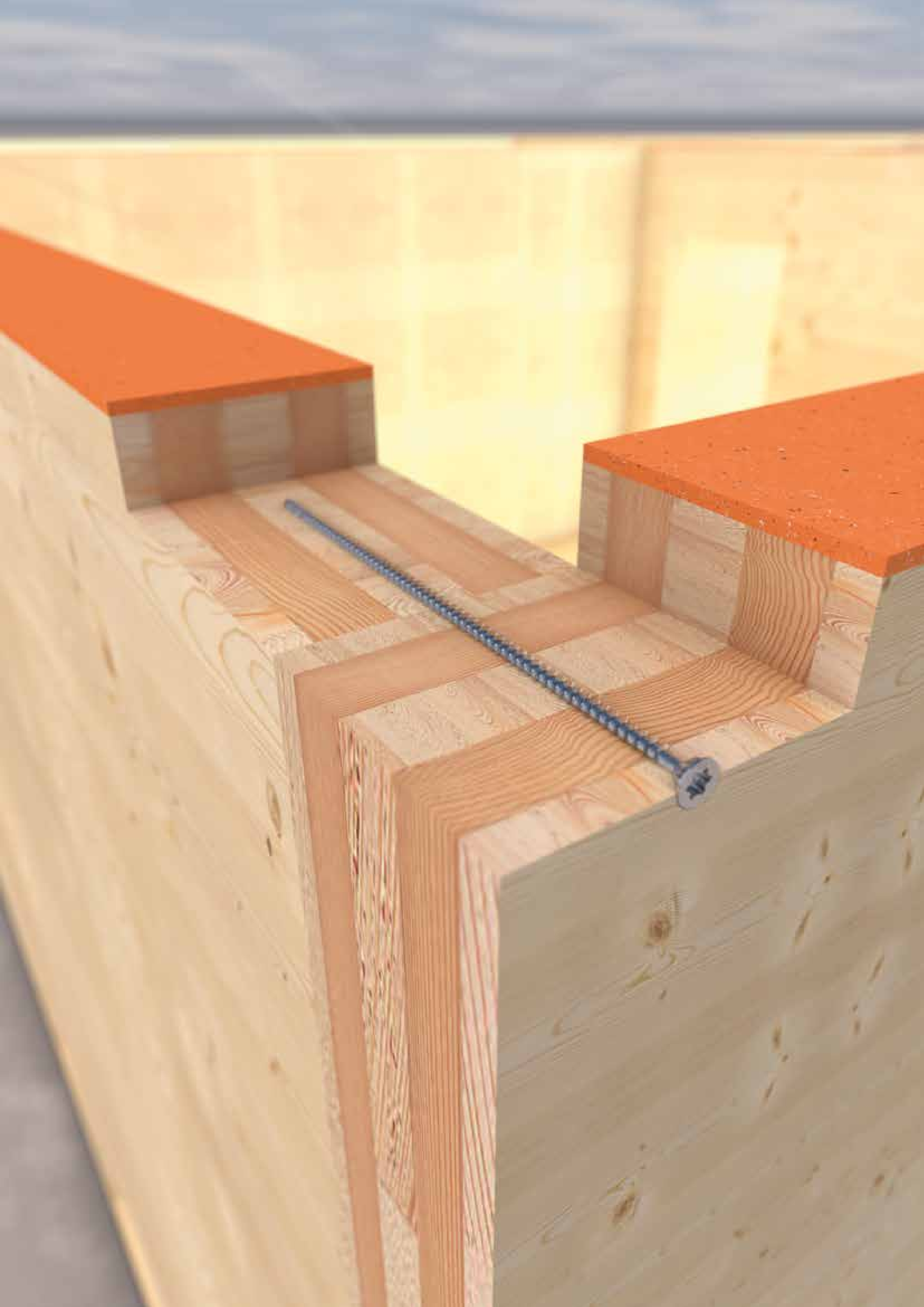
KONSTRUX FULLY THREADED SCREW

The powerful solution for both new constructions and renovations

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

KonstruX fully threaded screws **maximise the load-bearing capacity** of the connections thanks to the **high thread-extraction resistance** present in both structural components. When partially threaded screws are used, the significantly lower head pull-through resistance in the attachment part limits the connection's load-bearing capacity. KonstruX fully threaded screws represent a **cost-saving alternative** to traditional connections or timber connectors such as joist and beam hangers.



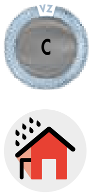


KONSTRUX FULLY THREADED SCREW

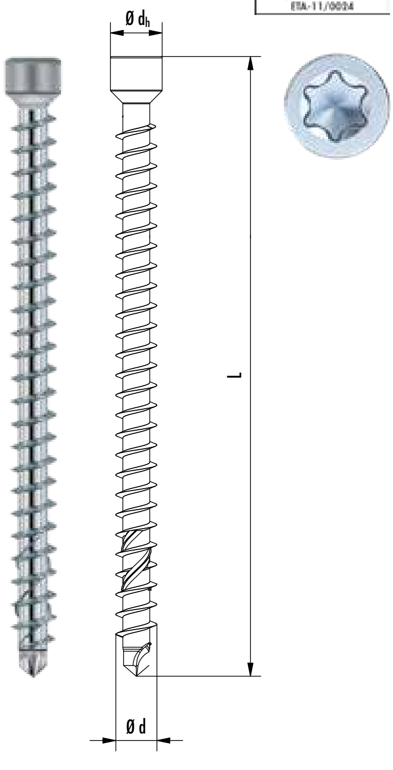
Carbon steel, blue galvanised

KonstruX ST fully threaded screw

Cylinder head, drill tip, blue galvanised



NKL 1 – 2

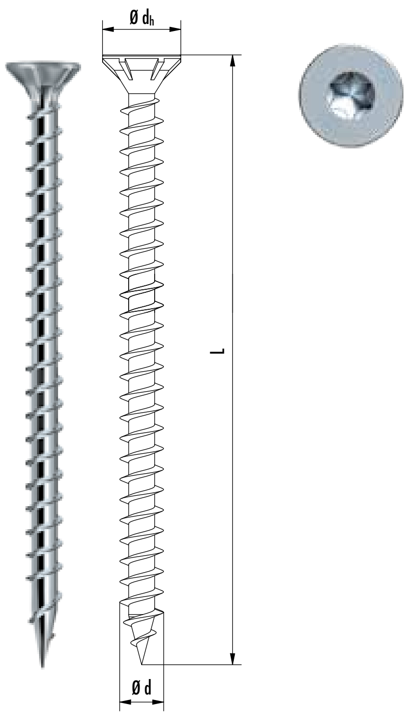


Item number	Ø d [mm]	L [mm]	Ø dh [mm]	Drive	PU
904808	6,5	80	8,0	TX30 ●	100
904809	6,5	100	8,0	TX30 ●	100
904810	6,5	120	8,0	TX30 ●	100
904811	6,5	140	8,0	TX30 ●	100
904812	6,5	160	8,0	TX30 ●	100
904813	6,5	195	8,0	TX30 ●	100
904825	8,0	155	10,0	TX40 ●	50
904826	8,0	195	10,0	TX40 ●	50
904827	8,0	220	10,0	TX40 ●	50
904828	8,0	245	10,0	TX40 ●	50
904834	8,0	270	10,0	TX40 ●	50
904829	8,0	295	10,0	TX40 ●	50
904830	8,0	330	10,0	TX40 ●	50
904831	8,0	375	10,0	TX40 ●	50
904832	8,0	400	10,0	TX40 ●	50
944804	8,0	430	10,0	TX40 ●	50
944805	8,0	480	10,0	TX40 ●	50
944806	8,0	530	10,0	TX40 ●	50
944807	8,0	580	10,0	TX40 ●	50
904815	10,0	300	13,0	TX50 ●	25
904816	10,0	330	13,0	TX50 ●	25
904817	10,0	360	13,0	TX50 ●	25
904818	10,0	400	13,0	TX50 ●	25
904819	10,0	450	13,0	TX50 ●	25
904820	10,0	500	13,0	TX50 ●	25
904821	10,0	550	13,0	TX50 ●	25
904822	10,0	600	13,0	TX50 ●	25

KonstruX ST fully threaded screw

Countersunk head, screw tip AG, blue galvanised

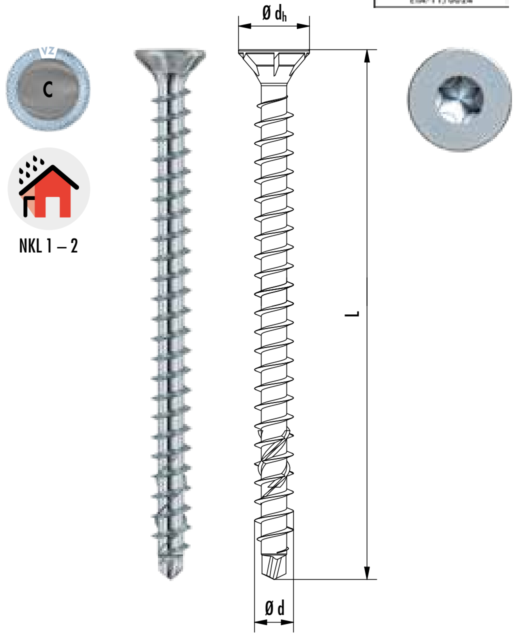
NKL 1 – 2



Item number	Ø d [mm]	L [mm]	Ø dh [mm]	Drive	PU
905737	11,3	300	18,0	TX50 ●	20
905738	11,3	340	18,0	TX50 ●	20
905739	11,3	380	18,0	TX50 ●	20
905740	11,3	420	18,0	TX50 ●	20
905741	11,3	460	18,0	TX50 ●	20
905742	11,3	500	18,0	TX50 ●	20
905743	11,3	540	18,0	TX50 ●	20
905744	11,3	580	18,0	TX50 ●	20
905745	11,3	620	18,0	TX50 ●	20
905746	11,3	660	18,0	TX50 ●	20
905747	11,3	700	18,0	TX50 ●	20
905748	11,3	750	18,0	TX50 ●	20
905749	11,3	800	18,0	TX50 ●	20
904750	11,3	900	18,0	TX50 ●	20
904751	11,3	1000	18,0	TX50 ●	20

KonstruX ST fully threaded screw

Countersunk head, drill tip, blue galvanised



Item number	Ø d [mm]	L [mm]	Ø dh [mm]	Drive	PU
904857	6,5	80	11,5	TX30 ●	100
904858	6,5	100	11,5	TX30 ●	100
904859	6,5	120	11,5	TX30 ●	100
904860	6,5	140	11,5	TX30 ●	100
904790	8,0	95	14,5	TX40 ●	50
904791	8,0	125	14,5	TX40 ●	50
904792	8,0	155	14,5	TX40 ●	50
904793	8,0	195	14,5	TX40 ●	50
904794	8,0	220	14,5	TX40 ●	50
904795	8,0	245	14,5	TX40 ●	50
904796	8,0	270	14,5	TX40 ●	50
904797	8,0	295	14,5	TX40 ●	50
904798	8,0	330	14,5	TX40 ●	50
904799	8,0	375	14,5	TX40 ●	50
904800	8,0	400	14,5	TX40 ●	50
904801	8,0	430	14,5	TX40 ●	50
904802	8,0	480	14,5	TX40 ●	50
904803	8,0	545	14,5	TX40 ●	50
904770	10,0	125	17,8	TX50 ●	25
904771	10,0	155	17,8	TX50 ●	25
904772	10,0	195	17,8	TX50 ●	25
904773	10,0	220	17,8	TX50 ●	25
904774	10,0	245	17,8	TX50 ●	25
904775	10,0	270	17,8	TX50 ●	25
904776	10,0	300	17,8	TX50 ●	25
904777	10,0	330	17,8	TX50 ●	25
904778	10,0	360	17,8	TX50 ●	25
904779	10,0	400	17,8	TX50 ●	25
904780	10,0	450	17,8	TX50 ●	25
904781	10,0	500	17,8	TX50 ●	25
904782	10,0	550	17,8	TX50 ●	25
904783	10,0	600	17,8	TX50 ●	25

KONSTRUX FULLY THREADED SCREW

Stainless steel A4

KonstruX ST A4 fully threaded screws **maximise the load-bearing capacity of connections thanks to the high thread-extraction resistance in both structural components.** When partially threaded screws are used on the other hand, the significantly lower head pull-through resistance in the attachment part limits the connection's load-bearing capacity.

Suitable for use in timber-timber connections in both indoor and outdoor settings. The application areas of KonstruX ST A4 screws are to be found outdoors in **playgrounds, on balconies,** in sun protection applications in the shape of pergolas as well as near the coast and in **hydraulic engineering,** e.g. on jetties and piers.

KonstruX ST fully threaded screw

Cylinder head, drill tip, stainless steel A4

ETA-11/0024

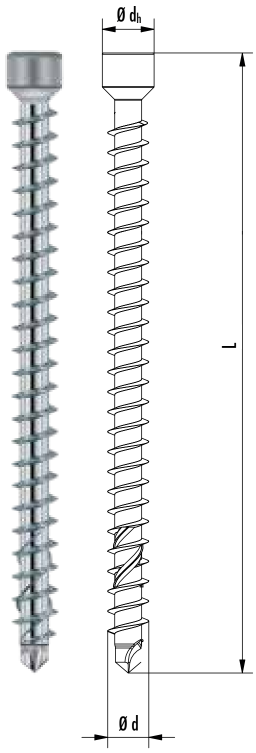
A4

NKL 1 – 3

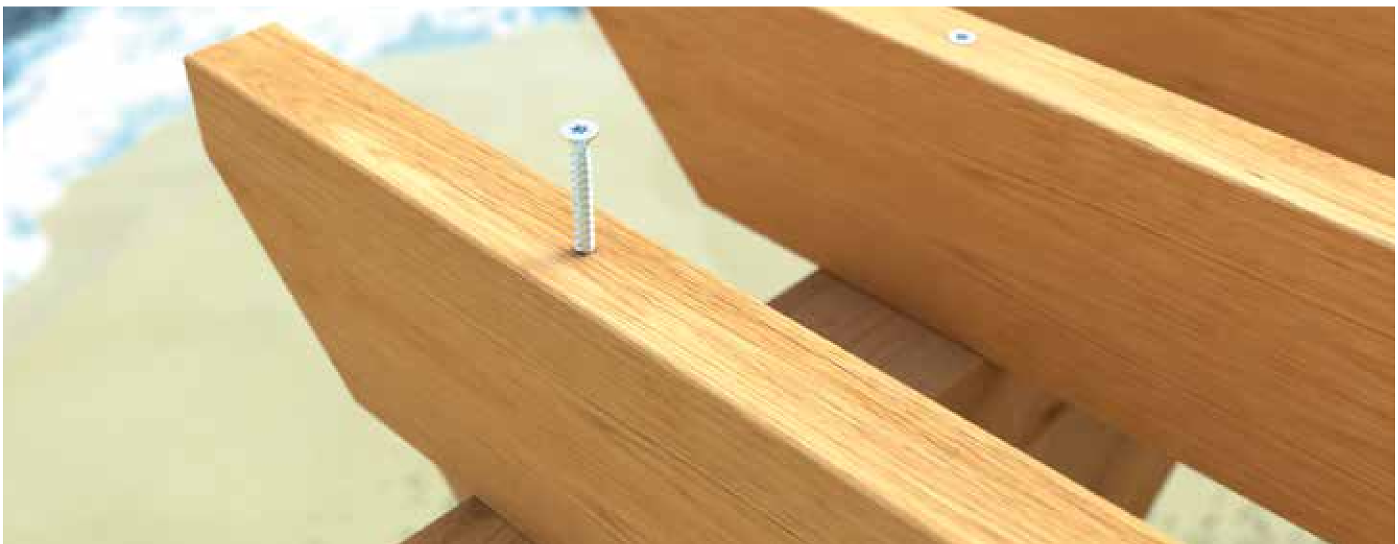
CRC III

C5

T5



Item number	Ø d [mm]	L [mm]	Ø dh [mm]	Drive	PU
944780	6,5	140	8,0	TX40 ●	100
944781	6,5	160	8,0	TX40 ●	100
944782	6,5	195	8,0	TX40 ●	100
944783	8,0	155	8,0	TX40 ●	50
944784	8,0	195	8,0	TX40 ●	50
944785	8,0	220	8,0	TX40 ●	50
944786	8,0	245	8,0	TX40 ●	50
944787	8,0	270	8,0	TX40 ●	50
944788	8,0	295	8,0	TX40 ●	50
944789	8,0	330	8,0	TX40 ●	50
944790	8,0	375	8,0	TX40 ●	50
944791	8,0	400	8,0	TX40 ●	50

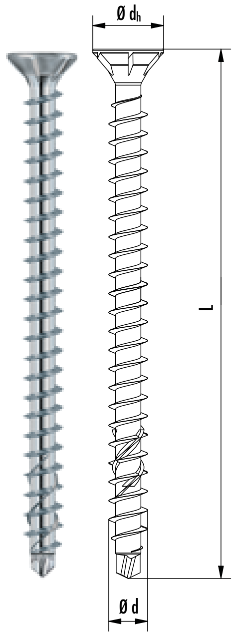


KonstruX with countersunk head stainless steel A4: Ideal for timber-timber connections in polluted urban and industrial areas > 0.25 km from the coast.

KonstruX ST fully threaded screw

Countersunk head, drill tip, stainless steel A4

A4
NKL 1 – 3
CRC III
C5
T5

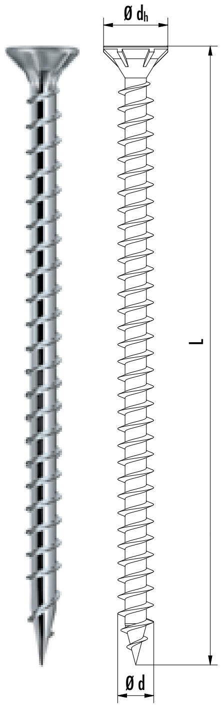


Item number	Ø d [mm]	L [mm]	Ø dh [mm]	Drive	PU
944795	8,0	95	14,5	TX40 ●	50
944792	8,0	125	14,5	TX40 ●	50
944793	8,0	155	14,5	TX40 ●	50
944794	8,0	195	14,5	TX40 ●	50

KonstruX fully threaded screw

Countersunk head, stainless steel A4

A4
NKL 1 – 3
CRC III
C5
T5

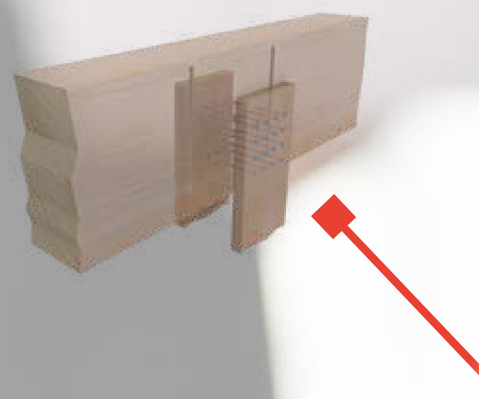


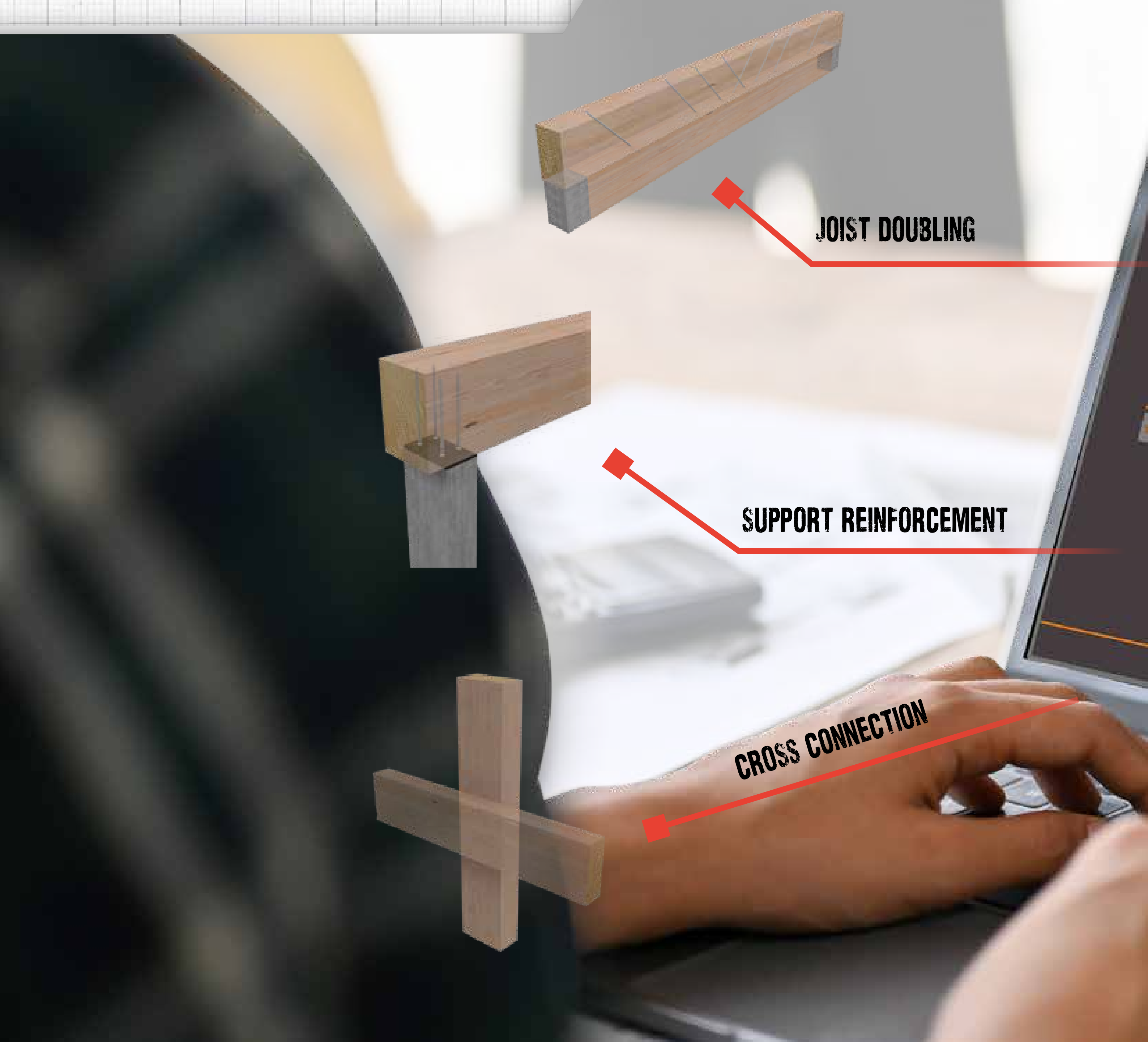
Item number	Ø d [mm]	L [mm]	Ø dh [mm]	Drive	PU
905750	10,0	160	17,8	TX50 ●	25
905751	10,0	200	17,8	TX50 ●	25
905752	10,0	220	17,8	TX50 ●	25
905753	10,0	240	17,8	TX50 ●	25
905754	10,0	260	17,8	TX50 ●	25
905755	10,0	280	17,8	TX50 ●	25
905756	10,0	300	17,8	TX50 ●	25
905757	10,0	350	17,8	TX50 ●	25
905758	10,0	400	17,8	TX50 ●	25

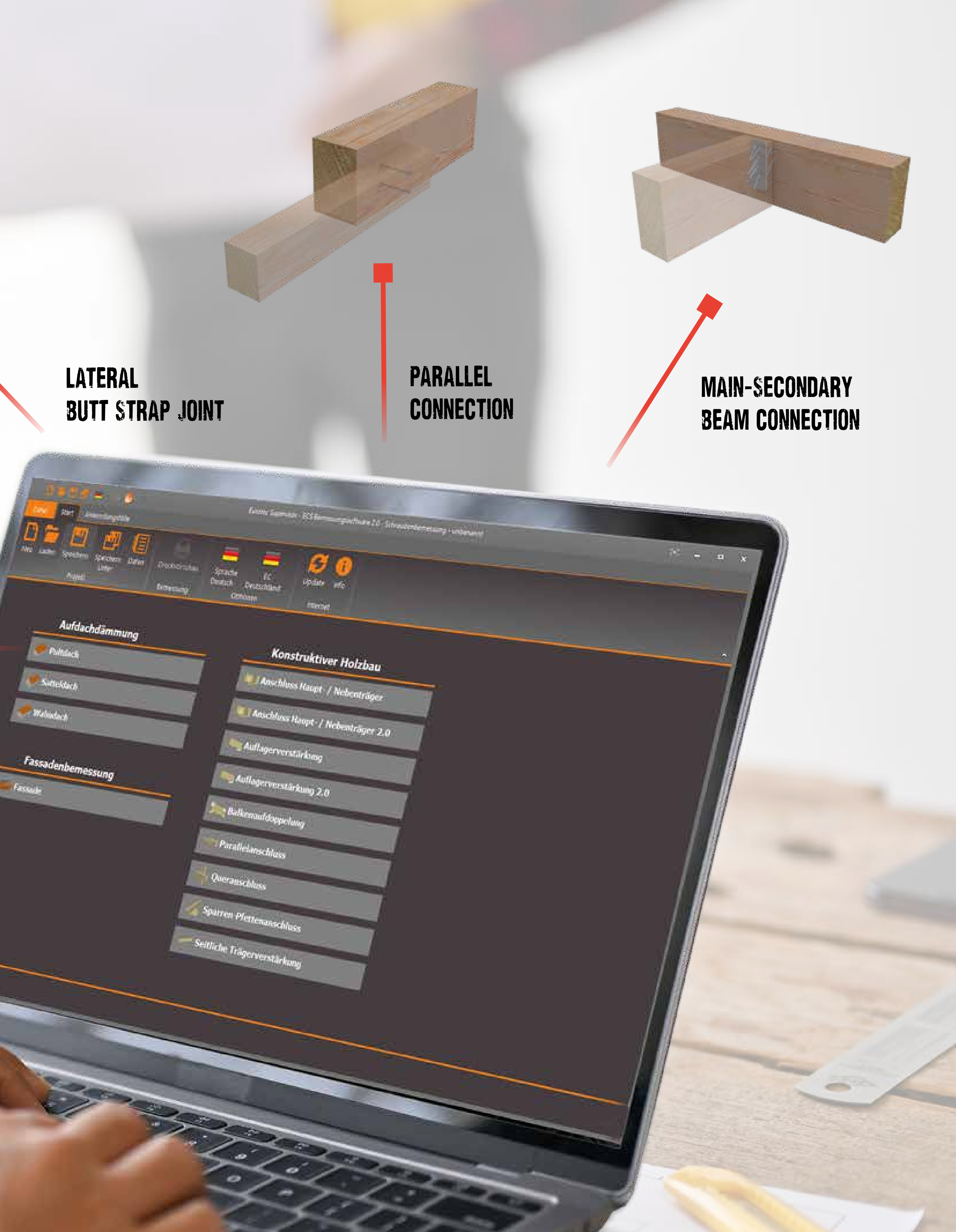
NEW MODULES IN OUR **ECS SOFTWARE**

Our ECS design software has been further developed in the course of a comprehensive revision and expansion. In particular, the focus was on the integration of modules for structural engineered wood constructions. The aim is to provide the user with effective tools to design standardised connections quickly and verifiably.

To learn more about ECS software, just scan the QR code.







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APPLICATION EXAMPLE: SUPPORT REINFORCEMENT

BEAM REINFORCEMENT (PRESSURE PERPENDICULAR TO THE GRAIN)

In contrast to concrete and steel, wood is a building material created by nature which has a highly anisotropic load-bearing behaviour. The ratio between the characteristic tensile and compressive strengths found perpendicular to the grain and parallel to the grain is about 1/30 and 1/8, respectively. Timber structures should therefore be carefully detailed to minimise these kinds of load cases as much as possible. In addition, reinforcement methods should be used to compensate for these weaknesses as needed.

One example for this are beam supports: In this scenario, glued-in threaded rods and glued-on plywood panels were previously often used as reinforcement methods, but these are time-consuming and expensive due to the epoxy adhesives used. Fully threaded screws represent a more modern and cost-effective alternative and can experimentally increase the support's load-bearing capacity by up to 300%. They are mounted in front of the steel beam panel and absorb part of the local pressure load by means of retraction (limited by the buckling resistance), whereby the load distribution within the timber is improved.

DESIGN VALUE OF THE LOAD-BEARING CAPACITY PERPENDICULAR TO THE DIRECTION OF THE GRAIN WITH SCREW REINFORCEMENT:

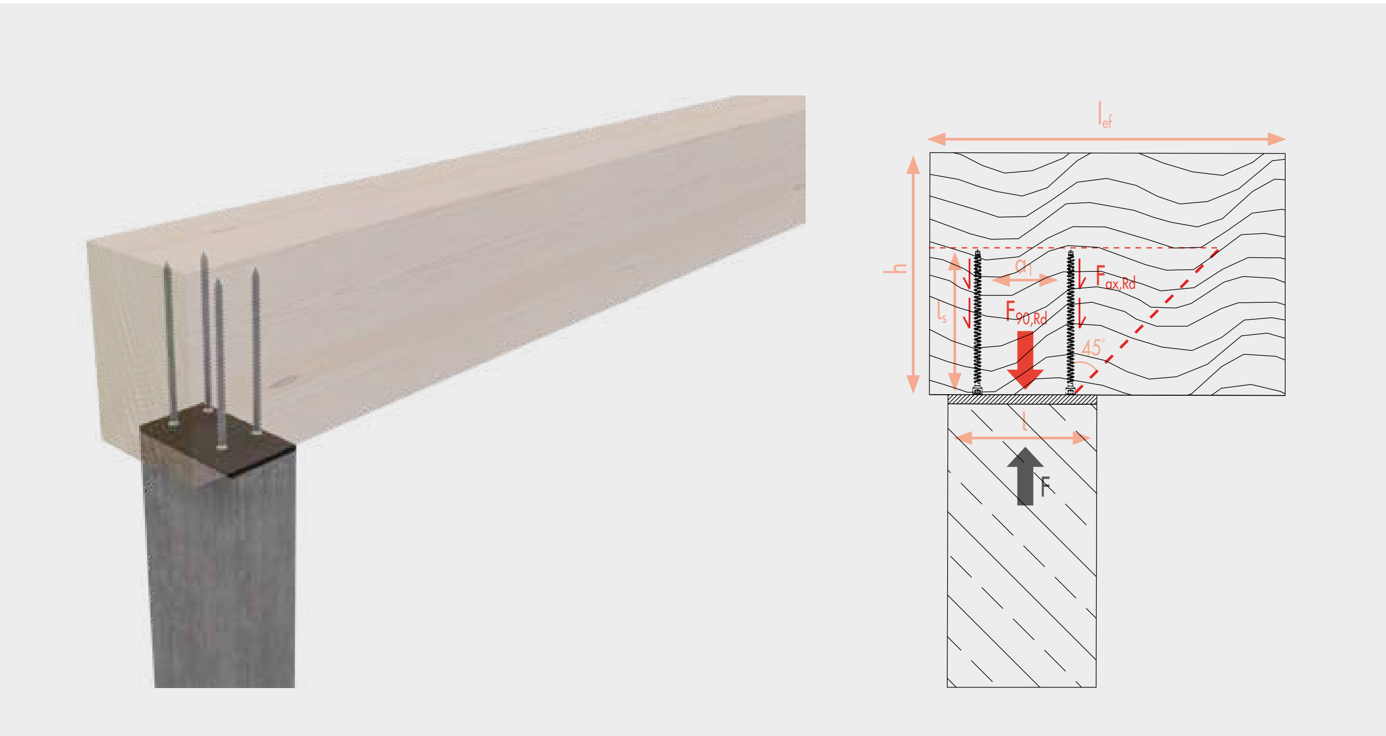
$$F_{90,Rd} = \min \begin{cases} F_{c,90,Rd} + n_s \cdot F_{ax,Rd} \\ b \cdot l_{ef} \cdot f_{c,90,d} \end{cases}$$

$$F_{c,90,Rd} = k_{c,90} \cdot b \cdot l \cdot f_{c,90,d}$$

$$F_{ax,Rd} = \min \begin{cases} \text{Buckling load capacity of the screw} \\ \text{Pull-out load-bearing capacity of the screw} \end{cases}$$

n_s: Number of screws
b: Contact surface width
$k_{c,90}$: Stress distribution factor taking into account the load configuration, the possibility of splitting and the compression set level
$f_{c,90,d}$: Designed compressive strength perpendicular to the direction of the grain

For the design of the screw's pull-out and buckling resistance see ETA-11/0024.



APPLICATION EXAMPLE: MAIN-SECONDARY BEAM CONNECTION

There are various connection options for the connection of the main and secondary beams, e.g. external metal brackets and internal aluminium T-profiles. However, additional sheet metal can be costly and time-consuming during the assembly phase. Instead, self-tapping screws are easy to use for the fastening of this common connection type.

Fully threaded screws represent a cost- and time-saving solution. KonstruX screws are applied crosswise and in pairs at a 45° angle to the wood grain, so that the architectural wood look is preserved. More importantly still is that the fire behaviour is improved. In structural wood constructions, three failure types should be tested when designing cross-head screws: (a) The pull-out performance while using the effective thread length and kmod factor, (b) the screw's tensile strength as well as (c) the screw's compressive strength. Please note that only the design capacities should be compared (not the characteristic values), since the failure types have different partial safety factors.

DIMENSIONING OF THE CROSS SCREWS' LOAD-BEARING CAPACITY:

$F_{Rd} = 2 \cdot \sin 45° \cdot n_{pair}^{0,9} \cdot F_{ax,Rd}$

$F_{ax,Rd} = \min \begin{cases} \text{Relief: } l_{ef}, k_{mod}, \gamma_M = 1{,}3 \\ \text{Tensile strength: } \gamma_{M2} = 1.25 \\ \text{Buckling resistance: } \gamma_{M1} = 1.00 \end{cases}$

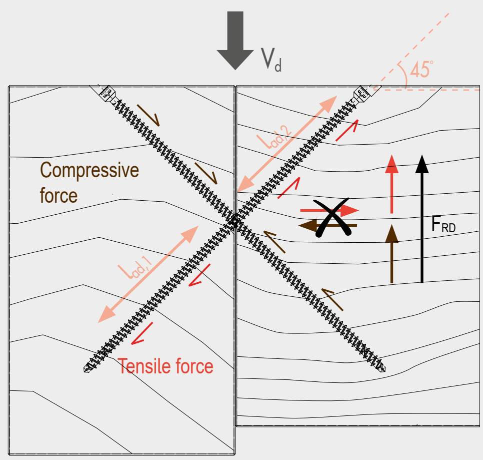
$L_{ef} = \min (l_{ad,1} ; l_{ad,2})$

γMi: Partial safety factor

n_{pair}: Number of screws

k_{mod}: Modification factor that takes into account both the influence of the load duration and the moisture content of the timber element.

For the design of the screw's pull-out and buckling resistance see ETA-11/0024.



APPLICATION EXAMPLE: LATERAL BUTT STRAP JOINT

SCREWED CONNECTING REINFORCEMENT (NOT AVAILABLE IN ECS)

When dimensioning timber structures, it is well known that stresses perpendicular to the direction of the grain should be avoided as much as possible. Due to the low resistance wood has in this direction, in such cases cracks can quickly form in structural timber components, which will then weaken the structural timber components over time. However, there are cases where this cannot be avoided and reinforcement measures should be put in place. Either self-tapping screws or glued-in threaded rods may be used for this purpose, with the former being generally more economical and quicker to install.

Screw connections that are under loads acting perpendicular to the direction of the grain are very common in this regard. The reinforcement is determined against the rated tensile force acting perpendicular to the grain at the level defined by the distance between the edge under load and the centre of the most distant screw. The threaded part of the reinforcement should cover at least 75% of the beam height.

RATED TENSILE FORCE ACTING PERPENDICULAR TO THE DIRECTION OF THE GRAIN, WHICH MUST BE TAKEN UP BY THE REINFORCEMENT:

$$F_{t,90,d} = F_{v,Ed} \cdot \overbrace{[1 - 3 \cdot k + 2 \cdot k^3]}^{\text{taking into account the shear stresses}}$$

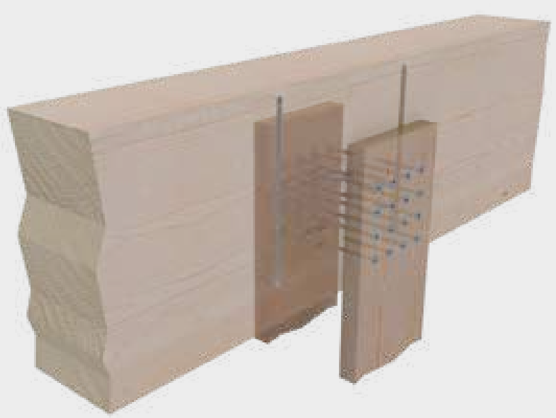
$$k = \frac{h_e}{h}$$

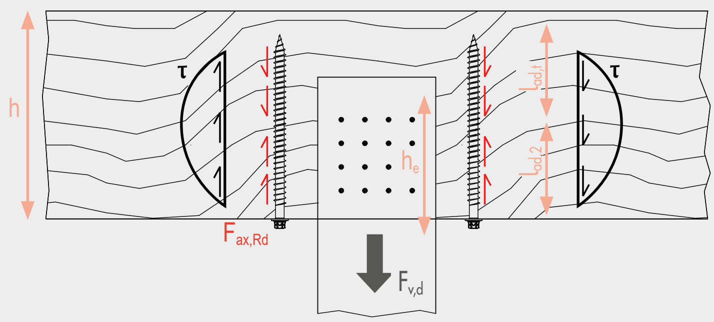
$$l_{ef} = \min (l_{ad,t}) \; ; \; l_{ad,c})$$

$$F_{t,90,Rd} = n_s \cdot \min \begin{cases} f_{ax,d} \cdot d \cdot l_{ef} \\ f_{tens,d} \end{cases}$$

$$\frac{F_{t,90,d}}{F_{t,90,Rd}} \leq 1.0$$

$F_{v,d}$: Design value of the shear force component perpendicular to the direction of the grain





APPLICATION EXAMPLE: JOIST DOUBLING

JOIST DOUBLING (AVAILABLE IN ECS)

Double timber beams are often used as a reinforcement solution in conversions and serve to reinforce existing beams when the loads increase due to a change in the use of the floor above. The load-bearing capacity is improved when the beam height is increased by the addition of an extra timber beam which is attached either above or below the existing beam. The bending moment causes shear stresses (sliding movement) at the interface between the two components. These stresses increasingly change from the centre of the span in the direction of the end supports. Screws are used to transfer these stresses, the former allow the two components to work together and act like a single large beam. Fully threaded screws, which are installed at an oblique angle to the wood grain, use their axial strength for this purpose and thereby achieve a much stiffer result than screws that are offset by 90° in a pure shear position.

SHEAR STRESSES RESULTING FROM SCREWS (AT A 45° INCLINATION TO THE WOOD GRAIN):

$$\tau_v = \frac{3}{2} \cdot \frac{F_{v,d}}{b \cdot 2h}$$

$$V_d = \tau_v \cdot b$$

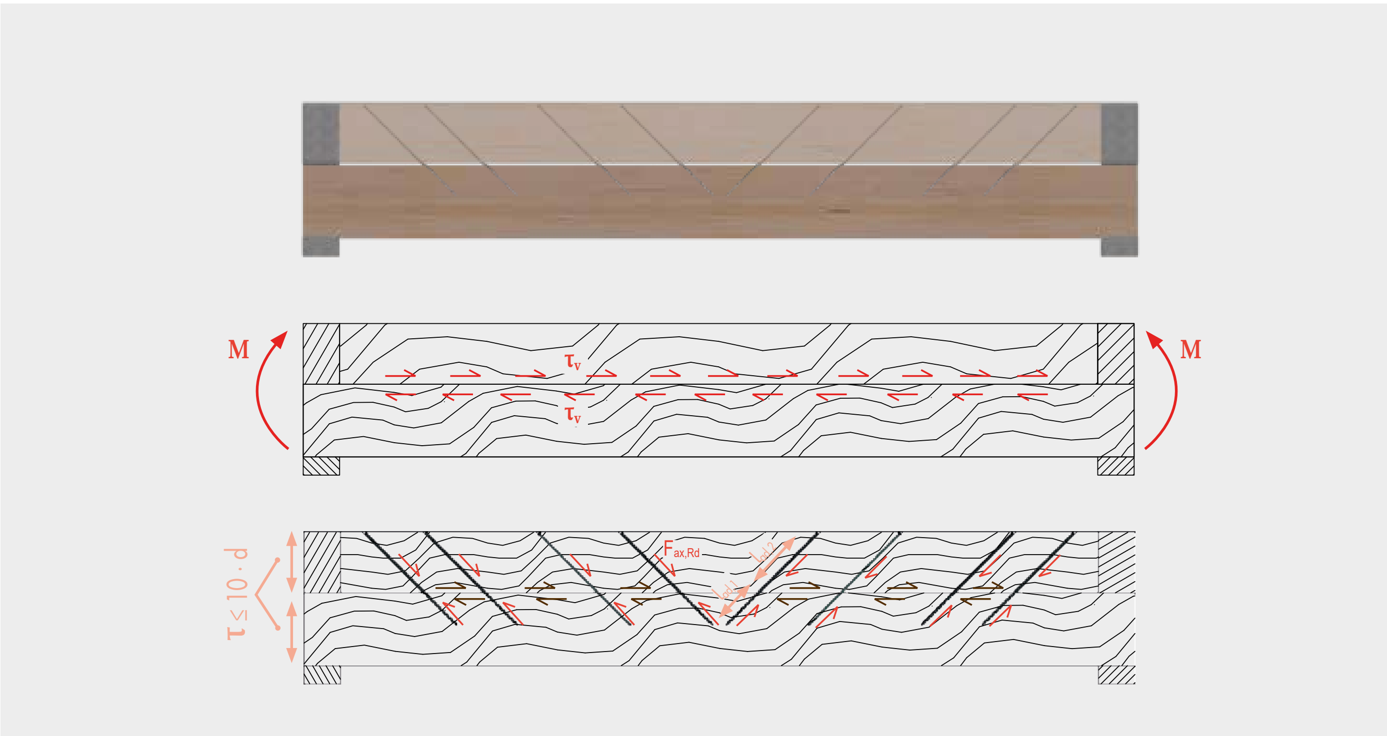
$$F_{ax,Rd} = \min \begin{cases} f_{ax,d} \cdot d \cdot l_{ef} \\ f_{tens,d} \end{cases}$$

$$l_{ef} = \min (l_{ad,1} \, ; \, l_{ad,2})$$

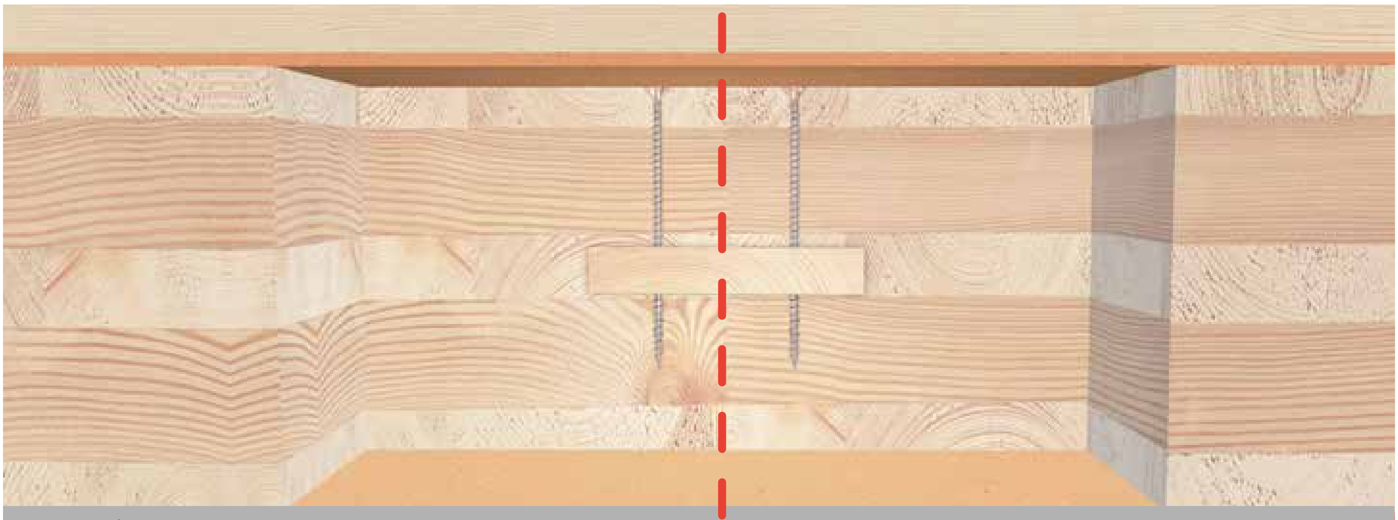
$$F_{v,Rd} = F_{ax,Rd} \cdot \frac{n_s}{a)}$$

$$\frac{V_d}{F_{v,Rd}} \leq 1{,}0$$

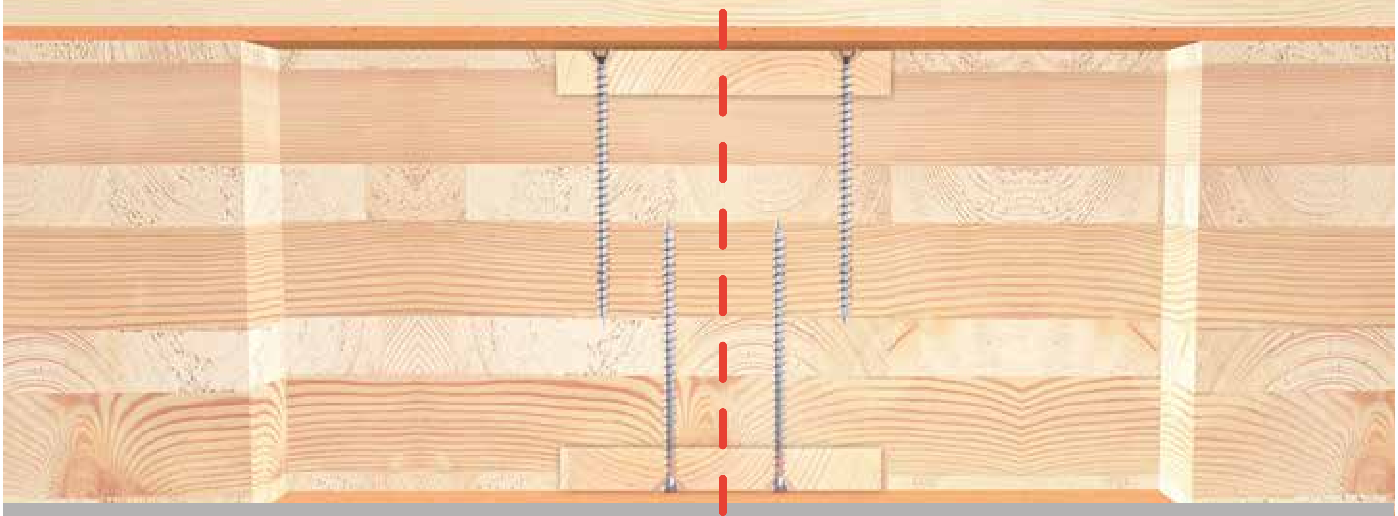
$F_{v,d}$ is greatest at the supports and smallest in the centre of the span. To optimise the construction design, the screws can be distributed accordingly.
V_d: Shear force per metre
a: Screw spacing



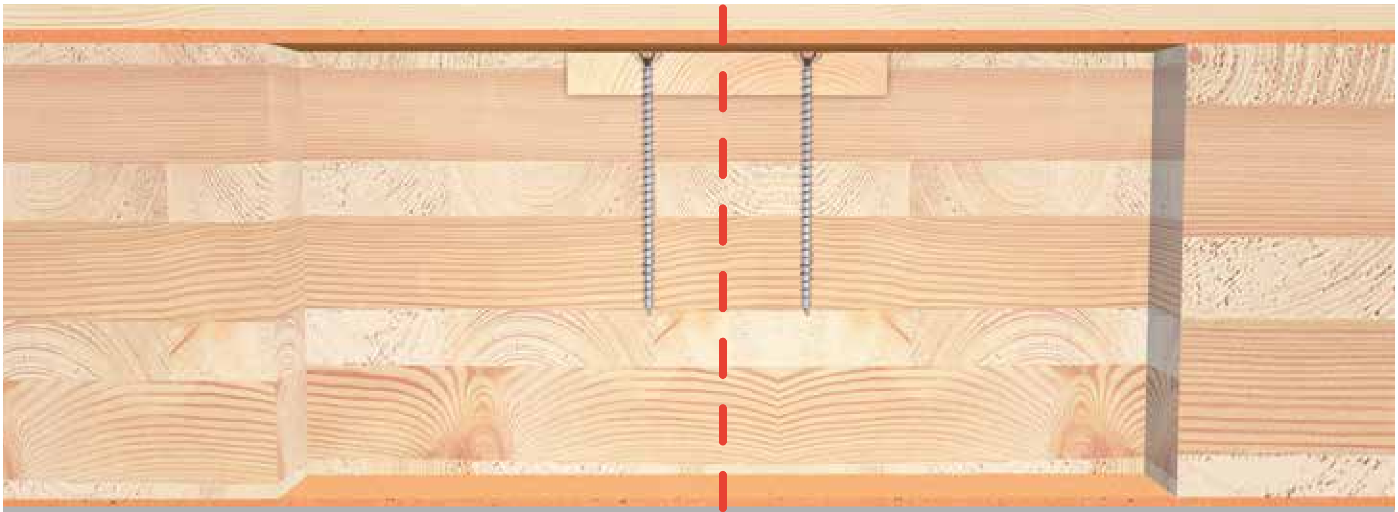
APPLICATION EXAMPLES: CEILING ELEMENTS



Connection of ceiling elements using an internal buttboard

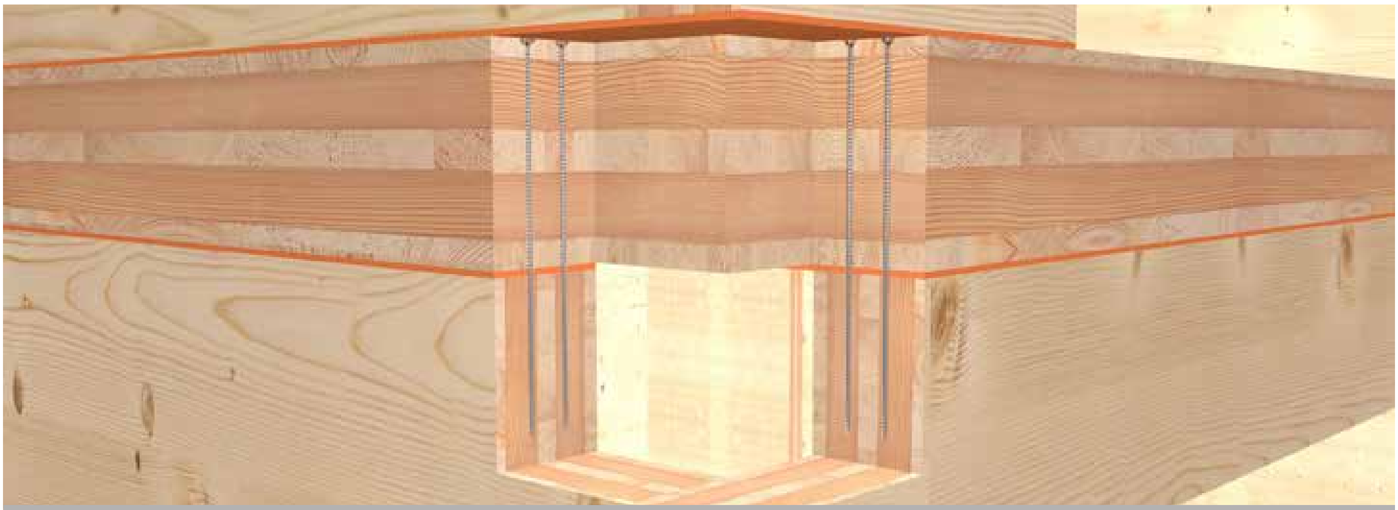


Connection of ceiling elements using a double buttboard



KonstructX for connecting a wall and ceiling on the upper floor

APPLICATION EXAMPLES: WALL ELEMENTS

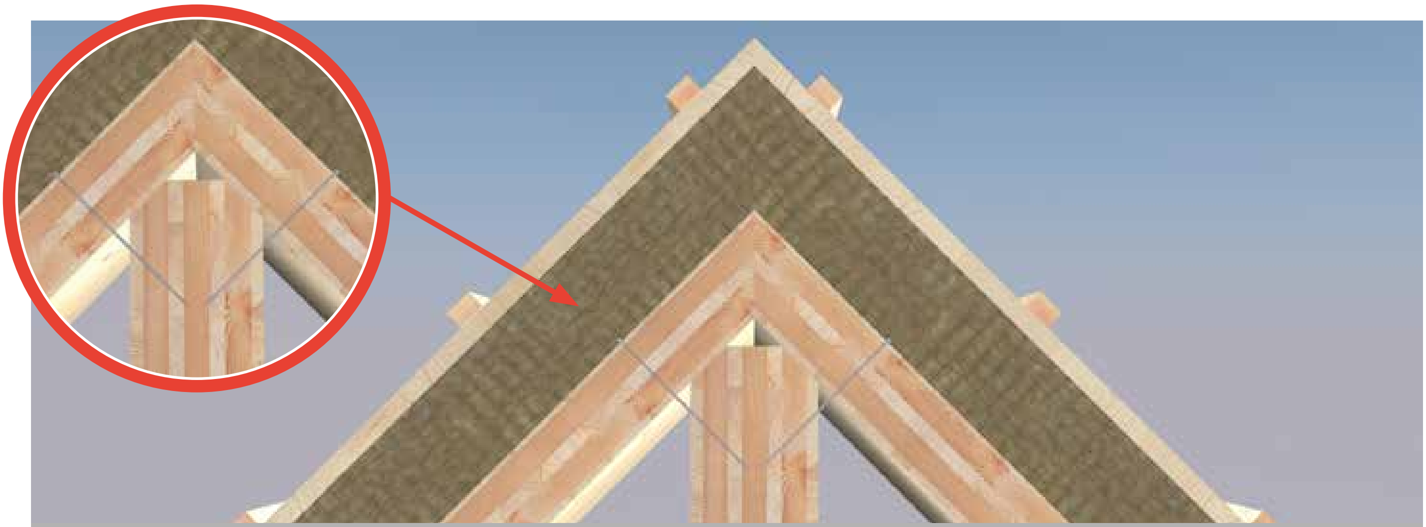


Connection of a wall element and ceiling element

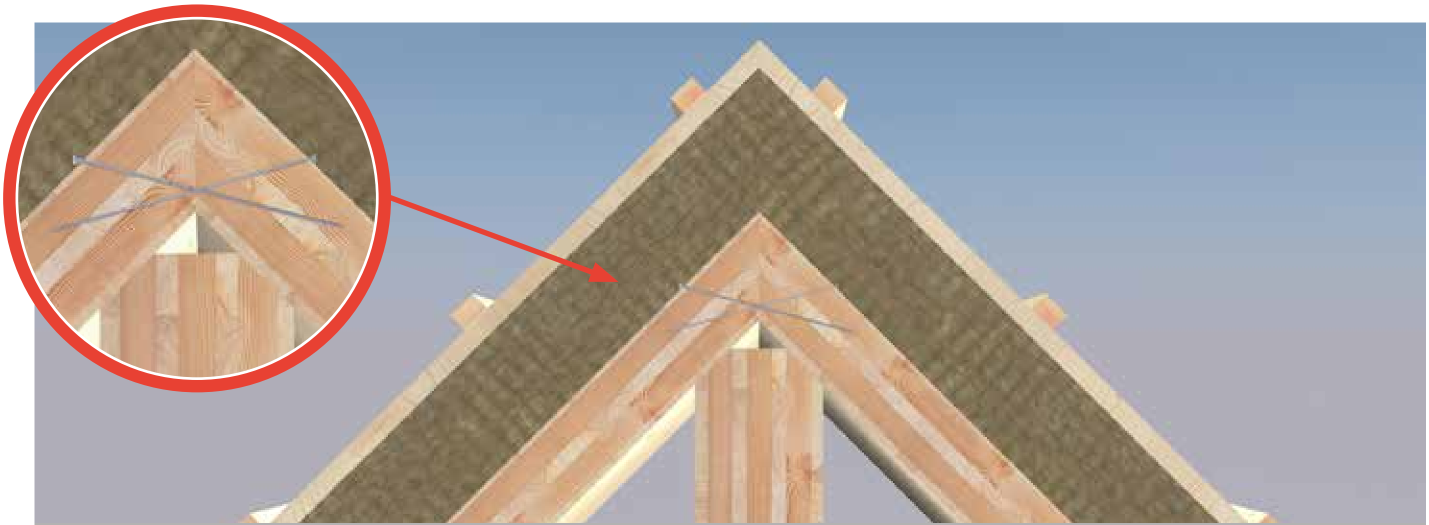
Connection of a wall and wooden floor on the upper floor

Connection of a roof and wall element

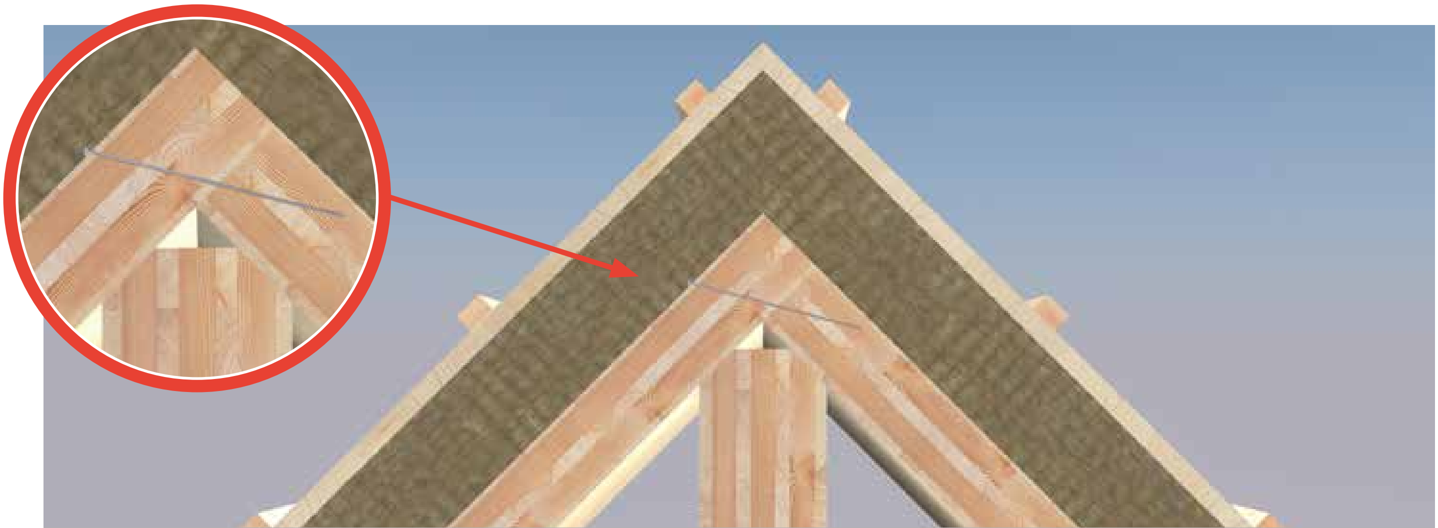
APPLICATION EXAMPLES: ROOF ELEMENTS



Roof panels with a mitred edge – screw connection with ridge purlin



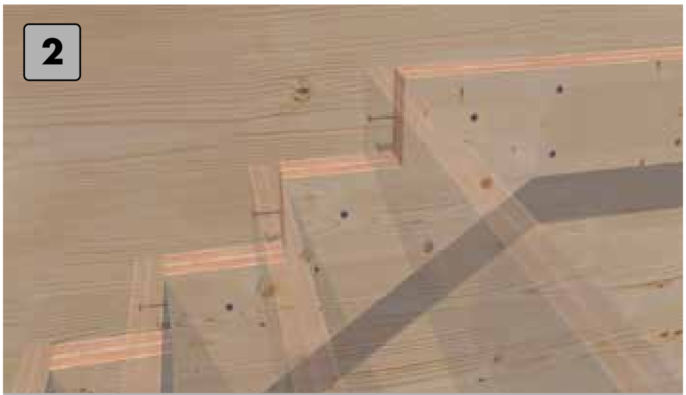
Roof panels with a mitred edge – oblique screw connection



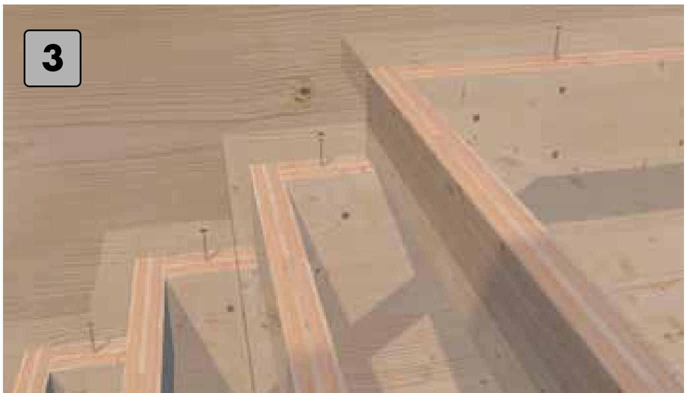
Roof panels with a butt joint – oblique screw connection

APPLICATION EXAMPLES: STAIR CONSTRUCTION USING CLT

Attach the step support to the wall.



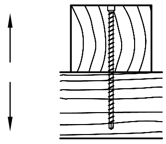
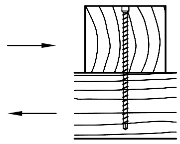
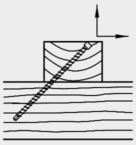
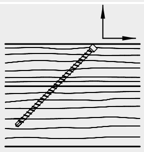
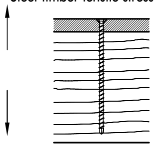
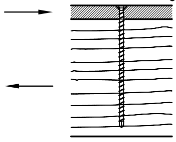
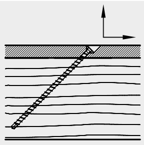
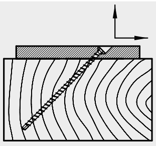
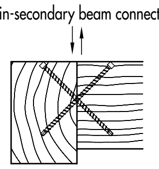
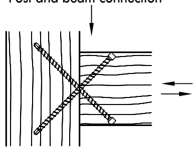
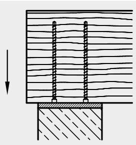
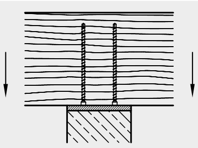
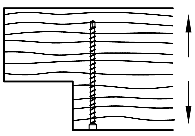
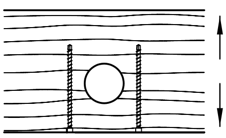
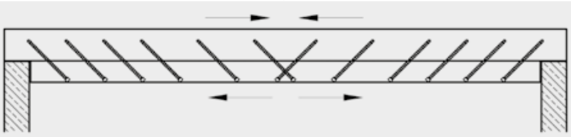
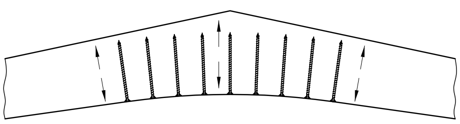
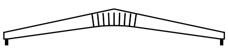
Attach the step end cap to the front of the step support.



Attach steps to the top of the step support.

That's it!

THE FAST AND SAFE WOOD CONNECTION SYSTEM
KONSTRUX CYLINDER HEAD/COUNTERSUNK HEAD SCREWS

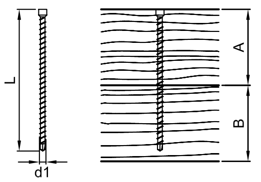
Application examples		Cylinder head			Countersunk head			
		Ø 6,5 [mm]	Ø 8,0 [mm]	Ø 10,0 [mm]	Ø 6,5 [mm]	Ø 8,0 [mm]	Ø 10,0 [mm]	Ø 11,3 [mm]
Timber-timber tensile stress 	Timber-timber shearing 	×	×	×	×	×	×	×
Timber-timber under tension 45° 	Timber-timber under tension 45° 	×	×	×	×	×	×	×
Steel-timber tensile stress 	Steel-timber shearing 	–	–	–	×	×	×	×
Steel-timber under tension 45° 	Steel-timber under tension 45° 	–	–	–	×	×	×	×
Main-secondary beam connection 	Post and beam connection 	×	×	×	×	×	×	–
Support reinforcement 	Support reinforcement 	×	×	×	×	×	×	×
Transverse tensile reinforcement at a notch 	Transverse tensile reinforcement at an opening 	×	×	×	×	×	×	×
Joist doubling 		–	×	×	–	×	×	×
Transverse tensile reinforcement of hall trusses  		–	–	×	–	–	×	×

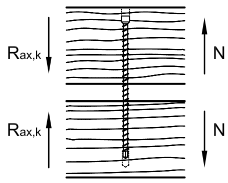
KONSTRUX FULLY THREADED SCREWS

Technical information

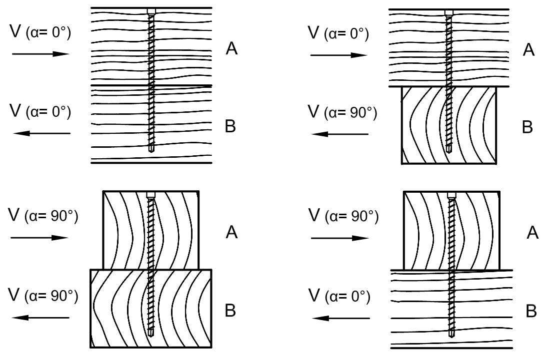
KONSTRUX ST WITH CYLINDER HEAD AND DRILL TIP 6,5 TO 10,0 MM: TIMBER-TIMBER CONNECTION

Dimensions	Extraction resistance	Shearing





Characteristic load-bearing-capacity value of the connection $R_{ax,k}$ according to ETA-11/0024



Characteristic load-bearing-capacity value of the connection R_K according to ETA-11/0024

d1 x L [mm]	A [mm]	B [mm]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]	R_k a) - [kN]	R_k a) - [kN]	R_k a) - [kN]
				α= 0°	α= 90°	α_A= 0°, α_B= 90°	α_A= 90°, α_B= 0°
6,5 x 120	60	80	4,75	3,93	3,47	3,93	3,47
6,5 x 140	80	80	4,75	3,93	3,47	3,47	3,93
6,5 x 160	80	100	6,33	4,32	3,86	4,32	3,86
6,5 x 195	100	100	7,52	4,62	4,16	4,16	4,62
8,0 x 155	80	80	7,11	5,67	4,99	4,99	5,67
8,0 x 195	100	100	9,01	6,15	5,46	5,46	6,15
8,0 x 220	120	120	9,48	6,27	5,58	5,58	6,27
8,0 x 245	120	140	11,38	6,74	6,06	6,74	6,06
8,0 x 295	140	160	13,28	7,21	6,42	7,21	6,42
8,0 x 330	160	180	15,17	7,69	6,42	7,69	6,42
8,0 x 375	180	200	17,07	7,79	6,42	7,79	6,42
8,0 x 400	200	220	18,97	7,79	6,42	7,79	6,42
8,0 x 430	220	220	19,92	7,79	6,42	6,42	7,79
8,0 x 480	240	260	22,76	7,79	6,42	7,79	6,42
10,0 x 300	160	160	16,15	9,48	8,48	8,48	9,48
10,0 x 330	160	180	18,46	10,06	8,90	10,06	8,90
10,0 x 360	180	200	20,76	10,64	8,90	10,64	8,90
10,0 x 400	200	220	23,07	10,89	8,90	10,89	8,90
10,0 x 450	220	240	25,38	10,89	8,90	10,89	8,90
10,0 x 500	240	280	27,68	10,89	8,90	10,89	8,90
10,0 x 550	260	300	29,99	10,89	8,90	10,89	8,90
10,0 x 600	300	320	33,00	10,89	8,90	10,89	8,90

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 380 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
a) The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d = R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

Example:

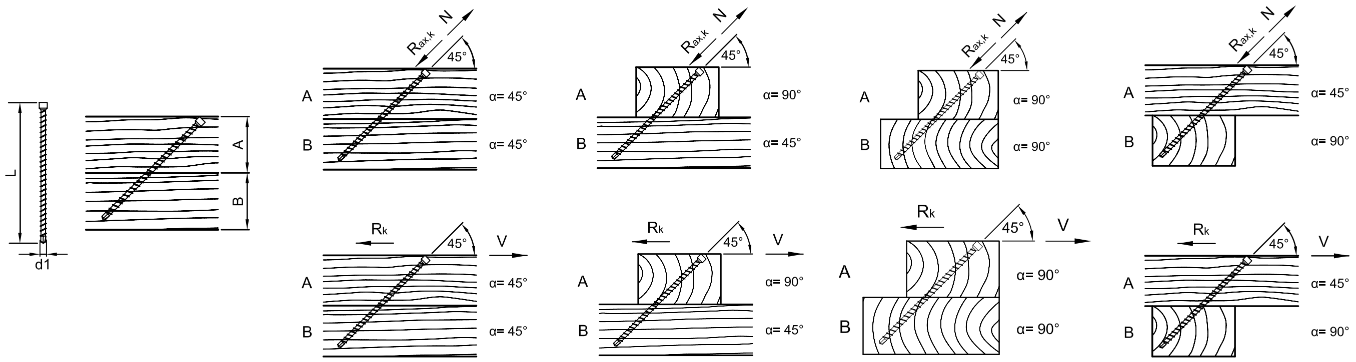
Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k = R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k = R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

Attention: These are planning aids. The projects must always be designed by authorised persons.

KONSTRUX ST WITH CYLINDER HEAD AND DRILL TIP 6,5 TO 10,0 MM: TIMBER-TIMBER CONNECTION

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

Dimensions	Tension connection



Characteristic value of the load-bearing capacity of the connection $R_{ax,k}$ or R_k according to ETA-11/0024

d1 x L [mm]	A [mm]	B [mm]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]
			α= 45°		$α_A$= 90° $α_B$= 45°		$α_A$= 90° $α_B$= 90°		$α_A$= 45° $α_B$= 90°	
6,5 x 160	60	80	5,95	4,21	5,95	4,21	5,95	4,21	5,95	4,21
6,5 x 195	80	80	6,48	4,58	6,48	4,58	6,48	4,58	6,48	4,58
8,0 x 155	60	60	6,65	4,70	6,65	4,70	6,65	4,70	6,65	4,70
8,0 x 195	80	80	7,76	5,49	7,76	5,49	7,76	5,49	7,76	5,49
8,0 x 220	80	100	10,13	7,17	10,13	7,17	10,13	7,17	10,13	7,17
8,0 x 245	100	100	9,82	6,95	9,82	6,95	9,82	6,95	9,82	6,95
8,0 x 295	120	100	11,88	8,40	11,88	8,40	11,88	8,40	11,88	8,40
8,0 x 330	120	140	15,20	10,75	15,20	10,75	15,20	10,75	15,20	10,75
8,0 x 375	140	140	16,79	11,87	16,79	11,87	16,79	11,87	16,79	11,87
8,0 x 400	160	140	16,48	11,65	16,48	11,65	16,48	11,65	16,48	11,65
8,0 x 430	160	160	19,32	13,66	19,32	13,66	19,32	13,66	19,32	13,66
8,0 x 480	180	180	21,38	15,12	21,38	15,12	21,38	15,12	21,38	15,12
10,0 x 300	120	120	15,03	10,63	15,03	10,63	15,03	10,63	15,03	10,63
10,0 x 330	120	140	18,49	13,07	18,49	13,07	18,49	13,07	18,49	13,07
10,0 x 360	140	140	18,69	13,21	18,69	13,21	18,69	13,21	18,69	13,21
10,0 x 400	160	140	20,04	14,17	20,04	14,17	20,04	14,17	20,04	14,17
10,0 x 450	160	180	25,81	18,25	25,81	18,25	25,81	18,25	25,81	18,25
10,0 x 500	180	200	28,31	20,02	28,31	20,02	28,31	20,02	28,31	20,02
10,0 x 550	200	200	30,82	21,79	30,82	21,79	30,82	21,79	30,82	21,79
10,0 x 600	220	220	33,00	23,33	33,00	23,33	33,00	23,33	33,00	23,33

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 380 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
a) The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d= R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

Example:

Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
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That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k= R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

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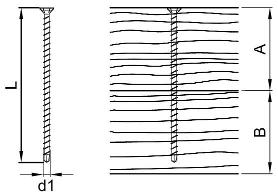
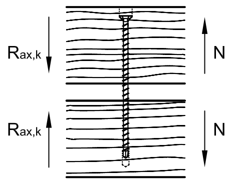
KONSTRUX ST WITH COUNTERSUNK HEAD AND DRILL TIP 6,5 TO 10,0 MM: TIMBER-TIMBER CONNECTION

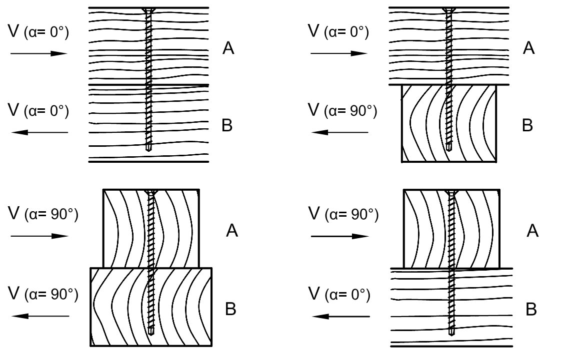
Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

Dimensions	Extraction resistance	Shearing





Characteristic load-bearing-capacity value of the connection $R_{ax,k}$ according to ETA-11/0024



Characteristic load-bearing-capacity value of the connection R_k according to ETA-11/0024

d1 x L [mm]	A [mm]	B [mm]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]	R_k a) - [kN]	R_k a) - [kN]	R_k a) - [kN]
				$\alpha = 0°$	$\alpha = 90°$	$\alpha_A = 0°$, $\alpha_B = 90°$	$\alpha_A = 90°$, $\alpha_B = 0°$
6,5 x 120	60	80	4,75	3,93	3,47	3,93	3,47
6,5 x 140	80	80	4,75	3,93	3,47	3,47	3,93
8,0 x 95	40	60	3,08	4,61	3,57	4,61	3,57
8,0 x 125	60	80	4,61	5,05	4,37	5,05	4,37
8,0 x 155	80	80	7,11	5,67	4,99	4,99	5,67
8,0 x 195	100	100	9,01	6,15	5,46	5,46	6,15
8,0 x 220	120	120	9,48	6,27	5,58	5,58	6,27
8,0 x 245	120	140	11,38	6,74	6,06	6,74	6,06
8,0 x 270	140	140	12,33	6,98	6,29	6,29	6,98
8,0 x 295	140	160	13,28	7,21	6,42	7,21	6,42
8,0 x 330	160	180	15,17	7,69	6,42	7,69	6,42
8,0 x 375	180	200	17,07	7,79	6,42	7,79	6,42
8,0 x 400	200	220	18,97	7,79	6,42	7,79	6,42
8,0 x 430	220	220	19,92	7,79	6,42	6,42	7,79
8,0 x 480	240	260	22,76	7,79	6,42	7,79	6,42
10,0 x 125	60	80	6,92	7,18	6,18	7,18	6,18
10,0 x 155	80	80	8,65	7,61	6,61	6,61	7,61
10,0 x 195	100	100	10,96	8,19	7,19	7,19	8,19
10,0 x 220	120	120	11,53	8,33	7,33	7,33	8,33
10,0 x 245	120	140	13,84	8,91	7,91	8,91	7,91
10,0 x 270	140	140	14,99	9,20	8,20	8,20	9,20
10,0 x 300	160	160	16,15	9,48	8,48	8,48	9,48
10,0 x 330	160	180	18,46	10,06	8,90	10,06	8,90
10,0 x 360	180	200	20,76	10,64	8,90	10,64	8,90
10,0 x 400	200	220	23,07	10,89	8,90	10,89	8,90
10,0 x 450	220	240	25,38	10,89	8,90	10,89	8,90
10,0 x 500	240	280	27,68	10,89	8,90	10,89	8,90
10,0 x 550	260	300	29,99	10,89	8,90	10,89	8,90
10,0 x 600	300	320	33,00	10,89	8,90	10,89	8,90

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 380 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
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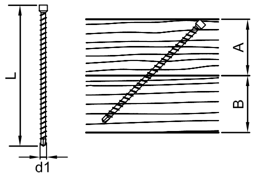
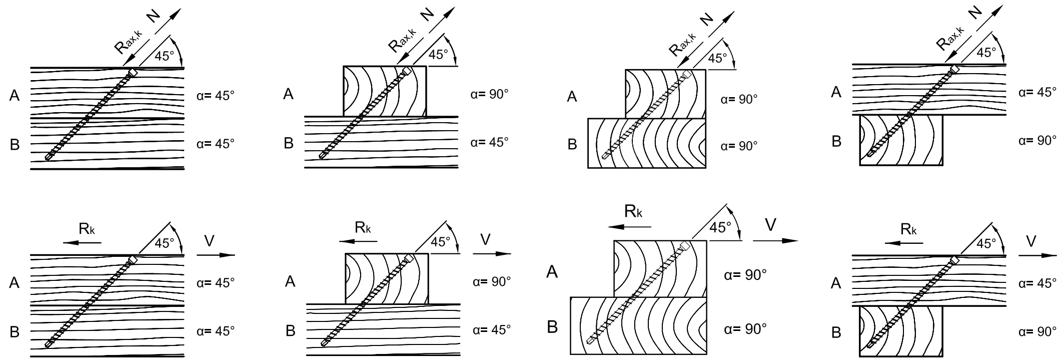
KONSTRUX ST WITH CYLINDER HEAD AND DRILL TIP 6,5 TO 10,0 MM: TIMBER-TIMBER CONNECTION

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

Dimensions	Tension connection





Characteristic value of the load-bearing capacity of the connection $R_{ax,k}$ or R_k according to ETA-11/0024

d1 x L [mm]	A [mm]	B [mm]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]
			α= 45°		α_A= 90° α_B= 45°		α_A= 90° α_B= 90°		α_A= 45° α_B= 90°	
6,5 x 160	60	80	5,95	4,21	5,95	4,21	5,95	4,21	5,95	4,21
6,5 x 195	80	80	6,48	4,58	6,48	4,58	6,48	4,58	6,48	4,58
8,0 x 155	60	60	6,65	4,70	6,65	4,70	6,65	4,70	6,65	4,70
8,0 x 195	80	80	7,76	5,49	7,76	5,49	7,76	5,49	7,76	5,49
8,0 x 220	80	100	10,13	7,17	10,13	7,17	10,13	7,17	10,13	7,17
8,0 x 245	100	100	9,82	6,95	9,82	6,95	9,82	6,95	9,82	6,95
8,0 x 295	120	100	11,88	8,40	11,88	8,40	11,88	8,40	11,88	8,40
8,0 x 330	120	140	15,20	10,75	15,20	10,75	15,20	10,75	15,20	10,75
8,0 x 375	140	140	16,79	11,87	16,79	11,87	16,79	11,87	16,79	11,87
8,0 x 400	160	140	16,48	11,65	16,48	11,65	16,48	11,65	16,48	11,65
8,0 x 430	160	160	19,32	13,66	19,32	13,66	19,32	13,66	19,32	13,66
8,0 x 480	180	180	21,38	15,12	21,38	15,12	21,38	15,12	21,38	15,12
10,0 x 300	120	120	15,03	10,63	15,03	10,63	15,03	10,63	15,03	10,63
10,0 x 330	120	140	18,49	13,07	18,49	13,07	18,49	13,07	18,49	13,07
10,0 x 360	140	140	18,69	13,21	18,69	13,21	18,69	13,21	18,69	13,21
10,0 x 400	160	140	20,04	14,17	20,04	14,17	20,04	14,17	20,04	14,17
10,0 x 450	160	180	25,81	18,25	25,81	18,25	25,81	18,25	25,81	18,25
10,0 x 500	180	200	28,31	20,02	28,31	20,02	28,31	20,02	28,31	20,02
10,0 x 550	200	200	30,82	21,79	30,82	21,79	30,82	21,79	30,82	21,79
10,0 x 600	220	220	33,00	23,33	33,00	23,33	33,00	23,33	33,00	23,33

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 380 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
a) The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d = R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

Example:

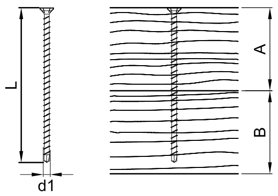
Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k = R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k = R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

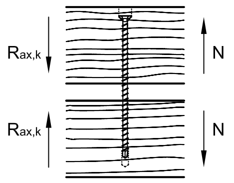
Attention: These are planning aids. The projects must always be designed by authorised persons.

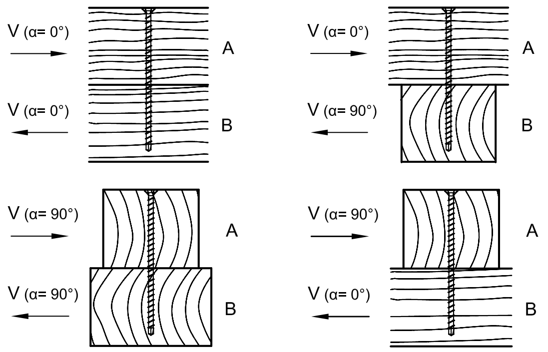
KONSTRUX ST WITH COUNTERSUNK HEAD AND DRILL TIP 6,5 TO 10,0 MM: TIMBER-TIMBER CONNECTION

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

Dimensions	Extraction resistance	Shearing







Characteristic load-bearing-capacity value of the connection $R_{ax,k}$ according to ETA-11/0024

Characteristic load-bearing-capacity value of the connection R_k according to ETA-11/0024

d1 x L [mm]	A [mm]	B [mm]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN] α= 0°	R_k a) - [kN] α= 90°	R_k a) - [kN] $α_A$= 0°, $α_B$= 90°	R_k a) - [kN] $α_A$= 90°, $α_B$= 0°
6,5 x 120	60	80	4,75	3,93	3,47	3,93	3,47
6,5 x 140	80	80	4,75	3,93	3,47	3,47	3,93
8,0 x 95	40	60	3,08	4,61	3,57	4,61	3,57
8,0 x 125	60	80	4,61	5,05	4,37	5,05	4,37
8,0 x 155	80	80	7,11	5,67	4,99	4,99	5,67
8,0 x 195	100	100	9,01	6,15	5,46	5,46	6,15
8,0 x 220	120	120	9,48	6,27	5,58	5,58	6,27
8,0 x 245	120	140	11,38	6,74	6,06	6,74	6,06
8,0 x 270	140	140	12,33	6,98	6,29	6,29	6,98
8,0 x 295	140	160	13,28	7,21	6,42	7,21	6,42
8,0 x 330	160	180	15,17	7,69	6,42	7,69	6,42
8,0 x 375	180	200	17,07	7,79	6,42	7,79	6,42
8,0 x 400	200	220	18,97	7,79	6,42	7,79	6,42
8,0 x 430	220	220	19,92	7,79	6,42	6,42	7,79
8,0 x 480	240	260	22,76	7,79	6,42	7,79	6,42
10,0 x 125	60	80	6,92	7,18	6,18	7,18	6,18
10,0 x 155	80	80	8,65	7,61	6,61	6,61	7,61
10,0 x 195	100	100	10,96	8,19	7,19	7,19	8,19
10,0 x 220	120	120	11,53	8,33	7,33	7,33	8,33
10,0 x 245	120	140	13,84	8,91	7,91	8,91	7,91
10,0 x 270	140	140	14,99	9,20	8,20	8,20	9,20
10,0 x 300	160	160	16,15	9,48	8,48	8,48	9,48
10,0 x 330	160	180	18,46	10,06	8,90	10,06	8,90
10,0 x 360	180	200	20,76	10,64	8,90	10,64	8,90
10,0 x 400	200	220	23,07	10,89	8,90	10,89	8,90
10,0 x 450	220	240	25,38	10,89	8,90	10,89	8,90
10,0 x 500	240	280	27,68	10,89	8,90	10,89	8,90
10,0 x 550	260	300	29,99	10,89	8,90	10,89	8,90
10,0 x 600	300	320	33,00	10,89	8,90	10,89	8,90

Dimensioning according to ETA-11/0024. Bulk density $ρ_k$= 380 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
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Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. $γ_M$= 1,3. → Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d ≥ E_d$. → min $R_k = R_d \cdot γ_M / k_{mod}$. That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k = R_d \cdot γ_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

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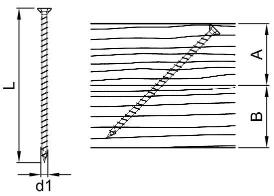
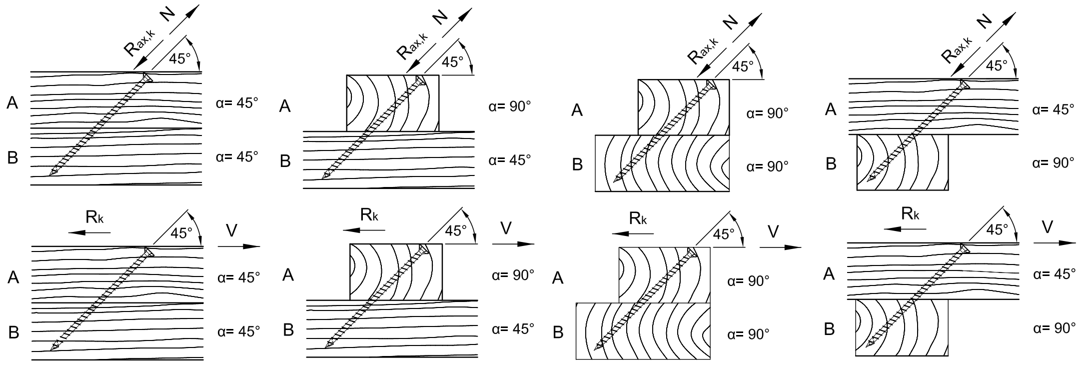
KONSTRUX WITH COUNTERSUNK HEAD AND AG TIP 11,3 MM: TIMBER-TIMBER CONNECTION

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

Dimensions	Tension connection





Characteristic value of the load-bearing capacity of the connection $R_{ax,k}$ or R_k according to ETA-11/0024

d1 x L [mm]	A [mm]	B [mm]	$R_{ax,k}$ [a] - [kN]	R_k [a] - [kN]	$R_{ax,k}$ [a] - [kN]	R_k [a] - [kN]	$R_{ax,k}$ [a] - [kN]	R_k [a] - [kN]	$R_{ax,k}$ [a] - [kN]	R_k [a] - [kN]
			α= 45°		$α_A$= 90° $α_B$= 45°		$α_A$= 90° $α_B$= 90°		$α_A$= 45° $α_B$= 90°	
11,3 x 300	120	120	16,98	12,01	16,98	12,01	16,98	12,01	16,98	12,01
11,3 x 340	140	120	18,51	13,09	18,51	13,09	18,51	13,09	18,51	13,09
11,3 x 380	140	140	23,72	16,77	23,72	16,77	23,72	16,77	23,72	16,77
11,3 x 420	160	160	25,25	17,85	25,25	17,85	25,25	17,85	25,25	17,85
11,3 x 460	180	160	26,78	18,93	26,78	18,93	26,78	18,93	26,78	18,93
11,3 x 500	180	200	31,99	22,62	31,99	22,62	31,99	22,62	31,99	22,62
11,3 x 540	200	200	33,52	23,70	33,52	23,70	33,52	23,70	33,52	23,70
11,3 x 580	220	220	35,04	24,78	35,04	24,78	35,04	24,78	35,04	24,78
11,3 x 620	220	240	40,26	28,47	40,26	28,47	40,26	28,47	40,26	28,47
11,3 x 660	240	240	41,79	29,55	41,79	29,55	41,79	29,55	41,79	29,55
11,3 x 700	260	260	43,31	30,63	43,31	30,63	43,31	30,63	43,31	30,63
11,3 x 750	280	280	46,14	32,63	46,14	32,63	46,14	32,63	46,14	32,63
11,3 x 800	300	280	48,97	34,63	48,97	34,63	48,97	34,63	48,97	34,63
11,3 x 900	320	340	50,00	35,36	50,00	35,36	50,00	35,36	50,00	35,36
11,3 x 1000	360	360	50,00	35,36	50,00	35,36	50,00	35,36	50,00	35,36

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 380 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
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a) The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: R_d= $R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

Example:

Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min R_k= $R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min R_k= $R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

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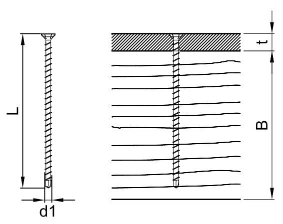
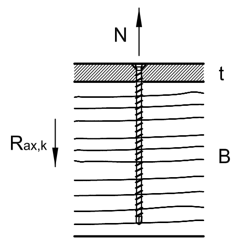
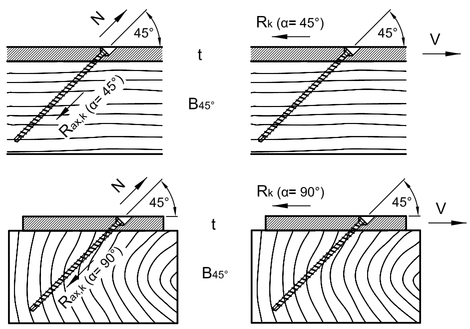
KONSTRUX ST WITH COUNTERSUNK HEAD AND DRILL TIP 6,5 TO 10,0 MM: STEEL-TIMBER CONNECTION

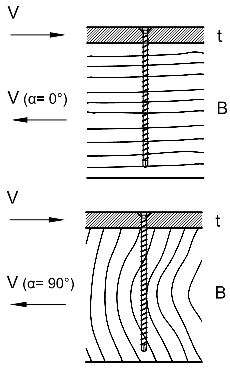
Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

Dimensions	Extraction resistance	Tension connection	Shearing









Characteristic load-bearing-capacity of the connection $R_{ax,k}$ according to ETA-11/0024

Characteristic load-bearing-capacity value of the connection $R_{ax,k}$ or R_k according to ETA-11/0024

Characteristic load-bearing-capacity value of the connection R_k according to ETA-11/0024

d1 x L [mm]	t [mm]	B [mm]	$B_{45°}$ [mm]	$R_{ax,k}$ a) - [kN]	$R_{ax,k}$ a) - [kN]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]	R_k a) - [kN]	R_k a) - [kN]	R_k a) - [kN]
					α= 45°	α=90°	α= 45°	α= 90°	α= 0°	α= 90°
6,5 x 80	15	80	60	5,14	4,65	4,65	3,29	3,29	4,17	3,52
6,5 x 100	15	100	80	6,73	6,24	6,24	4,41	4,41	4,17	3,52
6,5 x 120	15	120	80	8,31	7,82	7,82	5,53	5,53	4,17	3,52
6,5 x 140	15	140	100	9,89	9,40	9,40	6,65	6,65	4,17	3,52
8,0 x 95	15	100	80	7,59	7,00	7,00	4,95	4,95	6,18	5,22
8,0 x 125	15	120	100	10,43	9,84	9,84	6,96	6,96	6,18	5,22
8,0 x 155	15	160	120	13,28	12,69	12,69	8,97	8,97	6,18	5,22
8,0 x 195	15	200	140	17,07	16,48	16,48	11,65	11,65	6,18	5,22
8,0 x 220	15	220	160	19,44	18,85	18,85	13,33	13,33	6,18	5,22
8,0 x 245	15	240	180	21,81	21,22	21,22	15,01	15,01	6,18	5,22
8,0 x 270	15	280	200	24,18	23,59	23,59	16,68	16,68	6,18	5,22
8,0 x 295	15	300	220	25,00	25,00	25,00	17,68	17,68	6,18	5,22
8,0 x 330	15	340	240	25,00	25,00	25,00	17,68	17,68	6,18	5,22
8,0 x 375	15	380	280	25,00	25,00	25,00	17,68	17,68	6,18	5,22
8,0 x 400	15	400	280	25,00	25,00	25,00	17,68	17,68	6,18	5,22
8,0 x 430	15	440	300	25,00	25,00	25,00	17,68	17,68	6,18	5,22
8,0 x 480	15	480	340	25,00	25,00	25,00	17,68	17,68	6,18	5,22
10,0 x 125	15	120	100	12,69	11,97	11,97	8,46	8,46	8,72	7,30
10,0 x 155	15	160	120	16,15	15,43	15,43	10,91	10,91	8,72	7,30
10,0 x 195	15	200	140	20,76	20,05	20,05	14,17	14,17	8,72	7,30
10,0 x 220	15	220	160	23,65	22,93	22,93	16,21	16,21	8,72	7,30
10,0 x 245	15	240	180	26,53	25,81	25,81	18,25	18,25	8,72	7,30
10,0 x 270	15	280	200	29,41	28,70	28,70	20,29	20,29	8,72	7,30
10,0 x 300	15	300	220	32,87	32,16	32,16	22,74	22,74	8,72	7,30
10,0 x 330	15	340	240	33,00	33,00	33,00	23,33	23,33	8,72	7,30
10,0 x 360	15	360	260	33,00	33,00	33,00	23,33	23,33	8,72	7,30
10,0 x 400	15	400	280	33,00	33,00	33,00	23,33	23,33	8,72	7,30
10,0 x 450	15	460	320	33,00	33,00	33,00	23,33	23,33	8,72	7,30
10,0 x 500	15	500	360	33,00	33,00	33,00	23,33	23,33	8,72	7,30
10,0 x 550	15	560	400	33,00	33,00	33,00	23,33	23,33	8,72	7,30
10,0 x 600	15	600	420	33,00	33,00	33,00	23,33	23,33	8,72	7,30

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 380 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
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Example:

Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3. → Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k = R_d \cdot \gamma_M / k_{mod}$ That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k = R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1.3/0.9= 10.40 kN → Comparison with the table values.

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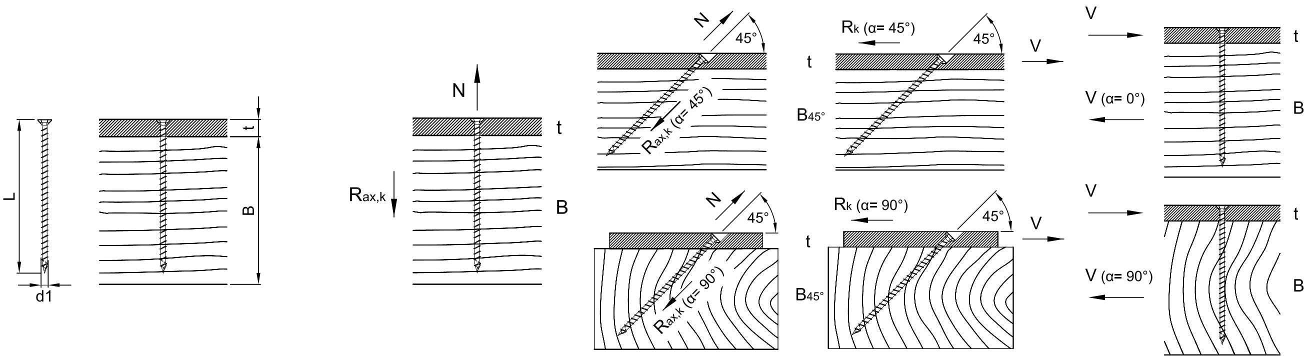
KONSTRUX WITH COUNTERSUNK HEAD AND AG TIP 11,3 MM: STEEL-TIMBER CONNECTION

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024



Dimensions				Extraction resistance	Tension connection				Shearing	
				Characteristic load-bearing-capacity value of the connection $R_{ax,k}$ according to ETA-11/0024	Characteristic value of the load-bearing capacity of the connection $R_{ax,k}$ or R_k according to ETA-11/0024				Characteristic value of the load-bearing capacity of the connection R_k according to ETA-11/0024	
d1 x L [mm]	t [mm]	B [mm]	$B_{45°}$ [mm]	$R_{ax,k}$ a) - [kN]	$R_{ax,k}$ a) - [kN]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]	R_k a) - [kN]	R_k a) - [kN]	R_k a) - [kN]
					α= 45°	α=90°	α= 45°	α= 90°	α= 0°	α= 90°
11,3 x 300	20	300	220	36,49	35,42	35,42	25,04	25,04	11,79	9,76
11,3 x 340	20	340	240	41,71	40,63	40,63	28,73	28,73	11,79	9,76
11,3 x 380	20	380	260	46,92	45,84	45,84	32,42	32,42	11,79	9,76
11,3 x 420	20	420	300	50,00	50,00	50,00	35,36	35,36	11,79	9,76
11,3 x 460	20	460	320	50,00	50,00	50,00	35,36	35,36	11,79	9,76
11,3 x 500	20	500	360	50,00	50,00	50,00	35,36	35,36	11,79	9,76
11,3 x 540	20	540	380	50,00	50,00	50,00	35,36	35,36	11,79	9,76
11,3 x 580	20	580	420	50,00	50,00	50,00	35,36	35,36	11,79	9,76
11,3 x 620	20	620	440	50,00	50,00	50,00	35,36	35,36	11,79	9,76
11,3 x 660	20	660	460	50,00	50,00	50,00	35,36	35,36	11,79	9,76
11,3 x 700	20	700	500	50,00	50,00	50,00	35,36	35,36	11,79	9,76
11,3 x 750	20	740	540	50,00	50,00	50,00	35,36	35,36	11,79	9,76
11,3 x 800	20	800	560	50,00	50,00	50,00	35,36	35,36	11,79	9,76
11,3 x 900	20	900	640	50,00	50,00	50,00	35,36	35,36	11,79	9,76
11,3 x 1000	20	1000	700	50,00	50,00	50,00	35,36	35,36	11,79	9,76

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 380 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
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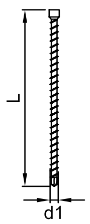
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k = R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k = R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

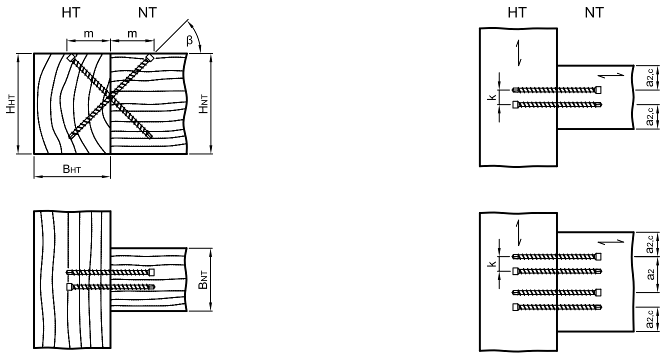
Attention: These are planning aids. The projects must always be designed by authorised persons.

KONSTRUX ST WITH CYLINDER HEAD AND DRILL TIP 6,5 MM: MAIN/SECONDARY BEAM CONNECTION

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

Dimensions	Main/secondary beam connection





a_2= min. 33 mm, $a_{2,c}$= min. 20 mm, k= min. 10 mm

Characteristic load-bearing-capacity value of the connection $R_{v,k}$ according to ETA-11/0024

d1 x L [mm]	min. W_{NT} [mm]	min. H_{NT} [mm]	min. W_{HT} [mm]	min. H_{HT} [mm]	m [mm]	β °	$R_{v,k}$ a) b) - [kN]	Pair (n)
6,5 x 195	60	160	80	160	69	45	10,91	1
	100						20,36	2
	120						29,33	3
	160						38,00	4

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 380 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
a) The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: R_d= $R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

Example:

Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min R_k= $R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min R_k= $R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.
b) Determined with an eff. number of screw pairs of: $n^{0.9}$.

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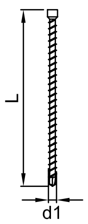
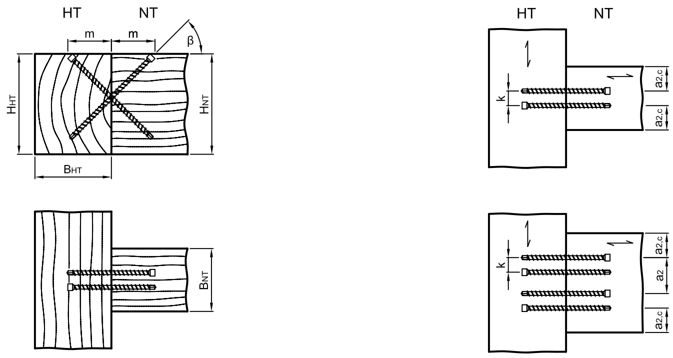
KONSTRUX ST WITH CYLINDER HEAD AND DRILL TIP 8,0 MM: MAIN/SECONDARY BEAM CONNECTION

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

Dimensions	Main/secondary beam connection





a_2= min. 40 mm, $a_{2,c}$= min. 24 mm, k= min. 12 mm

Characteristic load-bearing-capacity value of the connection $R_{v,k}$ according to ETA-11/0024

d1 x L [mm]	min. W_{NT} [mm]	min. H_{NT} [mm]	min. W_{HT} [mm]	min. H_{HT} [mm]	m [mm]	β °	$R_{v,k}$ a) b) - [kN]	Pair (n)
8,0 x 245	80	200	100	200	87	45	16,43	1
	100						30,66	2
	140						44,16	3
	180						57,21	4
8,0 x 295	80	220	120	220	104	45	17,44	1
	100						32,55	2
	140						46,88	3
	180						60,74	4
8,0 x 330	80	260	140	260	117	45	17,44	1
	100						32,55	2
	140						46,88	3
	180						60,74	4
8,0 x 375	80	280	160	280	133	45	17,44	1
	100						32,55	2
	140						46,88	3
	180						60,74	4
8,0 x 400	80	300	160	300	141	45	17,44	1
	100						32,55	2
	140						46,88	3
	180						60,74	4
8,0 x 430	80	320	180	320	152	45	17,44	1
	100						32,55	2
	140						46,88	3
	180						60,74	4
8,0 x 480	80	360	180	360	170	45	17,44	1
	100						32,55	2
	140						46,88	3
	180						60,74	4

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 380 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
a) The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d = R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

Example:

Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k = R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k = R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0.9= 10,40 kN → Comparison with the table values.
b) Determined with an eff. number of screw pairs of: $n^{0.9}$.

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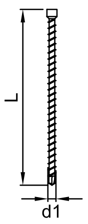
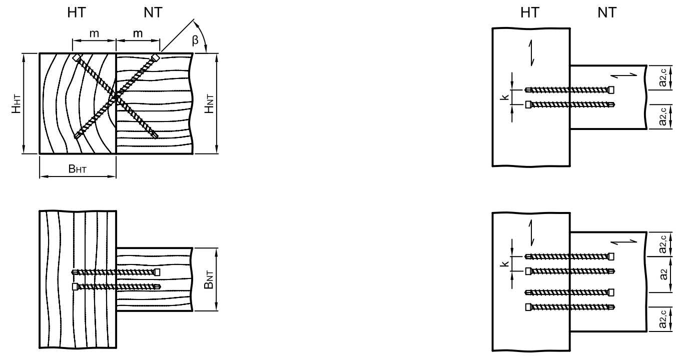
KONSTRUX ST WITH CYLINDER HEAD AND DRILL TIP 10,0 MM: MAIN/SECONDARY BEAM CONNECTION

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

Dimensions	Main/secondary beam connection





a_2= min. 50 mm, $a_{2,c}$= min. 30 mm, k= min. 15 mm

Characteristic value for the load-bearing-capacity of the connection $R_{v,k}$ according to ETA-11/0024

d1 x L [mm]	min. W_{NT} [mm]	min. H_{NT} [mm]	min. W_{HT} [mm]	min. H_{HT} [mm]	m [mm]	β °	$R_{v,k}$ a) b) - [kN]	Pair (n)
10,0 x 300	80	240	120	240	106	45	23,67	1
	140						44,18	2
	180						63,63	3
	240						82,44	4
10,0 x 330	80	260	140	260	117	45	23,67	1
	140						44,18	2
	180						63,63	3
	240						82,44	4
10,0 x 360	80	280	140	280	127	45	23,67	1
	140						44,18	2
	180						63,63	3
	240						82,44	4
10,0 x 400	80	300	160	300	141	45	23,67	1
	140						44,18	2
	180						63,63	3
	240						82,44	4
10,0 x 450	80	340	180	340	159	45	23,67	1
	140						44,18	2
	180						63,63	3
	240						82,44	4
10,0 x 500	80	380	200	380	177	45	23,67	1
	140						44,18	2
	180						63,63	3
	240						82,44	4
10,0 x 550	80	400	220	400	194	45	23,67	1
	140						44,18	2
	180						63,63	3
	240						82,44	4
10,0 x 600	80	440	240	440	212	45	23,67	1
	140						44,18	2
	180						63,63	3
	240						82,44	4

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 380 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
a) The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d = R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

Example:

Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k = R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k = R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.
b) Determined with an eff. number of screw pairs of: $n^{0.9}$.

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TIMBERFRAME CONSTRUCTION WITH KONSTRUX ST

Connections with fully threaded screws

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

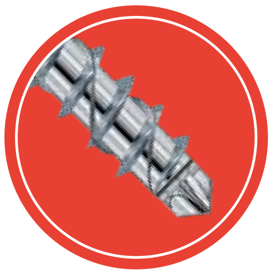
The KonstruX ST screw is suitable for use as a universal fully threaded screw for **connecting timber frame elements such as posts and cross beams**. The Ø 6 KonstruX ST ZK screws in particular are suitable for connecting slender timber frame elements from the **service classes 1 and 2**.

Thanks to the special drill tip geometry, **reduced edge and centre distances** may be used. Only this allows their use in smaller cross-sections. The reduced drill tip does not negatively effect the screw thread's extraction resistance. The **fine double thread** behind the drill tip **reduces the screw-in torque.**

Fully threaded screws are **optimally used** when **axially loaded, i.e. subjected to tension (or pressure).** In cases where the stress results exclusively from shearing, fully threaded screws cannot realise their full potential. Therefore, efforts are always made to position the screws in the direction of the acting force. If the **force-axis angle** (not to be confused with the axis-grain angle) is **between 0° and 45°,** the screws may be considered **to be purely under tensile stress**. Evidence of shearing is therefore not required. The connection therefore has a **significantly higher load-bearing capacity** in cases where there is an oblique screw connection than when the screw connection is positioned at 90° to the force.
KonstruX ST can be installed **regardless of the direction of the grain**, i.e. including parallel to the grain. For calculation purposes, the extraction resistance remains the same, i.e. between 45° and 90°.

MATCHING SCREW

KonstruX ST: ZK, Ø 6,5 mm
Screw lengths: 80 – 195 mm
Cylinder head suitable for countersinking
Material: hardened steel
Surface coating: galvanised



APPLICATION EXAMPLES

The applications for fully threaded screws are varied. **Cylinder head screws are designed for connecting timber/timber components.** The cylinder heads can be sunk deep into the timber by using a corresponding long bit.
In the case of visible beam constructions, the **connecting elements become thus virtually invisible.** Unlike with partially threaded screws, with fully threaded screws, it also does not matter in which component the head is located, except of course for steel/timber connections. In any case, the required **minimum edge and centre distances must be observed.**


Fastening of cross beams in light timber frame constructions

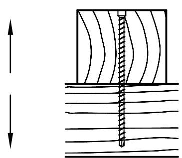

Fastening of supports in timber frame constructions


Fastening of supports in timber frame constructions as well as main/secondary beam connections

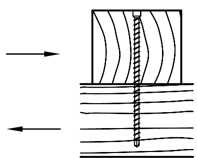

Fastening of supports in timber frame constructions in the inferior purlin area

Application examples

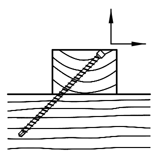
Timber-timber tensile stress



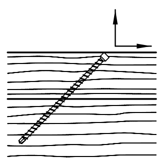
Timber-timber shearing



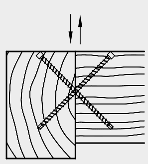
Timber-timber under tension 45°



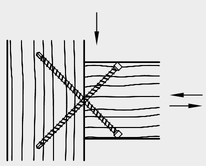
Timber-timber under tension 45°



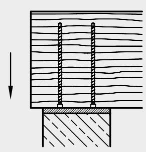
Main-secondary beam connection



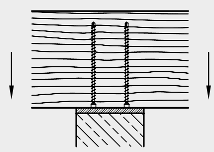
Post and beam connection



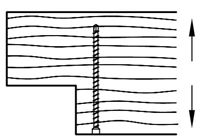
Support reinforcement



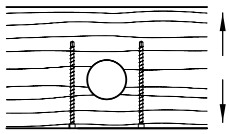
Support reinforcement



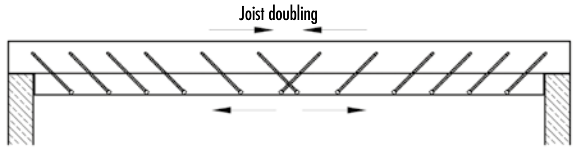
Transverse tensile reinforcement at a notch



Transverse tensile reinforcement at an opening

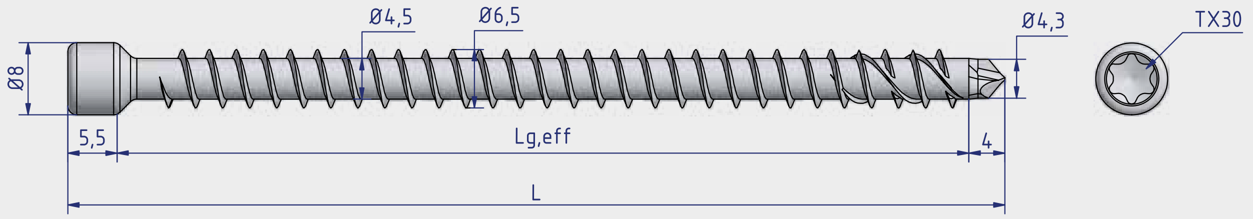


Joist doubling



KONSTRUX ST WITH CYLINDER HEAD 6.5 MM

GEOMETRY AND MECHANICAL CHARACTERISTICS

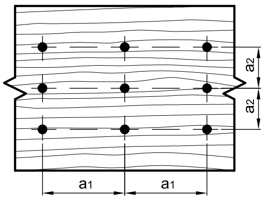


KonstruX ST ZK Ø 6.5xL -TX30								
Item number	L [mm]	$L_{g,eff}$ [mm]	Pcs./ PU	Pre-drilling diameter $Ød_v$ [mm]	Characteristic value of the extraction resistance $f_{ax,k}$ [N/mm²]	Characteristic value of the the tensile strength $f_{tens,k}$ [kN]	Characteristic yield moment $M_{y,k}$ [Nmm]	Characteristic Stretch limit $f_{ax,k}$ [N/mm²]
904808	80	71	100	4,5	11,4	17,0	15000	1000
904809	100	91	100	4,5	11,4	17,0	15000	1000
904810	120	111	100	4,5	11,4	17,0	15000	1000
904811	140	131	100	4,5	11,4	17,0	15000	1000
904812	160	151	100	4,5	11,4	17,0	15000	1000
904813	195	186	100	4,5	11,4	17,0	15000	1000

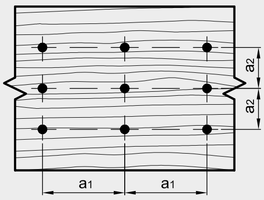
Centre and edge distances				
The minimum distances for KonstruX screws in predrilled and non-predrilled holes that are under loads acting exclusively in an axial direction in components with a minimum thickness t = 65 and minimum width 60 mm are to be selected as follows				
Centre distance parallel to the direction of the grain	a_1	[mm]	5 · d	33
Centre distance at a right angle to the direction of the grain	a_2	[mm]	5 · d	33
Distance between the centre of gravity of the screw area screwed into timber and the end grain surface	$a_{1,c}$	[mm]	5 · d	33
Distance between the centre of gravity of the screw area screwed into the timber and the side bar	$a_{2,c}$	[mm]	3 · d	20
Centre distance between the intersecting screw pair	$a_{2,k}$	[mm]	1.5 · d	10
Reduced centre distance a_2 at a right angle to the direction of the grain, if $a_1 \cdot a_2 \geq 25 \cdot d^2$	$a_{2,red}$	[mm]	2.5 · d	16

The centre and edge distances are minimum distances according to DIN EN 1995:2014 (EC5) and generally apply to connecting means **that are under loads acting in a transverse direction**

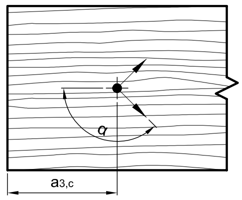
a_1 — Distance between the connecting means in a single row along the direction of the grain



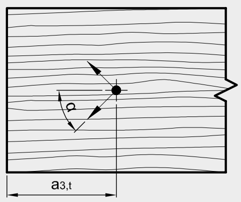
a_2 — Distance between the connecting means at a right angle to the direction of the grain



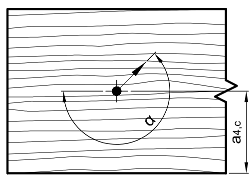
$a_{3,c}$ — Distance between the connecting means and the unstressed end grain 90° ≤ α ≤ 270°



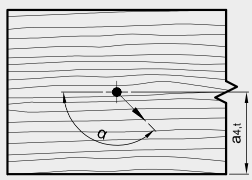
$a_{3,t}$ — Distance between the connecting means and the end grain under load -90° ≤ α ≤ 90°



$a_{4,c}$ — Distance between the connecting means and the unstressed edge 180° ≤ α ≤ 360°

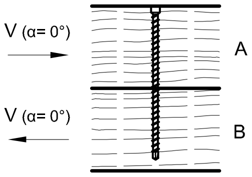


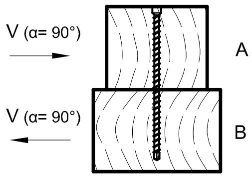
$a_{4,t}$ — Distance between the connecting means and the edge under load 0° ≤ α ≤ 180°



Once evaluated, the minimum distances for KonstruX screws under loads acting in a transverse direction with predrilled holes result as follows, based on the direction of the grain

Minimum distances for KonstruX screws in predrilled holes under loads acting in a transverse direction with a force-grain angle of 0° and 90°

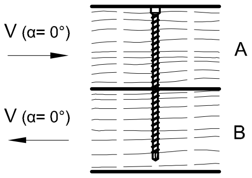


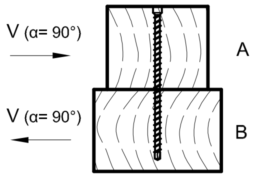


			Force-grain angle α = 0°		Force-grain angle α = 90°	
Centre distance parallel to the direction of the grain	a_1	[mm]	5 · d	33	4 · d	33
Centre distance at a right angle to the direction of the grain	a_2	[mm]	3 · d	20	4 · d	33
Distance of the centre of gravity of the screw area screwed into the wood from the end grain not under load	$a_{3,c}$	[mm]	7 · d	46	7 · d	46
Distance between the centre of gravity of the screw area screwed into the wood and the end grain under load	$a_{3,t}$	[mm]	12 · d	78	7 · d	46
Centre distance at a right angle to the edge not under load	$a_{4,c}$	[mm]	3 · d	20	3 · d	20
Centre distance to the edge under load	$a_{4,t}$	[mm]	3 · d	20	7 · d	46

Once evaluated, the minimum distances for KonstruX screws in non-predrilled holes under loads acting in a transverse direction result as follows, based on the direction of the grain

Minimum distances for KonstruX screws in non-predrilled holes under loads acting in a transverse direction with a force-grain angle of 0° and 90°





			Force-grain angle α = 0°		Force-grain angle α = 90°	
Centre distance parallel to the direction of the grain	a_1	[mm]	12 · d	78	5 · d	33
Centre distance at a right angle to the direction of the grain	a_2	[mm]	5 · d	33	5 · d	33
Distance between the centre of gravity of the screw area screwed into the wood and the end grain not under load	$a_{3,c}$	[mm]	10 · d	65	10 · d	65
Distance between the centre of gravity of the screw area screwed into the wood and the end grain under load	$a_{3,t}$	[mm]	15 · d	98	10 · d	65
Centre distance at a right angle to the edge not under load	$a_{4,c}$	[mm]	5 · d	33	5 · d	33
Centre distance to the edge under load	$a_{4,t}$	[mm]	5 · d	33	10 · d	65

KONSTRUX ST WITH CYLINDER HEAD AND DRILL TIP 6.5 MM: SHEAR LOAD-BEARING CAPACITY WITHOUT PRE-DRILLING

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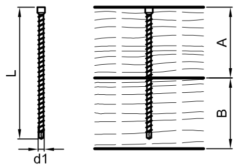
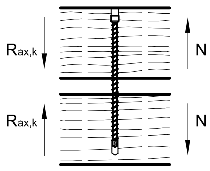
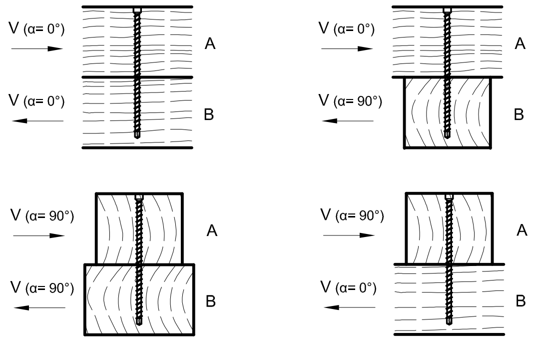
European Technical Assessment
ETA-11/0024

Dimensions	Axial pull-out load-bearing capacity	Shear load-bearing capacity without pre-drilling





Characteristic value for the load-bearing-capacity of the connection $R_{ax,k}$ according to ETA-11/0024



Characteristic load-bearing-capacity value of the connection R_K according to ETA-11/0024

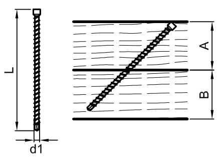
Ø d1 x L [mm]	A [mm]	B [mm]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]	R_k a) - [kN]	R_k a) - [kN]	R_k a) - [kN]
				α= 0°	α= 90°	$α_A$= 0°, $α_B$= 90°	$α_A$= 90°, $α_B$= 0°
6,5 x 120	60	80	4,35	3,83	3,37	3,83	3,37
6,5 x 140	80	80	4,43	3,85	3,39	3,39	3,85
6,5 x 160	80	100	5,94	4,22	3,76	4,22	3,76
6,5 x 195	100	100	7,20	4,54	4,08	4,08	4,54

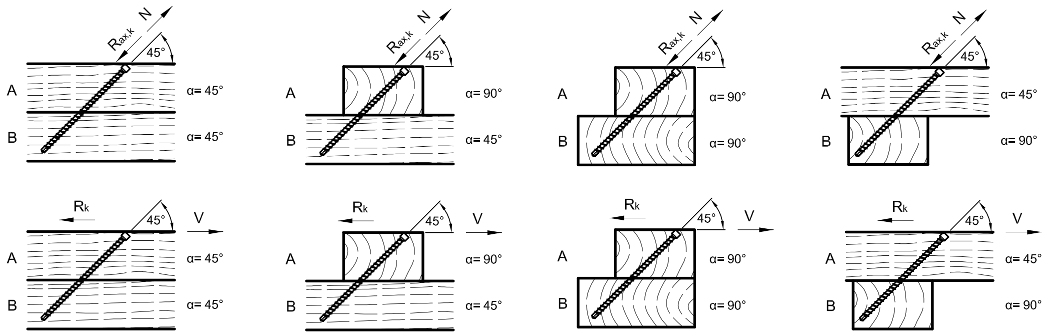
Dimensioning according to ETA-11/0024. Bulk density ρ_k= 380 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
a) The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d = R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

KONSTRUX ST WITH CYLINDER HEAD AND DRILL TIP 6,5 MM: AXIAL PULL-OUT LOAD-BEARING CAPACITY WITHOUT PRE-DRILLING

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

Dimensions	Axial pull-out load-bearing capacity without pre-drilling





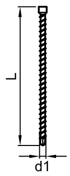
Characteristic value the for load-bearing-capacity of the connection R_k according to ETA-11/0024

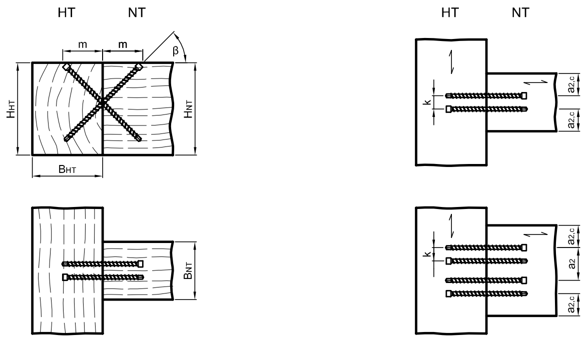
Ød1 x L [mm]	A [mm]	B [mm]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]
			α= 45°		α_A= 90° α_B= 45°		α_A= 90° α_B= 90°		α_A= 45° α_B= 90°	
6,5 x 160	60	80	5,51	3,90	5,51	3,90	5,51	3,90	5,51	3,90
6,5 x 195	80	80	6,04	4,27	6,04	4,27	6,04	4,27	6,04	4,27

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 380 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
a) The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d = R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

KONSTRUX ST WITH CYLINDER HEAD AND DRILL TIP 6,5 MM: MAIN/SECONDARY BEAM CONNECTION

Dimensions	Main/secondary beam connection





a_2= min. 33 mm, $a_{2,c}$= min. 20 mm, k= min. 10 mm

Characteristic value for the load-bearing-capacity of the connection $R_{v,k}$ according to ETA-11/0024

d1 x L [mm]	min. W_{NT} [mm]	min. H_{NT} [mm]	min. W_{HT} [mm]	min. H_{HT} [mm]	m [mm]	β °	$R_{v,k}$ a) b) - [kN]	Pair (n)
6,5 x 195	60	160	80	160	69	45	10,91	1
	100						20,36	2
	120						29,33	3
	160						38,00	4

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 380 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
a) The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d = R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

KONSTRUX DUO

Fully threaded screw with contraction effect

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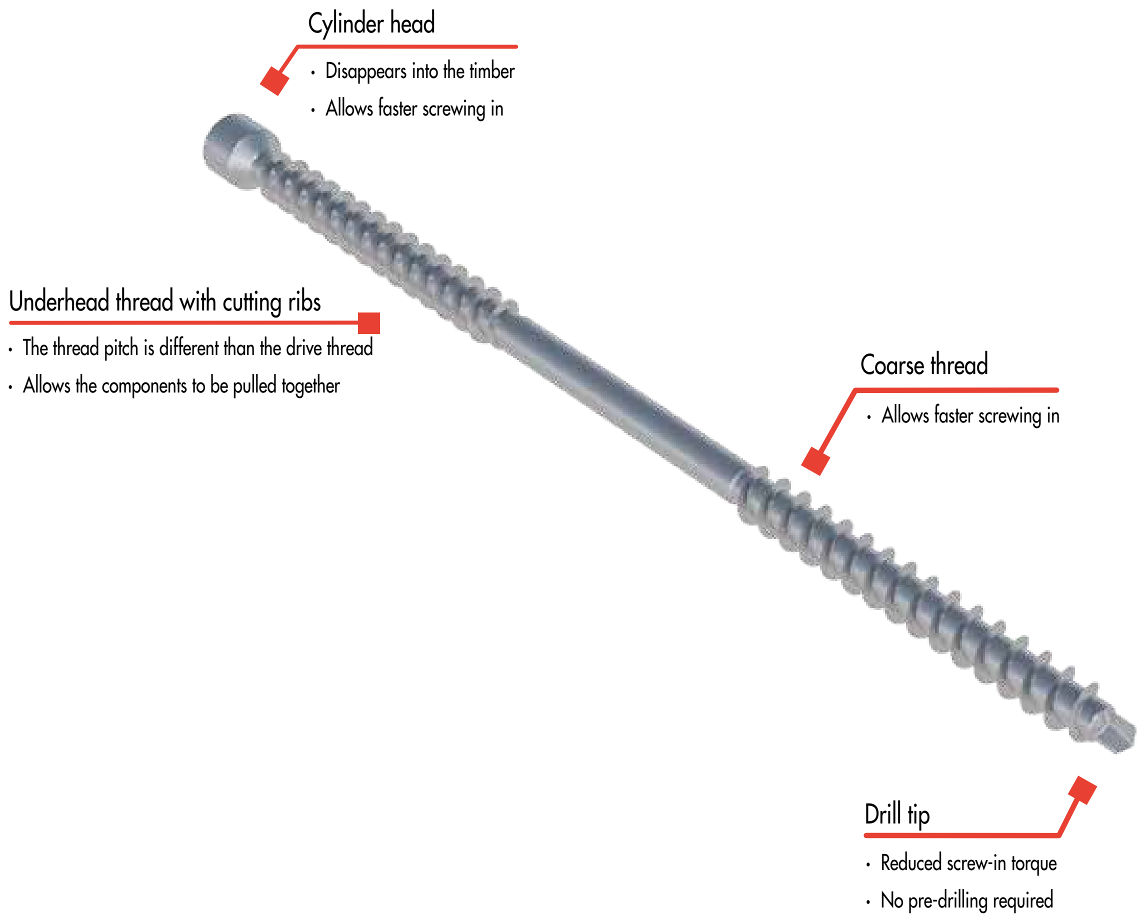
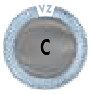
NEW to our product range

The KonstruX DUO is an innovative fully threaded screw that combines the best characteristics of fully and partially threaded screws by: **maximising the load-bearing capacity** of the connection via the equal extraction resistance in both structural components. KonstruX DUO screws have a limited corrosion-resistance and **can be used in the service classes 1 and 2 according to DIN EN 1995 (Eurocode 5).** The application areas are to be found both in the new construction sector as well as in building renovations.

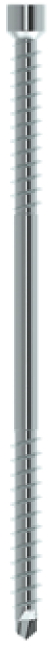


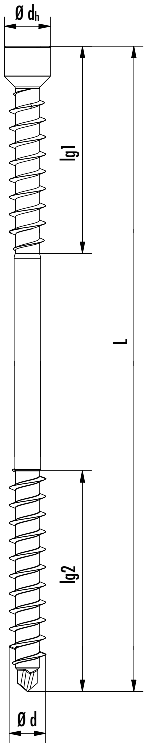
KonstruX DUO

Cylinder head, drill tip,
steel blue galvanised



SC 1–2





Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg1 / lg2 [mm]	Drive	PU
100606	6,5	90	8,0	40/40	TX30	100
100607	6,5	130	8,0	43/43	TX30	100
100608	6,5	160	8,0	67/67	TX30	100
100609	6,5	190	8,0	82/82	TX30	100
100610	6,5	220	8,0	97/97	TX30	100
100611	8,0	160	10,0	67/67	TX40	100
100612	8,0	190	10,0	92/92	TX40	100
100613	8,0	220	10,0	92/92	TX40	100
100614	8,0	245	10,0	107/107	TX40	100
100615	8,0	280	10,0	107/107	TX40	100
100616	8,0	300	10,0	137/137	TX40	100
100617	8,0	330	10,0	137/137	TX40	100
100618	8,0	400	10,0	137/137	TX40	100

APPLICATION EXAMPLES

KonstruX DUO for the construction of a stair substructure

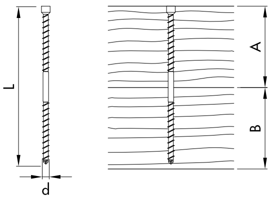
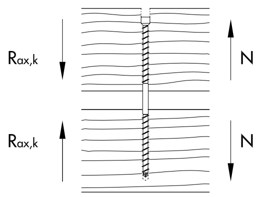
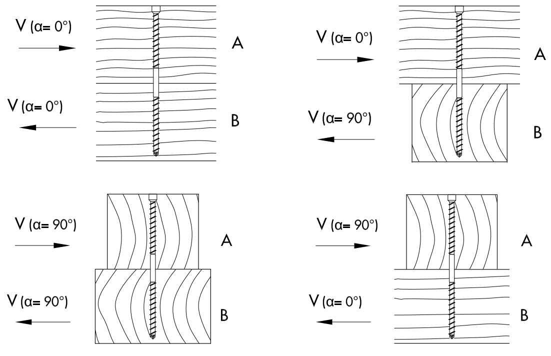
KonstruX DUO sectional view between two structural components

KonstruX DUO for the fastening of a covering

KonstruX DUO for the fastening of a joist

TECHNICAL INFORMATION
KONSTRUX DUO, STEEL BLUE GALVANISED

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

Dimensions	Extraction resistance	Shearing
		

d x L [mm]	A [mm]	B [mm]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]	R_k a) - [kN]	R_k a) - [kN]	R_k a) - [kN]
				$\alpha = 0°$	$\alpha = 90°$	$\alpha_A = 0°$ / $\alpha_B = 90°$	$\alpha_A = 90°$ / $\alpha_B = 0°$
6,5 x 90	40	40	0,96	3,00	2,51	2,75	2,64
6,5 x 130	60	60	1,04	3,02	2,57	2,77	2,77
6,5 x 160	80	80	1,71	3,19	2,74	2,94	2,94
6,5 x 190	100	100	2,12	3,29	2,85	3,04	3,04
6,5 x 220	120	120	2,54	3,40	2,95	3,14	3,14
8,0 x 160	80	80	5,74	5,37	4,72	5,00	5,00
8,0 x 190	100	100	8,11	5,97	5,31	5,60	5,60
8,0 x 220	120	120	8,11	5,97	5,31	5,60	5,60
8,0 x 245	120	120	9,53	6,32	5,67	5,95	5,95
8,0 x 280	140	140	9,53	6,32	5,67	5,95	5,95
8,0 x 300	160	160	12,38	7,03	6,38	6,66	6,66
8,0 x 330	180	180	12,38	7,03	6,38	6,66	6,66
8,0 x 400	200	200	12,38	7,03	6,38	6,66	6,66

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 380 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
a) The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d = R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must to be compared to the design values for the actions E_d ($R_d \geq E_d$).

Example:

Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3. ⟶ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. ⟶ min $R_k = R_d \cdot \gamma_M / k_{mod}$. That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k = R_d \cdot \gamma_M / k_{mod}$ ⟶ R_k= 7,20 kN · 1,3/0,9= 10,40 kN ⟶ Comparison with the table values.

Attention: These are planning aids. The projects must always be designed by authorised persons.

TECHNICAL INFORMATION
KONSTRUX DUO, STEEL BLUE GALVANISED

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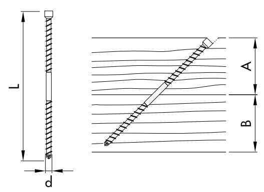
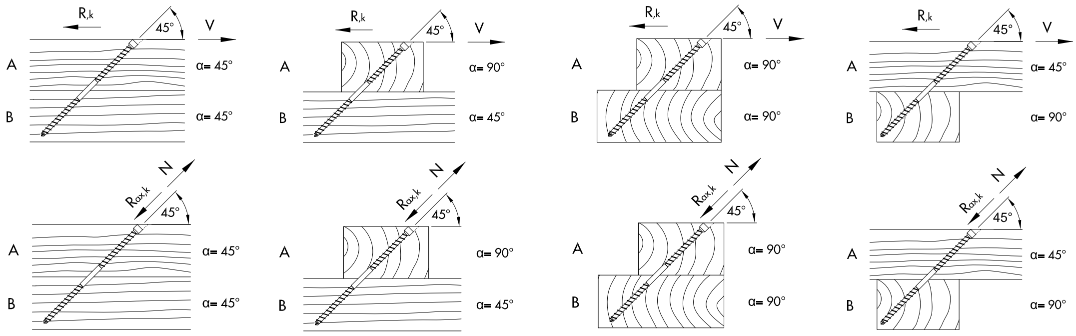
European Technical Assessment
ETA-11/0024

Dimensions	Tension connection





Characteristic value of the load-bearing capacity of the connection $R_{ax,k}$ or R_k according to ETA-11/0024

d x L [mm]	A [mm]	B [mm]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]
			α= 45°		α_A= 90° α_B= 45°		α_A= 90° α_B= 90°		α_A= 45° α_B= 90°	
6,5 x 90	40	40	0,68	0,48	0,68	0,48	0,68	0,48	0,68	0,48
6,5 x 130	40	40	0,74	0,52	0,74	0,52	0,74	0,52	0,74	0,52
6,5 x 160	60	60	1,21	0,86	1,21	0,86	1,21	0,86	1,21	0,86
6,5 x 190	60	60	1,50	1,06	1,50	1,06	1,50	1,06	1,50	1,06
6,5 x 220	80	80	1,80	1,27	1,80	1,27	1,80	1,27	1,80	1,27
8,0 x 160	60	60	4,06	2,87	4,06	2,87	4,06	2,87	4,06	2,87
8,0 x 190	60	60	5,73	4,05	5,73	4,05	5,73	4,05	5,73	4,05
8,0 x 220	80	80	5,73	4,05	5,73	4,05	5,73	4,05	5,73	4,05
8,0 x 245	100	100	6,74	4,77	6,74	4,77	6,74	4,77	6,74	4,77
8,0 x 280	100	100	6,74	4,77	6,74	4,77	6,74	4,77	6,74	4,77
8,0 x 300	120	120	8,75	6,19	8,75	6,19	8,75	6,19	8,75	6,19
8,0 x 330	120	120	8,75	6,19	8,75	6,19	8,75	6,19	8,75	6,19
8,0 x 400	140	140	8,75	6,19	8,75	6,19	8,75	6,19	8,75	6,19

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 380 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
a) The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d = R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must to be compared to the design values for the actions E_d ($R_d \geq E_d$).

Example:

Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k = R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k = R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

Attention: These are planning aids. The projects must always be designed by authorised persons.

KONSTRUX DUO, STEEL BLUE GALVANISED MAIN/SECONDARY BEAM CONNECTION

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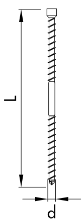
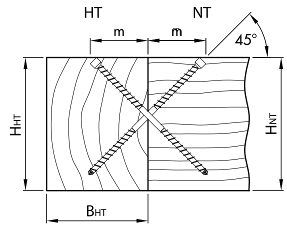
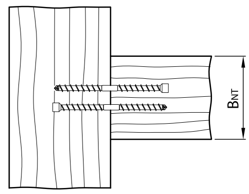
ETA-11/0024

Dimensions	Main/secondary beam connection







d x L [mm]	min. W_{NT} [mm]	min. H_{NT} [mm]	min. W_{HT} [mm]	min. H_{HT} [mm]	$F_{v,Rd}$ [kN]		Pair (n)
					k_{mod} = 0,8	k_{mod} = 0,9	
	60				1,84	2,08	1
6,5 x 190	100	160	80	160	3,43	3,88	2
	120				4,95	5,59	3
	60				2,21	2,49	1
6,5 x 220	100	180	100	180	4,13	4,64	2
	120				5,94	6,69	3
	80				7,06	7,94	1
8,0 x 190	100	160	80	160	13,17	14,81	2
	140				18,97	21,34	3
	80				7,06	7,94	1
8,0 x 220	100	180	100	180	13,17	14,81	2
	140				18,97	21,34	3
	80				8,30	9,33	1
8,0 x 245	100	200	100	200	15,48	17,41	2
	140				22,30	25,08	3
	80				8,30	9,33	1
8,0 x 280	100	220	120	220	15,48	17,41	2
	140				22,30	25,08	3
	80				10,77	12,12	1
8,0 x 300	100	240	120	240	20,10	22,61	2
	140				28,95	32,57	3
	80				10,77	12,12	1
8,0 x 330	100	260	140	260	20,10	22,61	2
	140				28,95	32,57	3
	80				10,77	12,12	1
8,0 x 400	100	300	160	300	20,10	22,61	2
	140				28,95	32,57	3

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 380 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
a) The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d = R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must to be compared to the design values for the actions E_d ($R_d \geq E_d$).

Example:

Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k = R_d \cdot \gamma_M / k_{mod}$That is to say that the characteristic minimum value for the load-bearing capacity is calculated as:
min $R_k = R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.
b) Determined with an eff. number of screw pairs of: $n^{0.9}$.

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KONSTRUX DUO, STEEL BLUE GALVANISED MAIN/SECONDARY BEAM CONNECTION

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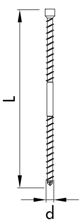
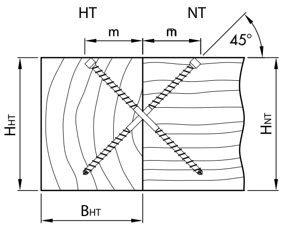
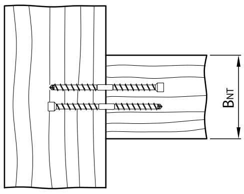
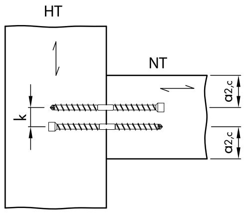
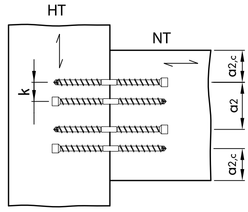
Dimensions	Main/secondary beam connection











d x L [mm]	B_{NT} [mm]	H_{NT} [mm]	B_{HT} [mm]	H_{HT} [mm]	m [mm]	$a_{2,c,min}$ [mm]	$a_{2,min}$ [mm]	k_{min} [mm]	Pair (n)
	60								1
6,5 x 190	100	160	80	160	67	20	33	10	2
	120								3
	60								1
6,5 x 220	100	180	100	180	78	20	33	10	2
	120								3
	80								1
8,0 x 190	100	160	80	160	67	24	40	12	2
	140								3
	80								1
8,0 x 220	100	180	100	180	78	24	40	12	2
	140								3
	80								1
8,0 x 245	100	200	100	200	87	24	40	12	2
	140								3
	80								1
8,0 x 280	100	220	120	220	100	24	40	12	2
	140								3
	80								1
8,0 x 300	100	240	120	240	106	24	40	12	2
	140								3
	80								1
8,0 x 330	100	260	140	260	117	24	40	12	2
	140								3
	80								1
8,0 x 400	100	300	160	300	141	24	40	12	2
	140								3

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 380 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
a) The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d = R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

Example:

Characteristic value for the continuous action (dead load) G_k= 2.00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k = R_d \cdot \gamma_M / k_{mod}$ That is to say that the characteristic minimum value for the load-bearing capacity is calculated as:
min $R_k = R_d \cdot \gamma_M / k_{mod}$ → R_k= 7.20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.
b) Determined with an eff. number of screw pairs of: $n^{0.9}$.

Attention: These are planning aids. The projects must always be designed by authorised persons.

KONSTRUX, 13 MM E12

For large spans in wood construction

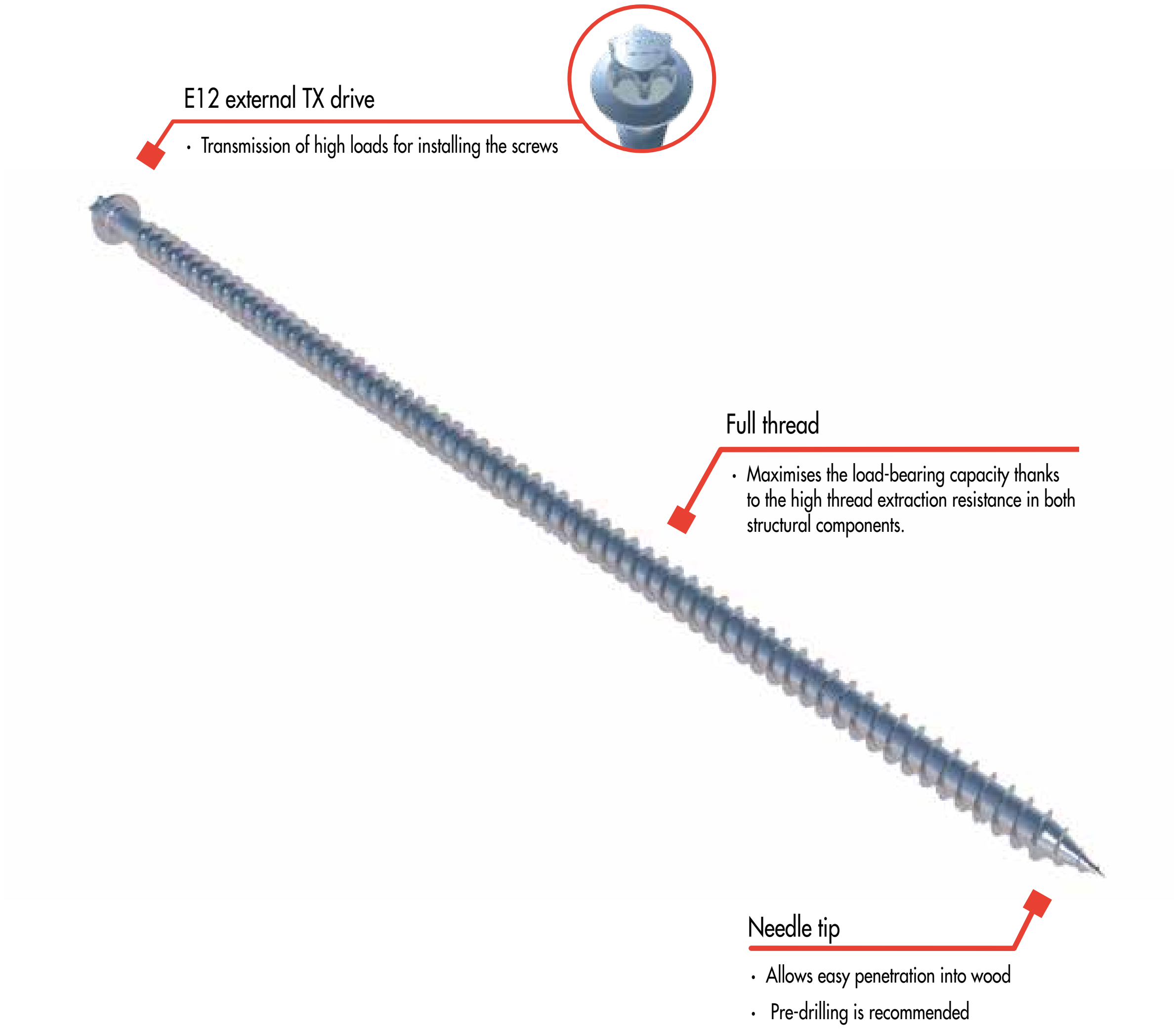
Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

NEW to our product range

KonstruX screws with an E12 drive are widely used in engineered wood construction, carpentry, timber frame construction, hall construction and timber element construction as well as in the renovation of floor slabs and more. KonstruX fully threaded screws maximise the load-bearing capacity of connections thanks to the **high thread-extraction resistance** in both structural components.

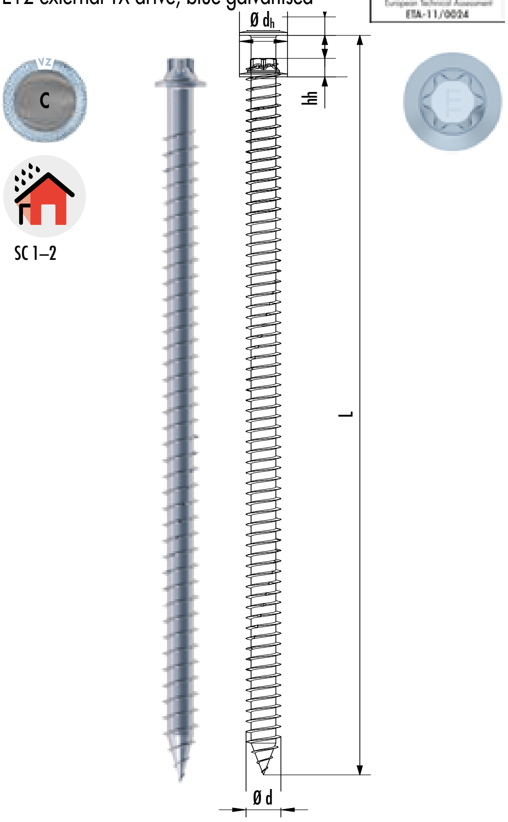
With a coarse thread across their entire length and an outer diameter of 13 mm, these screws are designed to have an **excellent axial extraction resistance** in structural timber components. With their **impressive tensile strength of 75 kN,** the screws can take full advantage of their maximum length of 1,400 mm and are therefore particularly suitable for large reinforcement projects.

Typical applications are to be found in laminated timber elements or hall trusses with large spans, beam and connection reinforcements, transverse tensile reinforcements, recess reinforcements on notches, opening reinforcements and support reinforcements in order to increase, maintain or restore the load-bearing capacity and reduce long-term deformations.



Konstrux, 13 mm E12

E12 external TX drive, blue galvanised



Item number	Ø d [mm]	L [mm]	Ø dh [mm]	hh [mm]	Drive	PU
904835	13.0	200	18	10	TX50 ●	20
904836	13.0	220	18	10	TX50 ●	20
904837	13.0	240	18	10	TX50 ●	20
904838	13.0	260	18	10	TX50 ●	20
904839	13.0	280	18	10	TX50 ●	20
904840	13.0	300	18	10	TX50 ●	20
904841	13.0	320	18	10	TX50 ●	20
904842	13.0	340	18	10	TX50 ●	20
904843	13.0	360	18	10	TX50 ●	20
904844	13.0	380	18	10	TX50 ●	20
904845	13.0	420	18	10	TX50 ●	20
904846	13.0	460	18	10	TX50 ●	20
904847	13.0	500	18	10	TX50 ●	20
904848	13.0	540	18	10	TX50 ●	20
904849	13.0	580	18	10	TX50 ●	20
904850	13.0	620	18	10	TX50 ●	20
904851	13.0	660	18	10	TX50 ●	20
904852	13.0	700	18	10	TX50 ●	20
904853	13.0	750	18	10	TX50 ●	20
904854	13.0	800	18	10	TX50 ●	20
904855	13.0	900	18	10	TX50 ●	20
904856	13.0	1000	18	10	TX50 ●	20
904861	13.0	1200	18	10	TX50 ●	20
904862	13.0	1400	18	10	TX50 ●	20

APPLICATION EXAMPLES

Reinforcement of beam openings

Reinforcement of the main/secondary beam supports

Reinforcement of notched beams

Reinforcement of trapezoidally shaped beams

TECHNICAL INFORMATION
KONSTRUX, 13 MM E12, STEEL BLUE GALVANISED

ETA
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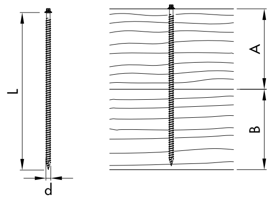
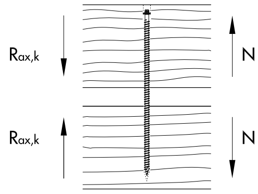
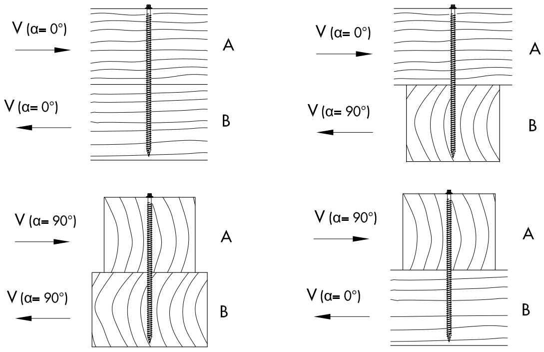
ETA-11/0024

Dimensions	Extraction resistance	Shearing







Characteristic load-bearing-capacity value of the connection $R_{ax,k}$ according to ETA-11/0024

Characteristic load-bearing-capacity value of the connection R_K according to ETA-11/0024

d x L [mm]	A [mm]	B [mm]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]	R_k a) - [kN]	R_k a) - [kN]	R_k a) - [kN]
				$\alpha = 0^\circ$	$\alpha = 90^\circ$	$\alpha_A = 0^\circ$ / $\alpha_B = 90^\circ$	$\alpha_A = 90^\circ$ / $\alpha_B = 0^\circ$
13,0 x 300	150	150	22,49	16,20	14,13	15,00	15,00
13,0 x 340	170	170	25,49	16,95	14,88	15,75	15,75
13,0 x 380	190	190	28,49	17,70	15,63	16,50	16,50
13,0 x 420	210	210	31,49	18,45	16,38	17,25	17,25
13,0 x 460	230	230	34,49	19,20	17,02	18,00	18,00
13,0 x 500	250	250	37,49	19,25	17,02	18,75	18,75
13,0 x 540	270	270	40,49	20,70	17,02	18,75	18,75
13,0 x 580	290	290	43,48	21,15	17,02	18,75	18,75
13,0 x 620	310	310	46,48	21,15	17,02	18,75	18,75
13,0 x 660	330	330	49,48	21,15	17,02	18,75	18,75
13,0 x 700	350	350	52,48	21,15	17,02	18,75	18,75
13,0 x 750	375	375	56,23	21,15	17,02	18,75	18,75
13,0 x 800	400	400	59,98	21,15	17,02	18,75	18,75
13,0 x 900	450	450	67,48	21,15	17,02	18,75	18,75
13,0 x 1000	500	500	74,97	21,15	17,02	18,75	18,75
13,0 x 1200	600	600	75,00	21,15	17,02	18,75	18,75
13,0 x 1400	700	700	75,00	21,15	17,02	18,75	18,75

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 380 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
a) The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d = R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

Example:

Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3. → Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k = R_d \cdot \gamma_M / k_{mod}$. That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k = R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

Attention: These are planning aids. The projects must always be designed by authorised persons.

1/2" EXTERNAL TX SOCKET

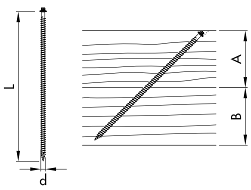
Suitable to this

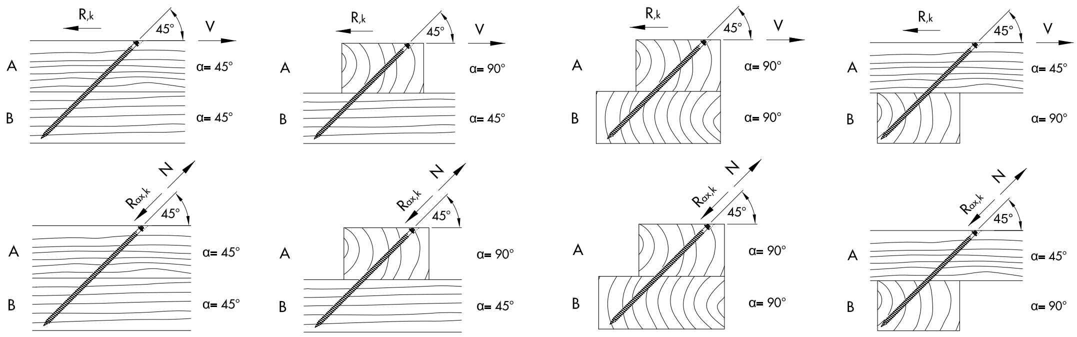
Item number	Drive	PU
800420	E12	1

TECHNICAL INFORMATION
KONSTRUX, 13 MM E12, STEEL BLUE GALVANISED

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

Dimensions	Tension connection





Characteristic value of the load-bearing capacity of the connection $R_{ax,k}$ or R_k according to ETA-11/0024

d x L [mm]	A [mm]	B [mm]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]
			α= 45°		$α_A$= 90° $α_B$= 45°		$α_A$= 90° $α_B$= 90°		$α_A$= 45° $α_B$= 90°	
13,0 x 300	105	105	15,75	11,14	15,75	11,14	15,75	11,14	15,75	11,14
13,0 x 340	120	120	17,99	12,72	17,99	12,72	17,99	12,72	17,99	12,72
13,0 x 380	135	135	20,05	14,18	20,05	14,18	20,05	14,18	20,05	14,18
13,0 x 420	150	150	22,05	15,59	22,05	15,59	22,05	15,59	22,05	15,59
13,0 x 460	160	160	23,99	16,96	23,99	16,96	23,99	16,96	23,99	16,96
13,0 x 500	180	180	26,02	18,40	26,02	18,40	26,02	18,40	26,02	18,40
13,0 x 540	190	190	28,49	20,15	28,49	20,15	28,49	20,15	28,49	20,15
13,0 x 580	205	205	30,74	21,74	30,74	21,74	30,74	21,74	30,74	21,74
13,0 x 620	220	220	32,76	23,16	32,76	23,16	32,76	23,16	32,76	23,16
13,0 x 660	235	235	34,75	24,57	34,75	24,57	34,75	24,57	34,75	24,57
13,0 x 700	250	250	36,73	25,97	36,73	25,97	36,73	25,97	36,73	25,97
13,0 x 750	265	265	39,74	28,10	39,74	28,10	39,74	28,10	39,74	28,10
13,0 x 800	285	285	42,09	29,76	42,09	29,76	42,09	29,76	42,09	29,76
13,0 x 900	320	320	47,45	33,55	47,45	33,55	47,45	33,55	47,45	33,55
13,0 x 1000	355	355	52,80	37,34	52,80	37,34	52,80	37,34	52,80	37,34
13,0 x 1200	425	425	53,03	37,50	53,03	37,50	53,03	37,50	53,03	37,50
13,0 x 1400	500	500	53,03	37,50	53,03	37,50	53,03	37,50	53,03	37,50

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 380 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
a) The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d = R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

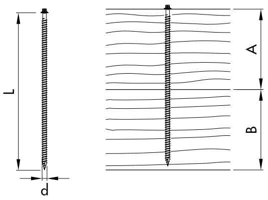
Example:

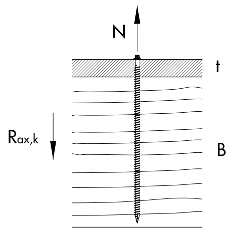
Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1.5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k = R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k = R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

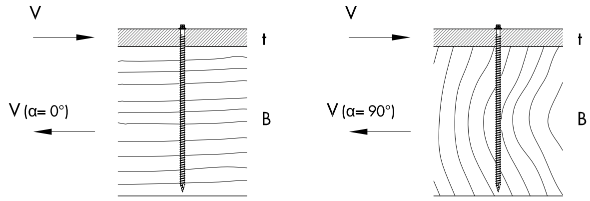
Attention: These are planning aids. The projects must always be designed by authorised persons.

TECHNICAL INFORMATION
KONSTRUX, 13 MM E12, STEEL BLUE GALVANISED

Dimensions	Extraction resistance	Shearing







d x L [mm]	t [mm]	B [mm]	$R_{ax,k}$ a) - [kN]	R_k a) - [kN]	R_k a) - [kN]
				α= 0°	α= 90°
13,0 x 300	20	300	41,99	25,45	22,53
13,0 x 340	20	340	47,98	26,95	24,03
13,0 x 380	20	380	53,98	28,45	24,07
13,0 x 420	20	420	59,98	29,91	24,07
13,0 x 460	20	460	65,98	29,91	24,07
13,0 x 500	20	500	71,97	29,91	24,07
13,0 x 540	20	540	75,00	29,91	24,07
13,0 x 580	20	580	75,00	29,91	24,07
13,0 x 620	20	620	75,00	29,91	24,07
13,0 x 660	20	660	75,00	29,91	24,07
13,0 x 700	20	700	75,00	29,91	24,07
13,0 x 750	20	750	75,00	29,91	24,07
13,0 x 800	20	800	75,00	29,91	24,07
13,0 x 900	20	900	75,00	29,91	24,07
13,0 x 1000	20	1000	75,00	29,91	24,07
13,0 x 1200	20	1200	75,00	29,91	24,07
13,0 x 1400	20	1400	75,00	29,91	24,07

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 380 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
a) The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d = R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

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Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k = R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k = R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

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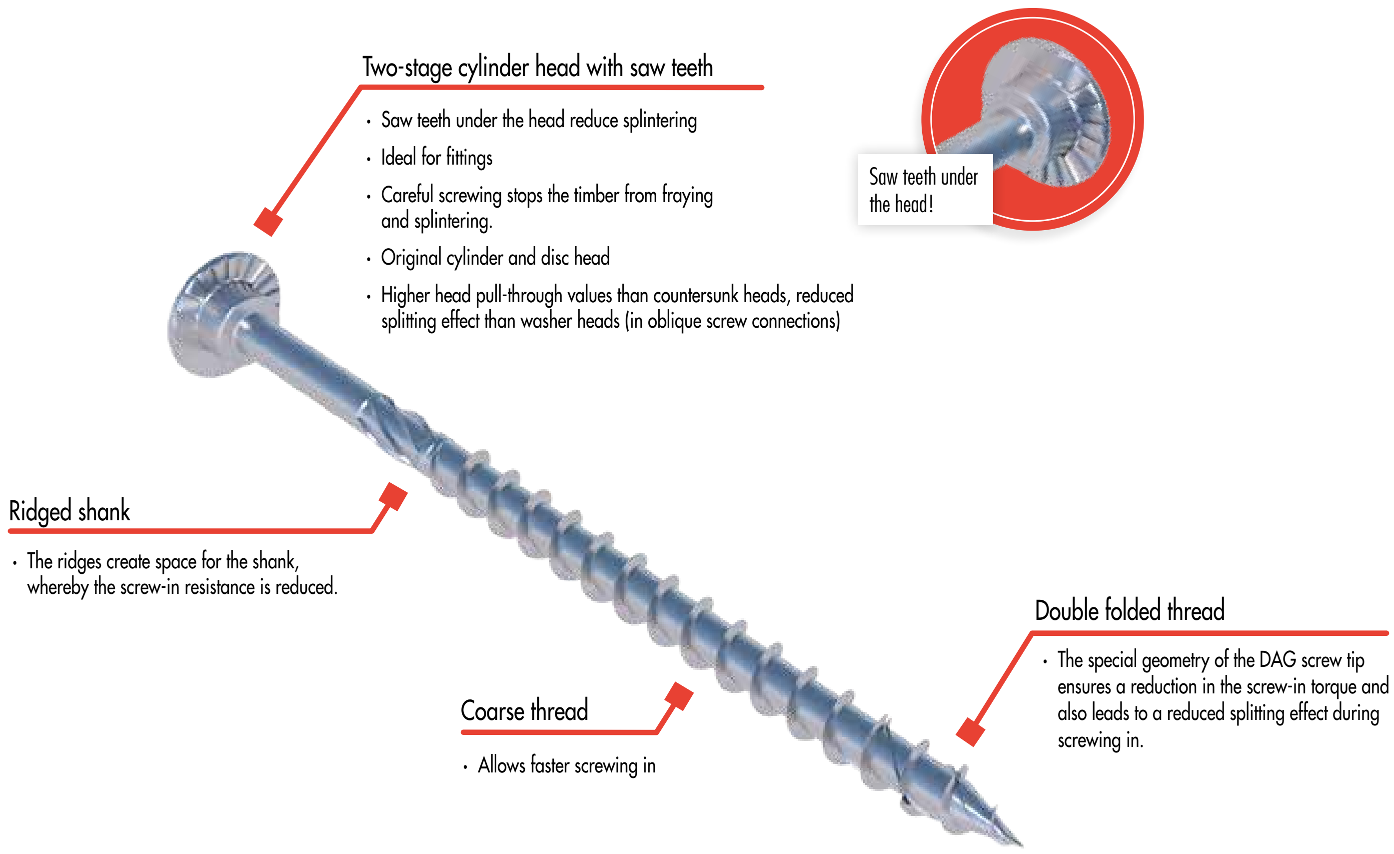
SAWTEC

Wood construction screw made of hardened carbon steel

The SawTec screw is a wooden construction screw **with a special screw tip and saw teeth** under the head. The screw has a **two-stage cylinder head.** The special geometry of the screw tip ensures a **reduction in the screw-in torque** and also leads to a **reduced splitting effect** during screwing in.

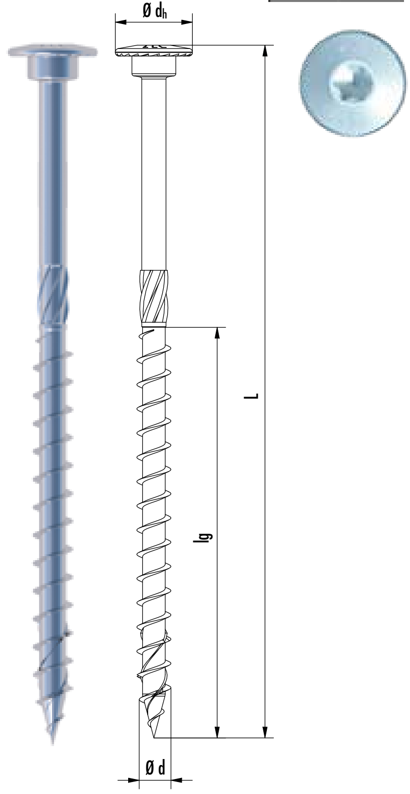


SawTec

Cylinder head, blue galvanised

ETA-11/0024

SC 1–2

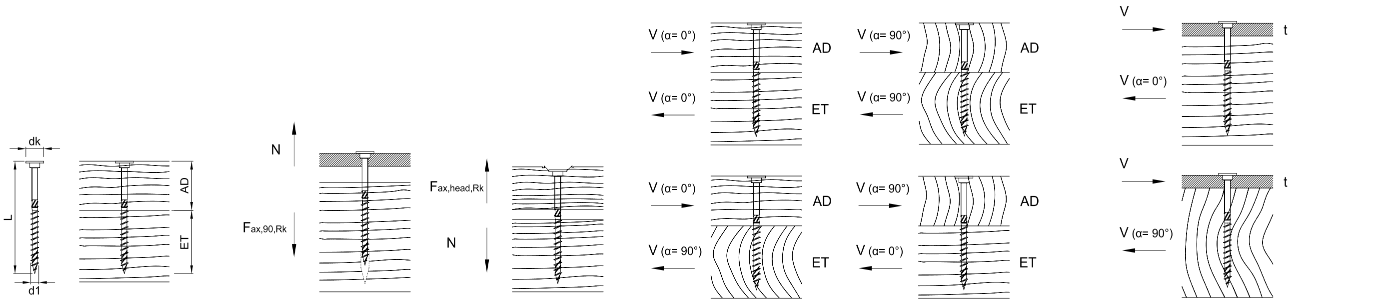


Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
954115	5,0	40	10,5	24	TX25	200
954117	5,0	50	10,5	30	TX25	200
954118	5,0	60	10,5	36	TX25	200
954119	5,0	70	10,5	42	TX25	200
954120	5,0	80	10,5	48	TX25	200
954121	5,0	90	10,5	54	TX25	200
954122	5,0	100	10,5	60	TX25	200
954124	5,0	120	10,5	60	TX25	200
954128	6,0	60	13,0	36	TX30	100
954129	6,0	70	13,0	42	TX30	100
954130	6,0	80	13,0	48	TX30	100
954131	6,0	100	13,0	60	TX30	100
954133	6,0	120	13,0	60	TX30	100
954135	6,0	140	13,0	70	TX30	100
954137	6,0	160	13,0	70	TX30	100
954138	6,0	180	13,0	70	TX30	100
954145	8,0	80	18,0	48	TX40	50
954146	8,0	100	18,0	60	TX40	50
954147	8,0	120	18,0	60	TX40	50
954148	8,0	140	18,0	95	TX40	50
954149	8,0	160	18,0	95	TX40	50
954150	8,0	180	18,0	95	TX40	50
954151	8,0	200	18,0	95	TX40	50
954152	8,0	220	18,0	95	TX40	50
954153	8,0	240	18,0	95	TX40	50
954154	8,0	260	18,0	95	TX40	50
954155	8,0	280	18,0	95	TX40	50
954156	8,0	300	18,0	95	TX40	50
954157	8,0	320	18,0	95	TX40	50
954158	8,0	340	18,0	95	TX40	50
954159	8,0	360	18,0	95	TX40	50
954160	8,0	380	18,0	95	TX40	50
954161	8,0	400	18,0	95	TX40	50
954181	8,0	420	18,0	95	TX40	50
954182	8,0	440	18,0	95	TX40	50
954183	8,0	460	18,0	95	TX40	50
954184	8,0	480	18,0	95	TX40	50
954185	8,0	500	18,0	95	TX40	50
954186	8,0	550	18,0	95	TX40	50
954187	8,0	600	18,0	95	TX40	50
954162	10,0	100	22,0	60	TX50	50
954163	10,0	120	22,0	60	TX50	50
954164	10,0	140	22,0	95	TX50	50
954165	10,0	160	22,0	95	TX50	50
954166	10,0	180	22,0	95	TX50	50
954167	10,0	200	22,0	95	TX50	50
954168	10,0	220	22,0	95	TX50	50
954169	10,0	240	22,0	95	TX50	50
954170	10,0	260	22,0	95	TX50	50
954171	10,0	280	22,0	95	TX50	50
954172	10,0	300	22,0	95	TX50	50
954173	10,0	320	22,0	95	TX50	50
954174	10,0	340	22,0	95	TX50	50
954175	10,0	360	22,0	95	TX50	25
954176	10,0	380	22,0	95	TX50	25
954177	10,0	400	22,0	95	TX50	25

TECHNICAL INFORMATION
SAWTEC, CYLINDER HEAD, STEEL, BLUE GALVANISED

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber				Shearing steel-timber		



d1 x L [mm]	dk [mm]	AD [mm]	SP [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								α_{AD}= 0°	α_{AD}= 90°			
						α= 0°	α=90°	α_{ET}= 90°	α_{ET}= 0°		α= 0°	α= 90°
5,0 x 40	10,5	16	24	1,45	1,10	1,09				2	1,44	
5,0 x 50	10,5	20	30	1,82	1,10	1,22				2	1,67	
5,0 x 60	10,5	24	36	2,18	1,10	1,31				2	1,76	
5,0 x 70	10,5	28	42	2,54	1,10	1,41				2	1,85	
5,0 x 80	10,5	32	48	2,90	1,10	1,49				2	1,94	
5,0 x 90	10,5	36	54	3,27	1,10	1,49				2	2,03	
5,0 x 100	10,5	40	60	3,63	1,10	1,49				2	2,12	
5,0 x 120	10,5	60	60	3,63	1,10	1,49				2	2,12	
6,0 x 60	13,0	24	36	2,46	1,69	1,70				2	2,26	
6,0 x 70	13,0	28	42	2,87	1,69	1,81				2	2,36	
6,0 x 80	13,0	32	48	3,28	1,69	1,92				2	2,46	
6,0 x 90	13,0	36	54	3,69	1,69	2,04				2	2,57	
6,0 x 100	13,0	40	60	4,10	1,69	2,07				2	2,67	
6,0 x 110	13,0	50	60	4,10	1,69	2,07				2	2,67	
6,0 x 120	13,0	60	60	4,10	1,69	2,07				2	2,67	
6,0 x 130	13,0	60	70	4,79	1,69	2,07				2	2,84	
6,0 x 140	13,0	70	70	4,79	1,69	2,07				2	2,84	
6,0 x 150	13,0	80	70	4,79	1,69	2,07				2	2,84	
6,0 x 160	13,0	90	70	4,79	1,69	2,07				2	2,84	
6,0 x 180	13,0	110	70	4,79	1,69	2,07				2	2,84	
8,0 x 80	18,0	30	50	4,26	3,24	3,89	3,08	3,89	3,08	3	4,61	3,94
8,0 x 100	18,0	40	60	5,33	3,24	4,31	3,48	4,31	3,48	3	4,83	4,20
8,0 x 120	18,0	60	60	5,33	3,24	4,31	3,68	4,31	3,68	3	4,83	4,20
8,0 x 140	18,0	40	100	8,44	3,24	4,31	3,48	4,31	3,48	3	5,60	4,98
8,0 x 160	18,0	60	100	8,44	3,24	4,31	3,68	4,31	3,68	3	5,60	4,98
8,0 x 180	18,0	80	100	8,44	3,24	4,31	3,68	4,31	3,68	3	5,60	4,98
8,0 x 200	18,0	100	100	8,44	3,24	4,31	3,68	3,68	4,31	3	5,60	4,98

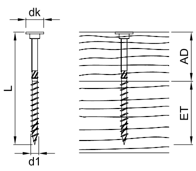
Other 8 sizes on the next page

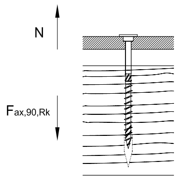
Dimensioning according to ETA-11/0024. Bulk density ρ_k= 350 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
a) The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d= R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

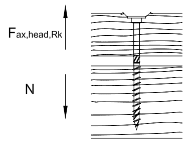
Example:

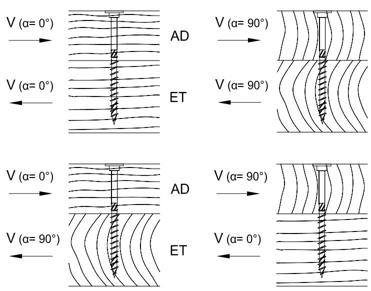
Characteristic value for the continuous action (dead load) G_k= 2.00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k= R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k= R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.
Attention: These are planning aids. The projects must always be designed by authorised persons.

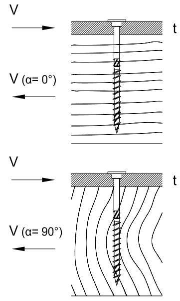
Attention: Check the assumptions that have been made. The specified values, type and number of connecting means represent a preliminary design. The projects must always be designed by authorised persons and in accordance with the state building regulations [LBauO]. Please contact a qualified structural engineer to obtain a proof of stability certificate in accordance with the state building regulations [LBauO] for a fee. We will be happy to put you in touch with someone.











Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber				Shearing steel-timber		
d1 x L [mm]	dk [mm]	AD [mm]	SP [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								$\alpha_{AD}= 0°$	$\alpha_{AD}= 90°$			
						$\alpha= 0°$	$\alpha=90°$	$\alpha_{ET}= 90°$	$\alpha_{ET}= 0°$		$\alpha= 0°$	$\alpha= 90°$
8,0 x 220	18,0	120	100	8,44	3,24	4,31	3,68	3,68	4,31	3	5,60	4,98
8,0 x 240	18,0	140	100	8,44	3,24	4,31	3,68	3,68	4,31	3	5,60	4,98
8,0 x 260	18,0	160	100	8,44	3,24	4,31	3,68	3,68	4,31	3	5,60	4,98
8,0 x 280	18,0	180	100	8,44	3,24	4,31	3,68	3,68	4,31	3	5,60	4,98
8,0 x 300	18,0	200	100	8,44	3,24	4,31	3,68	3,68	4,31	3	5,60	4,98
8,0 x 320	18,0	220	100	8,44	3,24	4,31	3,68	3,68	4,31	3	5,60	4,98
8,0 x 340	18,0	240	100	8,44	3,24	4,31	3,68	3,68	4,31	3	5,60	4,98
8,0 x 360	18,0	260	100	8,44	3,24	4,31	3,68	3,68	4,31	3	5,60	4,98
8,0 x 380	18,0	280	100	8,44	3,24	4,31	3,68	3,68	4,31	3	5,60	4,98
8,0 x 400	18,0	300	100	8,44	3,24	4,31	3,68	3,68	4,31	3	5,60	4,98
8,0 x 420	18,0	320	100	8,44	3,24	4,31	3,68	3,68	4,31	3	5,60	4,98
8,0 x 440	18,0	340	100	8,44	3,24	4,31	3,68	3,68	4,31	3	5,60	4,98
8,0 x 460	18,0	360	100	8,44	3,24	4,31	3,68	3,68	4,31	3	5,60	4,98
8,0 x 480	18,0	380	100	8,44	3,24	4,31	3,68	3,68	4,31	3	5,60	4,98
8,0 x 500	18,0	400	100	8,44	3,24	4,31	3,68	3,68	4,31	3	5,60	4,98
8,0 x 550	18,0	450	100	8,44	3,24	4,31	3,68	3,68	4,31	3	5,60	4,98
8,0 x 600	18,0	500	100	8,44	3,24	4,31	3,68	3,68	4,31	3	5,60	4,98
10,0 x 100	22, 0	40	60	6,48	4,84	6,03	4,67	6,03	4,67	3	6,78	5,81
10,0 x 120	22, 0	60	60	6,48	4,84	6,37	5,40	6,37	5,40	3	6,78	5,81
10,0 x 140	22, 0	40	100	10,26	4,84	6,03	4,67	6,03	4,67	3	7,72	6,76
10,0 x 160	22, 0	60	100	10,26	4,84	6,37	5,40	6,37	5,40	3	7,72	6,76
10,0 x 180	22, 0	80	100	10,26	4,84	6,37	5,40	6,37	5,40	3	7,72	6,76
10,0 x 200	22, 0	100	100	10,26	4,84	6,37	5,40	5,40	6,37	3	7,72	6,76
10,0 x 220	22, 0	120	100	10,26	4,84	6,37	5,40	5,40	6,37	3	7,72	6,76
10,0 x 240	22, 0	140	100	10,26	4,84	6,37	5,40	5,40	6,37	3	7,72	6,76
10,0 x 260	22, 0	160	100	10,26	4,84	6,37	5,40	5,40	6,37	3	7,72	6,76
10,0 x 280	22, 0	180	100	10,26	4,84	6,37	5,40	5,40	6,37	3	7,72	6,76
10,0 x 300	22, 0	200	100	10,26	4,84	6,37	5,40	5,40	6,37	3	7,72	6,76
10,0 x 320	22, 0	220	100	10,26	4,84	6,37	5,40	5,40	6,37	3	7,72	6,76
10,0 x 340	22, 0	240	100	10,26	4,84	6,37	5,40	5,40	6,37	3	7,72	6,76
10,0 x 360	22, 0	260	100	10,26	4,84	6,37	5,40	5,40	6,37	3	7,72	6,76
10,0 x 380	22, 0	280	100	10,26	4,84	6,37	5,40	5,40	6,37	3	7,72	6,76
10,0 x 400	22, 0	300	100	10,26	4,84	6,37	5,40	5,40	6,37	3	7,72	6,76

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 350 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
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COLLATED SCREWS

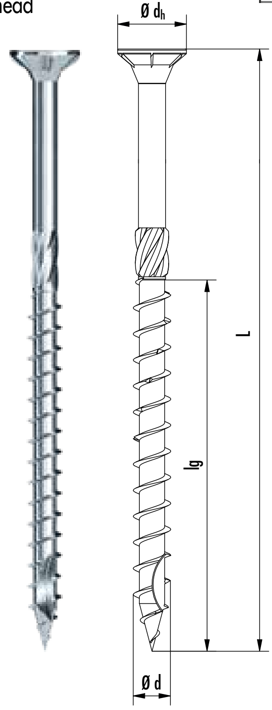
Holzher system

Paneltwistec

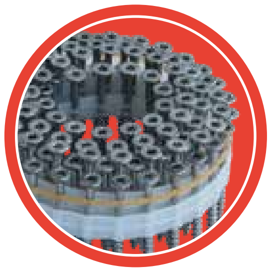
Collated, steel blue galvanised, countersunk head

C

SC 1–2



Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	Piece/belt	Coil/cardboard box
905613	4,0	40	8,0	24	TX20 ●	167	12
905614	4,0	50	8,0	30	TX20 ●	167	12
905615	4,0	60	8,0	36	TX20 ●	167	12
905616	4,5	50	9,0	30	TX25 ●	125	12
905617	4,5	60	9,0	36	TX25 ●	125	12
905622	4,5	70	9,0	42	TX25 ●	125	5
905635	5,0	50	10,0	30	TX25 ●	125	10
905636	5,0	60	10,0	36	TX25 ●	125	10
905637	5,0	70	10,0	42	TX25 ●	125	5

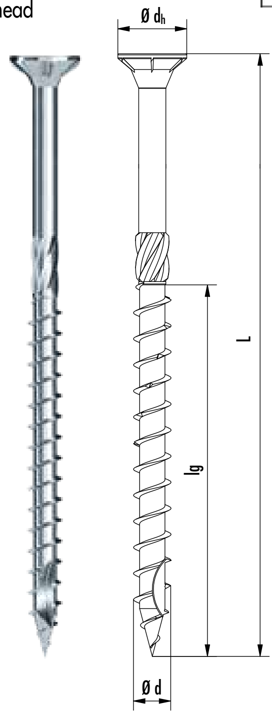


Paneltwistec

Collated, hardened stainless steel, countersunk head

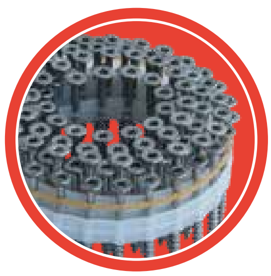
C1

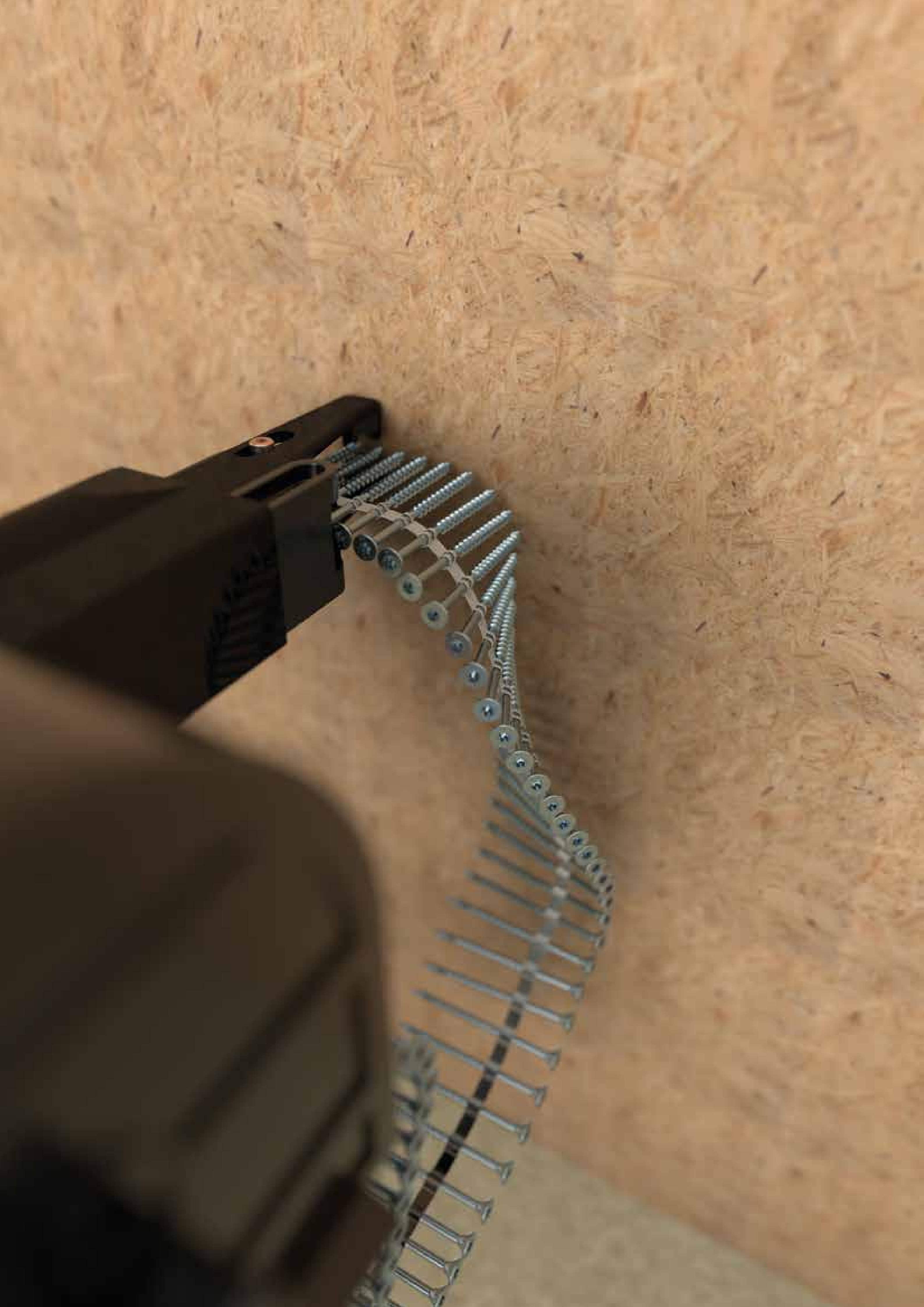
SC 1–3



Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	Piece/belt	Coil/cardboard box
905650	4,5	50	9,0	30	TX20 ●	125	12
905651	4,5	60	9,0	36	TX20 ●	125	12
903605*	4,5	50	9,0	30	TX25 ●	125	12
903606*	4,5	60	9,0	36	TX25 ●	125	12
903612	5,0	60	10,0	36	TX25 ●	125	5
903609	5,0	70	10,0	42	TX25 ●	125	5
903608	5,0	80	10,0	48	TX25 ●	125	10

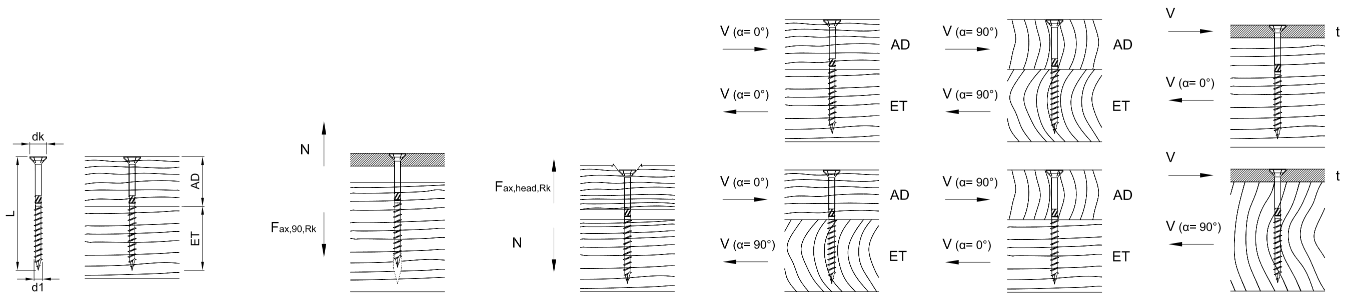
*Discontinued item





TECHNICAL INFORMATION
PANELTWISTEC COLLATED, STEEL BLUE GALVANISED

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024



Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber				Shearing steel-timber		
d1 x L [mm]	dk [mm]	AD [mm]	SP [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								α_{AD}= 0°	α_{AD}= 90°			
						α= 0°	α=90°	α_{ET}= 90°	α_{ET}= 0°		α= 0°	α= 90°
4,0 x 40	8,0	16	24	1,24	0,77	0,84				2	1,15	
4,0 x 50	8,0	20	30	1,55	0,77	0,92				2	1,23	
4,0 x 60	8,0	24	36	1,86	0,77	1,01				2	1,31	
4,0 x 70	8,0	28	42	2,17	0,77	1,03				2	1,38	
4,5 x 50	9,0	20	30	1,69	0,97	1,08				2	1,44	
4,5 x 60	9,0	24	36	2,03	0,97	1,17				2	1,53	
5,0 x 50	10,0	20	30	1,82	1,20	1,24				2	1,67	
5,0 x 60	10,0	24	36	2,18	1,20	1,34				2	1,76	
5,0 x 70	10,0	28	42	2,54	1,20	1,44				2	1,85	
5,0 x 80	10,0	32	48	2,90	1,20	1,52				2	1,94	

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 350 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
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That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k= R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

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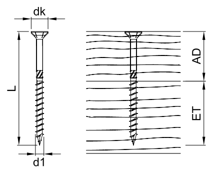
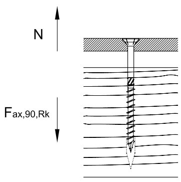
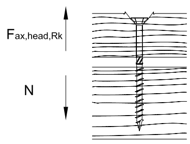
TECHNICAL INFORMATION
PANELTWISTEC COLLATED, HARDENED STAINLESS STEEL

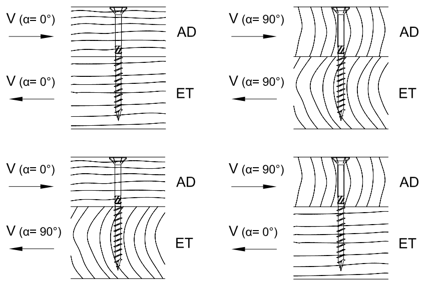
ETA · CE
Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

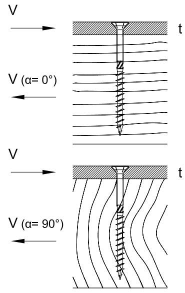
Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber				Shearing steel-timber		
d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								$\alpha_{AD}=0°$	$\alpha_{AD}=90°$			
						$\alpha=0°$	$\alpha=90°$	$\alpha_{ET}=90°$	$\alpha_{ET}=0°$		$\alpha=0°$	$\alpha=90°$
4,5 x 50	9,0	20	30	1,69	0,97	1,08				2	1,44	
4,5 x 60	9,0	24	36	2,03	0,97	1,17				2	1,53	
5,0 x 60	10,0	24	36	2,18	1,20	1,34				2	1,76	
5,0 x 70	10,0	28	42	2,54	1,20	1,44				2	1,85	
5,0 x 80	10,0	32	48	2,90	1,20	1,52				2	1,94	











Dimensioning according to ETA-11/0024. Bulk density ρ_k= 350 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
a) The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d= R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

Example:

Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k= R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k= R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

Attention: These are planning aids. The projects must always be designed by authorised persons.

UNIVERSAL WOOD CONSTRUCTION SCREW

Collated screws for timber frame construction and solid wood construction

HBS

Collated, steel blue galvanised

Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
945080	4,2	41	7,5	30	PH 2	1000
945081	4,2	55	7,5	30	PH 2	1000

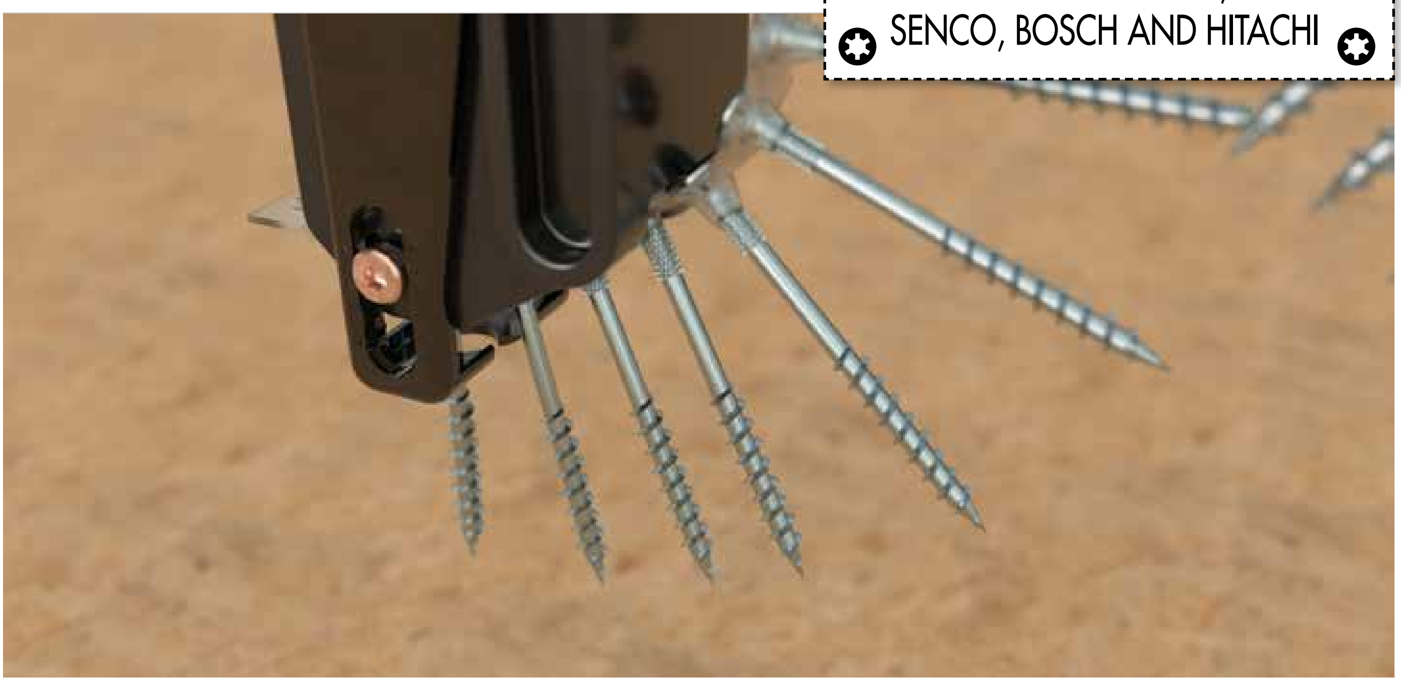
ADVANTAGES

- Suitable for universal use
- Fast installation thanks to the collated format
- The ridges beneath the head create an optimal hold in the application area
- Milling ribs on the countersunk head prevent the wood from splitting during screwing in

SUITABLE FOR UNIVERSAL USE, E.G.

- For the fastening of wood-based panels to wooden substructures
- For fastenings in timber frame and solid wood construction

SYSTEM LANGBAND
SUITABLE FOR MAKTITA, SENCO, BOSCH AND HITACHI



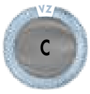
COLLATED SCREWS

Holzher system

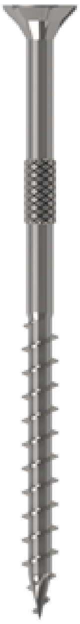
Paneltwistec

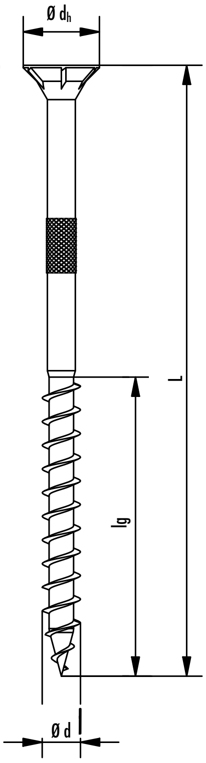
Collated, steel blue galvanised

Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	Piece/belt	Coil/cardboard box
905638	5,0	70	10,0	35	TX20	125	5
905642	5,0	80	10,0	40	TX20	125	5



SC 1–2



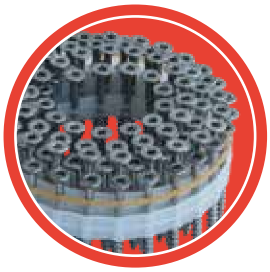


ADVANTAGES

- The shortened thread length allows for the secure fastening of thicker attachment parts
- Resistant to mechanical stress
- The self-clearing groove ensures quick and easy screwing in

USE

- For load-bearing timber structures between structural components made of solid timber, laminated timber, OSB boards and laminated veneer timber

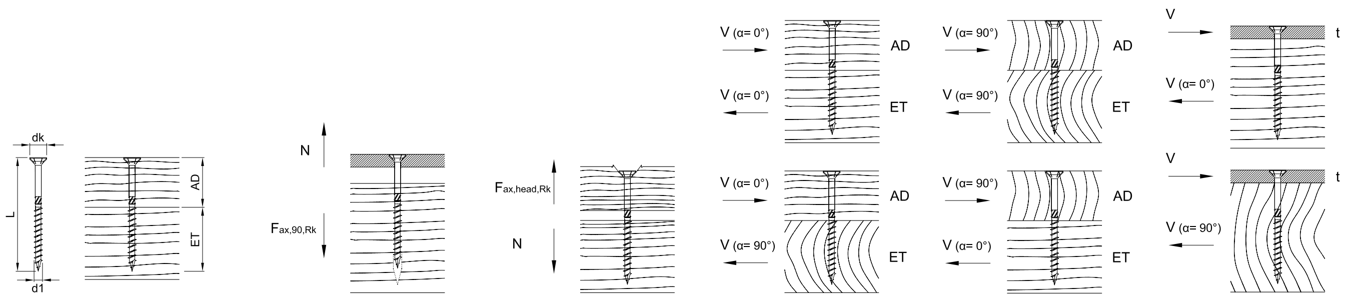


The magazine-fed Paneltwistec enables quick and straightforward timber-to-timber screwing through the use of a magazine screwdriver

TECHNICAL INFORMATION
PANELTWISTEC COLLATED, STEEL BLUE GALVANISED

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber				Shearing steel-timber		



d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								α_{AD}= 0°	α_{AD}= 90°			
						α= 0°	α=90°	α_{ET}= 90°	α_{ET}= 0°		α= 0°	α= 90°
5,0 x 70	10,0	35	35	2,12	1,20	1,52				2	1,74	
5,0 x 80	10,0	40	40	2,42	1,20	1,52				2	1,82	

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 350 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
a) The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: $R_d= R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

Example:

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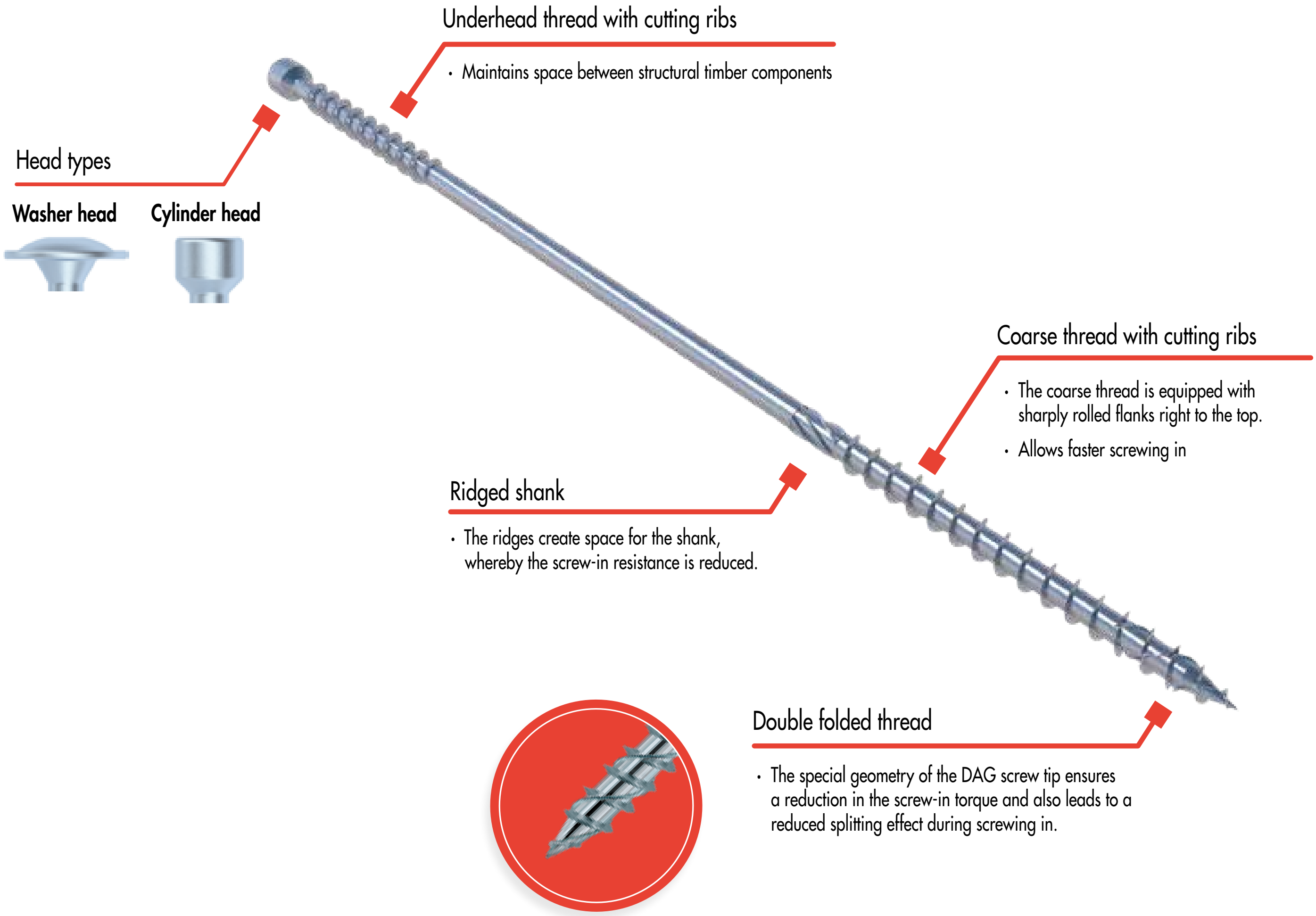
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k= R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k= R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0.9= 10,40 kN → Comparison with the table values.

Attention: These are planning aids. The projects must always be designed by authorised persons.

TOPDUO ROOFING SCREW

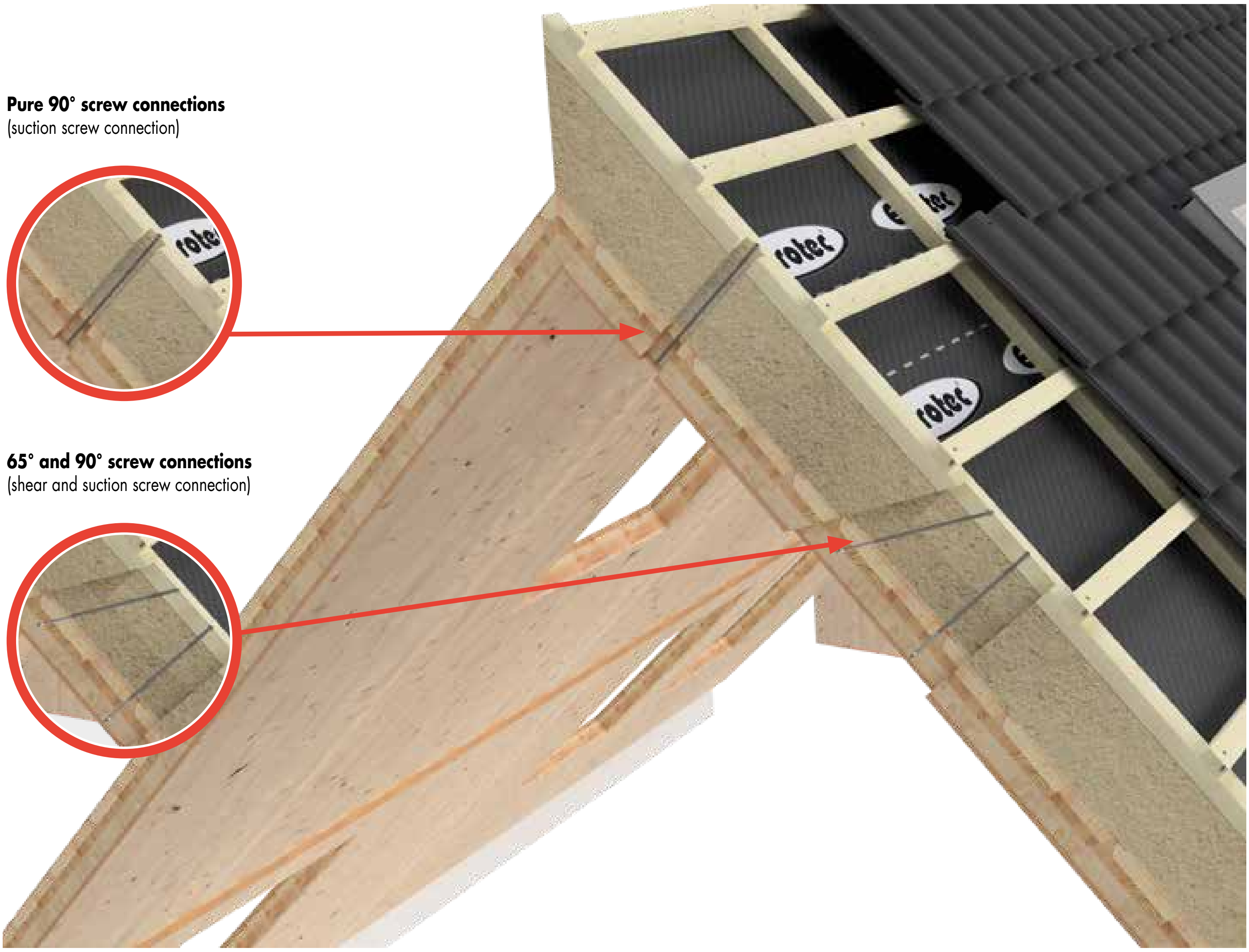
The wood construction screw for every above-rafter insulation system

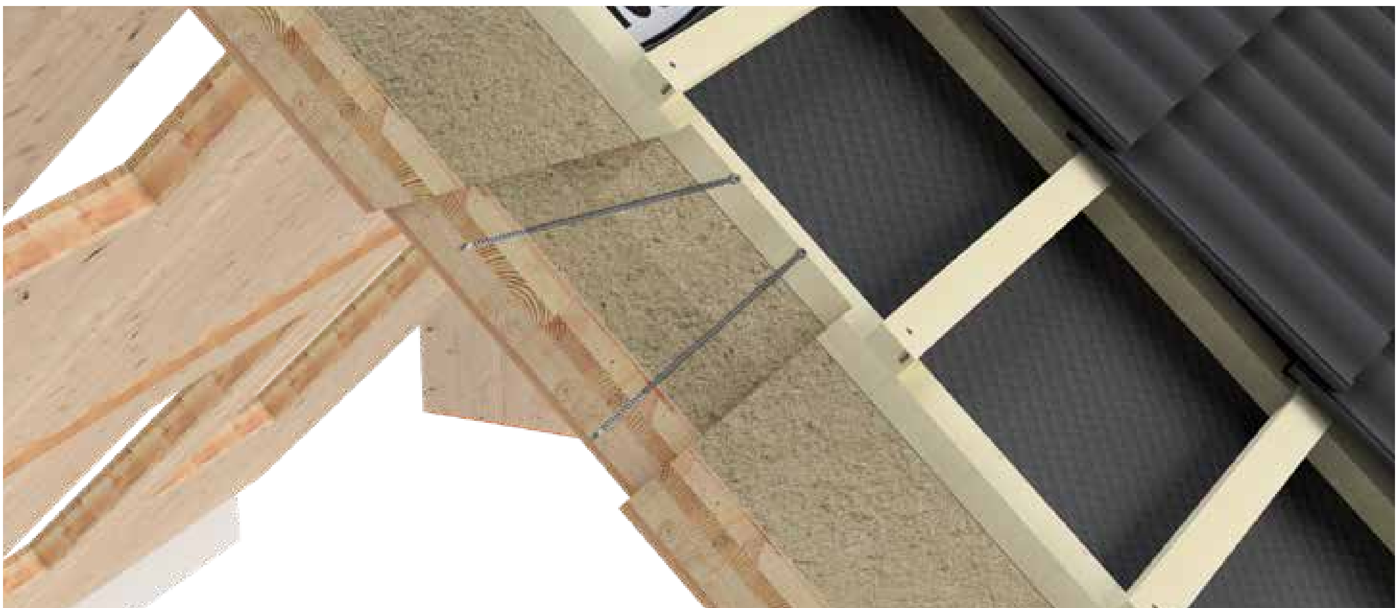
With the Topduo roofing screw, **both pressure- and** non-pressure-resistant rafter insulations can be fastened. The **high extraction resistance** in both connecting timbers is what also makes the Topduo attractive for many other wood construction applications. The screw has a **double thread and is available with washer and cylinder heads**.



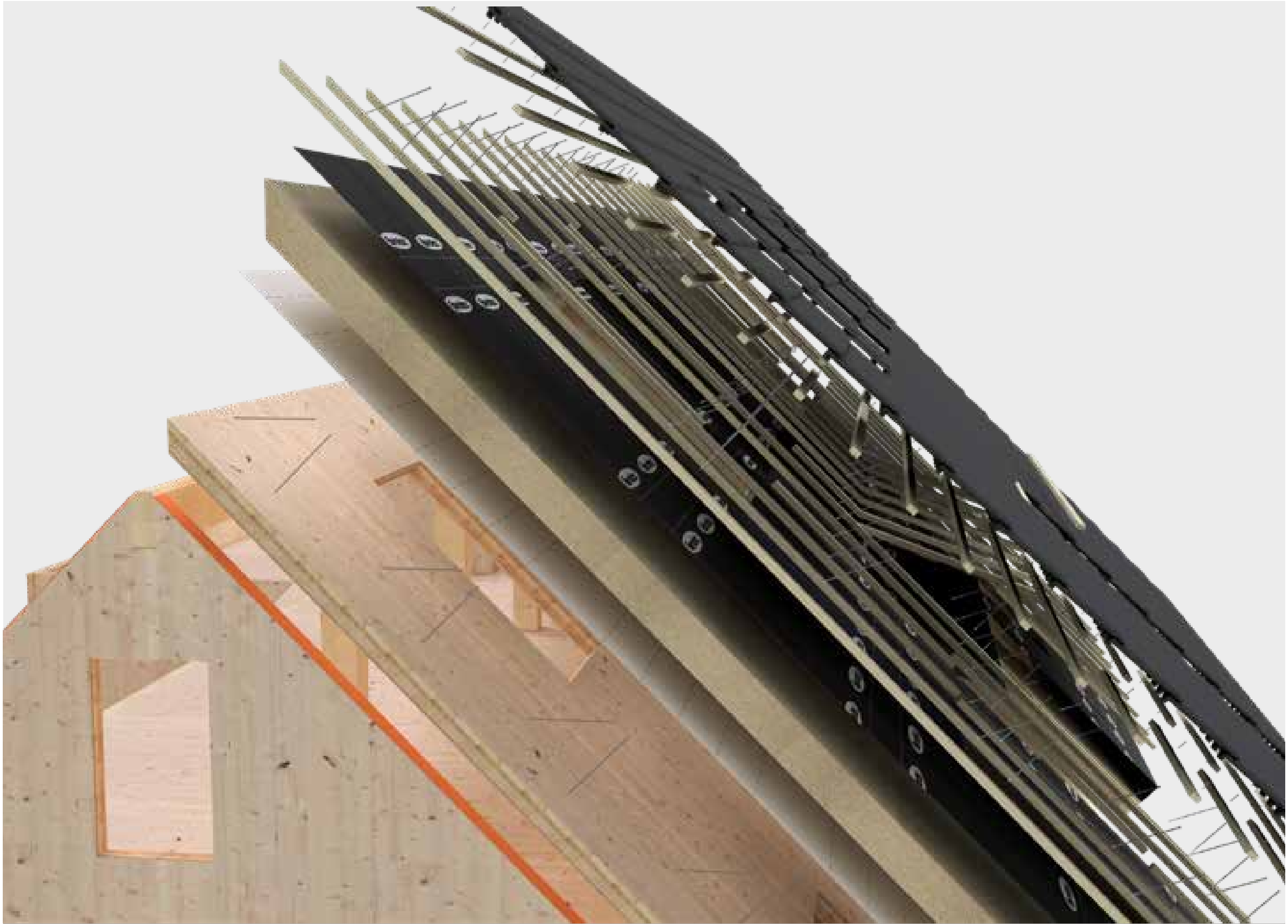
POSSIBLE SCREW-CONNECTION APPLICATIONS

Topduo screws are suitable for pressure-resistant (≥ 50 kPa) and non-pressure-resistant insulation systems.
The compressive strength $\sigma_{10\%}$ can be found in the product data sheet of the insulation material manufacturer.

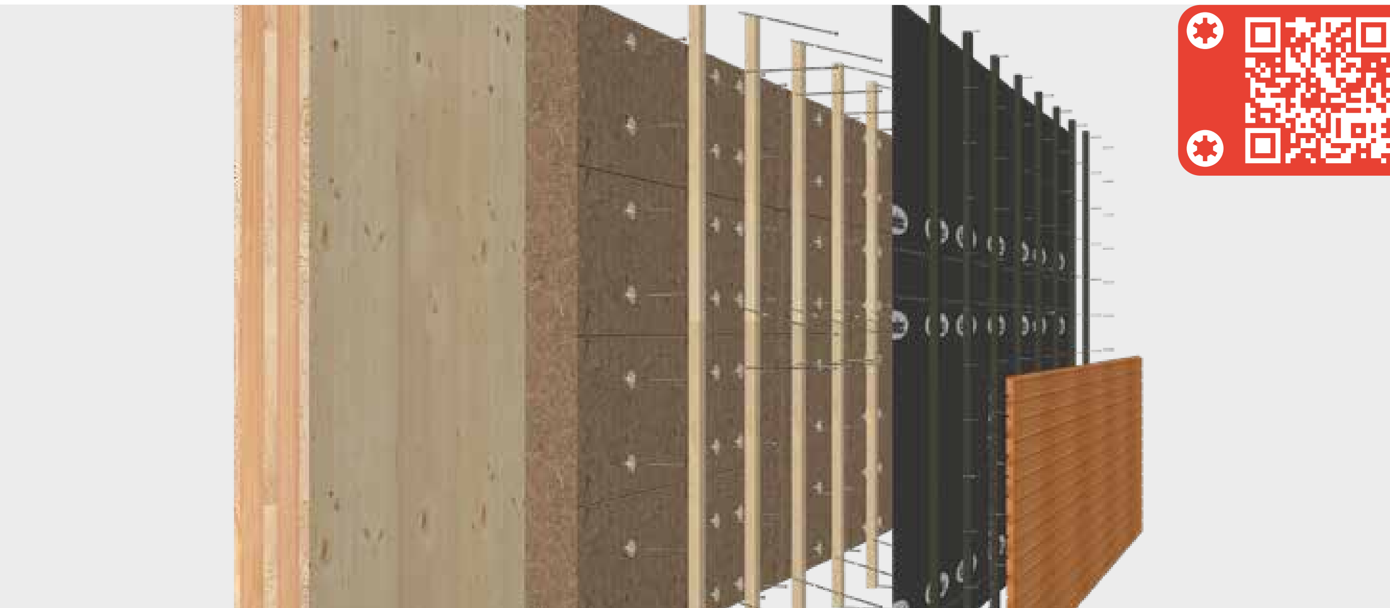




Topduo cylinder head screw for the fastening of installation material



Roof structure with Topduo



Façade construction with Topduo

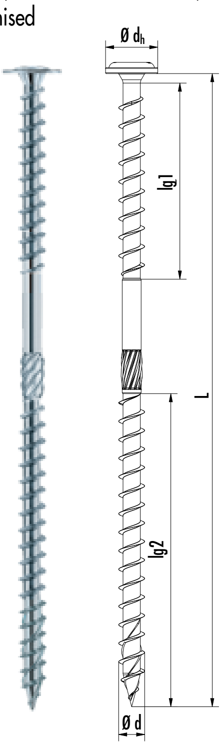
TOPDUO ROOFING SCREW

The wood construction screw for every above-rafter insulation system

Topduo roofing screw

Washer head, hardened carbon steel, electrogalvanised

SC 1–2

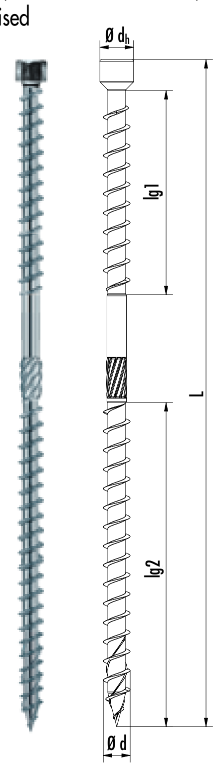


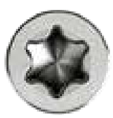
Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg1 / lg2 [mm]	Drive	PU
945870	8,0	165	16,0	60/66	TX40 ●	50
945871	8,0	195	16,0	60/95	TX40 ●	50
945813	8,0	225	16,0	60/95	TX40 ●	50
945814	8,0	235	16,0	60/95	TX40 ●	50
945815	8,0	255	16,0	60/95	TX40 ●	50
945816	8,0	275	16,0	60/95	TX40 ●	50
945817	8,0	302	16,0	60/95	TX40 ●	50
945818	8,0	335	16,0	60/95	TX40 ●	50
945819	8,0	365	16,0	60/95	TX40 ●	50
945820	8,0	397	16,0	60/95	TX40 ●	50
945821	8,0	435	16,0	60/95	TX40 ●	50
945843	8,0	472	16,0	60/95	TX40 ●	50

Topduo roofing screw

Cylinder head, hardened carbon steel, electrogalvanised

SC 1–2





Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg1 / lg2 [mm]	Drive	PU
945956	8,0	225	10,0	60/95	TX40 ●	50
945965	8,0	235	10,0	60/95	TX40 ●	50
945957	8,0	255	10,0	60/95	TX40 ●	50
945958	8,0	275	10,0	60/95	TX40 ●	50
945960	8,0	302	10,0	60/95	TX40 ●	50
945961	8,0	335	10,0	60/95	TX40 ●	50
945962	8,0	365	10,0	60/95	TX40 ●	50
945963	8,0	397	10,0	60/95	TX40 ●	50
945964	8,0	435	10,0	60/95	TX40 ●	50

Topduo washer head screw for the fastening of installation material

QUANTITY DETERMINATION TOPDUO ROOFING SCREW STATICALLY NOT PRESSURE-RESISTANT INSULATION MATERIALS WITH $\Sigma_{10\%} < 50$ KPA

Design example for the abovementioned assumptions; project-related designs may produce much more favourable results

Number of Topduo screws per m²

	Insulation thickness	40	60	80	100	120	140	140	160	180	200	220	240	260	280
	Formwork thickness (on rafters)	24	24	24	24	24	–	24	24	24	24	24	24	24	24
	Dimension Topduo TK or ZK[a]	8 x 165[b]	8 x 195[b]	8 x 225	8 x 235	8 x 255	8 x 275	8 x 302	8 x 335	8 x 335	8 x 365	8 x 365	8 x 397	8 x 435	8 x 435
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
Snow load zone 2*[c] Wind zone 4[d] Height above MSL ≤ 285 m	0° ≤ DN ≤ 10°	2,20	2,20	2,38	2,38	2,38	2,38	2,38	2,29	2,29	2,48	3,01	3,57	4,08	4,76
	10° < DN ≤ 25°	2,38	2,38	2,60	2,60	2,60	2,60	2,60	2,60	2,60	3,17	3,81	4,40	e)	e)
	25° < DN ≤ 40°	2,72	2,72	3,01	3,01	3,01	3,01	3,01	3,01	3,01	3,57	4,40	5,19	e)	e)
	40° < DN ≤ 60°	2,86	3,01	3,17	3,17	3,36	3,36	3,36	3,36	3,36	3,57	4,40	5,19	e)	e)
Snow load zone 3[f] Wind zone 2[g] Height above MSL ≤ 600 m	0° ≤ DN ≤ 10°	1,79	1,79	1,97	2,04	2,04	2,04	2,04	2,12	2,60	3,81	4,40	5,19	e)	e)
	10° < DN ≤ 25°	2,29	2,29	2,48	2,60	2,60	2,60	2,60	2,72	3,36	4,76	e)	e)	e)	e)
	25° < DN ≤ 40°	2,38	2,48	2,72	2,72	2,72	2,86	2,86	2,86	3,57	5,19	e)	e)	e)	e)
	40° < DN ≤ 60°	2,60	2,60	2,86	2,86	2,86	2,86	2,86	3,01	3,57	5,19	e)	e)	e)	e)

a) The indicated quantity always refers to the less favourable value from Topduo TK and ZK
b) Only Topduo TK, c) Includes snow load zones 1, 2 and 2*, d) Includes all wind zones except the North Sea islands
e) Use of our project-related design service is recommended. The design examples listed here represent unfavourable, i.e. statically safe, cases.
f) Includes snow load zones 1, 2 and 3, g) Includes wind zones 1 and 2 (inland)

Further assumptions:

Design produced with the ECS design software according to ETA-11/0024; screw-in angle of 65°; gable roof; ridge height above the ground of max. 18 m; Bulk density of the insulation 1,50 kN/m³; rafters C24 8/≥12 cm; counter batten C24 4/6 cm; rafter centre distance 0,70 m; dead weight of covering 0,55 kN/m²; roof snow guard available; quantity determination with respect to the wind suction based on the most unfavourable roof area.
All stated values must be considered as dependent on the assumptions made. They therefore represent design examples and are subject to typographical or printing errors.

Attention: These are planning aids. The projects must always be designed by authorised persons.

QUANTITY DETERMINATION TOPDUO ROOFING SCREW STATICALLY PRESSURE-RESISTANT INSULATING MATERIALS WITH $\Sigma_{10\%} \geq 50$ KPA

Design example for the abovementioned assumptions; project-related designs may produce much more favourable results

Number of Topduo screws per m²

	Insulation thickness	40	60	80	100	120	140	160	180	200	220	240	260	280	300
	Formwork thickness (on rafters)	24	24	24	24	24	24	24	24	24	24	24	24	24	24
	Dimension Topduo TK or ZK[a]	8 x 195[b]	8 x 225	8 x 235	8 x 255	8 x 275	8 x 302	8 x 335	8 x 335	8 x 365	8 x 365	8 x 397	8 x 435	8 x 435	8 x 472[b]
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
Snow load zone 2*[c] Wind zone 4[d] Height above MSL ≤ 285 m	0° ≤ DN ≤ 10°	1,96	2,06	2,06	2,06	2,06	2,06	2,06	2,06	2,06	2,06	2,12	1,80	2,40	2,32
	10° < DN ≤ 25°	2,11	2,05	1,97	1,94	1,97	1,90	1,85	2,14	2,01	2,74	2,57	2,38	3,23	2,93
	25° < DN ≤ 40°	2,48	2,41	2,28	2,35	2,41	2,35	2,18	2,67	2,49	3,48	3,22	2,96	4,42	3,79
	40° < DN ≤ 60°	2,31	2,30	2,56	2,65	2,74	2,65	2,42	2,96	2,74	4,00	3,70	3,48	4,87	4,47
Snow load zone 3[f] Wind zone 2[g] Height above MSL ≤ 400 m	0° ≤ DN ≤ 10°	2,65	2,54	2,39	2,34	2,26	2,23	2,34	2,34	2,16	2,46	2,32	2,19	2,86	2,65
	10° < DN ≤ 25°	4,04	3,81	3,55	3,33	3,33	3,15	3,15	2,99	2,99	3,66	3,37	3,06	4,37	3,74
	25° < DN ≤ 40°	4,46	4,16	3,84	3,58	3,58	3,58	3,37	3,37	3,37	4,67	4,20	3,92	e)	e)
	40° < DN ≤ 60°	3,55	3,26	3,26	3,26	3,44	3,26	2,96	3,66	3,44	e)	4,67	4,27	e)	e)

a) The indicated quantity always refers to the less favourable value from Topduo TK and ZK
b) Only Topduo TK, c) Includes snow load zones 1, 2 and 2* each with a roof snow guard, d) Includes all wind zones except the North Sea islands
e) Use of our project-related design service is recommended. The design examples listed here represent unfavourable, i.e. statically safe, cases.
f) Includes snow load zones 1, 2 and 3, g) Includes wind zones 1 and 2 (inland)

Further assumptions:

Design produced with the ECS design software according to ETA-11/0024; screw-in angle roof shear screw 65°/wind suction screw 90°; gable roof; ridge height above the ground of max. 18 m; Bulk density of the insulation 1,50 kN/m³; rafters C24 8/≥12 cm; counter batten C24 4/6 cm; rafter centre distance 0,70 m; dead weight of covering 0,55 kN/m²; roof snow guard available; quantity determination with regard to the wind suction based on the most unfavourable roof area.
All stated values must be considered as dependent on the assumptions made. They therefore represent design examples and are subject to typographical or printing errors.

Attention: These are planning aids. The projects must always be designed by authorised persons.

EuroTec calculation service

On-rafter insulation according to ETA-11/0024

by phone 02331 6245-444 · by fax 02331 6245-200 · by e-mail technik@eurotec.team

Please contact our technical department or use the free calculation services in the service section of our website.

Contact

Trader: ______________________ Contractor: ______________________

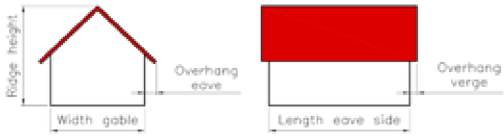
Contact person: ______________________ Contact person: ______________________

e-mail: ______________________ Phone: ______________________

Project: ______________________ e-mail: ______________________

Project details

☐ Shed roof ☐ Gable roof ☐ Hip roof



Building length eave side: ______________________ m

Gable width: ______________________ m

Rafter length: ______________________ m
(this information is optional)

Ridge height: ______________________ m
(above ground)

Roof overhang: eave __________ /verge __________ m
(quantity is determined for total roof area)

Roof pitch: main roof __________ /hip __________ °

Product name insulation: ______________________
(Maker`s product designation)

Insulation thickness: ______________________ mm

Rafter width: ______________________ mm

Rafter heigth: ______________________ mm

Rafter center distance: ______________________ mm

Sheathing thickness: ______________________ mm

Counter batten width: ______________________ mm
(min. 60 mm)

Counter batten height: ______________________ mm
(min. 40 mm)

Counter batten length:: ______________________ m
(longest piece of counter batten)

Load from roofing and battens:

☐ Standing seam metal roofing 0,35 kN/m²

☐ Concrete tile, clay tile 0,55 kN/m²

☐ Flat tile roofing 0,75 kN/m²

or ______________________ kN/m²

Postcode of project: ______________________
(to determine the wind and snow load zone)

charact. snow load on ground sk: ______________________ kN/m²
(only for municipalities with special provision)

Site elevation above sea level: ______________________ m
(important for municipalities with complex relief)

Snow guard provided? ▣ Yes ☐ No

Screw selection

☐ Paneltwistec countersunk head * ☐ Paneltwistec washer head * ☐ Topduo flange button head screw ** ☐ Topduo cylinder-head **

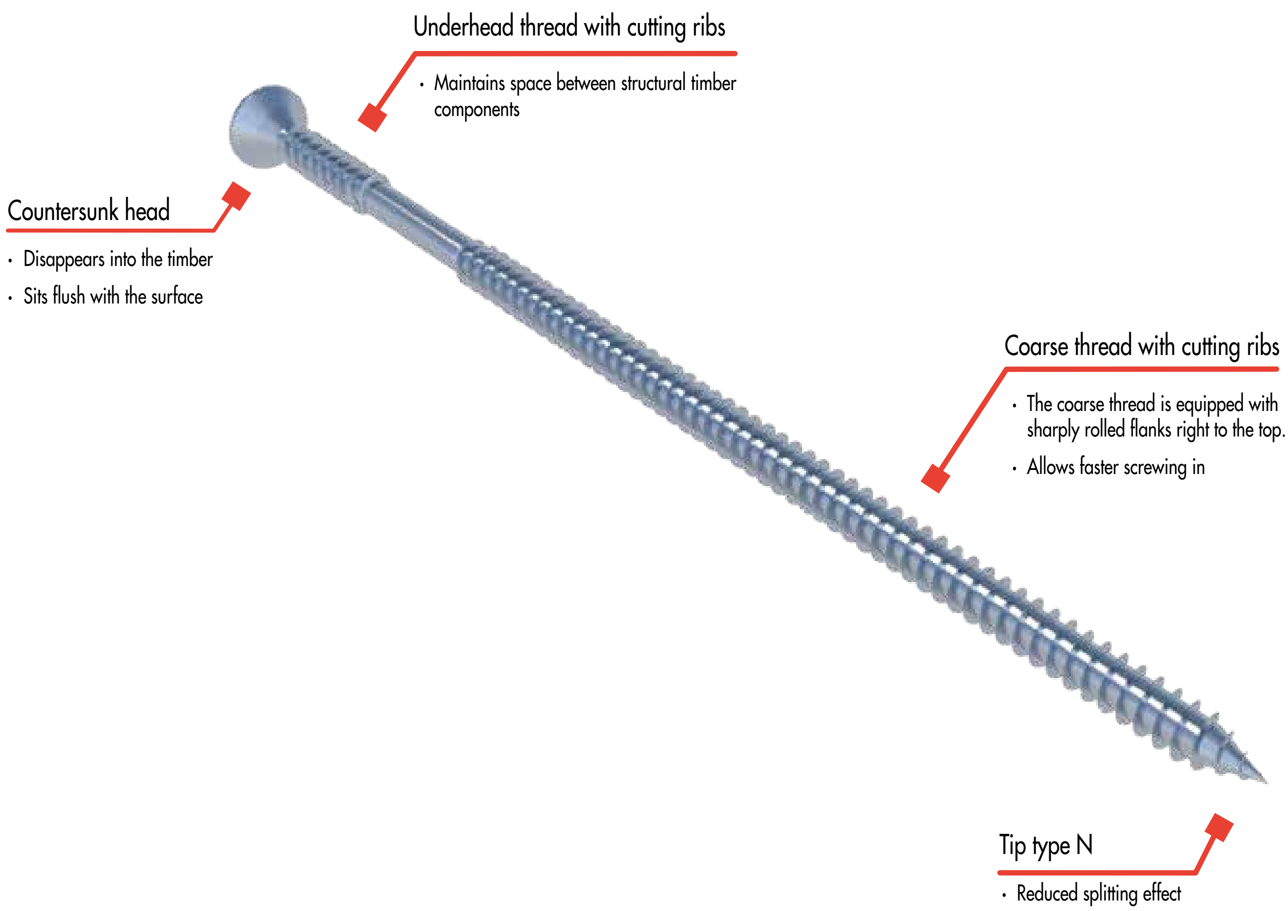
* only for compression-proof insulations with compression strength ≥ 50 kPa ** also for non-compression-proof insulations

BLUE-POWER SYSTEM SCREW

For the fastening of wooden substructures to concrete or masonry

The Blue-Power façade fastening system offers an efficient solution for the **quick fastening of wooden substructures to concrete or masonry.** The system screws effortlessly cope with the tensile and shear forces, especially in applications involving façade insulations. The insulation material takes up some of the shear forces and requires a **compressive strength** of at least **50 kPa at 10% compression.** For **maximum stability,** the **C24 batten cross-section** should measure at least **30 x 50 mm**.

The system is **corrosion resistant according to EN 12944-6 in C4 long and C5-M long**, suitable for service classes 1 and 2 according to EN 1995-1-1. It resists mechanical stress but is unsuitable for timbers that contain tannins. Thanks to the dowel-free installation and short assembly times, the Blue-Power façade fastening system is an ideal and practical solution for efficient construction projects.

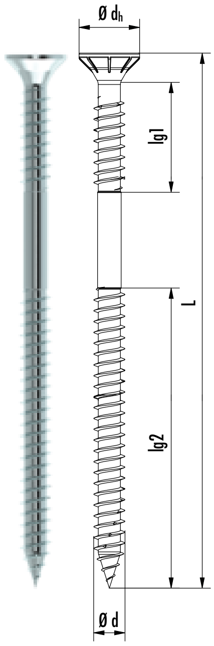


BLUE-POWER SYSTEM SCREW

For the fastening of wooden substructures to concrete or masonry

Blue-Power system screw

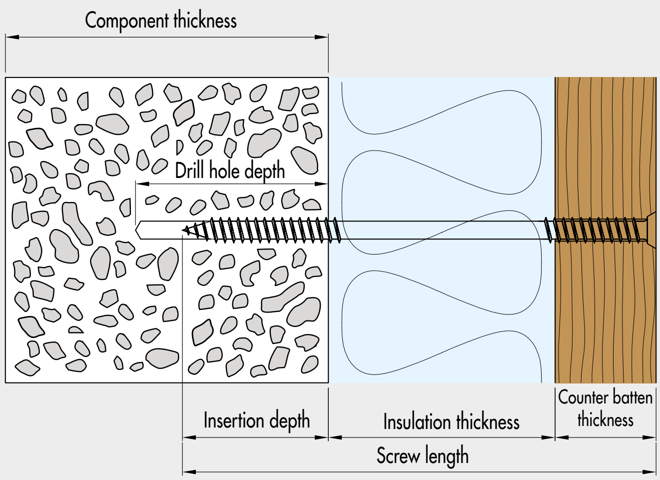
Countersunk head, case-hardened carbonsteel, zinc-based coating



Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg1 / lg2 [mm]	Drive	PU
110390	7,5	180	14,5	45/125	TX40 ●	100
110391	7,5	200	14,5	45/125	TX40 ●	100
110392	7,5	220	14,5	45/145	TX40 ●	100
110393	7,5	240	14,5	45/145	TX40 ●	100
110394	7,5	260	14,5	45/145	TX40 ●	100
110395	7,5	280	14,5	45/145	TX40 ●	100
110396	7,5	300	14,5	45/145	TX40 ●	100
110397	7,5	320	14,5	45/145	TX40 ●	100
110398	7,5	340	14,5	45/145	TX40 ●	100
110399	7,5	360	14,5	45/145	TX40 ●	100
110400	7,5	380	14,5	45/145	TX40 ●	100
110401	7,5	400	14,5	45/145	TX40 ●	100
110404	7,5	450	14,5	45/145	TX40 ●	100
110407	7,5	500	14,5	45/145	TX40 ●	100

ASSEMBLY

1. Pre-drill the battens to 6.5 mm
2. Pre-drill the substrate
3. Install the Blue-Power system screw, passing through the batten and into the substrate




Eurotec
Top 180

STATIC VALUES

Substrate	Bore Ø Substrate [mm]	Min. drill hole depth [mm]	Min. insertion depth Screw [mm]	Drilling method[a)]	Min. component thickness [mm]	Min. edge distance [mm]	Min. centre distance [mm]	Characteristic tensile strength N_{Rk}[b)] [kN]	Characteristic transverse load-bearing capacity V_{RK} [kN]
Concrete C20/25	6,0	70	50	H	100	50	100	2,5	0,75
Masonry brick Mz	6,0	70	50	H	115	50	100	3,5	0,6
Lime sand brick	6,0	70	50	H	115	50	100	3,5	0,5
Aerated concrete	5,0	85	70	D	115	50	100	0,9	0,3
Perforated SL brick	5,0	85	70	D	115	50	100	2,0	0,6
Vertically perforated brick HLz	6,5	140	120	D	175	50	100	0,5	0,4
Wood	c)	c)	50	D	60	25	100	d)	d)

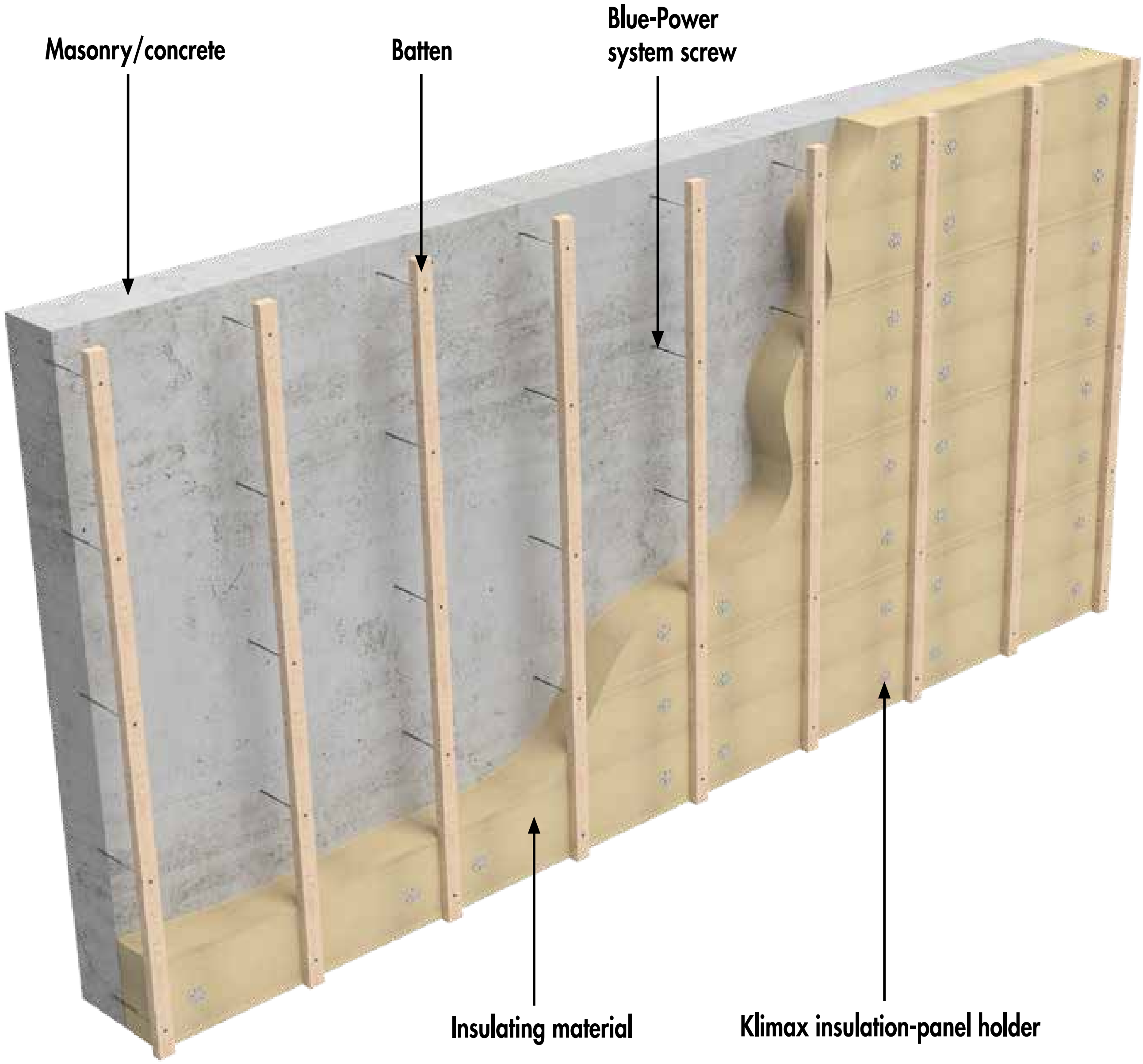
a) H = Hammer drilling D = Rotary drilling
B) The characteristic head pull-through resistance $F_{ax,head,Rd}$ in the support battens must be considered. $F_{ax,head,Rd}$ (ρ_k 350)= 1.45 kN. The support battens must be predrilled to 6.5 mm.
c) Wooden substrates do not need to be predrilled.
d) To be designed according to EN 1995-1-1:2010-12.

Item number	For insulating material thicknesses of up to[a)]		
	Concrete, brick & solid sand-lime brick [mm][a)]	Aerated concrete & perforated sand-lime brick [mm][a)]	Vertically perforated brick [mm][a)]
110390	100	80	30
110391	120	100	50
110392	140	120	70
110393	160	140	90
110394	180	160	110
110395	200	180	130
110396	220	200	150
110397	240	220	170
110398	260	240	190
110399	280	260	210
110400	300	280	230
110401	320	300	250
110404	340	320	270
110407	360	340	290

a) for a batten thickness of 30 mm

Screw length ≥ min. insertion depth + insulation thickness + batten thickness

SCHEMATIC STRUCTURE

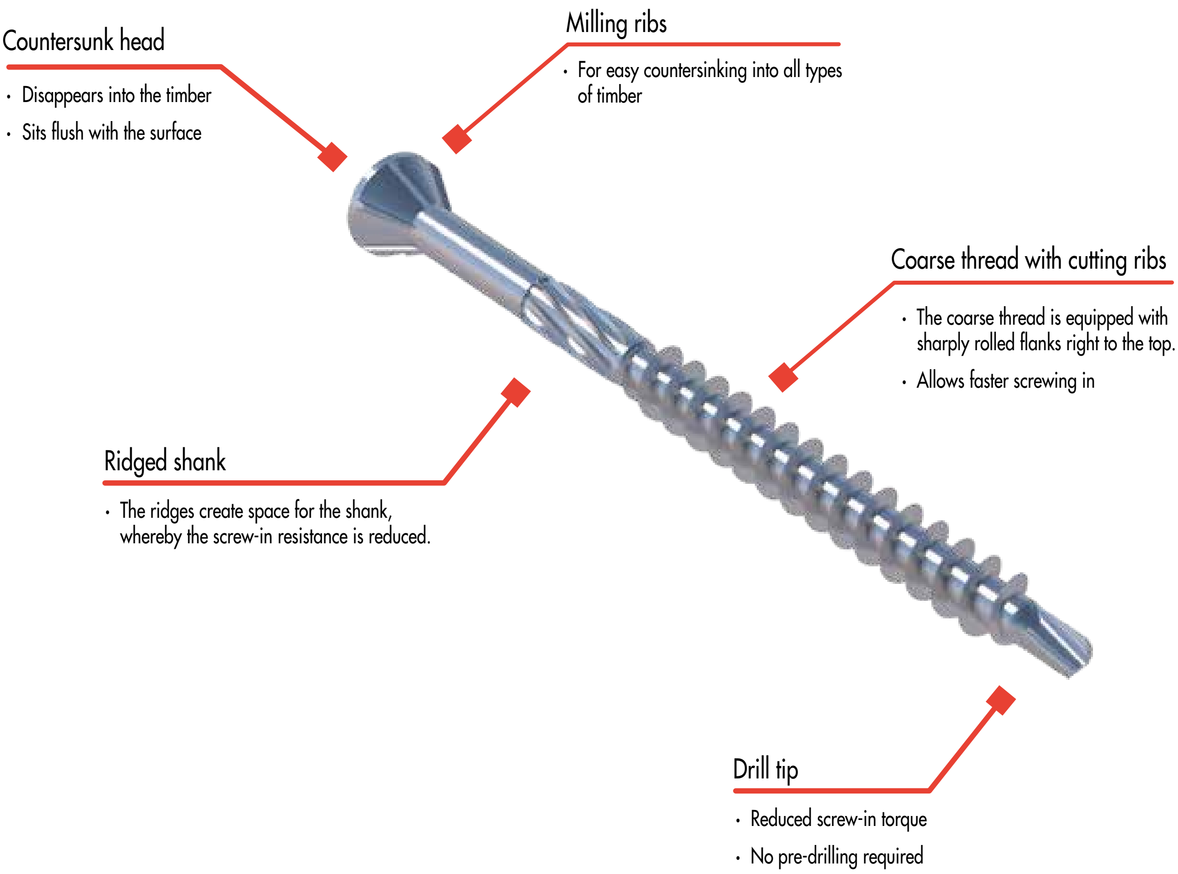


HOBOTEC

Galvanised steel and hardened stainless steel

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

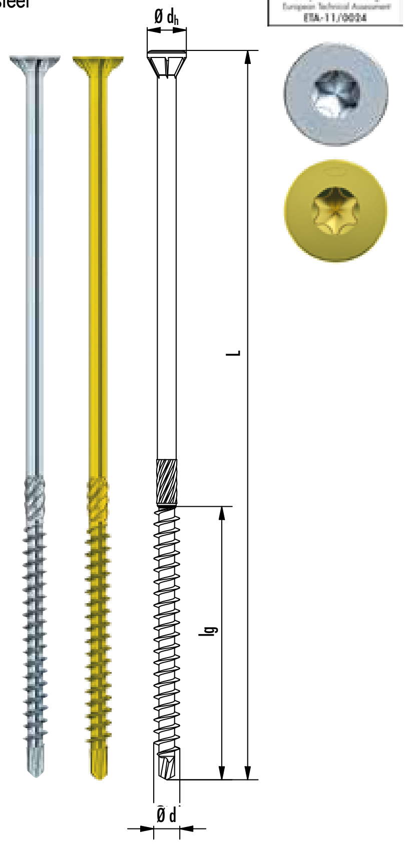
Hobotec screws enable the simple, fast and clean joining of **timber-timber connections.** These screws are particularly suitable for **applications with an increased risk of cracking and splitting.** The novel thread and **innovative drill bit** ensure a **clean fit as well as high extraction values.** The Hobotec screws are available in hardened stainless steel and galvanised steel.



Hobotec

Galvanised steel

SC 1–2



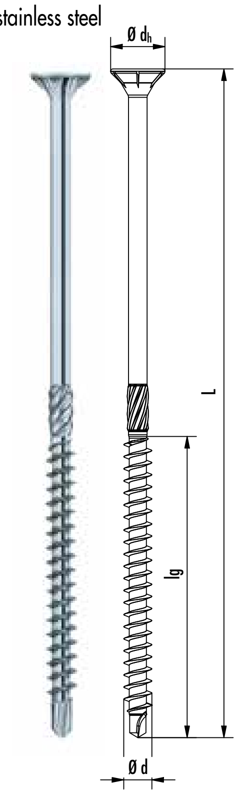
Item no. (yellow)	Item no. (blue)	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
110045*	111494	4,0	30	7,7	21	TX15 ●	1000
	111495	4,0	35	7,7	24	TX15 ●	1000
110047*	111496	4,0	40	7,7	26	TX15 ●	1000
	111497	4,0	45	7,7	28	TX15 ●	500
	111498	4,0	50	7,7	30	TX15 ●	500
	111499	4,0	60	7,7	36	TX15 ●	200
110050*	111501	4,5	35	8,7	24	TX20 ●	500
110077*	111502	4,5	40	8,7	26	TX20 ●	500
110052*	111503	4,5	45	8,7	28	TX20 ●	500
	111504	4,5	50	8,7	30	TX20 ●	500
	111505	4,5	60	8,7	36	TX20 ●	200
110055*	111506	4,5	70	8,7	42	TX20 ●	200
	111507	5,0	40	9,7	26	TX25 ●	200
	111508	5,0	50	9,7	30	TX25 ●	200
	111509	5,0	60	9,7	36	TX25 ●	200
	111510	5,0	70	9,7	42	TX25 ●	200
	111511	5,0	80	9,7	48	TX25 ●	200
	111512	5,0	90	9,7	54	TX25 ●	200
900462*	903623	5,0	100	9,7	60	TX25 ●	200
	903117	6,0	80	11,7	48	TX25 ●	200
	903118	6,0	90	11,7	54	TX25 ●	100
	903119	6,0	100	11,7	60	TX25 ●	100
	903120	6,0	120	11,7	60	TX25 ●	100
	903121	6,0	140	11,7	70	TX25 ●	100
	903122	6.0	160	11.7	70	TX25 ●	100

* Discontinued item

Hobotec

Hardened stainless steel

C1



Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
903323	4,0	30	7,7	21	TX15 ●	500
110299	4,0	40	7,7	26	TX15 ●	500
110300	4,0	45	7,7	28	TX15 ●	500
110301	4,0	50	7,7	30	TX15 ●	500
110302	4,0	60	7,7	36	TX15 ●	500
110319	4,5	40	8,7	26	TX20 ●	200
944839	4,5	45	8,7	28	TX20 ●	200
110303	4,5	50	8,7	30	TX20 ●	200
110304	4,5	60	8,7	36	TX20 ●	200
110305	4,5	70	8,7	42	TX20 ●	200
110306	4,5	80	8,7	48	TX20 ●	200
110307	5,0	50	9,7	30	TX25 ●	200
110308	5,0	60	9,7	36	TX25 ●	200
110309	5,0	70	9,7	42	TX25 ●	200
110310	5,0	80	9,7	48	TX25 ●	200
110311	5,0	90	9,7	54	TX25 ●	200
110312	5,0	100	9,7	60	TX25 ●	200
110313	6,0	80	11,7	48	TX25 ●	100
110314	6,0	90	11,7	54	TX25 ●	100
110315	6,0	100	11,7	60	TX25 ●	100
110316	6,0	120	11,7	60	TX25 ●	100
110317	6,0	140	11,7	70	TX25 ●	100
110318	6,0	160	11,7	70	TX25 ●	100

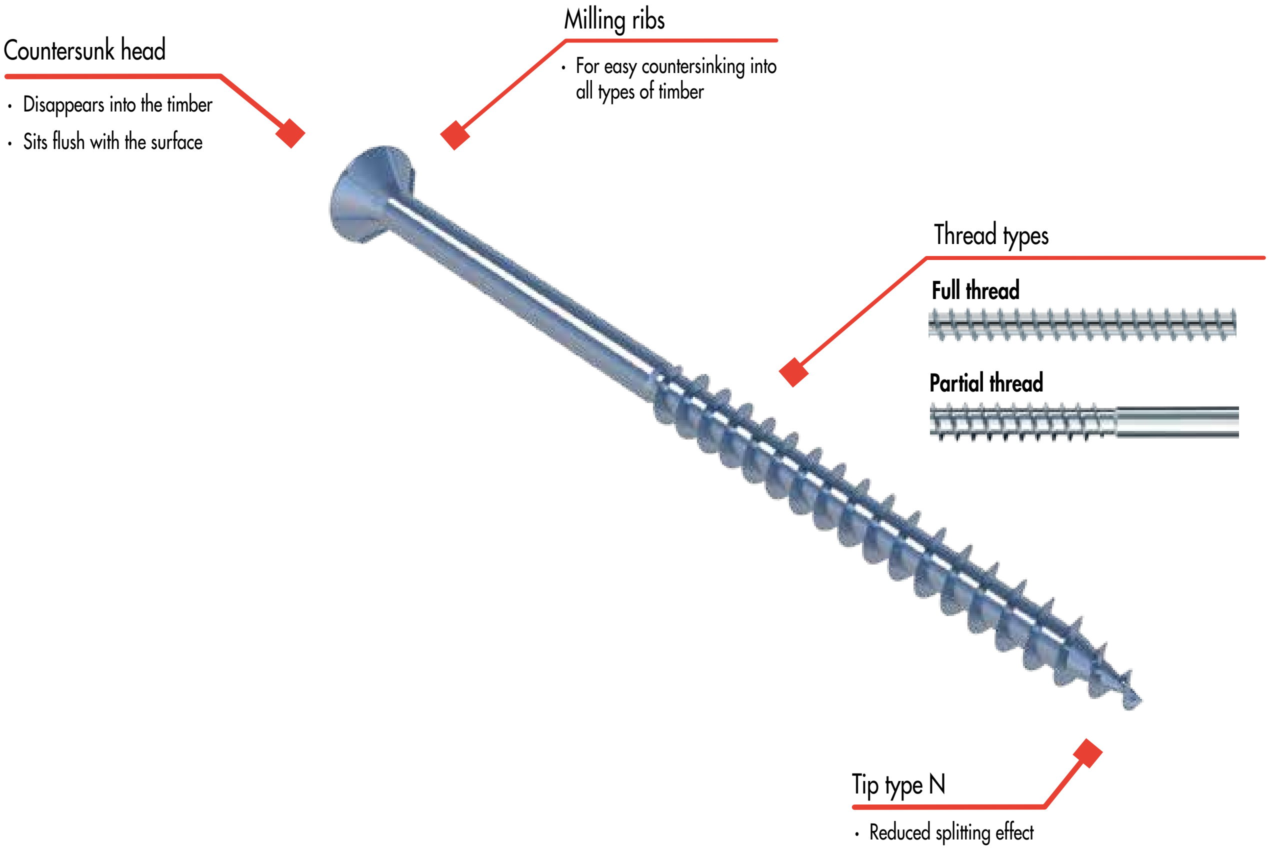
ON REQUEST, THE SCREW HEADS CAN BE SUPPLIED IN RAL COLOURS.

ECOTEC

Chipboard screw for indoor applications

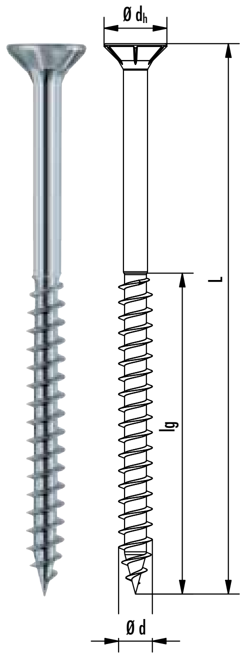
Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

The EcoTec **chipboard screw** is a wood construction screw that is mainly used **in indoor settings.**
It is available in galvanised, hardened carbon steel and in A2. In addition, it is available both with partial threads for non-positive connections between several structural timber components as well as with full threads for absorbing high tensile and compressive forces.



EcoTec

Chipboard screw, steel blue galvanised



Only screws with Ø = 3.0 mm

Item number	Ø d [mm]	L [mm]	lg [mm]	Drive	PU
903714	3,0	13	Full thread	TX10 ○	1000
903715	3,0	15	Full thread	TX10 ○	1000
903716	3,0	20	Full thread	TX10 ○	1000
903717	3,0	25	Full thread	TX10 ○	1000
903718	3,0	30	Full thread	TX10 ○	1000
903719	3,0	35	Full thread	TX10 ○	1000
903720	3,0	40	23	TX10 ○	1000
903721	3,0	45	23	TX10 ○	1000
903722	3,5	12	Full thread	TX20 •	1000
903723	3,5	15	Full thread	TX20 •	1000
903724	3,5	20	Full thread	TX20 •	1000
903725	3,5	25	Full thread	TX20 •	1000
903726	3,5	30	Full thread	TX20 •	1000
903727	3,5	35	21	TX20 •	1000
903728	3,5	40	23	TX20 •	1000
903729	3,5	45	25	TX20 •	500
903730	3,5	50	30	TX20 •	500
903731	4,0	15	Full thread	TX20 •	1000
903732	4,0	20	Full thread	TX20 •	1000
903733	4,0	25	Full thread	TX20 •	1000
903734	4,0	30	Full thread	TX20 •	1000
903735	4,0	35	Full thread	TX20 •	1000
903736	4,0	40	23	TX20 •	1000
903737	4,0	45	25	TX20 •	500
903738	4,0	50	30	TX20 •	500
903739	4,0	60	39	TX20 •	200
903740	4,0	70	44	TX20 •	200
903783	4,0	80	44	TX20 •	200
903741	4,5	20	Full thread	TX20 •	500
903742	4,5	25	Full thread	TX20 •	500
903743	4,5	30	Full thread	TX20 •	500
903744	4,5	35	Full thread	TX20 •	500
903745	4,5	40	23	TX20 •	500
903746	4,5	45	25	TX20 •	500
903747	4,5	50	30	TX20 •	500
903748	4,5	60	39	TX20 •	200
903749	4,5	70	44	TX20 •	200
903750	4,5	80	44	TX20 •	200
903751	5,0	20	Full thread	TX20 •	500
903752	5,0	25	Full thread	TX20 •	500
903753	5,0	30	Full thread	TX20 •	500
903754	5,0	35	Full thread	TX20 •	500
903755	5,0	40	23	TX20 •	200
903756	5,0	45	25	TX20 •	200
903757	5,0	50	30	TX20 •	200
903758	5,0	60	39	TX20 •	200
903759	5,0	70	44	TX20 •	200
903760	5,0	80	44	TX20 •	200
903761	5,0	90	54	TX20 •	200
903762	5,0	100	54	TX20 •	200
903763	5,0	120	70	TX20 •	200
903764	6,0	40	Full thread	TX30 •	200
903765	6,0	50	Full thread	TX30 •	200
903766	6,0	60	39	TX30 •	200
903767	6,0	70	44	TX30 •	200
903768	6,0	80	44	TX30 •	200
903769	6,0	90	54	TX30 •	100

other sizes on the next page

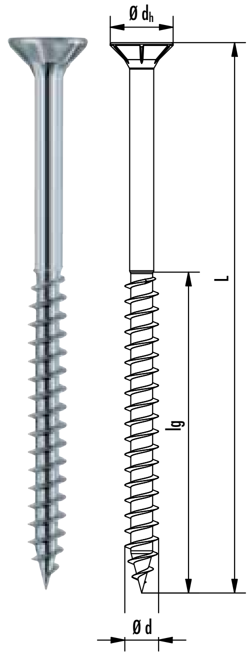
ATTENTION: Screws with Ø = 3.0 mm are not regulated by the ETA

EcoTec

Chipboard screw, steel blue galvanised

C

SC 1–2



Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

Only screws with Ø = 3.0 mm

Europäische Norm
EN 14592:2008+A1:2012

Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
903770	6,0	100	11,5	60	TX30	100
903771	6,0	120	11,5	70	TX30	100
903772	6,0	140	11,5	70	TX30	100
904540	6,0	160	11,5	70	TX30	100
904541	6,0	180	11,5	70	TX30	100
904542	6,0	200	11,5	70	TX30	100
904617	6,0	220	11,5	70	TX30	100
904618	6,0	240	11,5	70	TX30	100
904619	6,0	260	11,5	70	TX30	100
904620	6,0	280	11,5	70	TX30	100
904621	6,0	300	11,5	70	TX30	100

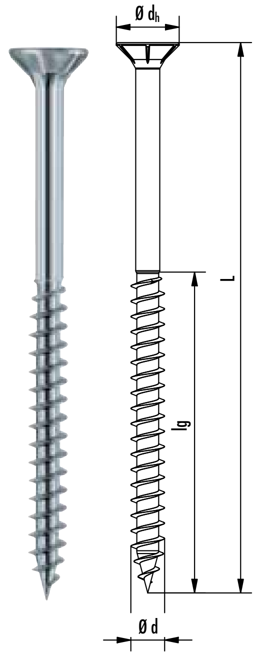
ATTENTION: Screws with Ø = 3.0 mm are not regulated by the ETA

EcoTec A2

Chipboard screw, stainless steel A2

A2

SC 1–3



Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

EDELSTAHL Rost frei®

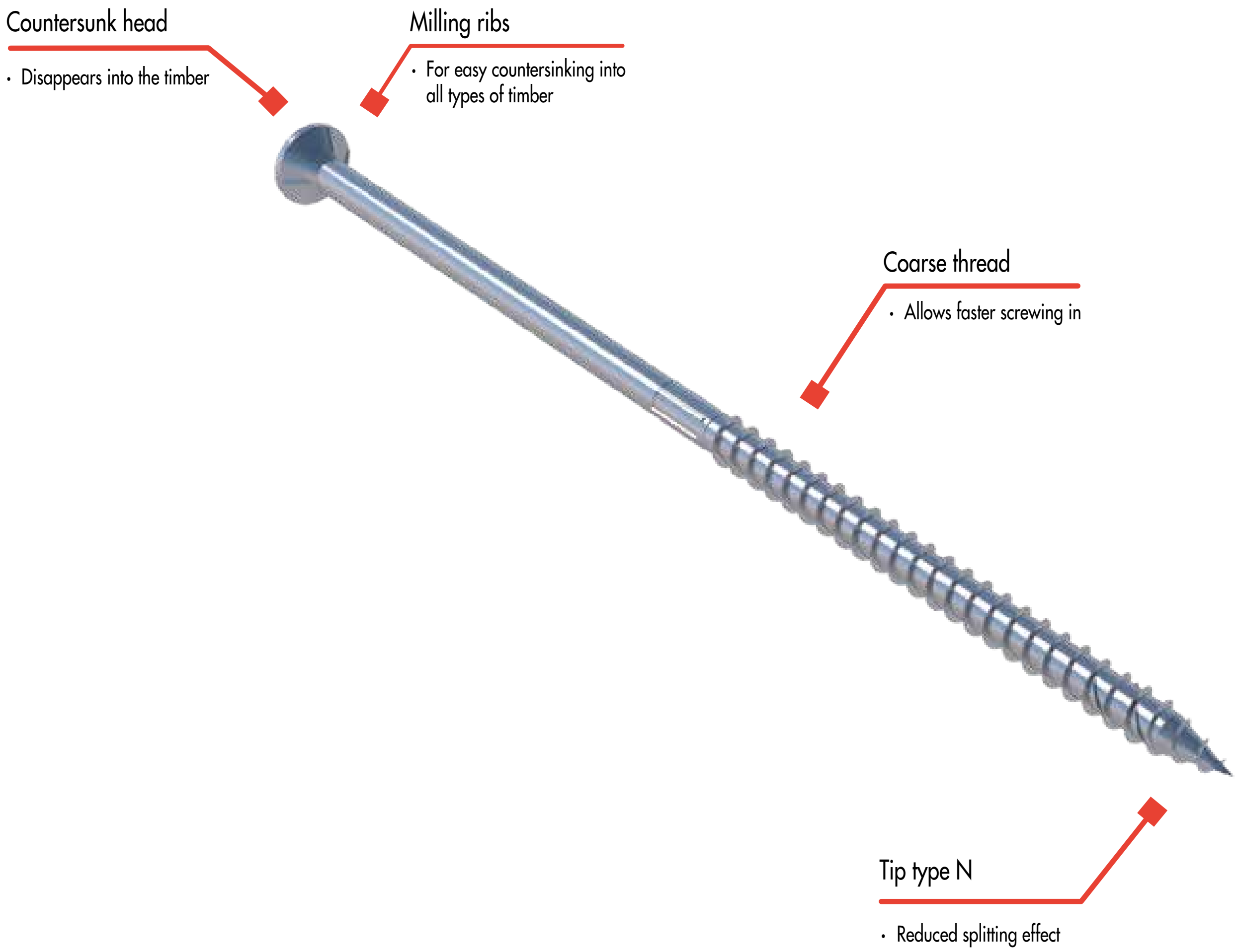
Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
903824	4,0	30	8,0	Full thread	TX20	500
903791	4,0	35	8,0	24	TX20	1000
903792	4,0	40	8,0	24	TX20	1000
903793	4,0	45	8,0	30	TX20	500
903794	4,0	50	8,0	30	TX20	500
903795	4,0	60	8,0	36	TX20	200
903796	4,0	70	8,0	42	TX20	200
903797	4,0	80	8,0	48	TX20	200
903836	4,5	20	9,0	Full thread	TX20	500
903837	4,5	25	9,0	Full thread	TX20	500
903838	4,5	30	9,0	Full thread	TX20	500
903839	4,5	35	9,0	Full thread	TX20	500
903840	4,5	40	9,0	23	TX20	500
903798	4,5	45	9,0	30	TX20	500
903799	4,5	50	9,0	30	TX20	500
903800	4,5	60	9,0	36	TX20	200
903801	4,5	70	9,0	42	TX20	200
903802	4,5	80	9,0	48	TX20	200
903841	5,0	40	10,0	23	TX25	500
903803	5,0	50	10,0	30	TX25	200
903804	5,0	60	10,0	36	TX25	200
903805	5,0	70	10,0	42	TX25	200
903806	5,0	80	10,0	48	TX25	200
903807	5,0	90	10,0	54	TX25	200
903808	5,0	100	10,0	60	TX25	200
903809	5,0	120	10,0	70	TX25	200
903810	6,0	50	12,0	30	TX25	200
903811	6,0	60	12,0	36	TX25	200
903812	6,0	70	12,0	42	TX25	200
903813	6,0	80	12,0	48	TX25	200
903814	6,0	90	12,0	54	TX25	100
903815	6,0	100	12,0	70	TX25	100
903816	6,0	120	12,0	70	TX25	100
903817	6,0	140	12,0	70	TX25	100
903818	6,0	160	12,0	70	TX25	100
903825	6,0	180	12,0	70	TX25	100
903826	6,0	200	12,0	70	TX25	100

LBS CONSTRUCTION SCREW

Hardwood screw for the fastening of elements made of beech laminated veneer timber

Europ. Techn. Bewertung
European Technical Assessment
ETA-11/0024

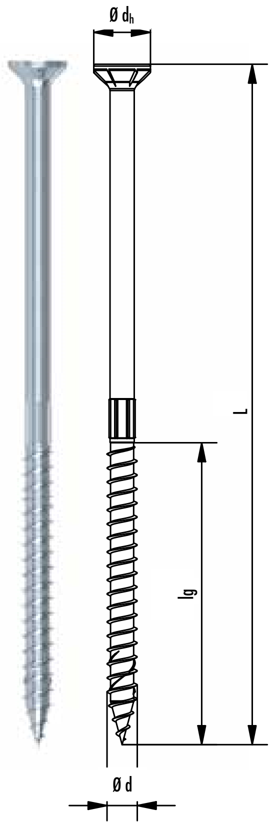
The Eurotec LBS construction screw is a wood screw used to connect **components made of beech laminated veneer timber to each other** or to connect attachment parts made of other **timbers, timber-based materials and steel to them.** The LBS construction screw is suitable for **use in load-bearing structures in the service classes 1 and 2**. Due to the **optimised anti-friction coating**, it is ideally suited for **use in hardwood**. The special thread geometry and particularly high breaking torque mean the screw can be installed without pre-drilling.



LBS Construction screw

Countersunk head, steel blue galvanised

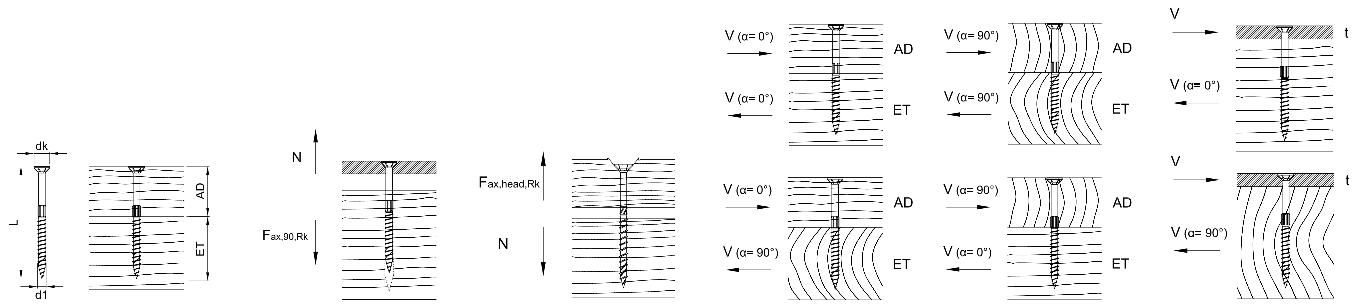
SC 1–2



Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
904881	8,0	80	15	50	TX40 ●	50
904882	8,0	100	15	80	TX40 ●	50
904883	8,0	120	15	80	TX40 ●	50
904884	8,0	140	15	80	TX40 ●	50
904885	8,0	160	15	80	TX40 ●	50
904886	8,0	180	15	80	TX40 ●	50
904887	8,0	200	15	80	TX40 ●	50
904888	8,0	220	15	80	TX40 ●	50
904889	8,0	240	15	80	TX40 ●	50

The LBS construction screw in beech laminated veneer timber

TECHNICAL INFORMATION
LBS CONSTRUCTION SCREW, COUNTERSUNK HEAD, STEEL BLUE GALVANISED



Dimensions				Extraction resistance	Head pull-through resistance	Shearing timber-timber				Shearing steel-timber		
d1 x L [mm]	dk [mm]	AD [mm]	ET [mm]	$F_{ax,90,Rk}$ [kN]	$F_{ax,head,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]	t [mm]	$F_{la,Rk}$ [kN]	$F_{la,Rk}$ [kN]
								$\alpha_{AD}= 0°$	$\alpha_{AD}= 90°$			
						$\alpha= 0°$	$\alpha=90°$	$\alpha_{ET}= 90°$	$\alpha_{ET}= 0°$		$\alpha= 0°$	$\alpha= 90°$
8,0 x 80	15,0	40	40	9,60	9,93	9,58	8,37	9,58	8,37	3	9,58	8,37
8,0 x 100	15,0	40	60	14,40	9,93	9,66	8,46	9,66	8,46	3	10,78	9,57
80,0 x 120	15,0	40	80	19,20	9,93	9,66	8,46	9,66	8,46	3	11,98	10,77
8,0 x 140	15,0	60	80	19,20	9,93	9,66	8,46	9,66	8,46	3	11,98	10,77
8,0 x 160	15,0	80	80	19,20	9,93	9,66	8,46	9,66	8,46	3	11,98	10,77
8,0 x 180	15,0	100	80	19,20	9,93	9,66	8,46	8,46	9,66	3	11,98	10,77
8,0 x 200	15,0	120	80	19,20	9,93	9,66	8,46	8,46	9,66	3	11,98	10,77
8,0 x 220	15,0	140	80	19,20	9,93	9,66	8,46	8,46	9,66	3	11,98	10,77
8,0 x 240	15,0	160	80	19,20	9,93	9,66	8,46	8,46	9,66	3	11,98	10,77

Design based on experimental values to obtain a European Technical Assessment (ETA). Bulk density hardwood laminated veneer timber ρk= 730 kg/m³ (not predrilled). All stated mechanical values must be considered as dependent on the assumptions made and represent design examples. All values are calculated minimum values and subject to typesetting and printing errors.

a) The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service class and load duration class: $R_d= R_k \times k_{mod} / \gamma M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

Example:

Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min $R_k= R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min $R_k= R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0.9= 10,40 kN → Comparison with the table values.

Attention: These are planning aids. The projects must always be designed by authorised persons.

The values given here are experimental values!

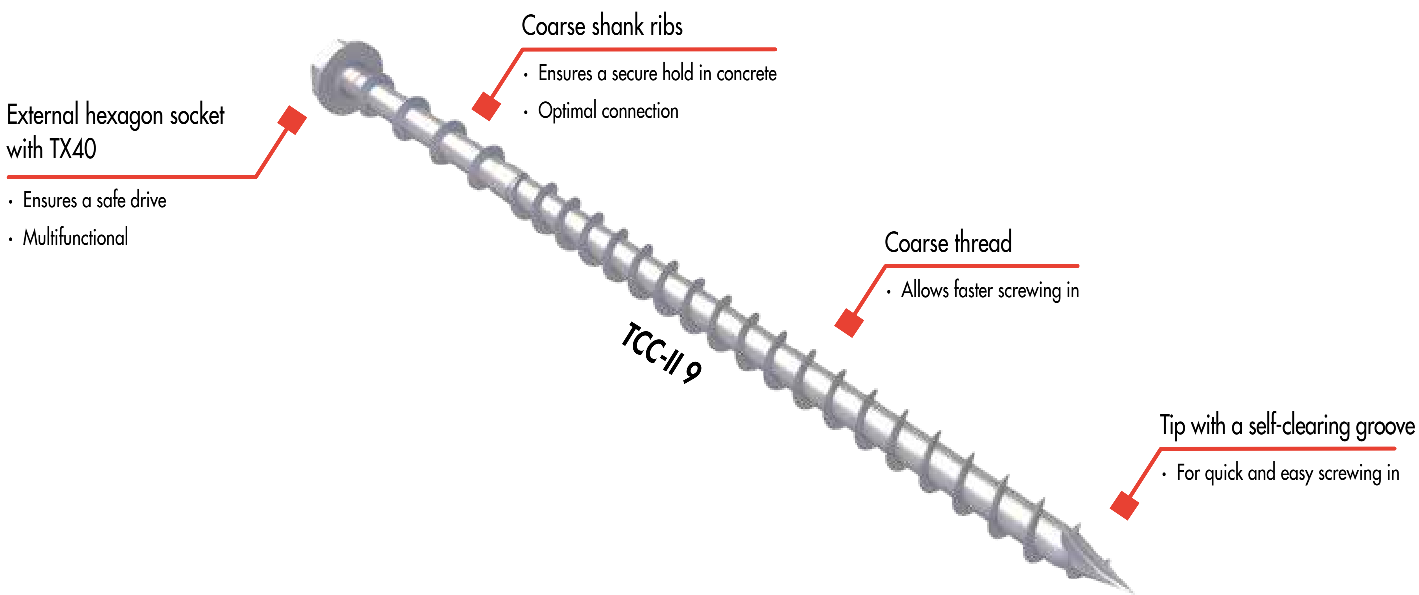
TIMBER-CONCRETE CONNECTION SCREW

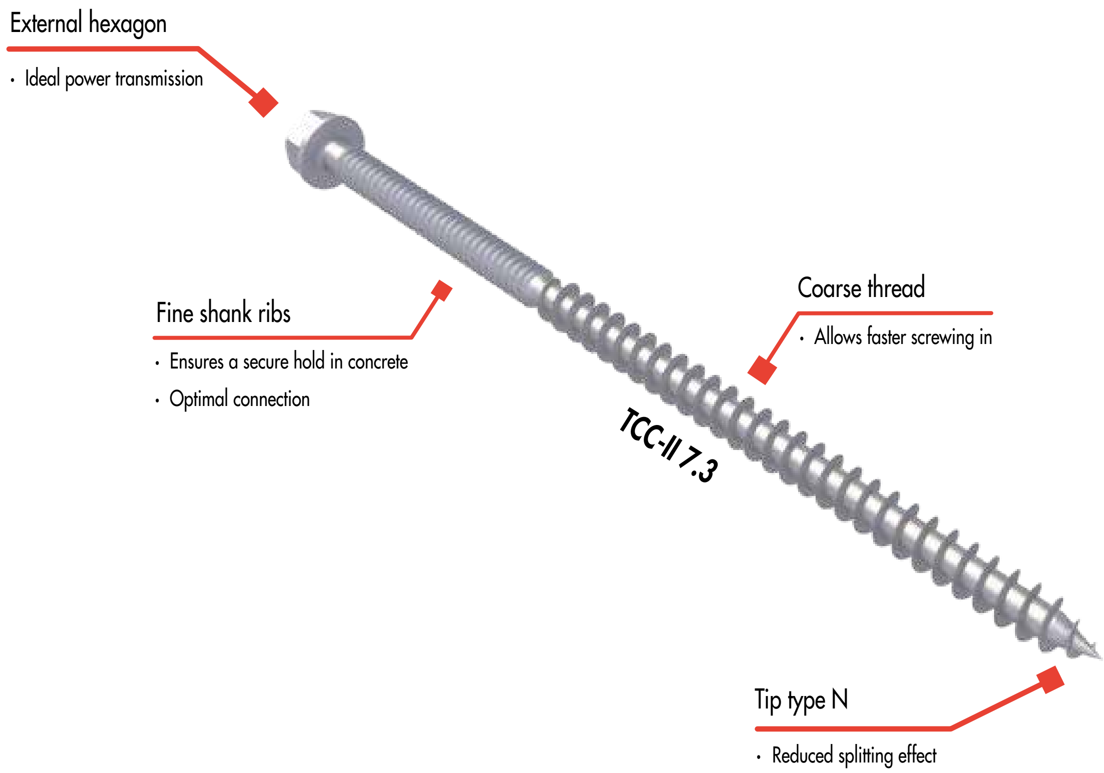
For the structural upgrading of floor slabs in new constructions and renovations

Europ. Techn. Bewertung
European Technical Assessment
ETA-16/0864

Construction projects with **large spans** and **high service loads** require **a high degree of rigidity**. Wood-beamed ceilings quickly reach their limits here. **Innovative timber-concrete connections created with connection screws** enable the effective use of the best properties of both wood and reinforced concrete, which results in structures with a high load-bearing capacity.

The system is used in **new buildings** for increased spans and in **renovations** for buildings with changes of use. Advantages include **the increased load-bearing capacity, higher degree of stiffness, improved sound insulation and increased fire resistance**. Renovations benefit from the **preservation of the existing beams** and often also the formwork – which is economically and ecologically advantageous. The **timber-concrete connection system** is a pioneering choice for demanding construction projects.






eurotec

TCC-II 7.3

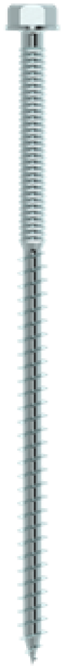
Hex socket, carbon steel, specially coated

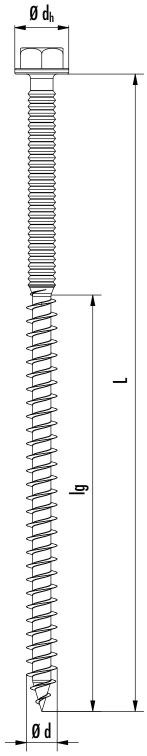
SC 1–2

Fire protection

Sound insulation

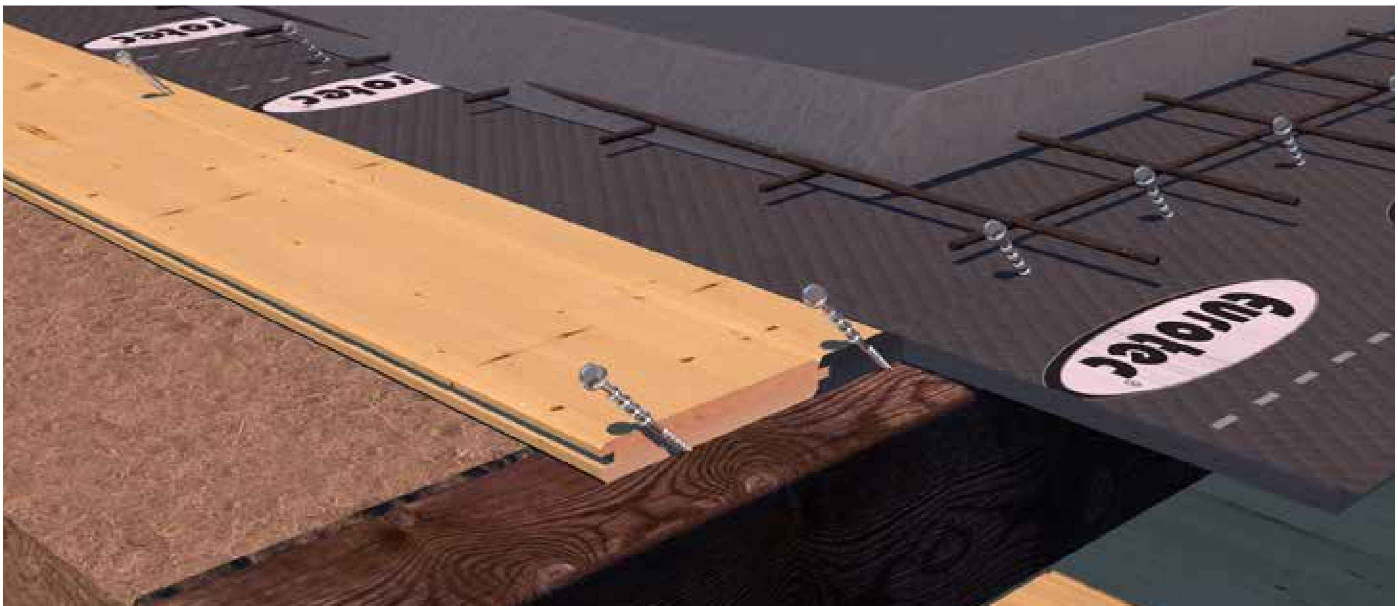
Load-bearing capacity





Europ. Techn. Bewertung
European Technical Assessment
ETA-16/0864

Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
981841	7,3	150	12,7	98	External hexagon	200



TCC ceiling in detail

TCC-II 9

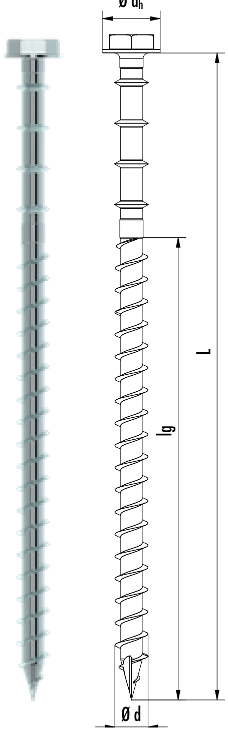
External hexagon, carbon steel, specially coated

SC 1–2

Fire protection

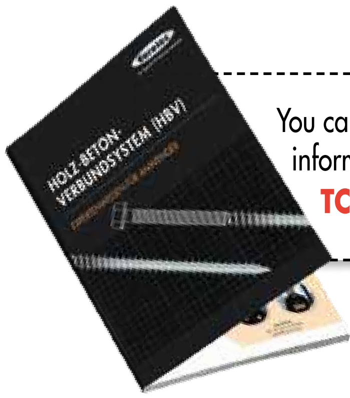
Sound insulation

Load-bearing capacity

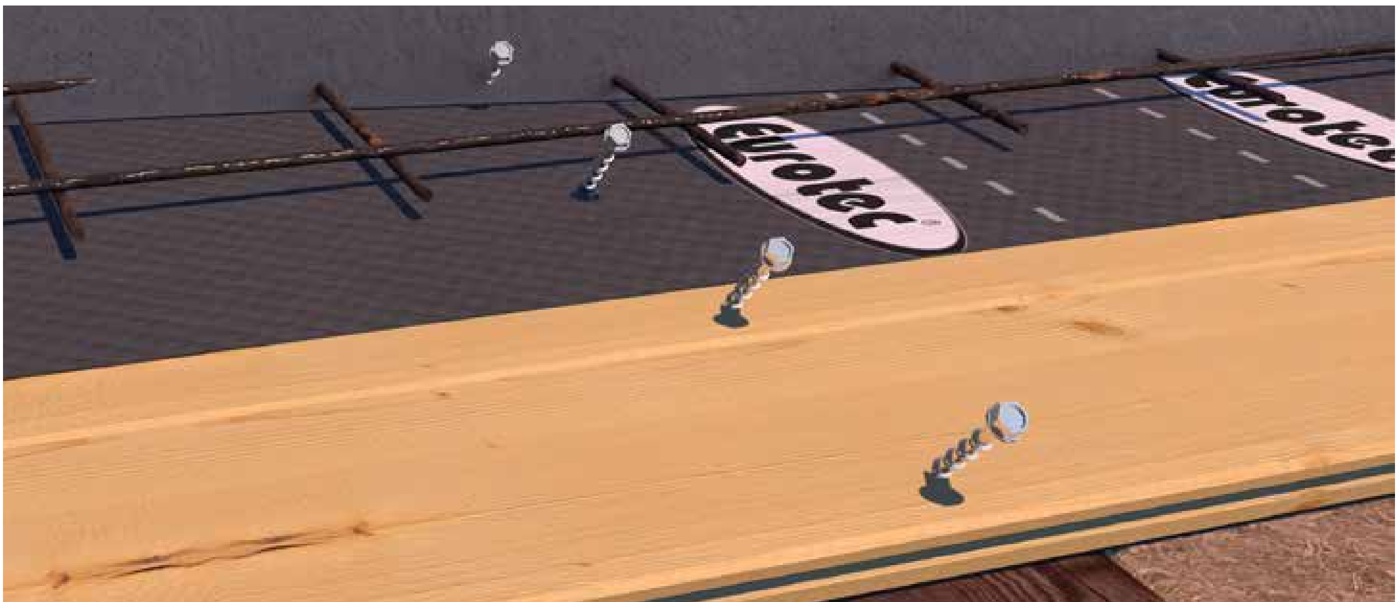


Europ. Techn. Bewertung
European Technical Assessment
ETA-16/0864

Item number	Ø d [mm]	L [mm]	Ø dh [mm]	lg [mm]	Drive	PU
903592	9,0	180	15,5	125	TX40 ●	200



You can find further information in our **TCC BROCHURE**



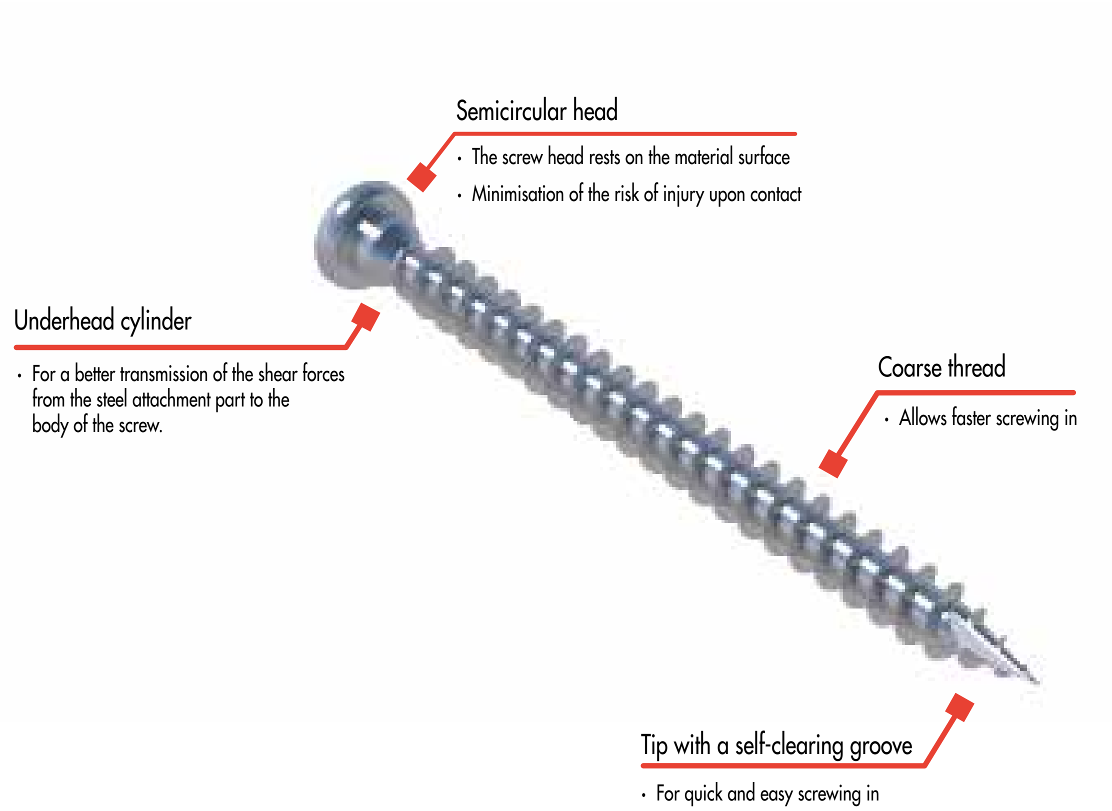
Impact sound decoupling and screed on the TCC ceiling

ANGLE-BRACKET SCREW (ABS)

For quick and easy screwing in

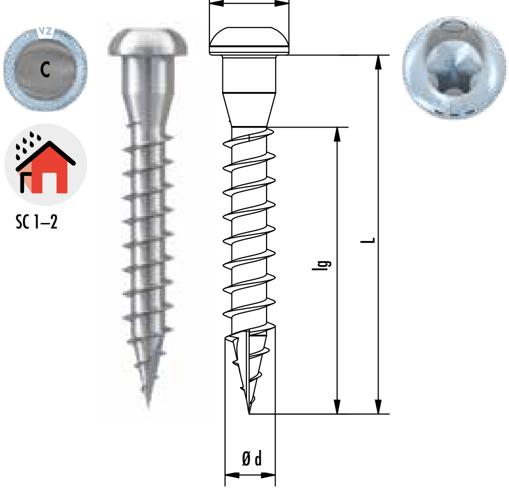
ETA – Europ. Techn. Bewertung / European Technical Assessment – ETA-11/0024

The Eurotec angle-bracket screw (ABS) **made of hardened carbon has been specially designed for connections between sheet steel and wood**. The **splitting effect in the wood** is **reduced** by the geometry of the screw tip. In addition, the screw is characterised, among other things, by the **smooth shank that sits directly beneath its head** which allows for the **transmission of the shear loads**.



Angle-bracket screw

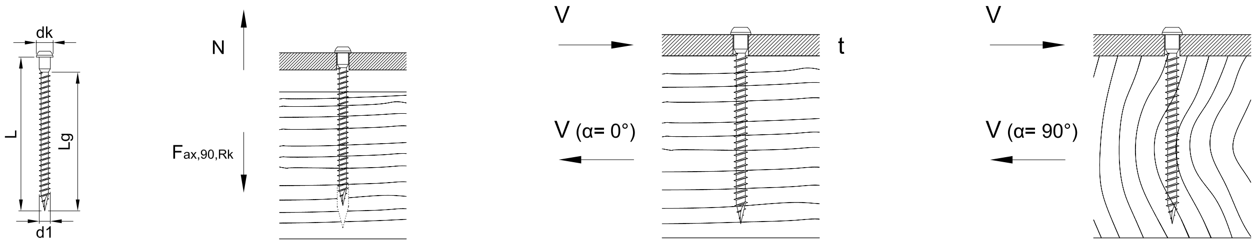
Steel, blue galvanised



Item number	Ø d [mm]	L [mm]	lg [mm]	Ø dh [mm]	Drive	PU
945343	5,0	25	16	7,2	TX20	250
945232	5,0	35	26	7,2	TX20	250
945241	5,0	40	31	7,2	TX20	250
945233	5,0	50	41	7,2	TX20	250
945344	5,0	60	51	7,2	TX20	250
945345	5,0	70	61	7,2	TX20	250

TECHNICAL INFORMATION
ANGLE-BRACKET SCREW, STEEL BLUE GALVANISED

Dimensions	Extraction resistance	Shearing steel-timber



d1 x L [mm]	dk [mm]	Lg [mm]	$F_{ax,90,Rk}$ [kN]	t [mm]	R_k [kN]	t [mm]	R_k [kN]	t [mm]	R_k [kN]	t [mm]	R_k [kN]	t [mm]	R_k [kN]
			t ≤ 9.0 [mm]		α= 0°		α=0°		α=0°		α=0°		α= 0°
					α= 90°		α= 90°		α= 90°		α= 90°		α= 90°
5,0 x 25	7,2	16	0,97	1,5	0,89	2,0	0,87	2,5	0,85	3,0	0,96	4,0	1,18
5,0 x 35		26	1,57		1,27		1,25		1,23		1,35		1,59
5,0 x 40		31	1,88		1,46		1,44		1,42		1,55		1,81
5,0 x 50		41	2,48		1,84		1,82		1,80		1,89		2,10
5,0 x 60		51	3,09		1,99		1,99		1,99		2,09		2,29
5,0 x 70		61	3,69		2,14		2,14		2,14		2,24		2,44

Dimensioning according to ETA-11/0024. Bulk density ρ_k= 350 kg/m³. All stated mechanical values must be considered as dependent on the assumptions made and represent design examples.
All values are calculated minimum values and subject to typesetting and printing errors.
a) The characteristic values for the load-bearing capacity R_k must not be equated with the max. possible action (the max. force). Characteristic values for the load-bearing capacity R_k must be reduced to the design values R_d with regard to the service and load duration class: R_d= $R_k \cdot k_{mod} / \gamma_M$. The design values for the load-bearing capacity R_d must be compared with the design values for the actions E_d ($R_d \geq E_d$).

Example:

Characteristic value for the continuous action (dead load) G_k= 2,00 kN and variable action, e.g. snow load Q_k= 3,00 kN. k_{mod}= 0,9. γ_M= 1,3.
→ Design value of the action E_d= 2,00 · 1,35 + 3,00 · 1,5= 7,20 kN.
The load-bearing capacity of the connection is considered to be proven if $R_d \geq E_d$. → min R_k= $R_d \cdot \gamma_M / k_{mod}$
That is to say that the characteristic minimum value for the load-bearing capacity is calculated as: min R_k= $R_d \cdot \gamma_M / k_{mod}$ → R_k= 7,20 kN · 1,3/0,9= 10,40 kN → Comparison with the table values.

Attention: These are planning aids. The projects must always be designed by authorised persons.

Attention: Check the assumptions that have been made. The specified values, type and number of connecting means represent a preliminary design. The projects must always be designed by authorised persons and in accordance with the state building regulations [LBauO]. Please contact a qualified structural engineer to obtain a proof of stability certificate in accordance with the state building regulations [LBauO] for a fee. We will be happy to put you in touch with someone.

Angle-bracket screw A4

Stainless steel A4

Applied for

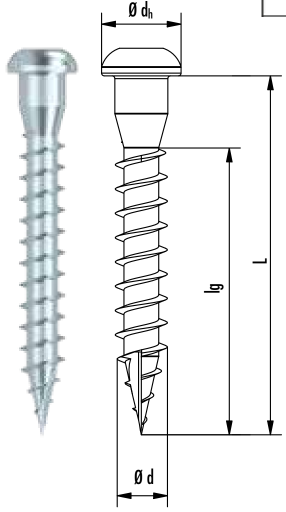
A4

SC 1–3

CRC III

C5

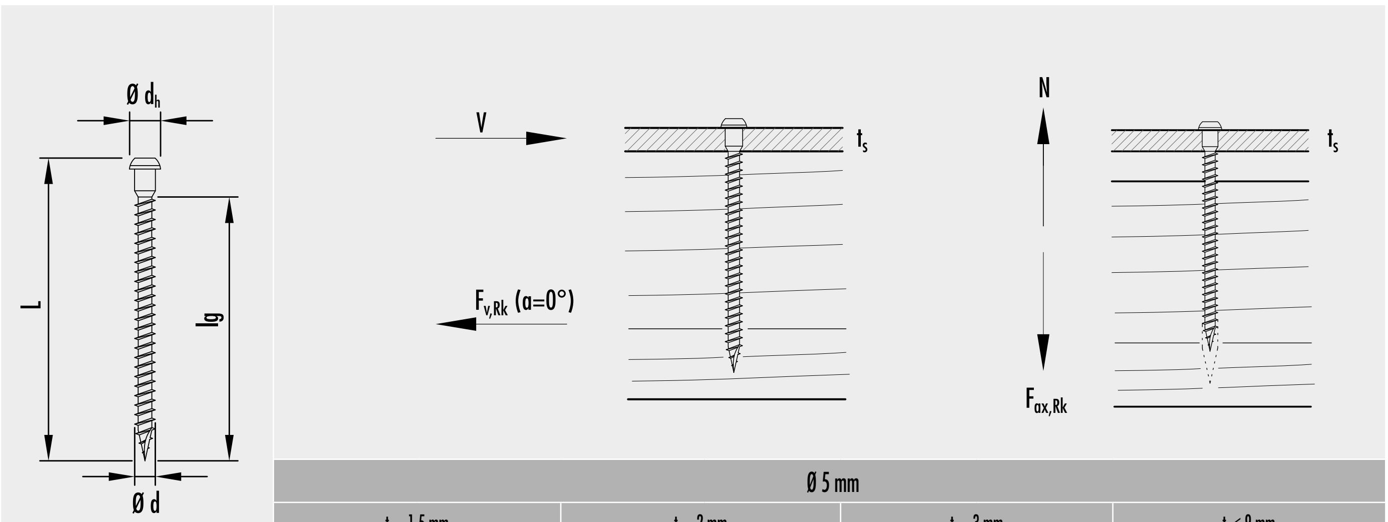
T5



EDELSTAHL Rostfrei

Item number	Ø d [mm]	L [mm]	lg [mm]	Ø dh [mm]	Drive	PU
945621	5,0	35	26	7,2	TX20	250
945622	5,0	40	31	7,2	TX20	250
945623	5,0	50	41	7,2	TX20	250
945625	5,0	60	51	7,2	TX20	250

LOAD-BEARING CAPACITIES OF SCREWS ALONG WITH REQUIRED MINIMUM LENGTHS



		Ø 5 mm							
		t_s = 1.5 mm		t_s = 2 mm		t_s = 3 mm		$t_s \leq$ 9 mm	
L [mm]	lg [mm]	$F_{v,Rk}$ [kN]	$F_{v,Rd}$ [kN]	$F_{v,Rk}$ [kN]	$F_{v,Rd}$ [kN]	$F_{v,Rd}$ [kN]	$F_{v,Rd}$ [kN]	$F_{v,Rd}$ [kN]	$F_{v,Rd}$ [kN]
35		1,19	0,73	1,60	0,98	1,60	0,98	1,57	0,97
40		1,32	0,81	1,67	1,03	1,67	1,03	1,88	1,16
50		1,47	0,91	1,83	1,12	1,83	1,12	2,48	1,53
60		1,62	1,00	1,98	1,22	1,98	1,22	3,09	1,90

Calculated according to ETA-11/0024, using non-predrilled holes and a wood density of ρ_k = 350 kg/m³. The F_{Rd} design values were calculated using k_{mod} = 0,8 and γ_M = 1,3.
A sheet steel thickness of ts ≥ 2,0 mm according to ETA-11/0024 is considered to be thick sheet metal. L is the minimum screw length needed to achieve the respective load-bearing capacity.

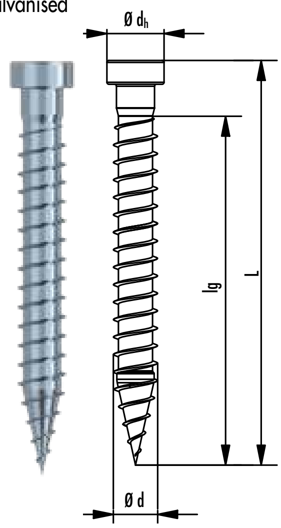
Please consider the following: These are planning aids. Projects may only be calculated by authorised individuals.

Angle-bracket screw ZK Hardwood

Steel, blue galvanised

Applied for

SC 1–2



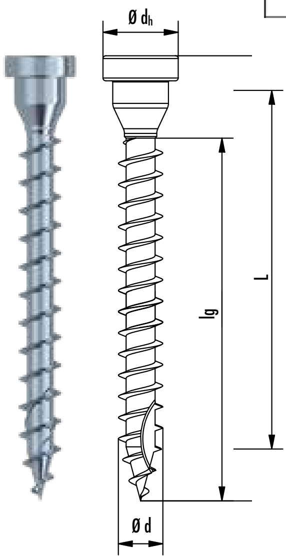
Item number	Ø d [mm]	L [mm]	lg [mm]	Ø dh [mm]	Drive	PU
945383	5,0	35	31	7,2	TX20 ●	250
945384	5,0	40	36	7,2	TX20 ●	250
945385	5,0	50	46	7,2	TX20 ●	250
945386	5,0	60	56	7,2	TX20 ●	250

Angle-bracket screw Strong

Steel, blue galvanised

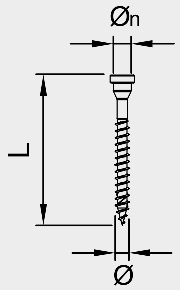
Applied for

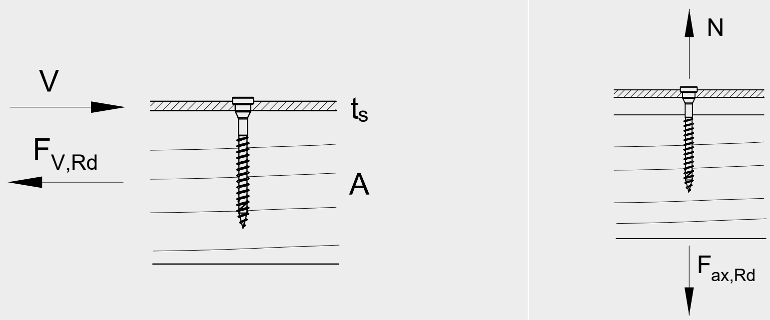
SC 1–2



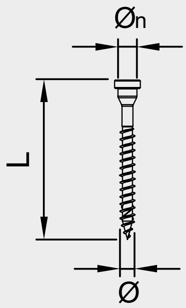
Item number	Ø d [mm]	L [mm]	lg [mm]	Ø dh [mm]	Drive	PU
975815	8,0	60	50	13,5	TX40 ●	50
975816	8,0	80	70	13,5	TX40 ●	50
975817	8,0	100	90	13,5	TX40 ●	50
975818	8,0	120	110	13,5	TX40 ●	50
975819	8,0	140	130	13,5	TX40 ●	50
975820	8,0	160	150	13,5	TX40 ●	50
975821	10,0	80	67,5	16,5	TX50 ●	50
975822	10,0	100	87,5	16,5	TX50 ●	50
975823	10,0	120	107,5	16,5	TX50 ●	50
975824	10,0	140	127,5	16,5	TX50 ●	50
975825	10,0	160	147,5	16,5	TX50 ●	50
975826	10,0	180	167,5	16,5	TX50 ●	50

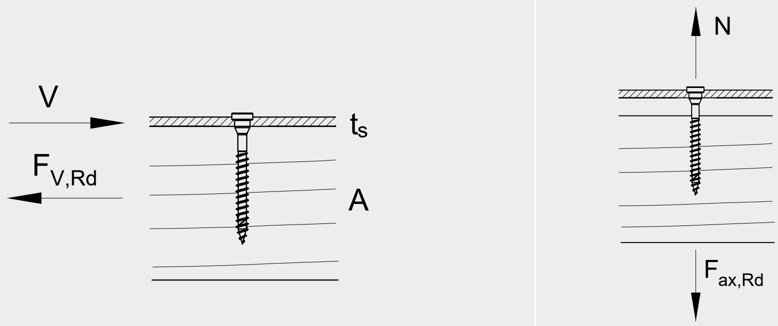
TECHNICAL INFORMATION
ANGLE-BRACKET SCREW STRONG, STEEL BLUE GALVANISED





		Ø 8 mm					
		$t_s \leq 4$ mm		$t_s \geq 8$ mm		$t_s \leq 10$ mm	
L [mm]	lg [mm]	$F_{v,Rk}$ [kN]	$F_{v,Rd}$ [kN]	$F_{v,Rk}$ [kN]	$F_{v,Rd}$ [kN]	$F_{ax,Rk}$ [kN]	$F_{ax,Rd}$ [kN]
60	50	2,76	1,70	4,42	2,72	4,44	2,73
80	70	3,74	2,30	5,60	3,44	6,22	3,83
100	90	4,72	2,91	6,03	3,71	8,00	4,92
120	110	5,30	3,26	6,48	4,00	9,77	6,01
140	130	5,74	3,53	6,92	4,26	11,54	7,10
160	150	6,18	3,80	7,36	4,53	13,32	8,20





		Ø 10 mm					
		$t_s \leq 5$ mm		$t_s \geq 10$ mm		$t_s \leq 12$ mm	
L [mm]	lg [mm]	$F_{v,Rk}$ [kN]	$F_{v,Rd}$ [kN]	$F_{v,Rk}$ [kN]	$F_{v,Rd}$ [kN]	$F_{ax,Rk}$ [kN]	$F_{ax,Rd}$ [kN]
80	67,5	4,32	2,66	6,78	4,17	7,29	4,49
100	87,5	5,47	3,36	7,88	4,85	9,45	5,82
120	107,5	6,62	4,07	8,42	5,18	11,61	7,14
140	127,5	7,34	4,52	8,96	5,51	13,77	8,47
160	147,5	7,88	4,85	9,50	5,85	15,93	9,80
180	167,5	8,42	5,18	10,04	6,18	18,09	11,13

Calculated according to ETA-11/0024, using non-predrilled holes and a wood density of ρ_k = 350 kg/m³. The F_{Rd} design values were calculated using k_{mod} = 0,8 and γ_M = 1,3. For different sheet metal thicknesses, it is possible to interpolate the shear strength between thin and thick sheet steels. L is the minimum screw length needed to achieve the respective load-bearing capacity.

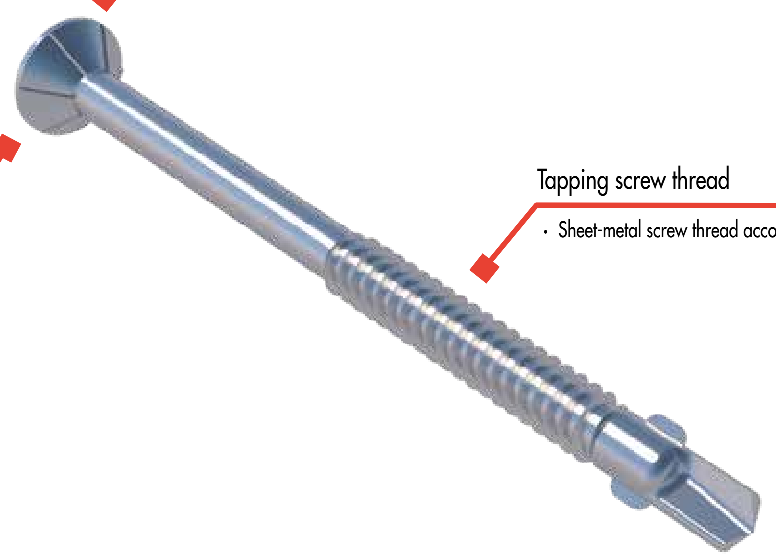
Please consider the following: These are planning aids. Projects may only be calculated by authorised individuals.

WING-TIPPED PROFILE DRILLING SCREW

For the fastening of narrow profiles

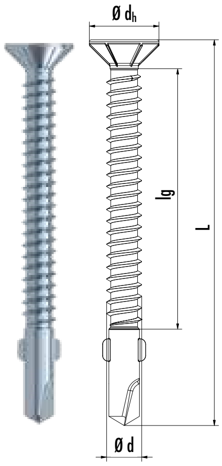
The wing-tipped profile drilling screw made of hardened stainless steel or carbon steel is a screw that has been **specially designed for the fastening of narrow profiles**. The screw has a **drill tip with special wings and** a countersunk head with TX drive.
These screws are characterised by the option of being used **without pre-drilling**, since the wings create a drill hole size that is bigger than the thread diameter. The wings drill both the core hole and the counter thread in the steel itself.

It is important to know that both galvanised steel and hardened stainless steel are not acid resistant and are therefore not suitable for the fastening of timbers that contain tannins, e.g. oak. Outdoors, we recommend that these screws **be only used for steel-timber connections,** where one screw per attachment point is sufficient.



Wing-tipped profile drilling screw

Hardened stainless steel

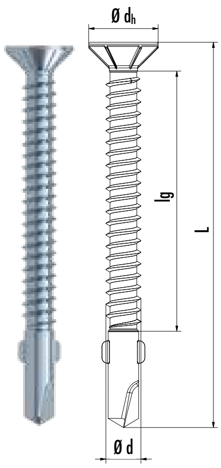


Item number	Ø d [mm]	L [mm]	lg [mm]	Ø dh [mm]	Drive	Clamping thickness [mm][a]	Drilling capacity	PU
901990	4,8	38	22	9,5	TX25 ●	20	3	200
111404	5,5	45	26,5	10,8	TX30 ●	25	3	200
111405	5,5	50	32	10,8	TX30 ●	30	3	200
111406	6,3	60	31	12,4	TX30 ●	35	5	200
901585	6,3	70	41	12,4	TX30 ●	45	5	200
904333	6,3	80	41	12,4	TX30 ●	55	5	200
901581	6,3	85	46	12,4	TX30 ●	60	5	100
901584	6,3	110	46	12,4	TX30 ●	85	5	100

a) Clamping thickness= attachment part thickness + sheet metal thickness t; $t_{max.}$ = drilling capacity

Wing-tipped profile drilling screw

Steel, blue galvanised



Item number	Ø d [mm]	L [mm]	lg [mm]	Ø dh [mm]	Drive	Clamping thickness [mm][a]	Drilling capacity	PU
111841	4,2	32	17	8,1	TX20 ●	15	3	500
111842	4,2	38	23	8,1	TX20 ●	20	3	500
111843	4,8	45	27	9,5	TX25 ●	25	3	500
111844	5,5	50	32	10,8	TX30 ●	30	3	200
111409	5,5	60	41	10,8	TX30 ●	40	3	200
111410	5,5	70	51	10,8	TX30 ●	50	3	200
111411	5,5	80	61	10,8	TX30 ●	60	3	200
111412	5,5	100	81	10,8	TX30 ●	80	3	200
111408	5,5	120	101	10,8	TX30 ●	100	3	200
111845	6,3	50	31	12,4	TX30 ●	25	5	200
111846	6,3	60	31	12,4	TX30 ●	35	5	200
111847	6,3	70	41	12,4	TX30 ●	45	5	200
111848	6,3	80	46	12,4	TX30 ●	55	5	200
111414	6,3	100	46	12,4	TX30 ●	75	5	200
111415	6,3	120	46	12,4	TX30 ●	95	5	200

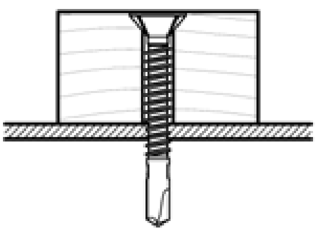
a) Clamping thickness= attachment part thickness + sheet metal thickness t; $t_{max.}$ = drilling capacity

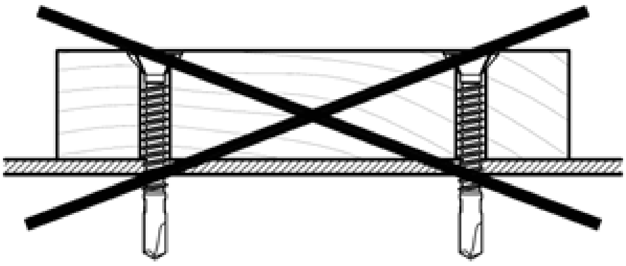
APPLICATION INSTRUCTIONS

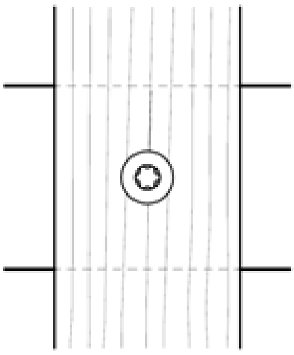
The wing-tipped profile drilling screw is only intended for the fastening of narrow profiles, i.e. for applications with only one screw per fastening point.

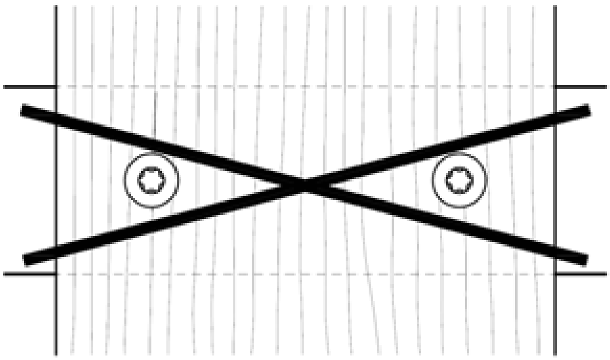
When fastening elements such as floor boards with two screws per fastening point, mutual obstructions can occur if the screws try to bend with the "working" (moving or deforming) wood. This will cause the screws to tear off, especially if used in relatively soft coniferous timber.

The wing-tipped profile drilling screw is unsuitable for the fastening of timber-aluminium connections.









WING-TIPPED PROFILE DRILLING SCREW WORKING METHOD

- Due to the wings, the drill hole in the wood is larger than the screw's thread diameter.
- The drill tip drills a core hole in the steel and forms a counter thread in the steel.
- Secure hold of the thread in the steel anchoring base.

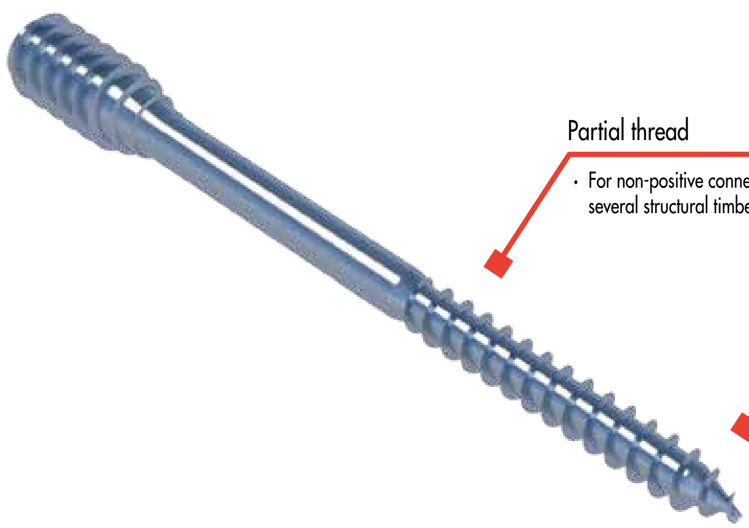
Wing-tipped profile drilling screw working method

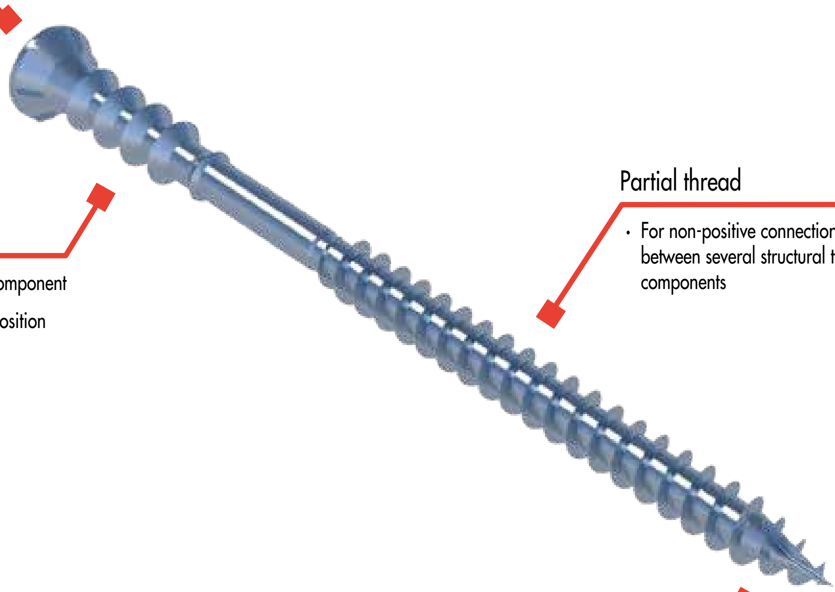
SPACER SCREW/MINI, JUSTITEC

For the fastening of wooden substructures for wall and ceiling claddings

The spacer screw is suitable for the fastening of wooden substructures for wall and ceiling claddings as well as for ridge and hip batten installations. In contrast to conventional screws, the spacer screw features **two separate threads at the head and tip.** Thanks to the head thread, the counter batten to be fastened is held (at a distance). **The thinner tip thread is used for fastening the screw to the substructure.**
To prevent the counter batten from splitting, we recommend pre-drilling the counter batten (drilling diameter = Ødh – 2 mm).

With the help of the Justitec screw, the wooden batten is held in place in both the upper and lower region. Furthermore, a **spacer screw** is used to keep the batten in position and to **prevent the possibility of it being displaced.**



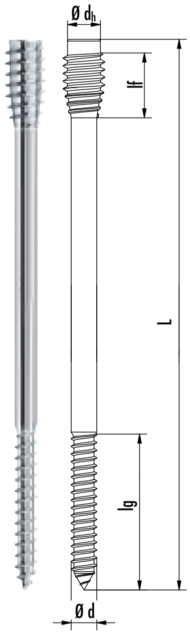



14
13
12

Spacer screw

Galvanised steel, anti-friction coating

SC 1–2



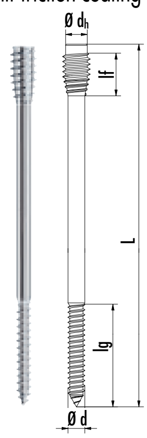
EN 14592:2008+A1:2012

Item number	Ø d [mm]	L [mm]	lg [mm]	Ø dh [mm]	lf [mm]	Drive	Distance range [mm]	PU
110099	6,0	60	40	10	20	TX25 •	0–15	200
110100	6,0	70	40	10	20	TX25 •	15–25	200
110101	6,0	80	40	10	20	TX25 •	15–35	200
110102	6,0	90	40	10	20	TX25 •	25–45	200
110103	6,0	100	40	10	20	TX25 •	35–55	200
110104	6,0	120	40	10	20	TX25 •	55–75	100
110105	6,0	135	40	10	20	TX25 •	70–90	100
110106	6,0	150	40	10	20	TX25 •	75–105	100
110107	6,0	180	40	10	20	TX25 •	100–135	100
110108	6,0	200	40	10	20	TX25 •	135–155	100

Spacer screw Mini

Galvanised steel, anti-friction coating

SC 1–2



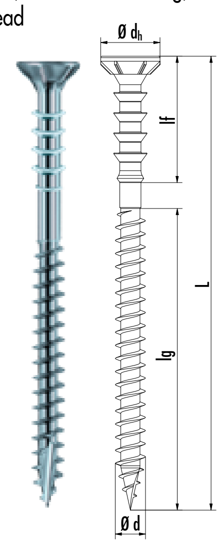
EN 14592:2008+A1:2012

Item number	Ø d [mm]	L [mm]	lg [mm]	Ø dh [mm]	lf [mm]	Drive	Distance range [mm]	PU
110121	4,5	60	30	8	22	TX25 •	0–15	100
110122	4,5	80	30	8	22	TX25 •	15–35	100
110123	4,5	100	30	8	22	TX25 •	35–55	100
110124	4,5	120	30	8	22	TX25 •	55–75	100

Justitec

Galvanised steel, anti-friction coating, countersunk head

SC 1–2



EN 14592:2008+A1:2012

Item number	Ø d [mm]	L [mm]	lg [mm]	Ø dh [mm]	lf [mm]	Drive	Adjustment range [mm]	PU
111804	6,0	60	25	10	25	TX25 •	0–10	200
111805	6,0	70	30	10	25	TX25 •	0–20	200
111806	6,0	80	30	10	25	TX25 •	0–30	200
111807	6,0	90	40	10	25	TX25 •	0–40	100
111808	6,0	100	60	10	25	TX25 •	0–50	100
111824	6,0	110	60	10	25	TX25 •	0–60	100
111809	6,0	120	60	10	25	TX25 •	0–70	100
905632	6,0	130	60	10	25	TX25 •	0–80	100
905633	6,0	145	60	10	25	TX25 •	0–95	100
905634	6,0	160	60	10	25	TX25 •	0–110	100

ADVANTAGES

- No pre-drilling required, continuously adjustable
- Wedges are not required,
  processing of timber against timber

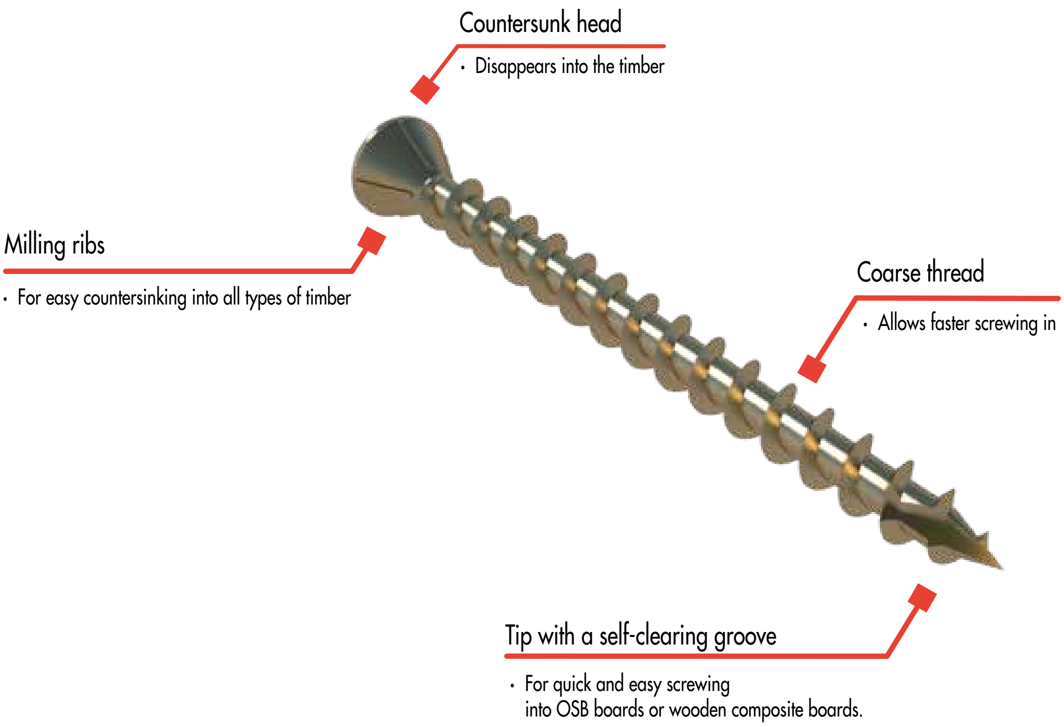
Quick alignment of a substructure using the Justitec screw.

Fastening of wooden slats using the spacer screw (bottom) and the Justitec screw (top).

OSB FIX

Yellow galvanised carbon screw

The OSB Fix is a **yellow galvanised carbon steel screw** with a countersunk head and full thread. The fully threaded screw has a 60° counter-sunk head with **milling ribs** and **TX drive** as well as a so-called tip with a self-clearing groove (type 17). The screw's special geometry ensures a **reduced splitting effect** during screwing in.



OSB Fix

Countersunk head, steel yellow galvanised

EN 14592:2008+A1:2012

Item number	Dimension[mm]	Drive	PU
900690	4,3 x 40	TX20 ●	250
900691	4,3 x 45	TX20 ●	250
900692	4,3 x 50	TX20 ●	250
900693	4,3 x 60	TX20 ●	250
900694	4,3 x 80	TX20 ●	250

FEATURES

- The full thread keeps the board in position
- Prevents creaking noises
- Suitable for all timber-based materials
- Surface yellow galvanised Cr3

OSB Fix for the installation of OSB boards

EUROTEC DISPLAY SYSTEM

Small packages

ADVANTAGES

With the Eurotec display system, you get screws in the most common dimensions and materials on one shelf. This offers you the opportunity to provide your customers with just one shelf for all everyday application scenarios typical in wood construction.

1 The upper part of the display system contains screws in batches of 10, 15, 20 or 45 pieces that are packaged in bags.

2 At the bottom of the display system, you will find screws in batches of 50 or 100 pieces packaged in cardboard boxes. All cardboard boxes have a resealable opening designed so the screws can be dispensed by pouring.

3 Bits, long bits and bit boxes with the appropriate TX sizes in the colour coding system also form part of this extensive display system.

YOU WILL FIND THE FOLLOWING SCREW TYPES AND DIMENSIONS ON THIS SHELF

- Paneltwistec AG specially coated,
  countersunk head Ø 3.5 x 30 mm bis Ø 6.0 x 120 mm
- EcoTec A2 chipboard screw,
  countersunk head Ø 4.0 x 40 mm bis Ø 6.0 x 120 mm
- Hapatec hardened stainless steel,
  ornamental head Ø 4.0 x 30 mm to Ø 5.0 x 80 mm

EURO PALLETS AND MAXI PACKAGES

With 8, 16 or 24 Eurotec Maxi packages

Holzbauschrauben
Eurotec
Paneltwistec AG
Senkkopf
EcoTec
Senkkopf
Hapatec
Zierkopf

KEYWORD INDEX

FACILITATES
THE SEARCH.

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The specialist for fastening technology

Publisher: E.u.r.o.Tec GmbH · Version 02/2024

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