

KLIMAS

FASTENER TECHNOLOGIES

SCREWS FOR WOODEN
CONSTRUCTIONS

2026

Wkręt-met
KLIMAS

Klimas Wkręt-met – STRONG FOR GENERATIONS

Klimas Wkręt-met is a family business, established in 1990 by Joanna and Wojciech Klimas. Initially operating locally, it quickly gained nationwide and then European coverage. Currently, the company is developing distribution in further foreign markets, and the company's GO GLOBAL strategy is setting increasingly new and interesting directions.



Production plant no. 2 and central warehouse - total area of 30,000 m²
New investment: plants no. 3 and 4 - total area of 30,000 m²



Production plant no. 1 - total area of 20,000 m²

4 PRODUCTION AND
STORAGE FACILITIES
OF TOTAL AREA OF
80k m²

OWN PRODUCTION OF FASTENER TECHNOLOGIES

Production of Klimas Wkręt-met fastening technologies is held in 4 modern facilities, located in Kuźnica Kiedrzyńska and Wanaty near Częstochowa. The Company has launched production in its third facility in Wanaty which, with use of state-of-the-art technologies and applications, implements the assumptions of the Industry 4.0. programme.

MODERN PRODUCTION

We are characterised by constant development, including technological development. Europe's most modern production lines are our calling card and indicate the importance of continuously improving our production facilities. Technological innovations allow us to introduce new products that respond to growing market needs. We have facilities in the form of 4 integrated production plants with a total area of 80,000 m², located in Kuźnica Kiedrzyńska and Wanaty near Częstochowa.



Production process of steel products:

- Top-quality raw-material from European steelworks.
- Various steel grades.
- Own R&D department.
- Extensive machine park.
- Hardening (heat treatment).
- Application of protective coats.
- Possibility of painting heads and washers to RAL colours.
- Quality control at each production stage.
- Polish and European technical assessments.



MORE THAN

400

MODERN MACHINES



Process of screw hardening:

- Advanced machine park including 7 hardening furnaces.
- 2 modern furnaces for hardening of screws over 200 mm long while keeping high quality of parameters – no curvature.
- Automated hardening line – high capacity.



HARDENING FURNACES



Custom coating

- Advanced machine park: Zn yellow without CR6+.
- Advanced processing line for SQ Cermic coating.
- Automatic passivation and top coat line.
- State-of-the-art robots and baths for sealing of coating.



White Zinc

Zinc coating guarantee of quality and high level of anti-corrosion protection.



Yellow Zinc

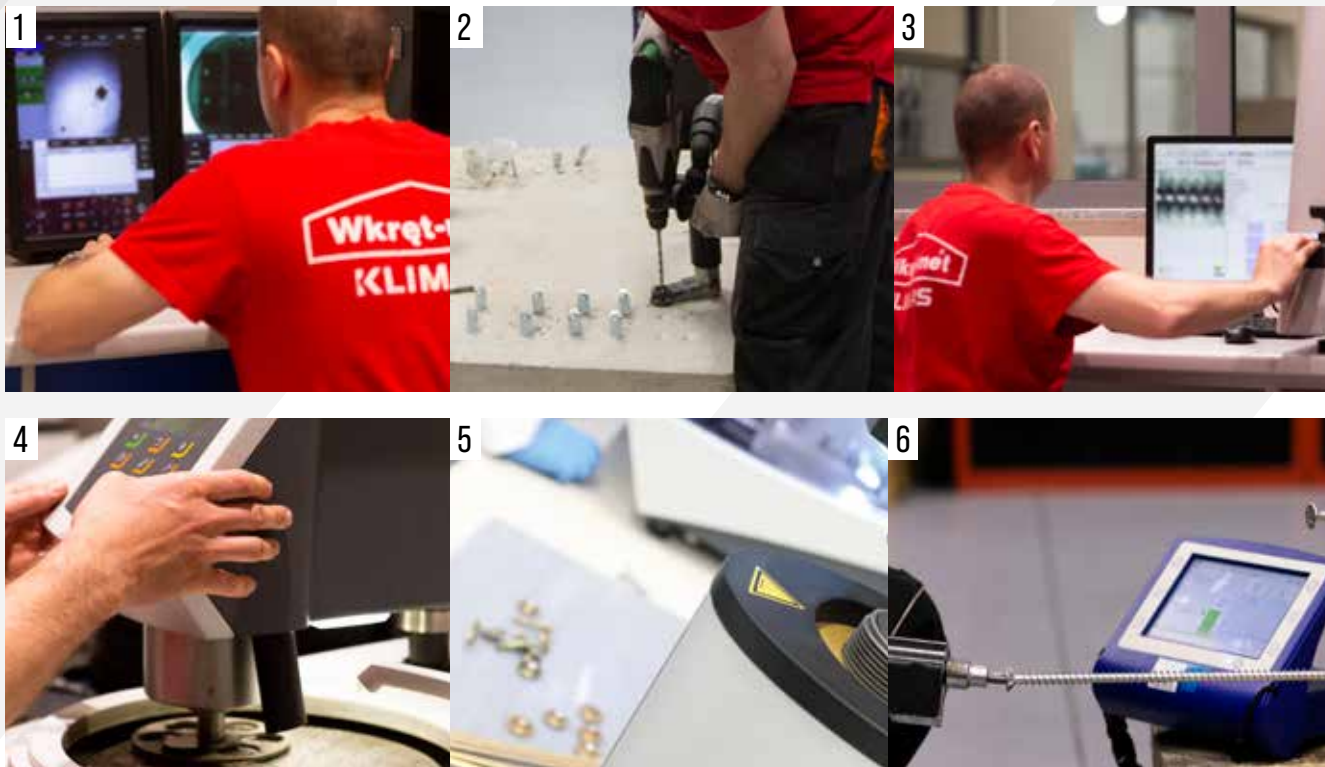
Zinc coating guarantee of quality and high level of anti-corrosion protection.



SQ Cermic

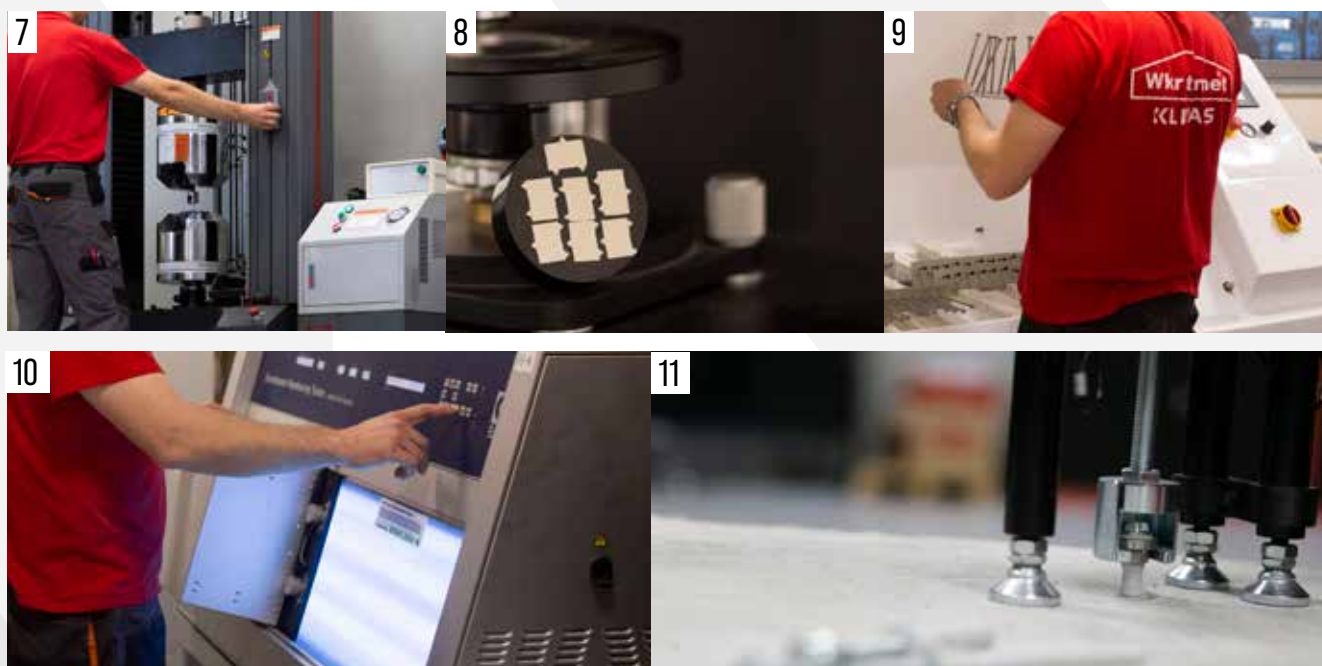
Very high level of anti-corrosion protection (several times higher than the traditional galvanization).

ADVANCED PROCESSING LINE – HARDENING PLANT AND GALVANIZING LINE DEPARTMENT



ADVANCED MACHINE PARK RESEARCH & DEVELOPMENT DEPARTMENT

1. Hardness and micro Vickers hardness testing. | 2. Assembly and load-resistance tests for all substrate categories according to ETAG. | 3. Testing thickness of corrosion protection plating using X-ray fluorescence spectroscopy tester - Fischerscope X-RAY XDL. Analysis of chemical composition of alloy steels. | 4. Preparation of metallographic micro-sections – metallographic tests. | 5. Preparation of metallographic micro-sections – metallographic tests. | 6. Torque value testing | 7. Determination of tensile strength for wire and finished goods. | 8. Metallographic tests – control of thermal and chemical treatment process, hardness, structure. | 9. Testing of corrosion resistance in salt spray/cyclic chamber. | 10. Accelerated ageing of paint coats in UV chamber. | 11. Testing of loading resistance of fasteners – characteristic pull-out strength.



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SCREWS FOR FASTENING CLADDINGS OF TERRACES AND FLOORS

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SCREWS FOR WOODEN CONSTRUCTIONS



THESE PRODUCTS OUST CONVENTIONAL NAILS DUE TO THEIR ADVANTAGES, SUCH AS:

- transfer of higher loads,
- comfortable and fast fixing,
- possibility of tightening the screwed elements,
- improved stiffness of the whole arrangement,
- possibility of correction in case of incorrect installation (screws can be removed and re-tightened).

TYPES OF WOOD

Carpentry screws are designed for joining wooden and wood-based members. In most cases these screws are used for:

JOINING THE FOLLOWING ELEMENTS:



Solid timber



CLT wood



LVL wood



KVH wood



BSH wood

JOINING WOOD-BASED MATERIALS AND WOODEN ELEMENTS, SUCH AS:



Plywood



Chipboard



Beaverboard



OSB board



Cement chipboard

FORCES AND CONDITIONS FASTENERS ARE EXPOSED TO

When designing and selecting carpentry fasteners a few basic parameters should be taken into account, such as:

1. Location of fastener's application,
2. Location and type of load,
3. Type of forces acting on fastener.

LOCATION OF FASTENER'S APPLICATION

Use Classes for Moisture Content

In the case of wooden structures, the classification of the use classes of structures is as follows:



Use class 1: characterized by material moisture content corresponding to a temperature of 20°C and a relative humidity of ambient air of above 65% only for a few weeks in the year. This class includes all structural elements which are located in a heated space, closed off from all sides, where external conditions have no impact. In such case an average moisture content in softwood timber does not exceed 12%.



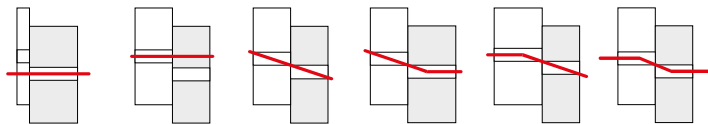
Use class 2: characterized by material moisture content corresponding to a temperature of 20°C and a relative humidity of ambient air of above 85% only for a few weeks in the year. This class includes roofed structural elements in open structures. Such elements are not directly exposed to weather conditions. In such case an average moisture content in softwood timber does not exceed 20%. Examples of such structures are shelters, or roofed, unheated loft spaces.



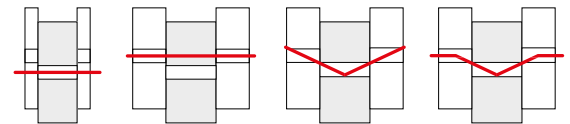
Use class 3: corresponds to conditions causing wood moisture higher than for use classes 1 and 2. This category includes all structural elements exposed to external weather conditions.

JOINT FAILURE DIAGRAMS

Single-cut joints:



Double-cut joints:



LOAD TYPES

Load duration classes

Load duration class	Order of magnitude of accumulated duration of characteristic load
Permanent	more than 10 years
Long-term	6 months - 10 years
Medium-term	1 week - 6 months
Short-term	shorter than one week
Instantaneous	-

Examples of load-duration assignment in each class

Load duration class	Examples of loading
Permanent	self-weight
Long-term	warehouse storage
Medium-term	imposed floor load, snow
Short-term	snow, wind
Instantaneous	wind, accidental load

TYPES OF FORCES ACTING ON FASTENER:

Forces, which are most frequently present in joints, are as follows:

- head pull-through fixed material (Fig. 1),
- fastener pull-out from structure caused by tensile force (Fig. 2),
- joint failure caused by shear force (Fig. 3).

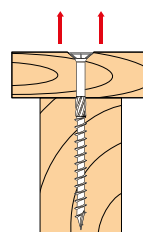


Fig. 1

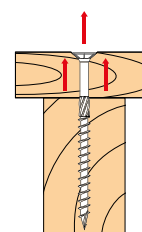


Fig. 2

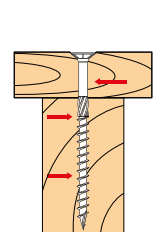


Fig. 3

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C4 COATING

**SUPER
QUALITY
SQ CERAMIC**

up to 1000 hours in the salted atmosphere chamber

WHAT IS SQ CERAMIC?

SQ Ceramic lamellar coating application technology is the modern way of protection against corrosion. Lamellar coating application technology properties are also used in the automotive and aerospace industries. The coating consists of a mix of zinc and aluminium flakes, and binding resins.

The lamellar coating is characterised by exceptionally effective protection against corrosion despite a relatively thin layer. **This ensures 10-time higher protection against corrosion in relation to zinc plating and 2-time higher protection in relation to hot-dip galvanizing (HDG). The lamellar coating maintains resistance to red corrosion even up to 1000 hours in the salted atmosphere chamber while hot-dip galvanizing only 500 hours.**

The coating has also high resistance to chemicals and UV radiation but does not contain heavy metals, including hexavalent chromium (VI).

MAIN CHARACTERISTICS

- › Very high protection against corrosion.
- › Non - hexavalent chromium (Cr-VI).
- › Thermal resistance up to 260°C.
- › Resistant to UV.

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STRONG FOR GENERATIONS

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ADVANCED MACHINE PARK RESEARCH & DEVELOPMENT DEPARTMENT

We have started a high-tech quality-control laboratory to ensure the highest quality of the products from our portfolio. Our laboratory is equipped with measuring microscope, X-ray spectrometer, salt spray chamber, load capacity testing machine, Vickers microhardness tester, Rockwell hardness tester, torque converters, permascope and a number of other equipment, which allow us to:

- check and control paint and zinc coat thickness;
- check resistance of protective coating to highly corrosive environments;
- check hardness of the screw surface and body, thickness of carburized layer;
- measure the torque required for a particular screw to be installed;
- test the pull-out strength;
- measure rigidity of the support washer;
- measure installation time of screws;
- and many others.



**SUPER
QUALITY**
SQ CERAMIC

SQ Ceramic

10x IMPROVED
RESISTANCE
TO CORROSION*

*compared to galvanising 5 µm



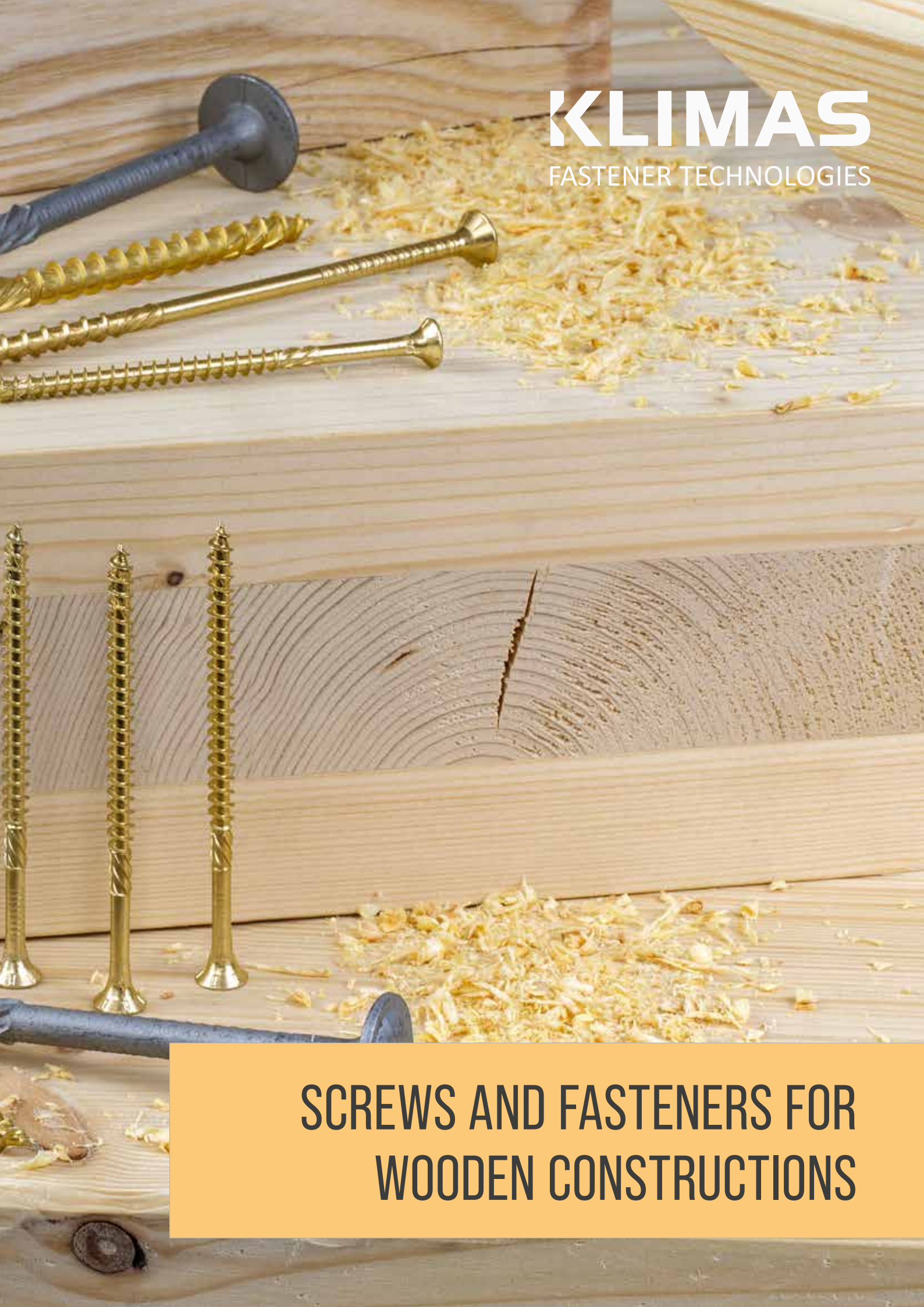
Galvanized steel in the salted atmosphere chamber



SQ Ceramic in the salted atmosphere chamber

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FASTENER TECHNOLOGIES

**SCREWS AND FASTENERS FOR
WOODEN CONSTRUCTIONS**



NEW MILLING TIP

TIMBER CONSTRUCTION SCREWS

WKCP, WKCS, WKCS



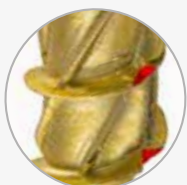
NEW CUTTING EDGE

New special design of cutting edge with added milling **reduces screwing resistance by 20%**. This helps to extend the life of batteries and power tools.



DOUBLE THREAD

Additional recessed second thread **improve remarkably a speed of timber penetration** and reaction time of first grip into the wood.



SERRATED THREAD

Special cutting notches integrated on the thread **cuts wood fibres structure while screwing in**.



WAX COATING

With a special wax coating needed torque has been reduced significantly. This provides faster and easier installation in same time extending the battery life of power tools.



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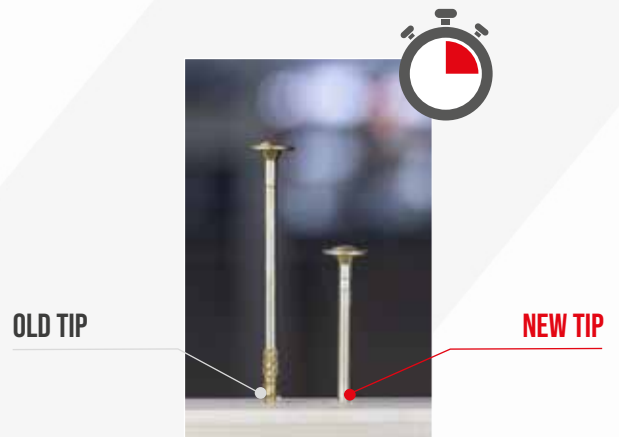
DOUBLE THREAD - QUICKER SCREWING

Additional recessed second thread turn rolled out to the tip of the screw **reduce the reaction time of first grip into the wood**. Such advantage is particularly important on the project site, when fastening wooden elements in the area with limited access and applying extra pressure is difficult. In such kind of situation the double thread ensures to reach the same effect with much lower pressure.



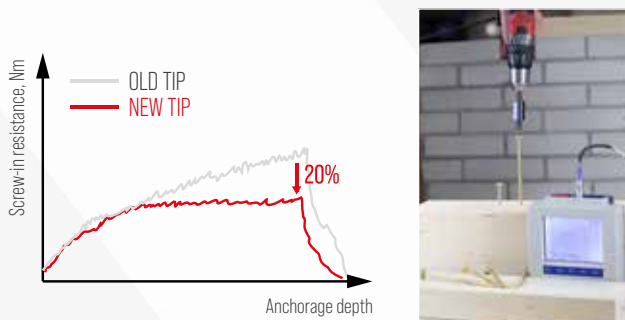
UP TO 40% FASTER SCREWING TIME

Testing performed prior to new product implementation confirmed, that new design of cutting edge provides **reduction of screwing time by up to 40%** with same pressure applied during installation. Exact time reduction result depends on type of fastening and wooden elements itself.



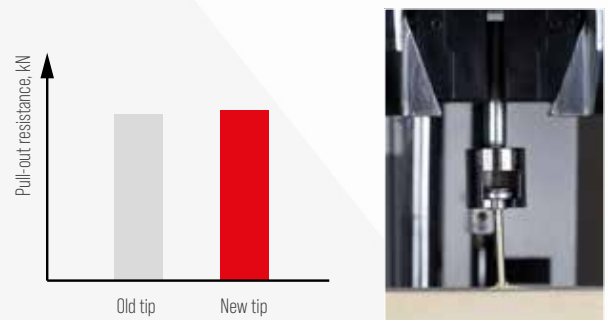
20 % LESS SCREWING RESISTANCE

The new design of cutting edge with added milling **reduces screwing resistance and friction by 20 %**. This parameter is especially needed for contractors, who use power tools on a daily basis - as this extends the battery life.



HIGH PERFORMANCE PARAMETERS

Designed in cooperation with contractors, the new cutting edge with added milling easy screwing and improves performance parameters such as pull-out and shear resistance, etc.

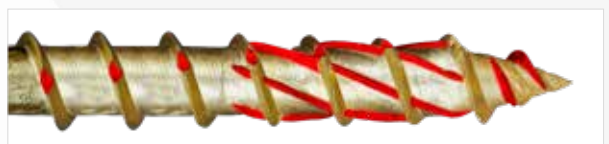


PRODUCT CODES AND BARCODES OF PRODUCTS REMAIN THE SAME

OLD TIP



NEW TIP





WKCP				Flange head construction screw, TX	18
ø5	ø6	ø8	ø10	Length range: 40 - 600 mm	Galvanized - yellow

WKCP-B				Flange head construction screw, TX	18
ø5	ø6	ø8	ø10	Length range: 40 - 600 mm	Galvanized - white



C4
COATING

WKCP-D				Flange head construction screw, TX	32
ø5	ø6	ø8	ø10	Length range: 40 - 600 mm	SQ Ceramic



WKCS				Countersunk head construction screw, TX	40
ø3	ø3,5	ø4	ø4,5	Length range: 30 - 600 mm	Galvanized - yellow
ø5	ø6	ø8	ø10		

WKCS-B				Countersunk head construction screw, TX	40
ø3	ø3,5	ø4	ø4,5	Length range: 30 - 600 mm	Galvanized - white
ø5	ø6	ø8	ø10		



C4
COATING



C4
COATING

WKCS-D				Countersunk head construction screw, TX	60
ø3	ø3,5	ø4	ø4,5	Length range: 30 - 600 mm	SQ Ceramic
ø5	ø6	ø8	ø10		

PWKCS			Washer for countersunk head timber screw
ø6	ø8	ø10	Material: SQ Ceramic, Galvanized - yellow / white



WKCR		Screw with a round head for steel-wood connections	74
ø8	ø10	Length range: 40 - 200 mm	Galvanized - white

WKCH		Screw with a hexagonal head for steel-wood connections	80
ø6	ø8	ø10	Length range: 40 - 400 mm
Galvanized - white			



WKFC			Screw for wooden constructions with full thread and cylindrical head	88
ø6	ø8	ø10	Length range: 80 - 600 mm	Galvanized - white



WKFS		Screw for wooden constructions with full thread and countersunk head	106
ø8	ø10	Length range: 120 - 600 mm	Galvanized - white



WKPC		Screws with double thread for over-rafter insulation, TX	122
ø8		Length range: 165-472 mm	Galvanized - white



WKSS		Spacer screws, TX	126
ø6		Length range: 60 - 160 mm	Galvanized - white



WKLC		Round head screws for steel plates, TX	130
ø5		Length range: 30 - 70 mm	Galvanized - white



K				Hex head wood screw	136
ø6	ø8	ø10	ø12	Length range: 60 - 260 mm	Galvanized - white



KDH / KMH			Hardened countersunk head wood screw with partial/full thread	142
ø3	ø3,5	ø4	Length range: 12 - 200 mm	Galvanized - yellow
ø4,5	ø5	ø6		

WKCP

Flange head construction screw with TX drive

Diameters: $\varnothing 5$ mm | $\varnothing 6$ mm | $\varnothing 8$ mm | $\varnothing 10$ mm

Length range: from 40 to 600 mm



Flange head construction screw with TX drive for structural connections of wooden members, including solid, bonded and wood-based panels.



TX DRIVE



Zn
WHITE



Zn
YELLOW



EUROPEAN TECHNICAL
ASSESSMENT
ETA-18/0817

SCREW MATERIAL - Carbon steel

ANTI-CORROSION PROTECTION - Galvanized steel (white or yellow)

PRODUCT ADVANTAGES:



FLANGE HEAD - Flange head increases the bearing area and provides tight connection as well as resistance to prevent head pull-through.



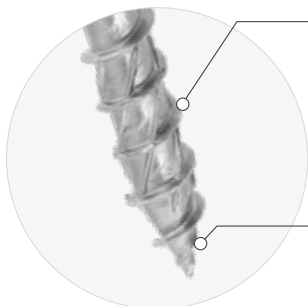
HIGH TORQUE - Allows screws to be installed without pre-drilling, even in hardwood substrates.



SHANK RIBS - Shank ribs reduces installation torque by reaming the hole.



WAX COATING - Wax coating applied during the production process significantly reduces the torque.



NEW CUTTING EDGE / SERRATED THREAD

New special design of cutting edge with added milling reduces screwing resistance by 20%. This helps to extend the life of batteries and power tools. Special cutting notches integrated on the thread cut wood fibres structure while screwing in.

DOUBLE THREAD

Additional recessed second thread improves remarkably the speed of timber penetration and reaction time of first grip into the wood.

EXAMPLES OF APPLICATIONS:



SUBSTRATES



Solid timber

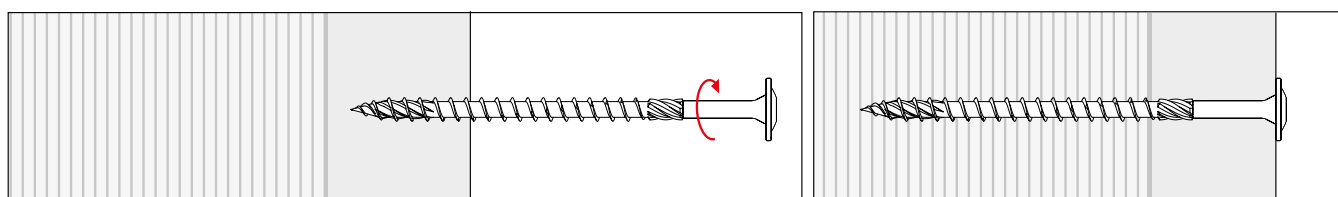


Glued laminated timber
CLT, KVH, BSH/GLT

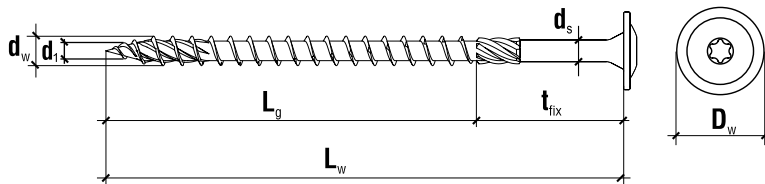


**Laminated Veneer
Lumber - LVL**

INSTALLATION INSTRUCTIONS (screw requires no pre-drilling)



WKCP - Flange head construction screw with TX drive



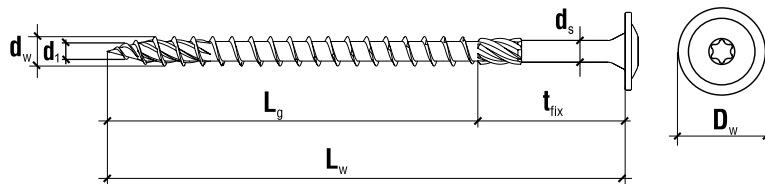
Codes and dimensions							
	Product code		Dimensions	Thread length	Max. usable length	Type of drive	Quantity
	Galvanized - white	Galvanized - yellow	$d_w \times L_w$ [mm]	L_g [mm]	t_{fix} [mm]	[-]	[pcs]
WKCP-5							
ø5	WKCP-05040-B	WKCP-05040	5x40	22	18	TX 25	400
	WKCP-05050-B	WKCP-05050	5x50	30	20	TX 25	250
	WKCP-05060-B	WKCP-05060	5x60	40	20	TX 25	150
	WKCP-05070-B	WKCP-05070	5x70	40	30	TX 25	150
	WKCP-05080-B	WKCP-05080	5x80	50	30	TX 25	150
	WKCP-05090-B	WKCP-05090	5x90	50	40	TX 25	150
	WKCP-05100-B	WKCP-05100	5x100	60	40	TX 25	150
	WKCP-05120-B	WKCP-05120	5x120	60	60	TX 25	150
WKCP-6							
ø6	WKCP-06050-B	WKCP-06050	6x50	30	20	TX 30	100
	WKCP-06060-B	WKCP-06060	6x60	30	30	TX 30	100
	WKCP-06070-B	WKCP-06070	6x70	40	30	TX 30	100
	WKCP-06080-B	WKCP-06080	6x80	50	30	TX 30	100
	WKCP-06090(100)-B	WKCP-06090(100)	6x90	50	40	TX 30	100
	WKCP-06100(100)-B	WKCP-06100(100)	6x100	60	40	TX 30	100
	WKCP-06120(100)-B	WKCP-06120(100)	6x120	75	45	TX 30	100
	WKCP-06140(100)-B	WKCP-06140(100)	6x140	75	65	TX 30	100
	WKCP-06160(100)-B	WKCP-06160(100)	6x160	75	85	TX 30	100
	WKCP-06180(100)-B	WKCP-06180(100)	6x180	75	105	TX 30	100
	WKCP-06200(100)-B	WKCP-06200(100)	6x200	75	125	TX 30	100
	WKCP-06220(100)-B	WKCP-06220(100)	6x220	75	145	TX 30	100
	WKCP-06240(100)-B	WKCP-06240(100)	6x240	75	165	TX 30	100
	WKCP-06260(100)-B	WKCP-06260(100)	6x260	75	185	TX 30	100
	WKCP-06280(100)-B	WKCP-06280(100)	6x280	75	205	TX 30	100
	WKCP-06300(100)-B	WKCP-06300(100)	6x300	75	225	TX 30	100

WKCP - Flange head construction screw with TX drive

Codes and dimensions							
	Product code		Dimensions	Thread length	Max. usable length	Type of drive	Quantity
	Galvanized - white	Galvanized - yellow	d _w x L _w [mm]	L _g [mm]	t _{fix} [mm]	[-]	[pcs]
ø8	WKCP-8						
	WKCP-08040-B	WKCP-08040	8x40	35	5	TX 40	50
	WKCP-08050-B	WKCP-08050	8x50	45	5	TX 40	50
	WKCP-08060-B	WKCP-08060	8x60	50	10	TX 40	50
	WKCP-08080-B	WKCP-08080	8x80	50	30	TX 40	50
	WKCP-08100-B	WKCP-08100	8x100	50	50	TX 40	50
	WKCP-08120-B	WKCP-08120	8x120	80	40	TX 40	50
	WKCP-08140(25)-B	WKCP-08140(25)	8x140	100	40	TX 40	25
	WKCP-08160(25)-B	WKCP-08160(25)	8x160	100	60	TX 40	25
	WKCP-08180-B	WKCP-08180	8x180	100	80	TX 40	50
	WKCP-08200-B	WKCP-08200	8x200	100	100	TX 40	50
	WKCP-08220-B	WKCP-08220	8x220	100	120	TX 40	50
	WKCP-08240-B	WKCP-08240	8x240	100	140	TX 40	50
	WKCP-08260-B	WKCP-08260	8x260	100	160	TX 40	50
	WKCP-08280-B	WKCP-08280	8x280	100	180	TX 40	50
	WKCP-08300-B	WKCP-08300	8x300	100	200	TX 40	50
	WKCP-08320-B	WKCP-08320	8x320	100	220	TX 40	50
	WKCP-08340-B	WKCP-08340	8x340	100	240	TX 40	50
	WKCP-08360-B	WKCP-08360	8x360	100	260	TX 40	50
	WKCP-08380-B	WKCP-08380	8x380	100	280	TX 40	50
	WKCP-08400-B	WKCP-08400	8x400	100	300	TX 40	50
	WKCP-08440-B*	WKCP-08440*	8x440	100	340	TX 40	50
	WKCP-08480-B*	WKCP-08480*	8x480	100	380	TX 40	50
	WKCP-08520-B*	WKCP-08520*	8x520	100	420	TX 40	50
	WKCP-08560-B*	WKCP-08560*	8x560	100	460	TX 40	50
	WKCP-08600-B*	WKCP-08600*	8x600	100	500	TX 40	50
ø10	WKCP-10						
	WKCP-10120(25)-B	WKCP-10120(25)	10x120	80	40	TX 40	25
	WKCP-10140(25)-B	WKCP-10140(25)	10x140	80	60	TX 40	25
	WKCP-10160(25)-B	WKCP-10160(25)	10x160	100	60	TX 40	25
	WKCP-10180(25)-B	WKCP-10180(25)	10x180	100	80	TX 40	25
	WKCP-10200(25)-B	WKCP-10200(25)	10x200	100	100	TX 40	25
	WKCP-10220-B	WKCP-10220	10x220	100	120	TX 40	25
	WKCP-10240-B	WKCP-10240	10x240	100	140	TX 40	25
	WKCP-10260-B	WKCP-10260	10x260	100	160	TX 40	25
	WKCP-10280-B	WKCP-10280	10x280	100	180	TX 40	25
	WKCP-10300-B	WKCP-10300	10x300	100	200	TX 40	25
	WKCP-10320-B	WKCP-10320	10x320	100	220	TX 40	25
	WKCP-10340-B	WKCP-10340	10x340	100	240	TX 40	25
	WKCP-10360-B	WKCP-10360	10x360	100	260	TX 40	25
	WKCP-10380-B	WKCP-10380	10x380	100	280	TX 40	25
	WKCP-10400-B	WKCP-10400	10x400	100	300	TX 40	25
	WKCP-10440-B*	WKCP-10440*	10x440	100	340	TX 40	25
	WKCP-10480-B*	WKCP-10480*	10x480	100	380	TX 40	25
	WKCP-10520-B*	WKCP-10520*	10x520	100	420	TX 40	25
	WKCP-10560-B*	WKCP-10560*	10x560	100	460	TX 40	25
	WKCP-10600-B*	WKCP-10600*	10x600	100	500	TX 40	25

* Product on order

WKCP - Flange head construction screw with TX drive



Geometry

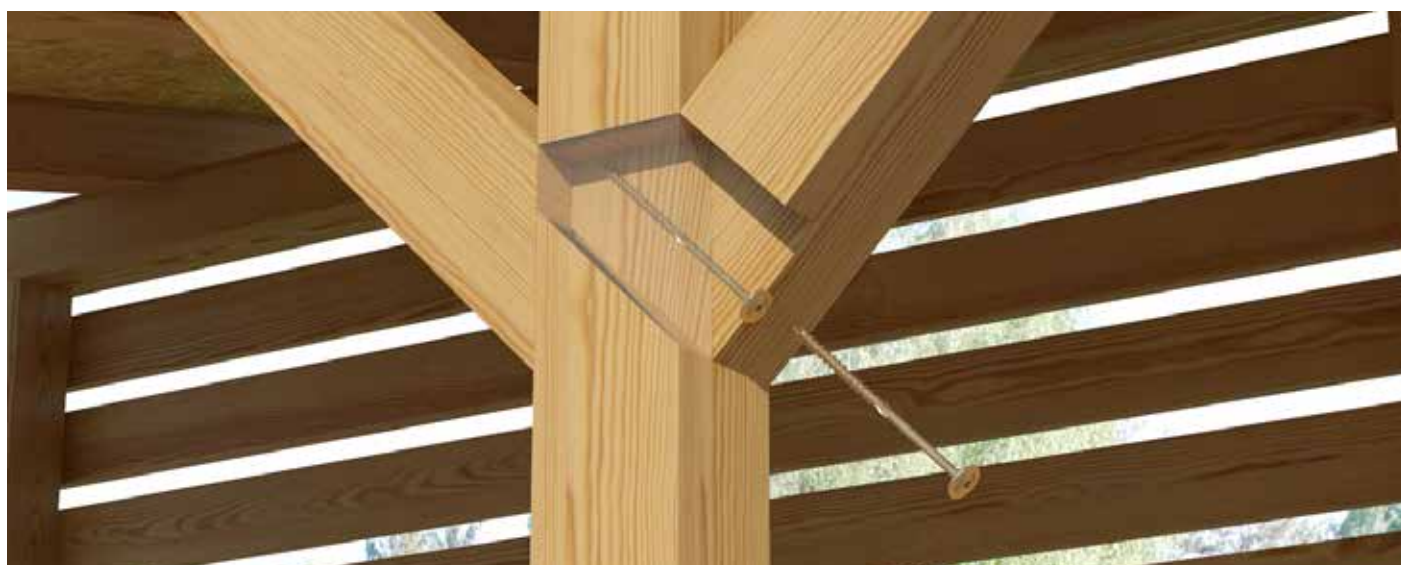
Product	Outer thread diameter	Inner thread diameter	Unthreaded part diameter	Head diameter	Length range
	d_w [mm]	d_i [mm]	d_s [mm]	D_w [mm]	L_w [mm]
WKCP ø5	5	3,15	3,50	12	40-120
WKCP ø6	6	3,80	4,30	14	50-300
WKCP ø8	8	5,50	5,78	21	40-600
WKCP ø10	10	6,30	7,00	25	120-600

Mechanical characteristics

Product	Characteristic yield moment	Characteristic withdrawal resistance parameter - softwood	Characteristic withdrawal resistance parameter - LVL	Characteristic head-pull-through resistance parameter - softwood	Characteristic head-pull-through resistance parameter - LVL	Characteristic tensile strength	Characteristic torsional strength
	$M_{y,k}$ [N*m]	$f_{ak,k}$ [N/mm ²]	$f_{ak,k}$ [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{tens,k}$ [kN]	$f_{tor,k}$ [N*m]
WKCP ø5	6	12	15	15,9	15,9	9	6
WKCP ø6	10	12	13	14,7	14,7	13	10
WKCP ø8	25	12	13	12	12	25	27
WKCP ø10	43	11	13	11	11	36	45

1. Characteristic withdrawal and head-pull-through resistance based on reference density of timber $\rho_a = 350 \text{ kg/m}^3$

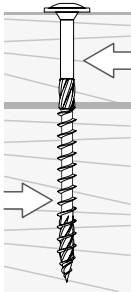
2. Characteristic withdrawal and head-pull-through resistance based on reference density of LVL $\rho_g = 480 \text{ kg/m}^3$



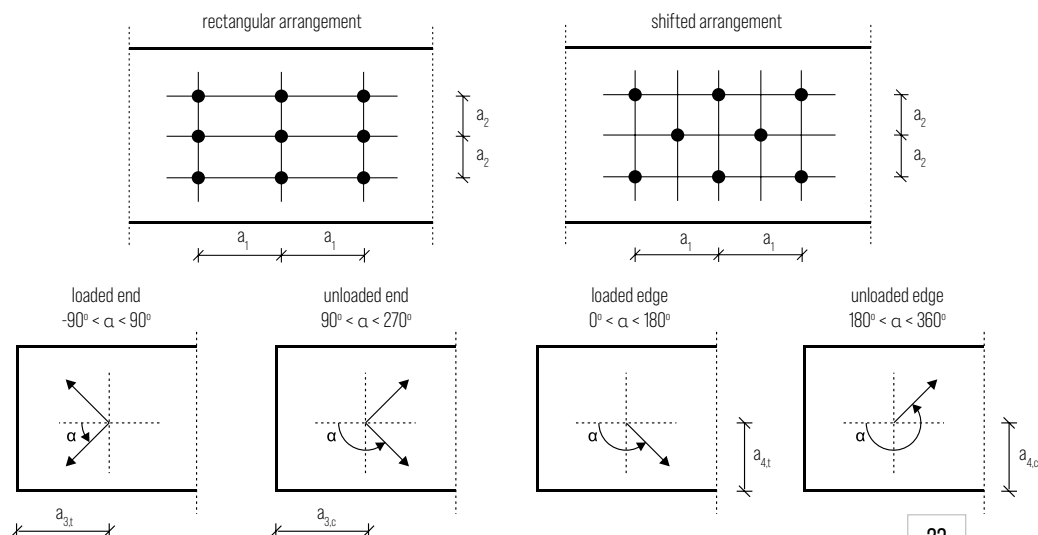
WKCP - Flange head construction screw with TX drive

TIMBER

Minimum distances for laterally loaded screws - timber

Angle between force and fiber direction $\alpha = 0^\circ$					Angle between force and fiber direction $\alpha = 90^\circ$				
									
WITHOUT PRE-DRILLED HOLE					WITHOUT PRE-DRILLED HOLE				
d_w [mm]	Ø 5	Ø 6	Ø 8	Ø 10	d_w [mm]	Ø 5	Ø 6	Ø 8	Ø 10
a_1 [mm]	60	72	96	120	a_1 [mm]	25	30	40	50
a_2 [mm]	25	30	40	50	a_2 [mm]	25	30	40	50
$a_{3,t}$ [mm]	75	90	120	150	$a_{3,t}$ [mm]	50	60	80	100
$a_{3,c}$ [mm]	50	60	80	100	$a_{3,c}$ [mm]	50	60	80	100
$a_{4,t}$ [mm]	25	30	40	50	$a_{4,t}$ [mm]	50	60	80	100
$a_{4,c}$ [mm]	25	30	40	50	$a_{4,c}$ [mm]	25	30	40	50
WITH PRE-DRILLED HOLE					WITH PRE-DRILLED HOLE				
d_w [mm]	Ø 5	Ø 6	Ø 8	Ø 10	d_w [mm]	Ø 5	Ø 6	Ø 8	Ø 10
d_0 [mm]	3	4	5	6	d_0 [mm]	3	4	5	6
a_1 [mm]	25	30	40	50	a_1 [mm]	20	24	32	40
a_2 [mm]	15	18	24	30	a_2 [mm]	20	24	32	40
$a_{3,t}$ [mm]	60	72	96	120	$a_{3,t}$ [mm]	35	42	56	70
$a_{3,c}$ [mm]	35	42	56	70	$a_{3,c}$ [mm]	35	42	56	70
$a_{4,t}$ [mm]	15	18	24	30	$a_{4,t}$ [mm]	35	42	56	70
$a_{4,c}$ [mm]	15	18	24	30	$a_{4,c}$ [mm]	15	18	24	30

1. Minimum distances in accordance with EN 1995 and ETA-18/0817
2. Minimum distances is valid for timber characteristic density of $\rho_k \leq 420 \text{ kg/m}^3$
3. In case of connection panel-timber minimum distances (a_1, a_2) should be multiplied by a factor of 0,85
4. Hole diameter d_0 is valid for softwood



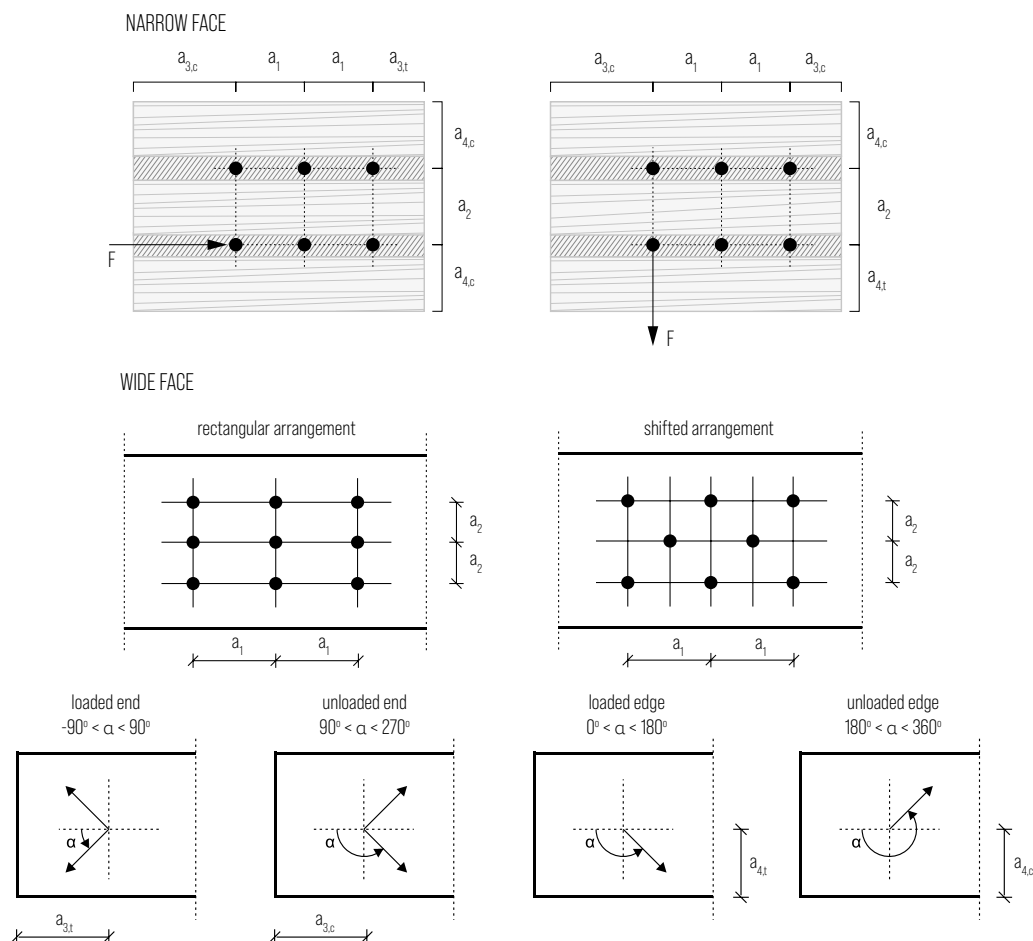
WKCP - Flange head construction screw with TX drive
CLT

Minimum distances for laterally and/or axially loaded screws - CLT

WIDE FACE				NARROW FACE			
WITHOUT PRE-DRILLED HOLE				WITHOUT PRE-DRILLED HOLE			
d_w [mm]	Ø 6	Ø 8	Ø 10	d_w [mm]	Ø 6	Ø 8	Ø 10
a_1 [mm]	24	32	40	a_1 [mm]	60	80	100
a_2 [mm]	15	20	25	a_2 [mm]	24	32	40
$a_{3,t}$ [mm]	36	48	60	$a_{3,t}$ [mm]	72	96	120
$a_{3,c}$ [mm]	36	48	60	$a_{3,c}$ [mm]	42	56	70
$a_{4,t}$ [mm]	36	48	60	$a_{4,t}$ [mm]	36	48	60
$a_{4,c}$ [mm]	15	20	25	$a_{4,c}$ [mm]	18	24	30

1. Minimum distances in accordance with ETA-18/0817

 2. Minimum CLT thickness $t_{\min} = 10d_w$

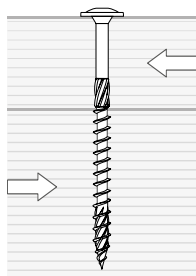
 3. Minimum penetration depth in CLT narrow face $l_{ef} = 10d_w$


WKCP - Flange head construction screw with TX drive

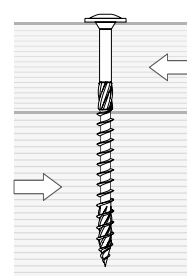
LVL

Minimum distances for laterally loaded screws - LVL

Angle between force and fiber direction $\alpha = 0^\circ$



Angle between force and fiber direction $\alpha = 90^\circ$



WITHOUT PRE-DRILLED HOLE

WITHOUT PRE-DRILLED HOLE

d_w [mm]	Ø 5	Ø 6	Ø 8	Ø 10	d_w [mm]	Ø 5	Ø 6	Ø 8	Ø 10
a_1 [mm]	75	90	120	150	a_1 [mm]	35	42	56	70
a_2 [mm]	35	42	56	70	a_2 [mm]	35	42	56	70
$a_{3,t}$ [mm]	100	120	160	200	$a_{3,t}$ [mm]	75	90	120	150
$a_{3,c}$ [mm]	75	90	120	150	$a_{3,c}$ [mm]	75	90	120	150
$a_{4,t}$ [mm]	35	42	56	70	$a_{4,t}$ [mm]	60	72	96	120
$a_{4,c}$ [mm]	35	42	56	70	$a_{4,c}$ [mm]	35	42	56	70

d_w [mm]	Ø 5	Ø 6	Ø 8	Ø 10	d_w [mm]	Ø 5	Ø 6	Ø 8	Ø 10
d_0 [mm]	3	4	5	6	d_0 [mm]	3	4	5	6
a_1 [mm]	25	30	40	50	a_1 [mm]	20	24	32	40
a_2 [mm]	15	18	24	30	a_2 [mm]	20	24	32	40
$a_{3,t}$ [mm]	60	72	96	120	$a_{3,t}$ [mm]	35	42	56	70
$a_{3,c}$ [mm]	35	42	56	70	$a_{3,c}$ [mm]	35	42	56	70
$a_{4,t}$ [mm]	15	18	24	30	$a_{4,t}$ [mm]	35	42	56	70
$a_{4,c}$ [mm]	15	18	24	30	$a_{4,c}$ [mm]	15	18	24	30

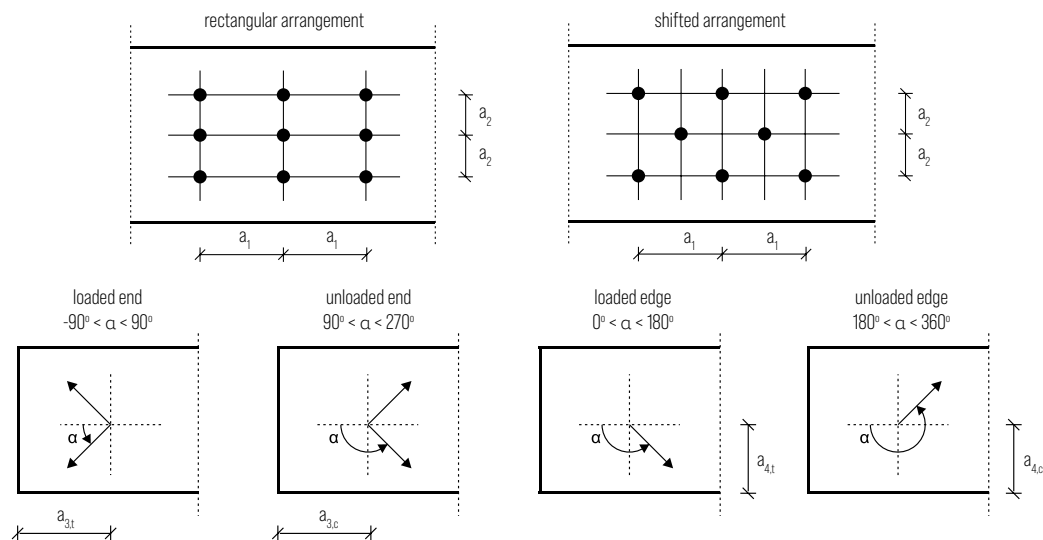
WITH PRE-DRILLED HOLE

WITH PRE-DRILLED HOLE

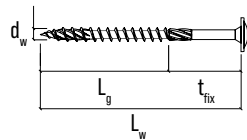
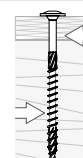
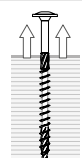
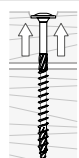
1. Minimum distances in accordance with EN 1995 and ETA-18/0817

2. Minimum distances is valid for LVL characteristic density in range of $420 \text{ kg/m}^3 < p_k \leq 500 \text{ kg/m}^3$

3. Hole diameter d_0 is valid for softwood LVL

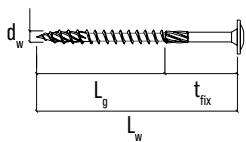


WKCP - Flange head construction screw with TX drive
TIMBER

Characteristic resistances for laterally and axially loaded screws - timber								
DIMENSIONS				SHEAR		TENSION		
Diameter	Length	Thread length	Usable length	timber-timber	OSB-timber	Withdrawal	Head pull-through	
								
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{v,k} [kN]	R _{v,k} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]	
WKCP 5								
ø5	40	22	18	1,07	t = 15 mm	1,20	1,32	2,29
	50	30	20	1,35		1,30	1,80	2,29
	60	40	20	1,47		1,30	2,40	2,29
	70	40	30	1,70		1,30	2,40	2,29
	80	50	30	1,70		1,30	3,00	2,29
	90	50	40	1,76		1,30	3,00	2,29
	100	60	40	1,76		1,30	3,60	2,29
	120	60	60	1,76		1,30	3,60	2,29
WKCP 6								
ø6	50	30	20	1,62	t = 15 mm	1,66	2,16	2,88
	60	30	30	1,79		1,66	2,16	2,88
	70	40	30	2,10		1,66	2,88	2,88
	80	50	30	2,10		1,66	3,60	2,88
	90	50	40	2,35		1,66	3,60	2,88
	100	60	40	2,35		1,66	4,32	2,88
	120	75	45	2,35		1,66	5,40	2,88
	140	75	65	2,35		1,66	5,40	2,88
	160	75	85	2,35		1,66	5,40	2,88
	180	75	105	2,35		1,66	5,40	2,88
	200	75	125	2,35		1,66	5,40	2,88
	220	75	145	2,35		1,66	5,40	2,88
	240	75	165	2,35		1,66	5,40	2,88
	260	75	185	2,35		1,66	5,40	2,88
	280	75	205	2,35		1,66	5,40	2,88
	300	75	225	2,35		1,66	5,40	2,88
WKCP 8								
ø8	40	35	5	0,62	t = 18 mm	1,69	3,36	5,29
	50	45	5	0,62		2,24	4,32	5,29
	60	50	10	1,23		2,78	4,80	5,29
	80	50	30	3,25		2,92	4,80	5,29
	100	50	50	3,75		2,92	4,80	5,29
	120	80	40	3,65		2,92	7,68	5,29
	140	100	40	3,65		2,92	9,60	5,29
	160	100	60	4,18		2,92	9,60	5,29
	180	100	80	4,18		2,92	9,60	5,29
	200	100	100	4,18		2,92	9,60	5,29

WKCP - Flange head construction screw with TX drive
TIMBER

Characteristic resistances for laterally and axially loaded screws - timber

DIMENSIONS				SHEAR		TENSION		
Diameter	Length	Thread length	Usable length	timber-timber	OSB-timber	Withdrawal	Head pull-through	
								
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{V,k} [kN]	R _{V,k} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]	
WKCP 8								
ø8	220	100	120	4,18	t = 18 mm	2,92	9,60	5,29
	240	100	140	4,18		2,92	9,60	5,29
	260	100	160	4,18		2,92	9,60	5,29
	280	100	180	4,18		2,92	9,60	5,29
	300	100	200	4,18		2,92	9,60	5,29
	320	100	220	4,18		2,92	9,60	5,29
	340	100	240	4,18		2,92	9,60	5,29
	360	100	260	4,18		2,92	9,60	5,29
	380	100	280	4,18		2,92	9,60	5,29
	400	100	300	4,18		2,92	9,60	5,29
	440	100	340	4,18		2,92	9,60	5,29
	480	100	380	4,18		2,92	9,60	5,29
	520	100	420	4,18		2,92	9,60	5,29
	560	100	460	4,18		2,92	9,60	5,29
	600	100	500	4,18		2,92	9,60	5,29
WKCP 10								
ø10	120	80	40	4,74	t = 22 mm	3,89	8,80	6,88
	140	80	60	5,45		3,89	8,80	6,88
	160	100	60	5,45		3,89	11,00	6,88
	180	100	80	5,76		3,89	11,00	6,88
	200	100	100	5,76		3,89	11,00	6,88
	220	100	120	5,76		3,89	11,00	6,88
	240	100	140	5,76		3,89	11,00	6,88
	260	100	160	5,76		3,89	11,00	6,88
	280	100	180	5,76		3,89	11,00	6,88
	300	100	200	5,76		3,89	11,00	6,88
	320	100	220	5,76		3,89	11,00	6,88
	340	100	240	5,76		3,89	11,00	6,88
	360	100	260	5,76		3,89	11,00	6,88
	380	100	280	5,76		3,89	11,00	6,88
	400	100	300	5,76		3,89	11,00	6,88
	440	100	340	5,76		3,89	11,00	6,88
	480	100	380	5,76		3,89	11,00	6,88
	520	100	420	5,76		3,89	11,00	6,88
	560	100	460	5,76		3,89	11,00	6,88
	600	100	500	5,76		3,89	11,00	6,88

NOTES:

1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817

2. In order to obtain a design resistance, use the following formula :

$$R_d = \frac{R_k * k_{mod}}{\gamma_M}$$

Factors γ_M and k_{mod} should be taken in accordance with EN 19953. Characteristic resistances were calculated for a characteristic density of timber $\rho_k = 350 \text{ kg/m}^3$

4. Characteristic resistances were calculated considering that the threaded part of the screw is fully inserted into timber element

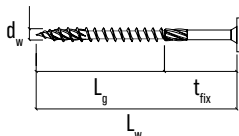
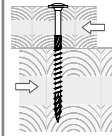
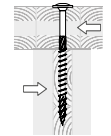
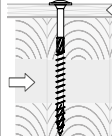
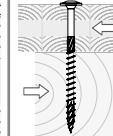
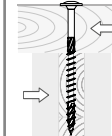
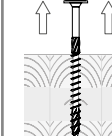
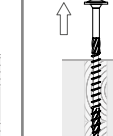
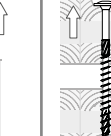
5. Characteristic shear resistances were calculated for connections without pre-drilled holes

6. Characteristic shear resistances for OSB-timber connections were calculated for OSB board with thickness t [mm] in accordance with EN 3007. Characteristic withdrawal resistances were calculated assuming an angle of 90° between screw and grain direction and for penetration length equal L_g

8. Characteristic head pull-through resistances were calculated for timber element

WKCP - Flange head construction screw with TX drive
CLT

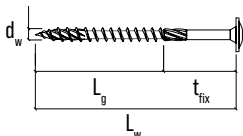
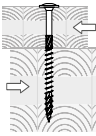
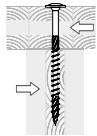
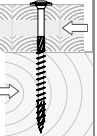
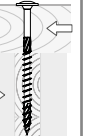
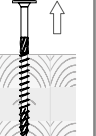
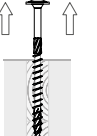
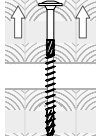
Characteristic resistances for laterally and axially loaded screws - CLT

DIMENSIONS				SHEAR					TENSION			
Diameter	Length	Thread length	Usable length	CLT-CLT (wide face-wide face)	CLT-CLT (wide face-narrow face)	OSB-CLT (wide face)	CLT-timber (wide face)	timber-CLT (narrow face)	Withdrawal (wide face)	Withdrawal (narrow face)	Head pull-through	
												
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{ax,k} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]	
WKCP 6												
ø6	50	30	20	1,62	-	t = 15 mm	1,66	1,62	-	2,16	-	2,88
	60	30	30	1,79	-		1,66	1,79	-	2,16	-	2,88
	70	40	30	2,10	-		1,66	2,10	-	2,88	-	2,88
	80	50	30	2,10	-		1,66	2,10	-	3,60	-	2,88
	90	50	40	2,35	-		1,66	2,35	-	3,60	-	2,88
	100	60	40	2,35	-		1,66	2,35	-	4,32	-	2,88
	120	75	45	2,35	-		1,66	2,35	-	5,40	-	2,88
	140	75	65	2,35	-		1,66	2,35	-	5,40	-	2,88
	160	75	85	2,35	-		1,66	2,35	-	5,40	-	2,88
	180	75	105	2,35	-		1,66	2,35	-	5,40	-	2,88
	200	75	125	2,35	-		1,66	2,35	-	5,40	-	2,88
	220	75	145	2,35	-		1,66	2,35	-	5,40	-	2,88
	240	75	165	2,35	-		1,66	2,35	-	5,40	-	2,88
	260	75	185	2,35	-		1,66	2,35	-	5,40	-	2,88
	280	75	205	2,35	-		1,66	2,35	-	5,40	-	2,88
	300	75	225	2,35	-		1,66	2,35	-	5,40	-	2,88
WKCP 8												
ø8	40	35	5	0,62	-	t = 18 mm	-	0,62	-	3,36	-	5,29
	50	45	5	0,62	-		2,24	0,62	-	4,32	-	5,29
	60	50	10	1,23	-		2,78	1,23	-	4,80	-	5,29
	80	50	30	3,25	-		2,92	3,25	-	4,80	-	5,29
	100	50	50	3,75	-		2,92	3,75	-	4,80	-	5,29
	120	80	40	3,65	3,25		2,92	3,65	3,25	7,68	5,45	5,29
	140	100	40	3,65	3,27		2,92	3,65	3,27	9,60	6,66	5,29
	160	100	60	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	180	100	80	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	200	100	100	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29

WKCP - Flange head construction screw with TX drive

CLT

Characteristic resistances for laterally and axially loaded screws - CLT

DIMENSIONS				SHEAR					TENSION			
Diameter	Length	Thread length	Usable length	CLT-CLT (wide face-wide face)	CLT-CLT (wide face-narrow face)	OSB-CLT (wide face)	CLT-timber (wide face)	timber-CLT (narrow face)	Withdrawal (wide face)	Withdrawal (narrow face)	Head pull-through	
												
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{Vk} [kN]	R _{Vk} [kN]	R _{Vk} [kN]	R _{Vk} [kN]	R _{Vk} [kN]	R _{ax,k} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]	
WKCP 8												
ø8	220	100	120	4,18	3,59	t = 18 mm	2,92	4,18	3,59	9,60	6,66	5,29
	240	100	140	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	260	100	160	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	280	100	180	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	300	100	200	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	320	100	220	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	340	100	240	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	360	100	260	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	380	100	280	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	400	100	300	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	440	100	340	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	480	100	380	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	520	100	420	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	560	100	460	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	600	100	500	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
WKCP 10												
ø10	120	80	40	4,74	-	t = 22 mm	3,89	4,74	-	8,80	-	6,88
	140	80	60	5,45	-		3,89	5,45	-	8,80	-	6,88
	160	100	60	5,45	4,69		3,89	5,45	4,69	11,00	7,96	6,88
	180	100	80	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	200	100	100	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	220	100	120	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	240	100	140	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	260	100	160	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	280	100	180	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	300	100	200	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	320	100	220	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	340	100	240	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	360	100	260	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	380	100	280	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	400	100	300	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	440	100	340	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	480	100	380	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	520	100	420	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	560	100	460	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	600	100	500	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88

NOTES:

1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817
2. In order to obtain a design resistance, use the following formula :

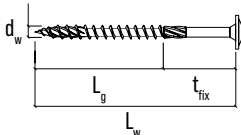
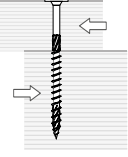
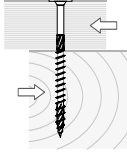
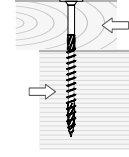
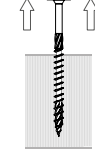
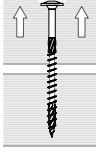
$$R_d = \frac{R_k * k_{mod}}{\gamma_M}$$

Factors γ_M and k_{mod} should be taken in accordance with EN 1995

3. Characteristic resistances were calculated for a characteristic density of timber and CLT $\rho_k = 350 \text{ kg/m}^3$
4. Characteristic resistances were calculated considering that the threaded part of the screw is fully inserted into timber element
5. Characteristic shear resistances were calculated for connections without pre-drilled holes
6. Characteristic shear resistances for OSB-timber connections were calculated for OSB board with thickness t [mm] in accordance with EN 300
7. Characteristic withdrawal resistances of CLT wide face were calculated assuming an angle of 90° between screw and grain direction and for minimum penetration length equal L_g
8. Characteristic withdrawal resistances of CLT narrow face were calculated for minimum thickness $t_{min} = 10d_w$ and for minimum penetration length equal $L_{gr} = 10d_w$
9. Characteristic head pull-through resistances were calculated for CLT

WKCP - Flange head construction screw with TX drive
LVL

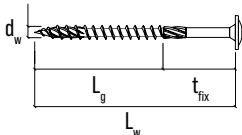
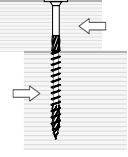
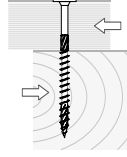
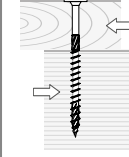
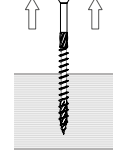
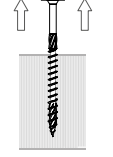
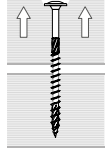
Characteristic resistances for laterally and axially loaded screws - LVL

DIMENSIONS				SHEAR			TENSION		
Diameter	Length	Thread length	Usable length	LVL-LVL	LVL-timber	timber-LVL	Withdrawal (wide face)	Withdrawal (edge face)	Head pull-through
									
d_w [mm]	L_w [mm]	L_g [mm]	t_{fix} [mm]	$R_{V,k}$ [kN]	$R_{V,k}$ [kN]	$R_{V,k}$ [kN]	$R_{ax,k}$ [kN]	$R_{ax,k}$ [kN]	$R_{head,k}$ [kN]
WKCP 5									
ø5	40	22	18	-	-	-	1,65	1,10	2,29
	50	30	20	-	-	-	2,25	1,50	2,29
	60	40	20	-	-	-	3,00	2,00	2,29
	70	40	30	1,96	1,85	1,76	3,00	2,00	2,29
	80	50	30	1,96	1,85	1,76	3,75	2,50	2,29
	90	50	40	1,96	1,85	1,85	3,75	2,50	2,29
	100	60	40	1,96	1,85	1,85	4,50	3,00	2,29
	120	60	60	1,96	1,85	1,85	4,50	3,00	2,29
WKCP 6									
ø6	50	30	20	-	-	-	2,34	1,56	2,88
	60	30	30	2,30	2,00	2,04	2,34	1,56	2,88
	70	40	30	2,50	2,39	2,18	3,12	2,08	2,88
	80	50	30	2,50	2,39	2,18	3,90	2,60	2,88
	90	50	40	2,63	2,47	2,47	3,90	2,60	2,88
	100	60	40	2,63	2,47	2,47	4,68	3,12	2,88
	120	75	45	2,63	2,47	2,47	5,85	3,90	2,88
	140	75	65	2,63	2,47	2,47	5,85	3,90	2,88
	160	75	85	2,63	2,47	2,47	5,85	3,90	2,88
	180	75	105	2,63	2,47	2,47	5,85	3,90	2,88
	200	75	125	2,63	2,47	2,47	5,85	3,90	2,88
	220	75	145	2,63	2,47	2,47	5,85	3,90	2,88
	240	75	165	2,63	2,47	2,47	5,85	3,90	2,88
	260	75	185	2,63	2,47	2,47	5,85	3,90	2,88
	280	75	205	2,63	2,47	2,47	5,85	3,90	2,88
	300	75	225	2,63	2,47	2,47	5,85	3,90	2,88
WKCP 8									
ø8	40	35	5	-	-	-	3,64	2,43	5,29
	50	45	5	-	-	-	4,68	3,12	5,29
	60	50	10	-	-	-	5,20	3,47	5,29
	80	50	30	3,86	3,58	3,48	5,20	3,47	5,29
	100	50	50	4,64	3,99	4,09	5,20	3,47	5,29
	120	80	40	4,30	4,12	3,78	8,32	5,55	5,29
	140	100	40	4,30	4,12	3,78	10,40	6,93	5,29
	160	100	60	4,66	4,39	4,39	10,40	6,93	5,29
	180	100	80	4,66	4,39	4,39	10,40	6,93	5,29
	200	100	100	4,66	4,39	4,39	10,40	6,93	5,29

WKCP - Flange head construction screw with TX drive

LVL

Characteristic resistances for laterally and axially loaded screws - LVL

DIMENSIONS				SHEAR			TENSION		
Diameter	Length	Thread length	Usable length	LVL-LVL	LVL-timber	timber-LVL	Withdrawal (wide face)	Withdrawal (edge face)	Head pull-through
									
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{ak,k} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]
WKCP 8									
ø8	220	100	120	4,66	4,39	4,39	10,40	6,93	5,29
	240	100	140	4,66	4,39	4,39	10,40	6,93	5,29
	260	100	160	4,66	4,39	4,39	10,40	6,93	5,29
	280	100	180	4,66	4,39	4,39	10,40	6,93	5,29
	300	100	200	4,66	4,39	4,39	10,40	6,93	5,29
	320	100	220	4,66	4,39	4,39	10,40	6,93	5,29
	340	100	240	4,66	4,39	4,39	10,40	6,93	5,29
	360	100	260	4,66	4,39	4,39	10,40	6,93	5,29
	380	100	280	4,66	4,39	4,39	10,40	6,93	5,29
	400	100	300	4,66	4,39	4,39	10,40	6,93	5,29
	440	100	340	4,66	4,39	4,39	10,40	6,93	5,29
	480	100	380	4,66	4,39	4,39	10,40	6,93	5,29
	520	100	420	4,66	4,39	4,39	10,40	6,93	5,29
	560	100	460	4,66	4,39	4,39	10,40	6,93	5,29
	600	100	500	4,66	4,39	4,39	10,40	6,93	5,29
WKCP 10									
ø10	120	80	40	5,51	5,27	4,92	10,40	6,93	6,88
	140	80	60	6,46	6,07	5,65	10,40	6,93	6,88
	160	100	60	6,46	6,07	5,65	13,00	8,67	6,88
	180	100	80	6,46	6,07	6,07	13,00	8,67	6,88
	200	100	100	6,46	6,07	6,07	13,00	8,67	6,88
	220	100	120	6,46	6,07	6,07	13,00	8,67	6,88
	240	100	140	6,46	6,07	6,07	13,00	8,67	6,88
	260	100	160	6,46	6,07	6,07	13,00	8,67	6,88
	280	100	180	6,46	6,07	6,07	13,00	8,67	6,88
	300	100	200	6,46	6,07	6,07	13,00	8,67	6,88
	320	100	220	6,46	6,07	6,07	13,00	8,67	6,88
	340	100	240	6,46	6,07	6,07	13,00	8,67	6,88
	360	100	260	6,46	6,07	6,07	13,00	8,67	6,88
	380	100	280	6,46	6,07	6,07	13,00	8,67	6,88
	400	100	300	6,46	6,07	6,07	13,00	8,67	6,88
	440	100	340	6,46	6,07	6,07	13,00	8,67	6,88
	480	100	380	6,46	6,07	6,07	13,00	8,67	6,88
	520	100	420	6,46	6,07	6,07	13,00	8,67	6,88
	560	100	460	6,46	6,07	6,07	13,00	8,67	6,88
	600	100	500	6,46	6,07	6,07	13,00	8,67	6,88

NOTES:

1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817

2. In order to obtain a design resistance, use the following formula :

$$R_d = \frac{R_k * k_{mod}}{\gamma_M}$$

Factors γ_M and k_{mod} should be taken in accordance with EN 1995

3. Characteristic resistances were calculated for a characteristic density of timber $\rho_k = 350 \text{ kg/m}^3$ and LVL $\rho_k = 480 \text{ kg/m}^3$

4. Characteristic resistances were calculated considering that the threaded part of the screw is fully inserted into timber element

5. Characteristic shear resistances were calculated for connections without pre-drilled holes

6. Characteristic withdrawal resistances were calculated assuming an angle of 90° between screw and grain direction and for penetration length equal L_g

7. Characteristic head pull-through resistances were calculated for LVL

WKCP-D (SQ Ceramic)

Flange head construction screw with TX drive

Diameters: $\varnothing 5$ mm | $\varnothing 6$ mm | $\varnothing 8$ mm | $\varnothing 10$ mm

Length range: from 40 to 600 mm



Flange head construction screw with TX drive for structural connections of wooden members, including solid, bonded and wood-based panels.



TX DRIVE



HIGH CORROSION RESISTANCE
C4 COATING



EUROPEAN TECHNICAL
ASSESSMENT
ETA-18/0817

SCREW MATERIAL - Carbon steel

ANTI-CORROSION PROTECTION - SQ Ceramic (C4 Coating)

PRODUCT ADVANTAGES:



FLANGE HEAD - Flange head increases the bearing area and provides tight connection as well as resistance to prevent head pull-through.



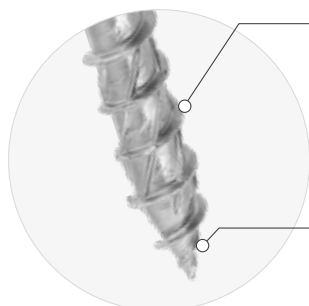
SHANK RIBS - Shank ribs reduce installation torque by reaming the hole.



HIGH TORQUE - Allows screws to be installed without pre-drilling, even in hardwood substrates.



WAX COATING - Wax coating applied during the production process significantly reduces the torque.



NEW CUTTING EDGE / SERRATED THREAD

New special design of cutting edge with added milling reduces screwing resistance by 20%. This helps to extend the life of batteries and power tools. Special cutting notches integrated on the thread cut wood fibres structure while screwing in.

DOUBLE THREAD

Additional recessed second thread improves remarkably the speed of timber penetration and reaction time of first grip into the wood.

EXAMPLES OF APPLICATIONS:



SUBSTRATES



Solid timber

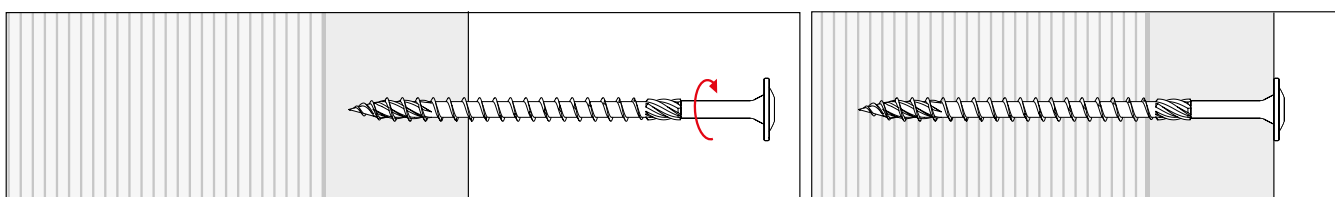


Glued laminated timber
CLT, KVH, BSH/GLT

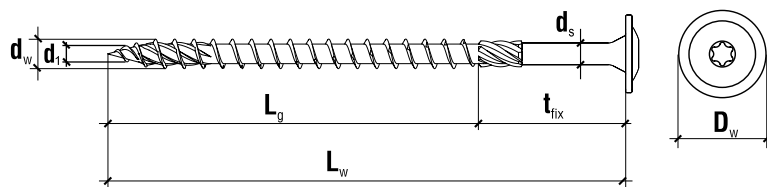


**Laminated Veneer
Lumber - LVL**

INSTALLATION INSTRUCTIONS (screw requires no pre-drilling)



WKCP-D - Flange head construction screw with TX drive



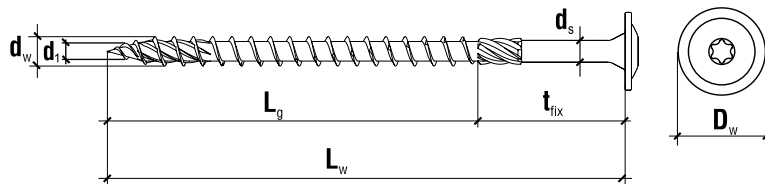
Codes and dimensions						
	Product code	Dimensions	Thread length	Max. usable length	Type of drive	Quantity
	SQ Ceramic	$d_w \times L_w$ [mm]	L_g [mm]	t_{fix} [mm]	[-]	[pcs]
WKCP-D-5						
ø5	WKCP-05040-D	5x40	22	18	TX 25	400
	WKCP-05050-D	5x50	30	20	TX 25	250
	WKCP-05060-D	5x60	40	20	TX 25	150
	WKCP-05070-D	5x70	40	30	TX 25	150
	WKCP-05080-D	5x80	50	30	TX 25	150
	WKCP-05090-D	5x90	50	40	TX 25	150
	WKCP-05100-D	5x100	60	40	TX 25	150
	WKCP-05120-D	5x120	60	60	TX 25	150
WKCP-D-6						
ø6	WKCP-06050-D	6x50	30	20	TX 30	100
	WKCP-06060-D	6x60	30	30	TX 30	100
	WKCP-06070-D	6x70	40	30	TX 30	100
	WKCP-06080-D	6x80	50	30	TX 30	100
	WKCP-06090(100)-D	6x90	50	40	TX 30	100
	WKCP-06100(100)-D	6x100	60	40	TX 30	100
	WKCP-06120(100)-D	6x120	75	45	TX 30	100
	WKCP-06140(100)-D	6x140	75	65	TX 30	100
	WKCP-06160(100)-D	6x160	75	85	TX 30	100
	WKCP-06180(100)-D	6x180	75	105	TX 30	100
	WKCP-06200(100)-D	6x200	75	125	TX 30	100
	WKCP-06220(100)-D	6x220	75	145	TX 30	100
	WKCP-06240(100)-D	6x240	75	165	TX 30	100
	WKCP-06260(100)-D	6x260	75	185	TX 30	100
	WKCP-06280(100)-D	6x280	75	205	TX 30	100
	WKCP-06300(100)-D	6x300	75	225	TX 30	100

WKCP-D - Flange head construction screw with TX drive

Codes and dimensions						
	Product code	Dimensions	Thread length	Max. usable length	Type of drive	Quantity
	SQ Ceramic	d _w x L _w [mm]	L _g [mm]	t _{fix} [mm]	[-]	[pcs]
WKCP-D-8						
ø8	WKCP-08040-D	8x40	35	5	TX 40	50
	WKCP-08050-D	8x50	45	5	TX 40	50
	WKCP-08060-D	8x60	50	10	TX 40	50
	WKCP-08080-D	8x80	50	30	TX 40	50
	WKCP-08100-D	8x100	50	50	TX 40	50
	WKCP-08120-D	8x120	80	40	TX 40	50
	WKCP-08140(25)-D	8x140	100	40	TX 40	25
	WKCP-08160(25)-D	8x160	100	60	TX 40	25
	WKCP-08180-D	8x180	100	80	TX 40	50
	WKCP-08200-D	8x200	100	100	TX 40	50
	WKCP-08220-D	8x220	100	120	TX 40	50
	WKCP-08240-D	8x240	100	140	TX 40	50
	WKCP-08260-D	8x260	100	160	TX 40	50
	WKCP-08280-D	8x280	100	180	TX 40	50
	WKCP-08300-D	8x300	100	200	TX 40	50
	WKCP-08320-D	8x320	100	220	TX 40	50
	WKCP-08340-D	8x340	100	240	TX 40	50
	WKCP-08360-D	8x360	100	260	TX 40	50
	WKCP-08380-D	8x380	100	280	TX 40	50
	WKCP-08400-D	8x400	100	300	TX 40	50
	WKCP-08440-D*	8x440	100	340	TX 40	50
	WKCP-08480-D*	8x480	100	380	TX 40	50
	WKCP-08520-D*	8x520	100	420	TX 40	50
	WKCP-08560-D*	8x560	100	460	TX 40	50
	WKCP-08600-D*	8x600	100	500	TX 40	50
WKCP-D-10						
ø10	WKCP-10120(25)-D	10x120	80	40	TX 40	25
	WKCP-10140(25)-D	10x140	80	60	TX 40	25
	WKCP-10160(25)-D	10x160	100	60	TX 40	25
	WKCP-10180(25)-D	10x180	100	80	TX 40	25
	WKCP-10200(25)-D	10x200	100	100	TX 40	25
	WKCP-10220-D	10x220	100	120	TX 40	25
	WKCP-10240-D	10x240	100	140	TX 40	25
	WKCP-10260-D	10x260	100	160	TX 40	25
	WKCP-10280-D	10x280	100	180	TX 40	25
	WKCP-10300-D	10x300	100	200	TX 40	25
	WKCP-10320-D	10x320	100	220	TX 40	25
	WKCP-10340-D	10x340	100	240	TX 40	25
	WKCP-10360-D	10x360	100	260	TX 40	25
	WKCP-10380-D	10x380	100	280	TX 40	25
	WKCP-10400-D	10x400	100	300	TX 40	25
	WKCP-10440-D*	10x440	100	340	TX 40	25
	WKCP-10480-D*	10x480	100	380	TX 40	25
	WKCP-10520-D*	10x520	100	420	TX 40	25
	WKCP-10560-D*	10x560	100	460	TX 40	25
	WKCP-10600-D*	10x600	100	500	TX 40	25

* Product on order

WKCP-D - Flange head construction screw with TX drive



Geometry

Product	Outer thread diameter	Inner thread diameter	Unthreaded part diameter	Head diameter	Length range
	d_w [mm]	d_i [mm]	d_s [mm]	D_w [mm]	L_w [mm]
WKCP-D ø5	5	3,15	3,50	12	40-120
WKCP-D ø6	6	3,80	4,30	14	50-300
WKCP-D ø8	8	5,50	5,78	21	40-600
WKCP-D ø10	10	6,30	7,00	25	120-600

Mechanical characteristics

Product	Characteristic yield moment	Characteristic withdrawal resistance parameter - softwood	Characteristic withdrawal resistance parameter - LVL	Characteristic head-pull-through resistance parameter - softwood	Characteristic head-pull-through resistance parameter - LVL	Characteristic tensile strength	Characteristic torsional strength
	M_{yk} [N*m]	$f_{ak,k}$ [N/mm ²]	$f_{ak,k}$ [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{tens,k}$ [kN]	$f_{tor,k}$ [N*m]
WKCP-D ø5	6	12	15	15,9	15,9	9	6
WKCP-D ø6	10	12	13	14,7	14,7	13	10
WKCP-D ø8	25	12	13	12	12	25	27
WKCP-D ø10	43	11	13	11	11	36	45

1. Characteristic withdrawal and head-pull-through resistance based on reference density of timber $\rho_a = 350 \text{ kg/m}^3$

2. Characteristic withdrawal and head-pull-through resistance based on reference density of LVL $\rho_g = 480 \text{ kg/m}^3$

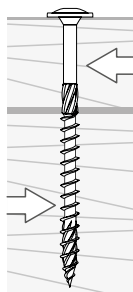


WKCP-D - Flange head construction screw with TX drive

TIMBER

Minimum distances for laterally loaded screws - timber

Angle between force and fiber direction $\alpha = 0^\circ$



Angle between force and fiber direction $\alpha = 90^\circ$



WITHOUT PRE-DRILLED HOLE

d_w [mm]	Ø 5	Ø 6	Ø 8	Ø 10
a_1 [mm]	60	72	96	120
a_2 [mm]	25	30	40	50
$a_{3,t}$ [mm]	75	90	120	150
$a_{3,c}$ [mm]	50	60	80	100
$a_{4,t}$ [mm]	25	30	40	50
$a_{4,c}$ [mm]	25	30	40	50

WITHOUT PRE-DRILLED HOLE

d_w [mm]	Ø 5	Ø 6	Ø 8	Ø 10
a_1 [mm]	25	30	40	50
a_2 [mm]	25	30	40	50
$a_{3,t}$ [mm]	50	60	80	100
$a_{3,c}$ [mm]	50	60	80	100
$a_{4,t}$ [mm]	50	60	80	100
$a_{4,c}$ [mm]	25	30	40	50

WITH PRE-DRILLED HOLE

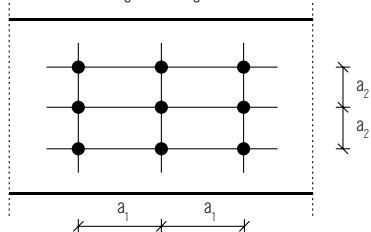
d_w [mm]	Ø 5	Ø 6	Ø 8	Ø 10
d_0 [mm]	3	4	5	6
a_1 [mm]	25	30	40	50
a_2 [mm]	15	18	24	30
$a_{3,t}$ [mm]	60	72	96	120
$a_{3,c}$ [mm]	35	42	56	70
$a_{4,t}$ [mm]	15	18	24	30
$a_{4,c}$ [mm]	15	18	24	30

WITH PRE-DRILLED HOLE

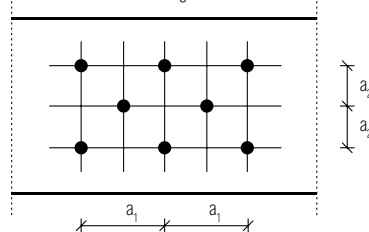
d_w [mm]	Ø 5	Ø 6	Ø 8	Ø 10
d_0 [mm]	3	4	5	6
a_1 [mm]	20	24	32	40
a_2 [mm]	20	24	32	40
$a_{3,t}$ [mm]	35	42	56	70
$a_{3,c}$ [mm]	35	42	56	70
$a_{4,t}$ [mm]	35	42	56	70
$a_{4,c}$ [mm]	15	18	24	30

1. Minimum distances in accordance with EN 1995 and ETA-18/0817
2. Minimum distances is valid for timber characteristic density of $\rho_k \leq 420 \text{ kg/m}^3$
3. In case of connection panel-timber minimum distances (a_1, a_2) should be multiplied by a factor of 0,85
4. Hole diameter d_0 is valid for softwood

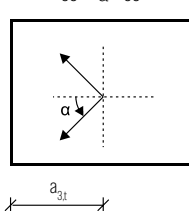
rectangular arrangement



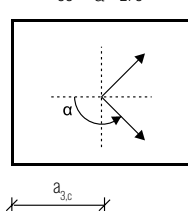
shifted arrangement



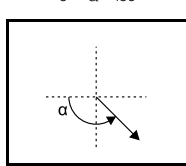
loaded end
 $-90^\circ < \alpha < 90^\circ$



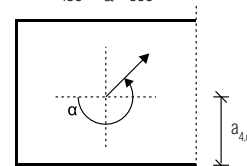
unloaded end
 $90^\circ < \alpha < 270^\circ$



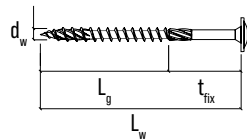
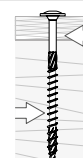
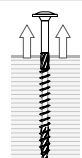
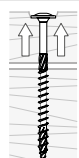
loaded edge
 $0^\circ < \alpha < 180^\circ$



unloaded edge
 $180^\circ < \alpha < 360^\circ$

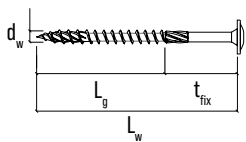


WKCP-D - Flange head construction screw with TX drive
TIMBER

Characteristic resistances for laterally and axially loaded screws - timber								
DIMENSIONS				SHEAR		TENSION		
Diameter	Length	Thread length	Usable length	timber-timber	OSB-timber	Withdrawal	Head pull-through	
								
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{v,k} [kN]	R _{v,k} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]	
WKCP 5								
ø5	40	22	18	1,07	t = 15 mm	1,20	1,32	2,29
	50	30	20	1,35		1,30	1,80	2,29
	60	40	20	1,47		1,30	2,40	2,29
	70	40	30	1,70		1,30	2,40	2,29
	80	50	30	1,70		1,30	3,00	2,29
	90	50	40	1,76		1,30	3,00	2,29
	100	60	40	1,76		1,30	3,60	2,29
	120	60	60	1,76		1,30	3,60	2,29
WKCP 6								
ø6	50	30	20	1,62	t = 15 mm	1,66	2,16	2,88
	60	30	30	1,79		1,66	2,16	2,88
	70	40	30	2,10		1,66	2,88	2,88
	80	50	30	2,10		1,66	3,60	2,88
	90	50	40	2,35		1,66	3,60	2,88
	100	60	40	2,35		1,66	4,32	2,88
	120	75	45	2,35		1,66	5,40	2,88
	140	75	65	2,35		1,66	5,40	2,88
	160	75	85	2,35		1,66	5,40	2,88
	180	75	105	2,35		1,66	5,40	2,88
	200	75	125	2,35		1,66	5,40	2,88
	220	75	145	2,35		1,66	5,40	2,88
	240	75	165	2,35		1,66	5,40	2,88
	260	75	185	2,35		1,66	5,40	2,88
	280	75	205	2,35		1,66	5,40	2,88
	300	75	225	2,35		1,66	5,40	2,88
WKCP 8								
ø8	40	35	5	0,62	t = 18 mm	1,69	3,36	5,29
	50	45	5	0,62		2,24	4,32	5,29
	60	50	10	1,23		2,78	4,80	5,29
	80	50	30	3,25		2,92	4,80	5,29
	100	50	50	3,75		2,92	4,80	5,29
	120	80	40	3,65		2,92	7,68	5,29
	140	100	40	3,65		2,92	9,60	5,29
	160	100	60	4,18		2,92	9,60	5,29
	180	100	80	4,18		2,92	9,60	5,29
	200	100	100	4,18		2,92	9,60	5,29

WKCP-D - Flange head construction screw with TX drive
TIMBER

Characteristic resistances for laterally and axially loaded screws - timber

DIMENSIONS				SHEAR		TENSION		
Diameter	Length	Thread length	Usable length	timber-timber	OSB-timber	Withdrawal	Head pull-through	
								
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{Vk} [kN]	R _{Vk} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]	
WKCP 8								
ø8	220	100	120	4,18	t = 18 mm	2,92	9,60	5,29
	240	100	140	4,18		2,92	9,60	5,29
	260	100	160	4,18		2,92	9,60	5,29
	280	100	180	4,18		2,92	9,60	5,29
	300	100	200	4,18		2,92	9,60	5,29
	320	100	220	4,18		2,92	9,60	5,29
	340	100	240	4,18		2,92	9,60	5,29
	360	100	260	4,18		2,92	9,60	5,29
	380	100	280	4,18		2,92	9,60	5,29
	400	100	300	4,18		2,92	9,60	5,29
	440	100	340	4,18		2,92	9,60	5,29
	480	100	380	4,18		2,92	9,60	5,29
	520	100	420	4,18		2,92	9,60	5,29
	560	100	460	4,18		2,92	9,60	5,29
	600	100	500	4,18		2,92	9,60	5,29
WKCP 10								
ø10	120	80	40	4,74	t = 22 mm	3,89	8,80	6,88
	140	80	60	5,45		3,89	8,80	6,88
	160	100	60	5,45		3,89	11,00	6,88
	180	100	80	5,76		3,89	11,00	6,88
	200	100	100	5,76		3,89	11,00	6,88
	220	100	120	5,76		3,89	11,00	6,88
	240	100	140	5,76		3,89	11,00	6,88
	260	100	160	5,76		3,89	11,00	6,88
	280	100	180	5,76		3,89	11,00	6,88
	300	100	200	5,76		3,89	11,00	6,88
	320	100	220	5,76		3,89	11,00	6,88
	340	100	240	5,76		3,89	11,00	6,88
	360	100	260	5,76		3,89	11,00	6,88
	380	100	280	5,76		3,89	11,00	6,88
	400	100	300	5,76		3,89	11,00	6,88
	440	100	340	5,76		3,89	11,00	6,88
	480	100	380	5,76		3,89	11,00	6,88
	520	100	420	5,76		3,89	11,00	6,88
	560	100	460	5,76		3,89	11,00	6,88
	600	100	500	5,76		3,89	11,00	6,88

NOTES:

1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817

2. In order to obtain a design resistance, use the following formula :

$$R_d = \frac{R_k * k_{mod}}{\gamma_M}$$

Factors γ_M and k_{mod} should be taken in accordance with EN 19953. Characteristic resistances were calculated for a characteristic density of timber $\rho_k = 350 \text{ kg/m}^3$

4. Characteristic resistances were calculated considering that the threaded part of the screw is fully inserted into timber element

5. Characteristic shear resistances were calculated for connections without pre-drilled holes

6. Characteristic shear resistances for OSB-timber connections were calculated for OSB board with thickness t [mm] in accordance with EN 3007. Characteristic withdrawal resistances were calculated assuming an angle of 90° between screw and grain direction and for penetration length equal L_g

8. Characteristic head pull-through resistances were calculated for timber element

WKCS

Countersunk head construction screw with TX drive

Diameters: $\varnothing 3$ mm | $\varnothing 3,5$ mm | $\varnothing 4$ mm | $\varnothing 4,5$ mm | $\varnothing 5$ mm | $\varnothing 6$ mm | $\varnothing 8$ mm | $\varnothing 10$ mm

Length range: from 30 to 600 mm



Countersunk head construction screw with TX drive for structural connections of wooden members, including solid, bonded and wood-based panels.



TX DRIVE



Zn
WHITE



Zn
YELLOW



EUROPEAN TECHNICAL
ASSESSMENT
ETA-18/0817

SCREW MATERIAL - Carbon steel

ANTI-CORROSION PROTECTION - Galvanized steel (white or yellow)

PRODUCT ADVANTAGES:



CUTTING RIBS - Allow optimal and smooth countersink with aesthetic finish result.



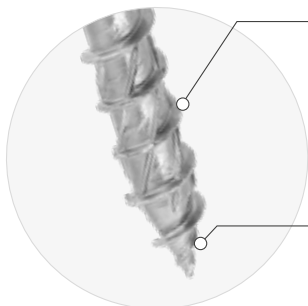
HIGH TORQUE - Allows screws to be installed without pre-drilling, even in hardwood substrates.



SHANK RIBS - Shank ribs reduce installation torque by reaming the hole.



WAX COATING - Wax coating applied during the production process significantly reduces the torque.



NEW CUTTING EDGE / SERRATED THREAD

New special design of cutting edge with added milling reduces screwing resistance by 20%. This helps to extend the life of batteries and power tools. Special cutting notches integrated on the thread cut wood fibres structure while screwing in.

DOUBLE THREAD

Additional recessed second thread improves remarkably the speed of timber penetration and reaction time of first grip into the wood.

EXAMPLES OF APPLICATIONS:



SUBSTRATES



Solid timber

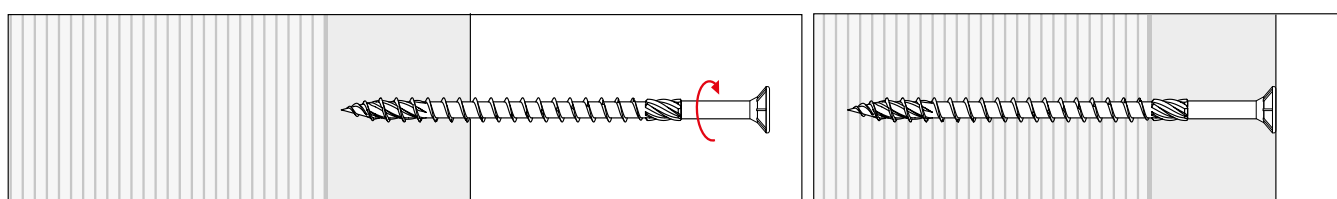


Glued laminated timber
CLT, KVH, BSH/GLT

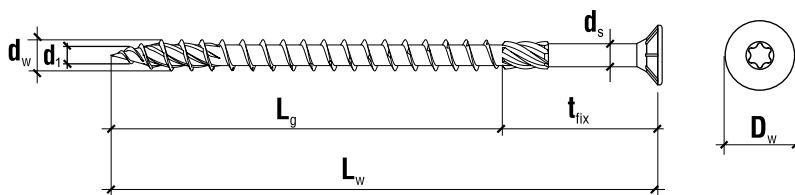


**Laminated Veneer
Lumber - LVL**

INSTALLATION INSTRUCTIONS (screw requires no pre-drilling)



WKCS - Countersunk head construction screw with TX drive



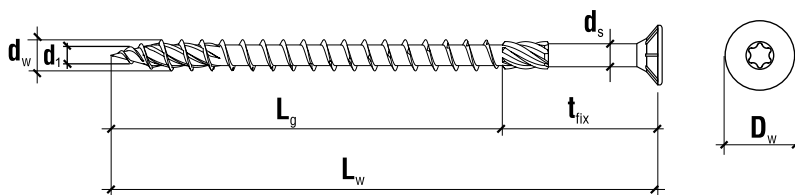
Codes and dimensions							
	Product code		Dimensions	Thread length	Max. usable length	Type of drive	Quantity
	Galvanized - white	Galvanized - yellow	$d_w \times L_w$ [mm]	L_g [mm]	t_{fix} [mm]	[-]	[pcs]
WKCS-3							
ø3	WKCS-30030-B	WKCS-30030	3x30	17	13	TX 10	500
	WKCS-30035-B	WKCS-30035	3x35	17	18	TX 10	500
	WKCS-30040-B	WKCS-30040	3x40	22	18	TX 10	500
WKCS-3.5							
ø3,5	WKCS-35030-B	WKCS-35030	3,5x30	17	13	TX 15	500
	WKCS-35035-B	WKCS-35035	3,5x35	17	18	TX 15	500
	WKCS-35040-B	WKCS-35040	3,5x40	22	18	TX 15	500
	WKCS-35050-B	WKCS-35050	3,5x50	30	20	TX 15	400
WKCS-4							
ø4	WKCS-40030-B	WKCS-40030	4x30	17	13	TX 20	500
	WKCS-40035-B	WKCS-40035	4x35	17	18	TX 20	500
	WKCS-40040(400)-B	WKCS-40040(400)	4x40	22	18	TX 20	400
	WKCS-40045-B	WKCS-40045	4x45	30	15	TX 20	300
	WKCS-40050-B	WKCS-40050	4x50	30	20	TX 20	300
	WKCS-40060-B	WKCS-40060	4x60	40	20	TX 20	250
	WKCS-40070(200)-B	WKCS-40070(200)	4x70	40	30	TX 20	200
WKCS-4.5							
ø4,5	WKCS-45040-B	WKCS-45040	4,5x40	22	18	TX 20	250
	WKCS-45050-B	WKCS-45050	4,5x50	30	20	TX 20	250
	WKCS-45060-B	WKCS-45060	4,5x60	40	20	TX 20	250
	WKCS-45070-B	WKCS-45070	4,5x70	40	30	TX 20	250
	WKCS-45080-B	WKCS-45080	4,5x80	50	30	TX 20	250

WKCS - Countersunk head construction screw with TX drive

Codes and dimensions							
	Product code		Dimensions	Thread length	Max. usable length	Type of drive	Quantity
	Galvanized - white	Galvanized - yellow	d _w x L _w [mm]	L _y [mm]	t _{fix} [mm]	[-]	[pcs]
WKCS-5							
ø5	WKCS-50040-B	WKCS-50040	5x40	22	18	TX 25	500
	WKCS-50050-B	WKCS-50050	5x50	30	20	TX 25	300
	WKCS-50060-B	WKCS-50060	5x60	40	20	TX 25	200
	WKCS-50070-B	WKCS-50070	5x70	40	30	TX 25	200
	WKCS-50080-B	WKCS-50080	5x80	50	30	TX 25	200
	WKCS-50090-B	WKCS-50090	5x90	50	40	TX 25	200
	WKCS-50100-B	WKCS-50100	5x100	60	40	TX 25	200
	WKCS-50120-B	WKCS-50120	5x120	60	60	TX 25	200
WKCS-6							
ø6	WKCS-60050-D	WKCS-60050	6x50	30	20	TX 30	200
	WKCS-60060(100)-D	WKCS-60060(100)	6x60	30	30	TX 30	100
	WKCS-60070(100)-D	WKCS-60070(100)	6x70	40	30	TX 30	100
	WKCS-60080(100)-D	WKCS-60080(100)	6x80	50	30	TX 30	100
	WKCS-60090-D	WKCS-60090	6x90	50	40	TX 30	100
	WKCS-60100-D	WKCS-60100	6x100	60	40	TX 30	100
	WKCS-60120-D	WKCS-60120	6x120	75	45	TX 30	100
	WKCS-60140-D	WKCS-60140	6x140	75	65	TX 30	100
	WKCS-60160-D	WKCS-60160	6x160	75	85	TX 30	100
	WKCS-60180-D	WKCS-60180	6x180	75	105	TX 30	100
	WKCS-60200-D	WKCS-60200	6x200	75	125	TX 30	100
	WKCS-06220-D	WKCS-60220	6x220	75	145	TX 30	100
	WKCS-06240-D	WKCS-60240	6x240	75	165	TX 30	100
	WKCS-06260-D	WKCS-60260	6x260	75	185	TX 30	100
	WKCS-06280-D	WKCS-60280	6x280	75	205	TX 30	100
	WKCS-06300-D	WKCS-60300	6x300	75	225	TX 30	100



WKCS - Countersunk head construction screw with TX drive



Codes and dimensions

	Product code		Dimensions	Thread length	Max. usable length	Type of drive	Quantity
	Galvanized - white	Galvanized - yellow	$d_w \times L_w$ [mm]	L_g [mm]	t_{fix} [mm]	[-]	[pcs]
WKCS-8							
Ø8	WKCS-08080-B	WKCS-08080(50)	8x80	50	30	TX 40	50
	WKCS-08100-B	WKCS-08100(50)	8x100	50	50	TX 40	50
	WKCS-08120-B	WKCS-08120(50)	8x120	80	40	TX 40	50
	WKCS-08140-B	WKCS-08140(50)	8x140	100	40	TX 40	50
	WKCS-08160-B	WKCS-08160(50)	8x160	100	60	TX 40	50
	WKCS-08180-B	WKCS-08180(50)	8x180	100	80	TX 40	50
	WKCS-08200-B	WKCS-08200(50)	8x200	100	100	TX 40	50
	WKCS-08220-B	WKCS-08220(50)	8x220	100	120	TX 40	50
	WKCS-08240-B	WKCS-08240(50)	8x240	100	140	TX 40	50
	WKCS-08260-B	WKCS-08260(50)	8x260	100	160	TX 40	50
	WKCS-08280-B	WKCS-08280(50)	8x280	100	180	TX 40	50
	WKCS-08300-B	WKCS-08300(50)	8x300	100	200	TX 40	50
	WKCS-08320-B	WKCS-08320(50)	8x320	100	220	TX 40	50
	WKCS-08340-B	WKCS-08340(50)	8x340	100	240	TX 40	50
	WKCS-08360-B	WKCS-08360(50)	8x360	100	260	TX 40	50
	WKCS-08380-B	WKCS-08380(50)	8x380	100	280	TX 40	50
	WKCS-08400-B	WKCS-08400(50)	8x400	100	300	TX 40	50
	WKCS-08440-B*	WKCS-08440(50)*	8x440	100	340	TX 40	50
	WKCS-08480-B*	WKCS-08480(50)*	8x480	100	380	TX 40	50
	WKCS-08520-B*	WKCS-08520(50)*	8x520	100	420	TX 40	50
	WKCS-08560-B*	WKCS-08560(50)*	8x560	100	460	TX 40	50
	WKCS-08600-B*	WKCS-08600(50)*	8x600	100	500	TX 40	50

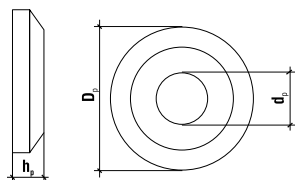
WKCS - Countersunk head construction screw with TX drive

Codes and dimensions							
	Product code		Dimensions	Thread length	Max. usable length	Type of drive	Quantity
	Galvanized - white	Galvanized - yellow	$d_w \times L_w$ [mm]	L_g [mm]	t_{fix} [mm]	[-]	[pcs]
ø10	WKCS-10						
	WKCS-10120-B	WKCS-10120	10x120	80	40	TX 40	50
	WKCS-10140-B	WKCS-10140	10x140	80	60	TX 40	50
	WKCS-10160(25)-B	WKCS-10160(25)	10x160	100	60	TX 40	25
	WKCS-10180(25)-B	WKCS-10180(25)	10x180	100	80	TX 40	25
	WKCS-10200(25)-B	WKCS-10200(25)	10x200	100	100	TX 40	25
	WKCS-10220-B	WKCS-10220	10x220	100	120	TX 40	25
	WKCS-10240-B	WKCS-10240	10x240	100	140	TX 40	25
	WKCS-10260-B	WKCS-10260	10x260	100	160	TX 40	25
	WKCS-10280-B	WKCS-10280	10x280	100	180	TX 40	25
	WKCS-10300-B	WKCS-10300	10x300	100	200	TX 40	25
	WKCS-10320-B	WKCS-10320	10x320	100	220	TX 40	25
	WKCS-10340-B	WKCS-10340	10x340	100	240	TX 40	25
	WKCS-10360-B	WKCS-10360	10x360	100	260	TX 40	25
	WKCS-10380-B	WKCS-10380	10x380	100	280	TX 40	25
	WKCS-10400-B	WKCS-10400	10x400	100	300	TX 40	25
	WKCS-10440-B*	WKCS-10440*	10x440	100	340	TX 40	25
	WKCS-10480-B*	WKCS-10480*	10x480	100	380	TX 40	25
	WKCS-10520-B*	WKCS-10520*	10x520	100	420	TX 40	25
	WKCS-10560-B*	WKCS-10560*	10x560	100	460	TX 40	25
	WKCS-10600-B*	WKCS-10600*	10x600	100	500	TX 40	25

* Product on order



PWKCS-B - Washer for countersunk head timber screw



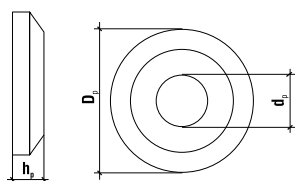
Example of use WKCS-B + PWKCS-B



Product code	Dimensions	Inner diameter	Quantity
Galvanized - white	$D_p \times h_p$ [mm]	d_p [mm]	[pcs]
PWKCS-6-B*	20 x 4	7,5	50
PWKCS-8-B*	25 x 5	8,5	50
PWKCS-10-B*	32 x 6	11	50

* Product on order

PWKCS - Washer for countersunk head timber screw



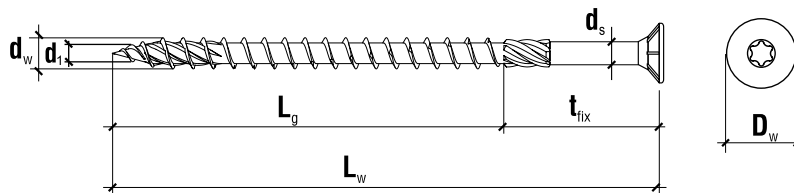
Example of use WKCS + PWKCS



Product code	Dimensions	Inner diameter	Quantity
Galvanized - yellow	$D_p \times h_p$ [mm]	d_p [mm]	[pcs]
PWKCS-6	20 x 4	7,5	50
PWKCS-8	25 x 5	8,5	50
PWKCS-10	32 x 6	11	50



WKCS - Countersunk head construction screw with TX drive



Geometry

Product	Outer thread diameter	Inner thread diameter	Unthreaded part diameter	Head diameter	Length range
	d_w [mm]	d_1 [mm]	d_s [mm]	D_w [mm]	L_w [mm]
WKCS $\varnothing 3$	3	2,00	2,20	6	30-40
WKCS $\varnothing 3,5$	3,5	2,25	2,50	7	30-50
WKCS $\varnothing 4$	4	2,55	2,87	8	30-70
WKCS $\varnothing 4,5$	4,5	2,95	3,10	9	40-80
WKCS $\varnothing 5$	5	3,15	3,50	10	40-120
WKCS $\varnothing 6$	6	3,80	4,30	12	50-300
WKCS $\varnothing 8$	8	5,50	5,78	14	80-600
WKCS $\varnothing 10$	10	6,30	7,00	18	120-600

Mechanical characteristics

Product	Characteristic yield moment	Characteristic withdrawal resistance parameter - softwood	Characteristic withdrawal resistance parameter - LVL	Characteristic head-pull-through resistance parameter - softwood	Characteristic head-pull-through resistance parameter - LVL	Characteristic tensile strength	Characteristic torsional strength
	M_{yk} [N*m]	f_{ak} [N/mm ²]	f_{ak} [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{tens,k}$ [kN]	$f_{tor,k}$ [N*m]
WKCS $\varnothing 3$	1,5	13	15	22,5	22,5	3,5	1,5
WKCS $\varnothing 3,5$	2	13	15	20,8	20,8	4	2
WKCS $\varnothing 4$	3,5	13	15	19,4	19,4	6	3,5
WKCS $\varnothing 4,5$	5	13	15	18,3	18,3	8	4,5
WKCS $\varnothing 5$	6	12	15	17,4	17,4	9	6
WKCS $\varnothing 6$	10	12	13	15,9	15,9	13	10
WKCS $\varnothing 8$	25	12	13	14,7	14,7	25	27
WKCS $\varnothing 10$	43	11	13	13,0	13,0	36	45

1. Characteristic withdrawal and head-pull-through resistance based on reference density of timber $\rho_a = 350 \text{ kg/m}^3$

2. Characteristic withdrawal and head-pull-through resistance based on reference density of LVL $\rho_a = 480 \text{ kg/m}^3$

WKCS - Countersunk head construction screw with TX drive
TIMBER
Minimum distances for laterally loaded screws - timber

 Angle between force and fiber direction $\alpha = 0^\circ$

 Angle between force and fiber direction $\alpha = 90^\circ$

WITHOUT PRE-DRILLED HOLE
WITHOUT PRE-DRILLED HOLE

d_w [mm]	Ø3	Ø3.5	Ø4	Ø4.5	Ø5	Ø6	Ø8	Ø10	d_w [mm]	Ø3	Ø3.5	Ø4	Ø4.5	Ø5	Ø6	Ø8	Ø10
a_1 [mm]	30	35	40	45	60	72	96	120	a_1 [mm]	15	18	20	23	25	30	40	50
a_2 [mm]	15	18	20	23	25	30	40	50	a_2 [mm]	15	18	20	23	25	30	40	50
$a_{3,t}$ [mm]	45	53	60	68	75	90	120	150	$a_{3,t}$ [mm]	30	35	40	45	50	60	80	100
$a_{3,c}$ [mm]	30	35	40	45	50	60	80	100	$a_{3,c}$ [mm]	30	35	40	45	50	60	80	100
$a_{4,t}$ [mm]	15	18	20	23	25	30	40	50	$a_{4,t}$ [mm]	21	25	28	32	50	60	80	100
$a_{4,c}$ [mm]	15	18	20	23	25	30	40	50	$a_{4,c}$ [mm]	15	18	20	23	25	30	40	50

d_w [mm]	Ø3	Ø3.5	Ø4	Ø4.5	Ø5	Ø6	Ø8	Ø10	d_w [mm]	Ø3	Ø3.5	Ø4	Ø4.5	Ø5	Ø6	Ø8	Ø10
d_0 [mm]	2	2	2,5	2,5	3	4	5	6	d_0 [mm]	2	2	2,5	2,5	3	4	5	6
a_1 [mm]	15	18	20	23	25	30	40	50	a_1 [mm]	12	14	16	18	20	24	32	40
a_2 [mm]	9	11	12	14	15	18	24	30	a_2 [mm]	12	14	16	18	20	24	32	40
$a_{3,t}$ [mm]	36	42	48	54	60	72	96	120	$a_{3,t}$ [mm]	21	25	28	32	35	42	56	70
$a_{3,c}$ [mm]	21	25	28	32	35	42	56	70	$a_{3,c}$ [mm]	21	25	28	32	35	42	56	70
$a_{4,t}$ [mm]	9	11	12	14	15	18	24	30	$a_{4,t}$ [mm]	15	18	20	23	35	42	56	70
$a_{4,c}$ [mm]	9	11	12	14	15	18	24	30	$a_{4,c}$ [mm]	9	11	12	14	15	18	24	30

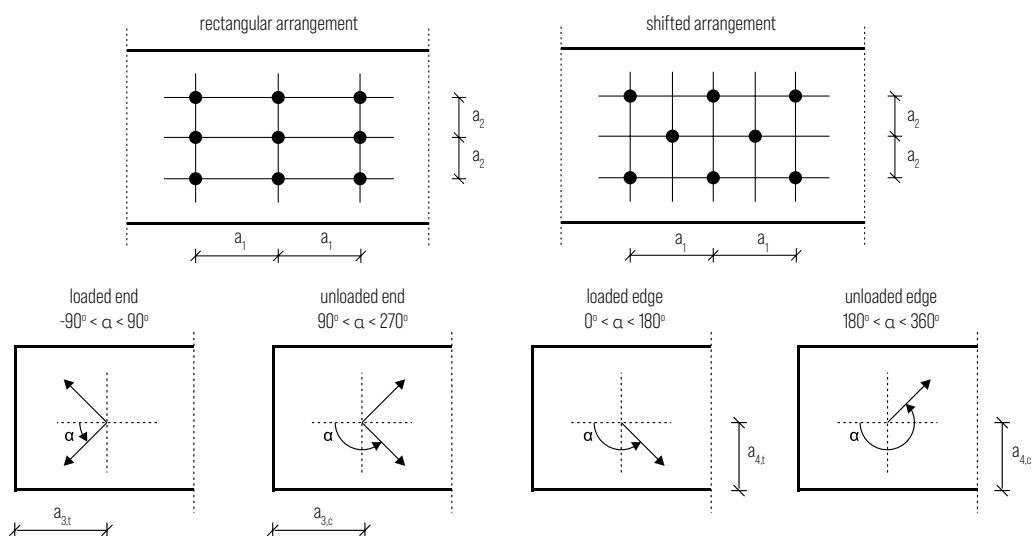
WITH PRE-DRILLED HOLE
WITH PRE-DRILLED HOLE

1. Minimum distances in accordance with EN 1995 and ETA-18/0817

 2. Minimum distances is valid for timber characteristic density of $\rho_k \leq 420 \text{ kg/m}^3$

 3. In case of connection panel-timber minimum distances (a_1, a_2) should be multiplied by a factor of 0,85

 4. In case of connection steel-timber minimum distances (a_1, a_2) should be multiplied by a factor of 0,7

 5. Hole diameter d_0 is valid for softwood


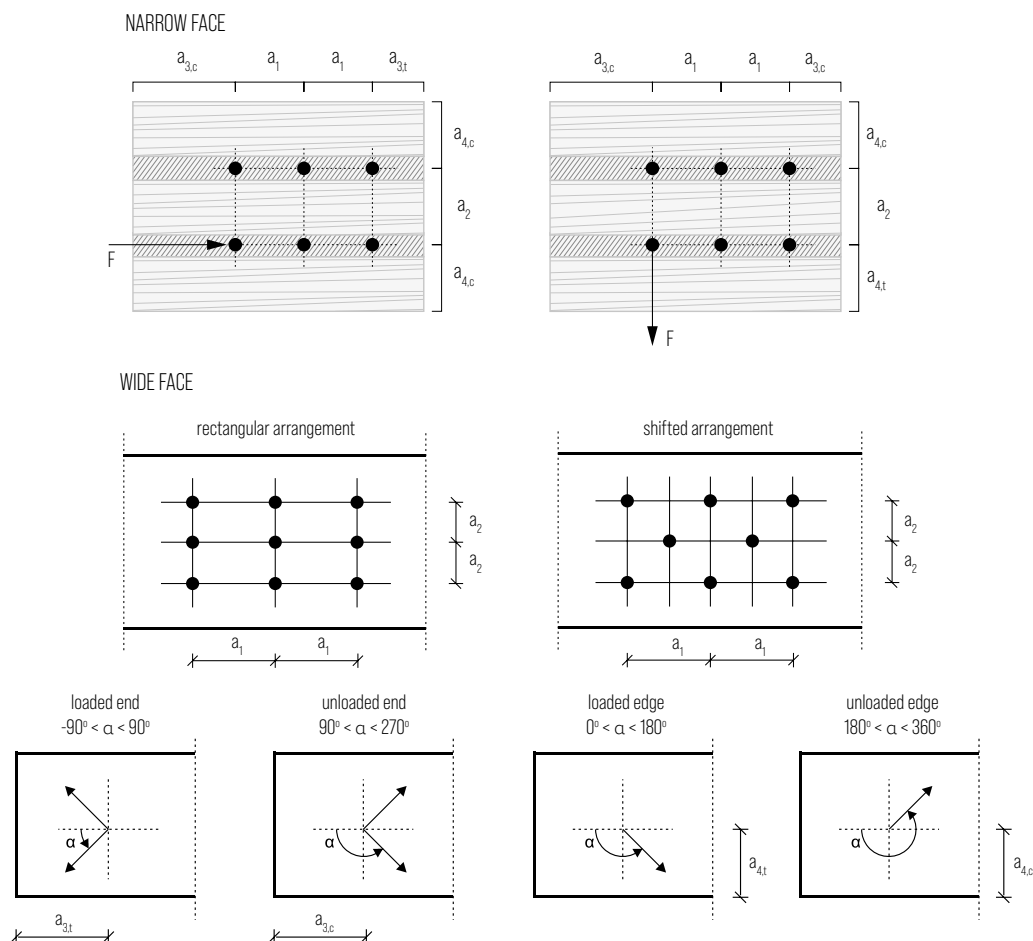
WKCS - Countersunk head construction screw with TX drive

CLT

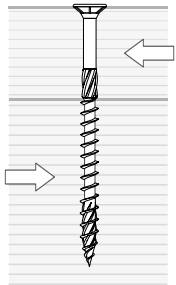
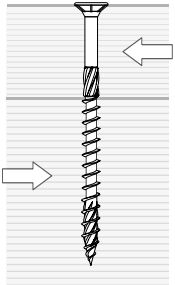
Minimum distances for laterally and/or axially loaded screws - CLT

WIDE FACE				NARROW FACE			
WITHOUT PRE-DRILLED HOLE				WITHOUT PRE-DRILLED HOLE			
d_w [mm]	Ø 6	Ø 8	Ø 10	d_w [mm]	Ø 6	Ø 8	Ø 10
a_1 [mm]	24	32	40	a_1 [mm]	60	80	100
a_2 [mm]	15	20	25	a_2 [mm]	24	32	40
$a_{3,t}$ [mm]	36	48	60	$a_{3,t}$ [mm]	72	96	120
$a_{3,c}$ [mm]	36	48	60	$a_{3,c}$ [mm]	42	56	70
$a_{4,t}$ [mm]	36	48	60	$a_{4,t}$ [mm]	36	48	60
$a_{4,c}$ [mm]	15	20	25	$a_{4,c}$ [mm]	18	24	30

1. Minimum distances in accordance with ETA-18/0817
2. Minimum CLT thickness $t_{min} = 10d_w$
3. Minimum penetration depth in CLT narrow face $l_{ef} = 10d_w$

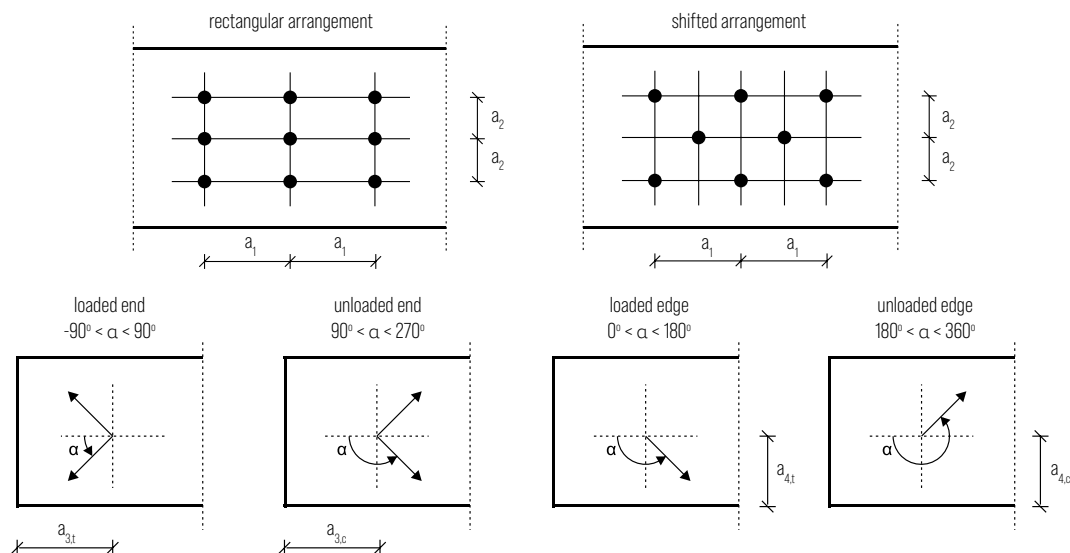


WKCS - Countersunk head construction screw with TX drive
LVL
Minimum distances for laterally loaded screws - LVL

Angle between force and fiber direction $\alpha = 0^\circ$					Angle between force and fiber direction $\alpha = 90^\circ$				
									
WITHOUT PRE-DRILLED HOLE					WITHOUT PRE-DRILLED HOLE				
d_w [mm]	Ø 5	Ø 6	Ø 8	Ø 10	d_w [mm]	Ø 5	Ø 6	Ø 8	Ø 10
a_1 [mm]	75	90	120	150	a_1 [mm]	35	42	56	70
a_2 [mm]	35	42	56	70	a_2 [mm]	35	42	56	70
$a_{3,t}$ [mm]	100	120	160	200	$a_{3,t}$ [mm]	75	90	120	150
$a_{3,c}$ [mm]	75	90	120	150	$a_{3,c}$ [mm]	75	90	120	150
$a_{4,t}$ [mm]	35	42	56	70	$a_{4,t}$ [mm]	60	72	96	120
$a_{4,c}$ [mm]	35	42	56	70	$a_{4,c}$ [mm]	35	42	56	70
WITH PRE-DRILLED HOLE					WITH PRE-DRILLED HOLE				
d_w [mm]	Ø 5	Ø 6	Ø 8	Ø 10	d_w [mm]	Ø 5	Ø 6	Ø 8	Ø 10
d_0 [mm]	3	4	5	6	d_0 [mm]	3	4	5	6
a_1 [mm]	25	30	40	50	a_1 [mm]	20	24	32	40
a_2 [mm]	15	18	24	30	a_2 [mm]	20	24	32	40
$a_{3,t}$ [mm]	60	72	96	120	$a_{3,t}$ [mm]	35	42	56	70
$a_{3,c}$ [mm]	35	42	56	70	$a_{3,c}$ [mm]	35	42	56	70
$a_{4,t}$ [mm]	15	18	24	30	$a_{4,t}$ [mm]	35	42	56	70
$a_{4,c}$ [mm]	15	18	24	30	$a_{4,c}$ [mm]	15	18	24	30

1. Minimum distances in accordance with EN 1995 and ETA-18/0817

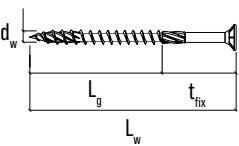
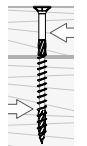
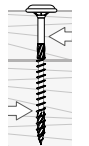
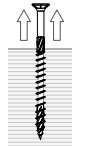
 2. Minimum distances is valid for LVL characteristic density in range of $420 \text{ kg/m}^3 < p_k \leq 500 \text{ kg/m}^3$

 3. Hole diameter d_0 is valid for softwood LVL




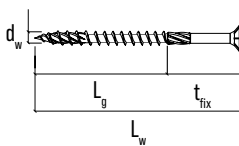
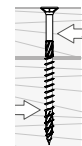
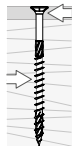
WKCS - Countersunk head construction screw with TX drive
TIMBER

Characteristic resistances for laterally and axially loaded screws - timber

DIMENSIONS				SHEAR					TENSION					
Diameter	Length	Thread length	Usable length	timber-timber	timber-timber (with washer)	OSB-timber	steel-timber (thin plate)	steel-timber (thick plate)	Withdrawal	Head pull-through	Head pull-through (with washer)			
														
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]	R _{head,k} [kN]			
WKCS 3														
ø3	30	17	13	0,56	-	t = 9 mm	0,52	t = 1,5 mm	0,66	t = 3 mm	0,87	-		
	35	17	18	0,61	-		0,52		0,66		0,87	-		
	40	22	18	0,68	-		0,52		0,71		0,92	0,86	0,81	-
WKCS 3,5														
ø3,5	30	17	13	0,63	-	t = 9 mm	0,61	t = 1,75 mm	0,78	t = 3,5 mm	1,05	0,77	1,02	-
	35	17	18	0,69	-		0,61		0,80		1,05	0,77	1,02	-
	40	22	18	0,79	-		0,61		0,85		1,10	1,00	1,02	-
	50	30	20	0,84	-		0,61		0,95		1,20	1,37	1,02	-
WKCS 4														
ø4	30	17	13	0,70	-	t = 12 mm	0,73	t = 2 mm	0,85	t = 4 mm	1,22	0,88	1,24	-
	35	17	18	0,77	-		0,83		1,00		1,35	0,88	1,24	-
	40	22	18	0,92	-		0,85		1,12		1,47	1,14	1,24	-
	45	30	15	0,92	-		0,85		1,23		1,57	1,56	1,24	-
	50	30	20	1,01	-		0,85		1,23		1,57	1,56	1,24	-
	60	40	20	1,01	-		0,85		1,36		1,70	2,08	1,24	-
	70	40	30	1,15	-		0,85		1,36		1,70	2,08	1,24	-
WKCS 4,5														
ø4,5	40	22	18	1,01	-	t = 12 mm	1,00	t = 2,25 mm	1,24	t = 4,5 mm	1,73	1,29	1,49	-
	50	30	20	1,18	-		1,00		1,48		1,91	1,76	1,49	-
	60	40	20	1,18	-		1,00		1,63		2,06	2,34	1,49	-
	70	40	30	1,40	-		1,00		1,63		2,06	2,34	1,49	-
	80	50	30	1,40	-		1,00		1,77		2,21	2,93	1,49	-
WKCS 5														
ø5	40	22	18	1,07	-	t = 15 mm	1,11	t = 2,5 mm	1,33	t = 5 mm	1,85	1,32	1,74	-
	50	30	20	1,34	-		1,21		1,64		2,13	1,80	1,74	-
	60	40	20	1,34	-		1,21		1,79		2,28	2,40	1,74	-
	70	40	30	1,56	-		1,21		1,79		2,28	2,40	1,74	-
	80	50	30	1,56	-		1,21		1,94		2,43	3,00	1,74	-
	90	50	40	1,62	-		1,21		1,94		2,43	3,00	1,74	-
	100	60	40	1,62	-		1,21		2,09		2,58	3,60	1,74	-
	120	60	60	1,62	-		1,21		2,09		2,58	3,60	1,74	-

WKCS - Countersunk head construction screw with TX drive

TIMBER

Characteristic resistances for laterally and axially loaded screws - timber												
DIMENSIONS				SHEAR					TENSION			
Diameter	Length	Thread length	Usable length	timber-timber	timber-timber (with washer)	OSB-timber	steel-timber (thin plate)	steel-timber (thick plate)	Withdrawal	Head pull-through	Head pull-through (with washer)	
												
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]	R _{head,k} [kN]	
WKCS 6												
ø6	50	30	20	1,62	1,62	1,55	1,89	2,69	2,16	2,29	6,35	
	60	30	30	1,79	1,79	1,55	2,17	2,85	2,16	2,29	6,35	
	70	40	30	1,95	2,10	1,55	2,35	3,03	2,88	2,29	6,35	
	80	50	30	1,95	2,28	1,55	2,53	3,21	3,60	2,29	6,35	
	90	50	40	2,20	2,53	1,55	2,53	3,21	3,60	2,29	6,35	
	100	60	40	2,20	2,71	1,55	2,71	3,39	4,32	2,29	6,35	
	120	75	45	2,20	2,98	1,55	2,98	3,66	5,40	2,29	6,35	
	140	75	65	2,20	2,98	1,55	2,98	3,66	5,40	2,29	6,35	
	160	75	85	2,20	2,98	1,55	2,98	3,66	5,40	2,29	6,35	
	180	75	105	2,20	2,98	1,55	2,98	3,66	5,40	2,29	6,35	
	200	75	125	2,20	2,98	1,55	2,98	3,66	5,40	2,29	6,35	
	220	75	145	2,20	2,98	1,55	2,98	3,66	5,40	2,29	6,35	
	240	75	165	2,20	2,98	1,55	2,98	3,66	5,40	2,29	6,35	
	260	75	185	2,20	2,98	1,55	2,98	3,66	5,40	2,29	6,35	
	280	75	205	2,20	2,98	1,55	2,98	3,66	5,40	2,29	6,35	
	300	75	225	2,20	2,98	1,55	2,98	3,66	5,40	2,29	6,35	

NOTES:

1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817
2. In order to obtain a design resistance, use the following formula :

$$R_d = \frac{R_k * k_{mod}}{\gamma_M}$$

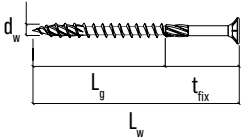
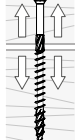
Factors γ_M and k_{mod} should be taken in accordance with EN 1995

3. Characteristic resistances were calculated for a characteristic density of timber $\rho_k = 350 \text{ kg/m}^3$
4. Characteristic resistances were calculated considering that the threaded part of the screw is fully inserted into timber element
5. Characteristic shear resistances were calculated for connections without pre-drilled holes
6. Characteristic shear resistances for OSB-timber connections were calculated for OSB board with thickness t [mm] in accordance with EN 300
7. Characteristic shear resistances for steel-timber connections were calculated for thin steel plate with thickness $t \leq 0,5d_w$
8. Characteristic shear resistances for steel-timber connections were calculated for thick steel plate with thickness $t \geq d_w$
9. Characteristic withdrawal resistances were calculated assuming an angle of 90° between screw and grain direction and for penetration length equal L_g
10. Characteristic head pull-through resistances were calculated for timber element



WKCS - Countersunk head construction screw with TX drive
TIMBER

Characteristic resistances for laterally and axially loaded screws - timber

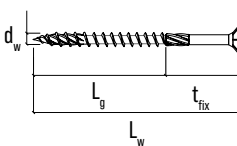
DIMENSIONS				SHEAR					TENSION		
Diameter	Length	Thread length	Usable length	timber-timber	timber-timber (with washer)	OSB-timber	steel-timber (thin plate)	steel-timber (thick plate)	Withdrawal	Head pull-through	Head pull-through (with washer)
											
d_w [mm]	L_w [mm]	L_g [mm]	t_{fix} [mm]	R_{vk} [kN]	R_{vk} [kN]	R_{vk} [kN]	R_{vk} [kN]	R_{vk} [kN]	$R_{ax,k}$ [kN]	$R_{head,k}$ [kN]	$R_{head,k}$ [kN]
WKCS 8											
ø8	80	50	30	2,77	3,25	2,44	3,74	5,23	4,80	2,88	9,19
	100	50	50	3,27	3,75	2,44	4,05	5,23	4,80	2,88	9,19
	120	80	40	3,05	4,25	2,44	4,77	5,95	7,68	2,88	9,19
	140	100	40	3,05	4,62	2,44	5,25	6,43	9,60	2,88	9,19
	160	100	60	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	180	100	80	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	200	100	100	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	220	100	120	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	240	100	140	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	260	100	160	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	280	100	180	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	300	100	200	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	320	100	220	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	340	100	240	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	360	100	260	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	380	100	280	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	400	100	300	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	440	100	340	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	480	100	380	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	520	100	420	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	560	100	460	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	600	100	500	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19



WKCS - Countersunk head construction screw with TX drive

TIMBER

Characteristic resistances for laterally and axially loaded screws - timber

DIMENSIONS				SHEAR					TENSION					
Diameter	Length	Thread length	Usable length	timber-timber	timber-timber (with washer)	OSB-timber	steel-timber (thin plate)	steel-timber (thick plate)	Withdrawal	Head pull-through	Head pull-through (with washer)			
														
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{Vk} [kN]	R _{Vk} [kN]	R _{Vk} [kN]	R _{Vk} [kN]	R _{Vk} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]	R _{head,k} [kN]			
WKCS 10														
ø10	120	80	40	4,07	5,22	t = 22 mm	3,89	t = 5 mm	t = 10 mm	7,92	8,80	4,20	13,27	
	140	80	60	4,78	5,93		3,89			6,24	7,92	8,80	4,20	13,27
	160	100	60	4,78	6,48		3,89			6,79	8,47	11,00	4,20	13,27
	180	100	80	5,09	6,79		3,89			6,79	8,47	11,00	4,20	13,27
	200	100	100	5,09	6,79		3,89			6,79	8,47	11,00	4,20	13,27
	220	100	120	5,09	6,79		3,89			6,79	8,47	11,00	4,20	13,27
	240	100	140	5,09	6,79		3,89			6,79	8,47	11,00	4,20	13,27
	260	100	160	5,09	6,79		3,89			6,79	8,47	11,00	4,20	13,27
	280	100	180	5,09	6,79		3,89			6,79	8,47	11,00	4,20	13,27
	300	100	200	5,09	6,79		3,89			6,79	8,47	11,00	4,20	13,27
	320	100	220	5,09	6,79		3,89			6,79	8,47	11,00	4,20	13,27
	340	100	240	5,09	6,79		3,89			6,79	8,47	11,00	4,20	13,27
	360	100	260	5,09	6,79		3,89			6,79	8,47	11,00	4,20	13,27
	380	100	280	5,09	6,79		3,89			6,79	8,47	11,00	4,20	13,27
	400	100	300	5,09	6,79		3,89			6,79	8,47	11,00	4,20	13,27
	440	100	340	5,09	6,79		3,89			6,79	8,47	11,00	4,20	13,27
	480	100	380	5,09	6,79		3,89			6,79	8,47	11,00	4,20	13,27
	520	100	420	5,09	6,79		3,89			6,79	8,47	11,00	4,20	13,27
	560	100	460	5,09	6,79		3,89			6,79	8,47	11,00	4,20	13,27
	600	100	500	5,09	6,79		3,89			6,79	8,47	11,00	4,20	13,27

NOTES:

- Characteristic resistances in accordance with EN 1995 and ETA-18/0817
- In order to obtain a design resistance, use the following formula :

$$R_d = \frac{R_k * k_{mod}}{\gamma_M}$$

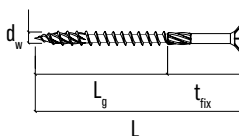
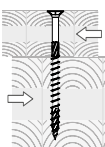
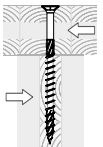
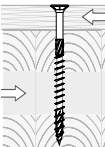
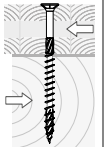
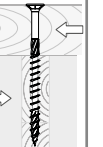
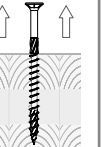
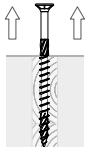
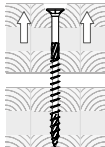
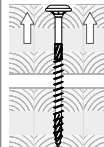
Factors γ_M and k_{mod} should be taken in accordance with EN 1995

- Characteristic resistances were calculated for a characteristic density of timber $\rho_k = 350 \text{ kg/m}^3$
- Characteristic resistances were calculated considering that the threaded part of the screw is fully inserted into timber element
- Characteristic shear resistances were calculated for connections without pre-drilled holes
- Characteristic shear resistances for OSB-timber connections were calculated for OSB board with thickness t [mm] in accordance with EN 300
- Characteristic shear resistances for steel-timber connections were calculated for thin steel plate with thickness $t \leq 0,5d_w$
- Characteristic shear resistances for steel-timber connections were calculated for thick steel plate with thickness $t \geq d_w$
- Characteristic withdrawal resistances were calculated assuming an angle of 90° between screw and grain direction and for penetration length equal L_g
- Characteristic head pull-through resistances were calculated for timber element



WKCS - Countersunk head construction screw with TX drive
CLT

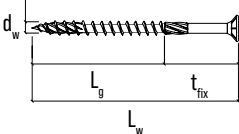
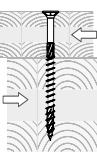
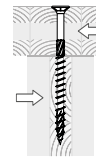
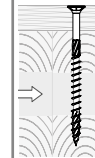
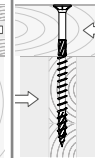
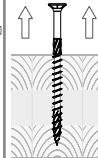
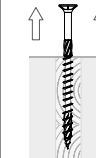
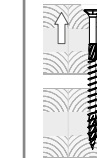
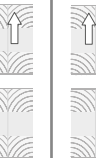
Characteristic resistances for laterally and axially loaded screws - CLT

DIMENSIONS				SHEAR					TENSION				
Diameter	Length	Thread length	Usable length	CLT-CLT (wide face-wide face)	CLT-CLT (wide face-nar- row face)	OSB-CLT (wide face)	CLT-timber (wide face)	timber-CLT (narrow face)	Withdrawal (wide face)	Withdrawal (narrow face)	Head pull-through	Head pull-through (with washer)	
													
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{ax,k} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]	R _{head,k} [kN]	
WKCS 6													
ø6	50	30	20	1,62	-	t = 15 mm	1,55	1,62	-	2,16	-	2,29	6,35
	60	30	30	1,79	-		1,55	1,79	-	2,16	-	2,29	6,35
	70	40	30	1,95	-		1,55	1,95	-	2,88	-	2,29	6,35
	80	50	30	1,95	-		1,55	1,95	-	3,60	-	2,29	6,35
	90	50	40	2,20	-		1,55	2,20	-	3,60	-	2,29	6,35
	100	60	40	2,20	-		1,55	2,20	-	4,32	-	2,29	6,35
	120	75	45	2,20	-		1,55	2,20	-	5,40	-	2,29	6,35
	140	75	65	2,20	-		1,55	2,20	-	5,40	-	2,29	6,35
	160	75	85	2,20	-		1,55	2,20	-	5,40	-	2,29	6,35
	180	75	105	2,20	-		1,55	2,20	-	5,40	-	2,29	6,35
	200	75	125	2,20	-		1,55	2,20	-	5,40	-	2,29	6,35
	220	75	145	2,20	-		1,55	2,20	-	5,40	-	2,29	6,35
	240	75	165	2,20	-		1,55	2,20	-	5,40	-	2,29	6,35
	260	75	185	2,20	-		1,55	2,20	-	5,40	-	2,29	6,35
	280	75	205	2,20	-		1,55	2,20	-	5,40	-	2,29	6,35
300	75	225	2,20	-	1,55	2,20	-	5,40	-	2,29	6,35		
WKCS 8													
ø8	80	50	30	2,77	-	t = 18 mm	2,44	2,77	-	4,80	-	2,88	9,19
	100	50	50	3,27	-		2,44	3,27	-	4,80	-	2,88	9,19
	120	80	40	3,05	2,65		2,44	3,05	2,65	7,68	5,45	2,88	9,19
	140	100	40	3,05	2,66		2,44	3,05	2,66	9,60	6,66	2,88	9,19
	160	100	60	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	180	100	80	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	200	100	100	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	220	100	120	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	240	100	140	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	260	100	160	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	280	100	180	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	300	100	200	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	320	100	220	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	340	100	240	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	360	100	260	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	380	100	280	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	400	100	300	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	440	100	340	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	480	100	380	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	520	100	420	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	560	100	460	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	600	100	500	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19

WKCS - Countersunk head construction screw with TX drive

CLT

Characteristic resistances for laterally and axially loaded screws - CLT

DIMENSIONS				SHEAR					TENSION				
Diameter	Length	Thread length	Usable length	CLT-CLT (wide face-wide face)	CLT-CLT (wide face-narrow face)	OSB-CLT (wide face)	CLT-timber (wide face)	timber-CLT (narrow face)	Withdrawal (wide face)	Withdrawal (narrow face)	Head pull-through	Head pull-through (with washer)	
													
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{ax,k} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]	R _{head,k} [kN]	
WKCS 10													
ø10	120	80	40	4,07	-	t = 22 mm	3,89	4,07	-	8,80	-	4,20	13,27
	140	80	60	4,78	-		3,89	4,78	-	8,80	-	4,20	13,27
	160	100	60	4,78	4,02		3,89	4,78	4,02	11,00	7,96	4,20	13,27
	180	100	80	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	200	100	100	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	220	100	120	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	240	100	140	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	260	100	160	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	280	100	180	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	300	100	200	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	320	100	220	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	340	100	240	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	360	100	260	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	380	100	280	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	400	100	300	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	440	100	340	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	480	100	380	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	520	100	420	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	560	100	460	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	600	100	500	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27

NOTES:

1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817
2. In order to obtain a design resistance, use the following formula :

$$R_d = \frac{R_k * k_{mod}}{\gamma_M}$$

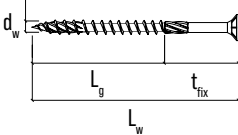
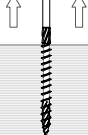
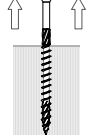
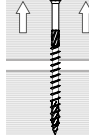
Factors γ_M and k_{mod} should be taken in accordance with EN 1995

3. Characteristic resistances were calculated for a characteristic density of timber and CLT $\rho_k = 350 \text{ kg/m}^3$
4. Characteristic resistances were calculated considering that the threaded part of the screw is fully inserted into timber element
5. Characteristic shear resistances were calculated for connections without pre-drilled holes
6. Characteristic shear resistances for OSB-timber connections were calculated for OSB board with thickness t [mm] in accordance with EN 300
7. Characteristic withdrawal resistances of CLT wide face were calculated assuming an angle of 90° between screw and grain direction and for minimum penetration length equal L_g
8. Characteristic withdrawal resistances of CLT narrow face were calculated for minimum thickness $t_{min} = 10d_w$ and for minimum penetration length equal $L_g = 10d_w$
9. Characteristic head pull-through resistances were calculated for CLT



WKCS - Countersunk head construction screw with TX drive
LVL

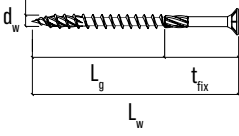
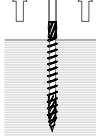
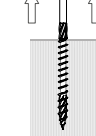
Characteristic resistances for laterally and axially loaded screws - LVL

DIMENSIONS				SHEAR			TENSION			
Diameter	Length	Thread length	Usable length	LVL-LVL	LVL-timber	timber-LVL	Withdrawal (wide face)	Withdrawal (edge face)	Head pull-through	Head pull-through (with washer)
										
d_w [mm]	L_w [mm]	L_g [mm]	t_{fix} [mm]	$R_{V,k}$ [kN]	$R_{V,k}$ [kN]	$R_{V,k}$ [kN]	$R_{ax,k}$ [kN]	$R_{ax,k}$ [kN]	$R_{head,k}$ [kN]	$R_{head,k}$ [kN]
WKCS 5										
ø5	40	22	18	-	-	-	1,65	1,10	1,74	-
	50	30	20	-	-	-	2,25	1,50	1,74	-
	60	40	20	-	-	-	3,00	2,00	1,74	-
	70	40	30	1,82	1,71	1,63	3,00	2,00	1,74	-
	80	50	30	1,82	1,71	1,63	3,75	2,50	1,74	-
	90	50	40	1,82	1,71	1,71	3,75	2,50	1,74	-
	100	60	40	1,82	1,71	1,71	4,50	3,00	1,74	-
	120	60	60	1,82	1,71	1,71	4,50	3,00	1,74	-
WKCS 6										
ø6	50	30	20	-	-	-	2,34	1,56	2,29	6,35
	60	30	30	2,29	2,00	2,03	2,34	1,56	2,29	6,35
	70	40	30	2,35	2,24	2,03	3,12	2,08	2,29	6,35
	80	50	30	2,35	2,24	2,03	3,90	2,60	2,29	6,35
	90	50	40	2,48	2,33	2,32	3,90	2,60	2,29	6,35
	100	60	40	2,48	2,33	2,32	4,68	3,12	2,29	6,35
	120	75	45	2,48	2,33	2,33	5,85	3,90	2,29	6,35
	140	75	65	2,48	2,33	2,33	5,85	3,90	2,29	6,35
	160	75	85	2,48	2,33	2,33	5,85	3,90	2,29	6,35
	180	75	105	2,48	2,33	2,33	5,85	3,90	2,29	6,35
	200	75	125	2,48	2,33	2,33	5,85	3,90	2,29	6,35
	220	75	145	2,48	2,33	2,33	5,85	3,90	2,29	6,35
	240	75	165	2,48	2,33	2,33	5,85	3,90	2,29	6,35
	260	75	185	2,48	2,33	2,33	5,85	3,90	2,29	6,35
	280	75	205	2,48	2,33	2,33	5,85	3,90	2,29	6,35
	300	75	225	2,48	2,33	2,33	5,85	3,90	2,29	6,35
WKCS 8										
ø8	80	50	30	3,28	3,10	2,90	5,20	3,47	2,88	9,19
	100	50	50	4,06	3,51	3,51	5,20	3,47	2,88	9,19
	120	80	40	3,70	3,51	3,18	8,32	5,55	2,88	9,19
	140	100	40	3,70	3,51	3,18	10,40	6,93	2,88	9,19
	160	100	60	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	180	100	80	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	200	100	100	4,06	3,79	3,79	10,40	6,93	2,88	9,19

WKCS - Countersunk head construction screw with TX drive

LVL

Characteristic resistances for laterally and axially loaded screws - LVL

DIMENSIONS				SHEAR			TENSION			
Diameter	Length	Thread length	Usable length	LVL-LVL	LVL-timber	timber-LVL	Withdrawal (wide face)	Withdrawal (edge face)	Head pull-through	Head pull-through (with washer)
										
d _w [mm]	L _w [mm]	L _g [mm]	t _{tx} [mm]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{ax,k} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]	R _{head,k} [kN]
WKCS 8										
ø8	220	100	120	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	240	100	140	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	260	100	160	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	280	100	180	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	300	100	200	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	320	100	220	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	340	100	240	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	360	100	260	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	380	100	280	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	400	100	300	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	440	100	340	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	480	100	380	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	520	100	420	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	560	100	460	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	600	100	500	4,06	3,79	3,79	10,40	6,93	2,88	9,19
WKCS 10										
ø10	120	80	40	4,84	4,60	4,25	10,40	6,93	4,20	13,27
	140	80	60	5,79	5,40	4,99	10,40	6,93	4,20	13,27
	160	100	60	5,79	5,40	4,99	13,00	8,67	4,20	13,27
	180	100	80	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	200	100	100	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	220	100	120	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	240	100	140	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	260	100	160	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	280	100	180	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	300	100	200	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	320	100	220	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	340	100	240	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	360	100	260	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	380	100	280	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	400	100	300	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	440	100	340	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	480	100	380	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	520	100	420	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	560	100	460	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	600	100	500	5,79	5,40	5,40	13,00	8,67	4,20	13,27

NOTES:

1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817

2. In order to obtain a design resistance, use the following formula :

$$R_d = \frac{R_k * k_{mod}}{\gamma_M}$$

Factors γ_M and k_{mod} should be taken in accordance with EN 1995

3. Characteristic resistances were calculated for a characteristic density of timber $\rho_k = 350 \text{ kg/m}^3$ and LVL $\rho_k = 480 \text{ kg/m}^3$

4. Characteristic resistances were calculated considering that the threaded part of the screw is fully inserted into timber element

5. Characteristic shear resistances were calculated for connections without pre-drilled holes

6. Characteristic withdrawal resistances were calculated assuming an angle of 90° between screw and grain direction and for penetration length equal L_g

7. Characteristic head pull-through resistances were calculated for LVL

WKCS-D (SQ Ceramic)

Countersunk head construction screw with TX drive

Diameters: $\varnothing 3$ mm | $\varnothing 3,5$ mm | $\varnothing 4$ mm | $\varnothing 4,5$ mm | $\varnothing 5$ mm | $\varnothing 6$ mm | $\varnothing 8$ mm | $\varnothing 10$ mm

Length range: from 30 to 600 mm

C4
COATING



Countersunk head construction screw with TX drive for structural connections of wooden members, including solid, bonded and wood-based panels.



TX DRIVE



HIGH CORROSION RESISTANCE
C4 COATING



EUROPEAN TECHNICAL
ASSESSMENT
ETA-18/0817

SCREW MATERIAL - Carbon steel

ANTI-CORROSION PROTECTION - SQ Ceramic (C4 Coating)

PRODUCT ADVANTAGES:



CUTTING RIBS - Allow optimal and smooth countersink with aesthetic finish result.



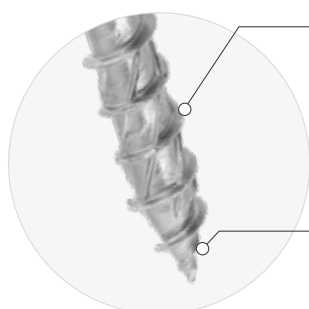
SHANK RIBS - Shank ribs reduces installation torque by reaming the hole.



HIGH TORQUE - Allows screws to be installed without pre-drilling, even in hardwood substrates.



WAX COATING - Wax coating applied during the production process significantly reduces the torque.



NEW CUTTING EDGE / SERRATED THREAD

New special design of cutting edge with added milling reduces screwing resistance by 20%. This helps to extend the life of batteries and power tools. Special cutting notches integrated on the thread cut wood fibres structure while screwing in.

DOUBLE THREAD

Additional recessed second thread improves remarkably the speed of timber penetration and reaction time of first grip into the wood.

EXAMPLES OF APPLICATIONS:



SUBSTRATES



Solid timber

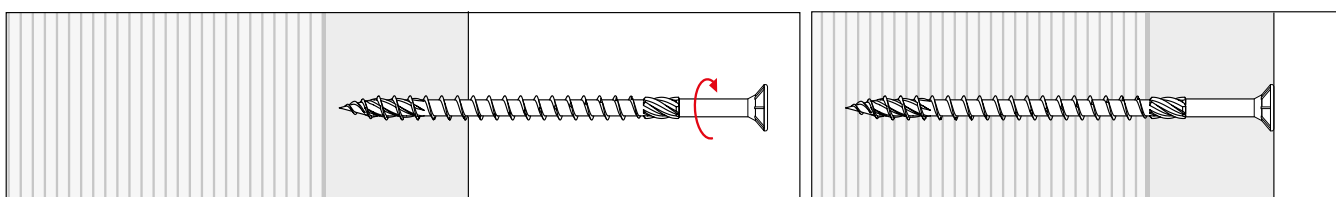


Glued laminated timber
CLT, KVH, BSH/GLT

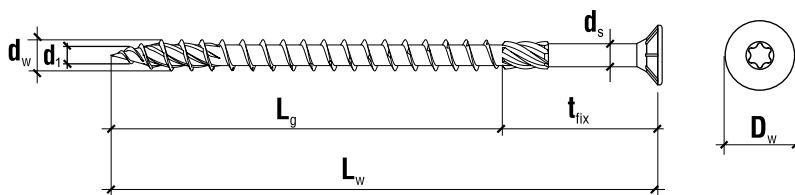


**Laminated Veneer
Lumber - LVL**

INSTALLATION INSTRUCTIONS (screw requires no pre-drilling)



WKCS-D - Countersunk head construction screw with TX drive



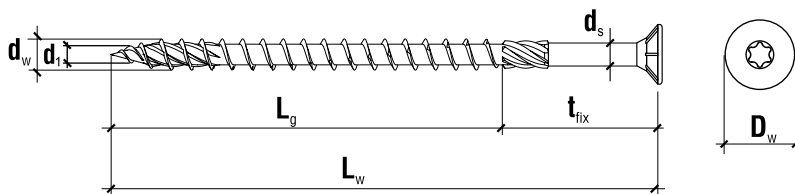
Codes and dimensions						
	Product code	Dimensions	Thread length	Max. usable length	Type of drive	Quantity
	SQ Ceramic	$d_w \times L_w$ [mm]	L_g [mm]	t_{fix} [mm]	[-]	[pcs]
WKCS-D-3						
ø3	WKCS-30030-D	3x30	17	13	TX 10	500
	WKCS-30035-D	3x35	17	18	TX 10	500
	WKCS-30040-D	3x40	22	18	TX 10	500
WKCS-D-3.5						
ø3,5	WKCS-35030-D	3,5x30	17	13	TX 15	500
	WKCS-35035-D	3,5x35	17	18	TX 15	500
	WKCS-35040-D	3,5x40	22	18	TX 15	500
	WKCS-35050-D	3,5x50	30	20	TX 15	400
WKCS-D-4						
ø4	WKCS-40030-D	4x30	17	13	TX 20	500
	WKCS-40035-D	4x35	17	18	TX 20	500
	WKCS-40040(400)-D	4x40	22	18	TX 20	400
	WKCS-40045-D	4x45	30	15	TX 20	300
	WKCS-40050-D	4x50	30	20	TX 20	300
	WKCS-40060-D	4x60	40	20	TX 20	250
	WKCS-40070(200)-D	4x70	40	30	TX 20	200
WKCS-D-4.5						
ø4,5	WKCS-45040-D	4,5x40	22	18	TX 20	250
	WKCS-45050-D	4,5x50	30	20	TX 20	250
	WKCS-45060-D	4,5x60	40	20	TX 20	250
	WKCS-45070-D	4,5x70	40	30	TX 20	250
	WKCS-45080-D	4,5x80	50	30	TX 20	250

WKCS-D - Countersunk head construction screw with TX drive

Codes and dimensions						
	Product code	Dimensions	Thread length	Max. usable length	Type of drive	Quantity
	SQ Ceramic	$d_w \times L_w$ [mm]	L_g [mm]	t_{tx} [mm]	[-]	[pcs]
WKCS-D-5						
ø5	WKCS-50040-D	5x40	22	18	TX 25	500
	WKCS-50050-D	5x50	30	20	TX 25	300
	WKCS-50060-D	5x60	40	20	TX 25	200
	WKCS-50070-D	5x70	40	30	TX 25	200
	WKCS-50080-D	5x80	50	30	TX 25	200
	WKCS-50090-D	5x90	50	40	TX 25	200
	WKCS-50100-D	5x100	60	40	TX 25	200
	WKCS-50120-D	5x120	60	60	TX 25	200
WKCS-D-6						
ø6	WKCS-60050-D	6x50	30	20	TX 30	200
	WKCS-60060(100)-D	6x60	30	30	TX 30	100
	WKCS-60070(100)-D	6x70	40	30	TX 30	100
	WKCS-60080(100)-D	6x80	50	30	TX 30	100
	WKCS-60090-D	6x90	50	40	TX 30	100
	WKCS-60100-D	6x100	60	40	TX 30	100
	WKCS-60120-D	6x120	75	45	TX 30	100
	WKCS-60140-D	6x140	75	65	TX 30	100
	WKCS-60160-D	6x160	75	85	TX 30	100
	WKCS-60180-D	6x180	75	105	TX 30	100
	WKCS-60200-D	6x200	75	125	TX 30	100
	WKCS-06220-D	6x220	75	145	TX 30	100
	WKCS-06240-D	6x240	75	165	TX 30	100
	WKCS-06260-D	6x260	75	185	TX 30	100
	WKCS-06280-D	6x280	75	205	TX 30	100
	WKCS-06300-D	6x300	75	225	TX 30	100



WKCS-D - Countersunk head construction screw with TX drive



Codes and dimensions

	Product code	Dimensions	Thread length	Max. usable length	Type of drive	Quantity
	SQ Ceramic	$d_w \times L_w$ [mm]	L_g [mm]	t_{fix} [mm]	[-]	[pcs]
WKCS-D-8						
Ø8	WKCS-08080-D	8x80	50	30	TX 40	50
	WKCS-08100-D	8x100	50	50	TX 40	50
	WKCS-08120-D	8x120	80	40	TX 40	50
	WKCS-08140-D	8x140	100	40	TX 40	50
	WKCS-08160-D	8x160	100	60	TX 40	50
	WKCS-08180-D	8x180	100	80	TX 40	50
	WKCS-08200-D	8x200	100	100	TX 40	50
	WKCS-08220-D	8x220	100	120	TX 40	50
	WKCS-08240-D	8x240	100	140	TX 40	50
	WKCS-08260-D	8x260	100	160	TX 40	50
	WKCS-08280-D	8x280	100	180	TX 40	50
	WKCS-08300-D	8x300	100	200	TX 40	50
	WKCS-08320-D	8x320	100	220	TX 40	50
	WKCS-08340-D	8x340	100	240	TX 40	50
	WKCS-08360-D	8x360	100	260	TX 40	50
	WKCS-08380-D	8x380	100	280	TX 40	50
	WKCS-08400-D	8x400	100	300	TX 40	50
	WKCS-08440-D*	8x440	100	340	TX 40	50
	WKCS-08480-D*	8x480	100	380	TX 40	50
	WKCS-08520-D*	8x520	100	420	TX 40	50
	WKCS-08560-D*	8x560	100	460	TX 40	50
	WKCS-08600-D*	8x600	100	500	TX 40	50

* Product on order

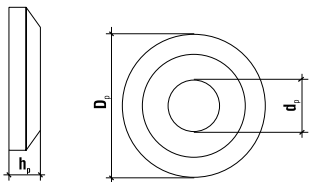
WKCS-D - Countersunk head construction screw with TX drive

Codes and dimensions						
	Product code	Dimensions	Thread length	Max. usable length	Type of drive	Quantity
	SQ Ceramic	$d_w \times L_w$ [mm]	L_g [mm]	t_{fix} [mm]	[-]	[pcs]
WKCS-D-10						
ø10	WKCS-10120-D	10x120	80	40	TX 40	50
	WKCS-10140-D	10x140	80	60	TX 40	50
	WKCS-10160(25)-D	10x160	100	60	TX 40	25
	WKCS-10180(25)-D	10x180	100	80	TX 40	25
	WKCS-10200(25)-D	10x200	100	100	TX 40	25
	WKCS-10220-D	10x220	100	120	TX 40	25
	WKCS-10240-D	10x240	100	140	TX 40	25
	WKCS-10260-D	10x260	100	160	TX 40	25
	WKCS-10280-D	10x280	100	180	TX 40	25
	WKCS-10300-D	10x300	100	200	TX 40	25
	WKCS-10320-D	10x320	100	220	TX 40	25
	WKCS-10340-D	10x340	100	240	TX 40	25
	WKCS-10360-D	10x360	100	260	TX 40	25
	WKCS-10380-D	10x380	100	280	TX 40	25
	WKCS-10400-D	10x400	100	300	TX 40	25
	WKCS-10440-D*	10x440	100	340	TX 40	25
	WKCS-10480-D*	10x480	100	380	TX 40	25
	WKCS-10520-D*	10x520	100	420	TX 40	25
	WKCS-10560-D*	10x560	100	460	TX 40	25
	WKCS-10600-D*	10x600	100	500	TX 40	25

* Product on order



PWKCS-D - Washer for countersunk head timber screw (SQ Ceramic coating)



Example of use WKCS-D + PWKCS-D

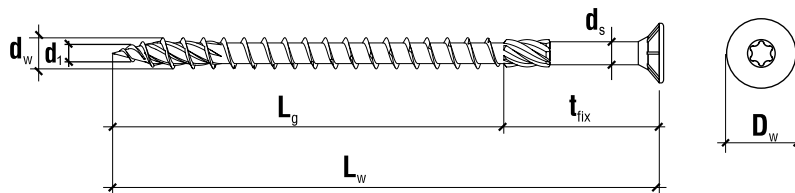


Product code	Dimensions	Inner diameter	Quantity
SQ Ceramic	$D_p \times h_p$ [mm]	d_p [mm]	[pcs]
PWKCS-6(100)-D*	20 x 4	7,5	100
PWKCS-8(100)-D*	25 x 5	8,5	100
PWKCS-10(100)-D*	32 x 6	11	100

* Product on order



WKCS-D - Countersunk head construction screw with TX drive


Geometry

Product	Outer thread diameter	Inner thread diameter	Unthreaded part diameter	Head diameter	Length range
	d_w [mm]	d_1 [mm]	d_s [mm]	D_w [mm]	L_w [mm]
WKCS-D ø3	3	2,00	2,20	6	30-40
WKCS-D ø3,5	3,5	2,25	2,50	7	30-50
WKCS-D ø4	4	2,55	2,87	8	30-70
WKCS-D ø4,5	4,5	2,95	3,10	9	40-80
WKCS-D ø5	5	3,15	3,50	10	40-120
WKCS-D ø6	6	3,80	4,30	12	50-300
WKCS-D ø8	8	5,50	5,78	14	80-600
WKCS-D ø10	10	6,30	7,00	18	120-600

Mechanical characteristics

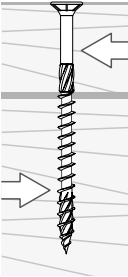
Product	Characteristic yield moment	Characteristic withdrawal resistance parameter - softwood	Characteristic withdrawal resistance parameter - LVL	Characteristic head-pull-through resistance parameter - softwood	Characteristic head-pull-through resistance parameter - LVL	Characteristic tensile strength	Characteristic torsional strength
	M_{yk} [N*m]	f_{ak} [N/mm ²]	f_{ak} [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{tens,k}$ [kN]	$f_{tor,k}$ [N*m]
WKCS-D ø3	1,5	13	15	22,5	22,5	3,5	1,5
WKCS-D ø3,5	2	13	15	20,8	20,8	4	2
WKCS-D ø4	3,5	13	15	19,4	19,4	6	3,5
WKCS-D ø4,5	5	13	15	18,3	18,3	8	4,5
WKCS-D ø5	6	12	15	17,4	17,4	9	6
WKCS-D ø6	10	12	13	15,9	15,9	13	10
WKCS-D ø8	25	12	13	14,7	14,7	25	27
WKCS-D ø10	43	11	13	13,0	13,0	36	45

1. Characteristic withdrawal and head-pull-through resistance based on reference density of timber $\rho_a = 350 \text{ kg/m}^3$

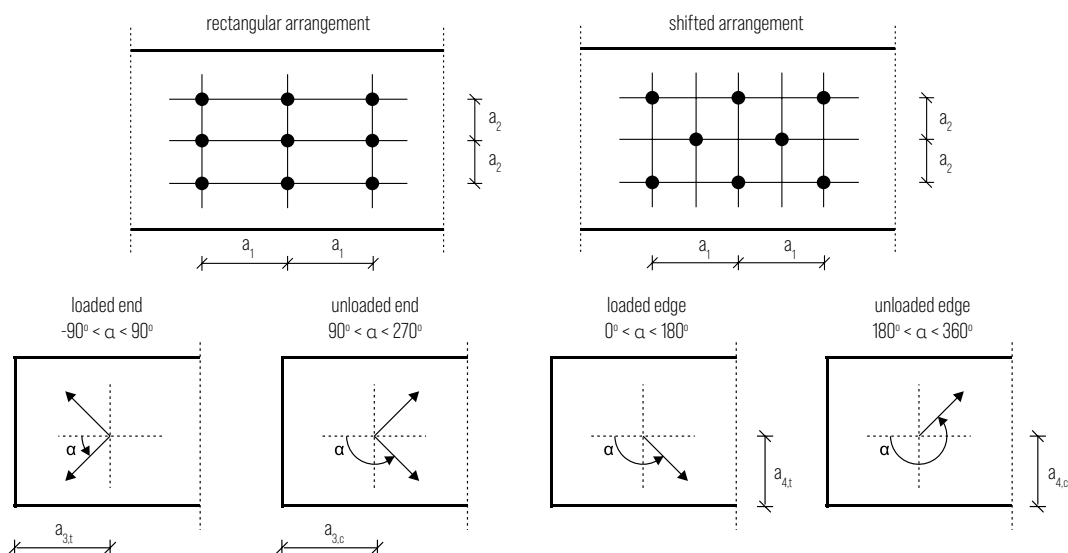
2. Characteristic withdrawal and head-pull-through resistance based on reference density of LVL $\rho_a = 480 \text{ kg/m}^3$

WKCS-D - Countersunk head construction screw with TX drive
TIMBER

Minimum distances for laterally loaded screws - timber

Angle between force and fiber direction $\alpha = 0^\circ$									Angle between force and fiber direction $\alpha = 90^\circ$								
																	
WITHOUT PRE-DRILLED HOLE									WITHOUT PRE-DRILLED HOLE								
d_w [mm]	Ø3	Ø3.5	Ø4	Ø4.5	Ø5	Ø6	Ø8	Ø10	d_w [mm]	Ø3	Ø3.5	Ø4	Ø4.5	Ø5	Ø6	Ø8	Ø10
a_1 [mm]	30	35	40	45	60	72	96	120	a_1 [mm]	15	18	20	23	25	30	40	50
a_2 [mm]	15	18	20	23	25	30	40	50	a_2 [mm]	15	18	20	23	25	30	40	50
a_{3t} [mm]	45	53	60	68	75	90	120	150	a_{3t} [mm]	30	35	40	45	50	60	80	100
a_{3c} [mm]	30	35	40	45	50	60	80	100	a_{3c} [mm]	30	35	40	45	50	60	80	100
a_{4t} [mm]	15	18	20	23	25	30	40	50	a_{4t} [mm]	21	25	28	32	50	60	80	100
a_{4c} [mm]	15	18	20	23	25	30	40	50	a_{4c} [mm]	15	18	20	23	25	30	40	50
WITH PRE-DRILLED HOLE									WITH PRE-DRILLED HOLE								
d_w [mm]	Ø3	Ø3.5	Ø4	Ø4.5	Ø5	Ø6	Ø8	Ø10	d_w [mm]	Ø3	Ø3.5	Ø4	Ø4.5	Ø5	Ø6	Ø8	Ø10
d_0 [mm]	2	2	2,5	2,5	3	4	5	6	d_0 [mm]	2	2	2,5	2,5	3	4	5	6
a_1 [mm]	15	18	20	23	25	30	40	50	a_1 [mm]	12	14	16	18	20	24	32	40
a_2 [mm]	9	11	12	14	15	18	24	30	a_2 [mm]	12	14	16	18	20	24	32	40
a_{3t} [mm]	36	42	48	54	60	72	96	120	a_{3t} [mm]	21	25	28	32	35	42	56	70
a_{3c} [mm]	21	25	28	32	35	42	56	70	a_{3c} [mm]	21	25	28	32	35	42	56	70
a_{4t} [mm]	9	11	12	14	15	18	24	30	a_{4t} [mm]	15	18	20	23	35	42	56	70
a_{4c} [mm]	9	11	12	14	15	18	24	30	a_{4c} [mm]	9	11	12	14	15	18	24	30

1. Minimum distances in accordance with EN 1995 and ETA-18/0817
2. Minimum distances is valid for timber characteristic density of $\rho_k \leq 420 \text{ kg/m}^3$
3. In case of connection panel-timber minimum distances (a_1, a_2) should be multiplied by a factor of 0,85
4. In case of connection steel-timber minimum distances (a_1, a_2) should be multiplied by a factor of 0,7
5. Hole diameter d_0 is valid for softwood





Wkret-met[®]

KLIMAS

TECHNICAL SUPPORT

AT EACH STAGE OF INVESTMENT

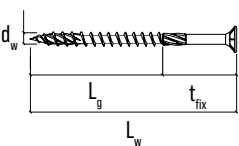
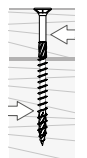
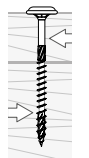
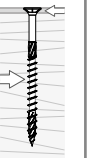
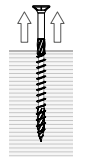
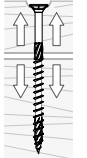
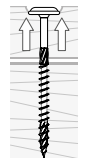
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TECHNICAL ADVICE AND ENGINEERING SUPPORT ON THE JOBSITE | PULL-OUT TESTS | ASSISTANCE WITH SELECTION OF FASTENERS

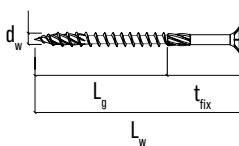
WKCS-D - Countersunk head construction screw with TX drive
TIMBER

Characteristic resistances for laterally and axially loaded screws - timber

DIMENSIONS				SHEAR					TENSION																																			
Diameter	Length	Thread length	Usable length	timber-timber	timber-timber (with washer)	OSB-timber	steel-timber (thin plate)	steel-timber (thick plate)	Withdrawal	Head pull-through	Head pull-through (with washer)																																	
																																												
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]	R _{head,k} [kN]																																	
WKCS-D 3																																												
ø3	30	17	13	0,56	-	t = 9 mm	0,52	t = 1,5 mm	0,66	t = 3 mm	0,87	0,66	0,81	-																														
	35	17	18	0,61	-		0,52								0,66	0,87	0,66	0,81	-																									
	40	22	18	0,68	-		0,52													0,92	0,86	0,81	-																					
WKCS-D 3,5																																												
ø3,5	30	17	13	0,63	-	t = 9 mm	0,61	t = 1,75 mm	0,78	t = 3,5 mm	1,05	0,77	1,02	-																														
	35	17	18	0,69	-		0,61								0,80	1,05	0,77	1,02	-																									
	40	22	18	0,79	-		0,61													0,85	1,10	1,00	1,02	-																				
	50	30	20	0,84	-		0,61																		1,20	1,37	1,02	-																
WKCS-D 4																																												
ø4	30	17	13	0,70	-	t = 12 mm	0,73	t = 2 mm	0,85	t = 4 mm	1,22	0,88	1,24	-																														
	35	17	18	0,77	-		0,83								1,00	1,35	0,88	1,24	-																									
	40	22	18	0,92	-		0,85													1,12	1,47	1,14	1,24	-																				
	45	30	15	0,92	-		0,85																		1,23	1,57	1,56	1,24	-															
	50	30	20	1,01	-		0,85																							1,23	1,57	1,56	1,24	-										
	60	40	20	1,01	-		0,85																												1,36	1,70	2,08	1,24	-					
	70	40	30	1,15	-		0,85																																	1,36	1,70	2,08	1,24	-
WKCS-D 4,5																																												
ø4,5	40	22	18	1,01	-	t = 12 mm	1,00	t = 2,25 mm	1,24	t = 4,5 mm	1,73	1,29	1,49	-																														
	50	30	20	1,18	-		1,00								1,48	1,91	1,76	1,49	-																									
	60	40	20	1,18	-		1,00													1,63	2,06	2,34	1,49	-																				
	70	40	30	1,40	-		1,00																		1,63	2,06	2,34	1,49	-															
	80	50	30	1,40	-		1,00																							1,77	2,21	2,93	1,49	-										
WKCS-D 5																																												
ø5	40	22	18	1,07	-	t = 15 mm	1,11	t = 2,5 mm	1,33	t = 5 mm	1,85	1,32	1,74	-																														
	50	30	20	1,34	-		1,21								1,64	2,13	1,80	1,74	-																									
	60	40	20	1,34	-		1,21													1,79	2,28	2,40	1,74	-																				
	70	40	30	1,56	-		1,21																		1,79	2,28	2,40	1,74	-															
	80	50	30	1,56	-		1,21																							1,94	2,43	3,00	1,74	-										
	90	50	40	1,62	-		1,21																												1,94	2,43	3,00	1,74	-					
	100	60	40	1,62	-		1,21																																	2,09	2,58	3,60	1,74	-
	120	60	60	1,62	-		1,21																																					

WKCS-D - Countersunk head construction screw with TX drive

TIMBER

Characteristic resistances for laterally and axially loaded screws - timber														
DIMENSIONS				SHEAR					TENSION					
Diameter	Length	Thread length	Usable length	timber-timber	timber-timber (with washer)	OSB-timber	steel-timber (thin plate)	steel-timber (thick plate)	Withdrawal	Head pull-through	Head pull-through (with washer)			
														
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]	R _{head,k} [kN]			
WKCS-D 6														
ø6	50	30	20	1,62	1,62	t = 15 mm	1,55	t = 3 mm	1,89	t = 6 mm	2,69	2,16	2,29	6,35
	60	30	30	1,79	1,79		1,55		2,17		2,85	2,16	2,29	6,35
	70	40	30	1,95	2,10		1,55		2,35		3,03	2,88	2,29	6,35
	80	50	30	1,95	2,28		1,55		2,53		3,21	3,60	2,29	6,35
	90	50	40	2,20	2,53		1,55		2,53		3,21	3,60	2,29	6,35
	100	60	40	2,20	2,71		1,55		2,71		3,39	4,32	2,29	6,35
	120	75	45	2,20	2,98		1,55		2,98		3,66	5,40	2,29	6,35
	140	75	65	2,20	2,98		1,55		2,98		3,66	5,40	2,29	6,35
	160	75	85	2,20	2,98		1,55		2,98		3,66	5,40	2,29	6,35
	180	75	105	2,20	2,98		1,55		2,98		3,66	5,40	2,29	6,35
	200	75	125	2,20	2,98		1,55		2,98		3,66	5,40	2,29	6,35
	220	75	145	2,20	2,98		1,55		2,98		3,66	5,40	2,29	6,35
	240	75	165	2,20	2,98		1,55		2,98		3,66	5,40	2,29	6,35
	260	75	185	2,20	2,98		1,55		2,98		3,66	5,40	2,29	6,35
	280	75	205	2,20	2,98		1,55		2,98		3,66	5,40	2,29	6,35
	300	75	225	2,20	2,98		1,55		2,98		3,66	5,40	2,29	6,35

NOTES:

1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817
2. In order to obtain a design resistance, use the following formula :

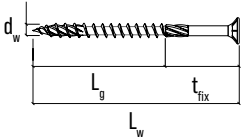
$$R_d = \frac{R_k * k_{mod}}{\gamma_M}$$

Factors γ_M and k_{mod} should be taken in accordance with EN 1995

3. Characteristic resistances were calculated for a characteristic density of timber $\rho_k = 350 \text{ kg/m}^3$
4. Characteristic resistances were calculated considering that the threaded part of the screw is fully inserted into timber element
5. Characteristic shear resistances were calculated for connections without pre-drilled holes
6. Characteristic shear resistances for OSB-timber connections were calculated for OSB board with thickness t [mm] in accordance with EN 300
7. Characteristic shear resistances for steel-timber connections were calculated for thin steel plate with thickness $t \leq 0,5d_w$
8. Characteristic shear resistances for steel-timber connections were calculated for thick steel plate with thickness $t \geq d_w$
9. Characteristic withdrawal resistances were calculated assuming an angle of 90° between screw and grain direction and for penetration length equal L_g
10. Characteristic head pull-through resistances were calculated for timber element

WKCS-D - Countersunk head construction screw with TX drive
TIMBER

Characteristic resistances for laterally and axially loaded screws - timber

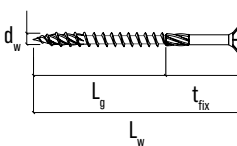
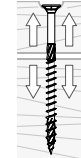
DIMENSIONS				SHEAR					TENSION		
Diameter	Length	Thread length	Usable length	timber-timber	timber-timber (with washer)	OSB-timber	steel-timber (thin plate)	steel-timber (thick plate)	Withdrawal	Head pull-through	Head pull-through (with washer)
											
d_w [mm]	L_w [mm]	L_g [mm]	t_{fix} [mm]	R_{vk} [kN]	R_{vk} [kN]	R_{vk} [kN]	R_{vk} [kN]	R_{vk} [kN]	$R_{ax,k}$ [kN]	$R_{head,k}$ [kN]	$R_{head,k}$ [kN]
WKCS-D 8											
ø8	80	50	30	2,77	3,25	2,44	3,74	5,23	4,80	2,88	9,19
	100	50	50	3,27	3,75	2,44	4,05	5,23	4,80	2,88	9,19
	120	80	40	3,05	4,25	2,44	4,77	5,95	7,68	2,88	9,19
	140	100	40	3,05	4,62	2,44	5,25	6,43	9,60	2,88	9,19
	160	100	60	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	180	100	80	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	200	100	100	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	220	100	120	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	240	100	140	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	260	100	160	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	280	100	180	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	300	100	200	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	320	100	220	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	340	100	240	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	360	100	260	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	380	100	280	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	400	100	300	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	440	100	340	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	480	100	380	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	520	100	420	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	560	100	460	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	600	100	500	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19



WKCS-D - Countersunk head construction screw with TX drive

TIMBER

Characteristic resistances for laterally and axially loaded screws - timber

DIMENSIONS				SHEAR					TENSION				
Diameter	Length	Thread length	Usable length	timber-timber	timber-timber (with washer)	OSB-timber	steel-timber (thin plate)	steel-timber (thick plate)	Withdrawal	Head pull-through	Head pull-through (with washer)		
													
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{Vk} [kN]	R _{Vk} [kN]	R _{Vk} [kN]	R _{Vk} [kN]	R _{Vk} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]	R _{head,k} [kN]		
WKCS-D 10													
ø10	120	80	40	4,07	5,22	t = 22 mm	3,89	6,24	t = 10 mm	7,92	8,80	4,20	13,27
	140	80	60	4,78	5,93		3,89	6,24		7,92	8,80	4,20	13,27
	160	100	60	4,78	6,48		3,89	6,79		8,47	11,00	4,20	13,27
	180	100	80	5,09	6,79		3,89	6,79		8,47	11,00	4,20	13,27
	200	100	100	5,09	6,79		3,89	6,79		8,47	11,00	4,20	13,27
	220	100	120	5,09	6,79		3,89	6,79		8,47	11,00	4,20	13,27
	240	100	140	5,09	6,79		3,89	6,79		8,47	11,00	4,20	13,27
	260	100	160	5,09	6,79		3,89	6,79		8,47	11,00	4,20	13,27
	280	100	180	5,09	6,79		3,89	6,79		8,47	11,00	4,20	13,27
	300	100	200	5,09	6,79		3,89	6,79		8,47	11,00	4,20	13,27
	320	100	220	5,09	6,79		3,89	6,79		8,47	11,00	4,20	13,27
	340	100	240	5,09	6,79		3,89	6,79		8,47	11,00	4,20	13,27
	360	100	260	5,09	6,79		3,89	6,79		8,47	11,00	4,20	13,27
	380	100	280	5,09	6,79		3,89	6,79		8,47	11,00	4,20	13,27
	400	100	300	5,09	6,79		3,89	6,79		8,47	11,00	4,20	13,27
	440	100	340	5,09	6,79		3,89	6,79		8,47	11,00	4,20	13,27
	480	100	380	5,09	6,79		3,89	6,79		8,47	11,00	4,20	13,27
	520	100	420	5,09	6,79		3,89	6,79		8,47	11,00	4,20	13,27
	560	100	460	5,09	6,79		3,89	6,79		8,47	11,00	4,20	13,27
	600	100	500	5,09	6,79		3,89	6,79		8,47	11,00	4,20	13,27

NOTES:

1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817
2. In order to obtain a design resistance, use the following formula :

$$R_d = \frac{R_k * k_{mod}}{\gamma_M}$$

Factors γ_M and k_{mod} should be taken in accordance with EN 1995

3. Characteristic resistances were calculated for a characteristic density of timber $\rho_k = 350 \text{ kg/m}^3$
4. Characteristic resistances were calculated considering that the threaded part of the screw is fully inserted into timber element
5. Characteristic shear resistances were calculated for connections without pre-drilled holes
6. Characteristic shear resistances for OSB-timber connections were calculated for OSB board with thickness t [mm] in accordance with EN 300
7. Characteristic shear resistances for steel-timber connections were calculated for thin steel plate with thickness $t \leq 0,5d_w$
8. Characteristic shear resistances for steel-timber connections were calculated for thick steel plate with thickness $t \geq d_w$
9. Characteristic withdrawal resistances were calculated assuming an angle of 90° between screw and grain direction and for penetration length equal L_g
10. Characteristic head pull-through resistances were calculated for timber element



WKCR

Screw with a round head for steel-wood connections

Diameters: $\varnothing 8$ mm | $\varnothing 10$ mm

Length range: from 40 to 200 mm



Round head construction screw for structural connections of wooden members, including solid, bonded and wood-based panels.



TX DRIVE



Zn
WHITE



EUROPEAN TECHNICAL
ASSESSMENT
ETA-18/0817

SCREW MATERIAL - Carbon steel

ANTI-CORROSION PROTECTION - Galvanized steel (white)

PRODUCT ADVANTAGES:



ROUND HEAD WITH CYLINDRICAL UNDERHEAD AND TX DRIVE - Allows safe and secure fastening of perforated and angular metal plates. TX drive guarantees optimum torque transfer.

UNDERHEAD REINFORCEMENT - Wider screw diameter under the head improves shear strength of the screw.



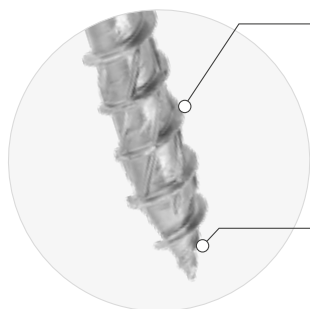
HIGH TORQUE - Allows screws to be installed without pre-drilling, even in hardwood substrates.



SHANK RIBS - Shank ribs reduce installation torque by reaming the hole.



WAX COATING - Wax coating applied during the production process significantly reduces the torque.



NEW CUTTING EDGE / SERRATED THREAD

New special design of cutting edge with added milling reduces screwing resistance by 20%. This helps to extend the life of batteries and power tools. Special cutting notches integrated on the thread cut wood fibres structure while screwing in.

DOUBLE THREAD

Additional recessed second thread improves remarkably the speed of timber penetration and reaction time of first grip into the wood.

EXAMPLES OF APPLICATIONS:



SUBSTRATES



Solid timber

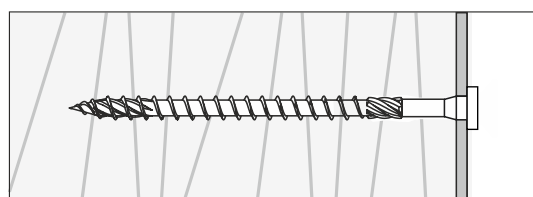
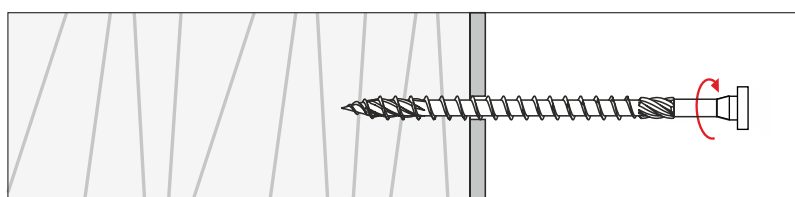


Glued laminated timber
CLT, KVH, BSH/GLT

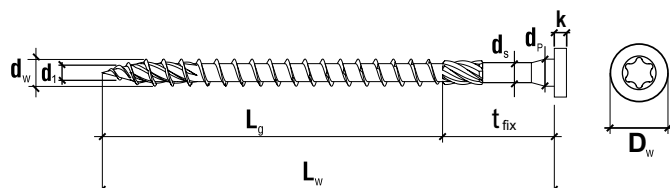


**Laminated Veneer
Lumber - LVL**

INSTALLATION INSTRUCTIONS (screw requires no pre-drilling)



WKCR - Screw with a round head for steel-wood connections



Codes and dimensions						
	Product code	Dimensions	Thread length	Max. usable length	Type of drive	Quantity
	Galvanized - white	$d_w \times L_w$ [mm]	L_g [mm]	t_{fix} [mm]	[-]	[pcs]
WKCH-8						
ø8	WKCR-08040-B	8x40	35	5	TX 40	50
	WKCR-08050-B	8x50	45	5	TX 40	50
	WKCR-08060-B	8x60	50	10	TX 40	50
	WKCR-08070-B	8x70	50	20	TX 40	50
	WKCR-08080-B	8x80	50	30	TX 40	50
	WKCR-08100-B	8x100	50	50	TX 40	50
	WKCR-08120-B	8x120	80	40	TX 40	50
	WKCR-08140-B	8x140	100	40	TX 40	50
	WKCR-08160-B	8x160	100	60	TX 40	50
	WKCR-08180-B	8x180	100	80	TX 40	50
	WKCR-08200-B	8x200	100	100	TX 40	50
WKCH-10						
ø10	WKCR-10060-B*	10x60	50	10	TX 40	50
	WKCR-10070-B*	10x70	50	20	TX 40	50
	WKCR-10080-B*	10x80	50	30	TX 40	50
	WKCR-10100-B*	10x100	50	50	TX 40	50
	WKCR-10120-B*	10x120	80	40	TX 40	50
	WKCR-10140-B*	10x140	80	60	TX 40	50
	WKCR-10160-B*	10x160	100	60	TX 40	50
	WKCR-10180-B*	10x180	100	80	TX 40	50
	WKCR-10200-B*	10x200	100	100	TX 40	50

* Product on order

Geometry							
Product	Outer thread diameter	Inner thread diameter	Unthreaded part diameter	Underhead diameter	Head diameter	Head thickness	Length range
	d_w [mm]	d_t [mm]	d_s [mm]	d_p [mm]	D_w [mm]	k [mm]	L_w [mm]
WKCR ø8	8	5,50	5,78	7,80	13,00	3,00	40-200
WKCR ø10	10	6,30	7,00	9,80	15,00	3,50	60-200

Mechanical characteristics					
Product	Characteristic yield moment	Characteristic withdrawal resistance parameter	Characteristic head-pull-through resistance parameter	Characteristic tensile strength	Characteristic torsional strength
	M_{yk} [N*m]	$f_{ax,k}$ [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{tens,k}$ [kN]	f_{tork} [N*m]
WKCR ø8	25	12	15,3	25	27
WKCR ø10	43	11	14,2	36	45

1. Characteristic withdrawal and head-pull-through resistance based on reference density of timber $\rho_g = 350 \text{ kg/m}^3$

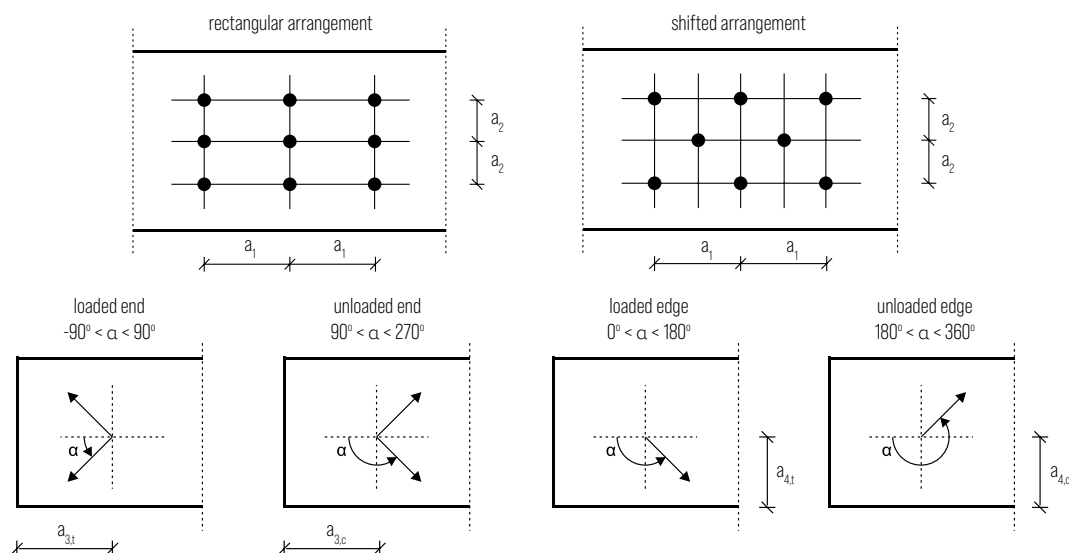
WKCR - Screw with a round head for steel-wood connections

TIMBER

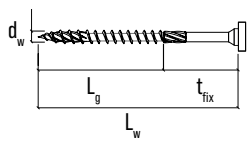
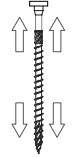
Minimum distances for laterally loaded screws - timber

Angle between force and fiber direction $\alpha = 0^\circ$			Angle between force and fiber direction $\alpha = 90^\circ$		
					
WITHOUT PRE-DRILLED HOLE			WITHOUT PRE-DRILLED HOLE		
d_w [mm]	$\varnothing 8$	$\varnothing 10$	d_w [mm]	$\varnothing 8$	$\varnothing 10$
a_1 [mm]	67	84	a_1 [mm]	28	35
a_2 [mm]	28	35	a_2 [mm]	28	35
$a_{3,t}$ [mm]	120	150	$a_{3,t}$ [mm]	80	100
$a_{3,c}$ [mm]	80	100	$a_{3,c}$ [mm]	80	100
$a_{4,t}$ [mm]	40	50	$a_{4,t}$ [mm]	80	100
$a_{4,c}$ [mm]	40	50	$a_{4,c}$ [mm]	40	50
WITH PRE-DRILLED HOLE			WITH PRE-DRILLED HOLE		
d_w [mm]	$\varnothing 8$	$\varnothing 10$	d_w [mm]	$\varnothing 8$	$\varnothing 10$
d_0 [mm]	5	6	d_0 [mm]	5	6
$d_{0,steel}$ [mm]	9	11	$d_{0,steel}$ [mm]	9	11
a_1 [mm]	28	35	a_1 [mm]	22	28
a_2 [mm]	17	21	a_2 [mm]	22	28
$a_{3,t}$ [mm]	96	120	$a_{3,t}$ [mm]	56	70
$a_{3,c}$ [mm]	56	70	$a_{3,c}$ [mm]	56	70
$a_{4,t}$ [mm]	24	30	$a_{4,t}$ [mm]	56	70
$a_{4,c}$ [mm]	24	30	$a_{4,c}$ [mm]	24	30

1. Minimum distances in accordance with EN 1995 and ETA-18/0817
2. Minimum distances is valid for timber characteristic density of $\rho_k \leq 420 \text{ kg/m}^3$
3. In case of connection timber-timber minimum distances (a_1, a_2) should be multiplied by a factor of 1,45
4. Hole diameter d_0 is valid for softwood
5. Hole diameter $d_{0,steel}$ is valid for steel plate



WKCR - Screw with a round head for steel-wood connections
TIMBER

Characteristic resistances for laterally and axially loaded screws - timber											
DIMENSIONS				SHEAR			TENSION				
Diameter	Length	Thread length	Usable length	timber-timber	steel-timber (thin plate)	steel-timber (thick plate)	Withdrawal	Head pull-through	Tension		
											
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]	R _{tens,k} [kN]		
WKCR 8											
ø8	40	35	5	0,62	t = 4 mm	1,77	t = 8 mm	3,41	3,36	2,58	25,00
	50	45	5	0,62		2,26		3,95	4,32	2,58	25,00
	60	50	10	1,23		2,76		4,51	4,80	2,58	25,00
	70	50	20	2,46		3,25		4,92	4,80	2,58	25,00
	80	50	30	2,70		3,74		5,23	4,80	2,58	25,00
	100	50	50	3,19		4,05		5,23	4,80	2,58	25,00
	120	80	40	2,97		4,77		5,95	7,68	2,58	25,00
	140	100	40	2,97		5,25		6,43	9,60	2,58	25,00
	160	100	60	3,50		5,25		6,43	9,60	2,58	25,00
	180	100	80	3,50		5,25		6,43	9,60	2,58	25,00
200	100	100	3,50	5,25	6,43	9,60	2,58	25,00			
WKCR 10											
ø10	60	50	10	1,44	t = 5 mm	3,16	t = 10 mm	5,51	5,50	3,20	36,00
	70	50	20	2,88		3,74		5,92	5,50	3,20	36,00
	80	50	30	3,31		4,32		6,39	5,50	3,20	36,00
	100	50	50	3,78		5,42		7,10	5,50	3,20	36,00
	120	80	40	3,82		6,24		7,92	8,80	3,20	36,00
	140	80	60	4,53		6,24		7,92	8,80	3,20	36,00
	160	100	60	4,53		6,79		8,47	11,00	3,20	36,00
	180	100	80	4,84		6,79		8,47	11,00	3,20	36,00
	200	100	100	4,84		6,79		8,47	11,00	3,20	36,00

NOTES:

1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817

2. In order to obtain a design resistance, use the following formula :

$$R_d = \frac{R_k * k_{mod}}{\gamma_M}$$

 Factors γ_M and k_{mod} should be taken in accordance with EN 1995

3. Design resistance for tension is smaller value of the following :

$$R_{ax,d} = \min \left\{ \frac{R_{ax,k} * k_{mod}}{\gamma_{M1}}, \frac{R_{tens,k}}{\gamma_{M2}} \right\}$$

 Factors γ_M and k_{mod} should be taken in accordance with EN 1995. Factor γ_{M2} should be taken in accordance with EN 1993

 4. Characteristic resistances were calculated for a characteristic density of timber $\rho_k = 350 \text{ kg/m}^3$

5. Characteristic resistances were calculated considering that the threaded part of the screw is fully inserted into timber element

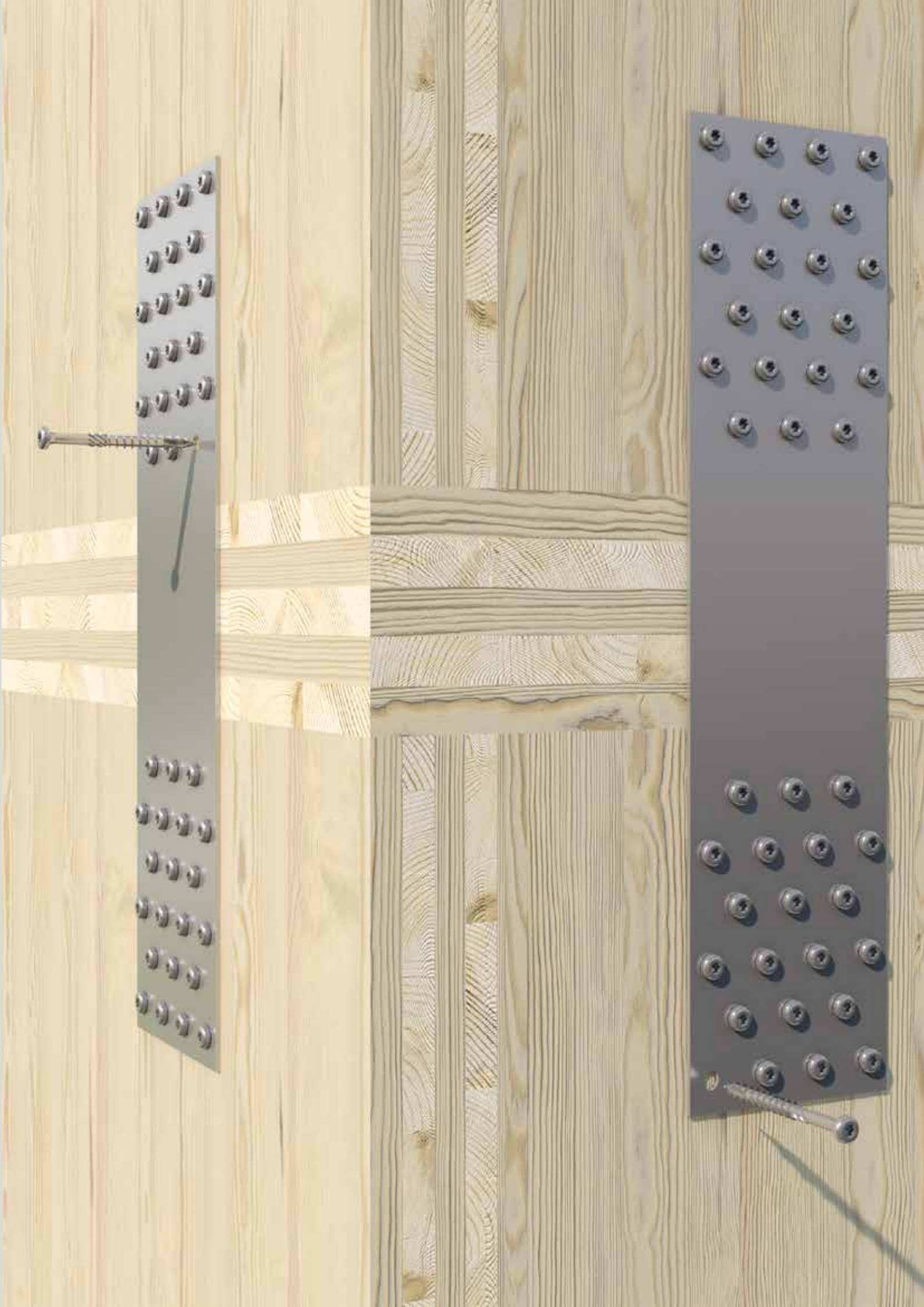
6. Characteristic shear resistances were calculated for connections without pre-drilled holes

 7. Characteristic shear resistances for steel-timber connections were calculated for thin steel plate with thickness $t \leq 0,5d_w$

 8. Characteristic shear resistances for steel-timber connections were calculated for thick steel plate with thickness $t \geq d_w$

 9. Characteristic withdrawal resistances were calculated assuming an angle of 90° between screw and grain direction and for penetration length equal L_g

10. Characteristic head pull-through resistances were calculated for timber element





WKCH

Screw with a hexagonal head for steel-wood connections

Diameters: $\varnothing 6$ mm | $\varnothing 8$ mm | $\varnothing 10$ mm

Length range: from 50 to 400 mm



Hexagonal head construction screw with TX drive for structural connections of wooden members, including solid, bonded and wood-based panels.



TX DRIVE



Zn
WHITE



EUROPEAN TECHNICAL
ASSESSMENT
ETA-18/0817

SCREW MATERIAL - Carbon steel

ANTI-CORROSION PROTECTION - Galvanized steel (white)

PRODUCT ADVANTAGES:



HEXAGONAL HEAD - Hex head improves pull-through resistance of joint and allows steel-wood applications

UNDERHEAD REINFORCEMENT - Wider screw diameter under the head improves shear strength of the screw.



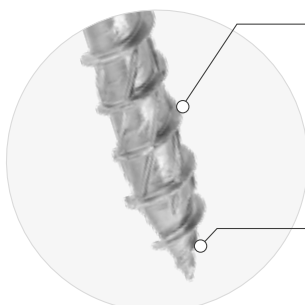
HIGH TORQUE - Allows screws to be installed without pre-drilling, even in hardwood substrates.



SHANK RIBS - Shank ribs reduce installation torque by reaming the hole.



WAX COATING - Wax coating applied during the production process significantly reduces the torque.



NEW CUTTING EDGE / SERRATED THREAD

New special design of cutting edge with added milling reduces screwing resistance by 20%. This helps to extend the life of batteries and power tools. Special cutting notches integrated on the thread cut wood fibres structure while screwing in.

DOUBLE THREAD

Additional recessed second thread improves remarkably the speed of timber penetration and reaction time of first grip into the wood.

EXAMPLES OF APPLICATIONS:



SUBSTRATES



Solid timber

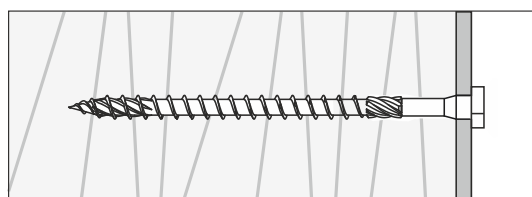
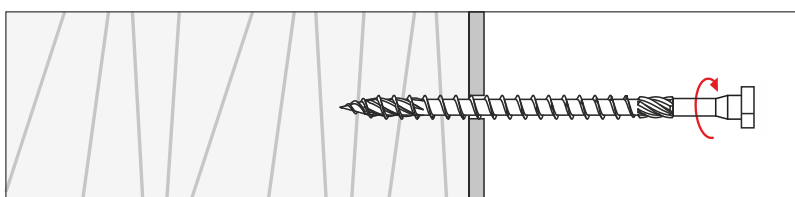


Glued laminated timber
CLT, KVH, BSH/GLT

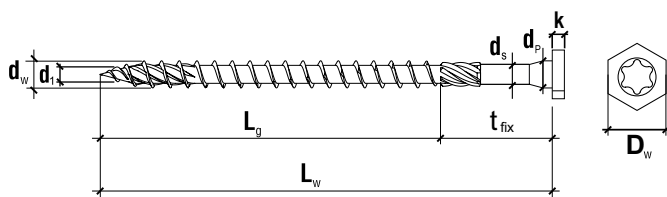


**Laminated Veneer
Lumber - LVL**

INSTALLATION INSTRUCTIONS (screw requires no pre-drilling)



WKCH - Screw with a hexagonal head for steel-wood connections



Codes and dimensions						
	Product code	Dimensions	Thread length	Max. usable length	Type of drive	Quantity
	Galvanized - white	$d_w \times L_w$ [mm]	L_g [mm]	t_{fix} [mm]	[-]	[pcs]
WKCH-6						
ø6	WKCH-06050-B*	6x50	30	20	TX 30	100
	WKCH-06060-B*	6x60	30	30	TX 30	100
	WKCH-06070-B*	6x70	40	30	TX 30	100
	WKCH-06080-B*	6x80	50	30	TX 30	100
	WKCH-06100-B*	6x100	60	40	TX 30	100
WKCH-8						
ø8	WKCH-08040-B	8x40	35	5	TX 40	50
	WKCH-08050-B	8x50	45	5	TX 40	50
	WKCH-08060-B	8x60	50	10	TX 40	50
	WKCH-08070-B	8x70	50	20	TX 40	50
	WKCH-08080-B	8x80	50	30	TX 40	50
	WKCH-08100-B	8x100	50	50	TX 40	50
	WKCH-08120-B	8x120	80	40	TX 40	50
	WKCH-08140-B	8x140	100	40	TX 40	50
	WKCH-08160-B	8x160	100	60	TX 40	50
	WKCH-08180-B	8x180	100	80	TX 40	50
	WKCH-08200-B	8x200	100	100	TX 40	50
	WKCH-08220-B	8x220	100	120	TX 40	50
	WKCH-08240-B	8x240	100	140	TX 40	50
	WKCH-08260-B	8x260	100	160	TX 40	50
	WKCH-08280-B	8x280	100	180	TX 40	50
	WKCH-08300-B	8x300	100	200	TX 40	50

* Product on order

WKCH - Screw with a hexagonal head for steel-wood connections

Codes and dimensions						
	Product code	Dimensions	Thread length	Max. usable length	Type of drive	Quantity
	Galvanized - white	$d_w \times L_w$ [mm]	L_y [mm]	t_{tx} [mm]	[-]	[pcs]
WKCH-10						
ø10	WKCH-10060-B*	10x60	50	10	TX 40	50
	WKCH-10070-B*	10x70	50	20	TX 40	50
	WKCH-10080-B*	10x80	50	30	TX 40	50
	WKCH-10100-B*	10x100	50	50	TX 40	50
	WKCH-10120-B*	10x120	80	40	TX 40	25
	WKCH-10140-B*	10x140	80	60	TX 40	25
	WKCH-10160-B*	10x160	100	60	TX 40	25
	WKCH-10180-B*	10x180	100	80	TX 40	25
	WKCH-10200-B*	10x200	100	100	TX 40	25
	WKCH-10220-B*	10x220	100	120	TX 40	25
	WKCH-10240-B*	10x240	100	140	TX 40	25
	WKCH-10260-B*	10x260	100	160	TX 40	25
	WKCH-10280-B*	10x280	100	180	TX 40	25
	WKCH-10300-B*	10x300	100	200	TX 40	25
	WKCH-10320-B*	10x320	100	220	TX 40	25
	WKCH-10340-B*	10x340	100	240	TX 40	25
	WKCH-10360-B*	10x360	100	260	TX 40	25
	WKCH-10380-B*	10x380	100	280	TX 40	25
	WKCH-10400-B*	10x400	100	300	TX 40	25

* Product on order

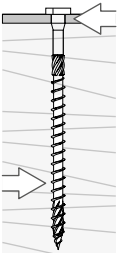
Geometry							
Product	Outer thread diameter	Inner thread diameter	Unthreaded part diameter	Underhead diameter	Head diameter	Head thickness	Length range
	d_w [mm]	d_i [mm]	d_s [mm]	d_p [mm]	D_w [mm]	k [mm]	L_w [mm]
WKCH ø6	6	3,80	4,30	5,80	10,00	4,00	50-100
WKCH ø8	8	5,50	5,78	7,80	13,00	5,50	40-300
WKCH ø10	10	6,30	7,00	9,80	15,00	6,15	60-400

Mechanical characteristics					
Product	Characteristic yield moment	Characteristic withdrawal resistance parameter	Characteristic head-pull-through resistance parameter	Characteristic tensile strength	Characteristic torsional strength
	$M_{y,k}$ [N*m]	$f_{ax,k}$ [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{tens,k}$ [kN]	$f_{tor,k}$ [N*m]
WKCH ø6	10,0	12	17,4	13,0	10,0
WKCH ø8	25	12	15,3	25,0	27,0
WKCH ø10	43	11	14,2	36,0	45,0

1. Characteristic withdrawal and head-pull-through resistance based on reference density of timber $\rho_a = 350 \text{ kg/m}^3$

WKCH - Screw with a hexagonal head for steel-wood connections
TIMBER

Minimum distances for laterally loaded screws - timber

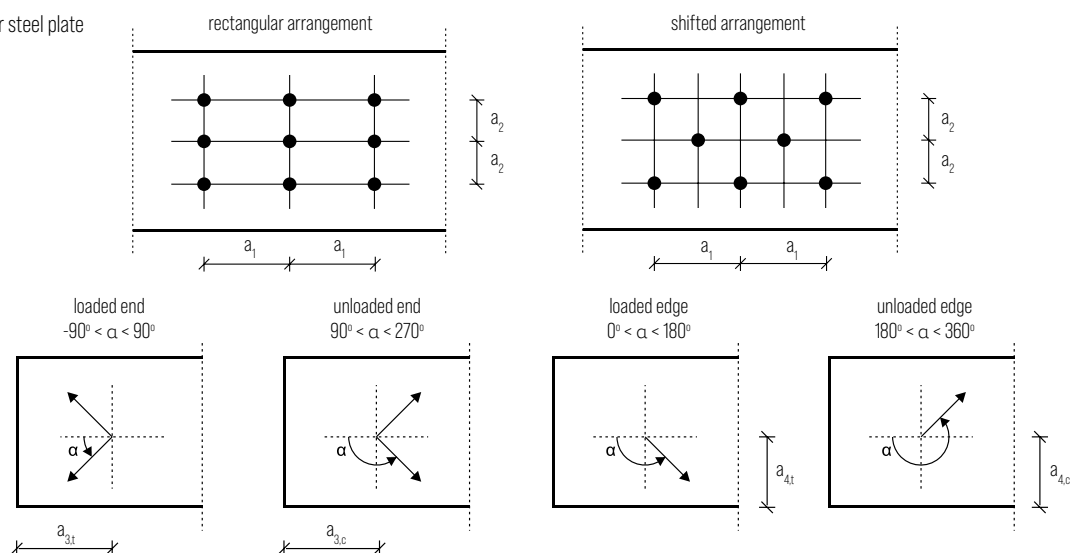
Angle between force and fiber direction $\alpha = 0^\circ$				Angle between force and fiber direction $\alpha = 90^\circ$			
							
WITHOUT PRE-DRILLED HOLE				WITHOUT PRE-DRILLED HOLE			
d_w [mm]	Ø 6	Ø 8	Ø 10	d_w [mm]	Ø 6	Ø 8	Ø 10
a_1 [mm]	50	67	84	a_1 [mm]	21	28	35
a_2 [mm]	21	28	35	a_2 [mm]	21	28	35
$a_{3,t}$ [mm]	90	120	150	$a_{3,t}$ [mm]	60	80	100
$a_{3,c}$ [mm]	60	80	100	$a_{3,c}$ [mm]	60	80	100
$a_{4,t}$ [mm]	30	40	50	$a_{4,t}$ [mm]	60	80	100
$a_{4,c}$ [mm]	30	40	50	$a_{4,c}$ [mm]	30	40	50
WITH PRE-DRILLED HOLE				WITH PRE-DRILLED HOLE			
d_w [mm]	Ø 6	Ø 8	Ø 10	d_w [mm]	Ø 6	Ø 8	Ø 10
d_0 [mm]	4	5	6	d_0 [mm]	4	5	6
$d_{0,steel}$ [mm]	7	9	11	$d_{0,steel}$ [mm]	7	9	11
a_1 [mm]	21	28	35	a_1 [mm]	17	22	28
a_2 [mm]	13	17	21	a_2 [mm]	17	22	28
$a_{3,t}$ [mm]	72	96	120	$a_{3,t}$ [mm]	42	56	70
$a_{3,c}$ [mm]	42	56	70	$a_{3,c}$ [mm]	42	56	70
$a_{4,t}$ [mm]	18	24	30	$a_{4,t}$ [mm]	42	56	70
$a_{4,c}$ [mm]	18	24	30	$a_{4,c}$ [mm]	18	24	30

1. Minimum distances in accordance with EN 1995 and ETA-18/0817

 2. Minimum distances is valid for timber characteristic density of $\rho_k \leq 420 \text{ kg/m}^3$

 3. In case of connection timber-timber minimum distances (a_1, a_2) should be multiplied by a factor of 1,45

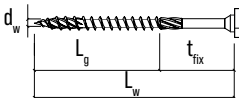
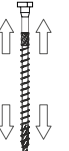
 4. Hole diameter d_0 is valid for softwood

 5. Hole diameter $d_{0,steel}$ is valid for steel plate




WKCH - Screw with a hexagonal head for steel-wood connections
TIMBER

Characteristic resistances for laterally and axially loaded screws - timber

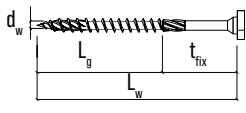
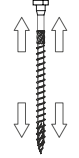
DIMENSIONS				SHEAR			TENSION				
Diameter	Length	Thread length	Usable length	timber-timber	steel-timber (thin plate)	steel-timber (thick plate)	Withdrawal	Head pull-through	Tension		
											
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{ack,k} [kN]	R _{head,k} [kN]	R _{tens,k} [kN]		
WKCH 6											
ø6	50	30	20	1,51	t = 3 mm	1,89	t = 6 mm	2,69	2,16	1,74	13,00
	60	30	30	1,68		2,17		2,85	2,16	1,74	13,00
	70	40	30	1,82		2,35		3,03	2,88	1,74	13,00
	80	50	30	1,82		2,53		3,21	3,60	1,74	13,00
	100	60	40	2,07		2,71		3,39	4,32	1,74	13,00
WKCH 8											
ø8	40	35	5	0,62	t = 4 mm	1,77	t = 8 mm	3,41	3,36	2,58	25,00
	50	45	5	0,62		2,26		3,95	4,32	2,58	25,00
	60	50	10	1,23		2,76		4,51	4,80	2,58	25,00
	70	50	20	2,46		3,25		4,92	4,80	2,58	25,00
	80	50	30	2,70		3,74		5,23	4,80	2,58	25,00
	100	50	50	3,19		4,05		5,23	4,80	2,58	25,00
	120	80	40	2,97		4,77		5,95	7,68	2,58	25,00
	140	100	40	2,97		5,25		6,43	9,60	2,58	25,00
	160	100	60	3,50		5,25		6,43	9,60	2,58	25,00
	180	100	80	3,50		5,25		6,43	9,60	2,58	25,00
	200	100	100	3,50		5,25		6,43	9,60	2,58	25,00
	220	100	120	3,50		5,25		6,43	9,60	2,58	25,00
	240	100	140	3,50		5,25		6,43	9,60	2,58	25,00
	260	100	160	3,50		5,25		6,43	9,60	2,58	25,00
	280	100	180	3,50		5,25		6,43	9,60	2,58	25,00
	300	100	200	3,50		5,25		6,43	9,60	2,58	25,00



WKCH - Screw with a hexagonal head for steel-wood connections

TIMBER

Characteristic resistances for laterally and axially loaded screws - timber

DIMENSIONS				SHEAR			TENSION				
Diameter	Length	Thread length	Usable length	timber-timber	steel-timber (thin plate)	steel-timber (thick plate)	Withdrawal	Head pull-through	Tension		
											
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]	R _{tens,k} [kN]		
WKCH 10											
ø10	60	50	10	1,44	t = 5 mm	3,16	t = 10 mm	5,51	5,50	3,20	36,00
	70	50	20	2,88		3,74		5,92	5,50	3,20	36,00
	80	50	30	3,31		4,32		6,39	5,50	3,20	36,00
	100	50	50	3,78		5,42		7,10	5,50	3,20	36,00
	120	80	40	3,82		6,24		7,92	8,80	3,20	36,00
	140	80	60	4,53		6,24		7,92	8,80	3,20	36,00
	160	100	60	4,53		6,79		8,47	11,00	3,20	36,00
	180	100	80	4,84		6,79		8,47	11,00	3,20	36,00
	200	100	100	4,84		6,79		8,47	11,00	3,20	36,00
	220	100	120	4,84		6,79		8,47	11,00	3,20	36,00
	240	100	140	4,84		6,79		8,47	11,00	3,20	36,00
	260	100	160	4,84		6,79		8,47	11,00	3,20	36,00
	280	100	180	4,84		6,79		8,47	11,00	3,20	36,00
	300	100	200	4,84		6,79		8,47	11,00	3,20	36,00
	320	100	220	4,84		6,79		8,47	11,00	3,20	36,00
	340	100	240	4,84		6,79		8,47	11,00	3,20	36,00
	360	100	260	4,84		6,79		8,47	11,00	3,20	36,00
	380	100	280	4,84		6,79		8,47	11,00	3,20	36,00
	400	100	300	4,84		6,79		8,47	11,00	3,20	36,00

NOTES:

1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817

2. In order to obtain a design resistance, use the following formula:

$$R_d = \frac{R_k * k_{mod}}{\gamma_M}$$

Factors γ_M and k_{mod} should be taken in accordance with EN 1995

3. Design resistance for tension is smaller value of the following:

$$R_{ax,d} = \min \left\{ \begin{array}{l} \frac{R_{ax,k} * k_{mod}}{\gamma_M} \\ \frac{R_{tens,k}}{\gamma_{M2}} \end{array} \right.$$

Factors γ_M and k_{mod} should be taken in accordance with EN 1995. Factor γ_{M2} should be taken in accordance with EN 1993

4. Characteristic resistances were calculated for a characteristic density of timber $\rho_k = 350 \text{ kg/m}^3$

5. Characteristic resistances were calculated considering that the threaded part of the screw is fully inserted into timber element

6. Characteristic shear resistances were calculated for connections without pre-drilled holes

7. Characteristic shear resistances for steel-timber connections were calculated for thin steel plate with thickness $t \leq 0,5d_w$

8. Characteristic shear resistances for steel-timber connections were calculated for thick steel plate with thickness $t \geq d_w$

9. Characteristic withdrawal resistances were calculated assuming an angle of 90° between screw and grain direction and for penetration length equal L_g

10. Characteristic head pull-through resistances were calculated for timber element



WKFC

Screw for wooden constructions with full thread and cylindrical head

Diameters: $\varnothing 6$ mm | $\varnothing 8$ mm | $\varnothing 10$ mm

Length range: from 80 to 600 mm



Construction cylindrical head screws with full thread and TX drive for structural connections and reinforcements of wooden members.



TX DRIVE



Zn
WHITE



EUROPEAN TECHNICAL
ASSESSMENT
ETA-18/0817

SCREW MATERIAL - Carbon steel

ANTI-CORROSION PROTECTION - Galvanized steel (white)

PRODUCT ADVANTAGES:



FULL THREAD - Without elements being over tighten to each other.



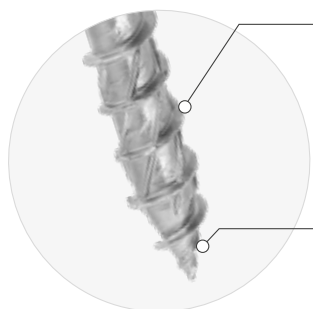
CYLINDRICAL HEAD - Allow quick and secure fastening, ideal for concealed joints.



HIGH TORQUE - Allows screws to be installed without pre-drilling, even in hardwood substrates.



WAX COATING - Wax coating applied during the production process significantly reduces the torque.



NEW CUTTING EDGE / SERRATED THREAD

New special design of cutting edge with added milling reduces screwing resistance by 20%. This helps to extend the life of batteries and power tools. Special cutting notches integrated on the thread cut wood fibres structure while screwing in.

DOUBLE THREAD

Additional recessed second thread improves remarkably the speed of timber penetration and reaction time of first grip into the wood.

EXAMPLES OF USE



Reinforcement with screws in roof ridge area



Protection against failure of notched beam



Reinforcement in the point of support



Reinforcement by coupling of beams



Reinforcement of beam in the point weakened by drill hole



Joint between two girders



Joint between two passing-by beams

SUBSTRATES



Solid timber

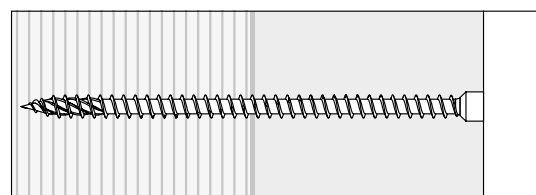
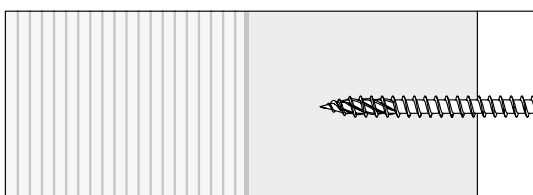


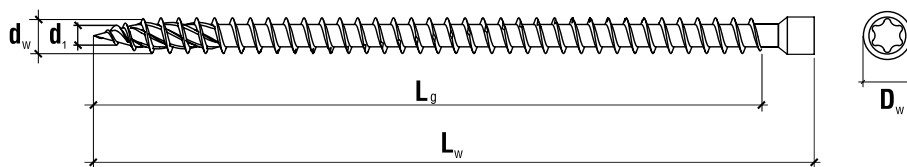
Glued laminated timber
CLT, KVH, BSH/GLT



Laminated Veneer
Lumber - LVL

INSTALLATION INSTRUCTIONS



WKFC - Screw for wooden constructions with full thread and cylindrical head


Codes and dimensions					
	Product code	Dimensions	Thread length	Type of drive	Quantity
	Galvanized - white	$d_w \times L_w$ [mm]	L_g [mm]	[-]	[pcs]
WKFC-6					
ø6	WKFC-06080-B	6x80	72	TX 30	100
	WKFC-06100-B	6x100	92	TX 30	100
	WKFC-06120-B	6x120	112	TX 30	100
	WKFC-06140-B	6x140	132	TX 30	100
	WKFC-06160-B	6x160	152	TX 30	100
	WKFC-06180-B	6x180	172	TX 30	100
	WKFC-06200-B	6x200	192	TX 30	100
	WKFC-06220-B	6x220	212	TX 30	100
	WKFC-06240-B	6x240	232	TX 30	100
	WKFC-06260-B	6x260	252	TX 30	100
	WKFC-06280-B	6x280	272	TX 30	100
	WKFC-06300-B	6x300	292	TX 30	100
WKFC-8					
ø8	WKFC-08120-B	8x120	108	TX 40	50
	WKFC-08140-B	8x140	128	TX 40	50
	WKFC-08160-B	8x160	148	TX 40	50
	WKFC-08180-B	8x180	168	TX 40	50
	WKFC-08200-B	8x200	188	TX 40	50
	WKFC-08220-B	8x220	208	TX 40	50
	WKFC-08240-B	8x240	228	TX 40	50
	WKFC-08260-B	8x260	248	TX 40	50
	WKFC-08280-B	8x280	268	TX 40	50
	WKFC-08300-B	8x300	288	TX 40	50
	WKFC-08350-B	8x350	338	TX 40	50
	WKFC-08400-B	8x400	388	TX 40	50
	WKFC-08450-B	8x450	438	TX 40	50
	WKFC-08500-B	8x500	488	TX 40	50

WKFC - Screw for wooden constructions with full thread and cylindrical head

Codes and dimensions					
		Dimensions	Thread length	Type of drive	Quantity
	Galvanized - white	$d_w \times L_w$ [mm]	L_g [mm]	[-]	[pcs]
WKFC-10					
ø10	WKFC-10300-B	10x300	285	TX 50	25
	WKFC-10330-B	10x330	315	TX 50	25
	WKFC-10360-B	10x360	345	TX 50	25
	WKFC-10400-B	10x400	385	TX 50	25
	WKFC-10450-B	10x450	435	TX 50	25
	WKFC-10500-B	10x500	485	TX 50	25
	WKFC-10550-B	10x550	535	TX 50	25
	WKFC-10600-B	10x600	585	TX 50	25

Geometry				
Product	Outer thread diameter	Inner thread diameter	Head diameter	Length range
	d_w [mm]	d_i [mm]	D_w [mm]	L_w [mm]
WKFC ø6	6	3,85	8	80-300
WKFC ø8	8	4,95	10	120-500
WKFC ø10	10	6,00	13	300-600

Mechanical characteristics								
Product	Characteristic yield moment	Characteristic withdrawal resistance parameter - softwood	Characteristic withdrawal resistance parameter - LVL	Characteristic head-pull-through resistance parameter - softwood	Characteristic head-pull-through resistance parameter - LVL	Characteristic tensile strength	Characteristic torsional strength	Characteristic yield strength
	$M_{y,k}$ [N*m]	$f_{ax,k}$ [N/mm ²]	$f_{ax,k}$ [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{tens,k}$ [kN]	$f_{tor,k}$ [N*m]	$f_{y,k}$ [N/mm ²]
WKFC ø6	14	12	13,0	19,4	19,4	16	10	1000,0
WKFC ø8	25	12	13,0	17,4	17,4	25	27	1000,0
WKFC ø10	43	11	13,0	15,3	15,3	36	45	1000,0

1. Characteristic withdrawal and head-pull-through resistance based on reference density of timber $\rho_a = 350 \text{ kg/m}^3$

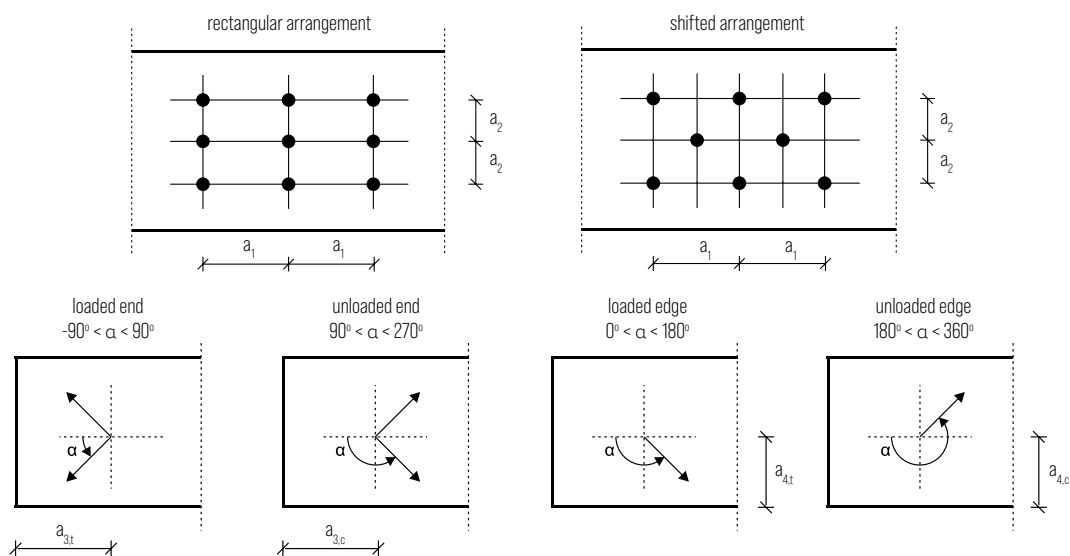
2. Characteristic withdrawal and head-pull-through resistance based on reference density of LVL $\rho_a = 480 \text{ kg/m}^3$



WKFC - Screw for wooden constructions with full thread and cylindrical head
TIMBER
Minimum distances for laterally loaded screws - timber

Angle between force and fiber direction $\alpha = 0^\circ$				Angle between force and fiber direction $\alpha = 90^\circ$			
							
WITHOUT PRE-DRILLED HOLE				WITHOUT PRE-DRILLED HOLE			
d_w [mm]	Ø 6	Ø 8	Ø 10	d_w [mm]	Ø 6	Ø 8	Ø 10
a_1 [mm]	72	96	120	a_1 [mm]	30	40	50
a_2 [mm]	30	40	50	a_2 [mm]	30	40	50
$a_{3,t}$ [mm]	90	120	150	$a_{3,t}$ [mm]	60	80	100
$a_{3,c}$ [mm]	60	80	100	$a_{3,c}$ [mm]	60	80	100
$a_{4,t}$ [mm]	30	40	50	$a_{4,t}$ [mm]	60	80	100
$a_{4,c}$ [mm]	30	40	50	$a_{4,c}$ [mm]	30	40	50
WITH PRE-DRILLED HOLE				WITH PRE-DRILLED HOLE			
d_w [mm]	Ø 6	Ø 8	Ø 10	d_w [mm]	Ø 6	Ø 8	Ø 10
d_0 [mm]	4	5	6	d_0 [mm]	4	5	6
a_1 [mm]	30	40	50	a_1 [mm]	24	32	40
a_2 [mm]	18	24	30	a_2 [mm]	24	32	40
$a_{3,t}$ [mm]	72	96	120	$a_{3,t}$ [mm]	42	56	70
$a_{3,c}$ [mm]	42	56	70	$a_{3,c}$ [mm]	42	56	70
$a_{4,t}$ [mm]	18	24	30	$a_{4,t}$ [mm]	42	56	70
$a_{4,c}$ [mm]	18	24	30	$a_{4,c}$ [mm]	18	24	30

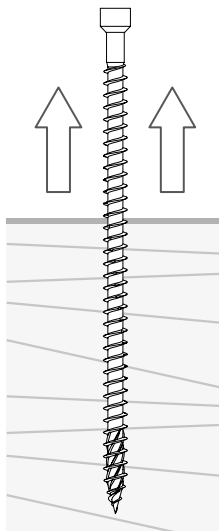
1. Minimum distances in accordance with EN 1995 and ETA-18/0817
2. Minimum distances is valid for timber characteristic density of $\rho_k \leq 420 \text{ kg/m}^3$
3. In case of connection panel-timber minimum distances (a_1, a_2) should be multiplied by a factor of 0,85
4. In case of connection steel-timber minimum distances (a_1, a_2) should be multiplied by a factor of 0,7
5. Hole diameter d_0 is valid for softwood



WKFC - Screw for wooden constructions with full thread and cylindrical head

TIMBER

Minimum distances for axially loaded screws - timber

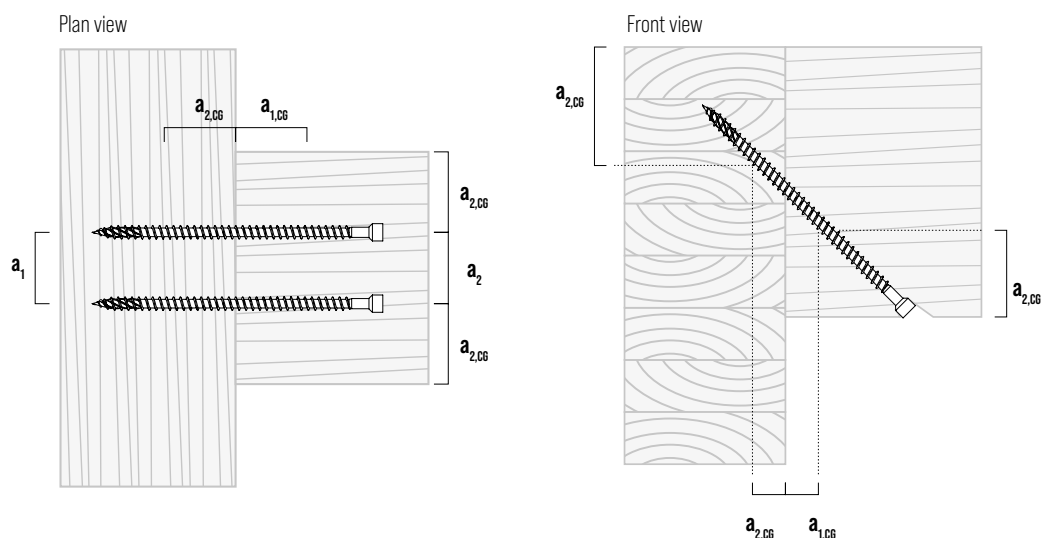


WITH AND WITHOUT PRE-DRILLED HOLE

d_w [mm]	Ø 6	Ø 8	Ø 10
a_1 [mm]	42	56	70
a_2 [mm]	30	40	50
$a_{1,CG}$ [mm]	60	80	100
$a_{2,CG}$ [mm]	24	32	40
a_{CROSS} [mm]	9	12	15
e [mm]	21	28	35

1. Minimum distances in accordance with EN 1995 and ETA-18/0817

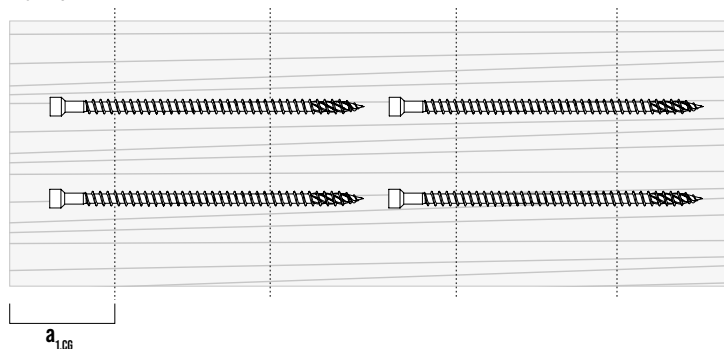
Screws under tension placed at an angle α to the grain



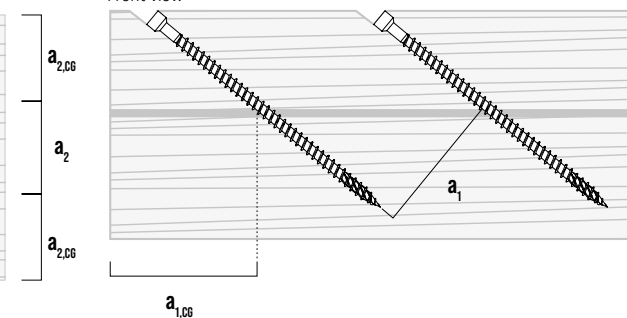
WKFC - Screw for wooden constructions with full thread and cylindrical head

Screws under tension placed at an angle α to the grain

Plan view

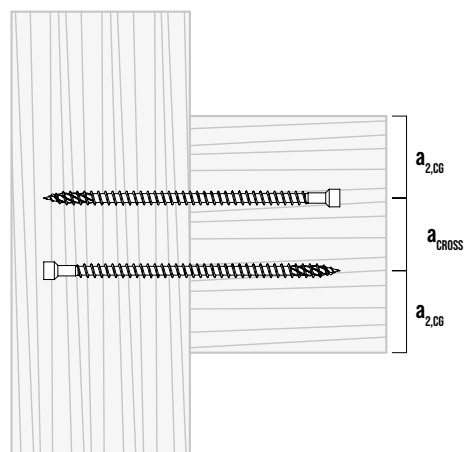


Front view

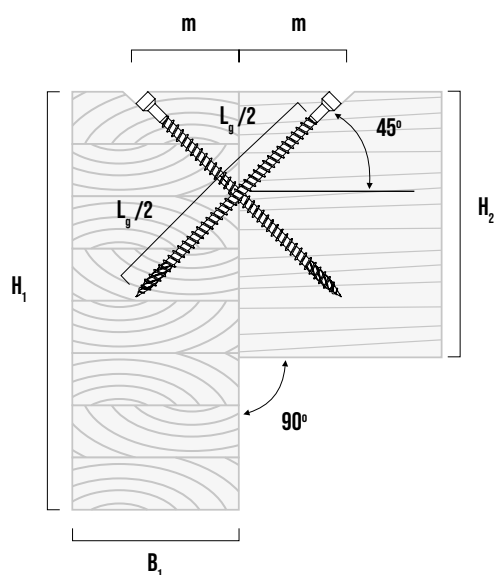


Crossed screws placed at an angle α to the grain - 1 pair

Plan view

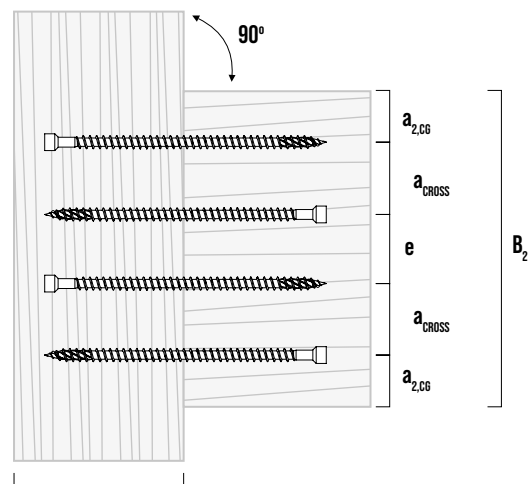


Cross-section

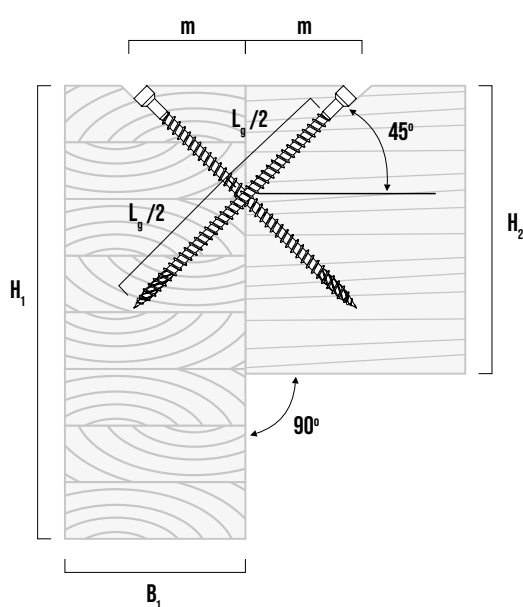


Crossed screws placed at an angle α to the grain - 2 pairs and more

Plan view



Cross-section



WKFC - Screw for wooden constructions with full thread and cylindrical head

CLT

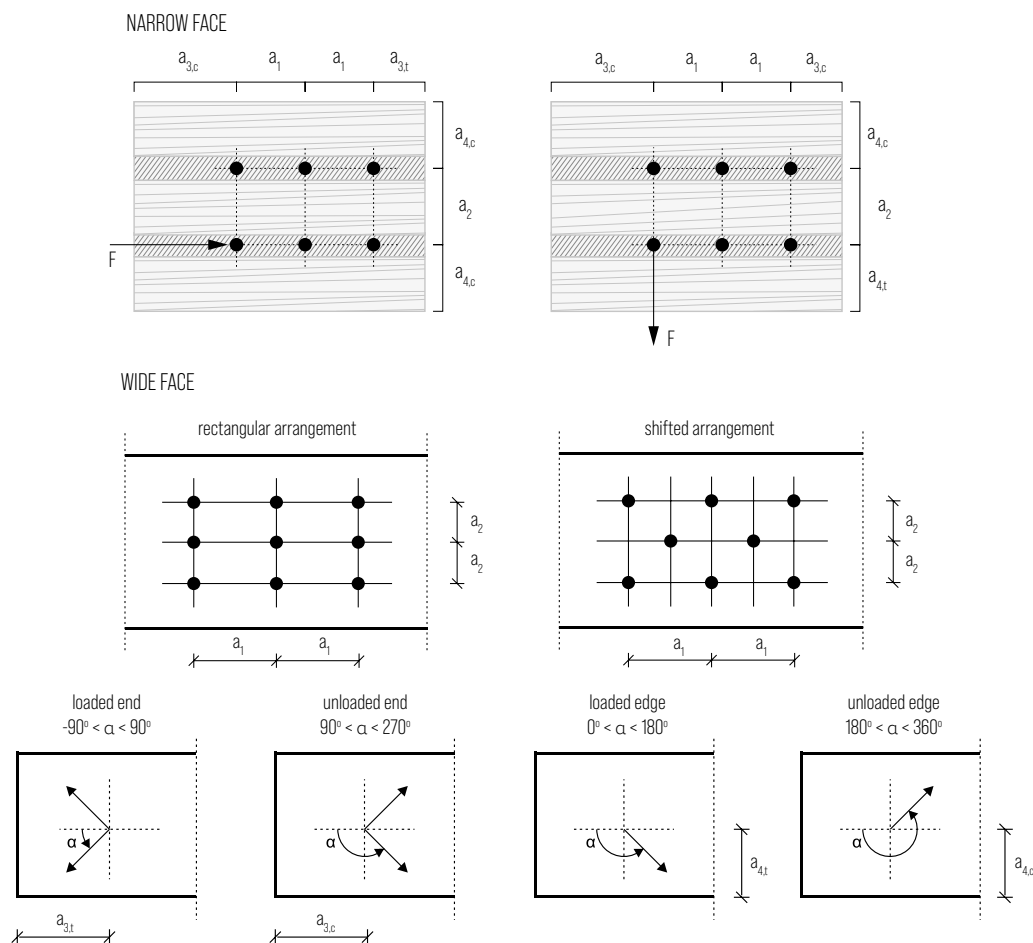
Minimum distances for laterally and/or axially loaded screws - CLT

WIDE FACE				NARROW FACE			
WITHOUT PRE-DRILLED HOLE				WITHOUT PRE-DRILLED HOLE			
d_w [mm]	Ø 6	Ø 8	Ø 10	d_w [mm]	Ø 6	Ø 8	Ø 10
a_1 [mm]	24	32	40	a_1 [mm]	60	80	100
a_2 [mm]	15	20	25	a_2 [mm]	24	32	40
$a_{3,t}$ [mm]	36	48	60	$a_{3,t}$ [mm]	72	96	120
$a_{3,c}$ [mm]	36	48	60	$a_{3,c}$ [mm]	42	56	70
$a_{4,t}$ [mm]	36	48	60	$a_{4,t}$ [mm]	36	48	60
$a_{4,c}$ [mm]	15	20	25	$a_{4,c}$ [mm]	18	24	30

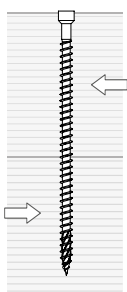
1. Minimum distances in accordance with ETA-18/0817

2. Minimum CLT thickness $t_{min} = 10d_w$

3. Minimum penetration depth in CLT narrow face $L_{ef} = 10d_w$

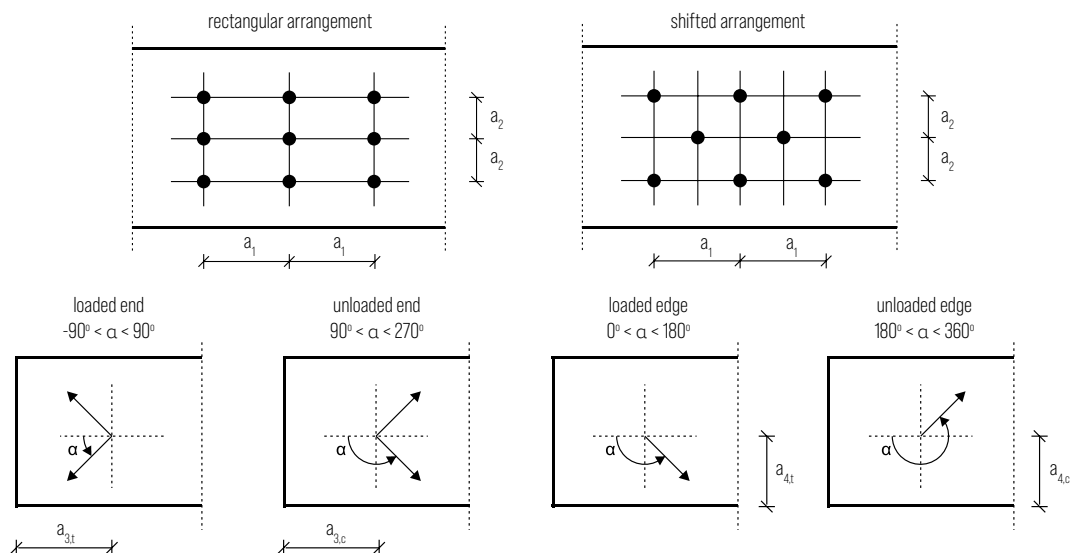


WKFC - Screw for wooden constructions with full thread and cylindrical head
LVL
Minimum distances for laterally loaded screws - LVL

Angle between force and fiber direction $\alpha = 0^\circ$				Angle between force and fiber direction $\alpha = 90^\circ$			
							
WITHOUT PRE-DRILLED HOLE				WITHOUT PRE-DRILLED HOLE			
d_w [mm]	Ø 6	Ø 8	Ø 10	d_w [mm]	Ø 6	Ø 8	Ø 10
a_1 [mm]	90	120	150	a_1 [mm]	42	56	70
a_2 [mm]	42	56	70	a_2 [mm]	42	56	70
$a_{3,t}$ [mm]	120	160	200	$a_{3,t}$ [mm]	90	120	150
$a_{3,c}$ [mm]	90	120	150	$a_{3,c}$ [mm]	90	120	150
$a_{4,t}$ [mm]	42	56	70	$a_{4,t}$ [mm]	72	96	120
$a_{4,c}$ [mm]	42	56	70	$a_{4,c}$ [mm]	42	56	70
WITH PRE-DRILLED HOLE				WITH PRE-DRILLED HOLE			
d_w [mm]	Ø 6	Ø 8	Ø 10	d_w [mm]	Ø 6	Ø 8	Ø 10
d_o [mm]	4	5	6	d_o [mm]	4	5	6
a_1 [mm]	30	40	50	a_1 [mm]	24	32	40
a_2 [mm]	18	24	30	a_2 [mm]	24	32	40
$a_{3,t}$ [mm]	72	96	120	$a_{3,t}$ [mm]	42	56	70
$a_{3,c}$ [mm]	42	56	70	$a_{3,c}$ [mm]	42	56	70
$a_{4,t}$ [mm]	18	24	30	$a_{4,t}$ [mm]	42	56	70
$a_{4,c}$ [mm]	18	24	30	$a_{4,c}$ [mm]	18	24	30

1. Minimum distances in accordance with EN 1995 and ETA-18/0817

 2. Minimum distances is valid for LVL characteristic density in range of $420 \text{ kg/m}^3 < \rho_k \leq 500 \text{ kg/m}^3$

 3. Hole diameter d_o is valid for softwood LVL


WKFC - Screw for wooden constructions with full thread and cylindrical head

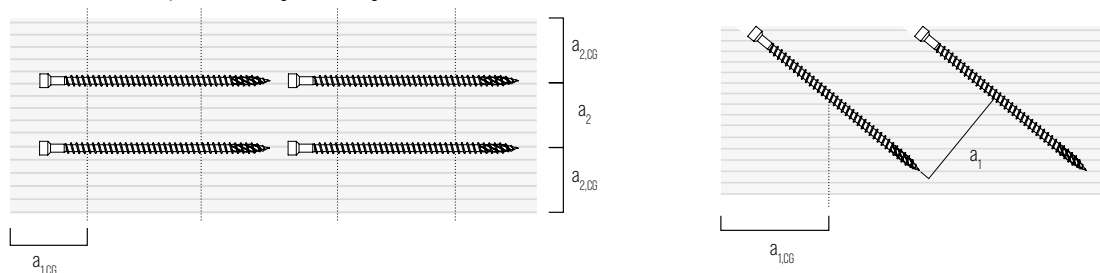
LVL

Minimum distances for axially loaded screws - LVL

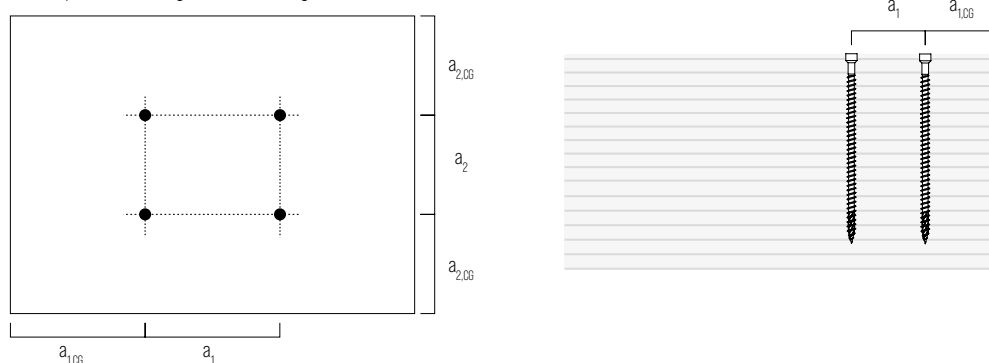
WIDE FACE				EDGE FACE			
WITHOUT PRE-DRILLED HOLE				WITHOUT PRE-DRILLED HOLE			
d_w [mm]	Ø 6	Ø 8	Ø 10	d_w [mm]	Ø 6	Ø 8	Ø 10
a_1 [mm]	42	56	70	a_1 [mm]	60	80	100
a_2 [mm]	30	40	50	a_2 [mm]	30	40	50
$a_{1,CG}$ [mm]	60	80	100	$a_{1,CG}$ [mm]	72	96	120
$a_{2,CG}$ [mm]	24	32	40	$a_{2,CG}$ [mm]	24	32	40

1. Minimum distances in accordance with EN 1995 and ETA-18/0817

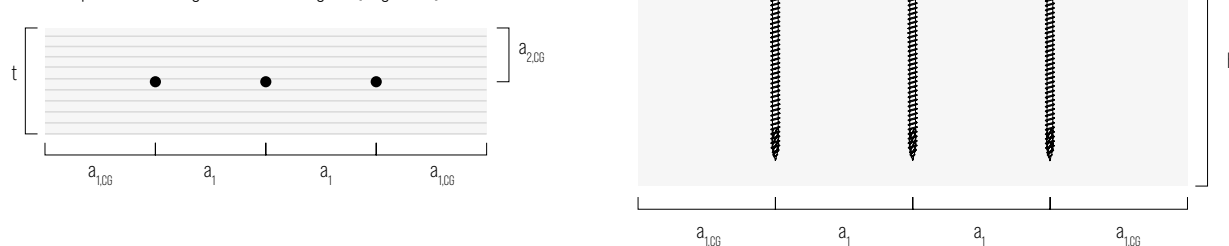
Screws under tension placed at an angle α to the grain (wide face)



Screws placed at an angle $\alpha=90^\circ$ to the grain (wide face)

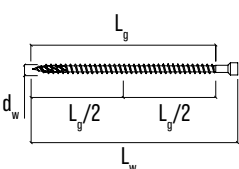
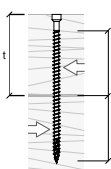
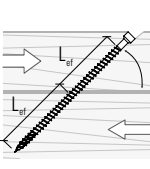
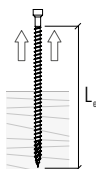
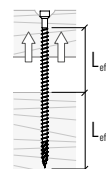


Screws placed at an angle $\alpha=90^\circ$ to the grain (edge face)



WKFC - Screw for wooden constructions with full thread and cylindrical head
TIMBER

Characteristic resistances for laterally and axially loaded screws - timber

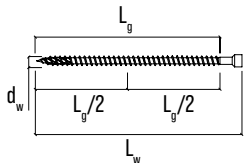
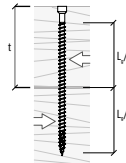
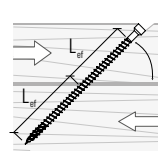
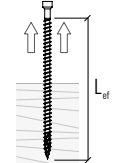
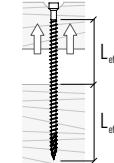
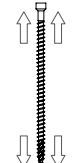
DIMENSIONS				SHEAR		SLIDING		TENSION					
Diameter	Length	Thread length	Partial thread length	timber-timber		timber-timber		Withdrawal-full thread		Withdrawal-partial thread		Tension	
													
d _w [mm]	L _w [mm]	L _g [mm]	L _g /2 [mm]	t [mm]	R _{V,k} [kN]	L _{ef} = L _g /2 [mm]	R _{ax,45,k} [kN]	L _{ef} = L _g [mm]	R _{ax,k} [kN]	L _{ef} = L _g /2 [mm]	R _{ax,k} [kN]	R _{tens,k} [kN]	R _{tens,45,k} [kN]
WKFC 6													
ø6	80	72	36	44	2,30	36	1,83	72	5,18	36	2,59	16,00	11,31
	100	92	46	54	2,75	46	2,34	92	6,62	46	3,31	16,00	11,31
	120	112	56	64	2,94	56	2,85	112	8,06	56	4,03	16,00	11,31
	140	132	66	74	3,12	66	3,36	132	9,50	66	4,75	16,00	11,31
	160	152	76	84	3,30	76	3,87	152	10,94	76	5,47	16,00	11,31
	180	172	86	94	3,48	86	4,38	172	12,38	86	6,19	16,00	11,31
	200	192	96	104	3,66	96	4,89	192	13,82	96	6,91	16,00	11,31
	220	212	106	114	3,84	106	5,40	212	15,26	106	7,63	16,00	11,31
	240	232	116	124	3,86	116	5,91	232	16,70	116	8,35	16,00	11,31
	260	252	126	134	3,86	126	6,41	252	18,14	126	9,07	16,00	11,31
	280	272	136	144	3,86	136	6,92	272	19,58	136	9,79	16,00	11,31
300	292	146	154	3,86	146	7,43	292	21,02	146	10,51	16,00	11,31	
WKFC 8													
ø8	120	108	54	66	4,08	54	3,67	108	10,37	54	5,18	25,00	17,68
	140	128	64	76	4,39	64	4,34	128	12,29	64	6,14	25,00	17,68
	160	148	74	86	4,63	74	5,02	148	14,21	74	7,10	25,00	17,68
	180	168	84	96	4,87	84	5,70	168	16,13	84	8,06	25,00	17,68
	200	188	94	106	5,11	94	6,38	188	18,05	94	9,02	25,00	17,68
	220	208	104	116	5,35	104	7,06	208	19,97	104	9,98	25,00	17,68
	240	228	114	126	5,59	114	7,74	228	21,89	114	10,94	25,00	17,68
	260	248	124	136	5,70	124	8,42	248	23,81	124	11,90	25,00	17,68
	280	268	134	146	5,70	134	9,10	268	25,73	134	12,86	25,00	17,68
	300	288	144	156	5,70	144	9,78	288	27,65	144	13,82	25,00	17,68
	350	338	169	181	5,70	169	11,47	338	32,45	169	16,22	25,00	17,68
	400	388	194	206	5,70	194	13,17	388	37,25	194	18,62	25,00	17,68
	450	438	219	231	5,70	219	14,87	438	42,05	219	21,02	25,00	17,68
	500	488	244	256	5,70	244	16,56	488	46,85	244	23,42	25,00	17,68



WKFC - Screw for wooden constructions with full thread and cylindrical head

TIMBER

Characteristic resistances for laterally and axially loaded screws - timber

DIMENSIONS				SHEAR		SLIDING		TENSION					
Diameter	Length	Thread length	Partial thread length	timber-timber		timber-timber		Withdrawal-full thread		Withdrawal-partial thread		Tension	
													
d _w [mm]	L _w [mm]	L _g [mm]	L _g /2 [mm]	t [mm]	R _{V,k} [kN]	L _{ef} = L _g /2 [mm]	R _{ax,45,k} [kN]	L _{ef} = L _g [mm]	R _{ax,k} [kN]	L _{ef} = L _g /2 [mm]	R _{ax,k} [kN]	R _{tens,k} [kN]	R _{tens,45,k} [kN]
WKFC 10													
ø10	300	285	142,5	157,5	7,96	142,5	11,08	285	31,35	142,5	15,68	36,00	25,46
	330	315	157,5	172,5	8,09	157,5	12,25	315	34,65	157,5	17,33	36,00	25,46
	360	345	172,5	187,5	8,09	172,5	13,42	345	37,95	172,5	18,98	36,00	25,46
	400	385	192,5	207,5	8,09	192,5	14,97	385	42,35	192,5	21,18	36,00	25,46
	450	435	217,5	232,5	8,09	217,5	16,92	435	47,85	217,5	23,93	36,00	25,46
	500	485	242,5	257,5	8,09	242,5	18,86	485	53,35	242,5	26,68	36,00	25,46
	550	535	267,5	282,5	8,09	267,5	20,81	535	58,85	267,5	29,43	36,00	25,46
	600	585	292,5	307,5	8,09	292,5	22,75	585	64,35	292,5	32,18	36,00	25,46

NOTES:

1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817

2. In order to obtain a design resistance, use the following formula:

$$R_d = \frac{R_k * k_{mod}}{\gamma_M}$$

Factors γ_M and k_{mod} should be taken in accordance with EN 1995

3. Design resistance for tension is smaller value of the following:

$$R_{ax,d} = \min \left\{ \frac{R_{ax,k} * k_{mod}}{\gamma_M}, \frac{R_{tens,k}}{\gamma_{M2}} \right\}$$

Factors γ_M and k_{mod} should be taken in accordance with EN 1995. Factor γ_{M2} should be taken in accordance with EN 1993

4. Design resistance for sliding is smaller value of the following:

$$R_{V,d} = \min \left\{ \frac{R_{ax,45,k} * k_{mod}}{\gamma_M}, \frac{R_{tens,45,k}}{\gamma_{M2}} \right\}$$

Factors γ_M and k_{mod} should be taken in accordance with EN 1995. Factor γ_{M2} should be taken in accordance with EN 1993

5. Characteristic resistances were calculated for a characteristic density of timber $\rho_k = 350 \text{ kg/m}^3$

6. Characteristic shear resistances were calculated for connections without pre-drilled holes

7. Characteristic shear resistances for timber-timber connections were calculated for timber thickness t [mm]

8. Characteristic resistances to withdrawal were calculated assuming an angle of 90° between screw and grain direction and for effective penetration length equal $L_{ef} = L_g$ and $L_{ef} = L_g/2$

9. Characteristic resistances to sliding were calculated assuming an angle of 45° between screw and grain direction and for effective penetration length equal $L_{ef} = L_g/2$

WKFC - Screw for wooden constructions with full thread and cylindrical head
TIMBER

Characteristic resistances for crossed screws - main beam/secondary beam												
DIMENSIONS				CONNECTION GEOMETRY						CHARACTERISTIC RESISTANCES		
Diameter	Length	Thread length	Partial thread length	Width of the main beam	Height of the main beam	Width of the secondary beam	Height of the secondary beam	Mounting distance	Number of screw pairs	Withdrawal	Buckling	Tension
d _w [mm]	L _w [mm]	L _g [mm]	L _g /2 [mm]	B ₁ [mm]	H ₁ [mm]	B ₂ [mm]	H ₂ [mm]	m [mm]	n	R _{ax,45,k} [kN]	R _{ki,45,k} [kN]	R _{tens,45,k} [kN]
WKFC 6												
ø6	180	172	86	76	137	57	137	66	1	8,76	9,22	22,63
						87			2	16,34	17,21	42,22
						117			3	23,64	24,89	61,09
	200	192	96	84	151	57	151	74	1	9,78	9,22	22,63
						87			2	18,24	17,21	42,22
						117			3	26,39	24,89	61,09
	220	212	106	91	166	57	166	81	1	10,79	9,22	22,63
						87			2	20,14	17,21	42,22
						117			3	29,14	24,89	61,09
	240	232	116	98	180	57	180	88	1	11,81	9,22	22,63
						87			2	22,04	17,21	42,22
						117			3	31,89	24,89	61,09
	260	252	126	105	194	57	194	95	1	12,83	9,22	22,63
						87			2	23,94	17,21	42,22
						117			3	34,64	24,89	61,09
	280	272	136	112	208	57	208	102	1	13,85	9,22	22,63
						87			2	25,84	17,21	42,22
						117			3	37,39	24,89	61,09
	300	292	146	119	222	57	222	109	1	14,87	9,22	22,63
						87			2	27,74	17,21	42,22
						117			3	40,14	24,89	61,09
WKFC 8												
ø8	240	228	114	99	180	76	180	89	1	15,48	15,58	35,36
						116			2	28,88	29,08	65,98
						156			3	41,79	42,07	95,46
	260	248	124	106	194	76	194	96	1	16,83	15,58	35,36
						116			2	31,41	29,08	65,98
						156			3	45,45	42,07	95,46
	280	268	134	113	208	76	208	103	1	18,19	15,58	35,36
						116			2	33,95	29,08	65,98
						156			3	49,12	42,07	95,46
	300	288	144	120	222	76	222	110	1	19,55	15,58	35,36
						116			2	36,48	29,08	65,98
						156			3	52,79	42,07	95,46
	350	338	169	138	257	76	257	128	1	22,94	15,58	35,36
						116			2	42,82	29,08	65,98
						156			3	61,95	42,07	95,46
	400	388	194	156	293	76	293	146	1	26,34	15,58	35,36
						116			2	49,15	29,08	65,98
						156			3	71,11	42,07	95,46
	450	438	219	173	328	76	328	163	1	29,73	15,58	35,36
						116			2	55,48	29,08	65,98
						156			3	80,28	42,07	95,46
	500	488	244	191	364	76	364	181	1	33,13	15,58	35,36
						116			2	61,82	29,08	65,98
						156			3	89,44	42,07	95,46

WKFC - Screw for wooden constructions with full thread and cylindrical head

TIMBER

Characteristic resistances for crossed screws - main beam/secondary beam												
DIMENSIONS				CONNECTION GEOMETRY						CHARACTERISTIC RESISTANCES		
Diameter	Length	Thread length	Partial thread length	Width of the main beam	Height of the main beam	Width of the secondary beam	Height of the secondary beam	Mounting distance	Number of screw pairs	Withdrawal	Buckling	Tension
d _w [mm]	L _w [mm]	L _g [mm]	L _g /2 [mm]	B ₁ [mm]	H ₁ [mm]	B ₂ [mm]	H ₂ [mm]	m [mm]	n	R _{ax,45,k} [kN]	R _{ki,45,k} [kN]	R _{tens,45,k} [kN]
WKFC 10												
ø10	300	285	142,5	121	222	95	222	111	1	22,17	23,35	50,91
						145			2	41,37	43,57	95,00
						195			3	59,85	63,04	137,46
	330	315	157,5	132	243	95	243	122	1	24,50	23,35	50,91
						145			2	45,72	43,57	95,00
						195			3	66,15	63,04	137,46
	360	345	172,5	143	265	95	265	133	1	26,83	23,35	50,91
						145			2	50,08	43,57	95,00
						195			3	72,45	63,04	137,46
	400	385	192,5	157	293	95	293	147	1	29,95	23,35	50,91
						145			2	55,88	43,57	95,00
						195			3	80,85	63,04	137,46
	450	435	217,5	174	328	95	328	164	1	33,84	23,35	50,91
						145			2	63,14	43,57	95,00
						195			3	91,35	63,04	137,46
	500	485	242,5	192	364	95	364	182	1	37,72	23,35	50,91
						145			2	70,40	43,57	95,00
						195			3	101,86	63,04	137,46
	550	535	267,5	210	399	95	399	200	1	41,61	23,35	50,91
						145			2	77,65	43,57	95,00
						195			3	112,36	63,04	137,46
	600	585	292,5	227	434	95	434	217	1	45,50	23,35	50,91
						145			2	84,91	43,57	95,00
						195			3	122,86	63,04	137,46

NOTES:

1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817
2. In order to obtain a design resistance, use the following formula :

$$R_{V,d} = \min \left\{ \begin{array}{l} \frac{R_{ax,45,k} * k_{mod}}{\gamma_M} \\ \frac{R_{ki,45,k}}{\gamma_{M1}} \\ \frac{R_{tens,45,k}}{\gamma_{M2}} \end{array} \right.$$

Factors γ_M and k_{mod} should be taken in accordance with EN 1995. Factor γ_{M1} and γ_{M2} should be taken in accordance with EN 1993

4. Characteristic resistances were calculated for a characteristic density of timber $\rho_k = 350 \text{ kg/m}^3$

5. Characteristic resistances to withdrawal were calculated assuming an angle of 45° to the shear plane and effective penetration length equal $L_{ef} = L_g/2$

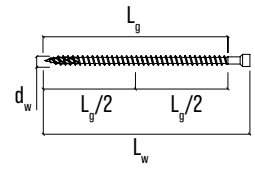
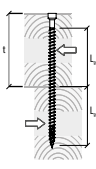
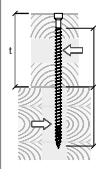
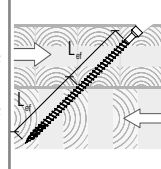
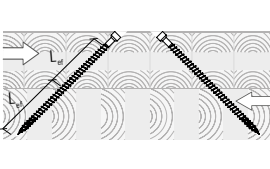
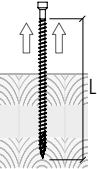
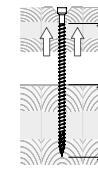
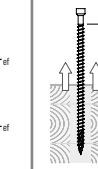
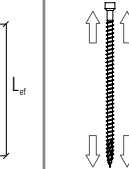
6. Characteristic resistances to withdrawal were calculated assuming symmetrical installation of screws

7. Characteristic resistances were calculated assuming a minimum distance $a_{1,05} \geq 5d$. According to ETA-18/0817 minimum distance $a_{1,05} \geq 10d$



WKFC - Screw for wooden constructions with full thread and cylindrical head
CLT

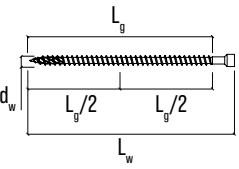
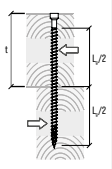
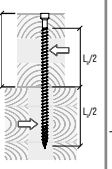
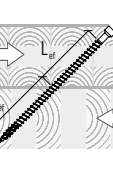
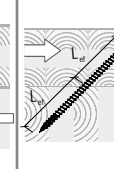
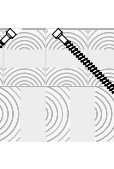
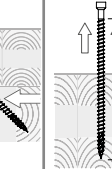
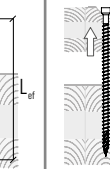
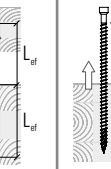
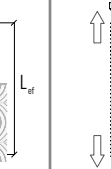
Characteristic resistances for laterally and axially loaded screws - CLT

DIMENSIONS				SHEAR				SLIDING					TENSION								
Diameter	Length	Thread length	Partial thread length	CLT-CLT (wide face-wide face)		CLT-CLT (wide face-narrow row face)		CLT - CLT (wide face-narrow face)		CLT - CLT (wide face-narrow face)			Withdrawal - full thread (wide face)		Withdrawal - partial thread (wide face)		Withdrawal - full thread (narrow face)		Tension		
																					
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	t [mm]	R _{V,k} [kN]	t [mm]	R _{V,k} [kN]	L _{ef} = L _g /2 [mm]	R _{ax,45,k} [kN]	L _{ef} = L _g /2 [mm]	R _{ax,45,k} [kN]	R _{kl,45,k} [kN]	L _{ef} = L _g [mm]	R _{ax,k} [kN]	L _{ef} = L _g /2 [mm]	R _{ax,k} [kN]	L _{ef} = L _g [mm]	R _{ax,k} [kN]	R _{tens,k} [kN]	R _{tens,45,k} [kN]	
WKFC 6																					
ø6	80	72	36	44	2,30	-	-	36	1,49	36	2,98	9,22	72	5,18	36	2,59	-	-	16,00	11,31	
	100	92	46	54	2,75	-	-	46	1,86	46	3,72	9,22	92	6,62	46	3,31	-	-	16,00	11,31	
	120	112	56	64	2,94	-	-	56	2,22	56	4,44	9,22	112	8,06	56	4,03	-	-	16,00	11,31	
	140	132	66	74	3,12	-	-	66	2,57	66	5,15	9,22	132	9,50	66	4,75	-	-	16,00	11,31	
	160	152	76	84	3,30	-	-	76	2,92	76	5,85	9,22	152	10,94	76	5,47	-	-	16,00	11,31	
	180	172	86	94	3,48	-	-	86	3,27	86	6,53	9,22	172	12,38	86	6,19	-	-	16,00	11,31	
	200	192	96	104	3,66	-	-	96	3,61	96	7,21	9,22	192	13,82	96	6,91	-	-	16,00	11,31	
	220	212	106	114	3,84	-	-	106	3,94	106	7,89	9,22	212	15,26	106	7,63	-	-	16,00	11,31	
	240	232	116	124	3,86	-	-	116	4,28	116	8,55	9,22	232	16,70	116	8,35	-	-	16,00	11,31	
	260	252	126	134	3,86	-	-	126	4,61	126	9,21	9,22	252	18,14	126	9,07	-	-	16,00	11,31	
	280	272	136	144	3,86	-	-	136	4,93	136	9,87	9,22	272	19,58	136	9,79	-	-	16,00	11,31	
	300	292	146	154	3,86	-	-	146	5,26	146	10,52	9,22	292	21,02	146	10,51	-	-	16,00	11,31	
WKFC 8																					
ø8	120	108	54	66	4,08	66	2,66	54	2,70	54	5,41	15,58	108	10,37	54	5,18	108	7,14	25,00	17,68	
	140	128	64	76	4,39	76	2,97	64	3,15	64	6,30	15,58	128	12,29	64	6,14	128	8,32	25,00	17,68	
	160	148	74	86	4,63	86	3,29	74	3,59	74	7,18	15,58	148	14,21	74	7,10	148	9,48	25,00	17,68	
	180	168	84	96	4,87	96	3,62	84	4,03	84	8,05	15,58	168	16,13	84	8,06	168	10,62	25,00	17,68	
	200	188	94	106	5,11	106	3,84	94	4,45	94	8,91	15,58	188	18,05	94	9,02	188	11,76	25,00	17,68	
	220	208	104	116	5,35	116	3,99	104	4,88	104	9,76	15,58	208	19,97	104	9,98	208	12,88	25,00	17,68	
	240	228	114	126	5,59	126	4,14	114	5,30	114	10,60	15,58	228	21,89	114	10,94	228	13,98	25,00	17,68	
	260	248	124	136	5,70	136	4,28	124	5,72	124	11,43	15,58	248	23,81	124	11,90	248	15,08	25,00	17,68	
	280	268	134	146	5,70	146	4,43	134	6,13	134	12,26	15,58	268	25,73	134	12,86	268	16,17	25,00	17,68	
	300	288	144	156	5,70	156	4,53	144	6,54	144	13,08	15,58	288	27,65	144	13,82	288	17,26	25,00	17,68	
	350	338	169	181	5,70	181	4,53	169	7,55	169	15,10	15,58	338	32,45	169	16,22	338	19,93	25,00	17,68	
	400	388	194	206	5,70	206	4,53	194	8,55	194	17,10	15,58	388	37,25	194	18,62	388	22,57	25,00	17,68	
	450	438	219	231	5,70	231	4,53	219	9,54	219	19,07	15,58	438	42,05	219	21,02	438	25,17	25,00	17,68	
	500	488	244	256	5,70	256	4,53	244	10,51	244	21,02	15,58	488	46,85	244	23,42	488	27,74	25,00	17,68	

WKFC - Screw for wooden constructions with full thread and cylindrical head

CLT

Characteristic resistances for laterally and axially loaded screws - CLT

DIMENSIONS				SHEAR				SLIDING				TENSION									
Diameter	Length	Thread length	Partial thread length	CLT-CLT (wide face-wide face)		CLT-CLT (wide face-narrow face)		CLT - CLT (wide face-narrow face)		CLT - CLT (wide face-narrow face)		Withdrawal - full thread (wide face)		Withdrawal - partial thread (wide face)		Withdrawal - full thread (narrow face)		Tension			
																					
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	t [mm]	R _{V,k} [kN]	t [mm]	R _{V,k} [kN]	L _{ef} = L _g /2 [mm]	R _{ax,45,k} [kN]	L _{ef} = L _g /2 [mm]	R _{ax,45,k} [kN]	R _{kl,45,k} [kN]	L _{ef} = L _g [mm]	R _{ax,k} [kN]	L _{ef} = L _g /2 [mm]	R _{ax,k} [kN]	L _{ef} = L _g [mm]	R _{ax,k} [kN]	R _{tens,k} [kN]	R _{tens,45,k} [kN]	
WKFC 10																					
ø10	300	285	142,5	157,5	7,96	157,5	5,90	142,5	7,74	142,5	15,49	23,35	285	31,35	142,5	15,68	285	20,44	36,00	25,46	
	330	315	157,5	172,5	8,09	172,5	6,16	157,5	8,47	157,5	16,95	23,35	315	34,65	157,5	17,33	315	22,36	36,00	25,46	
	360	345	172,5	187,5	8,09	187,5	6,32	172,5	9,20	172,5	18,39	23,35	345	37,95	172,5	18,98	345	24,27	36,00	25,46	
	400	385	192,5	207,5	8,09	207,5	6,32	192,5	10,15	192,5	20,30	23,35	385	42,35	192,5	21,18	385	26,79	36,00	25,46	
	450	435	217,5	232,5	8,09	232,5	6,32	217,5	11,33	217,5	22,66	23,35	435	47,85	217,5	23,93	435	29,90	36,00	25,46	
	500	485	242,5	257,5	8,09	257,5	6,32	242,5	12,50	242,5	24,99	23,35	485	53,35	242,5	26,68	485	32,98	36,00	25,46	
	550	535	267,5	282,5	8,09	282,5	6,32	267,5	13,65	267,5	27,30	23,35	535	58,85	267,5	29,43	535	36,02	36,00	25,46	
600	585	292,5	307,5	8,09	307,5	6,32	292,5	14,79	292,5	29,58	23,35	585	64,35	292,5	32,18	585	39,04	36,00	25,46		

NOTES:

1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817

2. In order to obtain a design resistance, use the following formula :

$$R_d = \frac{R_k * k_{mod}}{\gamma_M}$$

 Factors γ_M and k_{mod} should be taken in accordance with EN 1995

3. Design resistance for tension is smaller value of the following :

$$R_{ax,d} = \min \left\{ \begin{array}{l} \frac{R_{ax,k} * k_{mod}}{\gamma_M} \\ \frac{R_{tens,k}}{\gamma_{M2}} \end{array} \right.$$

 Factors γ_M and k_{mod} should be taken in accordance with EN 1995. Factor γ_{M2} should be taken in accordance with EN 1993

4. Design resistance for sliding is smaller value of the following :

$$R_{V,d} = \min \left\{ \begin{array}{l} \frac{R_{ax,45,k} * k_{mod}}{\gamma_M} \\ \frac{R_{kl,45,k}}{\gamma_{M1}} \\ \frac{R_{tens,45,k}}{\gamma_{M2}} \end{array} \right.$$

 Factors γ_M and k_{mod} should be taken in accordance with EN 1995. Factors γ_{M1} and γ_{M2} should be taken in accordance with EN 1993

 5. Characteristic resistances were calculated for a characteristic density of CLT $\rho_k = 350 \text{ kg/m}^3$

6. Characteristic shear resistances were calculated for connections without pre-drilled holes

 7. Characteristic shear resistances for CLT-CLT connections were calculated for timber thickness t [mm]

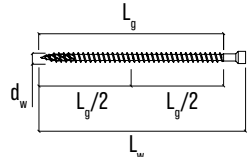
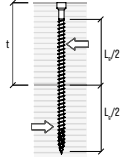
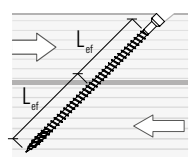
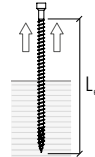
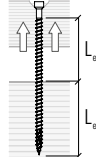
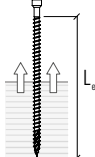
 8. Characteristic withdrawal resistances of CLT wide face were calculated assuming an angle of 90° between screw and grain direction and for effective penetration length equal $L_{ef} = L_g$ and $L_{ef} = L_g/2$

 9. Characteristic withdrawal resistances of CLT narrow face were calculated for minimum thickness $t_{min} = 10d_w$ and for effective penetration length equal $L_{ef} = L_g$

 10. Characteristic resistances to sliding were calculated assuming an angle of 45° between screw and grain direction and for effective penetration length equal $L_{ef} = L_g/2$

WKFC - Screw for wooden constructions with full thread and cylindrical head
LVL

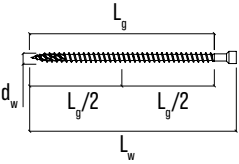
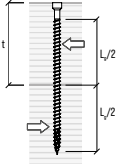
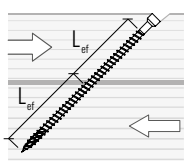
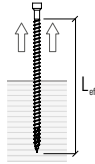
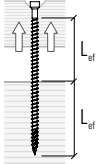
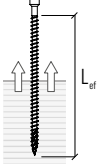
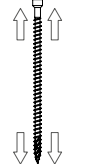
Characteristic resistances for laterally and axially loaded screws - LVL

DIMENSIONS				SHEAR		SLIDING		TENSION							
Diameter	Length	Thread length	Partial thread length	LVL - LVL (wide face-wide face)		LVL - LVL (wide face-wide face)		Withdrawal - full thread (wide face)		Withdrawal - partial thread (wide face)		Withdrawal - full thread (edge face)		Tension	
															
d_w [mm]	L_w [mm]	L_g [mm]	t_{mix} [mm]	t [mm]	$R_{V,k}$ [kN]	$L_{ef} = L_g/2$ [mm]	$R_{ax,45,k}$ [kN]	$L_{ef} = L_g$ [mm]	$R_{ax,k}$ [kN]	$L_{ef} = L_g/2$ [mm]	$R_{ax,k}$ [kN]	$L_{ef} = L_g$ [mm]	$R_{ax,k}$ [kN]	$R_{tens,k}$ [kN]	$R_{tens,45,k}$ [kN]
WKFC 6															
ø6	80	72	36	44	2,83	36	1,59	72	5,62	36	2,81	72	3,74	16,00	11,31
	100	92	46	54	3,16	46	2,03	92	7,18	46	3,59	92	4,78	16,00	11,31
	120	112	56	64	3,35	56	2,47	112	8,74	56	4,37	112	5,82	16,00	11,31
	140	132	66	74	3,55	66	2,91	132	10,30	66	5,15	132	6,86	16,00	11,31
	160	152	76	84	3,74	76	3,35	152	11,86	76	5,93	152	7,90	16,00	11,31
	180	172	86	94	3,94	86	3,79	172	13,42	86	6,71	172	8,94	16,00	11,31
	200	192	96	104	4,13	96	4,24	192	14,98	96	7,49	192	9,98	16,00	11,31
	220	212	106	114	4,33	106	4,68	212	16,54	106	8,27	212	11,02	16,00	11,31
	240	232	116	124	4,52	116	5,12	232	18,10	116	9,05	232	12,06	16,00	11,31
	260	252	126	134	4,52	126	5,56	252	19,66	126	9,83	252	13,10	16,00	11,31
	280	272	136	144	4,52	136	6,00	272	21,22	136	10,61	272	14,14	16,00	11,31
	300	292	146	154	4,52	146	6,44	292	22,78	146	11,39	292	15,18	16,00	11,31
WKFC 8															
ø8	120	108	54	66	4,74	54	3,18	108	11,23	54	5,62	108	7,49	25,00	17,68
	140	128	64	76	5,00	64	3,77	128	13,31	64	6,66	128	8,87	25,00	17,68
	160	148	74	86	5,26	74	4,35	148	15,39	74	7,70	148	10,26	25,00	17,68
	180	168	84	96	5,52	84	4,94	168	17,47	84	8,74	168	11,65	25,00	17,68
	200	188	94	106	5,78	94	5,53	188	19,55	94	9,78	188	13,03	25,00	17,68
	220	208	104	116	6,04	104	6,12	208	21,63	104	10,82	208	14,42	25,00	17,68
	240	228	114	126	6,30	114	6,71	228	23,71	114	11,86	228	15,81	25,00	17,68
	260	248	124	136	6,56	124	7,30	248	25,79	124	12,90	248	17,19	25,00	17,68
	280	268	134	146	6,68	134	7,88	268	27,87	134	13,94	268	18,58	25,00	17,68
	300	288	144	156	6,68	144	8,47	288	29,95	144	14,98	288	19,97	25,00	17,68
	350	338	169	181	6,68	169	9,94	338	35,15	169	17,58	338	23,43	25,00	17,68
	400	388	194	206	6,68	194	11,41	388	40,35	194	20,18	388	26,90	25,00	17,68
	450	438	219	231	6,68	219	12,88	438	45,55	219	22,78	438	30,37	25,00	17,68
	500	488	244	256	6,68	244	14,35	488	50,75	244	25,38	488	33,83	25,00	17,68

WKFC - Screw for wooden constructions with full thread and cylindrical head

LVL

Characteristic resistances for laterally and axially loaded screws - LVL

DIMENSIONS				SHEAR		SLIDING		TENSION							
Diameter	Length	Thread length	Partial thread length	LVL - LVL (wide face-wide face)		LVL - LVL (wide face-wide face)		Withdrawal - full thread (wide face)		Withdrawal - partial thread (wide face)		Withdrawal - full thread (edge face)		Tension	
															
dw [mm]	Lw [mm]	Lg [mm]	t _{fix} [mm]	t [mm]	R _{V,k} [kN]	L _{ef} = L _g /2 [mm]	R _{ax,45,k} [kN]	L _{ef} = L _g [mm]	R _{ax,k} [kN]	L _{ef} = L _g /2 [mm]	R _{ax,k} [kN]	L _{ef} = L _g [mm]	R _{ax,k} [kN]	R _{tens,k} [kN]	R _{tens,45,k} [kN]
WKFC 10															
ø10	300	285	142,5	157,5	9,37	142,5	10,48	285	37,05	142,5	18,53	285	24,70	36,00	25,46
	330	315	157,5	172,5	9,47	157,5	11,58	315	40,95	157,5	20,48	315	27,30	36,00	25,46
	360	345	172,5	187,5	9,47	172,5	12,69	345	44,85	172,5	22,43	345	29,90	36,00	25,46
	400	385	192,5	207,5	9,47	192,5	14,16	385	50,05	192,5	25,03	385	33,37	36,00	25,46
	450	435	217,5	232,5	9,47	217,5	15,99	435	56,55	217,5	28,28	435	37,70	36,00	25,46
	500	485	242,5	257,5	9,47	242,5	17,83	485	63,05	242,5	31,53	485	42,03	36,00	25,46
	550	535	267,5	282,5	9,47	267,5	19,67	535	69,55	267,5	34,78	535	46,37	36,00	25,46
	600	585	292,5	307,5	9,47	292,5	21,51	585	76,05	292,5	38,03	585	50,70	36,00	25,46

NOTES:

1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817

2. In order to obtain a design resistance, use the following formula :

$$R_d = \frac{R_k * k_{mod}}{\gamma_M}$$

Factors γ_M and k_{mod} should be taken in accordance with EN 1995

3. Design resistance for tension is smaller value of the following :

$$R_{ax,d} = \min \left\{ \frac{R_{ax,k} * k_{mod}}{\gamma_M}, \frac{R_{tens,k}}{\gamma_{M2}} \right\}$$

Factors γ_M and k_{mod} should be taken in accordance with EN 1995. Factor γ_{M2} should be taken in accordance with EN 1993

4. Design resistance for sliding is smaller value of the following :

$$R_{V,d} = \min \left\{ \frac{R_{ax,45,k} * k_{mod}}{\gamma_M}, \frac{R_{tens,45,k}}{\gamma_{M2}} \right\}$$

Factors γ_M and k_{mod} should be taken in accordance with EN 1995. Factor γ_{M2} should be taken in accordance with EN 1993

5. Characteristic resistances were calculated for a characteristic density of LVL $\rho_k = 480 \text{ kg/m}^3$

6. Characteristic shear resistances were calculated for connections without pre-drilled holes

7. Characteristic shear resistances for LVL-LVL connections were calculated for timber thickness t [mm]

8. Characteristic resistances to withdrawal were calculated assuming an angle of 90° between screw and grain direction and for effective penetration length equal $L_{ef} = L$ and $L_{ef} = L_g/2$

9. Characteristic resistances to sliding were calculated assuming an angle of 45° between screw and grain direction and for effective penetration length equal $L_{ef} = L_g/2$

WKFS

Screw for wooden constructions with full thread and countersunk head

Diameters: $\varnothing 8$ mm | $\varnothing 10$ mm

Length range: from 120 to 600 mm



Construction countersunk head screws with full thread and TX drive for structural connections and reinforcements of wooden members.



TX DRIVE



Zn
WHITE



EUROPEAN TECHNICAL
ASSESSMENT
ETA-18/0817

SCREW MATERIAL - Carbon steel

ANTI-CORROSION PROTECTION - Galvanized steel (white)

PRODUCT ADVANTAGES:



FULL THREAD - Without elements being over tighten to each other.



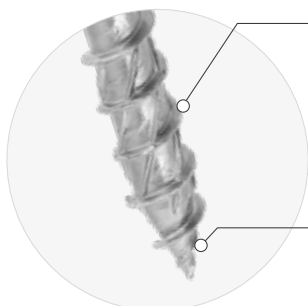
COUNTERSUNK HEAD - Allows quick and flush installation of the screw in the wooden member.



HIGH TORQUE - Allows screws to be installed without pre-drilling, even in hardwood substrates.



WAX COATING - Wax coating applied during the production process significantly reduces the torque.



NEW CUTTING EDGE / SERRATED THREAD

New special design of cutting edge with added milling reduces screwing resistance by 20%. This helps to extend the life of batteries and power tools. Special cutting notches integrated on the thread cut wood fibres structure while screwing in.

DOUBLE THREAD

Additional recessed second thread improves remarkably the speed of timber penetration and reaction time of first grip into the wood.

EXAMPLES OF USE



Reinforcement with screws in roof ridge area



Protection against failure of notched beam



Reinforcement in the point of support



Reinforcement by coupling of beams



Reinforcement of beam in the point weakened by drill hole



Joint between two girders



Joint between two passing-by beams

SUBSTRATES



Solid timber

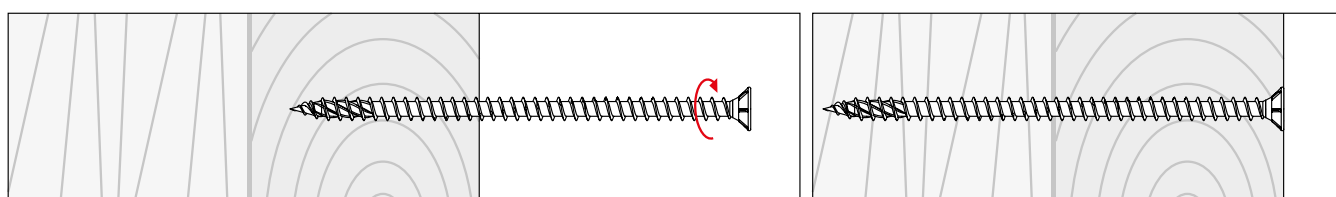


Glued laminated timber
CLT, KVH, BSH/GLT

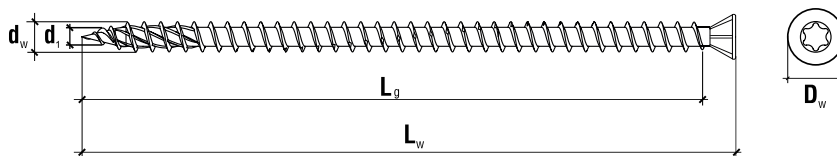


Laminated Veneer
Lumber - LVL

INSTALLATION INSTRUCTIONS



WKFS - Screw for wooden constructions with full thread and countersunk head



Codes and dimensions

	Product code	Dimensions	Thread length	Type of drive	Quantity
	Galvanized - white	$d_w \times L_w$ [mm]	L_g [mm]	[-]	[pcs]
WKFS-8					
ø8	WKFS-08120-B	8x120	108	TX 40	50
	WKFS-08140-B	8x140	128	TX 40	50
	WKFS-08160-B	8x160	148	TX 40	50
	WKFS-08180-B	8x180	168	TX 40	50
	WKFS-08200-B	8x200	188	TX 40	50
	WKFS-08220-B	8x220	208	TX 40	50
	WKFS-08240-B	8x240	228	TX 40	50
	WKFS-08260-B	8x260	248	TX 40	50
	WKFS-08280-B	8x280	268	TX 40	50
	WKFS-08300-B	8x300	288	TX 40	50
	WKFS-08350-B	8x350	338	TX 40	50
	WKFS-08400-B	8x400	388	TX 40	50
	WKFS-08450-B	8x450	438	TX 40	50
	WKFS-08500-B	8x500	488	TX 40	50
WKFS-10					
ø10	WKFS-10300-B	10x300	285	TX 50	25
	WKFS-10330-B	10x330	315	TX 50	25
	WKFS-10360-B	10x360	345	TX 50	25
	WKFS-10400-B	10x400	385	TX 50	25
	WKFS-10450-B	10x450	435	TX 50	25
	WKFS-10500-B	10x500	485	TX 50	25
	WKFS-10550-B	10x550	535	TX 50	25
	WKFS-10600-B	10x600	585	TX 50	25

Geometry

Product	Outer thread diameter	Inner thread diameter	Head diameter	Length range
	d_w [mm]	d_i [mm]	D_w [mm]	L_w [mm]
WKFS ø8	8	4,95	14	120-500
WKFS ø10	10	6,00	18	300-600

Mechanical characteristics

Product	Characteristic yield moment	Characteristic withdrawal resistance parameter - softwood	Characteristic withdrawal resistance parameter - LVL	Characteristic head-pull-through resistance parameter - softwood	Characteristic head-pull-through resistance parameter - LVL	Characteristic tensile strength	Characteristic torsional strength	Characteristic yield strength
	$M_{y,k}$ [N*m]	$f_{ax,k}$ [N/mm ²]	$f_{ax,k}$ [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{tens,k}$ [kN]	$f_{tor,k}$ [N*m]	$f_{y,k}$ [N/mm ²]
WKFS ø8	25,0	12,0	13,0	14,7	14,7	25,0	27,0	1000,0
WKFS ø10	43,0	11,0	13,0	13,0	13,0	36,0	45,0	1000,0

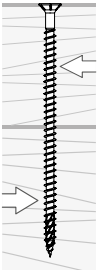
1. Characteristic withdrawal and head-pull-through resistance based on reference density of timber $\rho_a = 350 \text{ kg/m}^3$

2. Characteristic withdrawal and head-pull-through resistance based on reference density of LVL $\rho_a = 480 \text{ kg/m}^3$

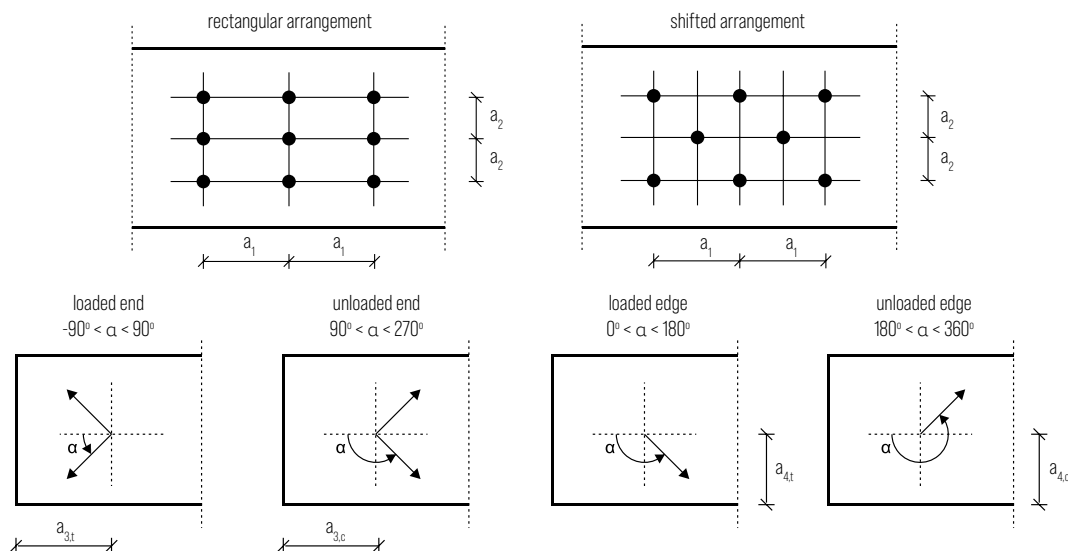
WKFS - Screw for wooden constructions with full thread and countersunk head

TIMBER

Minimum distances for laterally loaded screws - timber

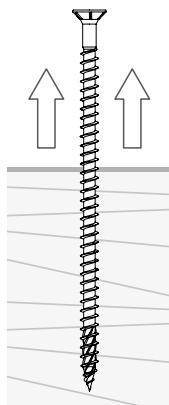
Angle between force and fiber direction $\alpha = 0^\circ$			Angle between force and fiber direction $\alpha = 90^\circ$		
					
WITHOUT PRE-DRILLED HOLE			WITHOUT PRE-DRILLED HOLE		
d_w [mm]	$\varnothing 8$	$\varnothing 10$	d_w [mm]	$\varnothing 8$	$\varnothing 10$
a_1 [mm]	96	120	a_1 [mm]	40	50
a_2 [mm]	40	50	a_2 [mm]	40	50
$a_{3,t}$ [mm]	120	150	$a_{3,t}$ [mm]	80	100
$a_{3,c}$ [mm]	80	100	$a_{3,c}$ [mm]	80	100
$a_{4,t}$ [mm]	40	50	$a_{4,t}$ [mm]	80	100
$a_{4,c}$ [mm]	40	50	$a_{4,c}$ [mm]	40	50
WITH PRE-DRILLED HOLE			WITH PRE-DRILLED HOLE		
d_w [mm]	$\varnothing 8$	$\varnothing 10$	d_w [mm]	$\varnothing 8$	$\varnothing 10$
d_0 [mm]	5	6	d_0 [mm]	5	6
a_1 [mm]	40	50	a_1 [mm]	32	40
a_2 [mm]	24	30	a_2 [mm]	32	40
$a_{3,t}$ [mm]	96	120	$a_{3,t}$ [mm]	56	70
$a_{3,c}$ [mm]	56	70	$a_{3,c}$ [mm]	56	70
$a_{4,t}$ [mm]	24	30	$a_{4,t}$ [mm]	56	70
$a_{4,c}$ [mm]	24	30	$a_{4,c}$ [mm]	24	30

1. Minimum distances in accordance with EN 1995 and ETA-18/0817
2. Minimum distances is valid for timber characteristic density of $\rho_k \leq 420 \text{ kg/m}^3$
3. In case of connection panel-timber minimum distances (a_1 , a_2) should be multiplied by a factor of 0,85
4. In case of connection steel-timber minimum distances (a_1 , a_2) should be multiplied by a factor of 0,7
5. Hole diameter d_0 is valid for softwood



WKFS - Screw for wooden constructions with full thread and countersunk head
TIMBER

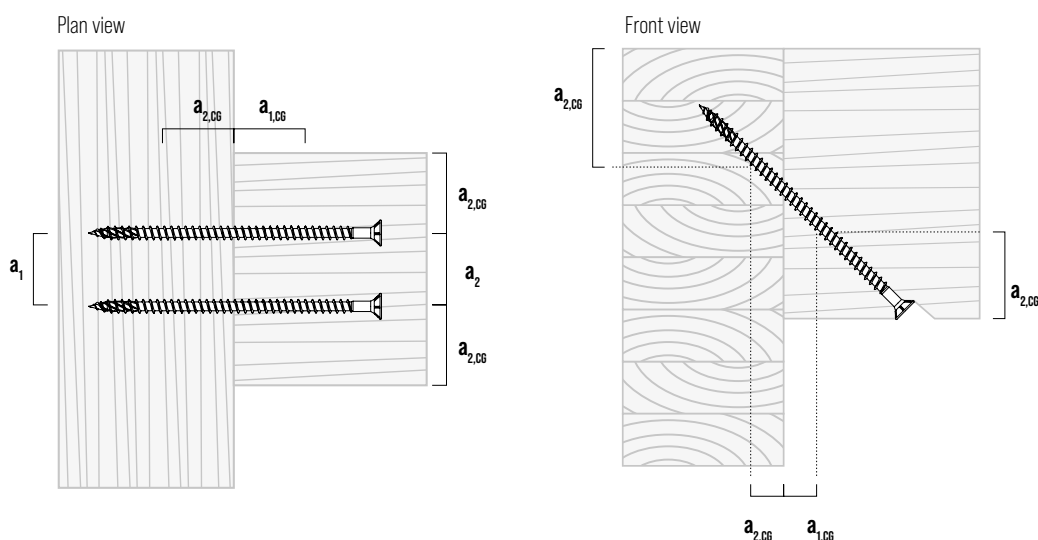
Minimum distances for axially loaded screws - timber



WITH AND WITHOUT PRE-DRILLED HOLE

d_w [mm]	Ø 8	Ø 10
a_1 [mm]	56	70
a_2 [mm]	40	50
$a_{1,CB}$ [mm]	80	100
$a_{2,CB}$ [mm]	32	40
a_{CROSS} [mm]	12	15
e [mm]	28	35

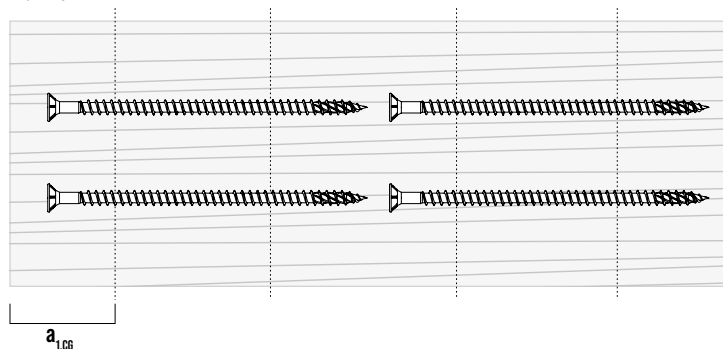
1. Minimum distances in accordance with EN 1995 and ETA-18/0817

Screws under tension placed at an angle α to the grain


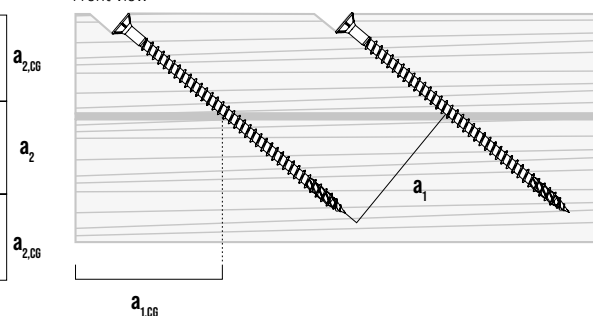
WKFS - Screw for wooden constructions with full thread and countersunk head

Screws under tension placed at an angle α to the grain

Plan view

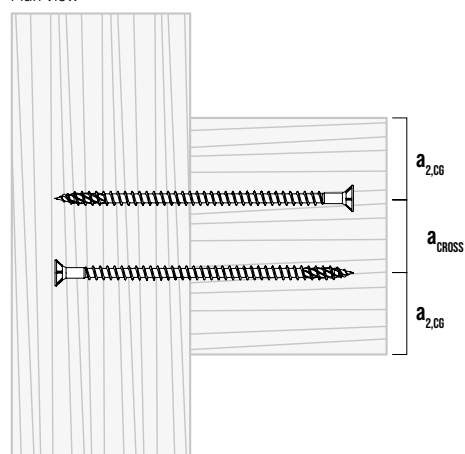


Front view

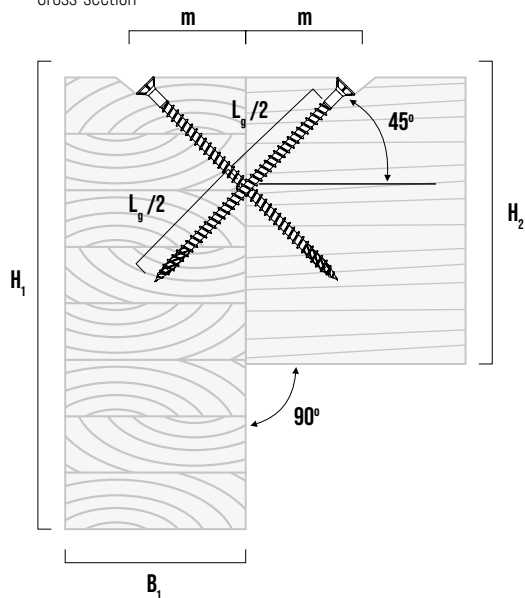


Crossed screws placed at an angle α to the grain - 1 pair

Plan view

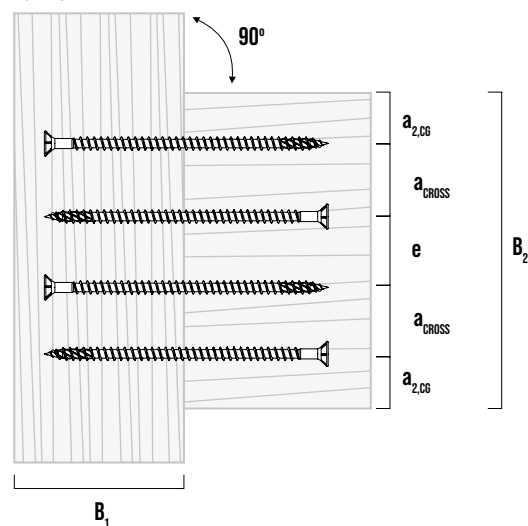


Cross-section

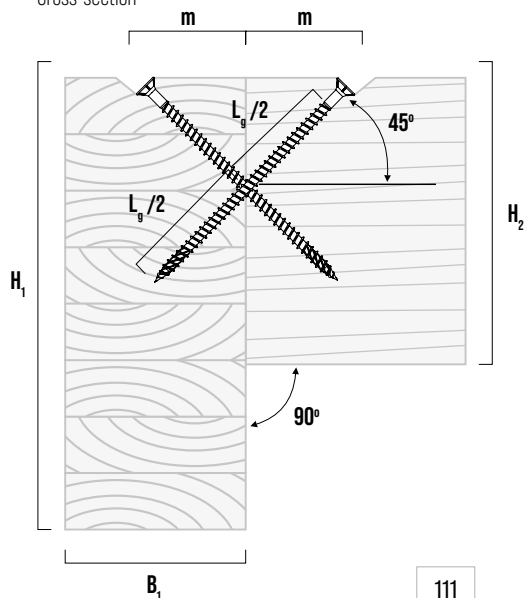


Crossed screws placed at an angle α to the grain - 2 pairs and more

Plan view



Cross-section



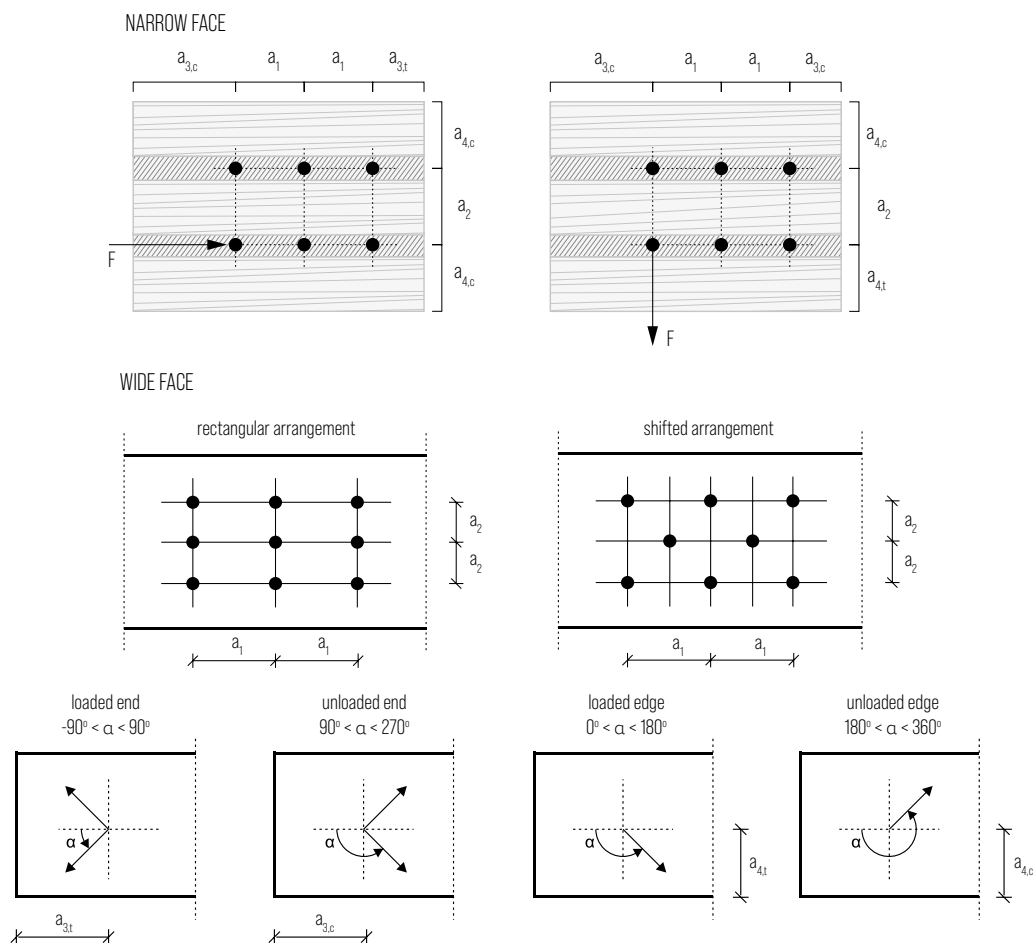
WKFS - Screw for wooden constructions with full thread and countersunk head
CLT

Minimum distances for laterally and/or axially loaded screws - CLT

WIDE FACE			NARROW FACE		
WITHOUT PRE-DRILLED HOLE			WITHOUT PRE-DRILLED HOLE		
d_w [mm]	Ø 8	Ø 10	d_w [mm]	Ø 8	Ø 10
a_1 [mm]	32	40	a_1 [mm]	80	100
a_2 [mm]	20	25	a_2 [mm]	32	40
$a_{3,t}$ [mm]	48	60	$a_{3,t}$ [mm]	96	120
$a_{3,c}$ [mm]	48	60	$a_{3,c}$ [mm]	56	70
$a_{4,t}$ [mm]	48	60	$a_{4,t}$ [mm]	48	60
$a_{4,c}$ [mm]	20	25	$a_{4,c}$ [mm]	24	30

1. Minimum distances in accordance with ETA-18/0817

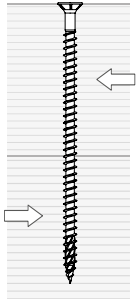
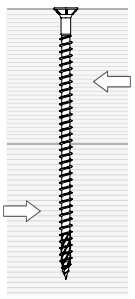
 2. Minimum CLT thickness $t_{min} = 10d_w$

 3. Minimum penetration depth in CLT narrow face $L_{ef} = 10d_w$


WKFS - Screw for wooden constructions with full thread and countersunk head

LVL

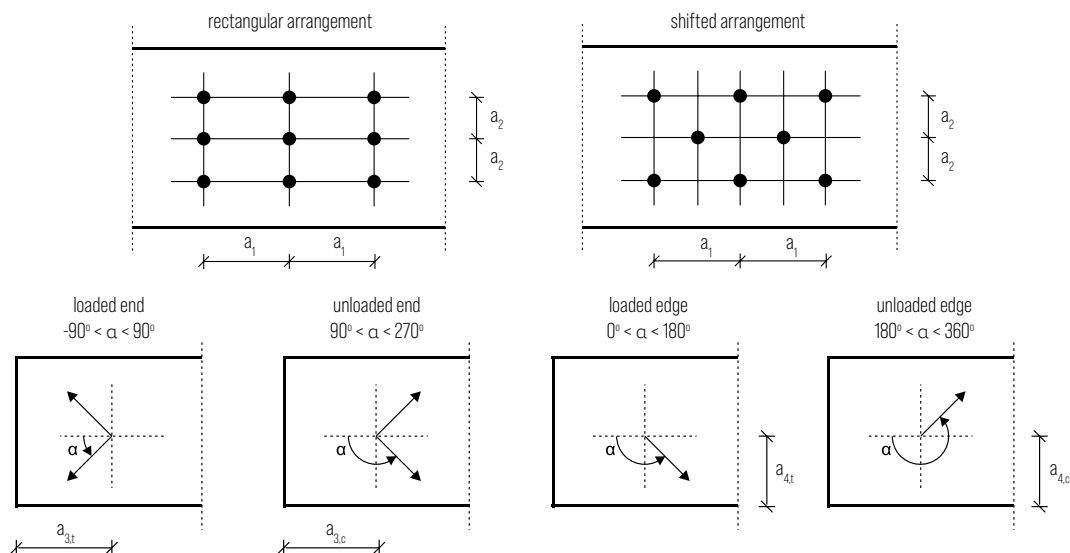
Minimum distances for laterally loaded screws - LVL

Angle between force and fiber direction $\alpha = 0^\circ$			Angle between force and fiber direction $\alpha = 90^\circ$		
					
WITHOUT PRE-DRILLED HOLE			WITHOUT PRE-DRILLED HOLE		
d_w [mm]	$\varnothing 8$	$\varnothing 10$	d_w [mm]	$\varnothing 8$	$\varnothing 10$
a_1 [mm]	120	150	a_1 [mm]	56	70
a_2 [mm]	56	70	a_2 [mm]	56	70
a_{3t} [mm]	160	200	a_{3t} [mm]	120	150
a_{3c} [mm]	120	150	a_{3c} [mm]	120	150
a_{4t} [mm]	56	70	a_{4t} [mm]	96	120
a_{4c} [mm]	56	70	a_{4c} [mm]	56	70
WITH PRE-DRILLED HOLE			WITH PRE-DRILLED HOLE		
d_w [mm]	$\varnothing 8$	$\varnothing 10$	d_w [mm]	$\varnothing 8$	$\varnothing 10$
d_0 [mm]	5	6	d_0 [mm]	5	6
a_1 [mm]	40	50	a_1 [mm]	32	40
a_2 [mm]	24	30	a_2 [mm]	32	40
a_{3t} [mm]	96	120	a_{3t} [mm]	56	70
a_{3c} [mm]	56	70	a_{3c} [mm]	56	70
a_{4t} [mm]	24	30	a_{4t} [mm]	56	70
a_{4c} [mm]	24	30	a_{4c} [mm]	24	30

1. Minimum distances in accordance with EN 1995 and ETA-18/0817

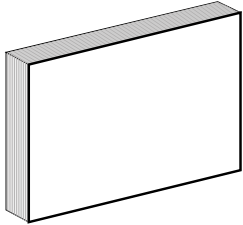
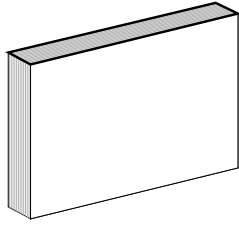
2. Minimum distances is valid for LVL characteristic density in range of $420 \text{ kg/m}^3 < \rho_k \leq 500 \text{ kg/m}^3$

3. Hole diameter d_0 is valid for softwood LVL

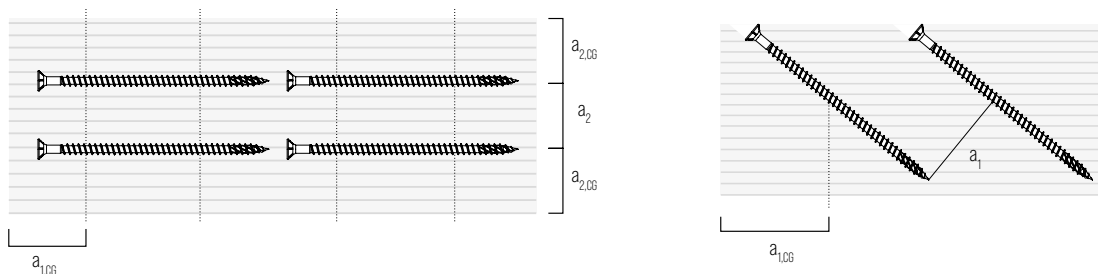
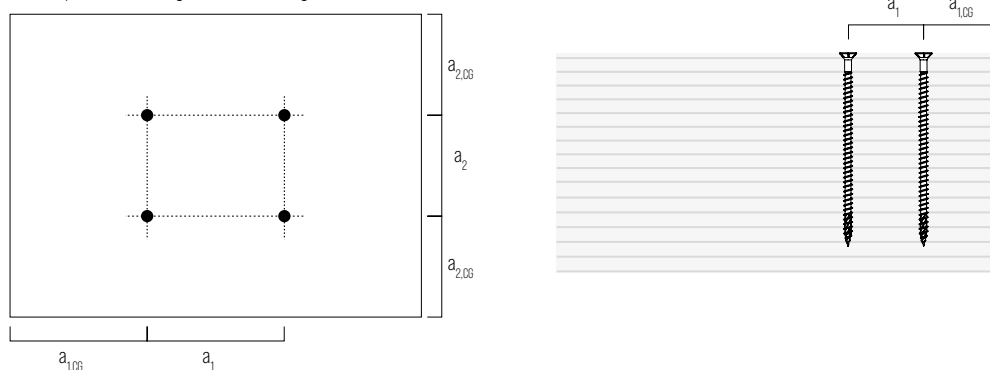
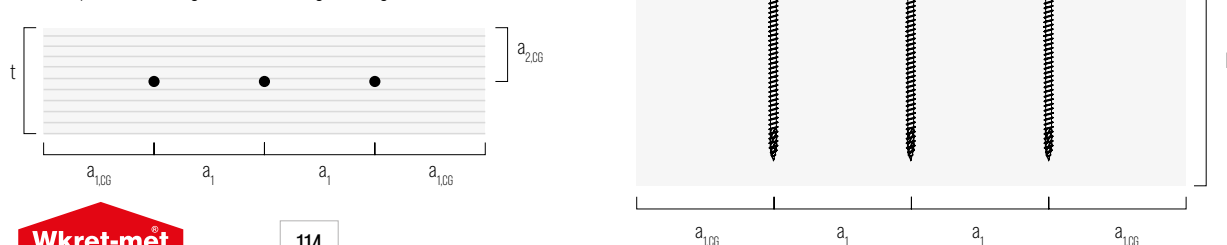


WKFS - Screw for wooden constructions with full thread and countersunk head
LVL

Minimum distances for axially loaded screws - LVL

WIDE FACE				EDGE FACE			
							
WITHOUT PRE-DRILLED HOLE				WITHOUT PRE-DRILLED HOLE			
d_w [mm]	Ø 6	Ø 8	Ø 10	d_w [mm]	Ø 6	Ø 8	Ø 10
a_1 [mm]	42	56	70	a_1 [mm]	60	80	100
a_2 [mm]	30	40	50	a_2 [mm]	30	40	50
$a_{1,OG}$ [mm]	60	80	100	$a_{1,OG}$ [mm]	72	96	120
$a_{2,OG}$ [mm]	24	32	40	$a_{2,OG}$ [mm]	24	32	40

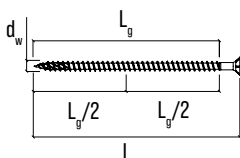
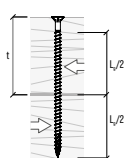
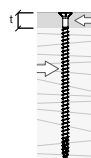
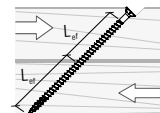
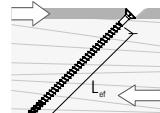
1. Minimum distances in accordance with EN 1995 and ETA-18/0817

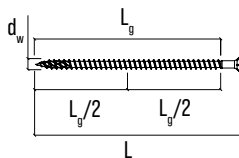
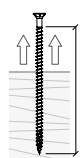
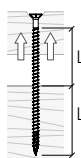
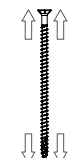
 Screws under tension placed at an angle α to the grain (wide face)

 Screws placed at an angle $\alpha=90^\circ$ to the grain (wide face)

 Screws placed at an angle $\alpha=90^\circ$ to the grain (edge face)




WKFS - Screw for wooden constructions with full thread and countersunk head
TIMBER

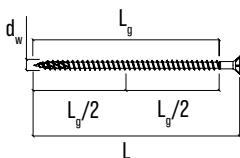
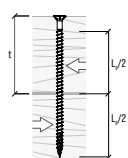
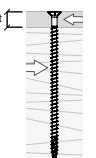
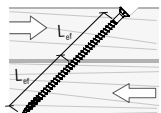
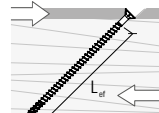
Characteristic resistances for laterally and axially loaded screws - timber

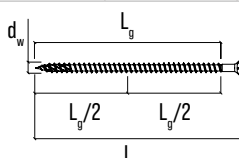
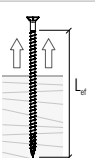
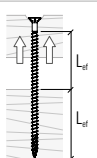
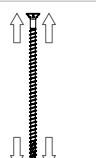
DIMENSIONS				SHEAR			SLIDING						
Diameter	Length	Thread length	Partial thread length	timber-timber		steel-timber (thin plate)	steel-timber (thick plate)	timber-timber		steel-timber			
													
d _w [mm]	L _w [mm]	L _g [mm]	L _g /2 [mm]	t [mm]	R _{Vk} [kN]	R _{Vk} [kN]	R _{Vk} [kN]	L _{ef} = L _g /2 [mm]	R _{ax,45,k} [kN]	L _{ef} = L _g [mm]	R _{ax,45,k} [kN]		
WKFS 8													
ø8	120	108	54	66	4,08	t = 4 mm	5,44	t = 8 mm	6,63	54	3,67	108	7,33
	140	128	64	76	4,39		5,70		7,11	64	4,34	128	8,69
	160	148	74	86	4,63		5,70		7,59	74	5,02	148	10,05
	180	168	84	96	4,87		5,70		8,07	84	5,70	168	11,40
	200	188	94	106	5,11		5,70		8,07	94	6,38	188	12,76
	220	208	104	116	5,35		5,70		8,07	104	7,06	208	14,12
	240	228	114	126	5,59		5,70		8,07	114	7,74	228	15,48
	260	248	124	136	5,70		5,70		8,07	124	8,42	248	16,83
	280	268	134	146	5,70		5,70		8,07	134	9,10	268	18,19
	300	288	144	156	5,70		5,70		8,07	144	9,78	288	19,55
	350	338	169	181	5,70		5,70		8,07	169	11,47	338	22,94
	400	388	194	206	5,70		5,70		8,07	194	13,17	388	26,34
	450	438	219	231	5,70		5,70		8,07	219	14,87	438	29,73
	500	488	244	256	5,70		5,70		8,07	244	16,56	488	33,13

DIMENSIONS				TENSION					
Diameter	Length	Thread length	Partial thread length	Withdrawal-full thread		Withdrawal-partial thread		Tension	
									
d_w [mm]	L_w [mm]	L_g [mm]	$L_g/2$ [mm]	$L_{ef} = L_g$ [mm]	$R_{ax,k}$ [kN]	$L_{ef} = L_g/2$ [mm]	$R_{ax,k}$ [kN]	$R_{tens,k}$ [kN]	$R_{tens,45,k}$ [kN]
WKFS 8									
ø8	120	108	54	108	10,37	54	5,18	25,00	17,68
	140	128	64	128	12,29	64	6,14	25,00	17,68
	160	148	74	148	14,21	74	7,10	25,00	17,68
	180	168	84	168	16,13	84	8,06	25,00	17,68
	200	188	94	188	18,05	94	9,02	25,00	17,68
	220	208	104	208	19,97	104	9,98	25,00	17,68
	240	228	114	228	21,89	114	10,94	25,00	17,68
	260	248	124	248	23,81	124	11,90	25,00	17,68
	280	268	134	268	25,73	134	12,86	25,00	17,68
	300	288	144	288	27,65	144	13,82	25,00	17,68
	350	338	169	338	32,45	169	16,22	25,00	17,68
	400	388	194	388	37,25	194	18,62	25,00	17,68
	450	438	219	438	42,05	219	21,02	25,00	17,68
	500	488	244	488	46,85	244	23,42	25,00	17,68

WKFS - Screw for wooden constructions with full thread and countersunk head
TIMBER

Characteristic resistances for laterally and axially loaded screws - timber

DIMENSIONS				SHEAR			SLIDING						
Diameter	Length	Thread length	Partial thread length	timber-timber		steel-timber (thin plate)	steel-timber (thick plate)	timber-timber		steel-timber			
													
d _w [mm]	L _w [mm]	L _g [mm]	L _g /2 [mm]	t [mm]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	L _{ef} = L _g /2 [mm]	R _{ax,45,k} [kN]	L _{ef} = L _g [mm]	R _{ax,45,k} [kN]		
WKFS 10													
ø10	300	285	142,5	157,5	7,96	t = 5 mm	8,09	t = 10 mm	11,44	142,5	11,08	285	22,17
	330	315	157,5	172,5	8,09		8,09		11,44	157,5	12,25	315	24,50
	360	345	172,5	187,5	8,09		8,09		11,44	172,5	13,42	345	26,83
	400	385	192,5	207,5	8,09		8,09		11,44	192,5	14,97	385	29,95
	450	435	217,5	232,5	8,09		8,09		11,44	217,5	16,92	435	33,84
	500	485	242,5	257,5	8,09		8,09		11,44	242,5	18,86	485	37,72
	550	535	267,5	282,5	8,09		8,09		11,44	267,5	20,81	535	41,61
	600	585	292,5	307,5	8,09		8,09		11,44	292,5	22,75	585	45,50

DIMENSIONS				TENSION					
Diameter	Length	Thread length	Partial thread length	Withdrawal-full thread		Withdrawal-partial thread		Tension	
									
d _w [mm]	L _w [mm]	L _g [mm]	L _g /2 [mm]	L _{ef} = L _g [mm]	R _{ax,k} [kN]	L _{ef} = L _g /2 [mm]	R _{ax,k} [kN]	R _{tens,k} [kN]	R _{tens,45,k} [kN]
WKFS 10									
ø10	300	285	142,5	285	31,35	142,5	15,68	36,00	25,46
	330	315	157,5	315	34,65	157,5	17,33	36,00	25,46
	360	345	172,5	345	37,95	172,5	18,98	36,00	25,46
	400	385	192,5	385	42,35	192,5	21,18	36,00	25,46
	450	435	217,5	435	47,85	217,5	23,93	36,00	25,46
	500	485	242,5	485	53,35	242,5	26,68	36,00	25,46
	550	535	267,5	535	58,85	267,5	29,43	36,00	25,46
	600	585	292,5	585	64,35	292,5	32,18	36,00	25,46

NOTES:

1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817

2. In order to obtain a design resistance, use the following formula:

$$R_d = \frac{R_k * k_{mod}}{\gamma_M}$$

Factors γ_M and k_{mod} should be taken in accordance with EN 1995

3. Design resistance for tension is smaller value of the following:

$$R_{ax,d} = \min \left\{ \frac{R_{ax,k} * k_{mod}}{\gamma_M}, \frac{R_{tens,k}}{\gamma_{M2}} \right\}$$

Factors γ_M and k_{mod} should be taken in accordance with EN 1995. Factor γ_{M2} should be taken in accordance with EN 1993

4. Design resistance for sliding is smaller value of the following:

$$R_{V,d} = \min \left\{ \frac{R_{ax,45,k} * k_{mod}}{\gamma_M}, \frac{R_{tens,45,k}}{\gamma_{M2}} \right\}$$

Factors γ_M and k_{mod} should be taken in accordance with EN 1995. Factor γ_{M2} should be taken in accordance with EN 19935. Characteristic resistances were calculated for a characteristic density of timber $\rho_k = 350 \text{ kg/m}^3$

6. Characteristic shear resistances were calculated for connections without pre-drilled holes

7. Characteristic shear resistances for timber-timber connections were calculated for timber thickness t [mm]8. Characteristic shear resistances for steel-timber connections were calculated for thin steel plate with thickness $t \leq 0,5d_w$ 9. Characteristic shear resistances for steel-timber connections were calculated for thick steel plate with thickness $t \geq d_w$ 10. Characteristic resistances to withdrawal were calculated assuming an angle of 90° between screw and grain direction and for effective penetration length equal $L_{ef} = L_g$ and $L_{ef} = L_g/2$ 11. Characteristic resistances to sliding were calculated assuming an angle of 45° between screw and grain direction and for effective penetration length equal $L_{ef} = L_g$ and $L_{ef} = L_g/2$

WKFS - Screw for wooden constructions with full thread and countersunk head
TIMBER

Characteristic resistances for crossed screws - main beam/secondary beam												
DIMENSIONS				CONNECTION GEOMETRY						CHARACTERISTIC RESISTANCES		
Diameter	Length	Thread length	Partial thread length	Width of the main beam	Height of the main beam	Width of the secondary beam	Height of the secondary beam	Mounting distance	Number of screw pairs	Withdrawal	Buckling	Tension
d_w [mm]	L_w [mm]	L_g [mm]	$L_g/2$ [mm]	B_1 [mm]	H_1 [mm]	B_2 [mm]	H_2 [mm]	m [mm]	n	$R_{ax,45,k}$ [kN]	$R_{ki,45,k}$ [kN]	$R_{tens,45,k}$ [kN]
WKFS 8												
ø8	240	228	114	99	180	76	180	89	1	15,48	15,58	35,36
						116			2	28,88	29,08	65,98
						156			3	41,79	42,07	95,46
	260	248	124	106	194	76	194	96	1	16,83	15,58	35,36
						116			2	31,41	29,08	65,98
						156			3	45,45	42,07	95,46
	280	268	134	113	208	76	208	103	1	18,19	15,58	35,36
						116			2	33,95	29,08	65,98
						156			3	49,12	42,07	95,46
	300	288	144	120	222	76	222	110	1	19,55	15,58	35,36
						116			2	36,48	29,08	65,98
						156			3	52,79	42,07	95,46
	350	338	169	138	257	76	257	128	1	22,94	15,58	35,36
						116			2	42,82	29,08	65,98
						156			3	61,95	42,07	95,46
	400	388	194	156	293	76	293	146	1	26,34	15,58	35,36
						116			2	49,15	29,08	65,98
						156			3	71,11	42,07	95,46
	450	438	219	173	328	76	328	163	1	29,73	15,58	35,36
						116			2	55,48	29,08	65,98
						156			3	80,28	42,07	95,46
	500	488	244	191	364	76	364	181	1	33,13	15,58	35,36
						116			2	61,82	29,08	65,98
						156			3	89,44	42,07	95,46



WKFS - Screw for wooden constructions with full thread and countersunk head
TIMBER

Characteristic resistances for crossed screws - main beam/secondary beam

DIMENSIONS				CONNECTION GEOMETRY						CHARACTERISTIC RESISTANCES		
Diameter	Length	Thread length	Partial thread length	Width of the main beam	Height of the main beam	Width of the secondary beam	Height of the secondary beam	Mounting distance	Number of screw pairs	Withdrawal	Buckling	Tension
d _w [mm]	L _w [mm]	L _g [mm]	L _g /2 [mm]	B ₁ [mm]	H ₁ [mm]	B ₂ [mm]	H ₂ [mm]	m [mm]	n	R _{ax,45,k} [kN]	R _{ki,45,k} [kN]	R _{tens,45,k} [kN]
WKFS 10												
ø10	300	285	142,5	121	222	95	222	111	1	22,17	23,35	50,91
						145			2	41,37	43,57	95,00
						195			3	59,85	63,04	137,46
	330	315	157,5	132	243	95	243	122	1	24,50	23,35	50,91
						145			2	45,72	43,57	95,00
						195			3	66,15	63,04	137,46
	360	345	172,5	143	265	95	265	133	1	26,83	23,35	50,91
						145			2	50,08	43,57	95,00
						195			3	72,45	63,04	137,46
	400	385	192,5	157	293	95	293	147	1	29,95	23,35	50,91
						145			2	55,88	43,57	95,00
						195			3	80,85	63,04	137,46
	450	435	217,5	174	328	95	328	164	1	33,84	23,35	50,91
						145			2	63,14	43,57	95,00
						195			3	91,35	63,04	137,46
	500	485	242,5	192	364	95	364	182	1	37,72	23,35	50,91
						145			2	70,40	43,57	95,00
						195			3	101,86	63,04	137,46
	550	535	267,5	210	399	95	399	200	1	41,61	23,35	50,91
						145			2	77,65	43,57	95,00
						195			3	112,36	63,04	137,46
	600	585	292,5	227	434	95	434	217	1	45,50	23,35	50,91
						145			2	84,91	43,57	95,00
						195			3	122,86	63,04	137,46

NOTES:

1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817

2. In order to obtain a design resistance, use the following formula :

$$R_{v,d} = \min \left\{ \begin{array}{l} \frac{R_{ax,45,k} * k_{mod}}{\gamma_M} \\ \frac{R_{ki,45,k}}{\gamma_{M1}} \\ \frac{R_{tens,45,k}}{\gamma_{M2}} \end{array} \right.$$

 Factors γ_M and k_{mod} should be taken in accordance with EN 1995. Factor γ_{M1} and γ_{M2} should be taken in accordance with EN 1993

 4. Characteristic resistances were calculated for a characteristic density of timber $\rho_k = 350 \text{ kg/m}^3$

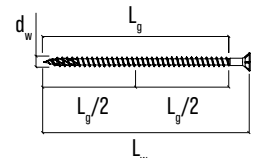
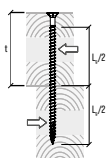
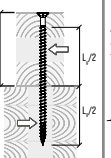
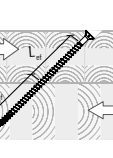
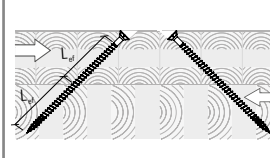
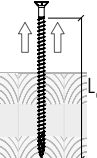
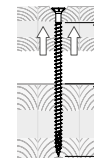
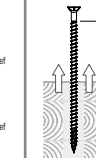
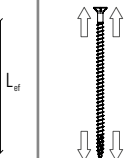
 5. Characteristic resistances to withdrawal were calculated assuming an angle of 45° to the shear plane and effective penetration length equal $L_{ef} = L_g/2$

6. Characteristic resistances to withdrawal were calculated assuming symmetrical installation of screws

 7. Characteristic resistances were calculated assuming a minimum distance $a_{100} \geq 5d$. According to ETA-18/0817 minimum distance $a_{100} \geq 10d$


WKFS - Screw for wooden constructions with full thread and countersunk head
CLT

Characteristic resistances for laterally and axially loaded screws - CLT

DIMENSIONS				SHEAR				SLIDING				TENSION								
Diameter	Length	Thread length	Partial thread length	CLT-CLT (wide face-wide face)		CLT-CLT (wide face-narrow face)		CLT - CLT (wide face-narrow face)		CLT - CLT (wide face-narrow face)		Withdrawal - full thread (wide face)		Withdrawal - partial thread (wide face)		Withdrawal - full thread (narrow face)		Tension		
																				
d _w [mm]	L _w [mm]	L _g [mm]	L _g /2 [mm]	t [mm]	R _{V,k} [kN]	t [mm]	R _{V,k} [kN]	L _{ef} = L _g /2 [mm]	R _{ax,45,k} [kN]	L _{ef} = L _g /2 [mm]	R _{ax,45,k} [kN]	R _{kl,45,k} [kN]	L _{ef} = L _g [mm]	R _{ax,k} [kN]	L _{ef} = L _g /2 [mm]	R _{ax,k} [kN]	L _{ef} = L _g [mm]	R _{ax,k} [kN]	R _{tens,k} [kN]	R _{tens,45,k} [kN]
WKFS 8																				
ø8	120	108	54	66	4,08	66	2,66	54	2,70	54	5,41	15,58	108	10,37	54	5,18	108	7,14	25,00	17,68
	140	128	64	76	4,39	76	2,97	64	3,15	64	6,30	15,58	128	12,29	64	6,14	128	8,32	25,00	17,68
	160	148	74	86	4,63	86	3,29	74	3,59	74	7,18	15,58	148	14,21	74	7,10	148	9,48	25,00	17,68
	180	168	84	96	4,87	96	3,62	84	4,03	84	8,05	15,58	168	16,13	84	8,06	168	10,62	25,00	17,68
	200	188	94	106	5,11	106	3,84	94	4,45	94	8,91	15,58	188	18,05	94	9,02	188	11,76	25,00	17,68
	220	208	104	116	5,35	116	3,99	104	4,88	104	9,76	15,58	208	19,97	104	9,98	208	12,88	25,00	17,68
	240	228	114	126	5,59	126	4,14	114	5,30	114	10,60	15,58	228	21,89	114	10,94	228	13,98	25,00	17,68
	260	248	124	136	5,70	136	4,28	124	5,72	124	11,43	15,58	248	23,81	124	11,90	248	15,08	25,00	17,68
	280	268	134	146	5,70	146	4,43	134	6,13	134	12,26	15,58	268	25,73	134	12,86	268	16,17	25,00	17,68
	300	288	144	156	5,70	156	4,53	144	6,54	144	13,08	15,58	288	27,65	144	13,82	288	17,26	25,00	17,68
	350	338	169	181	5,70	181	4,53	169	7,55	169	15,10	15,58	338	32,45	169	16,22	338	19,93	25,00	17,68
	400	388	194	206	5,70	206	4,53	194	8,55	194	17,10	15,58	388	37,25	194	18,62	388	22,57	25,00	17,68
	450	438	219	231	5,70	231	4,53	219	9,54	219	19,07	15,58	438	42,05	219	21,02	438	25,17	25,00	17,68
	500	488	244	256	5,70	256	4,53	244	10,51	244	21,02	15,58	488	46,85	244	23,42	488	27,74	25,00	17,68
WKFS 10																				
ø10	300	285	142,5	157,5	7,96	157,5	5,90	142,5	7,74	142,5	15,49	23,35	285	31,35	142,5	15,68	285	20,44	36,00	25,46
	330	315	157,5	172,5	8,09	172,5	6,16	157,5	8,47	157,5	16,95	23,35	315	34,65	157,5	17,33	315	22,36	36,00	25,46
	360	345	172,5	187,5	8,09	187,5	6,32	172,5	9,20	172,5	18,39	23,35	345	37,95	172,5	18,98	345	24,27	36,00	25,46
	400	385	192,5	207,5	8,09	207,5	6,32	192,5	10,15	192,5	20,30	23,35	385	42,35	192,5	21,18	385	26,79	36,00	25,46
	450	435	217,5	232,5	8,09	232,5	6,32	217,5	11,33	217,5	22,66	23,35	435	47,85	217,5	23,93	435	29,90	36,00	25,46
	500	485	242,5	257,5	8,09	257,5	6,32	242,5	12,50	242,5	24,99	23,35	485	53,35	242,5	26,68	485	32,98	36,00	25,46
	550	535	267,5	282,5	8,09	282,5	6,32	267,5	13,65	267,5	27,30	23,35	535	58,85	267,5	29,43	535	36,02	36,00	25,46
	600	585	292,5	307,5	8,09	307,5	6,32	292,5	14,79	292,5	29,58	23,35	585	64,35	292,5	32,18	585	39,04	36,00	25,46

NOTES:

1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817

 2. In order to obtain a design resistance, use the following formula : $R_d = \frac{R_k * k_{mod}}{\gamma_M}$

 Factors γ_M and k_{mod} should be taken in accordance with EN 1995

 3. Design resistance for tension is smaller value of the following : $R_{ax,d} = \min \left\{ \frac{R_{ax,k} * k_{mod}}{\gamma_M}, \frac{R_{tens,k}}{\gamma_{M2}} \right\}$

 Factors γ_M and k_{mod} should be taken in accordance with EN 1995. Factor γ_{M2} should be taken in accordance with EN 1993

 4. Design resistance for sliding is smaller value of the following : $R_{V,d} = \min \left\{ \frac{R_{ax,45,k} * k_{mod}}{\gamma_M}, \frac{R_{kl,45,k}}{\gamma_{M1}}, \frac{R_{tens,45,k}}{\gamma_{M2}} \right\}$

 Factors γ_M and k_{mod} should be taken in accordance with EN 1995. Factors γ_{M1} and γ_{M2} should be taken in accordance with EN 1993

 5. Characteristic resistances were calculated for a characteristic density of CLT $\rho_k = 350 \text{ kg/m}^3$

6. Characteristic shear resistances were calculated for connections without pre-drilled holes

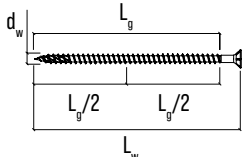
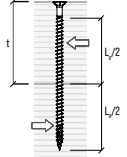
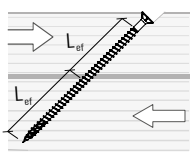
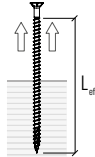
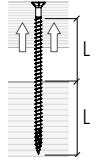
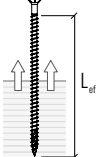
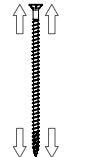
 7. Characteristic shear resistances for CLT-CLT connections were calculated for timber thickness t [mm]

 8. Characteristic withdrawal resistances of CLT wide face were calculated assuming an angle of 90° between screw and grain direction and for effective penetration length equal $L_{ef} = L_g$ and $L_{ef} = L_g/2$

 9. Characteristic withdrawal resistances of CLT narrow face were calculated for minimum thickness $t_{min} = 10d_w$ and for effective penetration length equal $L_{ef} = L_g$

 10. Characteristic resistances to sliding were calculated assuming an angle of 45° between screw and grain direction and for effective penetration length equal $L_{ef} = L_g/2$

WKFS - Screw for wooden constructions with full thread and countersunk head
CLT
Characteristic resistances for laterally and axially loaded screws - LVL

DIMENSIONS				SHEAR		SLIDING		TENSION							
Diameter	Length	Thread length	Partial thread length	LVL - LVL (wide face-wide face)		LVL - LVL (wide face-wide face)		Withdrawal - full thread (wide face)		Withdrawal - partial thread (wide face)		Withdrawal - full thread (edge face)		Tension	
															
d_w [mm]	L_w [mm]	L_g [mm]	$L_g/2$ [mm]	t [mm]	$R_{V,k}$ [kN]	$L_{ef} = L_g/2$ [mm]	$R_{ax,45,k}$ [kN]	$L_{ef} = L_g$ [mm]	$R_{ax,k}$ [kN]	$L_{ef} = L_g/2$ [mm]	$R_{ax,k}$ [kN]	$L_{ef} = L_g$ [mm]	$R_{ax,k}$ [kN]	$R_{tens,k}$ [kN]	$R_{tens,45,k}$ [kN]
WKFS 8															
ø8	120	108	54	66	4,74	54	3,18	108	11,23	54	5,62	108	7,49	25,00	17,68
	140	128	64	76	5,00	64	3,77	128	13,31	64	6,66	128	8,87	25,00	17,68
	160	148	74	86	5,26	74	4,35	148	15,39	74	7,70	148	10,26	25,00	17,68
	180	168	84	96	5,52	84	4,94	168	17,47	84	8,74	168	11,65	25,00	17,68
	200	188	94	106	5,78	94	5,53	188	19,55	94	9,78	188	13,03	25,00	17,68
	220	208	104	116	6,04	104	6,12	208	21,63	104	10,82	208	14,42	25,00	17,68
	240	228	114	126	6,30	114	6,71	228	23,71	114	11,86	228	15,81	25,00	17,68
	260	248	124	136	6,56	124	7,30	248	25,79	124	12,90	248	17,19	25,00	17,68
	280	268	134	146	6,68	134	7,88	268	27,87	134	13,94	268	18,58	25,00	17,68
	300	288	144	156	6,68	144	8,47	288	29,95	144	14,98	288	19,97	25,00	17,68
	350	338	169	181	6,68	169	9,94	338	35,15	169	17,58	338	23,43	25,00	17,68
	400	388	194	206	6,68	194	11,41	388	40,35	194	20,18	388	26,90	25,00	17,68
	450	438	219	231	6,68	219	12,88	438	45,55	219	22,78	438	30,37	25,00	17,68
	500	488	244	256	6,68	244	14,35	488	50,75	244	25,38	488	33,83	25,00	17,68
WKFS 10															
ø10	300	285	142,5	157,5	9,37	142,5	10,48	285	37,05	142,5	18,53	285	24,70	36,00	25,46
	330	315	157,5	172,5	9,47	157,5	11,58	315	40,95	157,5	20,48	315	27,30	36,00	25,46
	360	345	172,5	187,5	9,47	172,5	12,69	345	44,85	172,5	22,43	345	29,90	36,00	25,46
	400	385	192,5	207,5	9,47	192,5	14,16	385	50,05	192,5	25,03	385	33,37	36,00	25,46
	450	435	217,5	232,5	9,47	217,5	15,99	435	56,55	217,5	28,28	435	37,70	36,00	25,46
	500	485	242,5	257,5	9,47	242,5	17,83	485	63,05	242,5	31,53	485	42,03	36,00	25,46
	550	535	267,5	282,5	9,47	267,5	19,67	535	69,55	267,5	34,78	535	46,37	36,00	25,46
	600	585	292,5	307,5	9,47	292,5	21,51	585	76,05	292,5	38,03	585	50,70	36,00	25,46

NOTES:

1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817

 2. In order to obtain a design resistance, use the following formula : $R_d = \frac{R_k * k_{mod}}{\gamma_M}$

 Factors γ_M and k_{mod} should be taken in accordance with EN 1995

3. Design resistance for tension is smaller value of the following :

$$R_{ax,d} = \min \left\{ \frac{R_{ax,k} * k_{mod}}{\gamma_M}, \frac{R_{tens,k}}{\gamma_{M2}} \right\}$$

 Factors γ_M and k_{mod} should be taken in accordance with EN 1995. Factor γ_{M2} should be taken in accordance with EN 1993

4. Design resistance for sliding is smaller value of the following :

$$R_{V,d} = \min \left\{ \frac{R_{ax,45,k} * k_{mod}}{\gamma_M}, \frac{R_{tens,45,k}}{\gamma_{M2}} \right\}$$

 Factors γ_M and k_{mod} should be taken in accordance with EN 1995. Factor γ_{M2} should be taken in accordance with EN 1993

 5. Characteristic resistances were calculated for a characteristic density of LVL $\rho_k = 480 \text{ kg/m}^3$

6. Characteristic shear resistances were calculated for connections without pre-drilled holes

 7. Characteristic shear resistances for LVL-LVL connections were calculated for timber thickness t [mm]

 8. Characteristic resistances to withdrawal were calculated assuming an angle of 90° between screw and grain direction and for effective penetration length equal $L_{ef} = L$ and $L_{ef} = L_g/2$

 9. Characteristic resistances to sliding were calculated assuming an angle of 45° between screw and grain direction and for effective penetration length equal $L_{ef} = L_g/2$



WKPC

Screws with double thread for over-rafter insulation, TX

Diameters: $\varnothing 8$ mm

Length range: from 165 to 472 mm



Pan head screw with double thread and TX drive for installation of over-rafter insulation in timber substrates.



TX DRIVE



Zn
WHITE



EUROPEAN TECHNICAL
ASSESSMENT
ETA-18/0817

SCREW MATERIAL - Carbon steel

ANTI-CORROSION PROTECTION - Galvanized steel (white)

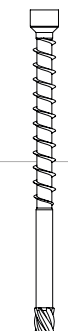
PRODUCT ADVANTAGES:



CYLINDRICAL HEAD WITH TX DRIVE - Allow quick and secure fastening, ideal for hidden insertion in the batten. TX drive guarantees optimum torque transfer.



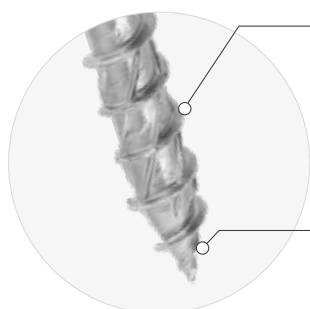
HIGH TORQUE - Allows screws to be installed without pre-drilling, even in hardwood substrates.



DOUBLE THREAD - Provides optimum load transfer from battens to rafters and allows uninterrupted fastening of insulation to prevent thermal bridges



WAX COATING - Wax coating applied during the production process significantly reduces the torque.



NEW CUTTING EDGE / SERRATED THREAD

New special design of cutting edge with added milling reduces screwing resistance by 20%. This helps to extend the life of batteries and power tools. Special cutting notches integrated on the thread cut wood fibres structure while screwing in.

DOUBLE THREAD

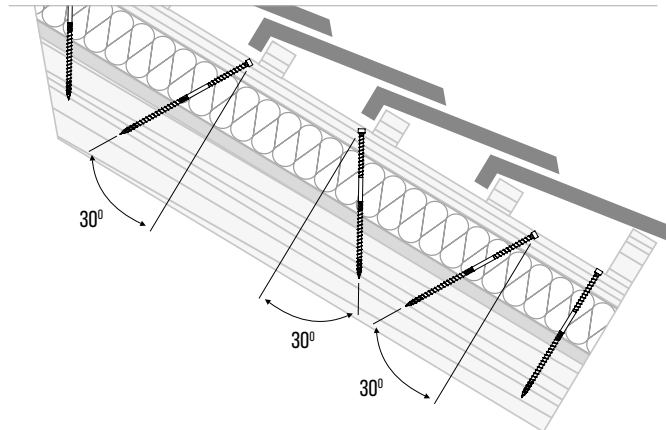
Additional recessed second thread improves remarkably the speed of timber penetration and reaction time of first grip into the wood.

EXAMPLES OF USE



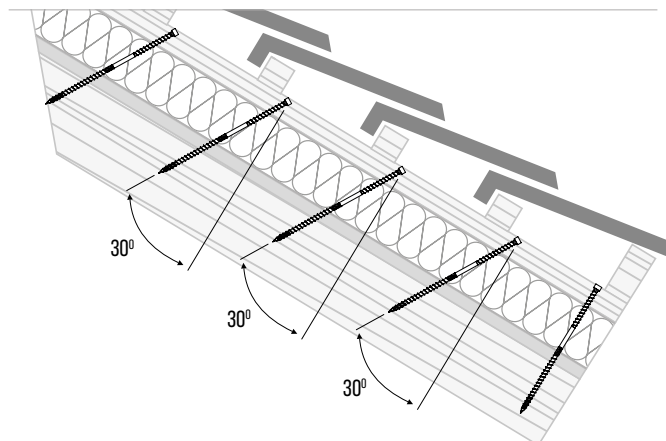
Fixing of soft over-rafter insulation

Insulation material with a low compressive strength ($\sigma(10\%) < 50 \text{ kPa}$ - EN 826)



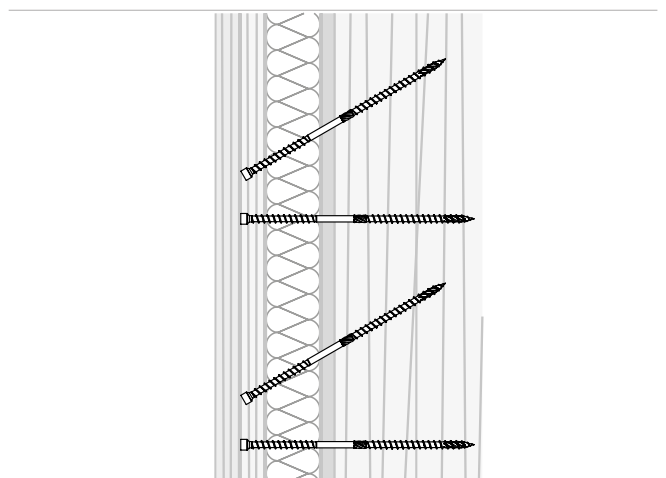
Fixing of rigid insulation

Insulation material with a high compressive strength ($\sigma(10\%) \geq 50 \text{ kPa}$ - EN 826)

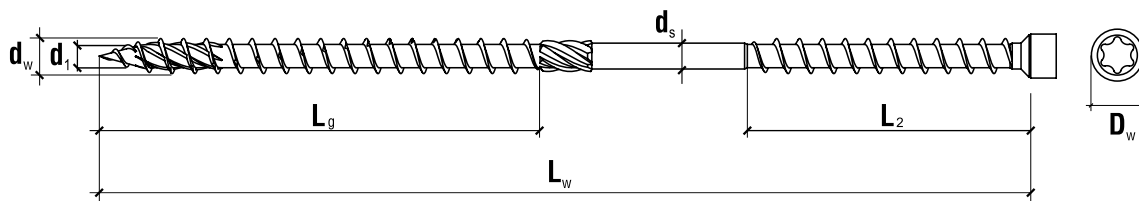


Fixing of insulation on façade

Insulation material with a high compressive strength ($\sigma(10\%) \geq 50 \text{ kPa}$ - EN 826)



WKPC - Screws with double thread for over-rafter insulation, TX



Codes and dimensions						
	Product code	Dimensions	Thread length	Underhead thread length	Type of drive	Quantity
	Galvanized - white	$d_w \times L_w$ [mm]	L_g [mm]	L_2 [mm]	[-]	[pcs]
WKPC-8						
ø8	WKPC-08165-B	8x165	80	60	TX 40	50
	WKPC-08195-B	8x195	100	60	TX 40	50
	WKPC-08225-B	8x225	100	60	TX 40	50
	WKPC-08235-B	8x235	100	60	TX 40	50
	WKPC-08255-B	8x255	100	60	TX 40	50
	WKPC-08275-B	8x275	100	60	TX 40	50
	WKPC-08302-B	8x302	100	60	TX 40	50
	WKPC-08335-B	8x335	100	60	TX 40	50
	WKPC-08365-B	8x365	100	60	TX 40	50
	WKPC-08397-B	8x397	100	60	TX 40	50
	WKPC-08435-B	8x435	100	60	TX 40	50
	WKPC-08472-B	8x472	100	60	TX 40	50

Geometry					
Product	Outer thread diameter	Inner thread diameter	Unthreaded part diameter	Head diameter	Length range
	d_w [mm]	d_1 [mm]	d_s [mm]	D_w [mm]	L_w [mm]
WKPC ø8	8	5,4	5,78	10	165-472

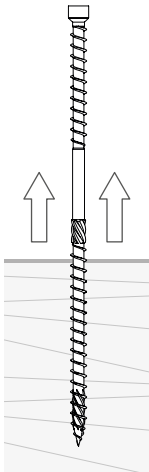
Mechanical characteristics					
Product	Characteristic yield moment	Characteristic withdrawal resistance parameter	Characteristic head-pull-through resistance parameter	Characteristic tensile strength	Characteristic torsional strength
	$M_{y,k}$ [N*m]	$f_{ak,k}$ [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{tens,k}$ [kN]	$f_{tor,k}$ [N*m]
WKPC ø8	25,0	12,0	17,4	25,0	27,0

1. Characteristic withdrawal and head-pull-through resistance based on reference density of timber $\rho_s = 350 \text{ kg/m}^3$

WKPC - Screws with double thread for over-rafter insulation, TX

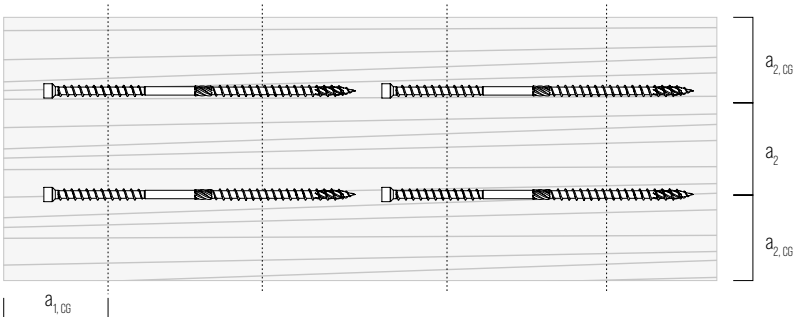
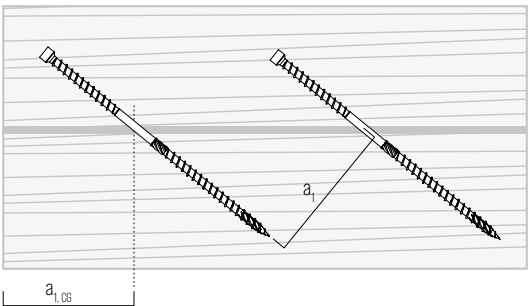
TIMBER

Minimum distances for axially loaded screws - timber



WITH PRE-DRILLED HOLE AND WITHOUT PRE-DRILLED HOLE

	a_1 [mm]	a_2 [mm]	$a_{1,CG}$ [mm]	$a_{2,CG}$ [mm]
WKPC $\varnothing 8$	56	40	80	32



WKSS

Spacer screws, TX

Diameters: $\varnothing 6$ mm

Length range: from 60 to 160 mm



Countersunk head spacer screw with TX drive is designed to create and regulate space in joint between two wooden based members



TX DRIVE



Zn
WHITE



EUROPEAN TECHNICAL
ASSESSMENT
ETA-18/0817

SCREW MATERIAL - Carbon steel

ANTI-CORROSION PROTECTION - Galvanized steel (white)

PRODUCT ADVANTAGES:



CUTTING RIBS - Allow optimal and smooth countersink with aesthetic finish result.



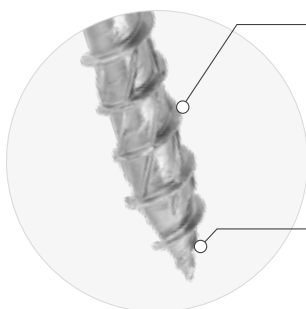
UNDERHEAD THREAD - Special asymmetric geometry of the thread enable levelling of fastening quickly and precisely.



HIGH TORQUE - Allows screws to be installed without pre-drilling, even in hardwood substrates.



WAX COATING - Wax coating applied during the production process significantly reduces the torque.



NEW CUTTING EDGE / SERRATED THREAD

New special design of cutting edge with added milling reduces screwing resistance by 20%. This helps to extend the life of batteries and power tools. Special cutting notches integrated on the thread cut wood fibres structure while screwing in.

DOUBLE THREAD

Additional recessed second thread improves remarkably the speed of timber penetration and reaction time of first grip into the wood.

EXAMPLES OF USE



SUBSTRATES



Solid timber



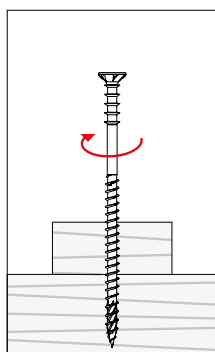
Glued laminated timber
CLT, KVH, BSH/GLT



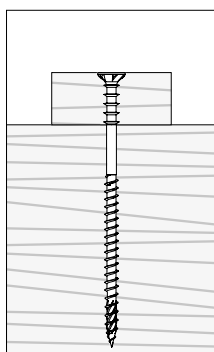
Laminated Veneer Lumber - LVL

INSTALLATION INSTRUCTIONS

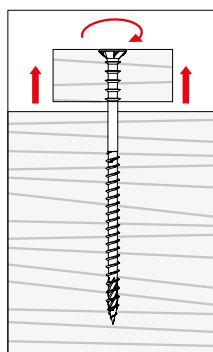
1. Place a screw in a structure.



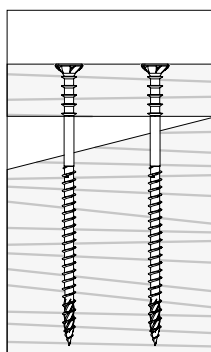
2. Tighten the screw completely.



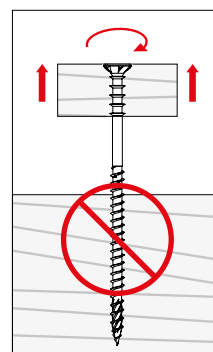
3. Loosen the screw to obtain a gap.



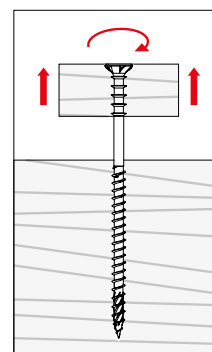
4. Adjust other screws.



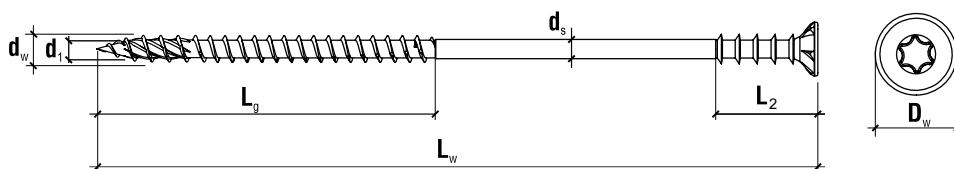
EXAMPLE OF INCORRECT INSTALLATION



EXAMPLE OF CORRECT INSTALLATION



WKSS - Spacer screws, TX



Codes and dimensions						
	Product code	Dimensions	Thread length	Underhead thread length	Type of drive	Quantity
	Galvanized - white	$d_w \times L_w$ [mm]	L_g [mm]	L_2 [mm]	[-]	[pcs]
WKSS-6						
ø6	WKSS-60060-B	6x60	30	25	TX 30	200
	WKSS-60070-B	6x70	40	25	TX 30	200
	WKSS-60080-B	6x80	50	25	TX 30	200
	WKSS-60090-B	6x90	60	25	TX 30	100
	WKSS-60100-B	6x100	60	25	TX 30	100
	WKSS-60110-B	6x110	60	25	TX 30	100
	WKSS-60120-B	6x120	75	25	TX 30	100
	WKSS-60130-B	6x130	75	25	TX 30	100
	WKSS-60145-B	6x145	75	25	TX 30	100
	WKSS-60160-B	6x160	75	25	TX 30	100

Geometry					
Product	Outer thread diameter	Inner thread diameter	Unthreaded part diameter	Head diameter	Length range
	d_w [mm]	d_i [mm]	d_s [mm]	D_w [mm]	L_w [mm]
WKSS ø6	6	3,9	4,3	12	60-160

Mechanical characteristics					
Product	Characteristic yield moment	Characteristic withdrawal resistance parameter	Characteristic head-pull-through resistance parameter	Characteristic tensile strength	Characteristic torsional strength
	$M_{y,k}$ [N*m]	$f_{ax,k}$ [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{tens,k}$ [kN]	$f_{tor,k}$ [N*m]
WKSS ø6	10,0	12,0	15,9	13,0	10,0

Characteristic withdrawal and head-pull-through resistance based on reference density of timber $\rho_a = 350 \text{ kg/m}^3$

Spacer and levelling collars

DW

Dimensions 40x40 mm, Thickness 2÷15 mm

Spacer and levelling collars for startup profile panels.
 Colour-coded thickness of spacer collars.



		Thickness	
DW-02(50)		2 mm	50
DW-03(50)		3 mm	50
DW-04(50)		4 mm	50
DW-05(50)		5 mm	50
DW-08(50)		8 mm	50
DW-10(50)		10 mm	50
DW-15(50)		15 mm	50



WKLC

Round head screw for plates

Diameters: $\varnothing 5$ mm

Length range: from 30 to 70 mm



Construction cylindrical head screws with full thread and TX drive for structural connections and reinforcements of wooden members.



TX DRIVE



Zn
WHITE



EUROPEAN TECHNICAL
ASSESSMENT
ETA-18/0817

SCREW MATERIAL - Carbon steel

ANTI-CORROSION PROTECTION - Galvanized steel (white or yellow)

PRODUCT ADVANTAGES:



ROUND HEAD WITH CYLINDRICAL UNDERHEAD AND TX DRIVE - Allows safe and secure fastening of perforated and angular metal plates. TX drive guarantees optimum torque transfer.



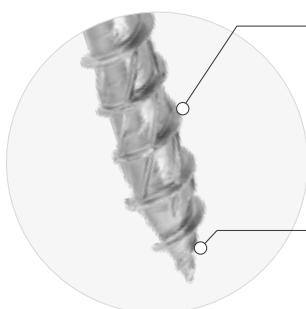
UNDERHEAD REINFORCEMENT - Wider screw diameter under the head improves shear strength of the screw.



WAX COATING - Wax coating applied during the production process significantly reduces the torque.



HIGH TORQUE - Allows screws to be installed without pre-drilling, even in hardwood substrates.



NEW CUTTING EDGE / SERRATED THREAD

New special design of cutting edge with added milling reduces screwing resistance by 20%. This helps to extend the life of batteries and power tools. Special cutting notches integrated on the thread cut wood fibres structure while screwing in.

DOUBLE THREAD

Additional recessed second thread improves remarkably the speed of timber penetration and reaction time of first grip into the wood.

EXAMPLES OF APPLICATIONS:



SUBSTRATES



Solid timber

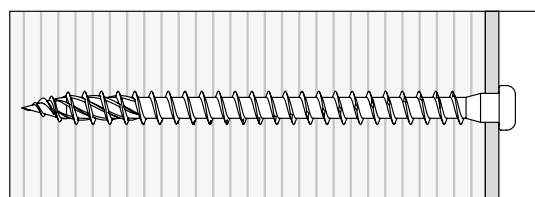
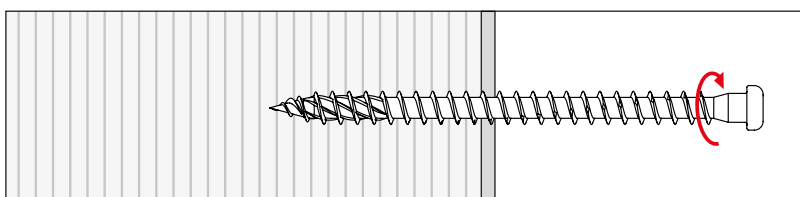


Glued laminated timber
CLT, KVH, BSH/GLT

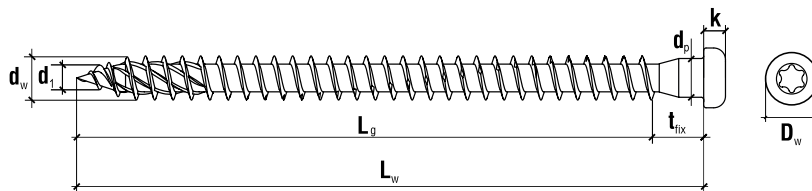


**Laminated Veneer
Lumber - LVL**

INSTALLATION INSTRUCTIONS (screw requires no pre-drilling)



WKLC - Round head screw for plates



Codes and dimensions

	Product code	Dimensions	Thread length	Max. usable length	Type of drive	Quantity
	Galvanized - white	$d_w \times L_w$ [mm]	L_g [mm]	t_{fix} [mm]	[-]	[pcs]
WKLC-5						
ø5	WKLC-50030-B	5x30	22	8	TX 20	250
	WKLC-50035-B	5x35	30	5	TX 20	250
	WKLC-50040-B	5x40	30	10	TX 20	250
	WKLC-50050-B	5x50	40	10	TX 20	250
	WKLC-50060-B	5x60	50	10	TX 20	250
	WKLC-50070-B	5x70	60	10	TX 20	250

Geometry

Product	Outer thread diameter	Inner thread diameter	Underhead diameter	Head diameter	Head thickness	Length range
	d_w [mm]	d_1 [mm]	d_p [mm]	D_w [mm]	k [mm]	L_w [mm]
WKLC ø5	5	3,15	4,80	7,4	2,70	30-70

Mechanical characteristics

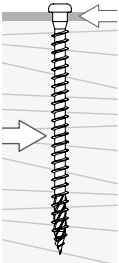
Product	Characteristic yield moment	Characteristic withdrawal resistance parameter	Characteristic head-pull-through resistance parameter	Characteristic tensile strength	Characteristic torsional strength
	M_{yk} [N*m]	$f_{ak,k}$ [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{tens,k}$ [kN]	$f_{tor,k}$ [N*m]
WKLC ø5	6	12	20,2	9	6

Characteristic withdrawal and head-pull-through resistance based on reference density of timber $\rho_a = 350 \text{ kg/m}^3$

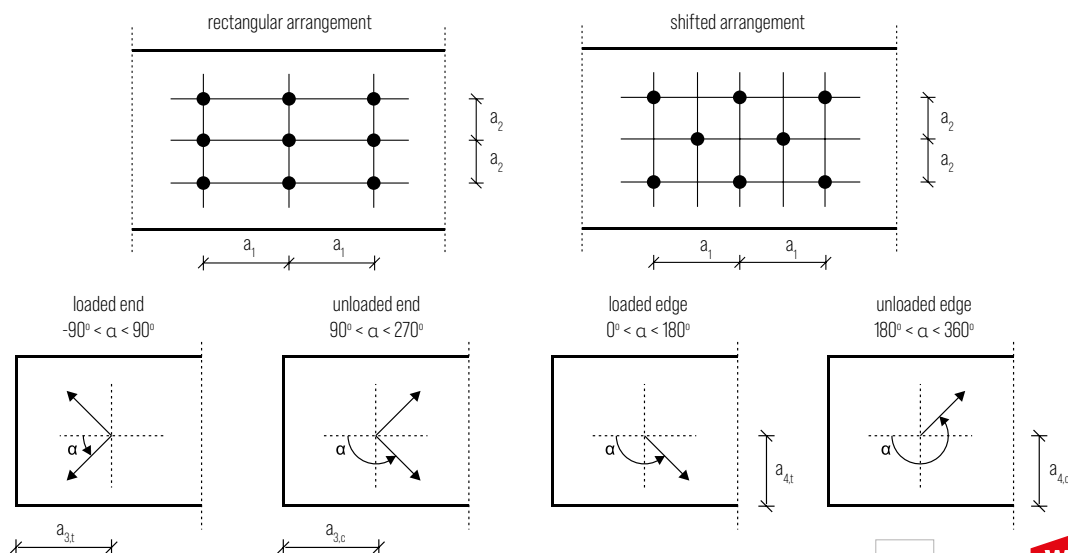
WKLC - Round head screw for plates

TIMBER

Minimum distances for laterally loaded screws - timber

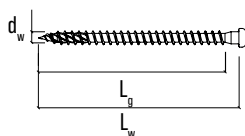
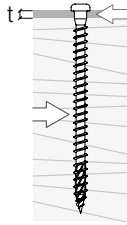
Angle between force and fiber direction $\alpha = 0^\circ$		Angle between force and fiber direction $\alpha = 90^\circ$	
			
WITHOUT PRE-DRILLED HOLE		WITHOUT PRE-DRILLED HOLE	
d_w [mm]	Ø 5	d_w [mm]	Ø 5
a_1 [mm]	42	a_1 [mm]	17,5
a_2 [mm]	17,5	a_2 [mm]	17,5
$a_{3,t}$ [mm]	75	$a_{3,t}$ [mm]	50
$a_{3,c}$ [mm]	50	$a_{3,c}$ [mm]	50
$a_{4,t}$ [mm]	25	$a_{4,t}$ [mm]	50
$a_{4,c}$ [mm]	25	$a_{4,c}$ [mm]	25
WITH PRE-DRILLED HOLE		WITH PRE-DRILLED HOLE	
d_w [mm]	Ø 5	d_w [mm]	Ø 5
d_0 [mm]	3	d_0 [mm]	3
$d_{0,steel}$ [mm]	5	$d_{0,steel}$ [mm]	5
a_1 [mm]	17,5	a_1 [mm]	14
a_2 [mm]	10,5	a_2 [mm]	14
$a_{3,t}$ [mm]	60	$a_{3,t}$ [mm]	35
$a_{3,c}$ [mm]	35	$a_{3,c}$ [mm]	35
$a_{4,t}$ [mm]	15	$a_{4,t}$ [mm]	35
$a_{4,c}$ [mm]	15	$a_{4,c}$ [mm]	15

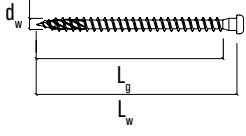
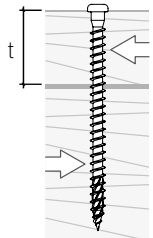
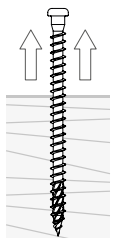
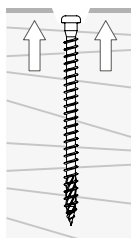
1. Minimum distances in accordance with EN 1995 and ETA-18/0817
2. Minimum distances is valid for timber characteristic density of $\rho_k \leq 420 \text{ kg/m}^3$
3. In case of connection timber-timber minimum distances (a_1 , a_2) should be multiplied by a factor of 1,45
4. Hole diameter d_0 is valid for softwood
5. Hole diameter $d_{0,steel}$ is valid for steel plate



WKLC - Round head screw for plates
TIMBER

Characteristic resistances for laterally and axially loaded screws - timber

DIMENSIONS			SHEAR													
Diameter	Length	Thread length	steel - timber													
																
d_w [mm]	L_w [mm]	L_g [mm]	$R_{v,k}$ [kN]													
WKLC-5																
ø5	5x30	22	t = 1,5 mm	1,66	t = 2 mm	1,65	t = 2,5 mm	1,63	t = 3 mm	1,62	t = 4 mm	1,60	t = 5 mm	1,57	t = 6 mm	1,55
	5x35	30		1,92		1,91		1,90		1,88		1,85		1,82		1,78
	5x40	30		2,08		2,06		2,05		2,03		2,00		1,97		1,94
	5x50	40	2,28	2,28	2,28	2,28	2,28	2,28	2,28	2,28						
	5x60	50	2,43	2,43	2,43	2,43	2,43	2,43	2,43	2,43						
	5x70	60	2,58	2,58	2,58	2,58	2,58	2,58	2,58	2,58						

DIMENSIONS			SHEAR		TENSION	
Diameter	Length	Thread length	timber-timber		Withdrawal	Head pull-through
						
d_w [mm]	L_w [mm]	L_g [mm]	t [mm]	$R_{v,k}$ [kN]	$R_{ax,k}$ [kN]	$R_{head,k}$ [kN]
WKLC-5						
ø5	5x30	22	10	0,88	1,32	1,11
	5x35	30	15	0,93	1,80	1,11
	5x40	30	20	1,01	1,80	1,11
	5x50	40	25	1,19	2,40	1,11
	5x60	50	30	1,38	3,00	1,11
	5x70	60	35	1,46	3,60	1,11

1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817

2. In order to obtain a design resistance, use the following formula:

$$R_d = \frac{R_k * k_{mod}}{\gamma_M}$$

 Factors γ_M and k_{mod} should be taken in accordance with EN 1995

 3. Characteristic resistances were calculated for a characteristic density of timber $\rho_k = 350 \text{ kg/m}^3$

4. Characteristic shear resistances were calculated for connections without pre-drilled holes

 5. Characteristic shear resistances for steel-timber connections were calculated for thick steel plate with thickness $t \geq 1,5 \text{ mm}$

 6. Characteristic withdrawal resistances were calculated assuming an angle of 90° between screw and grain direction and for penetration length equal L_g

7. Characteristic head pull-through resistances were calculated for timber element



K

Hex head wood screw

Diameters: $\varnothing 6$ mm | $\varnothing 8$ mm | $\varnothing 10$ mm | $\varnothing 12$ mm

Length range: from 60 to 260 mm



Screw for fastening of wooden, steel and PVC elements to timber



HEX HEAD



PN-EN 14592:2008
+A1:2012

SCREW MATERIAL - Carbon steel

ANTI-CORROSION PROTECTION - Galvanized steel (white or yellow)

PRODUCT ADVANTAGES:



HEX HEAD - Hex head improves pull-through resistance of joint and allows steel-wood applications.



PARTIAL THREAD - Partial thread prevents splitting of elements being installed and guarantees their tight fastening.

EXAMPLES OF APPLICATIONS:



SUBSTRATES



Solid timber

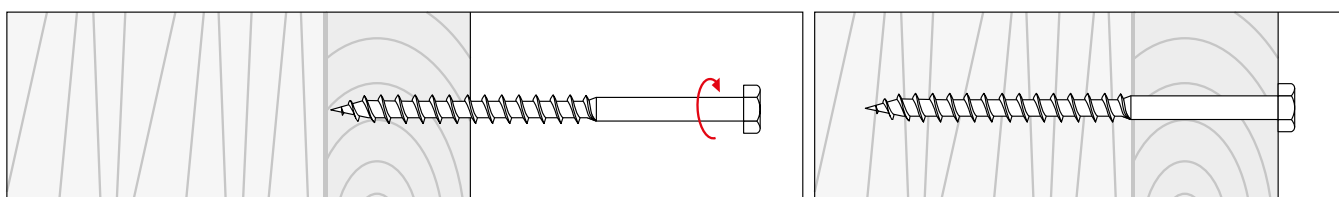


Glued laminated timber
CLT, KVH, BSH/GLT

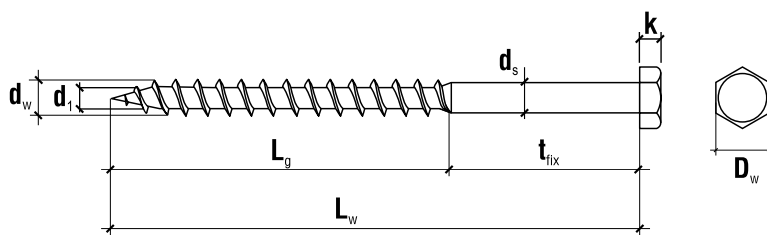


**Laminated Veneer
Lumber - LVL**

INSTALLATION INSTRUCTIONS



K - Hex head wood screw



Codes and dimensions						
	Product code	Dimensions	Thread length	Max. usable length	Head type	Quantity
	Galvanized - white	$d_w \times L_w$ [mm]	L_g [mm]	t_{fix} [mm]	[-]	[kg]
K-6						
ø6	K-06060(X5)	6x60	36	24	SW 10	5
	K-06070(X5)	6x70	42	28	SW 10	5
	K-06080(X5)	6x80	48	32	SW 10	5
	K-06090(X5)	6x90	54	36	SW 10	5
	K-06100(X5)	6x100	60	40	SW 10	5
	K-06120(X5)	6x120	72	48	SW 10	5
	K-06140(X5)	6x140	84	56	SW 10	5
K-8						
ø8	K-08060(X5)	8x60	36	24	SW 13	5
	K-08070(X5)	8x70	42	28	SW 13	5
	K-08080(X5)	8x80	48	32	SW 13	5
	K-08090(X5)	8x90	54	36	SW 13	5
	K-08100(X5)	8x100	60	40	SW 13	5
	K-08120(X5)	8x120	72	48	SW 13	5
	K-08140(X5)	8x140	84	56	SW 13	5
	K-08160(X5)	8x160	96	64	SW 13	5
	K-08180(X5)	8x180	108	72	SW 13	5
	K-08200(X5)	8x200	120	80	SW 13	5
K-10						
ø10	K-10080(X5)	10x80	48	32	SW 17	5
	K-10100(X5)	10x100	60	40	SW 17	5
	K-10120(X5)	10x120	72	48	SW 17	5
	K-10140(X5)	10x140	84	56	SW 17	5
	K-10160(X5)	10x160	96	64	SW 17	5
	K-10180(X5)	10x180	108	72	SW 17	5
	K-10200(X5)	10x200	120	80	SW 17	5
K-12						
ø12	K-12120(X5)	12x120	72	48	SW 19	5
	K-12140(X5)	12x140	84	56	SW 19	5
	K-12160(X5)	12x160	96	64	SW 19	5
	K-12180(X5)	12x180	108	72	SW 19	5
	K-12200(X5)	12x200	120	80	SW 19	5
	K-12220(X5)	12x220	132	88	SW 19	5
	K-12240(X5)	12x240	144	96	SW 19	5
	K-12260(X5)	12x260	156	104	SW 19	5

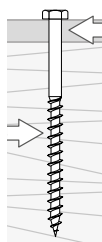
Geometry						
Product	Outer thread diameter	Inner thread diameter	Unthreaded part diameter	Head diameter	Head thickness	Length range
	d_w [mm]	d_i [mm]	d_s [mm]	D_w [mm]	k [mm]	L_w [mm]
K Ø6	6	4,2	5,6	10	4	60-140
K Ø8	8	5,5	7,5	13	5,5	60-200
K Ø10	10	6,8	9,5	17	7	80-200
K Ø12	12	9,2	11,3	19	8	120-260

Mechanical characteristics					
Product	Characteristic yield moment	Characteristic withdrawal resistance parameter	Characteristic head-pull-through resistance parameter	Characteristic tensile strength	Characteristic torsional strength
	$M_{y,k}$ [N*m]	$f_{ax,k}$ [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{tens,k}$ [kN]	$f_{tor,k}$ [N*m]
K Ø6	8,59	15,96	33,72	8,42	7,46
K Ø8	27,07	14,85	30,61	15,07	18,41
K Ø10	35,94	14,16	27,65	21,01	30,55
K Ø12	88,02	13,37	24,75	38,47	73,22

1. Characteristic withdrawal resistance based on reference density of timber $\rho_a = 350 \text{ kg/m}^3$

2. Characteristic head-pull-through resistance based on reference density of timber $\rho_a = 350 \text{ kg/m}^3$

TIMBER

Minimum distances for laterally loaded screws - timber									
Angle between force and fiber direction $\alpha = 0^\circ$					Angle between force and fiber direction $\alpha = 90^\circ$				
									
WITH PRE-DRILLED HOLE					WITH PRE-DRILLED HOLE				
d_w [mm]	Ø 6	Ø 8	Ø 10	Ø 12	d_w [mm]	Ø 6	Ø 8	Ø 10	Ø 12
d_o [mm]	4	5,5	7	8,5	d_o [mm]	4	5,5	7	8,5
$d_{o,steel}$ [mm]	6,5	8,5	10,5	12,5	$d_{o,steel}$ [mm]	6,5	8,5	10,5	12,5
a_1 [mm]	21	28	35	42	a_1 [mm]	17	22	28	34
a_2 [mm]	17	22	28	34	a_2 [mm]	17	22	28	34
$a_{3,t}$ [mm]	80	80	80	84	$a_{3,t}$ [mm]	80	80	80	84
$a_{3,c}$ [mm]	24	32	40	48	$a_{3,c}$ [mm]	42	56	70	84
$a_{4,t}$ [mm]	18	24	30	36	$a_{4,t}$ [mm]	24	32	40	48
$a_{4,c}$ [mm]	18	24	30	36	$a_{4,c}$ [mm]	18	24	30	36

1. Minimum distances in accordance with EN 1995

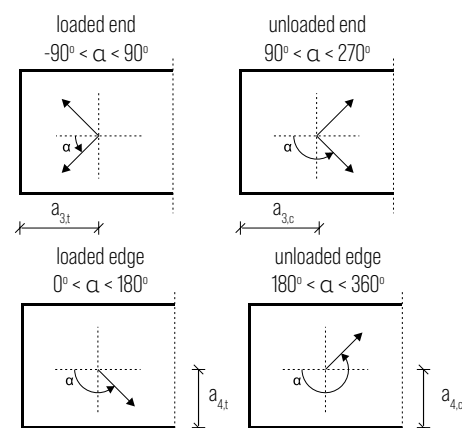
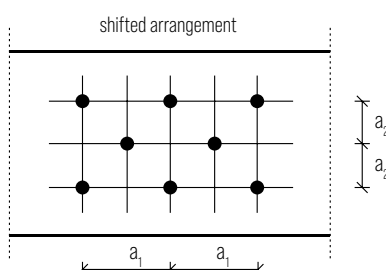
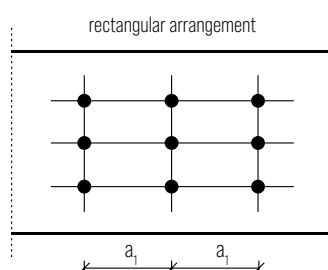
2. Minimum distances is valid for timber characteristic density of $\rho_k \leq 420 \text{ kg/m}^3$

3. In case of connection timber-timber minimum distances (a_1 , a_2) should be multiplied by a factor of 1,45

4. For screws K with a diameter of $d > 6 \text{ mm}$ a pre-drill is required

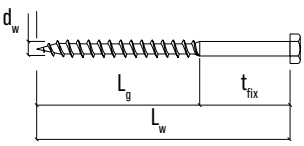
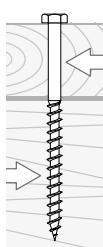
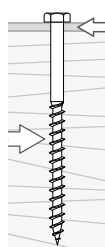
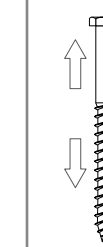
5. Hole diameter d_o is valid for softwood

6. Hole diameter $d_{o,steel}$ is valid for steel plate



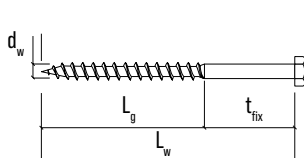
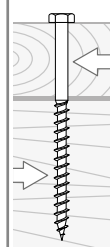
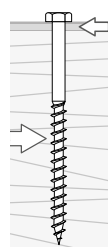
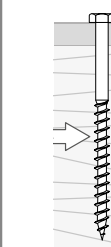
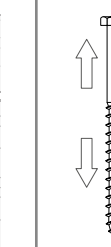
K - Hex head wood screw
TIMBER

Characteristic resistances for laterally and axially loaded screws - timber

DIMENSIONS				SHEAR			TENSION				
Diameter	Length	Thread length	Usable length	timber-timber	steel-timber (thin plate)	steel-timber (thick plate)	Withdrawal	Head pull-through	Tension		
											
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{Vk} [kN]	R _{Vk} [kN]	R _{Vk} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]	R _{tens,k} [kN]		
K 6											
ø6	60	36	24	2,36	t = 3 mm	2,56	t = 6 mm	3,36	2,59	3,37	8,42
	70	42	28	2,65		2,67		3,47	3,02	3,37	8,42
	80	48	32	2,76		2,78		3,57	3,45	3,37	8,42
	90	54	36	2,76		2,89		3,68	3,88	3,37	8,42
	100	60	40	2,76		2,99		3,79	4,31	3,37	8,42
	120	72	48	2,76		3,21		4,00	5,17	3,37	8,42
	140	84	56	2,76		3,43		4,22	6,03	3,37	8,42
K 8											
ø8	60	36	24	2,92	t = 4 mm	4,73	t = 8 mm	6,34	4,28	5,17	15,07
	70	42	28	3,40		5,14		6,75	4,99	5,17	15,07
	80	48	32	3,69		5,31		6,93	5,70	5,17	15,07
	90	54	36	3,82		5,49		7,10	6,42	5,17	15,07
	100	60	40	3,96		5,67		7,28	7,13	5,17	15,07
	120	72	48	4,27		6,03		7,64	8,55	5,17	15,07
	140	84	56	4,50		6,38		7,99	9,98	5,17	15,07
	160	96	64	4,50		6,74		8,35	11,40	5,17	15,07
	180	108	72	4,50		7,10		8,71	12,83	5,17	15,07
	200	120	80	4,50		7,45		9,06	14,26	5,17	15,07
K 10											
ø10	80	48	32	4,65	t = 5 mm	6,65	t = 10 mm	8,71	6,80	7,99	21,01
	100	60	40	5,27		7,08		9,13	8,50	7,99	21,01
	120	72	48	5,63		7,50		9,56	10,20	7,99	21,01
	140	84	56	6,02		7,93		9,98	11,89	7,99	21,01
	160	96	64	6,04		8,35		10,41	13,59	7,99	21,01
	180	108	72	6,04		8,78		10,83	15,29	7,99	21,01
	200	120	80	6,04		9,20		11,26	16,99	7,99	21,01

K - Hex head wood screw

TIMBER

Characteristic resistances for laterally and axially loaded screws - timber											
DIMENSIONS				SHEAR			TENSION				
Diameter	Length	Thread length	Usable length	timber-timber	steel-timber (thin plate)	steel-timber (thick plate)	Withdrawal	Head pull-through	Tension		
											
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]	R _{tens,k} [kN]		
K 12											
ø12	120	72	48	7,27	t = 6 mm	11,29	t = 12 mm	14,77	11,55	8,93	38,47
	140	84	56	7,62		11,77		15,25	13,48	8,93	38,47
	160	96	64	8,01		12,25		15,73	15,40	8,93	38,47
	180	108	72	8,44		12,73		16,21	17,33	8,93	38,47
	200	120	80	8,88		13,21		16,69	19,25	8,93	38,47
	220	132	88	9,02		13,69		17,17	21,18	8,93	38,47
	240	144	96	9,02		14,18		17,65	23,10	8,93	38,47
	260	156	104	9,02		14,66		18,14	25,03	8,93	38,47

NOTES:

1. Characteristic resistances in accordance with EN 1995

2. In order to obtain a design resistance, use the following formula: $R_d = \frac{R_k * k_{mod}}{\gamma_M}$

Factors γ_M and k_{mod} should be taken in accordance with EN 1995

3. Design resistance for tension is smaller value of the following:

$$R_{ax,d} = \min \left\{ \frac{R_{ax,k} * k_{mod}}{\gamma_M}, \frac{R_{tens,k}}{\gamma_{M2}} \right\}$$

Factors γ_M and k_{mod} should be taken in accordance with EN 1995. Factor γ_{M2} should be taken in accordance with EN 1993

4. Characteristic resistances were calculated for a characteristic density of timber $\rho_k = 350 \text{ kg/m}^3$

5. Characteristic resistances were calculated considering that the threaded part of the screw is fully inserted into timber element

6. Characteristic shear resistances were calculated for connections with pre-drilled holes

7. Characteristic shear resistances for steel-timber connections were calculated for thin steel plate with thickness $t \leq 0,5d_w$

8. Characteristic shear resistances for steel-timber connections were calculated for thick steel plate with thickness $t \geq d_w$

9. Characteristic withdrawal resistances were calculated assuming an angle of 90° between screw and grain direction and for penetration length equal L_g

10. Characteristic head pull-through resistances were calculated for timber element



KDH/KMH

Hardened countersunk head wood screw with partial/full thread

Diameters: $\varnothing 3$ mm | $\varnothing 3,5$ mm | $\varnothing 4$ mm | $\varnothing 4,5$ mm | $\varnothing 5$ mm | $\varnothing 6$ mm

Length range: from 12 to 200 mm



Hardened wood screw for making joints with wood and wood-based elements. Could be also applied to install furniture fittings e.g. hinges, drawer slides, hangers etc. to wooden elements, chipboard, plywood, OSB board.



PZ DRIVE



Zn
YELLOW



PN-EN 14592:2008
+A1:2012

SCREW MATERIAL - Carbon steel

ANTI-CORROSION PROTECTION - Galvanized steel (yellow)

PRODUCT ADVANTAGES:



COUNTERSUNK HEAD WITH PZ DRIVE - Allows ideally flush installation of the screw in the wooden member.



GEOMETRY OF THREAD - Specially designed geometry of thread speed up screw installation with securing long-lasting joint.

FULL THREAD - Full thread provides maximum coupling efficiency

EXAMPLES OF APPLICATIONS:



SUBSTRATES

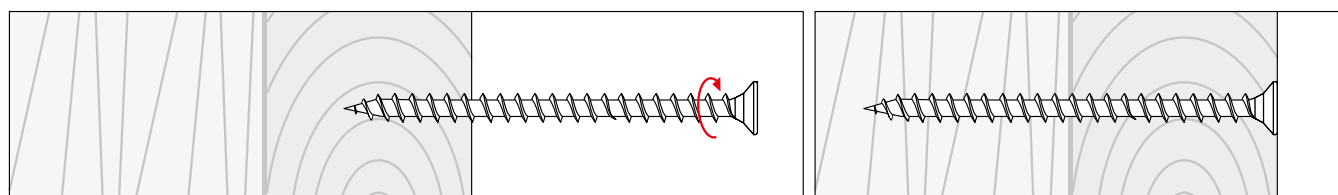


Solid timber

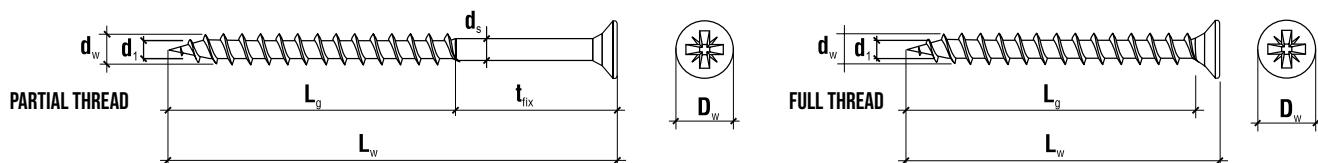

 Glued laminated timber
 CLT, KVH, BSH/GLT

 Wood-based panels - OSB, MDF,
 plywood, chipboard

INSTALLATION INSTRUCTIONS



KDH/KMH - Hardened countersunk head wood screw with partial/full thread



Codes and dimensions									
	Product code				Dimensions	Thread length	Max. usable length	Type of drive	Type of thread
	Galvanized - yellow	[kg]	Galvanized - yellow	[pcs]	$d_w \times L_w$ [mm]	L_g [mm]	t_{fix} [mm]	[-]	[-]
ø3	KDH-3 / KMH-3								
	KDH-30012(X5)	5	KMH-30012	2000	3x12	9	-	PZ 1	Full
	KDH-30013(X5)	5	KMH-30013	2000	3x13	10	-	PZ 1	Full
	KDH-30016(X5)	5	KMH-30016	2000	3x16	13	-	PZ 1	Full
	KDH-30020(X5)	5	KMH-30020	2000	3x20	17	2	PZ 1	Full
	KDH-30025(X5)	5	KMH-30025	1500	3x25	22	7	PZ 1	Full
	KDH-30030(X5)	5	KMH-30030	1000	3x30	27	12	PZ 1	Full
	KDH-30035(X5)	5	KMH-30035	1000	3x35	32	17	PZ 1	Full
	KDH-30040(X5)	5	KMH-30040	500	3x40	37	22	PZ 1	Full
ø3,5	KDH-3,5 / KMH-3,5								
	KDH-35013(X5)	5	KMH-35013	2000	3,5x13	9	-	PZ 2	Full
	KDH-35016(X5)	5	KMH-35016	2000	3,5x16	12	-	PZ 2	Full
	KDH-35020(X5)	5	KMH-35020	1500	3,5x20	16	-	PZ 2	Full
	KDH-35025(X5)	5	KMH-35025	1000	3,5x25	21	4	PZ 2	Full
	KDH-35030(X5)	5	KMH-35030	500	3,5x30	26	9	PZ 2	Full
	KDH-35035(X5)	5	KMH-35035	500	3,5x35	31	14	PZ 2	Full
	KDH-35040(X5)	5	KMH-35040	500	3,5x40	36	19	PZ 2	Full
	KDH-35045(X5)	5	KMH-35045	500	3,5x45	41	24	PZ 2	Full
	KDH-35050(X5)	5	KMH-35050	400	3,5x50	46	29	PZ 2	Full
	KDH-35060(X5)	5	KMH-35060	400	3,5x60	56	39	PZ 2	Full
ø4	KDH-4 / KMH-4								
	KDH-40013(X5)	5	KMH-40013	1000	4x13	8	-	PZ 2	Full
	KDH-40016(X5)	5	KMH-40016	1000	4x16	11	-	PZ 2	Full
	KDH-40020(X5)	5	KMH-40020	1000	4x20	15	-	PZ 2	Full
	KDH-40025(X5)	5	KMH-40025	1000	4x25	20	1	PZ 2	Full
	KDH-40030(X5)	5	KMH-40030	500	4x30	25	6	PZ 2	Full
	KDH-40035(X5)	5	KMH-40035	500	4x35	30	11	PZ 2	Full
	KDH-40040(X5)	5	KMH-40040	500	4x40	35	16	PZ 2	Full
	KDH-40045(X5)	5	KMH-40045	300	4x45	40	21	PZ 2	Full
	KDH-40050(X5)	5	KMH-40050	300	4x50	45	26	PZ 2	Full
	KDH-4005030(X5)	5	KMH-4005030	300	4x50	30	20	PZ 2	Partial
	KDH-40055(X5)	5	KMH-40055	250	4x55	50	31	PZ 2	Full
	KDH-40060(X5)	5	KMH-40060	250	4x60	55	36	PZ 2	Full
	KDH-4006035(X5)	5	KMH-4006035	250	4x60	35	25	PZ 2	Partial
	KDH-40070(X5)	5	KMH-40070	250	4x70	55	15	PZ 2	Partial

1. Max. usable length $t_{fix} = L_w - L_g$ for partially threaded screws
2. Max. usable length $t_{fix} = L_w - 6d_w$ for fully threaded screws

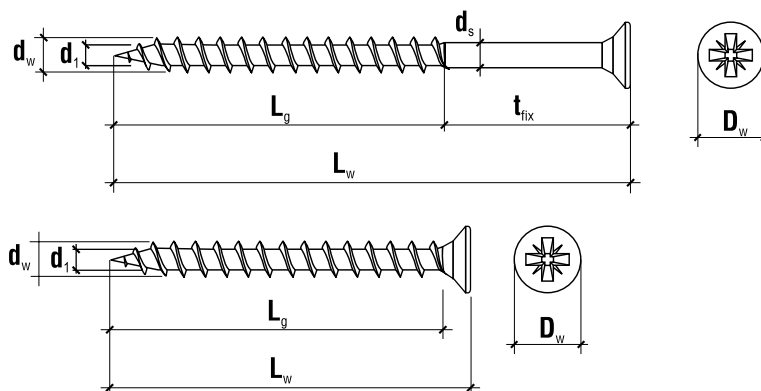
KDH/KMH - Hardened countersunk head wood screw with partial/full thread

Codes and dimensions									
	Product code				Dimensions	Thread length	Max. usable length	Type of drive	Type of thread
	Galvanized - yellow	[kg]	Galvanized - yellow	[pcs]	d _w x L _w [mm]	L _g [mm]	t _{fix} [mm]	[-]	[-]
KDH-4,5 / KMH-4,5									
ø4,5	KDH-45016(X5)	5	KMH-45016	1000	4,5x16	11	-	PZ 2	Full
	KDH-45020(X5)	5	KMH-45020	1000	4,5x20	15	-	PZ 2	Full
	KDH-45025(X5)	5	KMH-45025	500	4,5x25	20	-	PZ 2	Full
	KDH-45030(X5)	5	KMH-45030	500	4,5x30	25	3	PZ 2	Full
	KDH-45035(X5)	5	KMH-45035	500	4,5x35	30	8	PZ 2	Full
	KDH-45040(X5)	5	KMH-45040	300	4,5x40	35	13	PZ 2	Full
	KDH-45045(X5)	5	KMH-45045	300	4,5x45	40	18	PZ 2	Full
	KDH-45050(X5)	5	KMH-45050	250	4,5x50	45	23	PZ 2	Full
	KDH-45060(X5)	5	KMH-45060	250	4,5x60	55	33	PZ 2	Full
	KDH-45070(X5)	5	KMH-45070	250	4,5x70	55	15	PZ 2	Partial
	KDH-45080(X5)	5	KMH-45080	250	4,5x80	55	25	PZ 2	Partial
KDH-5 / KMH-5									
ø5	KDH-50020(X5)	5	KMH-50020	500	5x20	14	-	PZ 2	Full
	KDH-50025(X5)	5	KMH-50025	500	5x25	19	-	PZ 2	Full
	KDH-50030(X5)	5	KMH-50030	500	5x30	24	-	PZ 2	Full
	KDH-50035(X5)	5	KMH-50035	500	5x35	29	5	PZ 2	Full
	KDH-50040(X5)	5	KMH-50040	500	5x40	34	10	PZ 2	Full
	KDH-50045(X5)	5	KMH-50045	300	5x45	39	15	PZ 2	Full
	KDH-50050(X5)	5	KMH-50050	300	5x50	44	20	PZ 2	Full
	KDH-5005030(X5)	5	KMH-5005030	300	5x50	30	20	PZ 2	Partial
	KDH-50060(X5)	5	KMH-50060	200	5x60	54	30	PZ 2	Full
	KDH-5006035(X5)	5	KMH-5006035	200	5x60	35	25	PZ 2	Partial
	KDH-50070(X5)	5	KMH-50070	200	5x70	55	15	PZ 2	Partial
	KDH-50080(X5)	5	KMH-50080	200	5x80	55	25	PZ 2	Partial
	KDH-50090(X5)	5	KMH-50090	200	5x90	55	35	PZ 2	Partial
	KDH-50100(X5)	5	KMH-50100	200	5x100	55	45	PZ 2	Partial
	KDH-50120(X5)	5	KMH-50120	100	5x120	75	45	PZ 2	Partial
KDH-6 / KMH-6									
ø6	KDH-60040(X5)	5	KMH-60040	200	6x40	32	4	PZ 3	Full
	KDH-60050(X5)	5	KMH-60050	200	6x50	42	14	PZ 3	Full
	KDH-60060(X5)	5	KMH-60060	200	6x60	52	24	PZ 3	Full
	KDH-60070(X5)	5	KMH-60070	200	6x70	55	15	PZ 3	Partial
	KDH-60080(X5)	5	KMH-60080	200	6x80	55	25	PZ 3	Partial
	KDH-60090(X5)	5	KMH-60090	100	6x90	55	35	PZ 3	Partial
	KDH-60100(X5)	5	KMH-60100	100	6x100	55	45	PZ 3	Partial
	KDH-60110(X5)	5	KMH-60110	100	6x110	75	35	PZ 3	Partial
	KDH-60120(X5)	5	KMH-60120	100	6x120	75	45	PZ 3	Partial
	KDH-60140(X5)	5	KMH-60140	100	6x140	75	65	PZ 3	Partial
	KDH-60160(X5)	5	KMH-60160	100	6x160	75	85	PZ 3	Partial
	KDH-60180(X5)	5	KMH-60180	100	6x180	75	105	PZ 3	Partial
	KDH-60200(X5)	5	KMH-60200	100	6x200	75	125	PZ 3	Partial

1. Max. usable length $t_{fix} = L_w - L_g$ for partially threaded screws

2. Max. usable length $t_{fix} = L_w - 6d_w$ for fully threaded screws

KDH/KMH - Hardened countersunk head wood screw with partial/full thread



Geometry

Product	Outer thread diameter	Inner thread diameter	Unthreaded part diameter	Head diameter	Length range
	d_w [mm]	d_1 [mm]	d_s [mm]	D_w [mm]	L_w [mm]
KDH/KMH $\varnothing 3$	3	2	2,2	6	12-40
KDH/KMH $\varnothing 3,5$	3,5	2,2	2,45	7	13-60
KDH/KMH $\varnothing 4$	4	2,5	2,8	8	13-70
KDH/KMH $\varnothing 4,5$	4,5	2,7	3,1	9	16-80
KDH/KMH $\varnothing 5$	5	3,1	3,45	10	20-120
KDH/KMH $\varnothing 6$	6	3,8	4,25	12	40-200

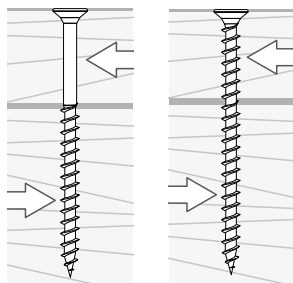
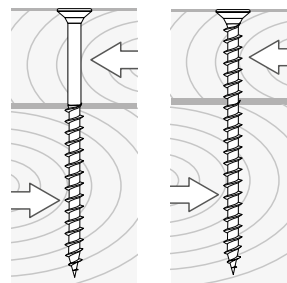
Mechanical characteristics

Product	Characteristic yield moment	Characteristic withdrawal resistance parameter	Characteristic head-pull-through resistance parameter	Characteristic tensile strength	Characteristic torsional strength
	$M_{y,k}$ [N*m]	f_{ack} [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{tens,k}$ [kN]	$f_{tor,k}$ [N*m]
KDH/KMH $\varnothing 3$	1,79	17,29	26,96	4,24	1,84
KDH/KMH $\varnothing 3,5$	2,61	16,92	24,29	5,13	2,55
KDH/KMH $\varnothing 4$	3,65	16,75	23,75	6,2	3,24
KDH/KMH $\varnothing 4,5$	6,35	16,69	22,74	7,25	4,63
KDH/KMH $\varnothing 5$	9,38	16,17	22,2	9,49	5,31
KDH/KMH $\varnothing 6$	13,55	15,59	21,82	14,23	11,6

1. Characteristic withdrawal resistance based on reference density of timber $\rho_a = 350 \text{ kg/m}^3$

2. Characteristic head-pull-through resistance based on reference density of timber $\rho_a = 350 \text{ kg/m}^3$

KDH/KMH - Hardened countersunk head wood screw with partial/full thread
TIMBER
Minimum distances for laterally loaded screws - timber

 Angle between force and fiber direction $\alpha = 0^\circ$

 Angle between force and fiber direction $\alpha = 90^\circ$

WITHOUT PRE-DRILLED HOLE

d_w [mm]	Ø 3	Ø 3.5	Ø 4	Ø 4.5	Ø 5	Ø 6
a_1 [mm]	30	35	40	45	60	72
a_2 [mm]	15	18	20	23	25	30
$a_{3,t}$ [mm]	45	53	60	68	75	90
$a_{3,c}$ [mm]	30	35	40	45	50	60
$a_{4,t}$ [mm]	15	18	20	23	25	30
$a_{4,c}$ [mm]	15	18	20	23	25	30

WITHOUT PRE-DRILLED HOLE

d_w [mm]	Ø 3	Ø 3.5	Ø 4	Ø 4.5	Ø 5	Ø 6
a_1 [mm]	15	18	20	23	25	30
a_2 [mm]	15	18	20	23	25	30
$a_{3,t}$ [mm]	30	35	40	45	50	60
$a_{3,c}$ [mm]	30	35	40	45	50	60
$a_{4,t}$ [mm]	21	25	28	32	50	60
$a_{4,c}$ [mm]	15	18	20	23	25	30

WITH PRE-DRILLED HOLE

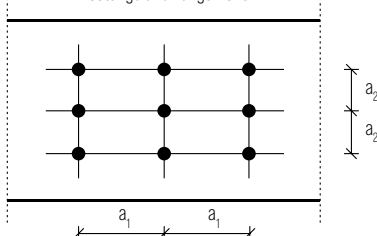
d_w [mm]	Ø 3	Ø 3.5	Ø 4	Ø 4.5	Ø 5	Ø 6
d_0 [mm]	2	2	2,5	2,5	3	4
a_1 [mm]	15	18	20	23	25	30
a_2 [mm]	9	11	12	14	15	18
$a_{3,t}$ [mm]	36	42	48	54	60	72
$a_{3,c}$ [mm]	21	25	28	32	35	42
$a_{4,t}$ [mm]	9	11	12	14	15	18
$a_{4,c}$ [mm]	9	11	12	14	15	18

WITH PRE-DRILLED HOLE

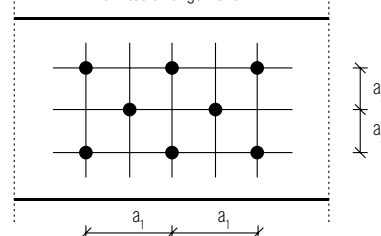
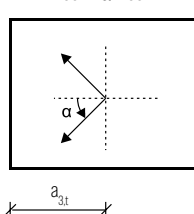
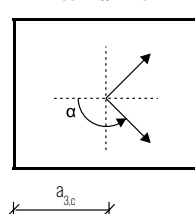
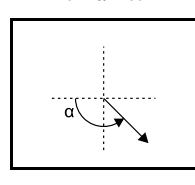
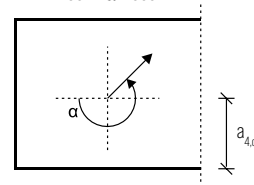
d_w [mm]	Ø 3	Ø 3.5	Ø 4	Ø 4.5	Ø 5	Ø 6
d_0 [mm]	2	2	2,5	2,5	3	4
a_1 [mm]	12	14	16	18	20	24
a_2 [mm]	12	14	16	18	20	24
$a_{3,t}$ [mm]	21	25	28	32	35	42
$a_{3,c}$ [mm]	21	25	28	32	35	42
$a_{4,t}$ [mm]	15	18	20	23	35	42
$a_{4,c}$ [mm]	9	11	12	14	15	18

1. Minimum distances in accordance with EN 1995
2. Minimum distances is valid for timber characteristic density of $\rho_k \leq 420 \text{ kg/m}^3$
3. In case of connection panel-timber minimum distances (a_1, a_2) should be multiplied by a factor of 0,85
4. In case of connection steel-timber minimum distances (a_1, a_2) should be multiplied by a factor of 0,7
5. Hole diameter d_0 is valid for softwood

rectangular arrangement



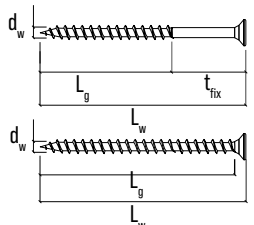
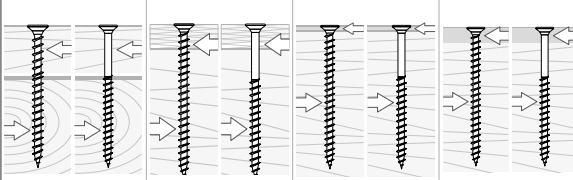
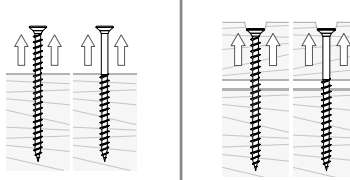
shifted arrangement


 loaded end
 $-90^\circ < \alpha < 90^\circ$

 unloaded end
 $90^\circ < \alpha < 270^\circ$

 loaded edge
 $0^\circ < \alpha < 180^\circ$

 unloaded edge
 $180^\circ < \alpha < 360^\circ$


KDH/KMH - Hardened countersunk head wood screw with partial/full thread

TIMBER

Characteristic resistances for laterally and axially loaded screws - timber

DIMENSIONS				SHEAR				TENSION	
Diameter	Length	Thread length	Usable length	timber-timber	OSB-timber	steel-timber (thin plate)	steel-timber (thick plate)	Withdrawal	Head pull-through
									
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]
KDH 3									
ø3	3x12	9	-	-	-	0,21	0,45	0,45	0,97
	3x13	10	-	-	-	0,23	0,50	0,50	0,97
	3x16	13	-	-	-	0,29	0,61	0,64	0,97
	3x20	17	2	0,10	-	0,37	0,70	0,84	0,97
	3x25	22	7	0,35	-	0,47	0,84	1,09	0,97
	3x30	27	12	0,54	0,68	0,57	0,98	1,34	0,97
	3x35	32	17	0,58	0,75	0,67	1,08	1,59	0,97
	3x40	37	22	0,63	0,75	0,77	1,15	1,84	0,97
KDH 3,5									
ø3,5	3,5x13	9	-	-	-	0,24	0,51	0,51	1,19
	3,5x16	12	-	-	-	0,31	0,68	0,68	1,19
	3,5x20	16	-	-	-	0,40	0,80	0,91	1,19
	3,5x25	21	4	0,22	-	0,50	0,94	1,19	1,19
	3,5x30	26	9	0,49	0,75	0,61	1,10	1,47	1,19
	3,5x35	31	14	0,70	0,87	0,72	1,26	1,76	1,19
	3,5x40	36	19	0,75	0,90	0,83	1,37	2,04	1,19
	3,5x45	41	24	0,80	0,90	0,94	1,45	2,32	1,19
	3,5x50	46	29	0,82	0,90	1,04	1,52	2,61	1,19
	3,5x60	56	39	0,82	0,90	1,22	1,66	3,17	1,19
KDH 4									
ø4	4x13	8	-	-	-	0,26	0,53	0,51	1,52
	4x16	11	-	-	-	0,33	0,71	0,70	1,52
	4x20	15	-	-	-	0,43	0,92	0,96	1,52
	4x25	20	1	-	-	0,54	1,06	1,28	1,52
	4x30	25	6	0,35	-	0,66	1,23	1,60	1,52
	4x35	30	11	0,65	-	0,78	1,40	1,92	1,52
	4x40	35	16	0,89	1,10	0,90	1,58	2,24	1,52
	4x45	40	21	0,93	1,15	1,02	1,71	2,56	1,52
	4x50	45	26	0,99	1,15	1,13	1,79	2,88	1,52
	4x50	30	20	0,97	1,13	1,13	1,55	1,92	1,52
	4x55	50	31	1,02	1,15	1,25	1,87	3,20	1,52
	4x60	55	36	1,02	1,15	1,37	1,95	3,52	1,52
	4x60	35	25	1,04	1,15	1,32	1,63	2,24	1,52
	4x70	55	15	0,89	1,15	1,51	1,95	3,52	1,52

partially threaded screws

KDH/KMH - Hardened countersunk head wood screw with partial/full thread
TIMBER

Characteristic resistances for laterally and axially loaded screws - timber

DIMENSIONS				SHEAR				TENSION	
Diameter	Length	Thread length	Usable length	timber-timber	OSB-timber	steel-timber (thin plate)	steel-timber (thick plate)	Withdrawal	Head pull-through
d_w [mm]	L_w [mm]	L_g [mm]	t_{fix} [mm]	R_{vk} [kN]	R_{vk} [kN]	R_{vk} [kN]	R_{vk} [kN]	$R_{ax,k}$ [kN]	$R_{head,k}$ [kN]
KDH 4,5									
ø4,5	4,5x16	11	-	-	-	0,36	0,75	0,79	1,84
	4,5x20	15	-	-	-	0,46	1,01	1,08	1,84
	4,5x25	20	-	-	-	0,60	1,31	1,44	1,84
	4,5x30	25	3	0,20	-	0,73	1,47	1,80	1,84
	4,5x35	30	8	0,52	-	0,86	1,65	2,16	1,84
	4,5x40	35	13	0,85	1,21	0,99	1,83	2,51	1,84
	4,5x45	40	18	1,09	1,40	1,12	2,03	2,87	1,84
	4,5x50	45	23	1,14	1,42	1,25	2,23	3,23	1,84
	4,5x60	55	33	1,28	1,42	1,51	2,47	3,95	1,84
	4,5x70	55	15	0,98	1,42	1,77	2,47	3,95	1,84
	4,5x80	55	25	1,27	1,42	2,03	2,47	3,95	1,84
KDH 5									
ø5	5x20	14	-	-	-	0,48	1,03	1,08	2,22
	5x25	19	-	-	-	0,62	1,37	1,47	2,22
	5x30	24	-	-	-	0,75	1,66	1,86	2,22
	5x35	29	5	0,34	-	0,89	1,82	2,24	2,22
	5x40	34	10	0,68	-	1,03	2,01	2,63	2,22
	5x45	39	15	1,03	1,40	1,16	2,21	3,02	2,22
	5x50	44	20	1,29	1,60	1,30	2,41	3,40	2,22
	5x50	30	20	1,29	1,50	1,30	2,14	2,32	2,22
	5x60	54	30	1,41	1,77	1,58	2,84	4,18	2,22
	5x60	35	25	1,43	1,71	1,58	2,47	2,71	2,22
	5x70	55	15	1,03	1,77	1,85	2,91	4,25	2,22
	5x80	55	25	1,50	1,77	2,12	2,91	4,25	2,22
	5x90	55	35	1,66	1,77	2,37	2,91	4,25	2,22
	5x100	55	45	1,84	1,77	2,37	2,91	4,25	2,22
	5x120	75	45	1,84	1,77	2,61	3,29	5,80	2,22

NOTES:

- Characteristic resistances in accordance with EN 1995
- In order to obtain a design resistance, use the following formula : $R_d = \frac{R_k * k_{mod}}{\gamma_M}$

 Factors γ_M and k_{mod} should be taken in accordance with EN 1995

 3. Characteristic resistances were calculated for a characteristic density of timber $\rho_k = 350 \text{ kg/m}^3$

 4. Characteristic resistances were calculated for penetration length at least $6d_w$

5. Characteristic shear resistances were calculated for connections without pre-drilled holes

 6. Characteristic shear resistances for OSB-timber connections were calculated for OSB board with thickness t [mm] and characteristic density $\rho_k = 500 \text{ kg/m}^3$

 7. Characteristic shear resistances for steel-timber connections were calculated for thin steel plate with thickness $t \leq 0,5d_w$

 8. Characteristic shear resistances for steel-timber connections were calculated for thick steel plate with thickness $t \geq d_w$

 9. Characteristic shear resistances were calculated based on usable length $t_{fix} = L_w - L_g$ for partially threaded screws

 10. Characteristic shear resistances were calculated based on usable length $t_{fix} = L_w - 6d_w$ for fully threaded screws

 11. Characteristic withdrawal resistances were calculated assuming an angle of 90° between screw and grain direction and for penetration length equal L_g

12. Characteristic head pull-through resistances were calculated for timber element

partially threaded screws

KDH/KMH - Hardened countersunk head wood screw with partial/full thread

TIMBER

Characteristic resistances for laterally and axially loaded screws - timber

DIMENSIONS				SHEAR				TENSION			
Diameter	Length	Thread length	Usable length	timber-timber	OSB-timber	steel-timber (thin plate)	steel-timber (thick plate)	Withdrawal	Head pull-through		
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{Vk} [kN]	R _{Vk} [kN]	R _{Vk} [kN]	R _{Vk} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]		
KDH 6											
ø6	6x40	32	4	0,31	t = 15 mm	-	1,16	t = 6 mm	2,19	2,15	3,14
	6x50	42	14	1,09		1,65	1,47		2,58	2,82	3,14
	6x60	52	24	1,63		1,96	1,78		3,00	3,49	3,14
	6x70	55	15	1,17		1,96	2,09		3,33	3,69	3,14
	6x80	55	25	1,95		1,96	2,41		3,33	3,69	3,14
	6x90	55	35	2,11		1,96	2,64		3,33	3,69	3,14
	6x100	55	45	2,31		1,96	2,64		3,33	3,69	3,14
	6x110	75	35	2,11		1,96	2,99		3,68	5,03	3,14
	6x120	75	45	2,31		1,96	2,99		3,68	5,03	3,14
	6x140	75	65	2,46		1,96	2,99		3,68	5,03	3,14
	6x160	75	85	2,46		1,96	2,99		3,68	5,03	3,14
	6x180	75	105	2,46		1,96	2,99		3,68	5,03	3,14
	6x200	75	125	2,46		1,96	2,99		3,68	5,03	3,14

NOTES:

1. Characteristic resistances in accordance with EN 1995

2. In order to obtain a design resistance, use the following formula:

$$R_d = \frac{R_k * k_{mod}}{\gamma_m}$$

Factors γ_m and k_{mod} should be taken in accordance with EN 1995

3. Characteristic resistances were calculated for a characteristic density of timber $\rho_k = 350 \text{ kg/m}^3$

4. Characteristic resistances were calculated for penetration length at least $6d_w$

5. Characteristic shear resistances were calculated for connections without pre-drilled holes

6. Characteristic shear resistances for OSB-timber connections were calculated for OSB board with thickness t [mm] and characteristic density $\rho_k = 500 \text{ kg/m}^3$

7. Characteristic shear resistances for steel-timber connections were calculated for thin steel plate with thickness $t \leq 0,5d_w$

8. Characteristic shear resistances for steel-timber connections were calculated for thick steel plate with thickness $t \geq d_w$

9. Characteristic shear resistances were calculated based on usable length $t_{fix} = L_w - L_g$ for partially threaded screws

10. Characteristic shear resistances were calculated based on usable length $t_{fix} = L_w - 6d_w$ for fully threaded screws

11. Characteristic withdrawal resistances were calculated assuming an angle of 90° between screw and grain direction and for penetration length equal L_g

12. Characteristic head pull-through resistances were calculated for timber element

partially threaded screws

STRONG FOR GENERATIONS

KLIMAS
FASTENER TECHNOLOGIES

QUALITY INCLUDED IN THE PROCESS



We have started a high-tech quality-control laboratory to ensure the highest quality of the products from our portfolio.

Our laboratory is equipped with measuring microscope, X-ray spectrometer, salt spray chamber, load capacity testing machine, Vickers microhardness tester, Rockwell hardness tester, torque converters, permascope and a number of other equipment, which allow us to:

- check and control paint and zinc coat thickness;
- check resistance of protective coating to highly corrosive environments;
- check hardness of the screw surface and body, thickness of carburized layer;
- measure the torque required for a particular screw to be installed;
- test the pull-out strength;
- measure rigidity of the support washer;
- measure installation time of screws;
- and many others.



SCREWS FOR FASTENING CLADDINGS OF TERRACES AND FLOORS

WN / HNT / WT

Group of screws designed for wooden flooring construction and for fastening claddings of terraces. Their special design prevents wood from breaking or splitting during installation.

These products have many features that make the installation quicker. Some of them improve aesthetics of flooring, allowing for e.g. concealed fixing.



TX DRIVE

TX drive guarantees optimum torque transfer.



SERRATED THREAD

Special cutting notches integrated on the thread cut wood fibres structure while screwing in.



SPECIAL CUTTING POINT

Special design of cutting point enables quick initiation of screwing and prevents splitting of wooden elements



WN		Screw with cone-shaped concealed head , TX	154
ø4	ø5	Length range: 40 - 80 mm	Stainless steel A2



HNT		Screw with cylindrical head and underhead thread, TX	156
ø5		Length range: 50 - 80 mm	Stainless steel A2



WT		Screw with countersunk head, TX	158
ø4		Length range: 45 mm	Stainless steel A2



WN

Screw with cone-shaped concealed head, TX

Diameters: $\varnothing 4$ mm | $\varnothing 5$ mm

Length range: from 40 to 80 mm



Screw is designed to be installed in outdoor environments into very hard woods.



PN-EN 14592:2008
+A1:2012



TX DRIVE



A2
INOX

SCREW MATERIAL - Stainless Steel A2

TYPE ON INSTALLATION - Pre-drilling is always recommended for very hard woods.

APPLICATION:

Decking of terraces

Fastening claddings of facades

Construction of small and medium-sized wooden structures in outdoor environments

Other outdoor applications

PRODUCT ADVANTAGES:



SPECIAL CONE-SHAPED CONCEALED HEAD 60, TX drive - Head angle of 60 ensures concealed installation of the screw in the wooden member. TX drive guarantees optimum torque transfer.



CUTTING RIBS - Allow optimal and smooth countersink with aesthetic finish result.

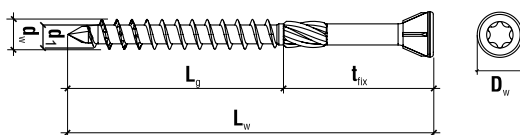


SHANK RIBS - Shank ribs reduce installation torque by reaming the hole.



SERRATED THREAD - Special cutting notches integrated on the thread cut wood fibres structure while screwing in.

SPECIAL CUTTING POINT - Special design of cutting point enables quick initiation of screwing and prevents splitting of wooden elements.



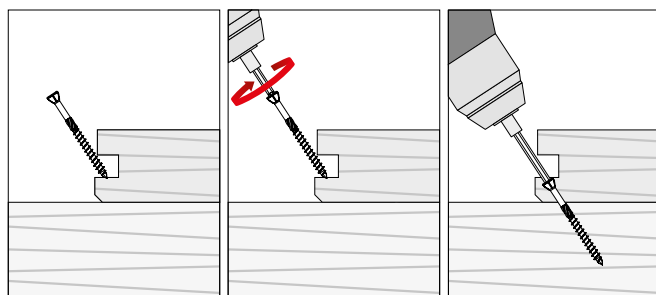
Codes and dimensions						
	Product code	Dimensions	Thread length	Max. usable length	Type of drive	Quantity
		d _w x L _w [mm]	L _g [mm]	t _{fix} [mm]	[-]	[pcs]
WN-4						
ø4	WN-40040-A2	4,0 x 40	22	18	TX 15	200
	WN-40045-A2	4,0 x 45	30	15	TX 15	200
	WN-40050-A2	4,0 x 50	30	20	TX 15	200
	WN-40060-A2	4,0 x 60	35	25	TX 15	200
WN-5						
ø5	WN-50050-A2	5,0 x 50	30	20	TX 20	100
	WN-50060-A2	5,0 x 60	35	25	TX 20	100
	WN-50070-A2	5,0 x 70	40	30	TX 20	100
	WN-50080-A2	5,0 x 80	50	30	TX 20	100

Geometry				
Product	Outer thread diameter	Inner thread diameter	Head diameter	Length range
	d_w [mm]	d_i [mm]	D_w [mm]	L_w [mm]
WN Ø4	4	2,9	6,3	40-60
WN Ø5	5	3,3	7,7	50-80

Mechanical characteristics					
Product	Characteristic yield moment	Characteristic withdrawal resistance parameter	Characteristic head-pull-through resistance parameter	Characteristic tensile strength	Characteristic torsional strength
	$M_{y,k}$ [N*m]	$f_{ax,k}$ [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{tens,k}$ [kN]	$f_{tor,k}$ [N*m]
WN Ø4	2,21	16,29	20,75	4,33	3,12
WN Ø5	5,01	15,92	21,57	6,29	5,08

1. Characteristic withdrawal resistance based on reference density of timber $\rho_a = 350 \text{ kg/m}^3$
2. Characteristic head-pull-through resistance based on reference density of timber $\rho_a = 350 \text{ kg/m}^3$

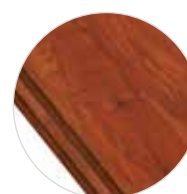
INSTALLATION EXAMPLE



SUBSTRATES



Solid timber



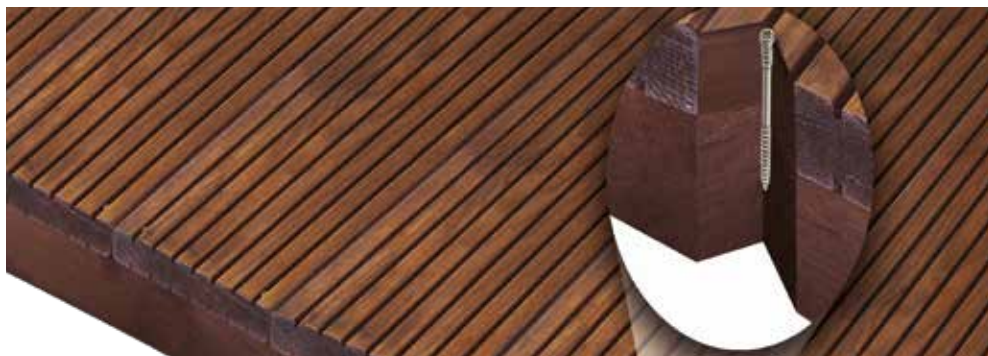
Hardwood

HNT

Screw with cylindrical head and underhead thread, TX

Diameters: $\varnothing 5$ mm

Length range: from 50 to 80 mm



Screw is designed to be installed in outdoor environments into very hard woods. Special underhead thread design ensures good coupling of the wooden elements. Cylindrical head allows easy installation of decking boards with pleasing appearance in case of using decking boards, which do not have the tongue cut on one side and the groove on the other side e.g. clips technology fastening. The advantage of direct fastening of decking boards is especially easy removal of single board without the need of removing adjacent boards.



TX DRIVE



PN-EN 14592:2008
+A1:2012

SCREW MATERIAL - Stainless Steel A2

TYPE ON INSTALLATION - Pre-drilling is always recommended for very hard woods.

APPLICATION:

Decking of terraces

Fastening claddings of facades

Construction of small and medium-sized wooden structures in outdoor environments

Other outdoor applications

PRODUCT ADVANTAGES:



TX DRIVE - TX drive guarantees optimum torque transfer.

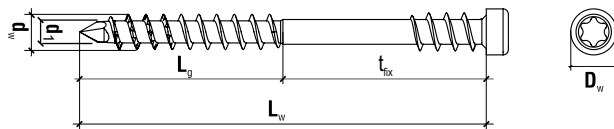
CYLINDRICAL HEAD AND UNDERHEAD THREAD -

Size of cylindrical head is matched to width of grooves on decking boards. Underhead thread ensures good coupling of the wooden elements. Aesthetic finish result and also secure fastening are therefore guaranteed.



SERRATED THREAD - Special cutting notches integrated on the thread cut wood fibres structure while screwing in.

SPECIAL CUTTING POINT - Special design of cutting point enables quick initiation of screwing and prevents splitting of wooden elements.



Codes and dimensions

Codes and dimensions						
	Product code	Dimensions	Thread length	Max. usable length	Type of drive	Quantity
		d _w x L _w [mm]	L _g [mm]	t _{fix} [mm]	[-]	[pcs]
HNT-5						
Ø5	HNT-50050-A2	5,0 x 50	22,5	27,5	TX 25	100
	HNT-50060-A2	5,0 x 60	27,5	32,5	TX 25	100
	HNT-50070-A2	5,0 x 70	32,5	37,5	TX 25	100
	HNT-50080-A2	5,0 x 80	37,5	42,5	TX 25	100

Geometry

Product	Outer thread diameter	Inner thread diameter	Head diameter	Length range
	d_w [mm]	d_i [mm]	D_w [mm]	L_w [mm]
HNT Ø5	5	3,55	7	50-80

Mechanical characteristics

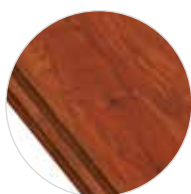
Product	Characteristic yield moment	Characteristic withdrawal resistance parameter	Characteristic head-pull-through resistance parameter	Characteristic tensile strength	Characteristic torsional strength
	M_{yk} [N*m]	$f_{ax,k}$ [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{tens,k}$ [kN]	$f_{tor,k}$ [N*m]
HNT Ø5	3,77	15,6	29,03	6,34	5,22

1. Characteristic withdrawal resistance based on reference density of timber $\rho_a = 350 \text{ kg/m}^3$
2. Characteristic head-pull-through resistance based on reference density of timber $\rho_a = 350 \text{ kg/m}^3$

SUBSTRATES

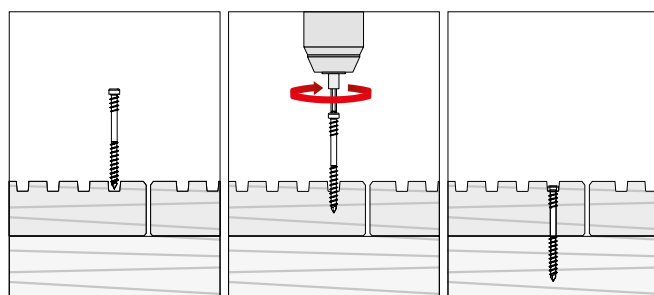


Solid timber



Hardwood

INSTALLATION EXAMPLE

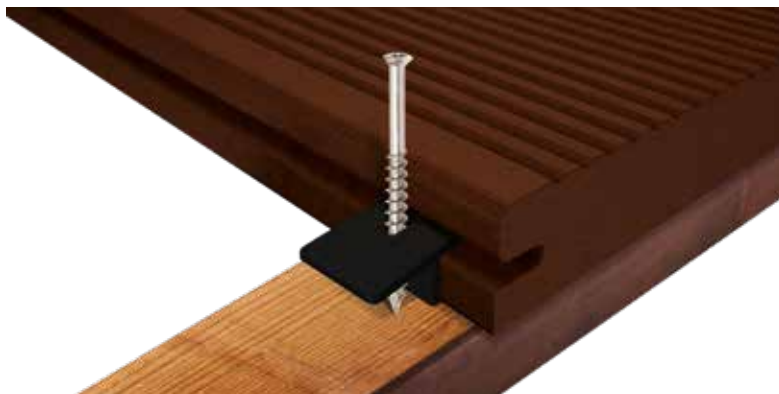


WT

Screw with countersunk head, TX

Diameters: $\varnothing 4$ mm

Length range: 45 mm



Screw is designed to be installed in outdoor environments into very hard woods.
Ideal for concealed fastening of decking boards with the use of clips in tongue and groove joints.



TX DRIVE



A2
INOX



PN-EN 14592:2008
+A1:2012

SCREW MATERIAL - Stainless Steel A2

TYPE ON INSTALLATION - Pre-drilling is always recommended for very hard woods.

APPLICATION:

Fastening of decking boards with the use of clips in tongue and groove joints

PRODUCT ADVANTAGES:



TX DRIVE - TX drive guarantees optimum torque transfer.

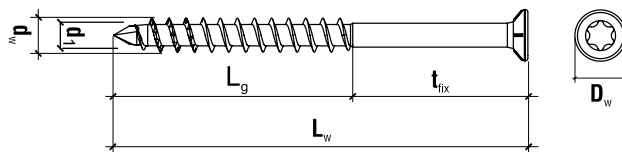
CUTTING RIBS AND SPECIAL SHAPED 6 mm

HEAD - Allow optimal and smooth countersink with aesthetic finish result.



SERRATED THREAD - Special cutting notches integrated on the thread cut wood fibres structure while screwing in.

SPECIAL CUTTING POINT - Special design of cutting point enables quick initiation of screwing and prevents splitting of wooden elements.



Codes and dimensions						
	Product code	Dimensions	Thread length	Max. usable length	Type of drive	Quantity
		d _w x L _w [mm]	L _g [mm]	t _{fix} [mm]	[-]	[pcs]
WT-4						
Ø4	WT-40045-A2	4,0 x 45	30	15	TX 15	200

Geometry				
Product	Outer thread diameter	Inner thread diameter	Head diameter	Length range
	d_w [mm]	d_i [mm]	D_w [mm]	L_w [mm]
WT Ø4	4	2,8	5,8	45

Mechanical characteristics					
Product	Characteristic yield moment	Characteristic withdrawal resistance parameter	Characteristic head-pull-through resistance parameter	Characteristic tensile strength	Characteristic torsional strength
	M_{yk} [N*m]	$f_{ax,k}$ [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{tens,k}$ [kN]	f_{tork} [N*m]
WT Ø4	3,13	15,24	23,53	4,31	2,96

1. Characteristic withdrawal resistance based on reference density of timber $\rho_a = 350 \text{ kg/m}^3$
2. Characteristic head-pull-through resistance based on reference density of timber $\rho_a = 350 \text{ kg/m}^3$

SUBSTRATES

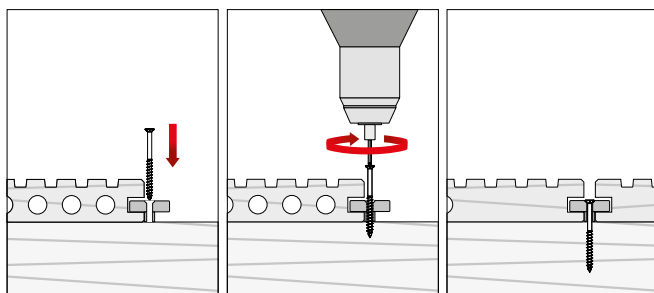


Solid timber



Hardwood

INSTALLATION EXAMPLE (Screws recommended for fastening of decking boards with the use of clips - concealed fastening)



NAILS



Designed for fixing various wooden parts to timber structures and to each other. The head of the nail is enlarged and flattened to allow easy hammering. Various head shapes are used depending on the type of materials being fastened and the intended appearance. As nails get longer, the diameter of the wire generally becomes larger as well. Larger sizes are used for joints requiring increased strength parameters.



GBCZ / GBOC	Common polished nails	162
Length range: 40 - 300 mm	Bright	Galvanized - white



GDCZ / GDOC	Roofing nails	162
Length range: 25 - 40 mm	Bright	Galvanized - white



GSCZ / GSOC	Lost head nails	163
Length range: 20 - 40 mm	Bright	Galvanized - white



GSKCZ / GSKOC	Twisted nails	163
Length range: 50 - 100 mm	Bright	Galvanized - white



GCOC	Carpentry nails	164
Length range: 40 - 80 mm	Galvanized - white	



GPCZ / GPOC	Clout nails	164
Length range: 25 - 40 mm	Bright	Galvanized - white



PGP	Washers for clout nails	165
Diameter: 27 mm	Galvanized - white	



GPPOC	Clout nails with washer	165
Length range: 25 - 38 mm	Galvanized - white	



GHWOC	Hardened grooved nails	166
Length range: 25 - 80 mm	Galvanized - white	



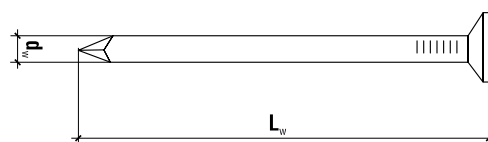
GWCZ / GWOC	Ring nails	166
Length range: 50 - 125 mm	Bright	Galvanized - white



GTCZ / GTOC	Upholstery nails	167
Length range: 18 - 20 mm	Bright	Galvanized - white

GBCZ / GBOC (PN-EN 10230-1)

Common polished nails



APPLICATION

For fixing various wooden parts to timber structures and to each other. Wide flush head with rough surface facilitates hammering and prevents the hammer from slipping. Shank diameter depends on shank length.

Installation

Does not require prior drilling.

Substrate

Chipboard, plywood, wood, OSB board, MDF board

Material

Bright or galvanized low-carbon steel

Bright	Galvanized - white	$d_w \times L_w$ [mm]	Unit pack [kg]
GBCZ-20040	GBOC-20040	2,0 x 40	5
GBCZ-22050	GBOC-22050	2,2 x 50	5
GBCZ-24060	GBOC-24060	2,4 x 60	5
GBCZ-27065	GBOC-27065	2,7 x 65	5
GBCZ-30070	GBOC-30070	3,0 x 70	5
GBCZ-30080	GBOC-30080	3,0 x 80	5
GBCZ-34090	GBOC-34090	3,4 x 90	5
GBCZ-42100	GBOC-42100	4,2 x 100	5
GBCZ-46125	GBOC-46125	4,6 x 125	5
GBCZ-50150	GBOC-50150	5,0 x 150	5
GBCZ-60175	GBOC-60175	6,0 x 175	5
GBCZ-70200	GBOC-70200	7,0 x 200	5
GBCZ-70225	GBOC-70225	7,0 x 225	5
GBCZ-80250	GBOC-80250	8,0 x 250	5
GBCZ-80280	GBOC-80280	8,0 x 280	5
GBCZ-80300	GBOC-80300	8,0 x 300	5

GDCZ / GDOC (PN-EN 10230-1)

Roofing nails



APPLICATION

For fixing various wooden parts to timber structures and to each other. Small diameter shank and flat head.

Installation

Does not require prior drilling.

Substrate

Chipboard, plywood, wood, OSB board, MDF board

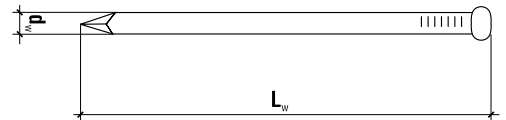
Material

Bright or galvanized low-carbon steel

Bright	Galvanized - white	$d_w \times L_w$ [mm]	Size in inches	Unit pack [kg]
GDCZ-12025	GDOC-12025	1,2 x 25	1"	5
GDCZ-14025	GDOC-14025	1,4 x 25	1"	5
GDCZ-14030	GDOC-14030	1,4 x 30	-	5
GDCZ-16030	GDOC-16030	1,6 x 30	-	5
GDCZ-16035	GDOC-16035	1,6 x 35	-	5
GDCZ-16040	GDOC-16040	1,6 x 40	1,5"	5

GSCZ / GSOC

Lost head nails



APPLICATION

For fixing various wooden parts to timber structures and to each other. Small barrel head with thin shank. Also suitable for concealed fixing.

Installation

Does not require prior drilling.

Substrate

Chipboard, plywood, wood, OSB board, MDF board

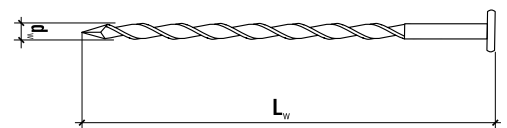
Material

Bright or galvanized low-carbon steel

Bright	Galvanized - white	$d_w \times L_w$ [mm]	Size in inches	Unit pack [kg]
GSCZ-12020	GSOC-12020	1,2 x 20	-	5
GSCZ-12025	GSOC-12025	1,2 x 25	1"	5
GSCZ-14025	GSOC-14025	1,4 x 25	1"	5
GSCZ-14030	GSOC-14030	1,4 x 30	-	5
GSCZ-16035	GSOC-16035	1,6 x 35	-	5
GSCZ-18040	GSOC-18040	1,8 x 40	1,5"	5
GSCZ-20040	GSOC-20040	2,0 x 40	1,5"	5

GSKCZ / GSKOC (PN-EN 10230-1)

Twisted nails



APPLICATION

For fixing various wooden parts to timber structures and to each other. Wide flat head with rough surface facilitates hammering and prevents hammer from slipping during installation. Twisted shank provides increased strength parameters.

Installation

Does not require prior drilling.

Substrate

Chipboard, plywood, wood, OSB board, MDF board

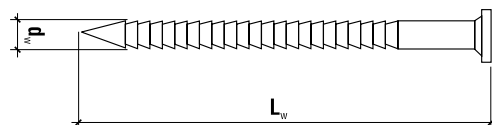
Material

Bright or galvanized low-carbon steel

Bright	Galvanized - white	$d_w \times L_w$ [mm]	Size in inches	Unit pack [kg]
GSKCZ-31050	GSKOC-31050	3,1 x 50	2"	5
GSKCZ-31060	GSKOC-31060	3,1 x 60	-	5
GSKCZ-35070	GSKOC-35070	3,5 x 70	-	5
GSKCZ-35080	GSKOC-35080	3,5 x 80	3"	5
GSKCZ-42090	GSKOC-42090	4,2 x 90	3,5"	5
GSKCZ-42100	GSKOC-42100	4,2 x 100	4"	5

GCOC (PN-EN 10230-1)

Carpentry nails


APPLICATION

For fixing various wooden parts to timber structures and to each other. Reinforced flat head with rough surface prevents hammer from slipping during installation. Ring shank provides increased strength parameters.

Installation

Does not require prior drilling.

Substrate

Chipboard, plywood, wood, OSB board, MDF board

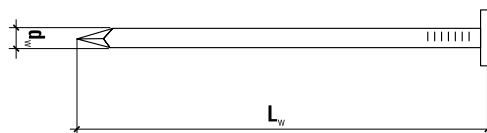
Material

Galvanized low-carbon steel

Galvanized - white	$d_w \times L_w$ [mm]	Size in inches	Unit pack [kg]
GCOC-40040	4,0 x 40	1,5"	5
GCOC-40050	4,0 x 50	2"	5
GCOC-40060	4,0 x 60	-	5
GCOC-40070	4,0 x 70	-	5
GCOC-40080	4,0 x 80	3"	5

GPCZ / GPOC (PN-EN 10230-1)

Clout nails


APPLICATION

For fixing felt roofing materials to timber structures. Large flat head with smooth surface.

Installation

Does not require prior drilling.

Substrate

Chipboard, plywood, wood, OSB board, MDF board

Material

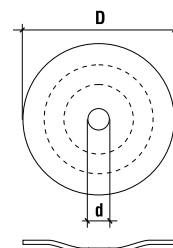
Bright or galvanized low-carbon steel

Bright	Galvanized - white	$d_w \times L_w$ [mm]	Size in inches	Unit pack [kg]
GPCZ-25025	GPOC-25025	2,5 x 25	1"	5
GPCZ-25030	GPOC-25030	2,5 x 30	-	5
GPCZ-30025	GPOC-30025	3,0 x 25	1"	5
GPCZ-30030	GPOC-30030	3,0 x 30	-	5
GPCZ-30035	GPOC-30035	3,0 x 35	-	5
GPCZ-30040	GPOC-30040	3,0 x 40	1,5"	5

PGP

(PN-EN 10230-1)

Washers for clout nails



APPLICATION Washers for clout nails increase pull-through resistance of felt roofing materials

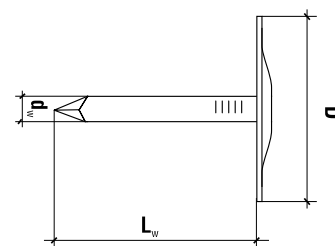
Material Galvanized low-carbon steel

Galvanized - white	D [mm]	d [mm]	Thickness [mm]	Unit pack [kg]
PGP-3	27	3,5	0,8	1

GPPOC

(PN-EN 10230-1)

Clout nails with washer



APPLICATION For fixing felt roofing materials to timber structures. Washers increase pull-through resistance.

Installation Does not require prior drilling.

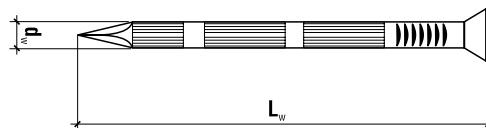
Substrate Chipboard, plywood, wood, OSB board, MDF board

Material Galvanized low-carbon steel

Galvanized - white	$d_w \times L_w$ [mm]	D [mm]	Unit pack [kg]
GPPOC-28025	2,8 x 25	30	5
GPPOC-28028	2,8 x 28	30	5
GPPOC-28038	2,8 x 38	30	5

GHWOC (PN-EN 10230-1)

Hardened grooved nails


APPLICATION

For fixing timber structures and various wooden elements to concrete, solid brick, AAC block, lightweight concrete. Grooved shank provides strong and reliable fastening.

Installation

Does not require prior drilling.

Substrate

Chipboard, plywood, wood, OSB board, MDF board

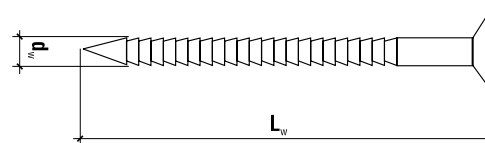
Material

Galvanized low-carbon steel

Galvanized - white	$d_w \times L_w$ [mm]	Size in inches	Unit pack [kg]
GHWOC-27025	2,7 x 25	1"	3
GHWOC-27030	2,7 x 30	-	3
GHWOC-27035	2,7 x 35	-	3
GHWOC-27040	2,7 x 40	1,5"	3
GHWOC-35045	3,5 x 45	-	3
GHWOC-35050	3,5 x 50	2"	3
GHWOC-35060	3,5 x 60	-	3
GHWOC-35065	3,5 x 65	2,5"	3
GHWOC-45070	4,5 x 70	-	3
GHWOC-45080	4,5 x 80	3"	3

GWCZ / GWOC (PN-EN 10230-1)

Ring nails


APPLICATION

For fixing various wooden parts to timber structures and to each other. Wide flat head with rough surface prevents hammer from slipping during installation. Ring shank provides increased strength parameters.

Installation

Does not require prior drilling.

Substrate

Chipboard, plywood, wood, OSB board, MDF board

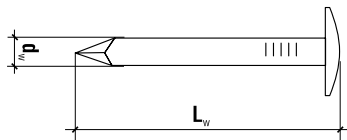
Material

Bright or galvanized low-carbon steel

Bright	Galvanized - white	$d_w \times L_w$ [mm]	Size in inches	Unit pack [kg]
GWCZ-31050	GWOC-31050	3,1 x 50	2"	5
GWCZ-35060	GWOC-35060	3,5 x 60	-	5
GWCZ-35070	GWOC-35070	3,5 x 70	-	5
GWCZ-35080	GWOC-35080	3,5 x 80	3"	5
GWCZ-42090	GWOC-42090	4,2 x 90	-	5
GWCZ-42100	GWOC-42100	4,2 x 100	4"	5
GWCZ-42125	GWOC-42125	4,2 x 125	-	5

GTCZ / GTOC

Upholstery nails



- APPLICATION**

For fixing upholstery padding or material to furniture wooden structure. Large domed head allow to push easily the sharp tip of the nail through the material and into the wooden structure.
- Installation**

Does not require prior drilling.
- Substrate**

Chipboard, plywood, wood, OSB board, MDF board
- Material**

Bright or galvanized low-carbon steel

Bright	Galvanized - white	d _w x L _w [mm]	Unit pack [kg]
GTCZ-18018	GTOC-18018	1,8 x 18	5
GTCZ-20020	GTOC-20020	2,0 x 20	5



SCREWED-IN FASTENERS FOR FASTENING INSULATION MATERIALS IN WOODEN SUBSTRATE

DRIVE W, DRIVE S

INNOVATIVE CONSTRUCTION OF PRESSURE COLLAR

Simple and fast assembly of mineral wool MW without the need to apply additional pressure collar. Very rigid flange of a diameter of 110 mm guarantees a certain pressure of insulation material.



TX DRIVE IN THE PIN'S HEAD

Screw-in installation, no hammer action.



PIN THREADED FOR USE IN TIMBER

Reliable installation in timber.



POCKET ADHESIVES (DRIVE W)

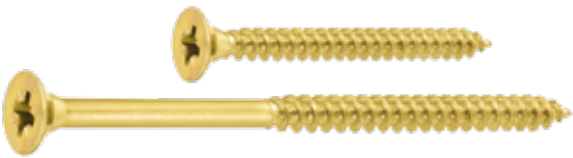
Very good adhesiveness of the mortar.



DRIVE W	Screwed-in fastener for fastening of mineral wool MW in wooden substrate		170
ø6	Length range: 110 - 310 mm	PLUG - polyamide	



DRIVE S	Screwed-in fastener for fastening of polystyrene EPS foam in wooden substrate		172
ø6	Length range: 110 - 310 mm	PLUG - polyamide	



KDH - HARDENED COUNTERSUNK HEAD WOOD
SCREW WITH PARTIAL/FULL THREAD, PZ DRIVE
ø5,0 mm / 6,0 mm

TD-060, TDP-060	Special screwed-in fastener with screw		174
ø64	Material - polyamide (TD-060) / polypropylene (TDP-060)		

Screwed-in fastener for fastening of mineral wool MW in wooden substrate

DRIVE W

ø6

Modern fastener with low spot thermal conductivity for fastening of mineral wool MW on wooden substrate in ETICS systems.



SUBSTRATES



Timber C22÷C24



OSB board, polywood



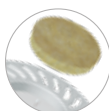
Fiber-cement board

FASTENER MATERIAL	Polyamide (PA)
PIN MATERIAL	Carbon steel
HEAD MATERIAL	Polyamide (PA) with glass fiber
CORROSION PROTECTION	Galvanized
INSTALLATION METHOD	Immerged mount
FASTENER TYPE	Screwed-in
APPLICATION	Universal screwed-in fastener for fastening of mineral wool
TYPE OF INSULATION MATERIAL	Mineral wool MW



INNOVATIVE CONSTRUCTION OF PRESSURE COLLAR

Simple and fast assembly of mineral wool MW without the need to apply additional pressure collar. Very rigid collar of a diameter of 110 mm guarantees a certain pressure of insulation material.



MINERAL WOOL DISC

Minimizes the formation of thermal bridges on the facade, increases the aesthetics of the insulation executed.



PIN THREADED FOR USE IN TIMBER

Reliable installation in timber.



POCKET ADHESIVES

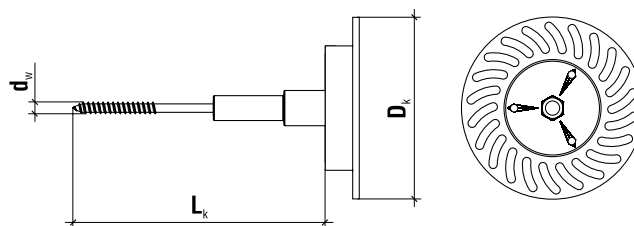
Very good adhesiveness of the mortar.

Metal pin + head covered with plastic PA with glass fiber

ø6

DRIVE W
Length range: 110 - 320 mm

	Product code	Dimensions	Insulation material thickness	Pack unit
		d _k x L _k [mm]	[mm]	[pcs]
DRIVE W				
ø6	DRIVE-W-06120(50)	6x110	90	50
	DRIVE-W-06140(50)	6x130	110	50
	DRIVE-W-06160(50)	6x150	130	50
	DRIVE-W-06180(50)	6x170	150	50
	DRIVE-W-06200(50)	6x190	170	50
	DRIVE-W-06220(50)	6x210	190	50
	DRIVE-W-06240(50)	6x230	210	50
	DRIVE-W-06260(50)	6x250	230	50
	DRIVE-W-06280(50)	6x270	250	50
	DRIVE-W-06300(50)	6x290	270	50
	DRIVE-W-06320(50)	6x310	290	50



Product marking - DRIVE-W-06120(50)			
DRIVE-W	06	120	(50)
Fastener type	Diameter	Length	Number of pieces in a box

TECHNICAL PARAMETERS

Parameter	Unit	Value
Fastener diameter	d_k [mm]	6
Collar diameter	D_k [mm]	110
Point thermal transmittance	χ [W/K]	0,000
Collar stiffness	S [kN/mm]	0,60
Fastener material	-	PA
Pin material	-	Carbon steel, head covered with plastic (PA+GF)
DiBT (Zulassung) Approval	-	Z-91-875
Polish Approval	-	ITB-KOT-2019/0913 (wyd. 1)

LOAD RESISTANCE (ITB APPROVAL)

Substrate	Effective anchorage depth [mm]	Design resistance [kN]
Timber C22÷C24	16	1,33
Timber C22÷C24	20÷40	1,52
Wood basen panels OSB	15	0,84
Particle-cement board	12	0,37

INSTALLATION ACCESSORIES

Setting tool

EDST-W diameter ø65 mm

Specifications:

- ECO-DRIVE W 8 and DRIVE W setting tool.



Mineral wool disc

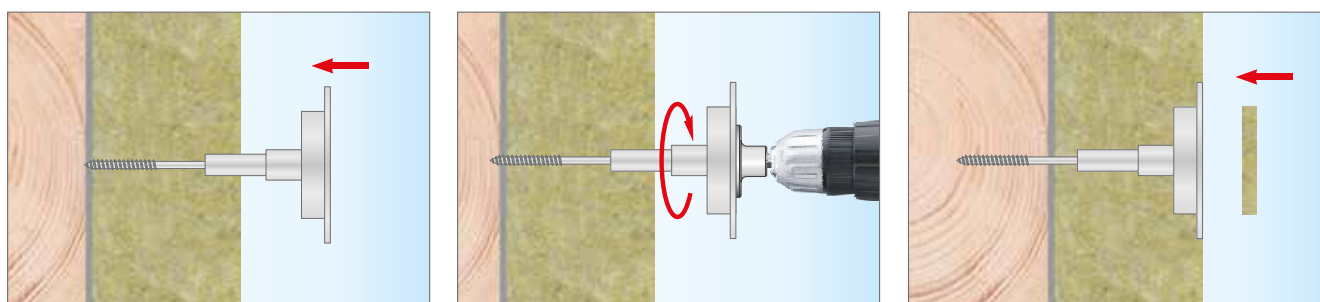
EDKW diameter ø67 mm / 10 mm

Specifications:

- Mineral wool disc density 135 kg/m³.



INSTALLATION INSTRUCTIONS - installation of a fastener with Mineral wool disc - immersed mount without cutter



Screwed-in fastener for fastening of polystyrene EPS foam in wooden substrate

DRIVE S

Ø6

Modern fastener with low spot thermal conductivity for fastening of polystyrene EPS foam on wooden substrate in ETICS systems.



SUBSTRATES



Timber C22-C24



OSB board, polywood



Fiber-cement board

FASTENER MATERIAL	Polyamide (PA)
PIN MATERIAL	Carbon steel
HEAD MATERIAL	Polyamide (PA) with glass fiber
CORROSION PROTECTION	Galvanized
INSTALLATION METHOD	Immerged mount
FASTENER TYPE	Screwed-in
APPLICATION	Innovative fastener for fastening of polystyrene EPS
TYPE OF INSULATION MATERIAL	Polystyrene EPS



INNOVATIVE DESIGN

Facilitates fast and easy installation of polystyrene EPS in wooden substrate.



POLYSTYRENE DISC

Eliminates thermal bridging on the facade and enhances aesthetics of the connection.



TX DRIVE IN THE PIN'S HEAD

Screw-in installation, no hammer action.



PIN THREADED FOR USE IN TIMBER

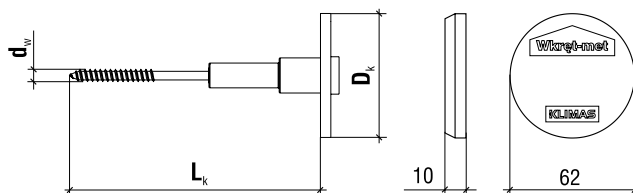
Preliable installation in timber.

Metal pin + head covered with plastic
PA with glass fiber

Ø6

DRIVE S
Length range: 110 - 320 mm

	Product code	Dimensions	Insulation material thickness	Pack unit
		d _k x L _k [mm]	[mm]	[pcs]
DRIVE S				
ø6	DRIVE-S-06120(100)	6x110	90	100
	DRIVE-S-06140(100)	6x130	110	100
	DRIVE-S-06160(100)	6x150	130	100
	DRIVE-S-06180(100)	6x170	150	100
	DRIVE-S-06200(100)	6x190	170	100
	DRIVE-S-06220(100)	6x210	190	100
	DRIVE-S-06240(100)	6x230	210	100
	DRIVE-S-06260(100)	6x250	230	100
	DRIVE-S-06280(100)	6x270	250	100
	DRIVE-S-06300(100)	6x290	270	100
	DRIVE-S-06320(100)	6x310	290	100



Product marking - DRIVE-S-06120(100)?			
DRIVE-S	06	120	(100)
Fastener type	Diameter	Length	Number of pieces in a box

TECHNICAL PARAMETERS

Parameter	Unit	Value
Fastener diameter	d_k [mm]	6
Collar diameter	D_k [mm]	60
Point thermal transmittance	χ [W/K]	0,000
Collar stiffness	S [kN/mm]	0,60
Fastener material	-	PA
Pin material	-	Carbon steel, head covered with plastic (PA+GF)
DiBT (Zulassung) Approval	-	Z-9.1-875
Polish Approval	-	ITB-KOT-2019/0913 (wyd. 1)

LOAD RESISTANCE (ITB APPROVAL)

Substrate	Effective anchorage depth [mm]	Design resistance [kN]
Timber C22÷C24	16	1,33
Timber C22÷C24	20÷40	1,52
Wood basen panels OSB	15	0,84
Particle-cement board	12	0,37

INSTALLATION ACCESSORIES

Setting tool

EDST

diameter ø120 mm with TX drive

Specifications:

- ECO-DRIVE 8, ECO-DRIVE S 8 and DRIVE S setting tool.



Polystyrene disc

EDKS*, EDKSG**

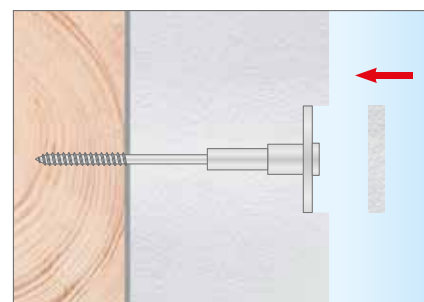
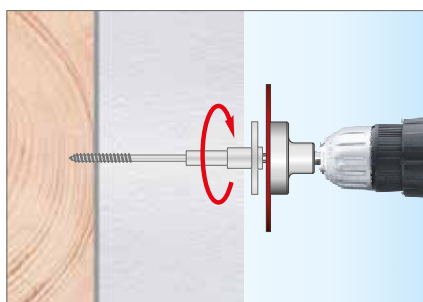
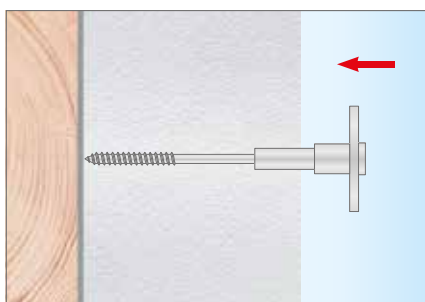
diameter ø62x10 mm

Specifications:

- * - WHITE DISC - supplied with fastener.
- ** - GRAPHITE DISC - on order.



INSTALLATION INSTRUCTIONS - immersed mount with a polystyrene EPS disc



Special screwed-in fastener with screw

TD-060, TDP-060

Support collar with steel screws for fastening of polystyrene EPS foam and mineral wool on profiled sheet and wooden substrates, in ETICS systems.


SUBSTRATES

Timber C22

OSB board, plywood

Fiber-cement board

Steel sheet


**KDH - HARDENED COUNTERSUNK HEAD WOOD
SCREW WITH PARTIAL/FULL THREAD, PZ DRIVE**
 ø5,0 mm / 6,0 mm

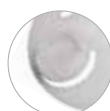
FASTENER MATERIAL	· Polyamide (TD-060) · Polypropylene (TDP-060)
SCREW MATERIAL	Galvanized steel
TYPE OF INSULATION MATERIAL	· Polystyrene EPS · Mineral wool MW
FASTENER TYPE	Screwed-in
INSTALLATION METHOD	Surface mount
APPLICATION	Special screwed-in fastener with steel screw for fastening of mineral wool MW and polystyrene EPS in wooden and steel sheet substrates


SUPPORT COLLAR

Universal application for installing commonly-used insulation material in timber and steel sheet substrates.

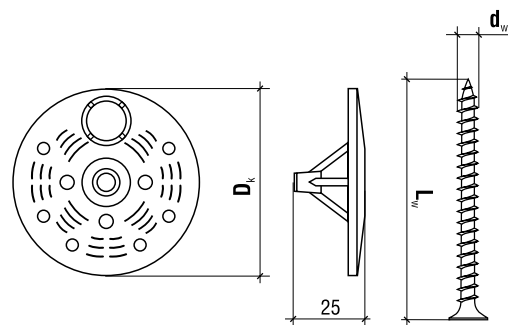

HOLDING COLLAR

To be used with a wide range of screws –allows for installing insulation materials of different thicknesses.

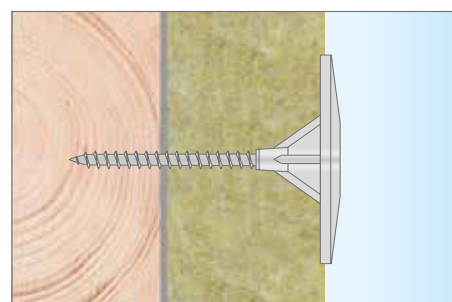
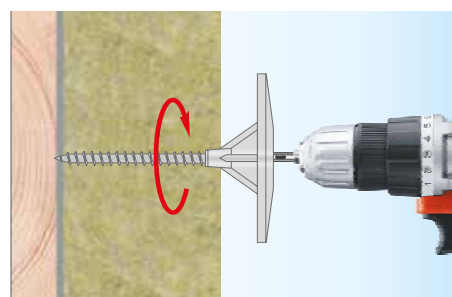
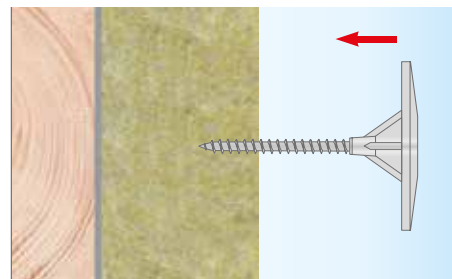

COLLAR-INTEGRATED CAP

Minimizes thermal bridging and seals connections.

Insulation material thickness [mm]	Collar	Timber, OSB, Cement board
		KDHT/KDH
30	TD-60, TDP-60	KDHT/KDH-05060
40	TD-60, TDP-60	KDHT/KDH-05070
50	TD-60, TDP-60	KDHT/KDH-05080
60	TD-60, TDP-60	KDHT/KDH-05090
70	TD-60, TDP-60	KDHT/KDH-05100
80	TD-60, TDP-60	KDHT/KDH-06110
90	TD-60, TDP-60	KDHT/KDH-06120
100	TD-60, TDP-60	KDHT/KDH-06140
110	TD-60, TDP-60	KDHT/KDH-06140
120	TD-60, TDP-60	KDHT/KDH-06160
130	TD-60, TDP-60	KDHT/KDH-06160
140	TD-60, TDP-60	KDHT/KDH-06180
150	TD-60, TDP-60	KDHT/KDH-06180
160	TD-60, TDP-60	KDHT/KDH-06200
170	TD-60, TDP-60	KDHT/KDH-06200
180	TD-60, TDP-60	KDHT/KDH-06200
190	TD-60, TDP-60	-



INSTALLATION INSTRUCTIONS - surface mount



TECHNICAL PARAMETERS

Parameter	Unit	Timber, OSB board, Cement board
Fastener diameter	d_w [mm]	5,0/6,0
Collar diameter	D_k [mm]	64
Fastener material	-	Polyamide PA Polypropylene PP
Pin material	-	Zinc plated steel
Polish Approval	-	ITB-KOT-2019/0913 (wyd. 1)

LOAD RESISTANCE

Substrate	Substrate thickness [mm]	Product marking	Design resistance [kN]	Product marking	Design resistance [kN]
Timber C22	25	TD+KDH 5,0 / TDP+KDH 5,0	1,19 / 2,08	-	-
Timber C22	30	-	-	TD+KDH 6,0 / TDP+KDH 6,0	2,08 / 2,47
OSB board	12,5	TD+KDH 5,0 / TDP+KDH 5,0	0,84 / 0,84	TD+KDH 6,0 / TDP+KDH 6,0	0,95 / 0,95
OSB board	18	TD+KDH 5,0 / TDP+KDH 5,0	1,19 / 1,26	TD+KDH 6,0 / TDP+KDH 6,0	1,38 / 1,38
Fibreboard	12,5	TD+KDH 5,0 / TDP+KDH 5,0	0,86 / 0,86	TD+KDH 6,0 / TDP+KDH 6,0	0,86 / 0,86

STRONG FOR GENERATIONS

KLIMAS

FASTENER TECHNOLOGIES

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