



# 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.



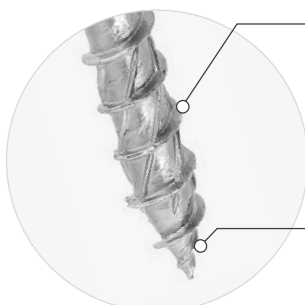
**HIGH TORQUE** - Allows screws to be installed without pre-drilling, even in hardwood substrates.



**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.

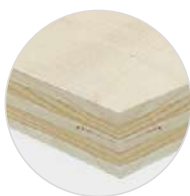
## EXAMPLES OF APPLICATIONS:



## SUBSTRATES



**Solid timber**

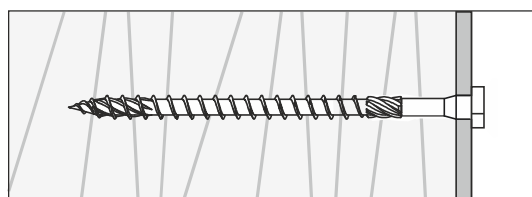
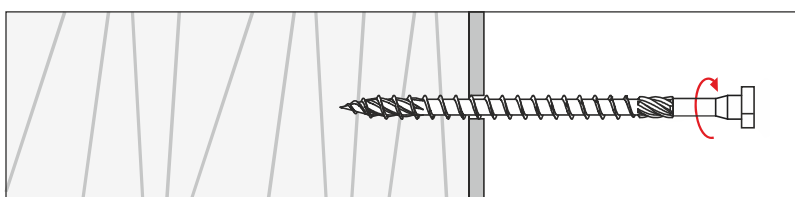


**Glued laminated timber**  
CLT, KVH, BSH/GLT

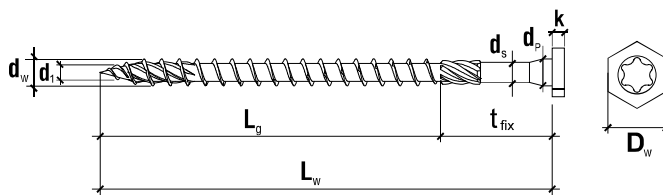


**Laminated Veneer  
Lumber - LVL**

## 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] | $L_g$ [mm]    | $t_{rx}$ [mm]      | [-]           | [pcs]    |
| <b>ø10</b>           | WKCH-10            |                       |               |                    |               |          |
|                      | 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

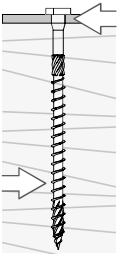
| Geometry        |                       |                       |                          |                    |               |                |              |
|-----------------|-----------------------|-----------------------|--------------------------|--------------------|---------------|----------------|--------------|
| 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]   |
| <b>WKCH ø6</b>  | 6                     | 3,80                  | 4,30                     | 5,80               | 10,00         | 4,00           | 50-100       |
| <b>WKCH ø8</b>  | 8                     | 5,50                  | 5,78                     | 7,80               | 13,00         | 5,50           | 40-300       |
| <b>WKCH ø10</b> | 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 |
|                            | $M_{yk}$ [N*m]              | $f_{ak,k}$ [N/mm²]                             | $f_{head,k}$ [N/mm²]                                  | $f_{tens,k}$ [kN]               | $f_{tor,k}$ [N*m]                 |
| <b>WKCH ø6</b>             | 10,0                        | 12                                             | 17,4                                                  | 13,0                            | 10,0                              |
| <b>WKCH ø8</b>             | 25                          | 12                                             | 15,3                                                  | 25,0                            | 27,0                              |
| <b>WKCH ø10</b>            | 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

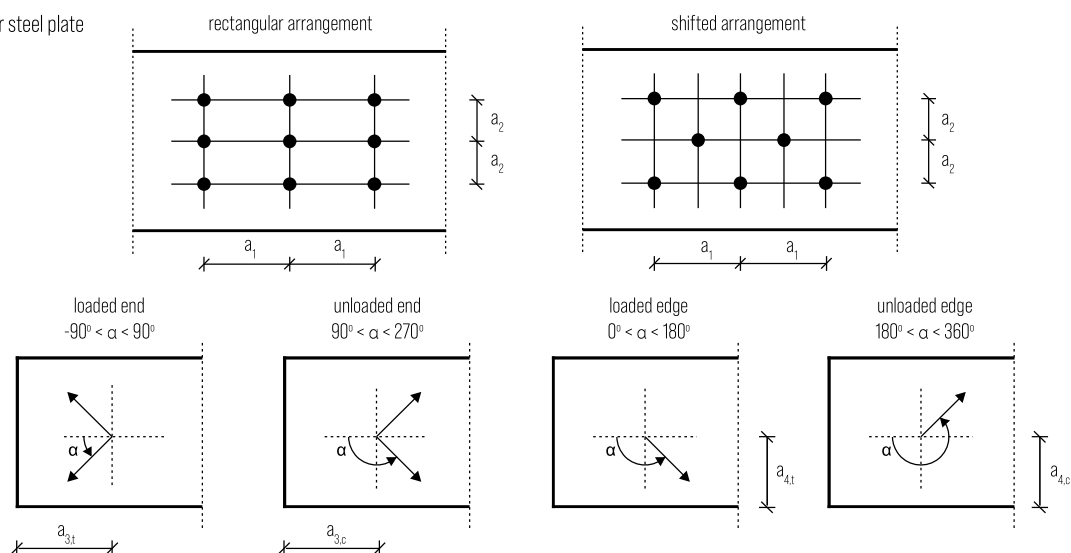
| Angle between force and fiber direction $\alpha = 0^\circ$                        |     |     |      | Angle between force and fiber direction $\alpha = 90^\circ$                         |     |     |      |
|-----------------------------------------------------------------------------------|-----|-----|------|-------------------------------------------------------------------------------------|-----|-----|------|
|  |     |     |      |  |     |     |      |
| 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 |
| $d_o$ [mm]                                                                        | 4   | 5   | 6    | $d_o$ [mm]                                                                          | 4   | 5   | 6    |
| $d_{o,steel}$ [mm]                                                                | 7   | 9   | 11   | $d_{o,steel}$ [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

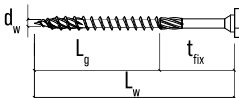
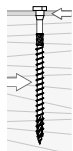
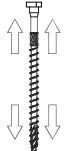
 4. Hole diameter  $d_o$  is valid for softwood

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




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**TIMBER**

Characteristic resistances for laterally and axially loaded screws - timber

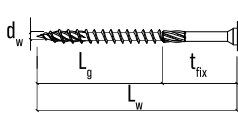
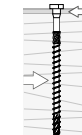
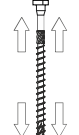
| DIMENSIONS                                                                        |                     |                     |                       | SHEAR                                                                             |                                                                                   |                                                                                   | TENSION                                                                             |                                                                                     |                                                                                     |      |       |
|-----------------------------------------------------------------------------------|---------------------|---------------------|-----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|-------|
| Diameter                                                                          | Length              | Thread length       | Usable length         | timber-timber                                                                     | steel-timber (thin plate)                                                         | steel-timber (thick plate)                                                        | Withdrawal                                                                          | Head pull-through                                                                   | Tension                                                                             |      |       |
|  |                     |                     |                       |  |  |  |  |  |  |      |       |
| d <sub>w</sub> [mm]                                                               | L <sub>w</sub> [mm] | L <sub>g</sub> [mm] | t <sub>fix</sub> [mm] | R <sub>V,k</sub> [kN]                                                             | R <sub>V,k</sub> [kN]                                                             | R <sub>V,k</sub> [kN]                                                             | R <sub>ack</sub> [kN]                                                               | R <sub>head,k</sub> [kN]                                                            | R <sub>tens,k</sub> [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 <sub>w</sub> [mm]                                                               | L <sub>w</sub> [mm] | L <sub>g</sub> [mm] | t <sub>fix</sub> [mm] | R <sub>V,k</sub> [kN]                                                             | R <sub>V,k</sub> [kN]                                                             | R <sub>V,k</sub> [kN]                                                             | R <sub>ax,k</sub> [kN]                                                              | R <sub>head,k</sub> [kN]                                                            | R <sub>tens,k</sub> [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  $\gamma_M$  and  $k_{mod}$  should be taken in accordance with EN 1995

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

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

Factors  $\gamma_M$  and  $k_{mod}$  should be taken in accordance with EN 1995. Factor  $\gamma_{M2}$  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  $90^\circ$  between screw and grain direction and for penetration length equal  $L_g$

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