

# WKR DOUBLE

## TENSILE ANGLE BRACKET FOR PREFABRICATED WALLS

### PREFABRICATION

The wall plate allows for pre-assembly in the factory, with the possibility of finishes prefabrication. Fastening on site is carried out using the base angle bracket or inter-storey plate and self-drilling metal screws.

### TOLERANCES

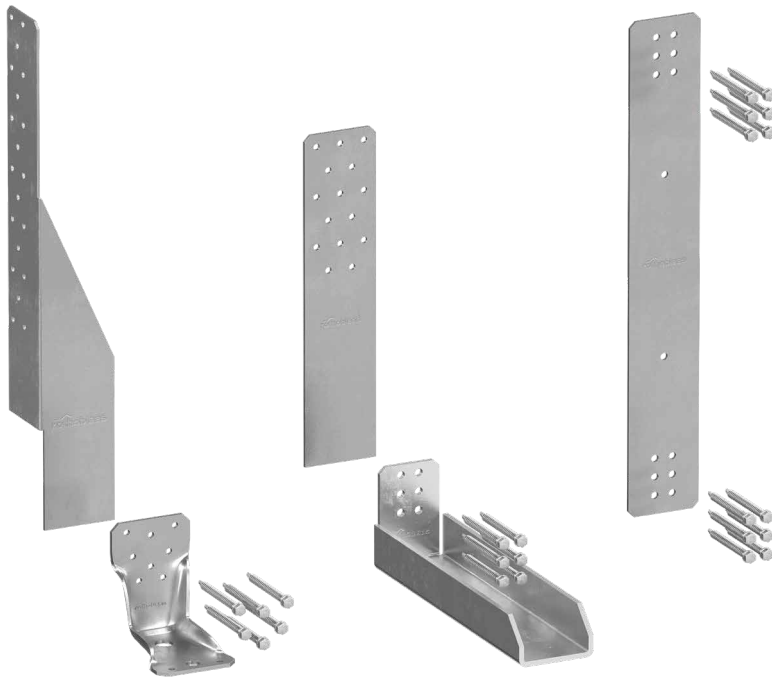
On-site management is quick and easy. The numerous models of the base angle bracket allow the wall to be installed on a bedding layer, on a base plate or on a reinforced concrete kerb.

### PRE-INSTALLATION

The base angle brackets can be pre-installed on the reinforced concrete foundation. Slotted holes for installing the anchors allow management of installation tolerances.



USA, Canada and more design values available online.



VIDEO

### SERVICE CLASS

SC1

SC2

### MATERIAL

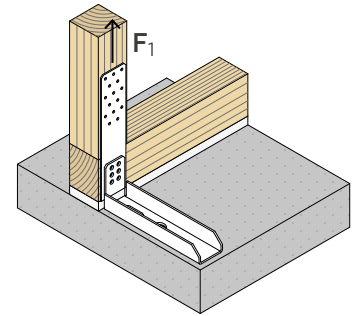
S355  
Fe/Zn12c

**BASE ANGLE-BRACKETS:** carbon steel  
S355 + Fe/Zn12c

S350  
Z275

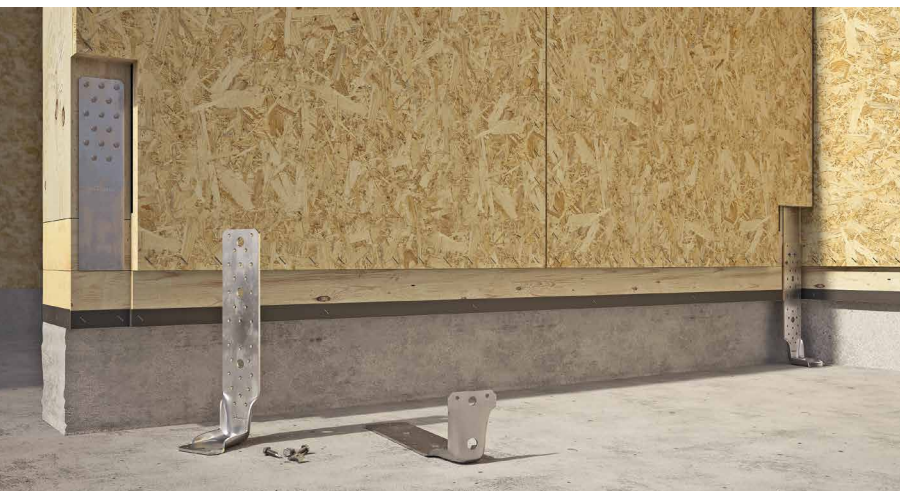
**OTHER COMPONENTS:** carbon steel  
S350GD+Z275

### EXTERNAL LOADS



### VIDEO

Scan the QR Code and watch the video on our YouTube channel



### FIELDS OF USE

Tension joints for prefabricated walls.  
Optimised for fastening frame walls.  
Timber-to-timber and timber-to-concrete configurations.

Can be applied to:

- solid timber and glulam
- timber frame
- CLT and LVL panels



## TIMBER-TO-CONCRETE TOLERANCE

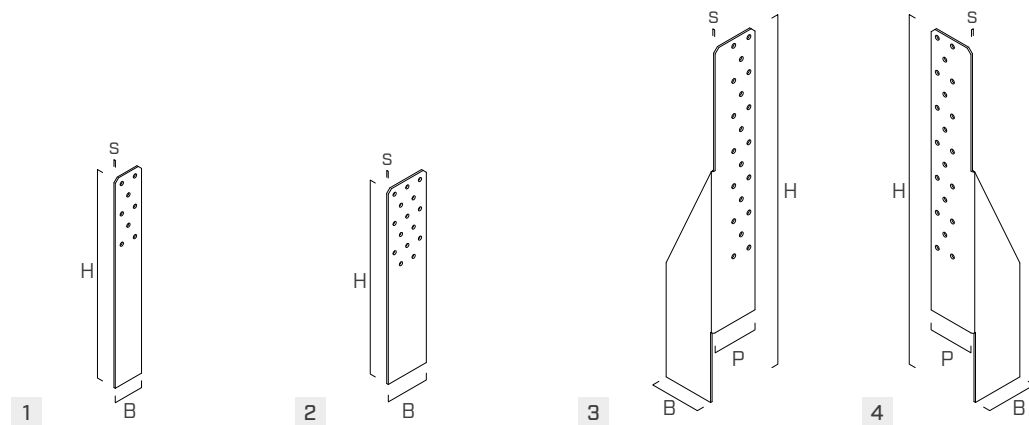
Thanks to the slotted hole for installing the anchor, it is possible to pre-install the bottom plate and subsequently install the walls. The slot allows tolerance management.



## TIMBER-TO-TIMBER

The inter-storey plate allows to create the wall-to-wall connection between one storey and the next.

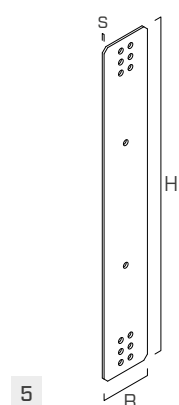
## CODES AND DIMENSIONS

### WALL PLATE



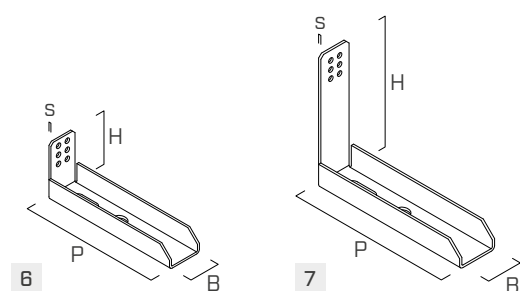
| CODE      | B<br>[mm] | P<br>[mm] | H<br>[mm] | s<br>[mm] | B<br>[in] | P<br>[in] | H<br>[in] | s<br>[in] | $n_v \varnothing 5$<br>$n_v \varnothing 0.20$<br>[pcs] |  |  | pcs |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--|---|---|-----|
| 1 WKRD40  | 40        | -         | 275       | 2         | 1 9/16    | -         | 10 7/8    | 0.08      | 8  | ●   | -   | 10  |
| 2 WKRD60  | 60        | -         | 265       | 2,5       | 2 3/8     | -         | 10 7/16   | 0.10      | 15   | ●   | -   | 10  |
| 3 WKRD60L | 62        | 55        | 403       | 2         | 2 7/16    | 2 3/16    | 15 7/8    | 0.08      | 20   | ●   | -   | 10  |
| 4 WKRD60R | 62        | 55        | 403       | 2         | 2 7/16    | 2 3/16    | 15 7/8    | 0.08      | 20   | ●   | -   | 10  |



### INTER-STOREY PLATE



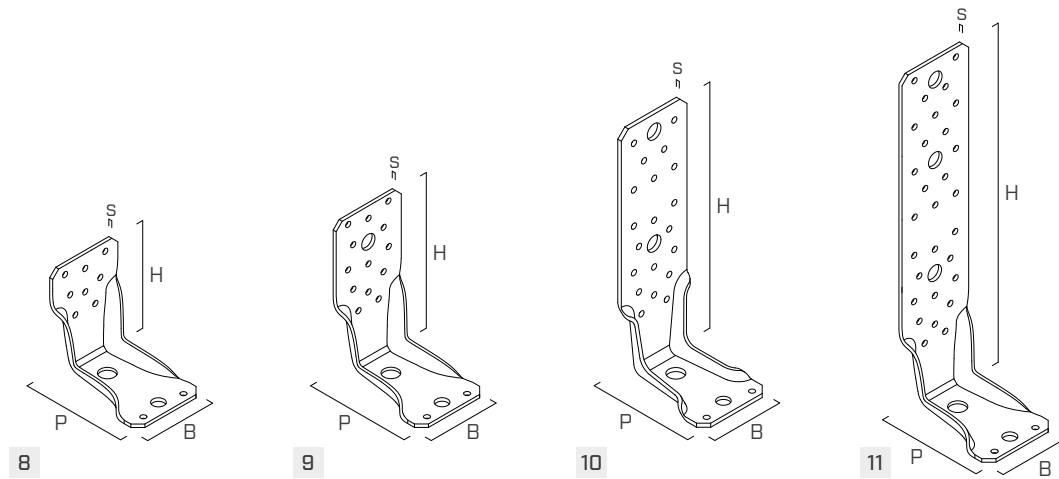
| CODE      | B<br>[mm] | H<br>[mm] | s<br>[mm] | B<br>[in] | H<br>[in] | s<br>[in] | $n_v \varnothing 6$<br>$n_v \varnothing 0.24$<br>[pcs] | pcs |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--|-----|
| 5 WKRD60T | 60        | 410       | 2,5       | 2 3/8     | 16 1/8    | 0.10      | 12   | 10  |



### BASE ANGLE BRACKET



| CODE       | B<br>[mm] | P<br>[mm] | H<br>[mm] | s<br>[mm] | B<br>[in] | P<br>[in] | H<br>[in] | s<br>[in] | $n_v \varnothing 6$<br>$n_v \varnothing 0.24$<br>[pcs] | $n_H \varnothing 23$<br>$n_H \varnothing 0.91$<br>[pcs] | $n_H - \varnothing_H$<br>[pcs]                                       |  |  | pcs |
|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--|---|--|---|---|-----|
| 6 WKRD80C  | 62        | 255       | 80        | 4         | 2 7/16    | 10 1/16   | 3 1/8     | 0.16      | 6  | 1   | 1 - $\varnothing 18 \times 30$<br>1 - $\varnothing 0.71 \times 1.18$ | -   | ●   | 10  |
| 7 WKRD180C | 62        | 255       | 180       | 4         | 2 7/16    | 10 1/16   | 7 1/8     | 0.16      | 6  | 1   | 1 - $\varnothing 18 \times 30$<br>1 - $\varnothing 0.71 \times 1.18$ | -   | ●   | 10  |

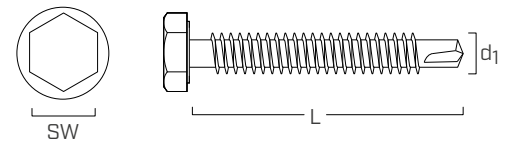
## BASE ANGLE BRACKET



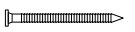

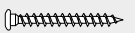

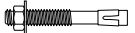

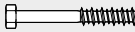

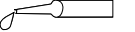

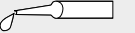

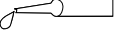

| CODE        | B    | P    | H    | s    | B      | P     | H       | s    | $n_v \varnothing 5$<br>$n_v \varnothing 0.20$ | $n_H \varnothing 14$<br>$n_H \varnothing 0.56$ |  |  | pcs |
|-------------|------|------|------|------|--------|-------|---------|------|---|--|---|---|-----|
|             | [mm] | [mm] | [mm] | [mm] | [in]   | [in]  | [in]    | [in] | [pcs]   | [pcs]  |   |   |     |
| 8 WKR9530   | 65   | 85   | 95   | 3    | 2 9/16 | 3 3/8 | 3 3/4   | 3    | 8   | 1  | -   | ●   | 25  |
| 9 WKR13535  | 65   | 85   | 135  | 3,5  | 2 9/16 | 3 3/8 | 5 5/16  | 3.5  | 13  | 1  | -   | ●   | 25  |
| 10 WKR21535 | 65   | 85   | 215  | 3,5  | 2 9/16 | 3 3/8 | 8 7/16  | 3.5  | 20  | 1  | -   | ●   | 25  |
| 11 WKR28535 | 65   | 85   | 287  | 3,5  | 2 9/16 | 3 3/8 | 11 5/16 | 3.5  | 29  | 1  | -   | ●   | 25  |

## SELF-DRILLING SCREW FOR STEEL

| CODE     | d <sub>1</sub> | SW    | L    | d <sub>1</sub> | L       | pcs |
|----------|----------------|-------|------|----------------|---------|-----|
|          | [mm]           | [mm]  | [mm] | [in]           | [in]    |     |
| WKRDSREW | 6,3            | SW 10 | 50   | 0.25           | 1 15/16 | 100 |

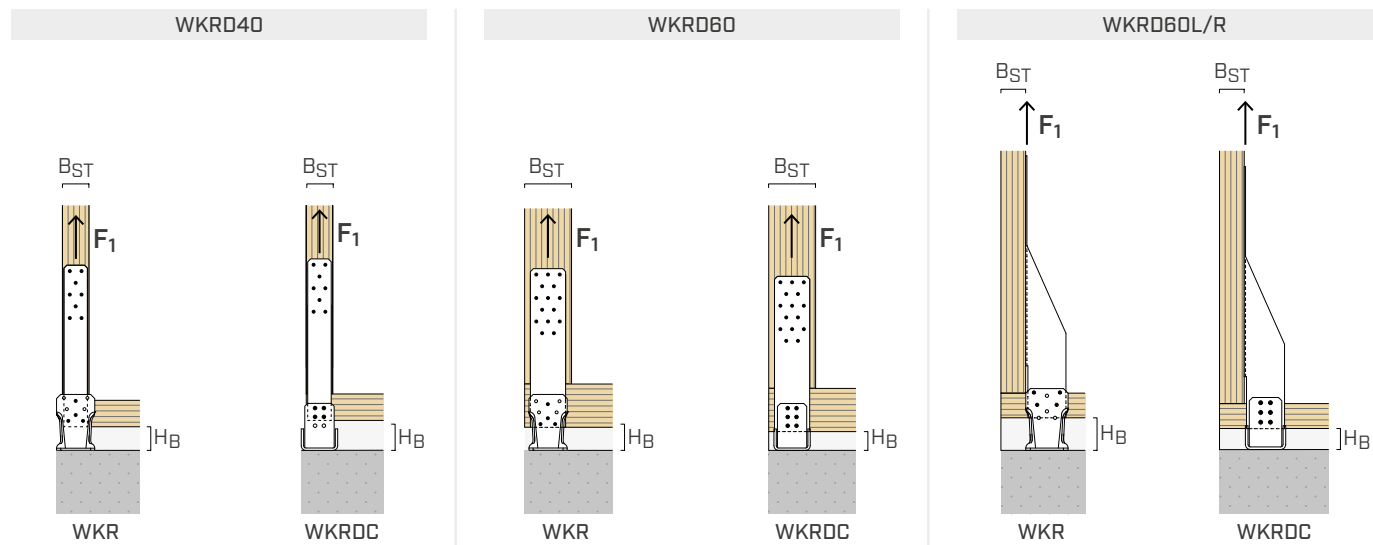


## FASTENERS

| type    | description                 |   | d<br>[mm]   | support   | page |
|---------|-----------------------------|---|-------------|---|------|
| LBA     | high bond nail              |  | 4           |  | 570  |
| LBS     | round head screw            |  | 5           |  | 571  |
| AB1     | CE1 expansion anchor        |  | 12-16       |  | 536  |
| SKR     | screw-in anchor             |  | M12-M16     |  | 528  |
| VIN-FIX | vinyl ester chemical anchor |  | M12-M16-M20 |  | 545  |
| HYB-FIX | epoxy chemical anchor       |  | M12-M16-M20 |  | 552  |
| EPO-FIX | hybrid chemical anchor      |  | M12-M16-M20 |  | 557  |

## FASTENING PATTERNS AND STRUCTURAL VALUES F<sub>1</sub>

### WALL-ANGLE BRACKET BASE PLATE COUPLING



| wall plate         | basic angle bracket | fasteners                                 |   | H <sub>B</sub> |             | B <sub>ST, min</sub><br>[mm] | R <sub>1,k,max</sub> <sup>(*)</sup><br>[kN] |
|--------------------|---------------------|---|---|----------------|-------------|------------------------------|---|
|                    |                     | steel-to-timber<br>LBA Ø4-LBS Ø5<br>[pcs] | steel-to-steel<br>WKRDSCREW Ø6,3<br>[pcs] | min<br>[mm]    | max<br>[mm] |                              |   |
| WKRD40             | WKR9530             | 8   | 4   | 0              | 40          | 45                           | 20,0  |
|                    | WKR21535            | 8   | 4   | 40             | 114         |                              |   |
|                    | WKR28535            | 8   | 4   | 112            | 210         |                              |   |
|                    | WKRD80C             | 8   | 4   | 0              | 47          |                              |   |
|                    | WKRD180C            | 8   | 4   | 0              | 147         |                              |   |
| WKRD60             | WKR9530             | 15  | 4   | 0              | 40          | 80                           | 26,0  |
|                    | WKR13535            | 15  | 4   | 0              | 74          |                              |   |
|                    | WKR21535            | 15  | 4   | 70             | 170         |                              |   |
|                    | WKR28535            | 15  | 4   | 142            | 230         |                              | 40,0  |
|                    | WKRD80C             | 15  | 6   | 0              | 32          |                              |   |
|                    | WKRD180C            | 15  | 6   | 30             | 132         |                              |   |
| WKRD60L<br>WKRD60R | WKR9530             | 20  | 4   | 0              | 40          | 38                           | 26,0  |
|                    | WKR13535            | 20  | 4   | 0              | 74          |                              |   |
|                    | WKR21535            | 20  | 4   | 70             | 150         |                              |   |
|                    | WKR28535            | 20  | 4   | 120            | 210         |                              |   |
|                    | WKRD80C             | 20  | 6   | 0              | 32          |                              |   |
|                    | WKRD180C            | 20  | 6   | 20             | 132         |                              |   |

<sup>(\*)</sup>R<sub>1,k,max</sub> is a preliminary strength value. See [www.rothoblaas.com](http://www.rothoblaas.com) for the complete technical data sheet.

#### GENERAL PRINCIPLES

- Characteristic values according to EN 1995:2014.
- Design values can be obtained from characteristic values as follows:

$$R_d = \frac{R_k \cdot \text{timber} \cdot k_{mod}}{\gamma_M}$$

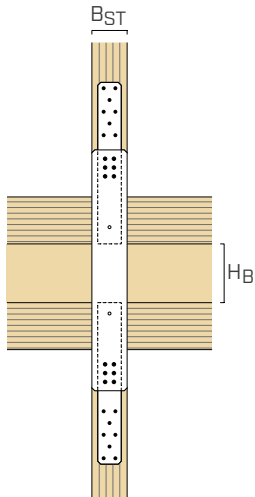
The coefficients k<sub>mod</sub>, γ<sub>M</sub> should be taken according to the current regulations used for the calculation.

- A timber density of ρ<sub>k</sub> = 350 kg/m<sup>3</sup> was considered for the calculation process.
- Dimensioning and verification of the timber elements must be carried out separately.

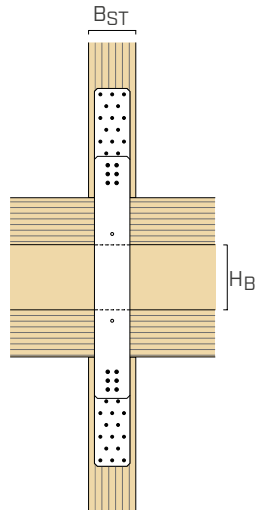


## PLATE COUPLING FOR INTER-STOREY WALL-PLATE

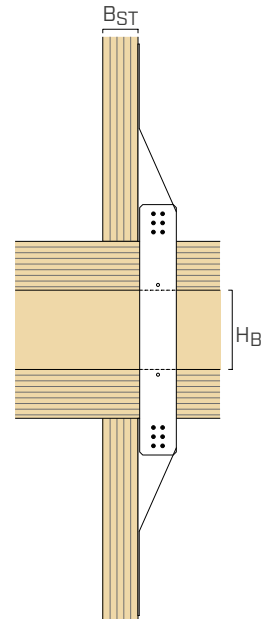
WKRD40 - WKRD60T



WKRD60 - WKRD60T



WKRD60L/R - WKRD60T



| wall plate         | inter-storey plate | fasteners                                 |   | H <sub>B</sub> |             | B <sub>ST, min</sub> | R <sub>1,k,max</sub> <sup>(*)</sup> |
|--------------------|--------------------|---|---|----------------|-------------|----------------------|-------------------------------------|
|                    |                    | steel-to-timber<br>LBA Ø4-LBS Ø5<br>[pcs] | steel-to-steel<br>WKRDSCREW Ø6,3<br>[pcs] | min<br>[mm]    | max<br>[mm] |                      |                                     |
| WKRD40             | WKRD60T            | 8+8                                       | 4+4                                       | 50             | 320         | 45                   | 20,0                                |
| WKRD60             | WKRD60T            | 15+15                                     | 6+6                                       | 110            | 300         | 80                   | 40,0                                |
| WKRD60L<br>WKRD60R | WKRD60T            | 20+20                                     | 6+6                                       | 120            | 300         | 38                   | 26,0                                |

<sup>(\*)</sup>R<sub>1,k,max</sub> is a preliminary strength value. See [www.rothoblaas.com](http://www.rothoblaas.com) for the complete technical data sheet.

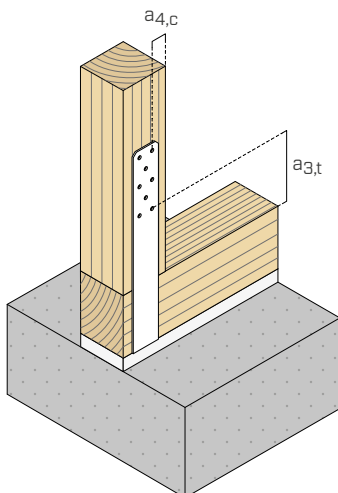
## INSTALLATION

### MINIMUM DISTANCES

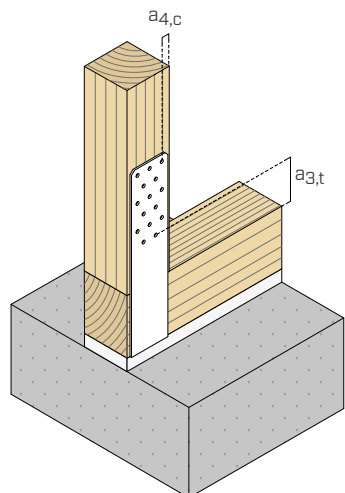
| TIMBER |                       | nails<br>LBA Ø4 | screws<br>LBS Ø5 |
|--------|-----------------------|-----------------|------------------|
| C/GL   | a <sub>4,c</sub> [mm] | ≥ 12            | ≥ 25             |
|        | a <sub>3,t</sub> [mm] | ≥ 60            | ≥ 75             |

C/GL: minimum distances for solid timber or glulam consistent with EN 1995:2014 according to ETA considering a timber density  $\rho_k \leq 420 \text{ kg/m}^3$ .

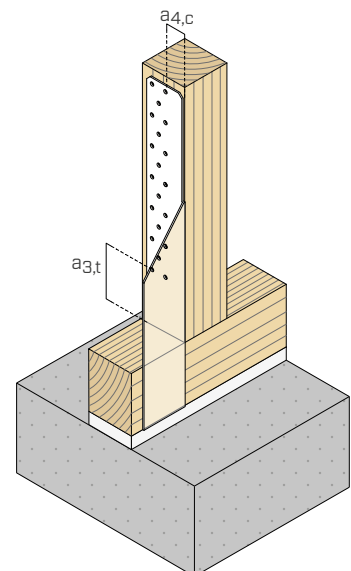
WKRD40



WKRD60



WKRD60L/R



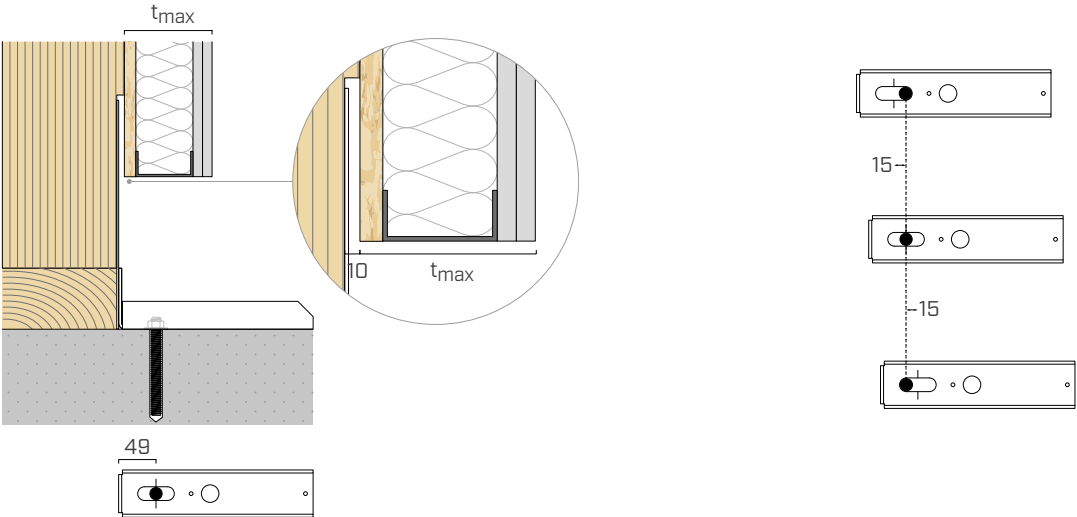
## ■ INSTALLATION

### INSTALLATION OF WKRD80C AND WKRD180C BASE ANGLE BRACKETS

Frame walls can be supplied with different levels of prefabrication. Depending on the presence and thickness of the interior finish, different installation methods are possible for the WKRD80C and WKRD180C base angle brackets, which provide slotted holes at the floor connection.

#### INSTALLATION OF BASE ANGLE BRACKETS PRIOR TO WALL INSTALLATION

The angle brackets can be pre-installed on the foundation in order to speed up the installation and fastening of the walls. In this configuration, it is advisable to install the anchor in the slotted hole, which then allows any installation tolerances to be compensated for.



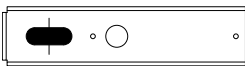
Example: pre-installed M16 anchor in central position for wall with prefabricated internal finish (without thickness limitation).

The presence of the slotted hole makes it possible to compensate for an installation tolerance of  $\pm 15$  mm after wall installation. After installation, simply apply the tightening torque required to fully anchor the connection to the ground.

#### INSTALLATION OF BASE ANGLE BRACKETS AFTER WALL INSTALLATION

The angle brackets can be installed after the walls have been installed. In this case, there are two possible ways of fastening them to the ground:

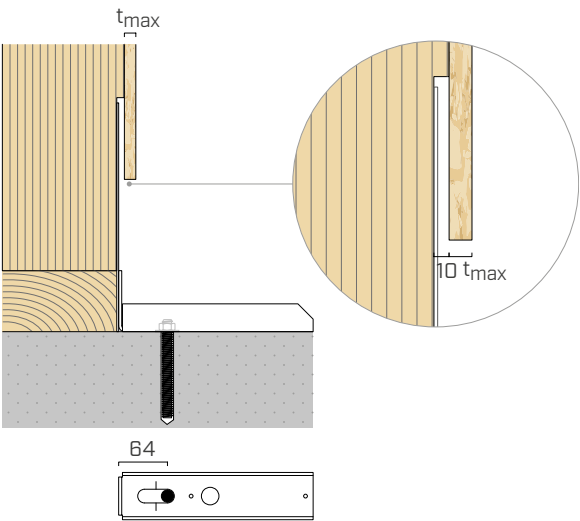
| $t_{max}$ [mm] | anchor choice |     |
|----------------|---------------|-----|
|                | IN            | OUT |
| 20             | M12-M16       | M20 |
| 80             | -             | M20 |



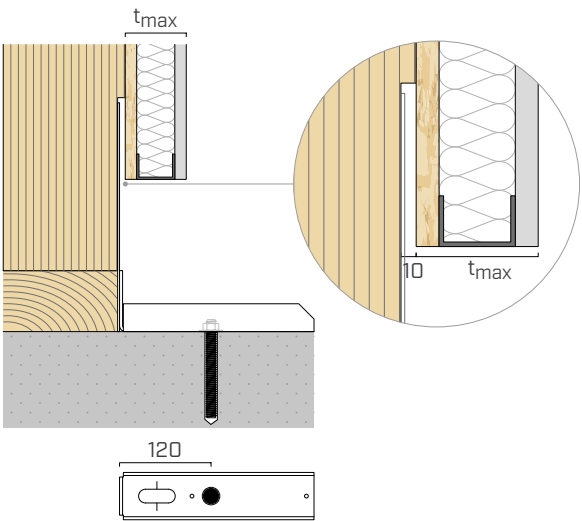
anchor positioned in the internal hole (IN)



anchor positioned in the outer hole (OUT)



Example: post-installed M16 anchor for prefabricated wall with single OSB panel.



Example: post-installed M20 anchor for prefabricated wall with internal counter wall.