



# HUS4-HR / HUS4-CR SCREW ANCHOR

**Technical Datasheet**



Update: Jan-23



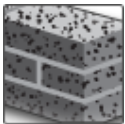
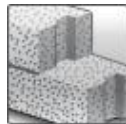
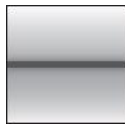




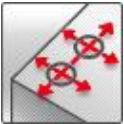






# HUS4-HR / HUS4-CR Screw anchor

Ultimate performance screw anchor for single point fastening

| Anchor version   | Benefits   |
|--|--|
|  <p>HUS4-HR<br/>(6-14)*</p> | <ul style="list-style-type: none"> <li>- High productivity - less drilling and fewer operations than with conventional anchors</li> <li>- ETA approval for cracked and non-cracked concrete</li> <li>- ETA approval for Seismic C1</li> <li>- Smaller edge and spacing distance</li> <li>- Three embedment depths for maximum design flexibility and flexible design for concrete cone capacity</li> <li>- No cleaning required size 6 to 14</li> <li>- Through fastening with H and C head</li> </ul> |
|  <p>HUS4-CR<br/>(6-10)</p>  |  |

| Base material   | Load conditions  |
|---|--|
|  <p>Concrete (non-cracked)</p> |  <p>Concrete (cracked)</p>          |
|  <p>Solid brick</p>            |  <p>Autoclaved aerated concrete</p> |
|   |  <p>Static / quasi-static</p>      |
|   |  <p>Seismic ETA-C1</p>            |
|   |  <p>Fire resistance</p>           |

| Installation conditions  | Other information   |
|--|---|
|  <p>Small edge distance and spacing</p> |  <p>European Technical Assessment</p>        |
|  |  <p>CE conformity</p>                       |
|  |  <p>PROFIS Engineering design software</p> |
|  |  <p>Corrosion resistance</p>               |

## Approvals / certificates

| Description                   | Authority | No. / date of issue      |
|-------------------------------|-----------|--------------------------|
| European Technical Assessment | DIBt      | ETA-20/0867 / 14-07-2022 |
| Fire test report              | DIBt      | ETA-20/0867 / 14-07-2022 |

\*HUS4-HR not available in size 12

## Static and quasi-static resistance (for a single anchor)

### All data in this section applies to:

- Correct setting (See setting instruction)
- No edge distance and spacing influence
- Steel failure
- Minimum base material thickness
- Concrete C 20/25,  $f_{ck,cube} = 25 \text{ N/mm}^2$

### Anchorage depth

| Anchor size             |                | 6      | 8                |    |    | 10               |    |    | 14 |    |     |
|-------------------------|----------------|--------|------------------|----|----|------------------|----|----|----|----|-----|
| Type                    | HUS4           | HR, CR | HR, CR           |    |    | HR, CR           |    |    | HR |    |     |
| Nominal embedment depth | $h_{nom}$ [mm] | 55     | 50 <sup>a)</sup> | 60 | 80 | 60 <sup>a)</sup> | 70 | 90 | -  | 70 | 110 |

a) Hilti Technical Data for embedment depth

### Characteristic resistance

| Anchor size                 |               | 6      | 8                  |      |      | 10                 |      |      | 14 |      |      |
|-----------------------------|---------------|--------|--------------------|------|------|--------------------|------|------|----|------|------|
| Type                        | HUS4          | HR, CR | HR, CR             |      |      | HR, CR             |      |      | HR |      |      |
| <b>Non-cracked concrete</b> |               |        |                    |      |      |                    |      |      |    |      |      |
| Tension                     | $N_{Rk}$ [kN] | 9,0    | 9,0 <sup>a)</sup>  | 12,0 | 16,0 | 12,0 <sup>a)</sup> | 16,0 | 25,0 | -  | 18,4 | 39,2 |
| Shear                       | $V_{Rk}$ [kN] | 17,0   | 23,0 <sup>a)</sup> | 26,0 | 26,0 | 30,7 <sup>a)</sup> | 33,0 | 33,0 | -  | 36,9 | 77,0 |
| <b>Cracked concrete</b>     |               |        |                    |      |      |                    |      |      |    |      |      |
| Tension                     | $N_{Rk}$ [kN] | 5,0    | 5,0 <sup>a)</sup>  | 8,5  | 15,0 | 7,5 <sup>a)</sup>  | 12,0 | 16,0 | -  | 12,0 | 25,0 |
| Shear                       | $V_{Rk}$ [kN] | 15,6   | 16,1 <sup>a)</sup> | 22,2 | 26,0 | 21,5 <sup>a)</sup> | 27,3 | 33,0 | -  | 25,8 | 54,9 |

a) Hilti Technical Data

### Design resistance

| Anchor size                 |               | 6      | 8                  |      |      | 10                 |      |      | 14 |      |      |
|-----------------------------|---------------|--------|--------------------|------|------|--------------------|------|------|----|------|------|
| Type                        | HUS4          | HR, CR | HR, CR             |      |      | HR, CR             |      |      | HR |      |      |
| <b>Non-cracked concrete</b> |               |        |                    |      |      |                    |      |      |    |      |      |
| Tension                     | $N_{Rd}$ [kN] | 4,3    | 5,0 <sup>a)</sup>  | 8,0  | 8,9  | 6,7 <sup>a)</sup>  | 8,9  | 16,7 | -  | 10,2 | 21,8 |
| Shear                       | $V_{Rd}$ [kN] | 11,3   | 15,4 <sup>a)</sup> | 17,3 | 17,3 | 20,5 <sup>a)</sup> | 22,0 | 22,0 | -  | 24,6 | 51,3 |
| <b>Cracked concrete</b>     |               |        |                    |      |      |                    |      |      |    |      |      |
| Tension                     | $N_{Rd}$ [kN] | 2,4    | 2,8 <sup>a)</sup>  | 5,7  | 8,3  | 4,2 <sup>a)</sup>  | 6,7  | 10,7 | -  | 6,7  | 13,9 |
| Shear                       | $V_{Rd}$ [kN] | 10,4   | 10,8 <sup>a)</sup> | 14,8 | 17,3 | 14,3 <sup>a)</sup> | 18,2 | 22,0 | -  | 17,2 | 36,6 |

a) Hilti Technical Data

### Recommended loads<sup>b)</sup>

| Anchor size                 |                | 6      | 8                  |      |      | 10                 |      |      | 14 |      |      |
|-----------------------------|----------------|--------|--------------------|------|------|--------------------|------|------|----|------|------|
| Type                        | HUS4           | HR, CR | HR, CR             |      |      | HR, CR             |      |      | HR |      |      |
| <b>Non-cracked concrete</b> |                |        |                    |      |      |                    |      |      |    |      |      |
| Tension                     | $N_{Rec}$ [kN] | 3,1    | 3,6 <sup>a)</sup>  | 5,7  | 6,3  | 4,8 <sup>a)</sup>  | 6,3  | 11,9 | -  | 7,3  | 15,6 |
| Shear                       | $V_{Rec}$ [kN] | 8,1    | 11,0 <sup>a)</sup> | 12,4 | 12,4 | 14,6 <sup>a)</sup> | 15,7 | 15,7 | -  | 17,6 | 36,7 |
| <b>Cracked concrete</b>     |                |        |                    |      |      |                    |      |      |    |      |      |
| Tension                     | $N_{Rec}$ [kN] | 1,7    | 2,0 <sup>a)</sup>  | 4,0  | 6,0  | 3,0 <sup>a)</sup>  | 4,8  | 7,6  | -  | 4,8  | 9,9  |
| Shear                       | $V_{Rec}$ [kN] | 7,4    | 7,7 <sup>a)</sup>  | 10,6 | 12,4 | 10,2 <sup>a)</sup> | 13,0 | 15,7 | -  | 12,3 | 26,2 |

a) Hilti Technical Data

b) With overall partial safety factor for action  $\gamma = 1,4$ . The partial safety factors for action depend on the type of loading and shall be taken from national regulations.



## Seismic resistance

### All data in this section applies to:

- Correct setting (See setting instruction)
- No edge distance and spacing influence
- Steel failure
- Minimum base material thickness
- Concrete C 20/25,  $f_{ck,cube} = 25 \text{ N/mm}^2$

### Anchorage depth

| Anchor size             |           |      | 8      | 10     | 14     |
|-------------------------|-----------|------|--------|--------|--------|
| Type                    | HUS4-     |      | HR, CR | HR, CR | HR, CR |
| Nominal anchorage depth | $h_{nom}$ | [mm] | 80     | 90     | 110    |

### Characteristic resistance in case of seismic performance category C1

| Anchor size                      |               |      | 8      | 10     | 14     |
|----------------------------------|---------------|------|--------|--------|--------|
| Type                             | HUS4-         |      | HR     | HR     | HR     |
| <b>with Hilti filling set</b>    |               |      |        |        |        |
| Tension                          | $N_{Rk,seis}$ | [kN] | 7,7    | 12,5   | 17,5   |
| Shear                            | $V_{Rk,seis}$ |      | 11,1   | 17,9   | 46,7   |
| Type                             | HUS4-         |      | HR, CR | HR, CR | HR, CR |
| <b>without Hilti filling set</b> |               |      |        |        |        |
| Tension                          | $N_{Rk,seis}$ | [kN] | 7,7    | 12,5   | 17,5   |
| Shear                            | $V_{Rk,seis}$ |      | 5,6    | 9,0    | 23,3   |

### Design resistance in case of seismic performance category C1

| Anchor size                      |               |      | 8      | 10     | 14     |
|----------------------------------|---------------|------|--------|--------|--------|
| Type                             | HUS4-         |      | HR     | HR     | HR     |
| <b>with Hilti filling set</b>    |               |      |        |        |        |
| Tension                          | $N_{Rd,seis}$ | [kN] | 4,3    | 8,3    | 9,7    |
| Shear                            | $V_{Rd,seis}$ |      | 7,4    | 11,9   | 31,1   |
| Type                             | HUS4-         |      | HR, CR | HR, CR | HR, CR |
| <b>without Hilti filling set</b> |               |      |        |        |        |
| Tension                          | $N_{Rd,seis}$ | [kN] | 4,3    | 8,3    | 9,7    |
| Shear                            | $V_{Rd,seis}$ |      | 3,7    | 6,0    | 15,6   |

## Fire resistance

### All data in this section applies to:

- Correct setting (See setting instruction)
- No edge distance and spacing influence
- Steel failure
- Minimum base material thickness
- Concrete C 20/25,  $f_{ck,cube} = 25 \text{ N/mm}^2$
- Partial safety factor for resistance under fire exposure  $\gamma_{M,fi}=1,0$  (in absence of other national regulations)
- For more fire resistance data please see ETA-20/0867.

### Anchorage depth

| Anchor size             |                | 6  |    | 8  |    |    |    | 10 |    |    |    | 14 |     |
|-------------------------|----------------|----|----|----|----|----|----|----|----|----|----|----|-----|
| Type                    | HUS4-          | HR | CR | HR | CR | HR | CR | HR | CR | HR | CR | HR |     |
| Nominal anchorage depth | $h_{nom}$ [mm] | 55 | 55 | 60 | 80 | 60 | 80 | 70 | 90 | 70 | 90 | 70 | 110 |

### Characteristic resistance

| Anchor size               |               | 6   |     | 8   |     |     |     | 10  |      |     |     | 14  |      |
|---------------------------|---------------|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|------|
| Type                      | HUS4-         | HR  | CR  | HR  | CR  | HR  | CR  | HR  | CR   | HR  | CR  | HR  |      |
| <b>Fire Exposure R30</b>  |               |     |     |     |     |     |     |     |      |     |     |     |      |
| Tension                   | $N_{Rk}$ [kN] | 1,3 | 0,2 | 1,5 | 3,0 | 0,8 | 0,8 | 2,3 | 4,0  | 1,4 | 1,4 | 3,0 | 6,3  |
| Shear                     | $V_{Rk}$ [kN] | 3,5 | 0,2 | 5,2 | 9,3 | 0,8 | 0,8 | 7,4 | 14,6 | 1,4 | 1,4 | 6,7 | 23,6 |
| <b>Fire Exposure R120</b> |               |     |     |     |     |     |     |     |      |     |     |     |      |
| Tension                   | $N_{Rk}$ [kN] | 1,0 | 0,1 | 1,2 | 1,7 | 0,4 | 0,4 | 1,8 | 2,4  | 0,8 | 0,8 | 2,4 | 5,0  |
| Shear                     | $V_{Rk}$ [kN] | 1,0 | 0,1 | 1,7 | 1,7 | 0,4 | 0,4 | 2,4 | 2,4  | 0,8 | 0,8 | 5,4 | 5,4  |

### Design resistance

| Anchor size               |               | 6   |     | 8   |     |     |     | 10  |      |     |     | 14  |      |
|---------------------------|---------------|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|------|
| Type                      | HUS4-         | HR  | CR  | HR  | CR  | HR  | CR  | HR  | CR   | HR  | CR  | HR  |      |
| <b>Fire Exposure R30</b>  |               |     |     |     |     |     |     |     |      |     |     |     |      |
| Tension                   | $N_{Rd}$ [kN] | 1,3 | 0,2 | 1,5 | 3,0 | 0,8 | 0,8 | 2,3 | 4,0  | 1,4 | 1,4 | 3,0 | 6,3  |
| Shear                     | $V_{Rd}$ [kN] | 3,5 | 0,2 | 5,2 | 9,3 | 0,8 | 0,8 | 7,4 | 14,6 | 1,4 | 1,4 | 6,7 | 23,6 |
| <b>Fire Exposure R120</b> |               |     |     |     |     |     |     |     |      |     |     |     |      |
| Tension                   | $N_{Rd}$ [kN] | 1,0 | 0,1 | 1,2 | 1,7 | 0,4 | 0,4 | 1,8 | 2,4  | 0,8 | 0,8 | 2,4 | 5,0  |
| Shear                     | $V_{Rd}$ [kN] | 1,0 | 0,1 | 1,7 | 1,7 | 0,4 | 0,4 | 2,4 | 2,4  | 0,8 | 0,8 | 5,4 | 5,4  |

## Materials



### Mechanical properties

| Anchor size                       |                               | 6      | 8      | 10     | 14    |
|-----------------------------------|-------------------------------|--------|--------|--------|-------|
| Type                              | HUS4-                         | HR, CR | HR, CR | HR, CR | HR    |
| Nominal tensile strength          | $f_{uk}$ [N/mm <sup>2</sup> ] | 1050   | 870    | 950    | 690   |
| Yield strength                    | $f_{yk}$ [N/mm <sup>2</sup> ] | 900    | 745    | 815    | 590   |
| Stressed cross-section            | $A_s$ [mm <sup>2</sup> ]      | 22,9   | 39     | 55,4   | 143,1 |
| Moment of resistance              | $W$ [mm <sup>3</sup> ]        | 15     | 34     | 58     | 255   |
| Characteristic bending resistance | $M^{0}_{Rk,s}$ [Nm]           | 19     | 36     | 66     | 193   |

### Material quality

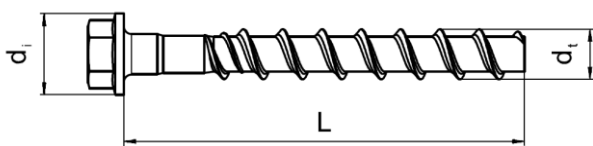
| Part                            | Material                   |
|---------------------------------|----------------------------|
| Hexagonal head concrete screw   | Stainless steel (grade A4) |
| Countersunk head concrete screw | Stainless steel (grade A4) |

### Head configuration

| Type    | Part             |  |
|---------|------------------|--|
| HUS4-HR | Hexagonal head   |   |
| HUS4-CR | Countersunk head |  |

### Fastener dimensions

| Anchor size                        |            | 6     | 8      | 10     | 14     |
|------------------------------------|------------|-------|--------|--------|--------|
| Type                               | HUS4-      | HR    | HR     | HR     | HR     |
| Outer diameter of the screw thread | $d_t$ [mm] | 7,55  | 10,05  | 12,25  | 16,56  |
| Diameter of integrated             | $d_i$ [mm] | 17,00 | 17,50  | 20,50  | 30,00  |
| Length of the screw (min/max)      | $L$ [mm]   | 60/70 | 65/105 | 75/130 | 80/135 |



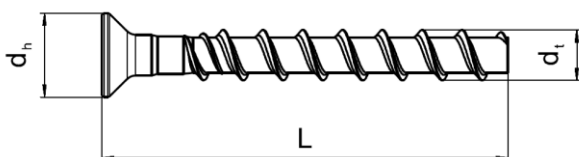
**HUS4:** Hilti Universal Screw 4<sup>th</sup> generation

**HR:** Hexagonal head, stainless steel

**10:** Nominal screw diameter

**100:** total length of the screw

| Anchor size                        |            | 6     | 8     | 10     |
|------------------------------------|------------|-------|-------|--------|
| Type                               | HUS4-      | CR    | CR    | CR     |
| Outer diameter of the screw thread | $d_t$ [mm] | 7,55  | 10,05 | 12,25  |
| Countersunk head diameter          | $d_h$ [mm] | 17,50 | 18,00 | 21,00  |
| Length of the screw (min/max)      | $L$ [mm]   | 60/70 | 65/95 | 75/105 |



**HUS4:** Hilti Universal Screw 4<sup>th</sup> generation

**HR:** Hexagonal head, stainless steel

**CR:** Countersunk head, stainless steel

**10:** Nominal screw diameter

**100:** total length of the screw

## Setting information

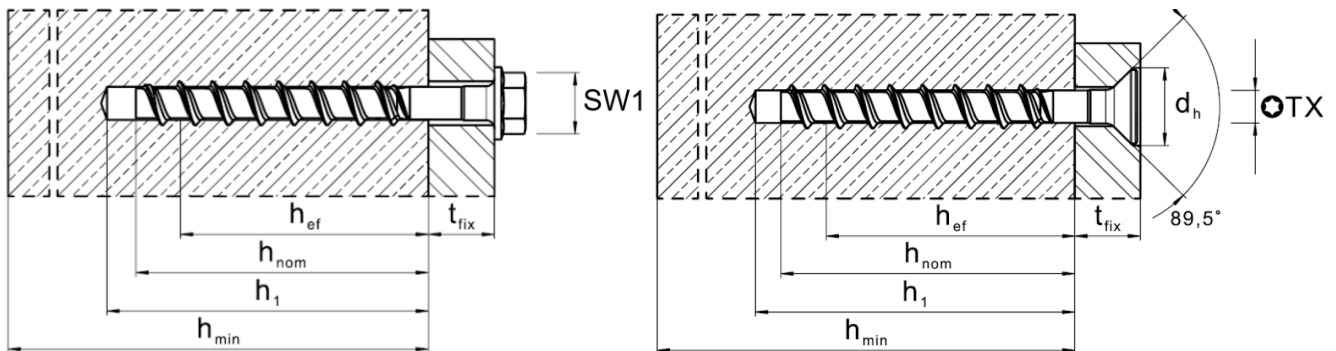
### Setting details

| Anchor size                    |                  |            | 6      | 8                    |      |     | 10                   |                  |     | 14   |      |      |
|--------------------------------|------------------|------------|--------|----------------------|------|-----|----------------------|------------------|-----|------|------|------|
| Type                           | HUS-             |            | HR, CR | HR, CR <sup>a)</sup> |      |     | HR, CR <sup>a)</sup> |                  |     | HR   |      |      |
| Nominal embedment depth        | $h_{nom}$        | [mm]       | 55     | 50                   | 60   | 80  | 60                   | 70               | 90  | 70   | 110  |      |
| Effective anchorage depth      | $h_{ef}$         | [mm]       | 45     | 38                   | 47   | 64  | 46                   | 54               | 71  | 52   | 86   |      |
| Nominal diameter of drill bit  | $d_0$            | [mm]       | 6      | 8                    |      |     | 10                   |                  |     | 14   |      |      |
| Cutting diameter of drill bit  | $d_{cut}$        | [mm]       | 6,4    | 8,45                 |      |     | 10,45                |                  |     | 14,5 |      |      |
| Clearance hole diameter        | $d_f$            | [mm]       | 9      | 12                   |      |     | 14                   |                  |     | 18   |      |      |
| Depth drill hole (cleaning)    | $h_1$            | [mm]       | 65     | 60                   | 70   | 90  | 70                   | 80               | 100 | 80   | 120  |      |
| Depth drill hole (no cleaning) | $h_1$            | [mm]       | 77     | 76                   | 86   | 106 | 90                   | 100              | 120 | 108  | 148  |      |
| Wrench size                    | SW               | [mm]       | 13     | 13                   |      |     | 15                   |                  |     | 21   |      |      |
| Diameter of countersunk        | $d_h$            | [mm]       | 11     | 18                   |      |     | 21                   |                  |     | -    |      |      |
| Installation torque            | Concrete         | $T_{inst}$ | [Nm]   | -a)                  | 35   | -a) | -a)                  | 45 <sup>c)</sup> |     |      | 65   |      |
|                                | Solid m, Mz 12   | $T_{inst}$ | [Nm]   | 10                   | - b) | 16  | 16                   | - b)             | 20  | 20   | - b) | - b) |
|                                | Solid m, KS 12   | $T_{inst}$ | [Nm]   | 10                   | - b) | 16  | 16                   | - b)             | 20  | 20   | - b) | - b) |
|                                | Aerated concrete | $T_{inst}$ | [Nm]   | 4                    | - b) | 8   | 8                    | - b)             | 10  | 10   | - b) | - b) |

a) Hand setting in concrete base material not allowed (machine setting only)

b) Hilti does not recommend this setting process for this application.

c) Installation torque refer to HUS4-HR only



### Installation equipment

| Anchor size                       | 6  | 8  | 10   | 14  |
|-----------------------------------|--|--|--|---|
| Type                              | HUS4-<br>HR, CR  | HR, CR   | HR, CR   | HR  |
| Rotary hammer                     | TE 2 – TE 30   |  |  |   |
| Drill bit                         | TE-CX4 (SDS PLUS) 6/17   | TE-CX4 (SDS PLUS) 8/17   | TE-CX4 (SDS PLUS) 10/22  | TE-CX4 (SDS PLUS) 14/22   |
| Socket wrench insert              | SI-S 13 ½" (S)   | SI-S 13 ½" (S)<br>S-NSD 13 ½" (L)  | SI-S 13 ½" (S)   | SI-S 13 ½" (S)  |
| Torx (CR type only)               | -  | S-SY TX 45   | S-SY TX 50   | -   |
| Impact screw driver <sup>1)</sup> | SIW 6AT-A22 ½"<br>SIW 4AT-A22 ½"<br>h <sub>nom1</sub> – gr.1<br>h <sub>nom2</sub> – gr.2<br>h <sub>nom3</sub> – gr.3 | SIW 6AT-A22 ½"<br>SIW 4AT-A22 ½"<br>SIW22T-A ½", ¾"<br>(L=55&65mm – long socket)<br>SIW6-22 gr.2 ½"<br>(L=55&65mm – long socket) | SIW 6AT-A22 ½"<br>SIW 4AT-A22 ½"<br>SIW22T-A ½", ¾"<br>SIW6-22 gr.2 ½" | SIW22T-A ½"<br>SIW6-22 gr.2 ½"<br>SIW8-22 gr.1 ½"<br>SIW9-22 ¾" |

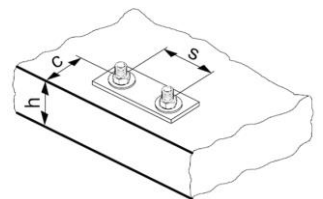
<sup>1)</sup> Installation with other impact screw driver of equivalent power is possible.

### Setting parameters

| Anchor size                                      | 6                       | 8                    | 10                   | 14                  |
|--|-------------------------|----------------------|----------------------|---------------------|
| Type   | HUS-<br>HR, CR          | HR, CR <sup>a)</sup> | HR, CR <sup>a)</sup> | HR                  |
| Nominal anchorage depth                          | h <sub>nom</sub> [mm]   | 55                   | 50 60 80             | 60 70 90 70 110     |
| Minimum base material thickness                  | h <sub>min</sub> [mm]   | 100                  | 100 100 120          | 120 120 140 140 160 |
| Minimum spacing                                  | s <sub>min</sub> [mm]   | 35                   | 45 45 50             | 50 50 50 50 60      |
| Minimum edge distance                            | c <sub>min</sub> [mm]   | 35                   | 45 45 50             | 50 50 50 50 60      |
| Critical spacing for splitting failure           | s <sub>cr,sp</sub> [mm] | 135                  | 114 114 192          | 166 194 256 187 310 |
| Critical edge distance for splitting failure     | c <sub>cr,sp</sub> [mm] | 68                   | 57 71 96             | 83 97 128 94 155    |
| Critical spacing for concrete cone failure       | s <sub>cr,N</sub> [mm]  | 135                  | 114 114 192          | 166 194 256 187 310 |
| Critical edge distance for concrete cone failure | c <sub>cr,N</sub> [mm]  | 68                   | 57 71 96             | 83 97 128 94 155    |

For spacing (edge distance) smaller than critical spacing (critical edge distance) the design loads have to be reduced (see system design resistance).

Critical spacing and critical edge distance for splitting failure apply only for non-cracked concrete. For cracked concrete only the critical spacing and critical edge distance for concrete cone failure are decisive.



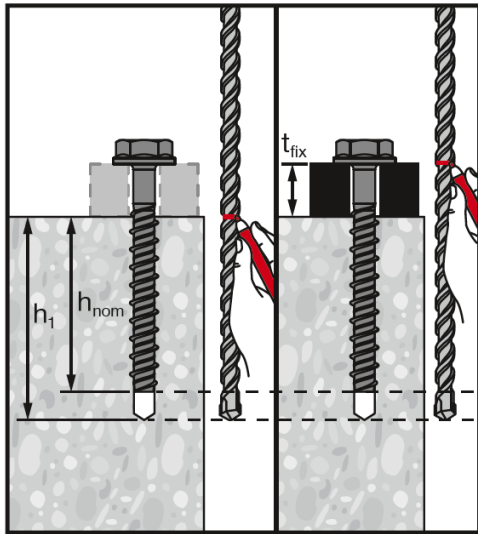


**Setting instructions**

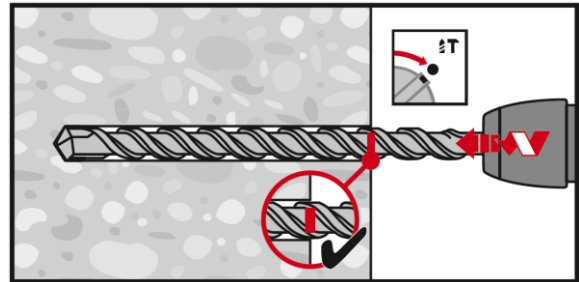
\*For detailed information on installation see instruction for use given with the package of the product

**Setting instruction**

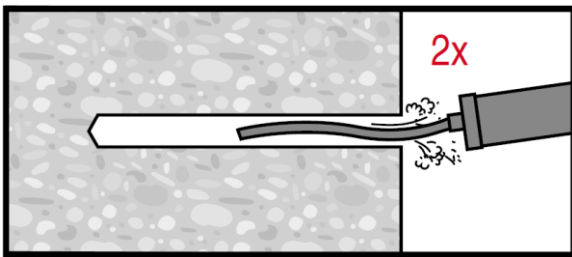
**Mark drill-bit length:**



**1. Hammer drilling:**

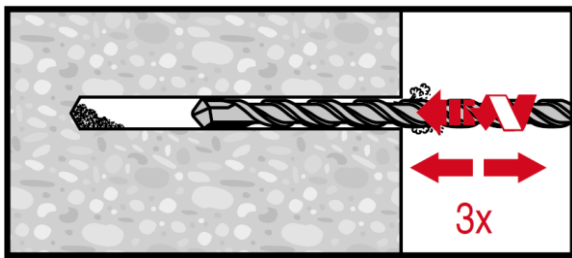


**2a. Cleaning:**



Cleaning needed in downward and horizontal installation direction with drill hole depth  $h_{nom} + 10\text{mm}$

**2b. Non-cleaning – 3x ventilation**

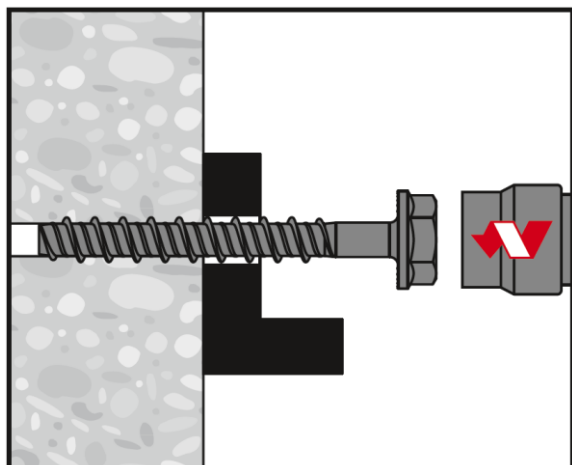


No cleaning is allowed in upward installation direction. No cleaning is allowed in downward and horizontal installation direction when 3x ventilation<sup>1)</sup> after drilling is executed.

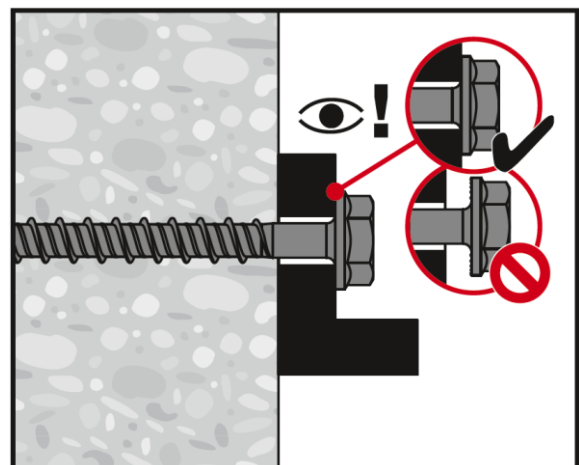
Drill hole depth  $h_{nom} + 10\text{mm} + 2 * d_0$

<sup>1)</sup> moving the drill bit in and out of the drill hole 3 times after the recommended drilling depth  $h_1$  is achieved. This procedure shall be done with both revolution and hammer functions activated in the drilling machine. For more details read the relevant installation instruction (MPII).

**3. Setting by impact screw driver**



**4. Setting check**



## Basic loading data (for a single anchor) in solid masonry units




### All data in this section applies to:

- Load values valid for holes drilled with TE rotary hammers in hammering mod
- Correct anchor setting (see instruction for use, setting details)
- The core/material ratio may not exceed 15 % of a bed joint area
- The brim area around holes must be at least 70mm
- Edge distances, spacing and other influences, see below
- All data given in this section according to Hilti Technical Data

### Nominal embedment depth

| Anchor size             |                | 6  | 8  | 10     |
|-------------------------|----------------|----|----|--------|
| Type                    | HUS4-          | HR | HR | HR, CR |
| Nominal embedment depth | $h_{nom}$ [mm] | 55 | 60 | 70     |

### Recommended loads for HUS4-HR / HUS4-CR

| Anchor size   |  |                        | 6   | 8   | 10  |
|---|--|------------------------|-----|-----|-----|
|    | Solid clay brick Mz 12/2,0<br>DIN 105 / EN 771-1<br>$f_b^{a)} \geq 12 \text{ N/mm}^2$    | Tension $N_{Rec}$ [kN] | 0,9 | 1,0 | 1,1 |
|   |  | Shear $V_{Rec}$ [kN]   | 1,4 | 2,0 | 2,3 |
|   | Solid sand-lime brick Mz 12/2,0<br>DIN 106/EN 771-2<br>$f_b^{a)} \geq 12 \text{ N/mm}^2$ | Tension $N_{Rec}$ [kN] | 0,6 | 0,6 | 1,0 |
|   |  | Shear $V_{Rec}$ [kN]   | 0,9 | 1,1 | 1,7 |
|  | Aerated concrete PPW 6-0,4<br>DIN 4165/EN 771-4<br>$f_b^{a)} \geq 6 \text{ N/mm}^2$      | Tension $N_{Rec}$ [kN] | 0,2 | 0,2 | 0,4 |
|   |  | Shear $V_{Rec}$ [kN]   | 0,4 | 0,4 | 0,9 |

## Permissible anchor location in brick and block walls

### Edge distance and spacing influence

- The technical data for HUS4-HR anchors are reference loads for MZ 12 and KS 12. Due to the large variation of natural stone solid bricks, on site anchor testing is recommended to validate technical data
- The HUS4-HR anchor was installed and tested in center of solid bricks as shown. The HUS4-HR anchor was not tested in the mortar joint between solid bricks or in hollow bricks, however a load reduction is expected
- For brick walls where anchor position in brick can not be determined, 100 % anchor testing is recommended
- Distance to free edge free edge to solid masonry (Mz and KS) units  $\geq 170\text{mm}$
- Distance to free edge free edge to solid masonry (autoclaved aerated gas concrete) units  $\geq 170\text{mm}$
- The minimum distance to horizontal and vertical mortar joint ( $c_{min}$ ) is started in drawing below
- Minimum anchor spacing ( $s_{min}$ ) in one brick/block is  $\geq 2 \cdot c_{min}$

### Limits

- Applied load to individual bricks may not exceed 1,0 kN without compression or 1,4 kN with compression
- All data is for multiple use for non-structural applications
- Plaster, graveling, lining or levelling courses are regarded as non-bearing and may not be taken into account for the calculation of embedment depth

