



# HILTI HKD FLUSH ANCHOR

**Technical Datasheet**



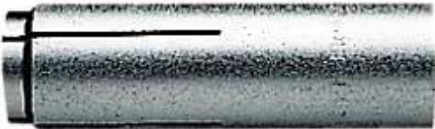
Update: Jan-23


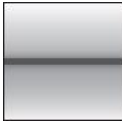









# HKD Flush anchor

Everyday standard manual set flush anchor for single anchor applications

| Anchor version   | Benefits  |
|--|---|
|  <p>HKD<br/>(M8-M20)</p>      | <ul style="list-style-type: none"> <li>- Simple and well proven</li> <li>- Approved, tested and confirmed by everyday jobsite experience</li> <li>- Reliable setting thanks to simple visual check</li> <li>- Versatile</li> <li>- For medium-duty fastening with bolts or threaded rods</li> <li>- Available in various materials and sizes for maximized coverage of possible applications</li> </ul> |
|  <p>HKD-S(R)<br/>(M6-M20)</p> |   |
|  <p>HKD-E(R)<br/>(M6-M20)</p> |   |

| Base material  | Load conditions   |
|--|---|
|  <p>Concrete<br/>(non-cracked)</p> |  <p>Static/<br/>quasi-static</p>  |
| Installation conditions  | Other information   |
|  <p>Hammer<br/>drilled holes</p>  |  <p>European<br/>Technical<br/>Assessment</p>  <p>CE<br/>conformity</p>  <p>PROFIS<br/>Engineering<br/>design<br/>software</p>  <p>A4<br/>316<br/>Corrosion<br/>resistance</p> |

## Approvals / certificates

| Description                                 | Authority / Laboratory | No. / date of issue      |
|---|------------------------|--------------------------|
| European Technical Assessment <sup>a)</sup> | CSTB, Marne-la-Vallée  | ETA-02/0032 / 2020-11-04 |
| Hilti technical data                        | Hilti                  |                          |

a) All data given in this section according to ETA-02/0032, issue 2015-01-07.

## Static resistance

### All data in this section applies to:

- Correct setting (See setting instruction)
- No edge distance and spacing influence
- Concrete as specified in the table
- Steel failure
- Minimum base material thickness
- Concrete C 20/25,  $f_{ck,cube} = 25 \text{ N/mm}^2$
- Screw or rod with steel grade 5.8 (carbon steel) and / or A4-70 (stainless steel)

### Effective anchorage depth for static

| Anchor size                             | M6 | M8 | M10 | M12 | M16 | M8 | M8 | M10 | M10 | M12 | M16 | M20 |
|---|----|----|-----|-----|-----|----|----|-----|-----|-----|-----|-----|
| Effective anchorage depth $h_{ef}$ [mm] | 25 | 25 | 25  | 25  | 30  | 30 | 40 | 30  | 40  | 50  | 65  | 80  |

### Characteristic resistance

| Anchor size |                | Hilti technical data |       |        |        | ETA-02/0032, issued 2020-11-04 |       |       |        |        |        |        |        |      |
|-------------|----------------|----------------------|-------|--------|--------|--------------------------------|-------|-------|--------|--------|--------|--------|--------|------|
|             |                | M6x25                | M8x25 | M10x25 | M12x25 | M6x30                          | M8x30 | M8x40 | M10x30 | M10x40 | M12x50 | M16x65 | M20x80 |      |
| Tension     | HKD            | 6,1                  | 6,1   | 6,1    | 6,1    | -                              | 8,1   | 9,0   | 8,1    | 12,4   | 17,4   | 25,8   | 35,2   |      |
|             | HKD-S, HKD-E   | $N_{Rk}$ [kN]        | 6,1   | -      | -      | -                              | 8,1   | 8,1   | 9,0    | 8,1    | 12,4   | 17,4   | 25,8   | 35,2 |
|             | HKD-SR, HKD-ER | 6,1                  | -     | -      | -      | 8,1                            | 8,1   | -     | -      | 12,4   | 17,4   | 25,8   | 35,2   |      |
| Shear       | HKD            | $V_{Rk}$ [kN]        | 5,0   | 6,1    | 6,1    | 6,1                            | -     | 8,6   | 9,2    | 10,0   | 11,0   | 18,3   | 33,8   | 49,5 |
|             | HKD-S, HKD-E   | 5,0                  | -     | -      | -      | 5,0                            | 7,0   | 7,0   | 7,4    | 8,0    | 14,1   | 21,9   | 34,7   |      |
|             | HKD-SR, HKD-ER | 6,2                  | -     | -      | -      | 6,4                            | 8,4   | -     | -      | 10,5   | 18,7   | 32,1   | 51,0   |      |

### Design resistance

| Anchor size |                | Hilti technical data |       |        |        | ETA-02/0032, issued 2020-11-04 |       |       |        |        |        |        |        |      |
|-------------|----------------|----------------------|-------|--------|--------|--------------------------------|-------|-------|--------|--------|--------|--------|--------|------|
|             |                | M6x25                | M8x25 | M10x25 | M12x25 | M6x30                          | M8x30 | M8x40 | M10x30 | M10x40 | M12x50 | M16x65 | M20x80 |      |
| Tension     | HKD            | $N_{Rd}$ [kN]        | 4,1   | 4,1    | 4,1    | 4,1                            | -     | 5,4   | 6,0    | 5,4    | 8,3    | 11,6   | 17,2   | 23,5 |
|             | HKD-S, HKD-E   | 4,1                  | -     | -      | -      | 5,4                            | 5,4   | 5,0   | 5,4    | 8,3    | 11,6   | 17,2   | 23,5   |      |
|             | HKD-SR, HKD-ER | 4,1                  | -     | -      | -      | 5,4                            | 5,4   | -     | -      | 8,3    | 11,6   | 17,2   | 23,5   |      |
| Shear       | HKD            | $V_{Rd}$ [kN]        | 4,0   | 4,1    | 4,1    | 4,1                            | -     | 6,9   | 7,3    | 8,0    | 8,8    | 14,6   | 27,0   | 39,6 |
|             | HKD-S, HKD-E   | 3,9                  | -     | -      | -      | 3,9                            | 5,5   | 5,5   | 5,9    | 6,4    | 11,3   | 17,5   | 27,8   |      |
|             | HKD-SR, HKD-ER | 4,1                  | -     | -      | -      | 4,2                            | 5,5   | -     | -      | 6,9    | 12,3   | 21,1   | 33,6   |      |



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

| Anchor size |                | Hilti technical data |       |        |        | ETA-02/0032, issued 2020-11-04 |       |       |        |        |        |        |        |
|-------------|----------------|----------------------|-------|--------|--------|--------------------------------|-------|-------|--------|--------|--------|--------|--------|
|             |                | M6x25                | M8x25 | M10x25 | M12x25 | M6x30                          | M8x30 | M8x40 | M10x30 | M10x40 | M12x50 | M16x65 | M20x80 |
| Tension     | HKD            | 2,9                  | 2,9   | 2,9    | 2,9    | -                              | 3,8   | 3,6   | 3,8    | 5,9    | 8,3    | 12,3   | 16,8   |
|             | HKD-S, HKD-E   | 2,9                  | -     | -      | -      | 3,8                            | 3,8   | 3,6   | 3,8    | 5,9    | 8,3    | 12,3   | 16,8   |
|             | HKD-SR, HKD-ER | 2,9                  | -     | -      | -      | 3,8                            | 3,8   | -     | -      | 5,9    | 8,3    | 12,3   | 16,8   |
| Shear       | HKD            | 2,9                  | 2,9   | 2,9    | 2,9    | -                              | 4,9   | 5,2   | 5,7    | 6,3    | 10,5   | 19,3   | 28,3   |
|             | HKD-S, HKD-E   | 2,8                  | -     | -      | -      | 2,8                            | 3,9   | 4,2   | 3,9    | 4,6    | 8,1    | 12,5   | 19,8   |
|             | HKD-SR, HKD-ER | 2,9                  | -     | -      | -      | 3,0                            | 3,9   | -     | -      | 4,9    | 8,8    | 15,1   | 24,0   |

a) 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.

### Materials

#### Mechanical properties

| Anchor size                              |                             | M6   | M8   | M10  | M12  | M16 | M20  |
|--|-----------------------------|------|------|------|------|-----|------|
| Nominal tensile strength                 | HKD                         | 570  | 570  | 570  | 570  | 640 | 590  |
|  | HKD-S, HKD-E                | 560  | 560  | 510  | 510  | -   | 460  |
|  | HKD-SR, HKD-ER              | 540  | 540  | 540  | 540  | -   | 540  |
| Yield strength                           | HKD                         | 460  | 460  | 460  | 480  | 510 | 470  |
|  | HKD-S, HKD-E                | 440  | 440  | 410  | 410  | -   | 375  |
|  | HKD-SR, HKD-ER              | 355  | 355  | 355  | 355  | -   | 355  |
| Stressed cross-section                   | HKD                         | 20,7 | 26,7 | 32,7 | 60,1 | 105 | 167  |
|  | HKD-S, HKD-E                | 20,9 | 26,1 | 28,8 | 58,7 | -   | 163  |
|  | HKD-SR, HKD-ER              |      |      |      |      |     |      |
| Moment of resistance                     | HKD                         | 32,3 | 54,6 | 82,9 | 184  | 431 | 850  |
|  | HKD-S, HKD-E                | 50   | 79   | 110  | 264  | 602 | 1191 |
|  | HKD-SR, HKD-ER              |      |      |      |      |     |      |
| Char. bending resistance for rod or bolt | With 5.8 Gr. Steel          | 7,6  | 18,7 | 37,4 | 65,5 | 167 | 325  |
|  | HKD-SR<br>HKD-ER with A4-70 | 11   | 26   | 52   | 92   | 187 | 454  |

#### Material quality

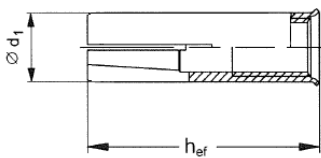
| Part           | Material       |  |
|----------------|----------------|--|
| Anchor body    | HKD            | Cold formed steel / galvanised to min. 5 $\mu\text{m}$ |
|                | HKD-S, HKD-E   | Steel Fe/Zn5 galvanised to min. 5 $\mu\text{m}$        |
|                | HKD-SR, HKD-ER | Stainless steel, 1.4401, 1.4404, 1.4571                |
| Expansion plug | HKD            | Cold formed steel                                      |
|                | HKD-S, HKD-E   | Cold formed steel                                      |
|                | HKD-SR, HKD-ER | Stainless steel, 1.4401, 1.4404, 1.4571                |

### Anchor dimensions of HKD, HKD-S, HKD-E, HKD-SR, HKD-ER

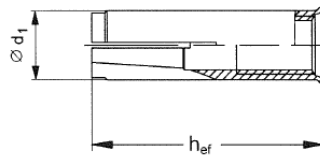
| Anchor size                        | Hilti technical data |       |        |        | ETA-02/0032, issued 2015-01-07 |       |       |        |        |        |        |        |  |
|------------------------------------|----------------------|-------|--------|--------|--------------------------------|-------|-------|--------|--------|--------|--------|--------|--|
|                                    | M6x25                | M8x25 | M10x25 | M12x25 | M6x30                          | M8x30 | M8x40 | M10x30 | M10x40 | M12x50 | M16x65 | M20x80 |  |
| Eff. anchorage depth $h_{ef}$ [mm] | 25                   | 25    | 25     | 25     | 30                             | 30    | 40    | 30     | 40     | 50     | 65     | 80     |  |
| Anchor diameter $d_1$ [mm]         | 7,9                  | 9,95  | 11,9   | 14,9   | 8                              | 9,95  | 9,95  | 11,8   | 11,95  | 14,9   | 19,75  | 24,75  |  |
| Plug diameter $d_2$ [mm]           | 5,1                  | 6,35  | 8,1    | 9,7    | 5                              | 6,5   | 6,35  | 8,2    | 8,2    | 10,3   | 13,8   | 16,4   |  |
| Plug length $l_1$ [mm]             | 10                   | 7     | 7      | 7,2    | 15                             | 12    | 16    | 12     | 16     | 20     | 29     | 30     |  |

#### Anchor body

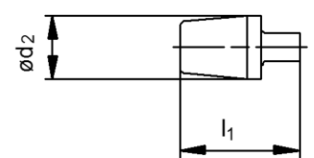
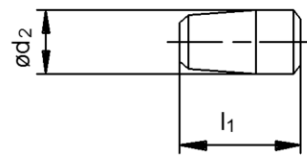
HKD



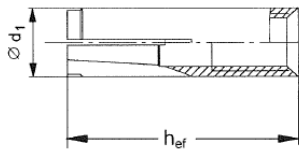
HKD-S and HKD-SR



#### Expansion plugs



HKD-E and HKD ER

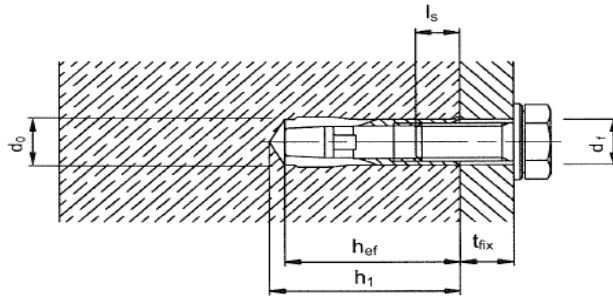


### Setting information

#### Setting details

| Anchor size   | Hilti technical data |       |        |        | ETA-02/0032, issued 2015-01-07 |       |       |                      |        |        |        |        |  |
|---|----------------------|-------|--------|--------|--------------------------------|-------|-------|----------------------|--------|--------|--------|--------|--|
|   | M6x25                | M8x25 | M10x25 | M12x25 | M6x30                          | M8x30 | M8x40 | M10x30 <sup>a)</sup> | M10x40 | M12x50 | M16x65 | M20x80 |  |
| Effective embedment depth $h_{ef}$ [mm]                   | 25                   | 25    | 25     | 25     | 30                             | 30    | 40    | 30                   | 40     | 50     | 65     | 80     |  |
| Nominal diameter of drill bit $d_o$ [mm]                  | 8                    | 10    | 12     | 15     | 8                              | 10    | 10    | 12                   | 12     | 15     | 20     | 25     |  |
| Cutting diameter of drill bit $d_{cut} \leq$ [mm]         | 8,45                 | 10,5  | 12,5   | 15,5   | 8,45                           | 10,5  | 10,5  | 12,5                 | 12,5   | 15,5   | 20,5   | 25,5   |  |
| Depth of drill hole $h_1 \geq$ [mm]                       | 27                   | 27    | 27     | 27     | 32                             | 33    | 43    | 33                   | 43     | 54     | 70     | 85     |  |
| Screwing depth $l_{s,min}$ [mm]                           | 6                    | 8     | 10     | 12     | 6                              | 8     | 8     | 10                   | 10     | 12     | 16     | 20     |  |
| Thread engagement depth $l_{s,max}$ [mm]                  | 12                   | 11,5  | 12     | 12     | 12,5                           | 14,5  | 17,5  | 12,7                 | 18     | 23,5   | 30,5   | 42     |  |
| Diameter of clearance hole in the fixture $d_f \leq$ [mm] | 7                    | 9     | 12     | 14     | 7                              | 9     | 9     | 12                   | 12     | 14     | 18     | 22     |  |
| Max. torque moment $T_{inst}$ [Nm]                        | 4                    | 8     | 15     | 35     | 4                              | 8     | 8     | 15                   | 15     | 35     | 60     | 100    |  |

a) With anchor size M10x30 only threaded rod is to be used.



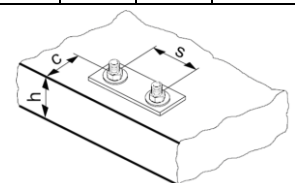
### Installation equipment

| Anchor size               |                | M6                                   | M8      | M10      | M10   | M12           | M16   |
|---------------------------|----------------|--------------------------------------|---------|----------|-------|---------------|-------|
| Rotary hammer for setting |                | TE 1 – TE 3                          |         |          |       | TE 16 – TE 50 |       |
| Machine setting tool      | HSD-M          | 6x25/30                              | 8x25/30 | 10x25/30 | 10x40 | 12x50         | 16x65 |
| Hand setting tool         | HSD-G<br>HSD-M | 6x25/30                              | 8x25/30 | 10x25/30 | 10x40 | 12x50         | 16x65 |
| Other tools               |                | hammer, torque wrench, blow out pump |         |          |       |               |       |

### Setting parameters

| Anchor size  |                  | Hilti technical data |       |        |        | ETA-02/0032, issued 2015-01-07 |       |       |        |        |        |        |        |
|--|------------------|----------------------|-------|--------|--------|--------------------------------|-------|-------|--------|--------|--------|--------|--------|
|  |                  | M6x25                | M8x25 | M10x25 | M12x25 | M6x30                          | M8x30 | M8x40 | M10x30 | M10x40 | M12x50 | M16x65 | M20x80 |
| Minimum base material thickness  | $h_{min}$ [mm]   | 100                  | 100   | 100    | 100    | 100                            | 100   | 100   | 100    | 100    | 100    | 130    | 160    |
| Minimum spacing and minimum edge distance HKD-S (R) / HKD-E (R)                        | $s_{min}$ [mm]   | 60                   | 60    | 60     | 60     | 60                             | 60    | 80    | 60     | 80     | 125    | 130    | 160    |
|  | $c_{min}$ [mm]   | 88                   | 88    | 88     | 88     | 105                            | 105   | 140   | 105    | 140    | 175    | 230    | 280    |
| Minimum spacing HKD  | $s_{min}$ [mm]   | 80                   | 80    | 80     | 80     | 60                             | 60    | 80    | 60     | 80     | 125    | 130    | 160    |
|  | $c \geq$ [mm]    | 140                  | 140   | 140    | 140    | 105                            | 105   | 140   | 105    | 140    | 175    | 230    | 280    |
| Minimum edge distance HKD  | $c_{min}$ [mm]   | 100                  | 100   | 100    | 100    | 80                             | 80    | 140   | 80     | 140    | 175    | 230    | 280    |
|  | $s \geq$ [mm]    | 150                  | 150   | 150    | 150    | 120                            | 120   | 80    | 120    | 80     | 125    | 130    | 160    |
| Critical spacing and edge distance for splitting failure HKD                           | $s_{cr,sp}$ [mm] | 200                  | 200   | 200    | 200    | 210                            | 210   | 280   | 210    | 280    | 350    | 455    | 560    |
|  | $c_{cr,N}$ [mm]  | 100                  | 100   | 100    | 100    | 105                            | 105   | 140   | 105    | 140    | 175    | 227    | 280    |
| Critical spacing and edge distance for concrete cone failure HKD / HKDS-(R) / HKD-E(R) | $s_{cr,N}$ [mm]  | 80                   | 80    | 80     | 80     | 90                             | 90    | 120   | 90     | 120    | 150    | 195    | 240    |
|  | $c_{cr,N}$ [mm]  | 40                   | 40    | 40     | 40     | 45                             | 45    | 60    | 45     | 60     | 75     | 97     | 120    |
| Critical spacing and edge distance for splitting failure HKD-S(R) / HKD-E(R)           | $s_{cr,sp}$ [mm] | 176                  | 176   | 176    | 176    | 210                            | 210   | 280   | 210    | 280    | 350    | 455    | 560    |
|  | $c_{cr,N}$ [mm]  | 88                   | 88    | 88     | 88     | 105                            | 105   | 140   | 105    | 140    | 175    | 227    | 280    |

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



### Setting instruction

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

| Setting instruction                          |                                   |
|--|-----------------------------------|
| <b>1. Drilling</b><br>                       | <b>2. Cleaning</b><br>            |
| <b>3. Inserting the anchor</b><br>           | <b>4. Setting tools</b><br>       |
| <b>5. Inserting the tools</b><br>            | <b>6. Inserting the tools</b><br> |
| <b>7. Attaching the belonging washer</b><br> |                                   |