

# Vorpa CSB COMBI

Steel anchor with European Technical Assessment for cracked concrete



products group



**CSB COMBI**  
thread M8/M10

**Approvato per**

- cracked and non cracked concrete
- multiple use for non structural applications for cracked and non cracked concrete and pre-stressed hollow core slabs

**Per ancorare**

- industrial systems
- structural fixings
- profiles
- pipes
- plants engineering
- structural fixings

**Idoneo anche per**

- natural stone
- solid brick



EAD 330232-00-0601  
for cracked and non cracked concrete

ETAG 001-046  
for multiple use for non structural applications for cracked and non cracked concrete and pre-stressed hollow core slabs



**R30-R120**

product information

**Characteristics**

- steel screw with European Technical Assessment for cracked concrete and multiple use for non structural applications for pre-stressed hollow core slabs.
- reduced hole diameter
- vibrations resistance
- ideal for permanent and removable fixing both inside and outside
- virtually expansion-free operation allows cost-efficient fixing with small axial spacing and edge distances.
- fire resistance ratings R30–R120

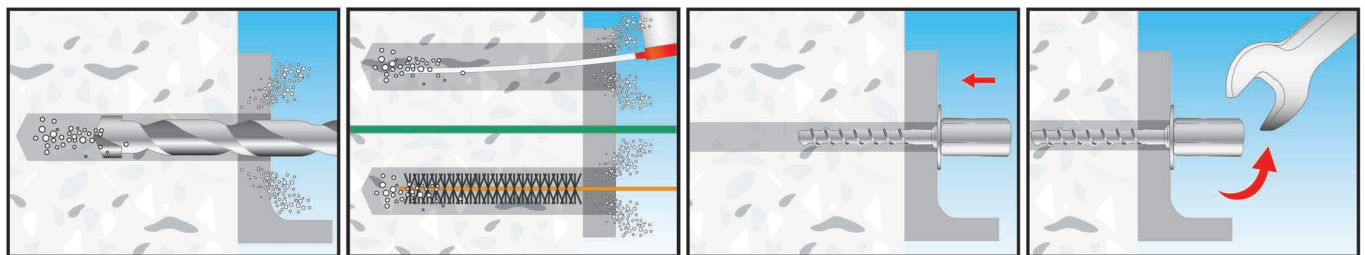
**Installation**

- through-setting anchor

**Suggestion for use**

- choose the right size of the anchor according to the load
- always check load bearing capacity values in the table
- respect the installation data
- clean the hole before the installation

installation sequence



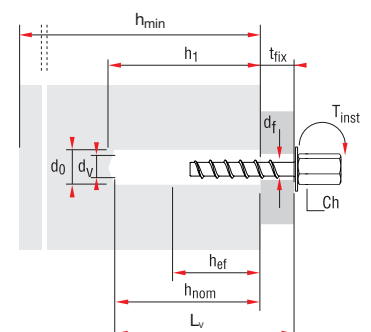
**Clean the hole before the installation**

product code and technical data

| Code  | Description       | t <sub>fix</sub><br>mm | d <sub>o</sub><br>mm | T <sub>inst</sub><br>Nm | Ch | C <sub>min</sub><br>mm | S <sub>min</sub><br>mm |
|-------|-------------------|------------------------|----------------------|-------------------------|----|------------------------|------------------------|
| 91151 | CSB CE COMBI 6x35 | -                      | 6                    | 10                      | 13 | 40                     | 40                     |
| 91152 | CSB CE COMBI 6x55 | 20                     | 6                    | 10                      | 13 | 40                     | 40                     |

h<sub>1</sub> = Minimum depth of drill hole  
 L<sub>v</sub> = Screw length  
 d<sub>o</sub> = Drill hole diameter  
 d<sub>v</sub> = Screw diameter  
 d<sub>f</sub> = Diameter of clearance hole in the fixture  
 t<sub>fix</sub> = Maximum thickness of fixture

T<sub>inst</sub> = Required torque moment  
 Ch = Spanner  
 h<sub>min</sub> = Minimum thickness of concrete member  
 h<sub>nom</sub> = Overall anchor embedment depth  
 h<sub>ef</sub> = Effective anchorage depth  
 C<sub>min</sub> = Minimum allowable edge distance  
 S<sub>min</sub> = Minimum allowable spacing



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Steel anchor with European Technical Assessment for cracked concrete



cracked concrete

installation data

## CSB COMBI

### CSB COMBI 6x35

### CSB COMBI 6x55

| Installation data            |            |    |      |      |      |     |
|------------------------------|------------|----|------|------|------|-----|
| Embedment depth              | $h_{nom}$  | mm | *35  | *35  | 40   | 55  |
| Fixture thickness            | $T_{fix}$  | mm | 0    | 20   | 15   | 0   |
| Hole diameter                | $d_o$      | mm | 6    | 6    | 6    | 6   |
| Hole depth                   | $h_1$      | mm | 40   | 40   | 45   | 60  |
| Torque moment                | $T_{inst}$ | Nm | ≤10  | ≤10  | ≤10  | ≤10 |
| Hole diameter in the fixture | $d_f$      | mm | 8    | 8    | 8    | 8   |
| Critical axial spacing       | $S_{cr,N}$ | mm | 81   | 81   | 93   | 132 |
| Critical edge distance       | $C_{cr,N}$ | mm | 40,5 | 40,5 | 46,5 | 66  |
| Minimum axial spacing        | $S_{min}$  | mm | 35   | 35   | 40   | 40  |
| Minimum edge distance        | $C_{min}$  | mm | 35   | 35   | 40   | 40  |
| Minimum structural thickness | $h_{min}$  | mm | 80   | 80   | 100  | 100 |

### Characteristic values application in concrete non-cracked C20/C25

|                  |            |           |      |      |      |      |
|------------------|------------|-----------|------|------|------|------|
| Embedment depth  | $h_{nom}$  | mm        | *35  | *35  | 40   | 55   |
| Pull out failure | $N_{rk,P}$ | C20/25 KN | 3,0  | 3,0  | 4,0  | 9,0  |
| ψc C30           |            | KN        | 1,22 | 1,22 | 1,22 | 1,22 |
| ψc C40           |            | KN        | 1,41 | 1,41 | 1,41 | 1,41 |
| ψc C50           |            | KN        | 1,58 | 1,58 | 1,58 | 1,58 |

### Characteristic values application in concrete cracked C20/C25

|                  |            |           |      |      |      |      |
|------------------|------------|-----------|------|------|------|------|
| Embedment depth  | $h_{nom}$  | mm        | *35  | *35  | 40   | 55   |
| Pull out failure | $N_{rk,P}$ | C20/25 KN | 3,0  | 3,0  | 2,0  | 4,0  |
| ψc C30           |            | KN        | 1,22 | 1,22 | 1,22 | 1,22 |
| ψc C40           |            | KN        | 1,41 | 1,41 | 1,41 | 1,41 |
| ψc C50           |            | KN        | 1,58 | 1,58 | 1,58 | 1,58 |

|                |            |           |      |      |      |      |
|----------------|------------|-----------|------|------|------|------|
| Shear failure  | $V_{rk,S}$ | C20/25 KN | 7,0  | 7,0  | 7,0  | 7,0  |
| Bending moment | $M_{rk,S}$ | KN        | 10,9 | 10,9 | 10,9 | 10,9 |

### Values with reduction factor

|                                       |            |    |     |     |     |     |
|---------------------------------------|------------|----|-----|-----|-----|-----|
| Pull out failure non cracked concrete | $N_{rk,P}$ | KN | 2,0 | 2,0 | 2,6 | 6,0 |
| Pull out failure cracked concrete     | $N_{rk,P}$ | KN | 2,0 | 2,0 | 1,3 | 2,6 |
| Shear failure                         | $V_{rk,S}$ | KN | 5,6 | 5,6 | 5,6 | 5,6 |
| Bending moment                        | $M_{rk,S}$ | KN | 8,7 | 8,7 | 8,7 | 8,7 |

### Recommended loads

|                                       |            |    |      |      |      |      |
|---------------------------------------|------------|----|------|------|------|------|
| Pull out failure non cracked concrete | $N_{rk,P}$ | KN | 1,40 | 1,40 | 1,80 | 4,2  |
| Pull out failure cracked concrete     | $N_{rk,P}$ | KN | 1,40 | 1,40 | 0,9  | 1,80 |
| Shear failure                         | $V_{rk,S}$ | KN | 4,0  | 4,0  | 4,0  | 4,0  |
| Bending moment                        | $M_{rk,S}$ | KN | 6,2  | 6,2  | 6,2  | 6,2  |

\*  $h_{nom}=35mm$ : Only for multiple use in non structural application. See ETA

### Examples of applications

