WÜRTH

# CONSTRUCTION FIXINGS

## Anchor technology
## Edition 10

# CONTENTS

| | Bonded anchors | | | | | | | | Mechanical anchors | |
|---|---|---|---|---|---|---|---|---|---|---|
| |  |  |  |  |  |  |  |  |  |  |
| **Product-name** | **W-VIZ** | **WIT-BS** | **WIT-UH 300** | **WIT-VM 250/ WIT-Nordic** | **WIT-PM 200** | **WIT-EA 200** | **WIT-PE 1000** | **WIT-PE 500** | **W-BS** | **W-FAZ** |
| **Page** | 7 | 11 | 14 | 17 | 21 | 24 | 27 | 30 | 51 | 55 |
| Load capacity | KG KG KG KG | KG KG KG KG | KG KG KG KG | KG KG KG | KG KG | KG KG | KG KG KG KG | KG KG KG | KG KG KG KG | KG KG KG |
| Assessment/ Approval | EU | DE | EU | EU | EU | EU | EU | EU | EU | EU |
| Cracked concrete | ✓ | ✓ | ✓ | ✓ | ✗ | ✗ | ✓ | ✓ | ✓ | ✓ |
| Uncracked concrete | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Post-installed REBAR | ✗ | ✗ | ✓ | ✓ | ✗ | ✗ | ✓ | ✓ | ✗ | ✗ |
| Solid bricks and blocks | ✗ | ✗ | ✗ | ✓ | ✓ | ✓ | ✗ | ✗ | ✗ | ✗ |
| Hollow bricks and blocks | ✗ | ✗ | ✗ | ✓ | ✓ | ✓ | ✗ | ✗ | ✗ | ✗ |
| Aerated concrete | ✗ | ✗ | ✗ | ✓ | ✓ | ✓ | ✗ | ✗ | ✗ | ✗ |
| Plasterboard | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ |

**Anchor rods and elements p. 33** **Mortar volume calculation p. 39** **Accessories p. 43**

| | | | | General fixings | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  |  |  |  |  |  |
| **W-HAZ** | **W-FA** | **W-ED** | **W-NA** | **W-UR** | **W-FRA** | **W-ND** | **Shark pro** | **Zebra Shark** | **Nylon plug** | **AMO III** | **W-GS** |
| 59 | 63 | 66 | 69 | 72 | 75 | 77 | 78 | 80 | 82 | 83 | 85 |
| KG KG KG | KG KG KG | KG KG | KG KG | KG KG | KG KG | KG | KG KG | KG | KG | KG | KG |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | | | |
| ✓ | ✗ | ✓ | ✓ | ✓ | ✓ | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ |
| ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ |
| ✗ | ✗ | ✗ | ✗ | ✓ | ✓ | ✗ | ✓ | ✓ | ✓ | ✓ | ✗ |
| ✗ | ✗ | ✗ | ✗ | ✓ | ✓ | ✗ | ✓ | ✓ | ✗ | ✓ | ✗ |
| ✗ | ✗ | ✗ | ✗ | ✓ | ✓ | ✗ | ✓ | ✓ | ✗ | ✗ | ✗ |
| ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | ✓ | ✗ | ✗ | ✓ |

# "FIRST AID" IN ANCHOR TECHNOLOGY

## ENVIRONMENT

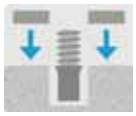
**Dry interior**
Material to be used:
Galvanized, hot-dipped and sherardized steel

**Wet rooms/outdoors**
Material to be used:
Stainless steel A4

**Highly corrosive environment (e.g. road tunnels or swimming pools)**
Material to be used:
High corrosion resistant (HCR) steel

## INSTALLATION TYPES

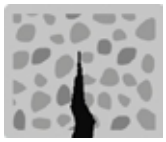
**Push-through installation**
Anchor is pushed through anchor plate



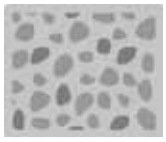
**In-place installation**
In-place installation of anchor; anchor plate fixed afterwards

**Stand-off Installation**
The item to be fastened is mounted at a distance from the surface of the base material.

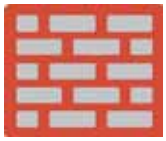
## BASE MATERIAL



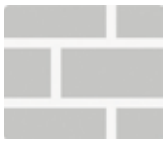
**Cracked concrete**
Concrete can be riddled with small, invisible cracks. Therefore, always use anchors approved for cracked concrete.



**Uncracked concrete**
Has to be certified for the entire life span in examinations by a planning or structural engineer.



**Perforated bricks and blocks**
Masonry made of perforated bricks or blocks can be recognized by a jerky drilling progress.



**Solid bricks and blocks masonry**
Masonry made of solid bricks and blocks can be recognized by a slow but steady drilling progress.

**Aerated concrete**
Masonry made of aerated concrete can be recognized by a fast and steady drilling progress and white drilling dust.

**Hollow pre-stressed concrete slabs**
Concrete slabs with cavities and pre-stressed strands.

**Dry walls**
Boards, often made of gypsum plaster, with cavities between the boards.

## INSTALLATION CONDITIONS

**Dry**
The base material is dry.
**Wet**
The base material is water saturated in the area of the anchorage.
**Flooded**
The drill hole is water flooded, but not in submerged conditions.

## DRILLING METHODS

**Rotary hammer driling**

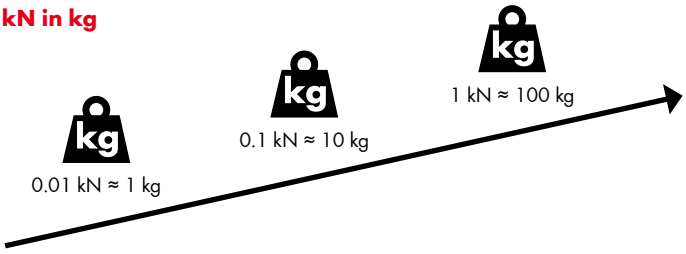
**Compressed air drilling**

**Rotary hammer drilling with a Hollow Drill Bit System**
This drilling system removes the dust and cleans the drill hole during drilling

**Diamond coring**

## CONVERSION

**kN in kg**



# SYMBOLS

**European Technical Assessment**
Key document for designing an anchorage. It contains the performance parameter of the anchor.

**German Technical Assessment**
Key document for designing an anchorage. It contains the performance parameter of the anchor.

**Seismic actions**
The ETA recommends the seismic performance categories for fasteners. They are C1 or C2.

**Fire resistance classification**

**Leed certificated**
The system looks at numerous factors that were divided into five categories, which relate to and include the health of humans and the environment.

**VOC Emissions class label**
In the context of analyzing the air a group of pollutants is analyzed, which can have serious health effects on humans. The term VOC (volatile organic compounds) is grouped together, a plurality of volatile organic compounds.

**NSF International**
The National Sanitation Foundation (NSF) is a nonprofit organization that ensures the safety of public health and environmental protection.
It ensures that the materials and additives used in food, water or air are not harmful to health.

For sprinkler systems

An **EPD** (Environmental Product Declaration) is a multipage document that serves to provide transparency to the public regarding the environmental influences of building products. It is the basis for the ecological evaluation of buildings.

# ASSESSMENT/APPROVAL

**Component (anchor)**

**Of relevance to building authorities**
- If the anchor fails, danger to life and/or great economic damage may occure
- **Load-bearing structure** (e.g. anchoring steel support)
- **redundant, non-structural system** (e.g. mounting suspended ceiling)

**Certificate required**

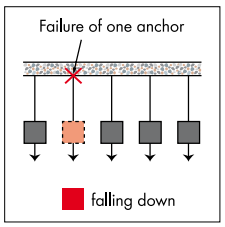
**Component (anchor)**

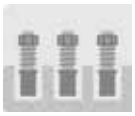
**Of no relevance to building authorities**
- No danger if the anchor fails
- e.g. mounting skirting boards, post boxes or the like

**No certificate necessary**
Planner/executor is responsible

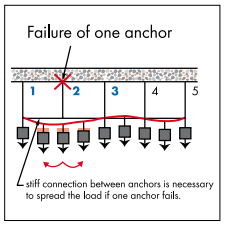
## Approved for:

**Single or group of fasteners**
The loads are applied to the individual fasteners.



**Fasteners in redundant non-structural systems**
It is assumed that the load can be transmitted to adjacent fasteners without violating the requirements on the fixture.
(Requirements are given in ETA)



# BONDED ANCHORS

# INJECTION SYSTEM WIT-VM 100/WIT-VIZ

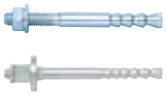

150 ml 420 ml

| Cartridge sizes | | Art. no. | Dispensing guns |
|---|---|---|---|
| 150 ml | coaxial | **0905 440 002** | p. 48 |
| 420 ml | coaxial | **0905 440 004** | |

## Application references




## Approvals and certificates


| | Special insert |
|---|---|
| |  |
| | ✓ |
| | p. 9 |

| Temperature of base material | Gelling – working time | Min. curing time – dry conditions[1)] |
|---|---|---|
| -5°C | 90 min | 6 h |
| -4°C to -1°C | 45 min | 6 h |
| 0°C to 4°C | 20 min | 3 h |
| 5°C to 9°C | 12 min | 2 h |
| 10°C to 19°C | 6 min | 80 min |
| 20°C to 29°C | 4 min | 45 min |
| 30°C to 34°C | 2 min | 25 min |
| 35°C to 39°C | 80 s | 20 min |
| 40°C | 80 s | 15 min |

[1)] for wet base material the curing time must be doubled

| Type of installation | | |
|---|---|---|
| Pre-positioned | In-place | Stand-off |
| ✓ | ✓ | ✓ |

| Installation condition | | |
|---|---|---|
| Dry concrete | Wet concrete | Flooded drill hole |
| ✓ | ✓ | ✓ |

| Drilling method | | |
|---|---|---|
| Hammer drill | Diamond drill | Hollow drill |
| ✓ | ✓ | ✓ |

# INJECTION SYSTEM WIT-VM 100/WIT-VIZ

## Loads

| Thread size | | | | M8 | | M10 | | M12 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Effective anchorage depth** | | $h_{ef}$ | [mm] | 40 | 50 | 60 | 75 | 75 | 70 | 80 | 95 | 100 | 110 | 125 |
| **Non-cracked Concrete** | | | | | | | | | | | | | | |
| **Tension** | S/A4 | $N_{rec}$ | [kN] | 4.3 | 8.3 | 10.9 | 11.9 | 15.2 | 13.7 | 16.8 | 19.0 | 23.4 | 23.8 | 23.8 |
| **Shear** | S | $V_{rec}$ | [kN] | 8.0 | 8.0 | 12.0 | 12.0 | 19.4 | 19.4 | 19.4 | 19.4 | 19.4 | 19.4 | 19.4 |
| | A4 | | | 8.6 | 8.6 | 13.1 | 13.1 | 19.4 | 19.4 | 19.4 | 19.4 | 19.4 | 19.4 | 19.4 |
| **Minimum edge distance** | | $c_{min}$ | [mm] | 40 | 40 | 50 | 50 | 50 | 55 | 55 | 55 | 55 | 55 | 55 |
| **Cracked Concrete** | | | | | | | | | | | | | | |
| **Tension** | S/A4 | $N_{rec}$ | [kN] | 4.1 | 5.8 | 7.6 | 10.7 | 10.7 | 9.6 | 11.7 | 15.2 | 16.4 | 18.9 | 22.9 |
| **Shear** | S | $V_{rec}$ | [kN] | 8.0 | 8.0 | 12.0 | 12.0 | 19.4 | 19.2 | 19.4 | 19.4 | 19.4 | 19.4 | 19.4 |
| | A4 | | | 8.3 | 8.6 | 13.1 | 13.1 | 19.4 | 19.2 | 19.4 | 19.4 | 19.4 | 19.4 | 19.4 |
| **Minimum edge distance** | | $c_{min}$ | [mm] | 40 | 40 | 40 | 40 | 50 | 55 | 50 | 50 | 50 | 50 | 50 |

[1] Loads are valid for single anchors. Normal spaced reinforcement in ≥ C20/25. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included. The material safety factor depends on the failure mode.
[2] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.

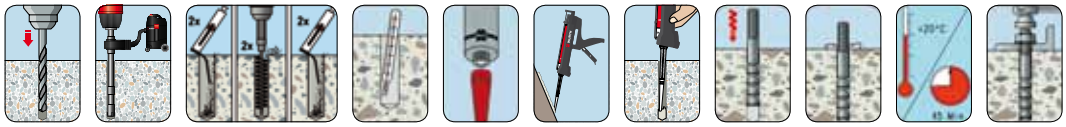
| **Clearance-hole in fixture** | $d_f$ | [mm] | 9 | | 12 | | 14 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Drill depth** | $h_0 = h_{ef}$ | [mm] | 40 | 50 | 60 | 75 | 75 | 70 | 80 | 95 | 100 | 110 | 125 |
| **Minimum thickness of concrete member** | $h_{min}$ | [mm] | 80 | 80 | 100 | 110 | 110 | 110 | 110 | 130 | 130 | 140 | 160 |

| Thread size | | | | M16 | | | | | M20 | | | M24 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Effective anchorage depth** | | $h_{ef}$ | [mm] | 90 | 105 | 125 | 145 | 160 | 115 | 170 | 190 | 170 | 200 | 225 |
| **Non-cracked Concrete** | | | | | | | | | | | | | | |
| **Tension** | S/A4 | $N_{rec}$ | [kN] | 20.0 | 25.2 | 32.7 | 35.7 | 42.9 | 28.9 | 51.9 | 61.4 | 51.9 | 66.3 | 79.1 |
| **Shear** | S | $V_{rec}$ | [kN] | 36.0 | 36.0 | 36.0 | 36.0 | 36.0 | 35.7 | 56.0 | 56.0 | 80.6 | 80.6 | 80.6 |
| | A4 | | | 36.0 | 36.0 | 36.0 | 36.0 | 36.0 | 43.9 | 49.1 | 49.1 | 70.3 | 70.3 | 70.3 |
| **Minimum edge distance** | | $c_{min}$ | [mm] | 50 | 60 | 60 | 60 | 60 | 80 | 80 | 80 | 80 | 105 | 105 |
| **Cracked Concrete** | | | | | | | | | | | | | | |
| **Tension** | S/A4 | $N_{rec}$ | [kN] | 14.0 | 17.6 | 22.9 | 28.6 | 33.2 | 20.2 | 36.3 | 42.9 | 36.3 | 46.4 | 55.3 |
| **Shear** | S | $V_{rec}$ | [kN] | 28.0 | 35.3 | 36.0 | 36.0 | 36.0 | 35.7 | 56.0 | 56.0 | 72.7 | 80.6 | 80.6 |
| | A4 | | | 28.0 | 35.3 | 36.0 | 36.0 | 36.0 | 40.4 | 49.1 | 49.1 | 70.3 | 70.3 | 70.3 |
| **Minimum edge distance** | | $c_{min}$ | [mm] | 50 | 50 | 60 | 60 | 60 | 80 | 80 | 80 | 80 | 80 | 80 |

[1] Loads are valid for single anchors. Normal spaced reinforcement in ≥ C20/25. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included. The material safety factor depends on the failure mode.
[2] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.

| **Clearance-hole in fixture** | $d_f$ | [mm] | 18 | | | | | 22 | 24 | | 26 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Drill depth** | $h_0 = h_{ef}$ | [mm] | 90 | 105 | 125 | 145 | 160 | 115 | 170 | 190 | 170 | 200 | 225 |
| **Minimum thickness of concrete member** | $h_{min}$ | [mm] | 130 | 150 | 170 | 190 | 205 | 160 | 230 | 250 | 230 | 270 | 300 |

## Installation Concrete



# INJECTION SYSTEM WIT-VM 100/WIT-VIZ

W-VIZ-A in combination with WIT-VM 100 (ETA-04/0095)

| Type | Effective anchorage depth $h_{ef}$ [mm] | Anchor length l [mm] | Fixture thickness for $t_{fix}$ [mm] | Art. no. Carbon steel galvanized | Art. no. Stainless steel A4 | Art. no. High corrosion resistant steel HCR | Drill hole diameter $d_o$ [mm] | Drill hole depth $h_0$ [mm] | Installation torque $T_{inst}$ [Nm] | Wrench size SW | Approval ETA-04/0095 | Approval Sesimic C1/C2 | Thread length M x length [mm] | P. Qty. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W-VIZ-A M8 | 40 | 65 | 15 | 0905 440 811 | 0905 450 811 | – | 10 | 42 | 10 | 13 | ✓ | - | M8x22 | 10 |
| | 50 | 80 | 15 | 0905 440 801 | 0905 450 801 | 5916 410 801 | | 55 | | | ✓ | - | M8x22 | |
| | | 95 | 30 | 0905 440 802 | 0905 450 802 | 5916 410 802 | | | | | ✓ | - | M8x31 | |
| | | 110 | 45 | 0905 440 803 | 0905 450 803 | 5916 410 803 | | | | | ✓ | - | M8x31 | |
| W-VIZ-A M10 | 60 | 85 | 10 | 0905 441 001 | 0905 451 001 | 5916 411 001 | 12 | 65 | 15 | 17 | ✓ | C1 + C2 | M10x18 | |
| | | 95 | 20 | 0905 441 002 | 0905 451 002 | 5916 411 002 | | | | | ✓ | C1 + C2 | M10x27 | |
| | | 105 | 30 | 0905 441 003 | 0905 451 003 | – | | | | | ✓ | C1 + C2 | M10x27 | |
| | | 135 | 60 | 0905 441 004 | 0905 451 004 | 5916 411 004 | | | | | ✓ | C1 + C2 | M10x47 | |
| | | 175 | 100 | 0905 441 005 | 0905 451 005 | 5916 411 005 | | | | | ✓ | C1 + C2 | M10x57 | |
| | 75 | 110 | 20 | 0905 441 011 | 0905 451 011 | – | | 80 | | | ✓ | C1 + C2 | M10x27 | |
| W-VIZ-A M12 | 75 | 120 | 25 | – | 0905 451 231 | – | 12 | 105* | 25 | 19 | ✓ | C1 + C2 | M12x37 | 10 |
| | | 135 | 40 | – | 0905 451 232 | – | | 120* | | | ✓ | C1 + C2 | M12x52 | |
| | | 155 | 60 | – | 0905 451 233 | – | | 140* | | | ✓ | C1 + C2 | M12x72 | |
| | | 175 | 80 | – | 0905 451 234 | – | | 160* | | | ✓ | C1 + C2 | M12x92 | |
| | 70 | 115 | 25 | 0905 441 211 | 0905 451 211 | – | 14 | 75 | | | ✓ | C1 + C2 | M12x26 | |
| | 80 | 110 | 10 | 0905 441 201 | 0905 451 201 | 5916 411 201 | | 85 | | | ✓ | C1 + C2 | M12x21 | |
| | | 125 | 25 | 0905 441 202 | 0905 451 202 | 5916 411 202 | | | | | ✓ | C1 + C2 | M12x36 | |
| | | 150 | 50 | 0905 441 203 | 0905 451 203 | 5916 411 203 | | | | | ✓ | C1 + C2 | M12x46 | |
| | | 200 | 100 | 0905 441 204 | 0905 451 204 | – | | | | | ✓ | C1 + C2 | M12x71 | |
| | | 225 | 125 | 0905 441 205 | 0905 451 205 | – | | | | | ✓ | C1 + C2 | M12x71 | |
| | | 265 | 165 | 0905 441 206 | 0905 451 206 | – | | | | | ✓ | C1 + C2 | M12x71 | |
| | 95 | 140 | 25 | 0905 441 221 | 0905 451 221 | – | | 100 | | | ✓ | C1 + C2 | M12x36 | |
| | 100 | 145 | 25 | 0905 441 251 | 0905 451 251 | 5916 411 251 | | 105 | 30 | | ✓ | C1 + C2 | M12x36 | |
| | | 180 | 60 | 0905 441 252 | 0905 451 252 | 5916 411 252 | | | | | ✓ | C1 + C2 | M12x56 | |
| | | 220 | 100 | 0905 441 253 | 0905 451 253 | – | | | | | ✓ | C1 + C2 | M12x84 | |
| | 110 | 155 | 25 | 0905 441 261 | 0905 451 261 | – | | 115 | | | ✓ | C1 + C2 | M12x36 | |
| | 125 | 170 | 25 | 0905 441 271 | 0905 451 271 | – | | 130 | | | ✓ | C1 + C2 | M12x36 | |
| W-VIZ-A M16 | 90 | 145 | 30 | 0905 441 611 | 0905 451 611 | – | 18 | 98 | 50 | 24 | ✓ | C1 + C2 | M16x44 | |
| | 105 | 160 | 30 | 0905 441 621 | 0905 451 621 | – | | 113 | | | ✓ | C1 + C2 | M16x44 | |
| | 125 | 180 | 30 | 0905 441 601 | 0905 451 601 | 5916 411 601 | | 133 | | | ✓ | C1 + C2 | M16x44 | |
| | | 210 | 60 | 0905 441 602 | 0905 451 602 | 5916 411 602 | | | | | ✓ | C1 + C2 | M16x55 | |
| | | 250 | 100 | 0905 441 603 | 0905 451 603 | 5916 411 603 | | | | | ✓ | C1 + C2 | M16x65 | |
| | | 315 | 165 | 0905 441 604 | 0905 451 604 | – | | | | | ✓ | C1 + C2 | M16x90 | |
| | 145 | 200 | 30 | 0905 441 631 | 0905 451 631 | – | | 153 | | | ✓ | C1 + C2 | M16x44 | |
| | 160 | 215 | 30 | 0905 441 641 | 0905 451 641 | – | | 168 | | | ✓ | C1 + C2 | M16x44 | |
| | | 245 | 60 | 0905 441 642 | 0905 451 642 | – | | | | | ✓ | C1 + C2 | M16x55 | |
| | | 285 | 100 | 0905 441 643 | 0905 451 643 | – | | | | | ✓ | C1 + C2 | M16x65 | |
| W-VIZ-A M20 | 115 | 175 | 30 | 0905 442 011 | 0905 452 011 | ** | 24 | 120 | 80 | 30 | ✓ | C1 + C2 | M20x46 | 5 |
| | 170 | 230 | 25 | 0905 442 001 | 0905 452 001 | ** | | 180 | | | ✓ | C1 + C2 | M20x33 | |
| | | 255 | 50 | 0905 442 002 | 0905 452 002 | ** | | | | | ✓ | C1 + C2 | M20x46 | |
| | | 305 | 100 | 0905 442 003 | 0905 452 003 | ** | | | | | ✓ | C1 + C2 | M20x71 | |
| | 190 | 275 | 50 | 0905 442 021 | 0905 452 021 | ** | | 200 | | | ✓ | C1 + C2 | M20x46 | |
| W-VIZ-A M24 | 200 | 290 | 50 | 0905 442 401 | 0905 452 401 | ** | 26 | 215 | 100 | 36 | ✓ | C1 + C2 | M24x50 | |
| | | 340 | 100 | 0905 442 402 | 0905 452 402 | ** | | | 120 | | ✓ | C1 + C2 | M24x75 | |
| | 225 | 315 | 50 | 0905 442 411 | 0905 452 411 | ** | | 240 | | | ✓ | C1 + C2 | M24x50 | |

* drill hole depth $h_2$ for through installation

** special order

# INJECTION SYSTEM WIT-VM 100/WIT-VIZ

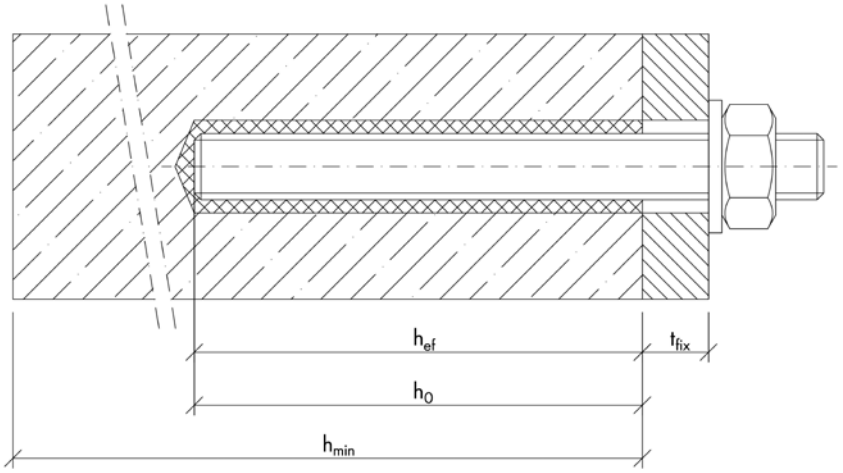
W-VIZ-IG in combination with WIT-VM 100 (ETA-04/0095)

| Type | Effective anchorage depth $h_{ef}$ [mm] | Anchor length l [mm] | Maximum screw-in depth $L_{th}$ [mm] | Art. no. Carbon steel galvanized | Art. no. Stainless steel A4 | Art. no. high corrosion resistant steel HCR | Drill hole diameter $d_o$ [mm] | Drill hole depth $h_0$ [mm] | Installation torque $T_{inst}$ [Nm] | Wrench size SW | Approval ETA-04/0095 | Approval Sesimic C1/C2 | Minimum screw-in depth $L_{sd,min}$ [mm] | P. Qty. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W-VIZ-IG M6 | 40 | 41 | 12 | 5916 106 041 | 5916 206 041 | – | 10 | 42 | 8 | – | ✓ | – | 7 | 10 |
| | 50 | 52 | | 5916 106 052 | 5916 206 052 | – | | 55 | | | ✓ | – | | |
| W-VIZ-IG M8 | 60 | 63 | 16 | 5916 108 063 | 5916 208 063 | – | 12 | 65 | 10 | – | ✓ | – | 9 | |
| | 75 | 78 | | 5916 108 078 | 5916 208 078 | – | | 85 | | | ✓ | – | | |
| W-VIZ-IG M10 | 70 | 74 | 20 | 5916 110 074 | 5916 210 074 | – | 14 | 80 | 15 | – | ✓ | – | 12 | |
| | 80 | 84 | | 5916 110 084 | 5916 210 084 | – | | 85 | | | ✓ | – | | |
| W-VIZ-IG M12 | 90 | 94 | 24 | 5916 112 094 | 5916 212 094 | – | 18 | 98 | 25 | – | ✓ | – | 14 | |
| | 105 | 109 | | 5916 112 109 | 5916 212 109 | – | | 113 | | | ✓ | – | | |
| | 125 | 130 | | 5916 112 130 | 5916 212 130 | – | | 133 | | | ✓ | – | | |
| W-VIZ-IG M16 | 115 | 120 | 32 | 5916 116 120 | 5916 216 120 | – | 22 | 120 | 50 | – | ✓ | – | 18 | 5 |
| | 170 | 180 | | 5916 116 180 | 5916 216 180 | – | 24 | 180 | | | ✓ | – | | |
| W-VIZ-IG M20 | 170 | 182 | 40 | 5916 120 182 | 5916 220 182 | – | 26 | 185 | 80 | – | ✓ | – | 22 | |

W-VIZ-A dynamic in combination with WIT-VM 100 (ETA-18/0979)

| Type | Effective anchorage depth $h_{ef}$ [mm] | Anchor length l [mm] | Fixture thickness for $t_{fix}$ [mm] | Art. no. Carbon steel galvanized | Art. no. Stainless steel A4 | Art. no. high corrosion resistant steel HCR | Drill hole diameter $d_o$ [mm] | Drill hole depth $h_0$ [mm] | Installation torque $T_{inst}$ [Nm] | Wrench size SW | Approval ETA-18/0979 | Approval Sesimic C1/C2 | Thread length M x length [mm] | P. Qty. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W-VIZ-A dynamic M12 | 100 | 155 | 25 | 0905 481 201 | **** | **** | 14 | 130*** | 30 | 19 | ✓ | – | – | 10 |
| | | 180 | 50 | 0905 481 202 | **** | **** | | 155*** | | | ✓ | – | – | |
| W-VIZ-A dynamic M16 | 125 | 195 | 30 | 0905 481 601 | **** | **** | 18 | 163*** | 50 | 24 | ✓ | – | – | |
| | | 215 | 50 | 0905 481 602 | – | – | | 183*** | | | ✓ | – | – | |
| W-VIZ-A dynamic M20 | 170 | 275 | 50 | 0905 482 001 | **** | **** | 24 | 230*** | 80 | 30 | ✓ | – | – | 5 |

*** drill hole depth $h_2$ for through installation
**** special order

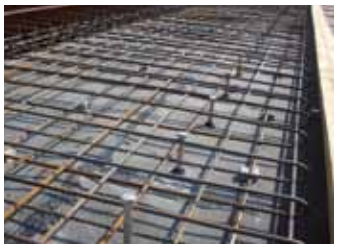


# INJECTION SYSTEM WIT-BS


150 ml 410 ml

| Cartridge sizes | | Art. no. | Dispensing guns |
|---|---|---|---|
| 150 ml | coaxial | **0905 450 301** | p. 48 |
| 410 ml | coaxial | **0905 450 302** | |

## Application references



## Approvals and certificates

| Special insert |
|---|
|  |
| ✓ |
| p. 13 |

| Temperature of base material | Gelling – working time | Min. curing time – dry conditions[1)] |
|---|---|---|
| –5 °C to –1 °C | 60 min | 360 min |
| 0 °C to 4 °C | 60 min | 180 min |
| 5 °C to 9 °C | 60 min | 120 min |
| 10 °C to 19 °C | 45 min | 80 min |
| 20 °C to 29 °C | 15 min | 45 min |
| 30 °C to 34 °C | 5 min | 25 min |
| ≥ 35 °C | 4 min | 20 min |

[1)] for wet base material the curing time must be doubled

## Type of installation

| Pre-positioned | In-place | Stand-off |
|---|---|---|
| ✓ | ✓ | – |

## Drilling method

| Hammer drill | Diamond drill | Hollow drill |
|---|---|---|
| ✓ | ✓ | – |

# INJECTION SYSTEM WIT-BS

## Loads

| Screw size | | | | 10 | | | | 12 | | | | 14/M16 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Effective anchorage depth** | | $h_{ef}$ | [mm] | 80 | 90 | 100 | 110 | 100 | 110 | 120 | 130 | 100 | 110 | 125 | 140 |
| **Cracked Concrete** | | | | | | | | | | | | | | | |
| **Tension** | C20/25 | $N_{rec}$ | [kN] | 13.1 | 15.7 | 18.3 | 21.2 | 21.7 | 25.0 | 28.5 | 32.1 | 21.7 | 25.0 | 30.3 | 35.9 |
| **Shear** | | $V_{rec}$ | [kN] | 16.2 | 16.2 | 16.2 | 16.2 | 20.0 | 20.0 | 20.0 | 20.0 | 30.5 | 30.5 | 30.5 | 30.5 |

[1] Loads are valid for single anchors. Normal spaced reinforcement in ≥ C20/25. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included. The material safety factor depends on the failure mode.
[2] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.

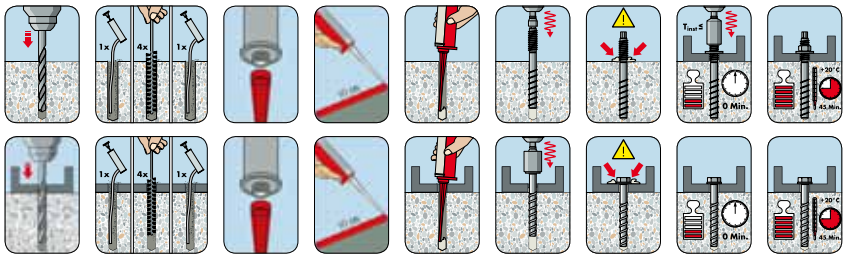
| **Clearance-hole in fixture** | | $d_f$ | [mm] | 14 | | | | 16 | | | | 18 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Minimum edge distance** | | $c_{min}$ | [mm] | 40 | | | | 50 | | | | 60 | | | |
| **Drill depth** | | $h_1$ | [mm] | 90 | 100 | 110 | 120 | 110 | 120 | 130 | 140 | 110 | 120 | 135 | 150 |
| **Minimum thickness of concrete member** | | $h_{min}$ | [mm] | 140 | 150 | 160 | 170 | 160 | 170 | 180 | 190 | 170 | 180 | 195 | 210 |

| Screw size | | | | 16/M18 | | | | 22/M20 | | | | 22/M24 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Effective anchorage depth** | | $h_{ef}$ | [mm] | 100 | 125 | 140 | 160 | 100 | 125 | 150 | 200 | 100 | 125 | 150 | 200 |
| **Cracked Concrete** | | | | | | | | | | | | | | | |
| **Tension** | C20/25 | $N_{rec}$ | [kN] | 21.7 | 30.3 | 35.9 | 43.9 | 21.7 | 30.3 | 39.8 | 61.3 | 21.7 | 30.3 | 39.8 | 61.3 |
| **Shear** | | $V_{rec}$ | [kN] | 43.3 | 45.7 | 45.7 | 45.7 | 43.3 | 51.0 | 51.0 | 51.0 | 43.3 | 51.0 | 51.0 | 51.0 |

[1] Loads are valid for single anchors. Normal spaced reinforcement in ≥ C20/25. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included. The material safety factor depends on the failure mode.
[2] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.

| **Clearance-hole in fixture** | $d_f$ | [mm] | 20 | | | | 26 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Minimum edge distance** | $c_{min}$ | [mm] | 70 | | | | 80 | | | | | | | |
| **Drill depth** | $h_1$ | [mm] | 110 | 135 | 150 | 170 | 110 | 135 | 160 | 210 | 110 | 135 | 160 | 210 |
| **Minimum thickness of concrete member** | $h_{min}$ | [mm] | 170 | 195 | 210 | 230 | 200 | 225 | 250 | 300 | 200 | 225 | 250 | 300 |

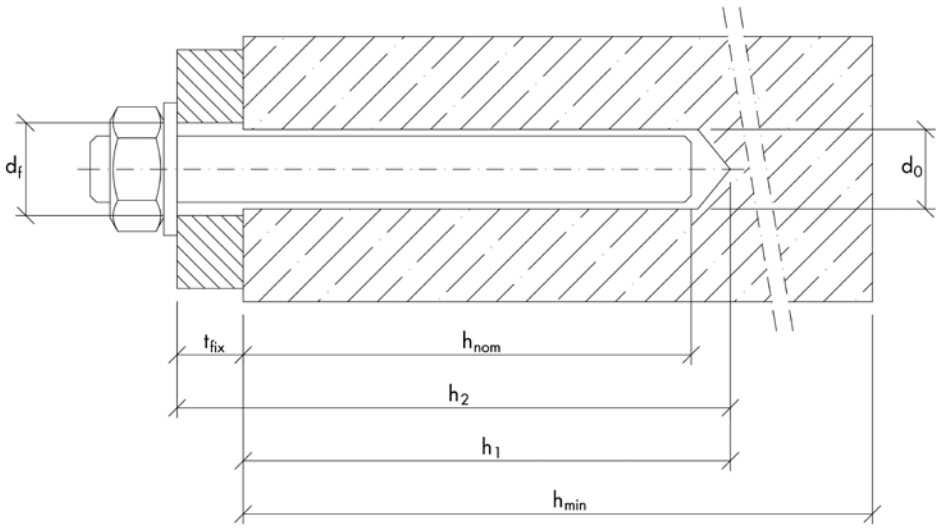
## Installation Concrete



# INJECTION SYSTEM WIT-BS

| | Anchor length | Fixture thickness for | | Art. no. | | Drill hole diameter | Drill hole depth for through installation | Installation torque | Wrench Size/ Drive | Approval | Head specification | P. Qty. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Type** | **l [mm]** | **$t_{fix,max}$** | **$t_{fix,min}$** | **Carbon steel galvanized** | **Stainless steel A4** | **$d_o$ [mm]** | **$h_{2,min}$ [mm]** | **$T_{inst}$ ≤ [Nm]** | **SW/ Torx [mm]** | **Z-21.1-2075** | **[mm]** | |
| W-BS hexagon head with pressed-on washer | | | | |  | | | | | | | |
| W-BS 10 | 90 | 10 | 5 | **5929 121 035** | **5929 221 035** | 10.0 | 100 | 40 | SW15 | ✓ | Ø 22.0 | 25 |
| | 100 | 20 | 5 | **5929 121 045** | **5929 221 045** | 10.0 | 110 | 40 | SW16 | ✓ | Ø 22.0 | 25 |
| | 120 | 40 | 10 | **5929 121 065** | **5929 221 065** | 10.0 | 130 | 40 | SW17 | ✓ | Ø 22.0 | 25 |
| | 140 | 60 | 30 | **5929 121 085** | – | 10.0 | 150 | 40 | SW18 | ✓ | Ø 22.0 | 25 |
| | 160 | 80 | 50 | **5929 121 105** | – | 10.0 | 170 | 40 | SW19 | ✓ | Ø 22.0 | 25 |
| W-BS 12 | 110 | 10 | 5 | **5929 122 045** | – | 12.0 | 120 | 60 | SW17 | ✓ | Ø 23.0 | 25 |
| W-BS 14 | 110 | 10 | 5 | **5929 124 035** | – | 14.0 | 120 | 80 | SW21 | ✓ | Ø 28.0 | 25 |
| | 130 | 30 | 10 | **5929 124 055** | – | | 140 | 80 | SW21 | ✓ | Ø 28.0 | 25 |
| W-BS hexagon head with big U-washer | | | | |  | | | | | | | |
| W-BS 10 | 180 | 100 | 70 | **5929 121 125** | – | 10.0 | 190 | 40 | SW15 | ✓ | Ø 44.0 | 25 |
| | 200 | 120 | 90 | **5929 121 145** | – | 10.0 | 210 | 40 | SW15 | ✓ | Ø 44.0 | 25 |
| | 240 | 160 | 130 | **5929 121 185** | – | 10.0 | 250 | 40 | SW15 | ✓ | Ø 44.0 | 15 |
| | 280 | 200 | 170 | **5929 121 225** | – | 10.0 | 290 | 40 | SW15 | ✓ | Ø 44.0 | 15 |
| | 320 | 240 | 210 | **5929 121 265** | – | 10.0 | 330 | 40 | SW15 | ✓ | Ø 44.0 | 15 |
| W-BS countersunk head | | | | |  | | | | | | | |
| W-BS 10 | 90 | 10 | 5 | **5929 131 035** | **5929 231 035** | 10.0 | 100 | 40 | TX50 | ✓ | Ø 22.0 | 25 |
| W-BS stair bolt with hexagon gear | | | | |  | | | | | | | |
| W-BS 10 | 140 | 35 | 5 | – | **5929 261 060** | 10.0 | 125 | 40 | SW9 | ✓ | M12 x 35 | 25 |
| | 160 | 55 | 25 | – | **5929 261 080** | 10.0 | 145 | 40 | SW9 | ✓ | M12 x 55 | 25 |

Other sizes on demand.



# INJECTION SYSTEM WIT-UH 300


280 ml 420 ml 825 ml

| Cartridge sizes | | Art. no. | Dispensing guns |
|---|---|---|---|
| 280 ml | peeler | **5918 504 280** | |
| 420 ml | coaxial | **5918 500 420** | p. 48 |
| 825 ml | side-by-side | **5918 503 825** | |

## Application references

## Approvals and certificates

| Threaded rod | Internal threaded rod | Rebar |
|---|---|---|
|  |  |  |
| ✓ | ✓ | ✓ |
| p. 34–36 | p. 36 | not supplied by Würth |

| Temperature of base material | Gelling – working time | Min. curing time – dry conditions[1)] |
|---|---|---|
| -5 °C to -1 °C | 50 min | 5 h |
| 0 °C to 4 °C | 25 min | 3.5 h |
| 5 °C to 9 °C | 15 min | 2 h |
| 10 °C to 14 °C | 10 min | 60 min |
| 15 °C to 19 °C | 6 min | 40 min |
| 20 °C to 29 °C | 3 min | 30 min |
| 30 °C to 40 °C | 2 min | 30 min |

[1)] for wet base material the curing time must be doubled

| Type of installation | | |
|---|---|---|
| Pre-positioned | In-place | Stand-off |
| ✓ | - | ✓ |

| Installation condition | | |
|---|---|---|
| Dry concrete | Wet concrete | Flooded drill hole |
| ✓ | ✓ | ✓ |

| Drilling method | | |
|---|---|---|
| Hammer drill | Diamond drill | Hollow drill |
| ✓ | - | ✓ |

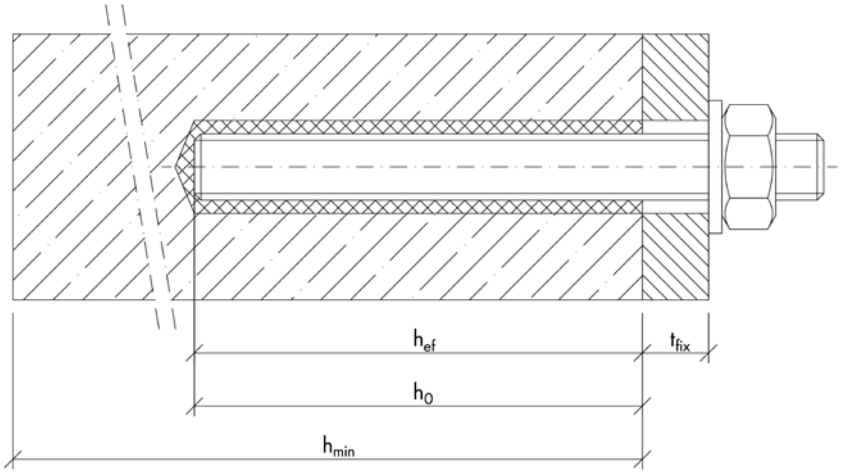
# INJECTION SYSTEM WIT-UH 300

## Loads – concrete

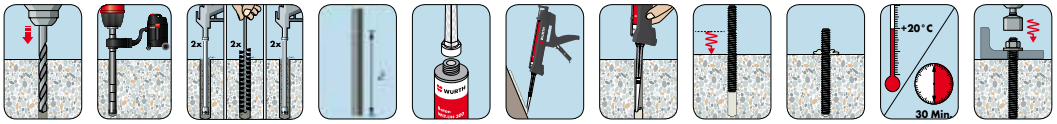
| Thread size | | | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Effective anchorage depth | | $h_{ef}$ | [mm] | 80 | 90 | 110 | 125 | 170 | 210 | 240 | 270 |
| **Non-cracked Concrete** | | | | | | | | | | | |
| Tension | 5.8 | $N_{rec}$ | [kN] | 8.7 | 13.8 | 20.1 | 32.7 | 51.9 | 71.3 | 87.1 | 103.9 |
| | 8.8 | | | 13.8 | 20.0 | 27.0 | 32.7 | 51.9 | 71.3 | 87.1 | 103.9 |
| | A4-70 | | | 9.9 | 15.7 | 22.5 | 32.7 | 51.9 | 71.3 | 57.4 | 70.2 |
| Shear | 5.8 | $V_{rec}$ | [kN] | 6.3 | 9.9 | 14.5 | 26.9 | 42.0 | 60.5 | 78.7 | 96.2 |
| | 8.8 | | | 8.6 | 13.1 | 19.4 | 36.0 | 56.0 | 80.6 | 105.1 | 128.0 |
| | A4-70 | | | 6.0 | 9.2 | 13.7 | 25.2 | 39.4 | 56.8 | 34.5 | 42.0 |
| **Cracked Concrete** | | | | | | | | | | | |
| Tension | 5.8/8.8 | $N_{rec}$ | [kN] | 6.7 | 10.1 | 15.8 | 22.9 | 36.3 | 49.9 | 61.0 | 72.7 |
| | A4-70 | | | 6.7 | 10.1 | 15.8 | 22.9 | 36.3 | 49.9 | 57.4 | 70.2 |
| Shear | 5.8 | $V_{rec}$ | [kN] | 6.3 | 9.9 | 14.5 | 26.9 | 42.0 | 60.5 | 78.7 | 96.2 |
| | 8.8 | | | 8.6 | 13.1 | 19.4 | 36.0 | 56.0 | 80.6 | 105.1 | 128.0 |
| | A4-70 | | | 6.0 | 9.2 | 13.7 | 25.2 | 39.4 | 56.8 | 34.5 | 42.0 |

[1] Loads are valid for single anchors. Normal spaced reinforcement in ≥ C20/25. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included. The material safety factor depends on the failure mode.
[2] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Clearance-hole in fixture** | | $d_f$ | [mm] | 9 | 12 | 14 | 18 | 22 | 26 | 30 | 33 |
| **Drill depth** | | $h_0 = h_{ef}$ | [mm] | 80 | 90 | 110 | 125 | 170 | 210 | 240 | 270 |
| **Minimum thickness of concrete member** | | $h_{min}$ | [mm] | 110 | 120 | 140 | 161 | 214 | 266 | 300 | 340 |
| **Minimum edge distance** | | $c_{min}$ | [mm] | 35 | 40 | 45 | 50 | 60 | 65 | 75 | 80 |




## Installation Concrete



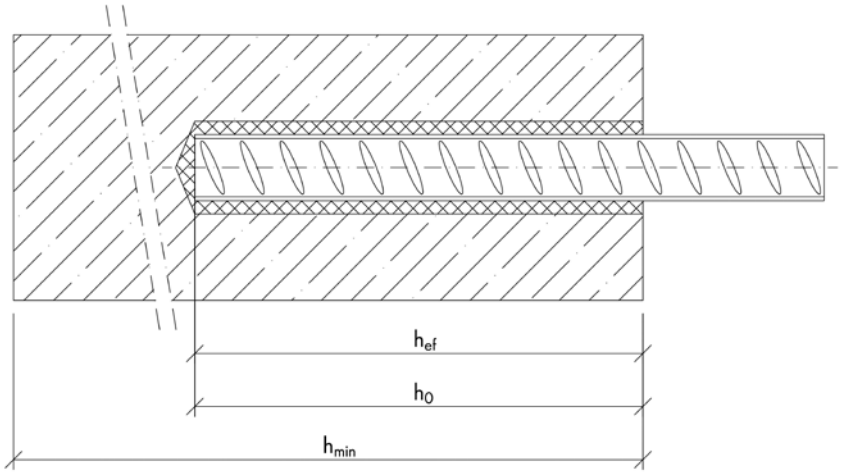
# INJECTION SYSTEM WIT-UH 300

## Loads – REBAR

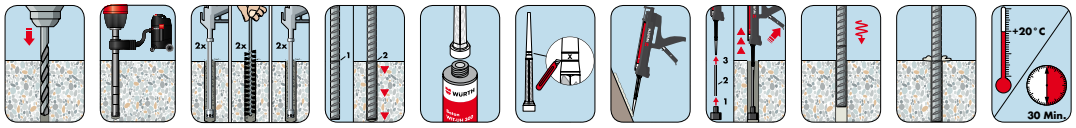
| Rebar size | | | | Ø 8 | Ø 10 | Ø 12 | Ø 14 | Ø 16 | Ø 20 | Ø 25 | Ø 28 | Ø 32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Effective anchorage depth** | | $h_{ef}$ | [mm] | 80 | 90 | 110 | 125 | 125 | 170 | 210 | 270 | 300 |
| **Non-cracked Concrete** | | | | | | | | | | | | |
| **Tension** | B500B | $N_{rec}$ | [kN] | 13.4 | 18.8 | 27.0 | 32.7 | 32.7 | 51.9 | 71.3 | 103.9 | 121.7 |
| **Shear** | | $V_{rec}$ | [kN] | 6.5 | 10.3 | 14.8 | 20.2 | 26.3 | 41.1 | 64.3 | 80.7 | 105.3 |
| **Cracked Concrete** | | | | | | | | | | | | |
| **Tension** | B500B | $N_{rec}$ | [kN] | 5.3 | 7.4 | 11.8 | 17.0 | 19.4 | 33.1 | 49.9 | 72.7 | 85.2 |
| **Shear** | | $V_{rec}$ | [kN] | 6.5 | 10.3 | 14.8 | 20.2 | 26.3 | 41.1 | 64.3 | 80.7 | 105.3 |

[1] Loads are valid for single anchors. Normal spaced reinforcement in ≥ C20/25. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included. The material safety factor depends on the failure mode.
[2] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Nominal hole diameter** | $d_0$ | [mm] | 12 | 14 | 16 | 18 | 20 | 25 | 32 | 35 | 40 |
| **Effective anchorage depth** | $h_{ef,min}$ | [mm] | 60 | 60 | 70 | 75 | 80 | 90 | 100 | 112 | 128 |
| | $h_{ef,max}$ | [mm] | 160 | 200 | 240 | 280 | 320 | 400 | 500 | 560 | 640 |
| **Minimum thickness of concrete member** | $h_{min}$ | [mm] | 110 | 120 | 142 | 161 | 165 | 220 | 274 | 340 | 380 |
| **Minimum spacing** | $s_{min}$ | [mm] | 40 | 50 | 60 | 70 | 75 | 95 | 120 | 130 | 150 |
| **Minimum edge distance** | $c_{min}$ | [mm] | 35 | 40 | 45 | 50 | 50 | 60 | 70 | 75 | 85 |

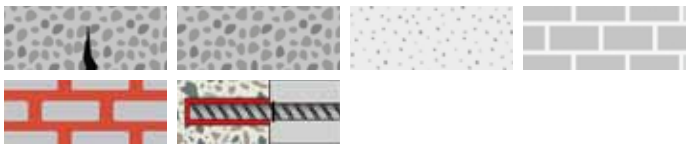



## Installation REBAR



# INJECTION SYSTEM WIT-VM 250


300 ml 330 ml 420 ml 825 ml



| Cartridge sizes | | Art. no. | Dispensing guns |
|---|---|---|---|
| 300 ml | foil-in-tube | **0903 450 201** | |
| 420 ml | coaxial | **0903 450 205** | p. 48 |
| 825 ml | side-by-side | **0903 450 206** | |
| WIT-Nordic = WIT-VM 250 for up to -20°C*: | | | |
| 330 ml | coaxial | **0903 450 102** | p. 48 |

* for more information look at the online shop

## Application references




## Approvals and certificates

| Threaded rod | Internal threaded rod | Rebar | Special insert |
|---|---|---|---|
|  |  |  |  |
| ✓ | ✓ | ✓ | ✓ |
| p. 34–36 | p. 36 | not supplied by Würth | p. 44 |

| Temperature of base material | Gelling – working time | Min. curing time – dry conditions[1)] |
|---|---|---|
| -10°C to -6°C | 90 min | 24 h |
| -5°C to -1°C | 90 min | 14 h |
| 0°C to 4°C | 45 min | 7 h |
| 5°C to 9°C | 25 min | 2 h |
| 10°C to 19°C | 15 min | 80 min |
| 20°C to 29°C | 6 min | 45 min |
| 30°C to 34°C | 4 min | 25 min |
| 35°C to 39°C | 2 min | 20 min |
| > 40°C | 90 s | 15 min |

[1)] for wet base material the curing time must be doubled

| Type of installation | | |
|---|---|---|
| Pre-positioned | In-place | Stand-off |
| ✓ | - | ✓ |

| Installation condition | | |
|---|---|---|
| Dry concrete | Wet concrete | Flooded drill hole |
| ✓ | ✓ | ✓ |

| Drilling method | | |
|---|---|---|
| Hammer drill | Diamond drill | Hollow drill |
| ✓ | - | - |

Rotary drilling in masonry required for some types of bricks and blocks

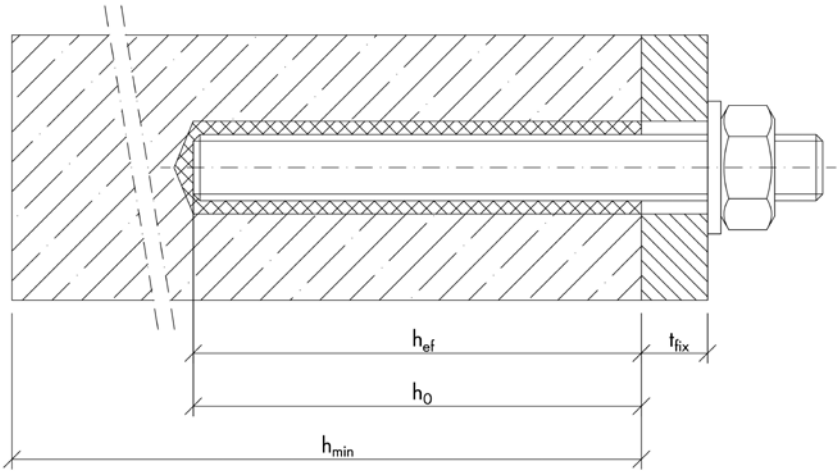
# INJECTION SYSTEM WIT-VM 250

## Loads – concrete

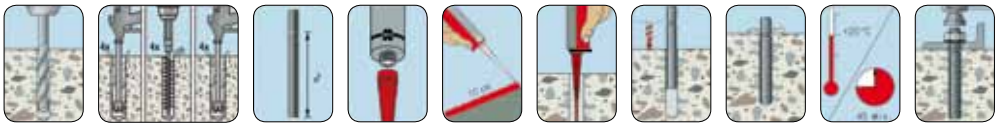
| Thread size | | | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Effective anchorage depth** | | $h_{ef,typ}$ | [mm] | 80 | 90 | 110 | 125 | 170 | 210 | 240 | 270 |
| **Non-cracked Concrete** | | | | | | | | | | | |
| **Tension** | 5.8 | $N_{rec}$ | [kN] | 8.7 | 13.5 | 19.7 | 27.3 | 43.3 | 59.4 | 72.6 | 86.6 |
| | 8.8 | | | 9.6 | 13.5 | 19.7 | 27.3 | 43.3 | 59.4 | 72.6 | 86.6 |
| | A4-70 | | | 9.6 | 13.5 | 19.7 | 27.3 | 43.3 | 59.4 | 57.4 | 70.2 |
| **Shear** | 5.8 | $V_{rec}$ | [kN] | 6.3 | 9.9 | 14.5 | 26.9 | 42.0 | 60.5 | 78.7 | 96.2 |
| | 8.8 | | | 8.6 | 13.1 | 19.4 | 36.0 | 56.0 | 80.6 | 105.1 | 128.0 |
| | A4-70 | | | 6.0 | 9.2 | 13.7 | 25.2 | 39.4 | 56.8 | 34.5 | 42.0 |
| **Cracked Concrete** | | | | | | | | | | | |
| **Tension** | 5.8/8.8/A4-70 | $N_{rec}$ | [kN] | 3.8 | 5.6 | 9.1 | 13.7 | 23.3 | 34.6 | 50.8 | 60.6 |
| **Shear** | 5.8 | $V_{rec}$ | [kN] | 6.3 | 9.9 | 14.5 | 26.9 | 42.0 | 60.5 | 78.7 | 96.2 |
| | 8.8 | | | 7.7 | 11.2 | 18.1 | 27.4 | 46.6 | 69.1 | 101.6 | 121.2 |
| | A4-70 | | | 6.0 | 9.2 | 13.7 | 25.2 | 39.4 | 56.8 | 34.5 | 42.0 |

[1] Loads are valid for single anchors. Normal spaced reinforcement in ≥ C20/25. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included. The material safety factor depends on the failure mode.
[2] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Clearance-hole in fixture** | | $d_f$ | [mm] | 9 | 12 | 14 | 18 | 22 | 26 | 30 | 33 |
| **Drill depth** | | $h_1$ | [mm] | 80 | 90 | 110 | 125 | 170 | 210 | 240 | 270 |
| **Minimum thickness of concrete member** | | $h_{min}$ | [mm] | 110 | 120 | 140 | 161 | 214 | 266 | 300 | 340 |
| **Minimum edge distance** | | $c_{min}$ | [mm] | 40 | 50 | 60 | 80 | 100 | 120 | 135 | 150 |




## Installation Concrete



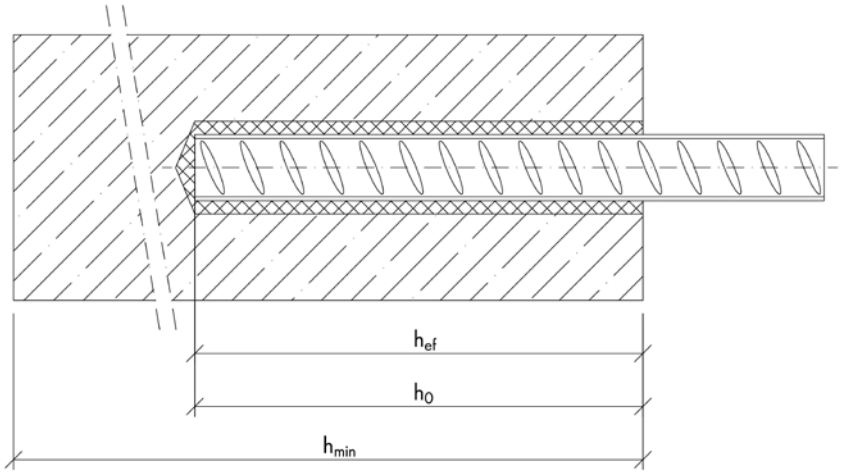
# INJECTION SYSTEM WIT-VM 250

## Loads – REBAR

| Rebar size | | | | Ø 8 | Ø 10 | Ø 12 | Ø 15 | Ø 14 | Ø 20 | Ø 25 | Ø 28 | Ø 32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Effective anchorage depth** | | $h_{ef,typ}$ | [mm] | 80 | 90 | 110 | 125 | 125 | 170 | 210 | 270 | 300 |
| **Non-cracked Concrete** | | | | | | | | | | | | |
| **Tensile** | B500 A | $N_{rec}$ | [kN] | 9.6 | 13.5 | 19.7 | 26.2 | 27.3 | 43.3 | 59.4 | 86.6 | 101.4 |
| **Shear** | B500 A | $V_{rec}$ | [kN] | 6.5 | 10.3 | 14.8 | 20.2 | 26.3 | 41.1 | 64.3 | 80.7 | 105.3 |
| **Minimum edge distance** | | $c_{min}$ | [mm] | 40 | 50 | 60 | 70 | 80 | 100 | 125 | 140 | 160 |
| **Cracked Concrete** | | | | | | | | | | | | |
| **Tensile** | B500 A | $N_{rec}$ | [kN] | 3.8 | 5.6 | 9.1 | 12.0 | 13.7 | 23.3 | 36.0 | 60.6 | 71.0 |
| **Shear** | B500 A | $V_{rec}$ | [kN] | 6.5 | 10.3 | 14.8 | 20.2 | 26.3 | 41.1 | 64.3 | 80.7 | 105.3 |
| **Minimum edge distance** | | $c_{min}$ | [mm] | 40 | 50 | 60 | 70 | 80 | 100 | 125 | 140 | 160 |

[1] Loads are valid for single anchors. Normal spaced reinforcement in ≥ C20/25. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included. The material safety factor depends on the failure mode.
[2] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Drill hole diameter** | $d_0$ | [mm] | 12 | 14 | 16 | 18 | 20 | 24 | 32 | 35 | 40 |
| **Drill depth** | $h_1$ | [mm] | 80 | 90 | 110 | 125 | 125 | 170 | 210 | 270 | 300 |
| **Minimum thickness of concrete member** | $h_{min}$ | [mm] | 110 | 120 | 142 | 161 | 165 | 218 | 274 | 340 | 380 |
| **Minimum effective anchorage depth** | $h_{ef,min}$ | [mm] | 60 | 60 | 70 | 75 | 80 | 90 | 100 | 112 | 128 |
| **Maximum effective anchorage depth** | $h_{ef,max}$ | [mm] | 160 | 200 | 240 | 280 | 320 | 400 | 480 | 540 | 640 |




## Installation Rebar

# INJECTION SYSTEM WIT-VM 250

## Loads – masonry

| Brick and Block | Type | Size | Compressive strength | Density | Drilling method | Sleeve | Metric thread size | Embedment depth | Edge distance | Tensile [1),2)] | Shear [1),2)] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | l x b x h | $f_b$ | ρ | | Ø x l | M | $h_{ef}$ | c | $N_{rec}$ | $V_{rec}$ |
| | | [mm] | [N/mm²] | [kg/dm³] | | | | [mm] | [mm] | [kN] | [kN] |
| Fired clay brick Mz | solid | 240 x 115 x 55 | 20 | 1.6 | Hammer | – | M8 | 80 | 120 | 1.29 | 1.43 |
| | | | | | | – | M10 | 90 | 135 | 1.57 | 1.43 |
| | | | | | | – | M12 | 100 | 150 | 1.71 | 1.43 |
| | | | | | | – | M16 | 100 | 150 | 1.71 | 2.29 |
| Fired clay brick Hlz | perforated | 497 x 240 x 238 | 12 | 0.8 | Rotary | SH12x80 | M8 | 80 | 100 | 1.00 | 0.71 |
| | | | | | | SH16x85 | M8 / M10 | 85 | 100 | 1.00 | 0.71 |
| | | | | | | SH16x130 | M8 / M10 | 130 | 100 | 1.43 | 0.71 |
| | | | | | | SH20x85 | M12 / M16 | 85 | 120 | 1.00 | 0.71 |
| | | | | | | SH20x130 | M12 / M16 | 130 | 120 | 1.43 | 0.71 |
| Light aggregate block Vbl | solid | 300 x 123 x 248 | 2 | 0.6 | Rotary | – | M8 | 80 | 120 | 0.86 | 0.86 |
| | | | | | | – | M8/M10 | 90 | 135 | 0.86 | 0.86 |
| | | | | | | – | M12 | 100 | 150 | 1.00 | 0.86 |
| | | | | | | – | M16 | 100 | 150 | 0.86 | 0.86 |
| Light aggregate block B40 | hollow | 495 x 200 x 190 | 4 | 0.8 | Rotary | SH12x80 | M8 | 80 | 100 | 0.34 | 0.71 |
| | | | | | | SH16x85 | M8 / M10 | 85 | 100 | 0.34 | 0.71 |
| | | | | | | SH16x130 | M8 / M10 | 130 | 100 | 0.34 | 0.71 |
| | | | | | | SH20x85 | M12 / M16 | 85 | 120 | 0.34 | 0.71 |
| | | | | | | SH20x130 | M12 / M16 | 130 | 120 | 0.34 | 0.71 |
| Calcium silicate brick KS | solid | 240 x 115 x 71 | 20 | 2.0 | Hammer | – | M8 | 80 | 120 | 1.71 | 1.14 |
| | | | | | | – | M10 | 90 | 135 | 1.71 | 1.29 |
| | | | | | | – | M12 | 100 | 150 | 1.71 | 1.14 |
| | | | | | | – | M16 | 100 | 150 | 1.43 | 1.14 |
| Calcium silicate block KSL | hollow | 498 x 175 x 238 | 12 | 1.4 | Rotary | SH12x80 | M8 | 80 | 100 | 0.21 | 0.71 |
| | | | | | | SH16x85 | M8 / M10 | 85 | 100 | 0.21 | 0.71 |
| | | | | | | SH16x130 | M8 / M10 | 130 | 100 | 0.86 | 0.71 |
| | | | | | | SH20x85 | M12 / M16 | 85 | 120 | 0.43 | 0.71 |
| | | | | | | SH20x130 | M12 / M16 | 130 | 120 | 0.86 | 0.71 |
| Aerated concrete block AAC | solid | 499 x 240 x 249 | 6 | 0.6 | Rotary | – | M8 | 80 | 120 | 0.89 | 2.14 |
| | | | | | | – | M10 | 90 | 135 | 1.43 | 3.03 |
| | | | | | | – | M12 | 100 | 150 | 1.79 | 3.57 |
| | | | | | | – | M16 | 100 | 150 | 2.32 | 3.57 |

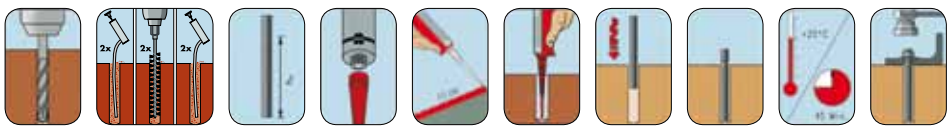
[1)] Loads are valid for single anchors and the given edge distance. Shear loads are acting parallel to the edge. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included. The material safety factor depends on failure mode and type of brick.

[2)] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.

[3)] The loads given are valid for the bricks and blocks which have been given. The loads can be taken for bricks and blocks of larger sizes, larger compressive strength of the masonry unit and same configuration of the cavities. The loads of the injection anchor may be determined by the so-called "job site tests" according to ETAG029 and TR053.

### Installation Masonry perforated

### Installation Masonry solid



# INJECTION SYSTEM WIT-PM 200


300 ml


330 ml

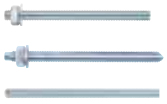

420 ml

| Cartridge sizes | | Art. no. | Dispensing guns |
|---|---|---|---|
| 300 ml | foil-in-tube | **5918 242 300** | |
| 330 ml | coaxial | **5918 240 330** | p. 48 |
| 420 ml | coaxial | **5918 240 420** | |

## Application references

## Approvals and certificates

## Threaded rod



## Special insert



| | |
|---|---|
| ✓ | ✓ |
| p. 34–36 | p. 44 |

| Temperature of base material | Gelling – working time | Min. curing time – dry conditions[1)] |
|---|---|---|
| –5 °C to –1 °C | 90 min | 6 h |
| 0 °C to 4 °C | 45 min | 3 h |
| 5 °C to 9 °C | 25 min | 2 h |
| 10 °C to 14 °C | 20 min | 100 min |
| 15 °C to 19 °C | 15 min | 80 min |
| 20 °C to 29 °C | 6 min | 45 min |
| 30 °C to 34 °C | 4 min | 25 min |
| 35 °C to 39 °C | 2 min | 20 min |

[1)] for wet base material the curing time must be doubled

## Type of installation

| Pre-positioned | In-place | Stand-off |
|---|---|---|
| ✓ | – | ✓ |

## Installation condition

| Dry concrete | Wet concrete | Flooded drill hole |
|---|---|---|
| ✓ | ✓ | ✓ |

## Drilling method

| Hammer drill | Diamond drill | Hollow drill |
|---|---|---|
| ✓ | – | – |

Rotary drilling in masonry required for some types of bricks and blocks

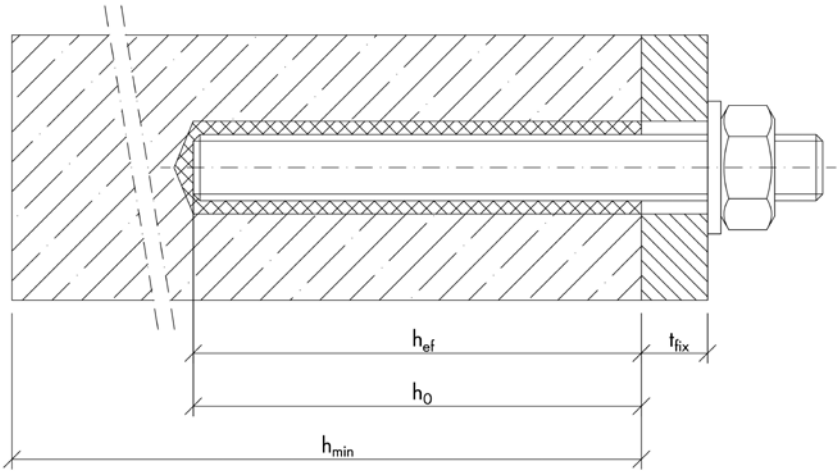
# INJECTION SYSTEM WIT-PM 200

## Loads – concrete

| Thread size | | | | M8 | M10 | M12 | M16 | M20 | M24 |
|---|---|---|---|---|---|---|---|---|---|
| **Effective anchorage depth** | | $h_{ef}$ | [mm] | 80 | 90 | 110 | 125 | 170 | 210 |
| **Non-cracked Concrete** | | | | | | | | | |
| **Tension** | 5.8/8.8/A4-70 | $N_{rec}$ | [kN] | 6.8 | 9.0 | 13.2 | 19.9 | 33.9 | 50.3 |
| **Shear** | 5.8 | $V_{rec}$ | [kN] | 6.3 | 9.9 | 14.5 | 26.9 | 42.0 | 60.5 |
| | 8.8 | | | 8.6 | 13.1 | 19.4 | 36.0 | 56.0 | 80.6 |
| | A4-70 | | | 6.0 | 9.2 | 13.7 | 25.2 | 39.4 | 56.8 |

[1] Loads are valid for single anchors. Normal spaced reinforcement in ≥ C20/25. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included. The material safety factor depends on the failure mode.
[2] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.

| | | | M8 | M10 | M12 | M16 | M20 | M24 |
|---|---|---|---|---|---|---|---|---|
| **Clearance-hole in fixture** | $d_f$ | [mm] | 9 | 12 | 14 | 18 | 22 | 26 |
| **Drill depth** | $h_0 = h_{ef}$ | [mm] | 80 | 90 | 110 | 125 | 170 | 210 |
| **Minimum thickness of concrete member** | $h_{min}$ | [mm] | 110 | 120 | 140 | 161 | 218 | 266 |
| **Minimum edge distance** | $c_{min}$ | [mm] | 40 | 50 | 60 | 80 | 100 | 120 |




## Installation Concrete

# INJECTION SYSTEM WIT-PM 200

## Loads – masonry

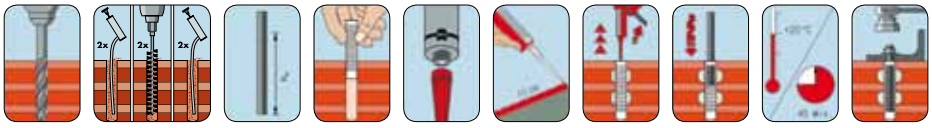
| Brick and Block | Type | Size | Compressive strength | Density | Drilling method | Sleeve | Metric thread size | Embedment depth | Edge distance | Tensile [1),2)] | Shear [1),2)] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | l x b x h | $f_b$ | ρ | | Ø x l | M | $h_{ef}$ | c | $N_{rec}$ | $V_{rec}$ |
| | | [mm] | [N/mm²] | [kg/dm³] | | | | [mm] | [mm] | [kN] | [kN] |
| Fired clay brick Mz | solid | 240 x 115 x 55 | 20 | 1.6 | Hammer | – | M8 | 80 | 120 | 0.71 | 1.29 |
| | | | | | | – | M10 | 90 | 135 | 0.71 | 1.57 |
| | | | | | | – | M12 | 100 | 150 | 0.57 | 2.14 |
| | | | | | | – | M16 | 100 | 150 | 1.00 | 2.14 |
| Fired clay brick Hlz | perforated | 497 x 240 x 238 | 12 | 0.8 | Rotary | SH12x80 | M8 | 80 | 100 | 0.43 | 0.71 |
| | | | | | | SH16x85 | M8 / M10 | 85 | 100 | 0.71 | 0.71 |
| | | | | | | SH16x130 | M8 / M10 | 130 | 100 | 1.00 | 0.71 |
| | | | | | | SH20x85 | M12 / M16 | 85 | 120 | 1.00 | 0.71 |
| | | | | | | SH20x130 | M12 / M16 | 130 | 120 | 1.00 | 0.71 |
| Light aggregate block Vbl | solid | 300 x 123 x 248 | 2 | 0.6 | Rotary | – | M8 | 80 | 120 | 0.57 | 0.86 |
| | | | | | | – | M8/M10 | 90 | 135 | 0.57 | 1.00 |
| | | | | | | – | M12 | 100 | 150 | 0.57 | 1.14 |
| | | | | | | – | M16 | 100 | 150 | 0.57 | 1.14 |
| Light aggregate block B40 | hollow | 495 x 200 x 190 | 4 | 0.8 | Rotary | SH12x80 | M8 | 80 | 100 | 0.11 | 0.71 |
| | | | | | | SH16x85 | M8 / M10 | 85 | 100 | 0.17 | 0.71 |
| | | | | | | SH16x130 | M8 / M10 | 130 | 100 | 0.57 | 0.71 |
| | | | | | | SH20x85 | M12 / M16 | 85 | 120 | 0.26 | 0.71 |
| | | | | | | SH20x130 | M12 / M16 | 130 | 120 | 0.57 | 0.71 |
| Calcium silicate brick KS | solid | 240 x 115 x 71 | 20 | 2.0 | Hammer | – | M8 | 80 | 120 | 1.29 | 1.29 |
| | | | | | | – | M10 | 90 | 135 | 1.29 | 1.29 |
| | | | | | | – | M12 | 100 | 150 | 1.57 | 1.43 |
| | | | | | | – | M16 | 100 | 150 | 1.29 | 1.43 |
| Calcium silicate block KSL | hollow | 498 x 175 x 238 | 12 | 1.4 | Rotary | SH12x80 | M8 | 80 | 100 | 0.11 | 0.71 |
| | | | | | | SH16x85 | M8 / M10 | 85 | 100 | 0.43 | 0.71 |
| | | | | | | SH16x130 | M8 / M10 | 130 | 100 | 1.29 | 0.71 |
| | | | | | | SH20x85 | M12 / M16 | 85 | 120 | 0.43 | 0.71 |
| | | | | | | SH20x130 | M12 / M16 | 130 | 120 | 1.29 | 0.71 |
| Aerated concrete block AAC | solid | 499 x 240 x 249 | 6 | 0.6 | Rotary | – | M8 | 80 | 120 | 0.71 | 1.96 |
| | | | | | | – | M10 | 90 | 135 | 1.07 | 3.21 |
| | | | | | | – | M12 | 100 | 150 | 1.61 | 3.21 |
| | | | | | | – | M16 | 100 | 150 | 1.96 | 3.93 |

[1)] Loads are valid for single anchors and the given edge distance. Shear loads are acting parallel to the edge. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included. The material safety factor depends on failure mode and type of brick.

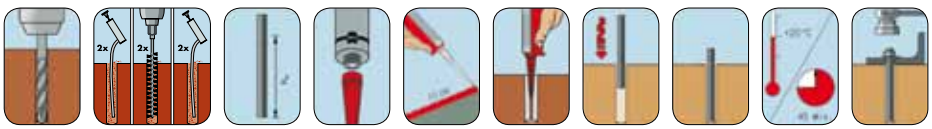
[2)] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.

[3)] The loads given are valid for the bricks and blocks which have been given. The loads can be taken for bricks and blocks of larger sizes, larger compressive strength of the masonry unit and same configuration of the cavities. The loads of the injection anchor may be determined by the so-called "job site tests" according to ETAG029 and TR053.

### Installation Masonry perforated




### Installation Masonry solid



# INJECTION SYSTEM WIT-EA 200


420 ml

| Cartridge sizes | | Art. no. | Dispensing guns |
|---|---|---|---|
| 420 ml | coaxial | **5918 320 420** | p. 48 |

## Application references




## Approvals and certificates

| Threaded rod | Special insert |
|---|---|
|  |  |
| ✓ | ✓ |
| p. 34–36 | p. 44 |

| Temperature of base material | Gelling – working time | Min. curing time – dry conditions[1)] |
|---|---|---|
| -5 °C to -1 °C | 90 min | 6 h |
| 0 °C to 4 °C | 45 min | 3 h |
| 5 °C to 9 °C | 25 min | 2 h |
| 10 °C to 14 °C | 20 min | 100 min |
| 15 °C to 19 °C | 15 min | 80 min |
| 20 °C to 29 °C | 6 min | 45 min |
| 30 °C to 34 °C | 4 min | 25 min |
| 35 °C to 39 °C | 2 min | 20 min |

[1)] for wet base material the curing time must be doubled

| Type of installation | | |
|---|---|---|
| Pre-positioned | In-place | Stand-off |
| ✓ | - | ✓ |

| Installation condition | | |
|---|---|---|
| Dry concrete | Wet concrete | Flooded drill hole |
| ✓ | ✓ | ✓ |

| Drilling method | | |
|---|---|---|
| Hammer drill | Diamond drill | Hollow drill |
| ✓ | - | - |

Rotary drilling in masonry required for some types of bricks and blocks

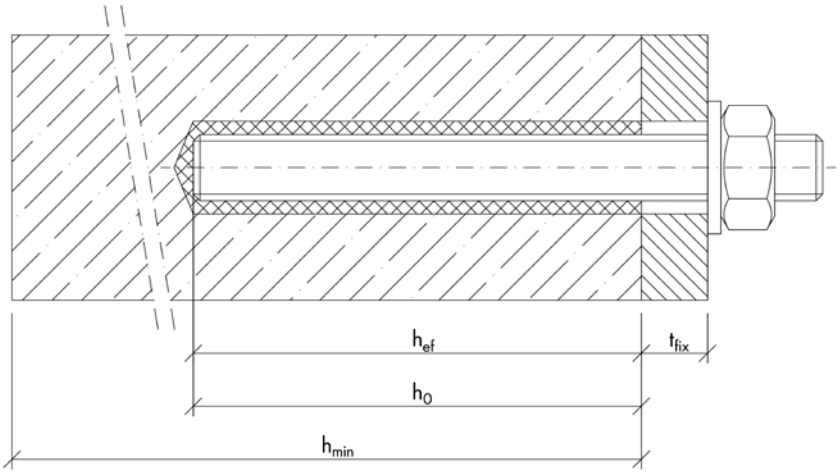
# INJECTION SYSTEM WIT-EA 200

## Loads – concrete

| Thread size | | | | M8 | M10 | M12 | M16 | M20 | M24 |
|---|---|---|---|---|---|---|---|---|---|
| **Effective anchorage depth** | | $h_{ef}$ | [mm] | 80 | 90 | 110 | 125 | 170 | 210 |
| **Non-cracked Concrete** | | | | | | | | | |
| **Tension** | 5.8/8.8/A4-70 | $N_{rec}$ | [kN] | 6.8 | 9.0 | 13.2 | 19.9 | 33.9 | 50.3 |
| **Shear** | 5.8 | $V_{rec}$ | [kN] | 6.3 | 9.9 | 14.5 | 26.9 | 42.0 | 60.5 |
| | 8.8 | | | 8.6 | 13.1 | 19.4 | 36.0 | 56.0 | 80.6 |
| | A4-70 | | | 6.0 | 9.2 | 13.7 | 25.2 | 39.4 | 56.8 |

[1] Loads are valid for single anchors. Normal spaced reinforcement in ≥ C20/25. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included. The material safety factor depends on the failure mode.
[2] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Clearance-hole in fixture** | $d_f$ | [mm] | 9 | 12 | 14 | 18 | 22 | 26 |
| **Drill depth** | $h_0 = h_{ef}$ | [mm] | 80 | 90 | 110 | 125 | 170 | 210 |
| **Minimum thickness of concrete member** | $h_{min}$ | [mm] | 110 | 120 | 140 | 161 | 218 | 266 |
| **Minimum edge distance** | $c_{min}$ | [mm] | 40 | 50 | 60 | 80 | 100 | 120 |




## Installation Concrete

# INJECTION SYSTEM WIT-EA 200

## Loads – masonry

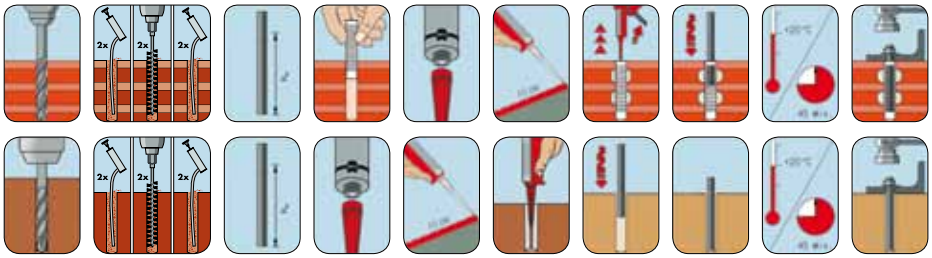
| Brick and Block | Type | Size | Compressive strength | Density | Drilling method | Sleeve | Metric thread size | Embedment depth | Edge distance | Tensile [1),2)] | Shear [1),2)] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | l x b x h | $f_b$ | ρ | | Ø x l | M | $h_{ef}$ | c | $N_{rec}$ | $V_{rec}$ |
| | | [mm] | [N/mm²] | [kg/dm³] | | | | [mm] | [mm] | [kN] | [kN] |
| Fired clay brick Mz | solid | 240 x 115 x 55 | 20 | 1.6 | Hammer | – | M8 | 80 | 120 | 0.71 | 1.29 |
| | | | | | | – | M10 | 90 | 135 | 0.71 | 1.57 |
| | | | | | | – | M12 | 100 | 150 | 0.57 | 2.14 |
| | | | | | | – | M16 | 100 | 150 | 1.00 | 2.14 |
| Fired clay brick Hlz | perforated | 497 x 240 x 238 | 12 | 0.8 | Rotary | SH12x80 | M8 | 80 | 100 | 0.43 | 0.71 |
| | | | | | | SH16x85 | M8 / M10 | 85 | 100 | 0.71 | 0.71 |
| | | | | | | SH16x130 | M8 / M10 | 130 | 100 | 1.00 | 0.71 |
| | | | | | | SH20x85 | M12 / M16 | 85 | 120 | 1.00 | 0.71 |
| | | | | | | SH20x130 | M12 / M16 | 130 | 120 | 1.00 | 0.71 |
| Light aggregate block Vbl | solid | 300 x 123 x 248 | 2 | 0.6 | Rotary | – | M8 | 80 | 120 | 0.57 | 0.86 |
| | | | | | | – | M8/M10 | 90 | 135 | 0.57 | 1.00 |
| | | | | | | – | M12 | 100 | 150 | 0.57 | 1.14 |
| | | | | | | – | M16 | 100 | 150 | 0.57 | 1.14 |
| Light aggregate block B40 | hollow | 495 x 200 x 190 | 4 | 0.8 | Rotary | SH12x80 | M8 | 80 | 100 | 0.11 | 0.71 |
| | | | | | | SH16x85 | M8 / M10 | 85 | 100 | 0.17 | 0.71 |
| | | | | | | SH16x130 | M8 / M10 | 130 | 100 | 0.57 | 0.71 |
| | | | | | | SH20x85 | M12 / M16 | 85 | 120 | 0.26 | 0.71 |
| | | | | | | SH20x130 | M12 / M16 | 130 | 120 | 0.57 | 0.71 |
| Calcium silicate brick KS | solid | 240 x 115 x 71 | 20 | 2.0 | Hammer | – | M8 | 80 | 120 | 1.29 | 1.29 |
| | | | | | | – | M10 | 90 | 135 | 1.29 | 1.29 |
| | | | | | | – | M12 | 100 | 150 | 1.57 | 1.43 |
| | | | | | | – | M16 | 100 | 150 | 1.29 | 1.43 |
| Calcium silicate block KSL | hollow | 498 x 175 x 238 | 12 | 1.4 | Rotary | SH12x80 | M8 | 80 | 100 | 0.11 | 0.71 |
| | | | | | | SH16x85 | M8 / M10 | 85 | 100 | 0.43 | 0.71 |
| | | | | | | SH16x130 | M8 / M10 | 130 | 100 | 1.29 | 0.71 |
| | | | | | | SH20x85 | M12 / M16 | 85 | 120 | 0.43 | 0.71 |
| | | | | | | SH20x130 | M12 / M16 | 130 | 120 | 1.29 | 0.71 |
| Aerated concrete block AAC | solid | 499 x 240 x 249 | 6 | 0.6 | Rotary | – | M8 | 80 | 120 | 0.71 | 1.96 |
| | | | | | | – | M10 | 90 | 135 | 1.07 | 3.21 |
| | | | | | | – | M12 | 100 | 150 | 1.61 | 3.21 |
| | | | | | | – | M16 | 100 | 150 | 1.96 | 3.93 |

[1)] Loads are valid for single anchors and the given edge distance. Shear loads are acting parallel to the edge. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included. The material safety factor depends on failure mode and type of brick.

[2)] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.

[3)] The loads given are valid for the bricks and blocks which have been given. The loads can be taken for bricks and blocks of larger sizes, larger compressive strength of the masonry unit and same configuration of the cavities. The loads of the injection anchor may be determined by the so-called "job site tests" according to ETAG029 and TR053.

## Installation Masonry



# INJECTION SYSTEM WIT-PE 1000

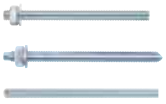
585 ml

| Cartridge sizes | | Art. no. | Dispensing guns |
|---|---|---|---|
| 440 ml | side-by-side | **5918 605 440** | |
| 585 ml | side-by-side | **5918 605 585** | p. 48 |
| 1400 ml | side-by-side | **5918 605 140** | |

## Application references




## Approvals and certificates

| Threaded rod | Internal threaded rod | Rebar |
|---|---|---|
|  |  |  |
| ✓ | – | ✓ |
| p. 34–36 | p. 36 | not supplied by Würth |

| Temperature of base material | Gelling – working time | Min. curing time – dry conditions[1)] |
|---|---|---|
| 5 °C to 9 °C | 80 min | 48 h |
| 10 °C to 14 °C | 60 min | 28 h |
| 15 °C to 19 °C | 40 min | 18 h |
| 20 °C to 24 °C | 30 min | 12 h |
| 25 °C to 34 °C | 12 min | 9 h |
| 35 °C to 39 °C | 8 min | 6 h |
| +40 °C | 8 min | 4 h |

[1)] for wet base material the curing time must be doubled

## Type of installation

| Pre-positioned | In-place | Stand-off |
|---|---|---|
| ✓ | – | ✓ |

## Installation condition

| Dry concrete | Wet concrete | Flooded drill hole |
|---|---|---|
| ✓ | ✓ | ✓ |

## Drilling method

| Hammer drill | Diamond drill | Hollow drill |
|---|---|---|
| ✓ | ✓ | ✓ |

Rotary drilling in masonry required for some types of bricks and blocks

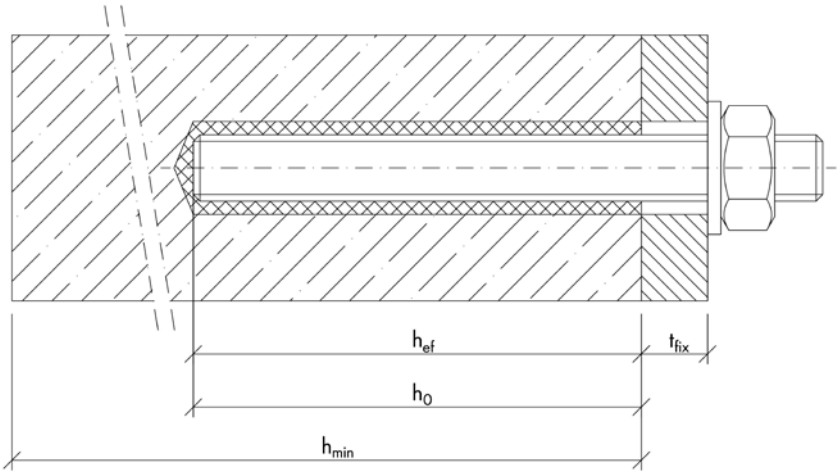
# INJECTION SYSTEM WIT-PE 1000

## Loads – concrete

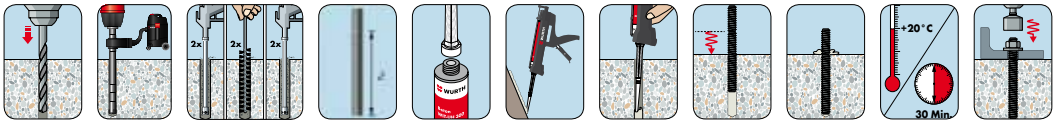
| Thread size | | | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Effective anchorage depth | | $h_{ef}$ | [mm] | 80 | 90 | 110 | 125 | 170 | 210 | 240 | 270 |
| **Non-cracked Concrete** | | | | | | | | | | | |
| Tension | 5.8 | $N_{rec}$ | [kN] | 8.7 | 13.8 | 20.1 | 32.7 | 51.9 | 71.3 | 87.1 | 103.9 |
| | 8.8 | | | 13.8 | 20.0 | 27.0 | 32.7 | 51.9 | 71.3 | 87.1 | 103.9 |
| | A4-70 | | | 9.9 | 15.7 | 22.5 | 32.7 | 51.9 | 71.3 | 57.4 | 70.2 |
| Shear | 5.8 | $V_{rec}$ | [kN] | 6.3 | 9.9 | 14.5 | 26.9 | 42.0 | 60.5 | 78.7 | 96.2 |
| | 8.8 | | | 8.6 | 13.1 | 19.4 | 36.0 | 56.0 | 80.6 | 105.1 | 128.0 |
| | A4-70 | | | 6.0 | 9.2 | 13.7 | 25.2 | 39.4 | 56.8 | 34.5 | 42.0 |
| **Cracked Concrete** | | | | | | | | | | | |
| Tension | 5.8/8.8 | $N_{rec}$ | [kN] | 6.7 | 9.4 | 16.8 | 22.9 | 36.3 | 49.9 | 61.0 | 72.7 |
| | A4-70 | | | 6.7 | 9.4 | 16.8 | 22.9 | 36.3 | 49.9 | 57.4 | 70.2 |
| Shear | 5.8 | $V_{rec}$ | [kN] | 6.3 | 9.9 | 14.5 | 26.9 | 42.0 | 60.5 | 78.7 | 96.2 |
| | 8.8 | | | 8.6 | 13.1 | 19.4 | 36.0 | 56.0 | 80.6 | 105.1 | 128.0 |
| | A4-70 | | | 6.0 | 9.2 | 13.7 | 25.2 | 39.4 | 56.8 | 34.5 | 42.0 |

[1] Loads are valid for single anchors. Normal spaced reinforcement in ≥ C20/25. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included. The material safety factor depends on the failure mode.
[2] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Clearance-hole in fixture | Pre-positioned | $d_f$ | [mm] | 9 | 12 | 14 | 18 | 22 | 26 | 30 | 33 |
| | Push through | $d_f$ | [mm] | 12 | 14 | 16 | 20 | 24 | 30 | 33 | 40 |
| Drill depth | | $h_0 = h_{ef}$ | [mm] | 80 | 90 | 110 | 125 | 170 | 210 | 240 | 270 |
| Minimum thickness of concrete member | | $h_{min}$ | [mm] | 110 | 120 | 140 | 161 | 214 | 266 | 300 | 340 |
| Minimum edge distance | | $c_{min}$ | [mm] | 35 | 40 | 45 | 50 | 60 | 65 | 75 | 80 |




## Installation Concrete



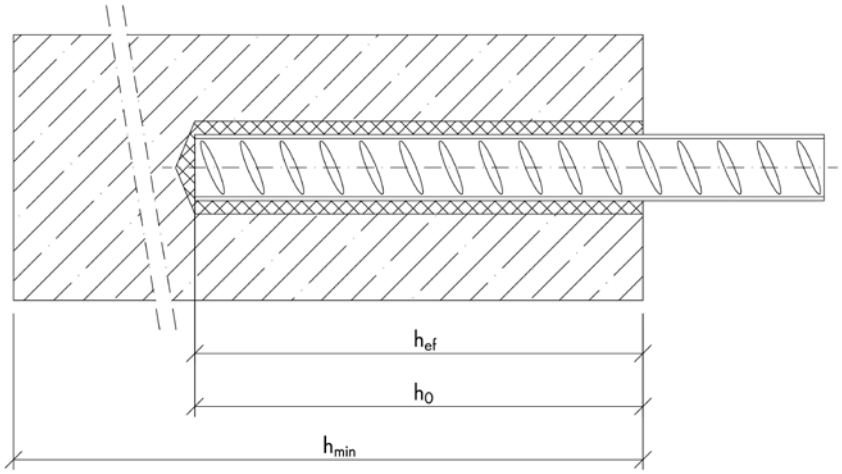
# INJECTION SYSTEM WIT-PE 1000

## Loads – REBAR

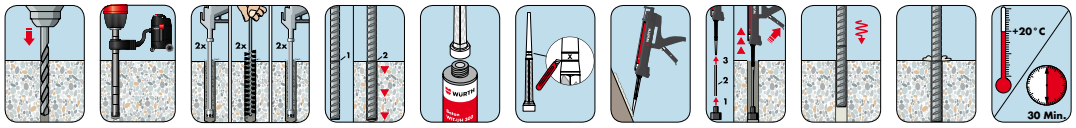
| Rebar size | | | | Ø 8 | Ø 10 | Ø 12 | Ø 14 | Ø 16 | Ø 20 | Ø 25 | Ø 28 | Ø 32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Effective anchorage depth** | | $h_{ef}$ | [mm] | 80 | 90 | 110 | 125 | 125 | 170 | 210 | 270 | 300 |
| **Non-cracked Concrete** | | | | | | | | | | | | |
| **Tension** | B500B | $N_{rec}$ | [kN] | 14.0 | 20.0 | 27.0 | 32.7 | 32.7 | 51.9 | 71.3 | 103.9 | 121.7 |
| **Shear** | | $V_{rec}$ | [kN] | 6.5 | 10.3 | 14.8 | 20.2 | 26.3 | 41.1 | 64.3 | 80.7 | 105.3 |
| **Cracked Concrete** | | | | | | | | | | | | |
| **Tension** | B500B | $N_{rec}$ | [kN] | 6.7 | 9.4 | 16.8 | 22.3 | 22.9 | 36.3 | 49.9 | 72.7 | 85.2 |
| **Shear** | | $V_{rec}$ | [kN] | 6.5 | 10.3 | 14.8 | 20.2 | 26.3 | 41.1 | 64.3 | 80.7 | 105.3 |

[1] Loads are valid for single anchors. Normal spaced reinforcement in ≥ C20/25. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included. The material safety factor depends on the failure mode.
[2] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Nominal hole diameter** | $d_0$ | [mm] | 10 | 12 | 14 | 18 | 20 | 25 | 32 | 35 | 40 |
| **Effective anchorage depth** | $h_{ef,min}$ | [mm] | 60 | 60 | 70 | 75 | 80 | 90 | 100 | 112 | 128 |
| | $h_{ef,max}$ | [mm] | 160 | 200 | 240 | 280 | 320 | 400 | 500 | 560 | 640 |
| **Minimum thickness of concrete member** | $h_{min}$ | [mm] | 110 | 120 | 140 | 161 | 165 | 220 | 274 | 340 | 380 |
| **Minimum spacing** | $s_{min}$ | [mm] | 40 | 50 | 60 | 70 | 75 | 95 | 120 | 130 | 150 |
| **Minimum edge distance** | $c_{min}$ | [mm] | 35 | 40 | 45 | 50 | 50 | 60 | 70 | 75 | 85 |




## Installation REBAR



# INJECTION SYSTEM WIT-PE 500

385 ml 585 ml 1400 ml

| Cartridge sizes | | Art. no. | Dispensing guns |
|---|---|---|---|
| 385 ml | side-by-side | **0903 480 001** | |
| 585 ml | side-by-side | **0903 480 005** | p. 48 |
| 1400 ml | side-by-side | **0903 480 002** | |

## Application references

## Approvals and certificates

| Threaded rod | Rebar |
|---|---|
| ✓ | ✓ |
| p. 34–36 | not supplied by Würth |

| Temperature of base material | Gelling – working time | Min. curing time – dry conditions[1)] |
|---|---|---|
| 5 °C to 9 °C | 120 min | 50 h |
| 10 °C to 19 °C | 90 min | 30 h |
| 20 °C to 29 °C | 30 min | 10 h |
| 30 °C to 39 °C | 20 min | 6 h |
| ≥ 40 °C | 12 min | 4 h |

[1)] for wet base material the curing time must be doubled

| Type of installation | | |
|---|---|---|
| Pre-positioned | In-place | Stand-off |
| ✓ | – | ✓ |

| Installation condition | | |
|---|---|---|
| Dry concrete | Wet concrete | Flooded drill hole |
| ✓ | ✓ | ✓ |

| Drilling method | | |
|---|---|---|
| Hammer drill | Diamond drill | Hollow drill |
| ✓ | ✓ | ✓ |

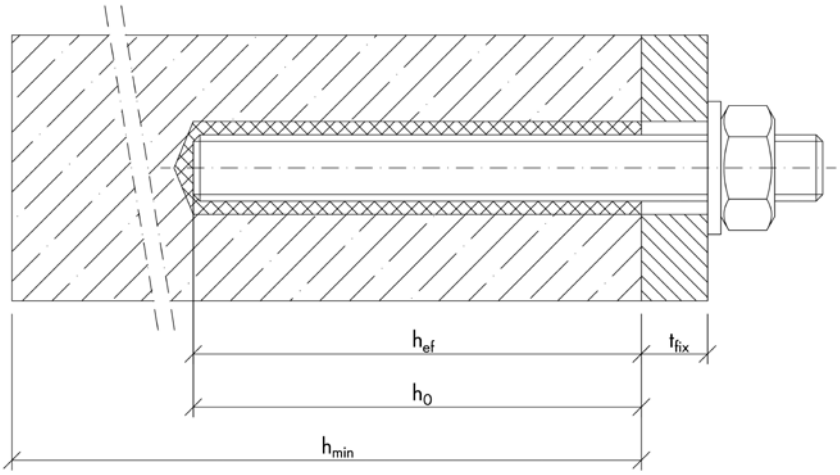
# INJECTION SYSTEM WIT-PE 500

## Loads – concrete

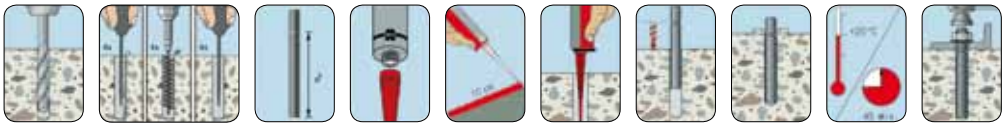
| Thread size | | | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Effective anchorage depth** | | $h_{ef}$ | [mm] | 80 | 90 | 110 | 125 | 170 | 210 | 240 | 270 |
| **Non-cracked Concrete** | | | | | | | | | | | |
| **Tension** | 5.8 | $N_{rec}$ | [kN] | 8.7 | 13.8 | 20.1 | 27.3 | 37.1 | 50.9 | 62.2 | 74.2 |
| | 8.8 | | | 12.0 | 16.7 | 22.5 | 27.3 | 37.1 | 50.9 | 62.2 | 74.2 |
| | A4-70 | | | 9.9 | 15.7 | 22.5 | 27.3 | 37.1 | 50.9 | 57.4 | 70.2 |
| **Shear** | 5.8 | $V_{rec}$ | [kN] | 6.3 | 9.9 | 14.5 | 26.9 | 42.0 | 60.5 | 78.7 | 96.2 |
| | 8.8 | | | 8.6 | 13.1 | 19.4 | 36.0 | 56.0 | 80.6 | 105.1 | 128.0 |
| | A4-70 | | | 6.0 | 9.2 | 13.7 | 25.2 | 39.4 | 56.8 | 34.5 | 42.0 |
| **Cracked Concrete** | | | | | | | | | | | |
| **Tension** | 5.8/8.8/A4-70 | $N_{rec}$ | [kN] | | | 12.3 | 16.2 | 21.8 | 29.6 | 38.1 | 47.6 |
| **Shear** | 5.8 | $V_{rec}$ | [kN] | | | 14.5 | 26.9 | 42.0 | 59.2 | 76.2 | 95.2 |
| | 8.8 | | | | | 19.4 | 32.4 | 43.6 | 59.2 | 76.2 | 95.2 |
| | A4-70 | | | | | 13.7 | 25.2 | 39.4 | 56.8 | 34.5 | 42.0 |

[1] Loads are valid for single anchors. Normal spaced reinforcement in ≥ C20/25. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included. The material safety factor depends on the failure mode.
[2] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Clearance-hole in fixture** | | $d_f$ | [mm] | 9 | 12 | 14 | 18 | 22 | 26 | 30 | 33 |
| **Drill depth** | | $h_0 = h_{ef}$ | [mm] | 80 | 90 | 110 | 125 | 170 | 210 | 240 | 270 |
| **Minimum thickness of concrete member** | | $h_{min}$ | [mm] | 110 | 120 | 140 | 161 | 218 | 266 | 304 | 340 |
| **Minimum edge distance** | | $c_{min}$ | [mm] | 40 | 50 | 60 | 80 | 100 | 120 | 135 | 150 |




## Installation Concrete



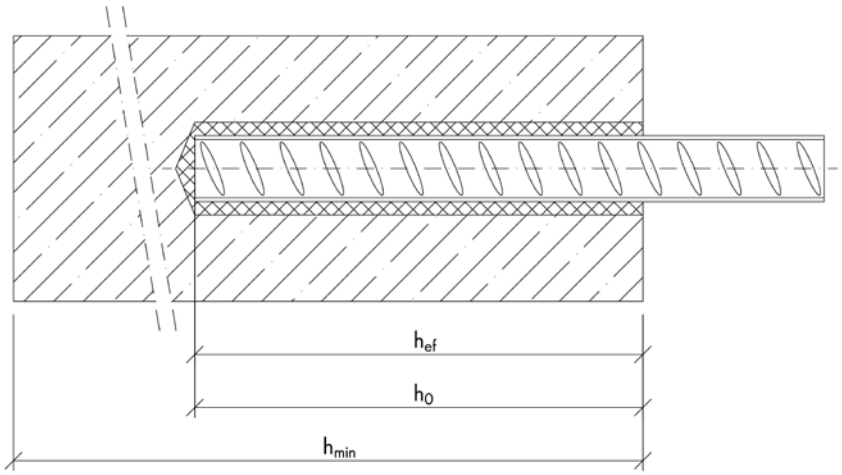
# INJECTION SYSTEM WIT-PE 500

## Loads – REBAR

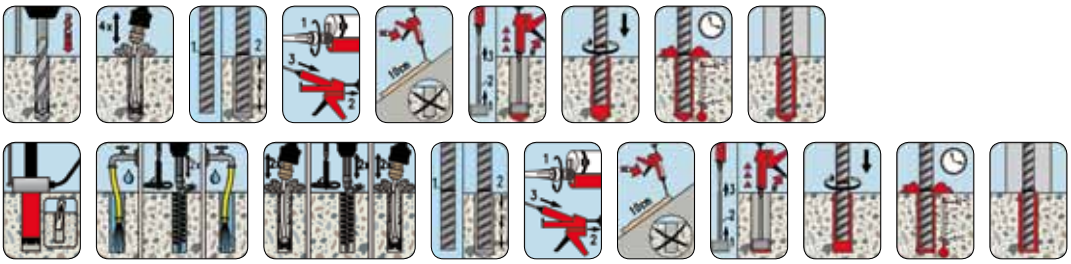
| Rebar size | | | | Ø 8 | Ø 10 | Ø 12 | Ø 15 | Ø 14 | Ø 20 | Ø 25 | Ø 28 | Ø 32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Effective anchorage depth** | | $h_{ef}$ | [mm] | 80 | 90 | 110 | 125 | 125 | 170 | 210 | 270 | 300 |
| **Non-cracked Concrete** | | | | | | | | | | | | |
| **Tension** | B500B | $N_{rec}$ | [kN] | 11.2 | 15.7 | 21.4 | 27.3 | 27.3 | 37.1 | 50.9 | 74.2 | 86.9 |
| **Shear** | | $V_{rec}$ | [kN] | 6.5 | 10.3 | 14.8 | 20.2 | 26.3 | 41.1 | 64.3 | 80.7 | 105.3 |
| **Cracked Concrete** | | | | | | | | | | | | |
| **Tension** | B500B | $N_{rec}$ | [kN] | | | 12.3 | 15.3 | 16.2 | 21.8 | 30.9 | 44.4 | 56.4 |
| **Shear** | | $V_{rec}$ | [kN] | | | 14.8 | 20.2 | 26.3 | 41.1 | 61.7 | 80.7 | 105.3 |

[1] Loads are valid for single anchors. Normal spaced reinforcement in ≥ C20/25. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included. The material safety factor depends on the failure mode.
[2] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.

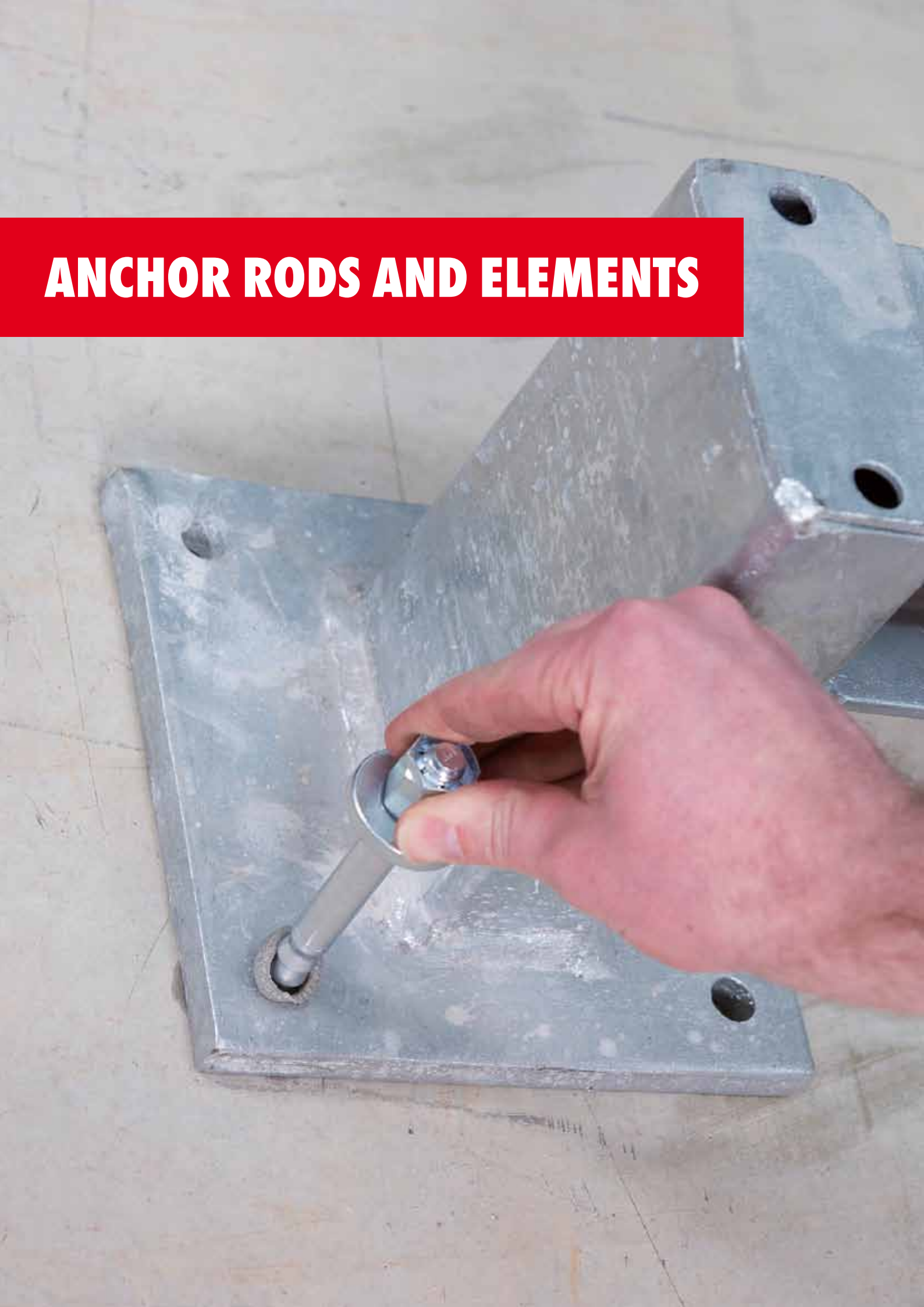
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Clearance-hole in fixture** | $d_0$ | [mm] | 12 | 14 | 16 | 18 | 20 | 24 | 32 | 35 | 40 |
| **Effective anchorage depth** | $h_{ef,min}$ | [mm] | 60 | 60 | 70 | 75 | 80 | 90 | 100 | 112 | 128 |
| | $h_{ef,max}$ | [mm] | 96 | 120 | 144 | 168 | 192 | 240 | 300 | 336 | 384 |
| **Minimum thickness of concrete member** | $h_{min}$ | [mm] | 110 | 120 | 142 | 161 | 165 | 218 | 274 | 340 | 380 |
| **Minimum spacing** | $s_{min}$ | [mm] | 40 | 50 | 60 | 70 | 80 | 100 | 125 | 140 | 160 |
| **Minimum edge distance** | $c_{min}$ | [mm] | 40 | 50 | 60 | 70 | 80 | 100 | 125 | 140 | 160 |




## Installation REBAR



# ANCHOR RODS AND ELEMENTS

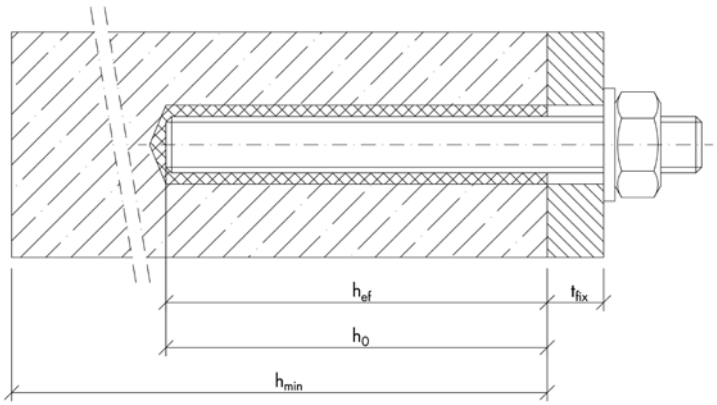


# FOR USE IN CONCRETE

W-VI-A in combination with approvals for WIT-UH 300, WIT-VM 250, WIT-PE 1000, WIT-PE 500, WIT-PM 200, WIT-EA 200

| Type | Anchor length l [mm] | Fixture thickness $t_{fix}$ [mm] | Art. no. Carbon steel 5.8 galvanized | Art. no. Carbon steel 8.8 galvanized | Art. no. Stainless steel A4 | Drill bit diameter $d_o$ [mm] | Drill hole depth $h_0$ [mm] | Installation torque $T_{inst}$ [Nm] | P.Qty. |
|---|---|---|---|---|---|---|---|---|---|
| W-VI-A M8 | 100 | 10 | 0905 460 811 | – | 0905 470 811 | 10 | 80 | 10 | 10 |
| | 110 | 20 | 0905 460 812 | – | 0905 470 812 | | | | |
| | 130 | 40 | 0905 460 813 | – | 0905 470 813 | | | | |
| | 145 | 55 | 0905 460 814 | – | 0905 470 814 | | | | |
| | 160 | 70 | 0905 460 815 | – | 0905 470 815 | | | | |
| | 205 | 115 | 0905 460 816 | – | 0905 470 816 | | | | |
| W-VI-A M10 | 110 | 10 | 0905 461 011 | – | 0905 471 011 | 12 | 90 | 20 | 10 |
| | 130 | 30 | 0905 461 012 | – | 0905 471 012 | | | | |
| | 150 | 50 | 0905 461 013 | – | 0905 471 013 | | | | |
| | 165 | 65 | 0905 461 014 | – | 0905 471 014 | | | | |
| | 190 | 90 | 0905 461 015 | – | 0905 471 015 | | | | |
| | 260 | 160 | 0905 461 016 | – | 0905 471 016 | | | | |
| W-VI-A M12 | 135 | 10 | 0905 461 211 | – | 0905 471 211 | 14 | 110 | 40 | 10 |
| | 155 | 30 | 0905 461 212 | – | 0905 471 212 | | | | |
| | 175 | 50 | 0905 461 213 | – | 0905 471 213 | | | | |
| | 210 | 85 | 0905 461 214 | – | 0905 471 214 | | | | |
| | 250 | 125 | 0905 461 215 | – | 0905 471 215 | | | | |
| | 300 | 175 | 0905 461 216 | – | 0905 471 216 | | | | |
| W-VI-A M16 | 160 | 15 | 0905 461 611 | – | 0905 471 611 | 18 | 125 | 60 | 10 |
| | 175 | 30 | 0905 461 612 | – | 0905 471 612 | | | | |
| | 205 | 60 | 0905 461 613 | – | 0905 471 613 | | | | |
| | 235 | 90 | 0905 461 614 | – | 0905 471 614 | | | | |
| | 300 | 155 | 0905 461 615 | – | 0905 471 615 | | | | |
| W-VI-A M20 | 240 | 50 | 0905 462 011 | – | 0905 472 011 | 24* | 170 | 100 | 10 |
| | 260 | 70 | 0905 462 012 | – | – | | | | |
| | 285 | 95 | 0905 462 013 | – | 0905 472 013 | | | | |
| | 300 | 210 | 0905 462 014 | – | 0905 472 014 | | | | |
| | 350 | 160 | 0905 462 015 | – | – | | | | |
| | 400 | 210 | 0905 462 016 | – | – | | | | |
| W-VI-A M24 | 290 | 55 | 0905 462 411 | – | 0905 472 411 | 28 | 210 | 170 | 5 |
| | 350 | 115 | 0905 462 412 | – | 0905 472 412 | | | | |
| | 400 | 165 | 0905 462 413 | – | 0905 472 413 | | | | |
| W-VI-A M30 | 370 | 90 | 0905 463 011 | – | 0905 473 011 | 35 | 250 | 300 | 5 |

* Ø 22 only for WIT-UH 300

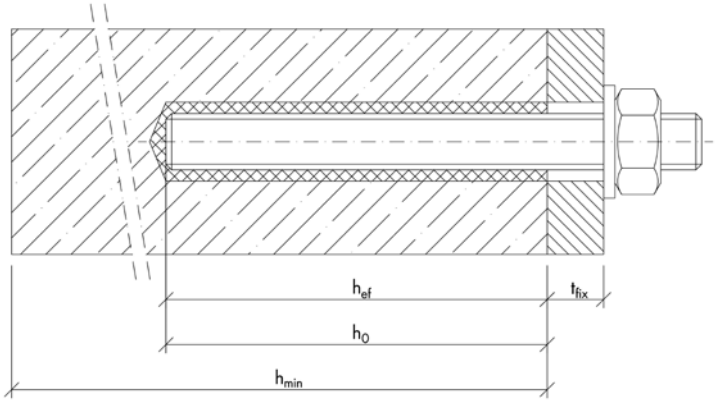


# FOR USE IN CONCRETE

W-VD-A in combination with approvals for WIT-UH 300, WIT-VM 250, WIT-PE 1000, WIT-PE 500, WIT-PM 200, WIT-EA 200

| Type | Anchor length l [mm] | Fixture thickness $t_{fix}$ [mm] | Art. no. | | | | Drill bit diameter $d_o$ [mm] | Drill hole depth $h_0$ [mm] | Installation torque $T_{inst}$ [Nm] | P.Qty. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Carbon steel 5.8 galvanized | Carbon steel 8.8 galvanized | Stainless steel A4 | High corrosion resistant steel HCR | | | | |
| W-VD-A M8 | 110 | 20 | **5915 108 110** | **5915 308 110** | **5915 208 110** | **5916 408 110** | 10 | 80 | 10 | 10 |
| | 150 | 60 | **5915 108 150** | **5915 308 150** | **5915 208 150** | – | | | | |
| W-VD-A M10 | 115 | 15 | **5915 110 115** | **5915 310 115** | **5915 210 115** | – | 12 | 90 | 20 | |
| | 130 | 30 | **5915 110 130** | **5915 310 130** | **5915 210 130** | **5916 410 130** | | | | |
| | 165 | 65 | **5915 110 165** | **5915 310 165** | **5915 210 165** | – | | | | |
| | 190 | 90 | **5915 110 190** | **5915 310 190** | **5915 210 190** | – | | | | |
| W-VD–A M12 | 135 | 10 | **5915 112 135** | **5915 312 135** | **5915 212 135** | – | 14 | 110 | 40 | |
| | 160 | 35 | **5915 112 160** | **5915 312 160** | **5915 212 160** | **5916 412 160** | | | | |
| | 210 | 85 | **5915 112 210** | **5915 312 210** | **5915 212 210** | – | | | | |
| | 250 | 125 | **5915 112 250** | **5915 312 250** | **5915 212 250** | – | | | | |
| | 300 | 175 | **5915 112 300** | **5915 312 300** | **5915 212 300** | – | | | | |
| W-VD-A M16 | 165 | 20 | **5915 116 165** | **5915 316 165** | **5915 216 165** | – | 18 | 125 | 80 | |
| | 190 | 45 | **5915 116 190** | **5915 316 190** | **5915 216 190** | **5916 416 190** | | | | |
| | 230 | 85 | **5915 116 230** | **5915 316 230** | **5915 216 230** | – | | | | |
| | 250 | 105 | **5915 116 250** | **5915 316 250** | **5915 216 250** | – | | | | |
| | 300 | 155 | **5915 116 300** | **5915 316 300** | **5915 216 300** | – | | | | |
| W-VD-A M20 | 220 | 20 | **5915 120 220** | **5915 320 220** | **5915 220 220** | – | 24* | 170 | 120 | |
| | 260 | 60 | **5915 120 260** | **5915 320 260** | **5915 220 260** | – | | | | |
| | 300 | 100 | **5915 120 300** | **5915 320 300** | **5915 220 300** | – | | | | |
| W-VD-A M24 | 260 | 15 | **5915 124 260** | **5915 324 260** | **5915 224 260** | – | 28 | 210 | 160 | 5 |
| | 300 | 55 | **5915 124 300** | **5915 324 300** | **5915 224 300** | – | | | | |

* Ø 22 only for WIT-UH 300



# FOR USE IN CONCRETE

W-VI-IG in combination with WIT-UH 300, WIT-VM 250, WIT-PE 1000, WIT-PE 500, WIT-PM 200, WIT-EA 200

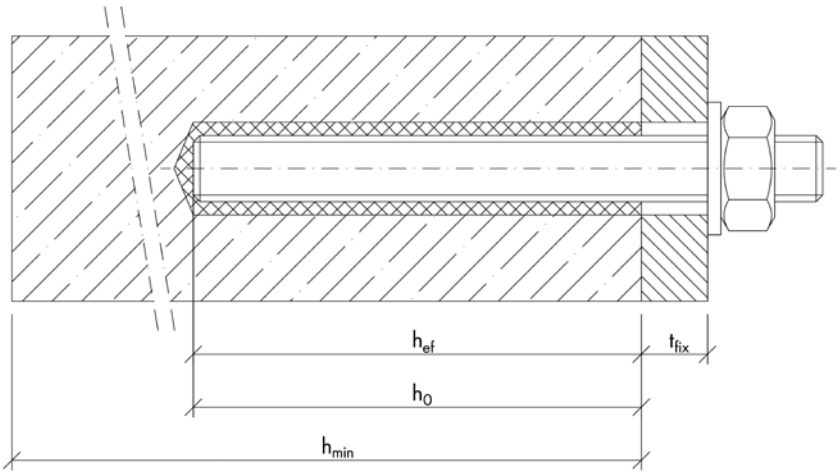
| Type | Anchor length l [mm] | Screw-in depth s [mm] | Art. no. Carbon steel 5.8 galvanized | Carbon steel 8.8 galvanized | Stainless steel A4 | Drill bit diameter $d_o$ [mm] | Drill hole depth $h_0$ [mm] | Installation torque $T_{inst}$ [Nm] | P.Qty. |
|---|---|---|---|---|---|---|---|---|---|
| W-VI-IG M6* | 80 | 8–20 | 5915 606 080 | – | 5915 706 080 | 12 | 90 | 10 | 10 |
| | 90 | | 5915 606 090 | – | 5915 706 090 | | | | |
| W-VI-IG M8* | 80 | | 5915 608 080 | – | 5915 708 080 | 14 | 100 | | |
| | 100 | | 5915 608 100 | – | 5915 708 100 | | | | |
| W-VI-IG M10* | 80 | 10–25 | 5915 610 080 | – | 5915 710 080 | 18 | 100 | 20 | |
| | 100 | | 5915 610 100 | – | 5915 710 100 | | | | |

* only approved with WIT-UH 300

Commercial standard rod with inspection certificate 3.1 acc. to EN 10204:2004 with approvals for WIT-UH 300, WIT-VM 250, WIT-PE 1000, WIT-PE 500, WIT-PM 200, WIT-EA 200

| Type | Anchor length l [mm] | Art. no. Carbon steel 5.8 galvanized | Carbon steel 8.8 galvanized | Stainless steel A4 | Drill bit diameter $d_o$ [mm] | Drill hole depth $h_0$ [mm] | Installation torque $T_{inst}$ [Nm] | P.Qty. |
|---|---|---|---|---|---|---|---|---|
| M8 | 1000 | 5916 008 999 | 5916 208 999 | 5916 108 999 | 10 | – | 10 | 10 |
| M10 | 1000 | 5916 010 999 | 5916 210 999 | 5916 110 999 | 12 | | 20 | |
| M12 | 1000 | 5916 012 999 | 5916 212 999 | 5916 112 999 | 14 | | 40 | |
| M16 | 1000 | 5916 016 999 | 5916 216 999 | 5916 116 999 | 18 | | 60 | |
| M20 | 1000 | 5916 020 999 | – | 5916 120 999 | 24* | | 100 | 5 |
| M24 | 1000 | 5916 024 999 | – | 5916 124 999 | 28 | | 170 | |

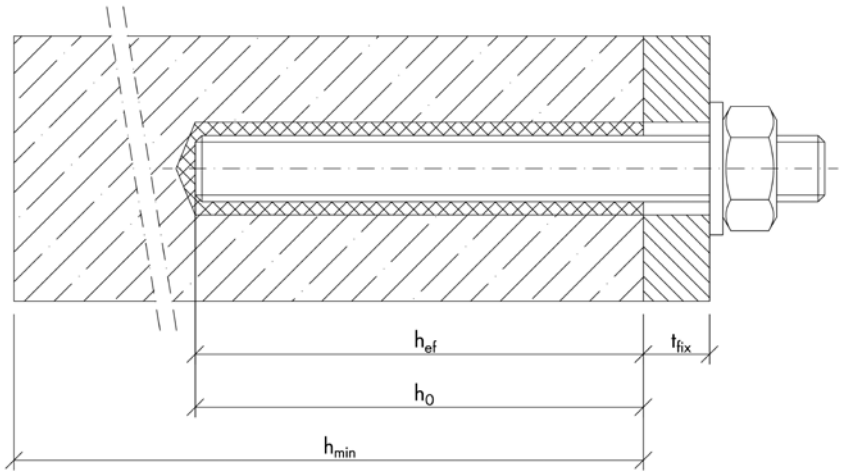
* Ø 22 only for WIT-UH 300



# FOR USE IN MASONRY UNITS

W-VI-A in combination with approvals for WIT-VM 250, WIT-PM 200, WIT-EA 200 and sleeve SH additionally for hollow bricks

| | Anchor length | Fixture thickness | | Art. no. | | | Drill hole diameter | | Drill hole depth | | Instal-lation torque | P. Qty. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | solid bricks no sleeve | solid or hollow bricks with different sleeves | | | | solid bricks no sleeve | solid or hollow bricks sleeve | solid bricks no sleeve | solid or hollow bricks sleeve | | |
| Type | l [mm] | $t_{fix}$ [mm] | | Carbon steel 5.8 galvanized | Carbon steel 8.8 galvanized | Stainless steel A4 | $d_o$ [mm] | | $h_o$ [mm] | | $T_{inst}$ [Nm] | |
| W-VI-A M8 | 100 | 10 | 10/5/- | **0905 460 811** | – | **0905 470 811** | 10 | 12/16/16 | 80 | 85/90/135 | 2 | 10 |
| | 110 | 20 | 20/15/- | **0905 460 812** | – | **0905 470 812** | | | | | | |
| | 130 | 40 | 40/35/- | **0905 460 813** | – | **0905 470 813** | | | | | | |
| | 145 | 55 | 55/50/5 | **0905 460 814** | – | **0905 470 814** | | | | | | |
| | 160 | 70 | 70/65/20 | **0905 460 815** | – | **0905 470 815** | | | | | | |
| | 205 | 115 | 115/110/65 | **0905 460 816** | – | **0905 470 816** | | | | | | |
| W-VI-A M10 | 110 | 10 | 15/ - | **0905 461 011** | – | **0905 471 011** | 12 | 16/16 | 90 | 90/135 | | |
| | 130 | 30 | 35/ - | **0905 461 012** | – | **0905 471 012** | | | | | | |
| | 150 | 50 | 55/10 | **0905 461 013** | – | **0905 471 013** | | | | | | |
| | 165 | 65 | 70/ 25 | **0905 461 014** | – | **0905 471 014** | | | | | | |
| | 190 | 90 | 95/50 | **0905 461 015** | – | **0905 471 015** | | | | | | |
| | 260 | 160 | 165/120 | **0905 461 016** | – | **0905 471 016** | | | | | | |
| W-VI-A M12 | 135 | 10 | 35/-/- | **0905 461 211** | – | **0905 471 211** | 14 | 20/20/20 | 100 | 90/135/205 | | |
| | 155 | 30 | 55/10/- | **0905 461 212** | – | **0905 471 212** | | | | | | |
| | 175 | 50 | 75/30/- | **0905 461 213** | – | **0905 471 213** | | | | | | |
| | 210 | 85 | 110/65/- | **0905 461 214** | – | **0905 471 214** | | | | | | |
| | 250 | 125 | 150/105/35 | **0905 461 215** | – | **0905 471 215** | | | | | | |
| | 300 | 175 | 200/155/85 | **0905 461 216** | – | **0905 471 216** | | | | | | |
| W-VI-A M16 | 160 | 15 | 55/10/- | **0905 461 611** | – | **0905 471 611** | 18 | 20/20/20 | 100 | 90/135/205 | | |
| | 175 | 30 | 70/25/- | **0905 461 612** | – | **0905 471 612** | | | | | | |
| | 205 | 60 | 100/55/- | **0905 461 613** | – | **0905 471 613** | | | | | | |
| | 235 | 90 | 130/ 85/15 | **0905 461 614** | – | **0905 471 614** | | | | | | |
| | 300 | 155 | 195/150/80 | **0905 461 615** | – | **0905 471 615** | | | | | | |



# FOR USE IN MASONRY UNITS

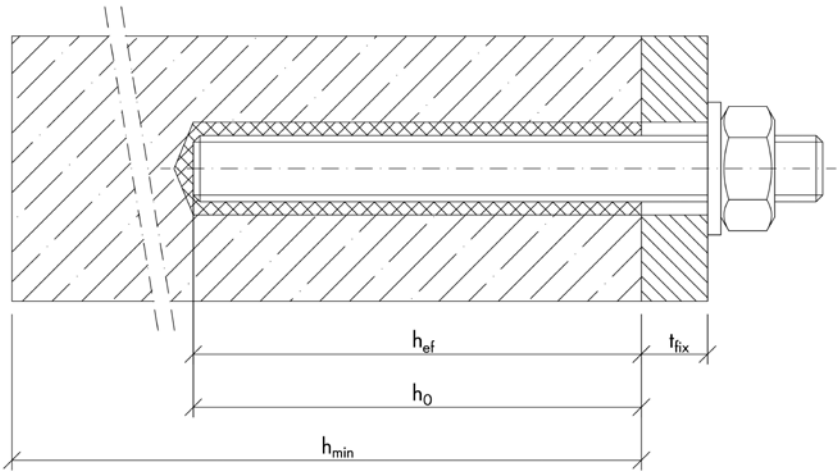
W-VI-IG in combination with WIT-VM 250, WIT-PM 200, WIT-EA 200

| | Anchor length | screw-in depth | Art. no. | | | Drill hole diameter | | Drill hole depth | | Instal-lation torque | P. Qty. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | solid bricks no sleeve | solid or hollow bricks sleeve | solid bricks no sleeve | solid or hollow bricks sleeve | | |
| **Type** | **l [mm]** | **s [mm]** | **Carbon steel 5.8 galvanized** | **Carbon steel 8.8 galvanized** | **Stainless steel A4** | **$d_o$ [mm]** | | **$h_0$ [mm]** | | **$T_{inst}$ [Nm]** | |
| W-VI-IG M6* | 80 | 8–20 | **5915 606 080** | – | **5915 706 080** | 12 | 16 | 90 | 90 | 2 | 10 |
| | 90 | | **5915 606 090** | – | **5915 706 090** | | | | | | |
| W-VI-IG M8* | 80 | | **5915 608 080** | – | **5915 708 080** | 14 | 20 | 100 | 90 | | |
| | 100 | | **5915 608 100** | – | **5915 708 100** | | | | | | |
| W-VI-IG M10* | 80 | 10–25 | **5915 610 080** | – | **5915 710 080** | 18 | 20 | 100 | 90 | | |
| | 100 | | **5915 610 100** | – | **5915 710 100** | | | | | | |

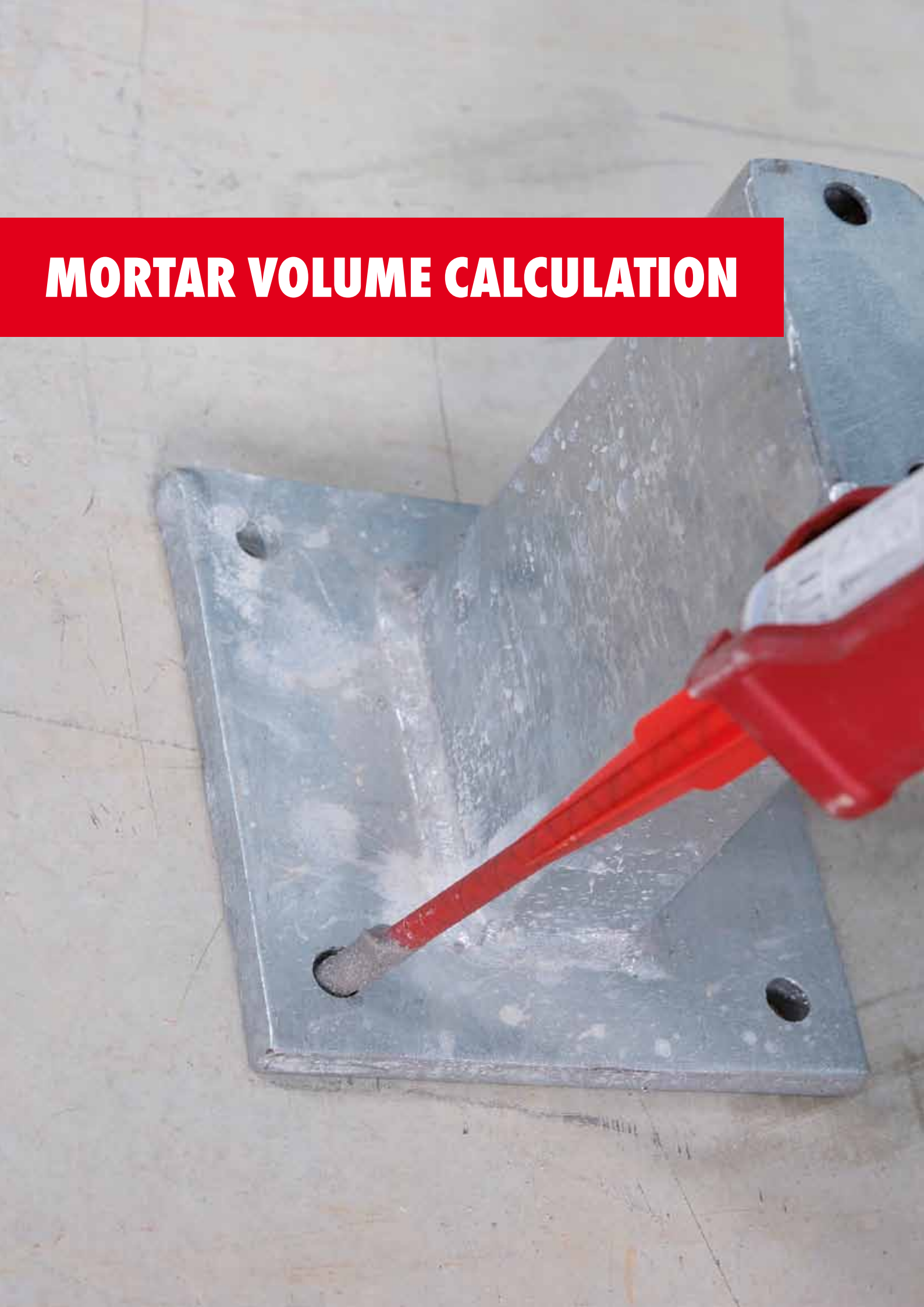
* only approved with WIT-VM 250

Commercial standard rod with inspection certificate 3.1 acc. To EN 10204:2004 with approvals for WIT-VM 250, WIT-PM 200, WIT EA-200 and sleeve SH for hollow bricks

| | Anchor length | Fixture thickness | | Art. no. | | | Drill hole diameter | | Drill hole depth | | Instal-lation torque | P. Qty. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | solid bricks no sleeve | solid or hollow bricks with different sleeves | | | | solid bricks no sleeve | solid or hollow bricks sleeve | solid bricks no sleeve | solid or hollow bricks sleeve | | |
| **Type** | **l [mm]** | **$t_{fix}$ [mm]** | | **Carbon steel 5.8 galvanized** | **Carbon steel 8.8 galvanized** | **Stainless steel A4** | **$d_o$ [mm]** | | **$h_0$ [mm]** | | **$T_{inst}$ [Nm]** | |
| M8 | 1000 | – | – | **5916 008 999** | **5916 208 999** | **5916 108 999** | 10 | 12/16/16 | – | 85/90/135 | 2 | 10 |
| M10 | 1000 | – | – | **5916 010 999** | **5916 210 999** | **5916 110 999** | 12 | 16/16 | | 90/135 | | |
| M12 | 1000 | – | – | **5916 012 999** | **5916 212 999** | **5916 112 999** | 14 | 20/20/20 | | 90/135/205 | | |
| M16 | 1000 | – | – | **5916 016 999** | **5916 216 999** | **5916 116 999** | 18 | 20/20/20 | | 90/135/205 | | |



# MORTAR VOLUME CALCULATION



# CONCRETE

**Metrical threaded rod W-VI-A, W-VD-A**

(WIT-UH 300, WIT-VM 250, WIT-PE 500, WIT-PM 200, WIT-PE 1000, WIT-EA 200)

| **Threaded rod dia.** | | **M8** | **M10** | **M12** | **M16** | **M20** | **M20** | **M24** | **M30** |
|---|---|---|---|---|---|---|---|---|---|
| **Drill hole dia.** | **[mm]** | 10 | 12 | 14 | 18 | 22 | 24 | 28 | 35 |
| **Amount of mortar** per anchorage depth **$h_{ef}$ = 10 mm** | [ml] | 0.65 | 0.82 | 0.98 | 1.36 | 1.79 | 2.67 | 3.23 | 4.87 |
| **Amount of mortar*** per anchorage depth **$h_{ef}$ = 100 mm** | [ml] | 6.53 | 8.16 | 9.82 | 13.61 | 17.89 | 26.71 | 32.25 | 48.67 |
| *Including ...% for discard, waste and other factors** | | 35% | 30% | 25% | 25% | 20% | 20% | 15% | 15% |
| **Number of anchors [qty.] per cartridge at anchorage depth $h_{ef}$ = 100 mm** | | | | | | | | | |
| **Threaded rod dia.** | | **M8** | **M10** | **M12** | **M16** | **M20** | **M20** | **M24** | **M30** |
| **Drill hole dia.** | **[mm]** | **10** | **12** | **14** | **18** | **22** | **24** | **28** | **35** |
| cartridge 150 ml | [qty.] | 16 | 13 | 11 | 8 | 6 | 4 | 3 | 2 |
| cartridge 280 ml | [qty.] | 36 | 29 | 24 | 17 | 13 | 8 | 7 | 4 |
| cartridge 300 ml | [qty.] | 39 | 31 | 26 | 19 | 14 | 9 | 8 | 5 |
| cartridge 320 ml | [qty.] | 42 | 34 | 28 | 20 | 15 | 10 | 8 | 5 |
| cartridge 330 ml | [qty.] | 44 | 35 | 29 | 21 | 16 | 10 | 9 | 5 |
| cartridge 420 ml | [qty.] | 58 | 46 | 38 | 27 | 21 | 14 | 11 | 7 |
| cartridge 825 ml | [qty.] | 118 | 94 | 78 | 56 | 43 | 29 | 24 | 15 |
| cartridge 385 ml | [qty.] | 51 | 41 | 34 | 24 | 18 | 12 | 10 | 6 |
| cartridge 585 ml | [qty.] | 81 | 65 | 54 | 39 | 29 | 20 | 16 | 11 |
| cartridge 1400 ml | [qty.] | 206 | 165 | 137 | 99 | 75 | 50 | 41 | 27 |
| **Necessary amount of mortar per anchor in [mm] on the scale on the cartridge for anchorage depth $h_{ef}$ = 100 mm** | | | | | | | | | |
| **Threaded rod dia.** | | **M8** | **M10** | **M12** | **M16** | **M20** | **M20** | **M24** | **M30** |
| **Drill hole dia.** | **[mm]** | **10** | **12** | **14** | **18** | **22** | **24** | **28** | **35** |
| cartridge 150 ml, 1.69 ml/mm | [mm] | 4 | 5 | 6 | 9 | 11 | 16 | 20 | 29 |
| cartridge 280 ml, 1.69 ml/mm | [mm] | 4 | 5 | 6 | 9 | 11 | 16 | 20 | 29 |
| cartridge 300 ml, 1.74 ml/mm | [mm] | 4 | 5 | 6 | 8 | 11 | 16 | 19 | 28 |
| cartridge 320 ml, 1.69 ml/mm | [mm] | 4 | 5 | 6 | 9 | 11 | 16 | 20 | 29 |
| cartridge 330 ml, 1.69 ml/mm | [mm] | 4 | 5 | 6 | 9 | 11 | 16 | 20 | 29 |
| cartridge 420 ml 2.73 ml/mm | [mm] | 3 | 3 | 4 | 5 | 7 | 10 | 12 | 18 |
| cartridge 385 ml 2.74 ml/mm | [mm] | 3 | 3 | 4 | 5 | 7 | 10 | 12 | 18 |
| cartridge 585 ml 2.74 ml/mm | [mm] | 3 | 3 | 4 | 5 | 7 | 10 | 12 | 18 |

** Less mortar could be wasted depending on the number of serial drill holes, type of application and experience. The percentage can be adapted individually.

# Mortar volume calculation

## Anchor rod W-VIZ-A

(WIT-VM 100)

| Anchor rod dia. | | M8 | | M10 | | M12 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Anchorage depth** | $h_{ef}$ = [mm] | **40** | **50** | **60** | **75** | **75** | **70** | **80** | **95** | **100** | **110** | **125** |
| **Drill-hole dia.** | [mm] | 10 | 10 | 12 | 12 | 12 | 14 | 14 | 14 | 14 | 14 | 14 |
| **Amount of mortar*** | [ml] | 3.4 | 4.1 | 6.1 | 7.0 | 7.0 | 6.8 | 8.6 | 9.0 | 9.2 | 9.4 | 9.6 |
| *Including ...% for discard, waste and other factors** | | 35% | | 30% | | 25% | | | | | | |
| **Number of anchors per cartridge** | | | | | | | | | | | | |
| cartridge 150 ml | [qty.] | 31 | 26 | 18 | 15 | 15 | 16 | 12 | 12 | 11 | 11 | 11 |
| cartridge 330 ml | [qty.] | 85 | 70 | 47 | 41 | 41 | 42 | 33 | 32 | 31 | 30 | 30 |
| cartridge 420 ml | [qty.] | 111 | 92 | 62 | 54 | 54 | 55 | 44 | 42 | 41 | 40 | 39 |
| **Necessary amount of mortar per anchor in [mm] on the scale on the cartridge** | | | | | | | | | | | | |
| cartridge 150 ml, 1.69 ml/mm | [mm] | 2 | 3 | 4 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 |
| cartridge 330 ml, 1.69 ml/mm | [mm] | 2 | 3 | 4 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 |
| cartridge 420 ml, 2.73 ml/mm | [mm] | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 |

| Anchor rod dia. | | M16 | | | | | M20 | | | M24 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Anchorage depth** | $h_{ef}$ = [mm] | **90** | **105** | **125** | **145** | **160** | **115** | **170** | **190** | **170** | **200** | **225** |
| **Drill-hole dia.** | [mm] | 18 | 18 | 18 | 18 | 18 | 22 | 24 | 24 | 26 | 26 | 26 |
| **Amount of mortar*** | [ml] | 11.1 | 12.6 | 14.5 | 15.8 | 17.4 | 20.8 | 30.1 | 32.2 | 33.3 | 36.6 | 41.3 |
| *Including ...% for discard, waste and other factors** | | 25% | | | | | 20% | | | 15% | | |
| **Number of anchors per cartridge** | | | | | | | | | | | | |
| cartridge 150 ml | [qty.] | 9 | 8 | 7 | 6 | 6 | 5 | 3 | 3 | 3 | 3 | 2 |
| cartridge 330 ml | [qty.] | 26 | 23 | 20 | 18 | 16 | 13 | 9 | 9 | 8 | 7 | 7 |
| cartridge 420 ml | [qty.] | 34 | 30 | 26 | 24 | 21 | 18 | 12 | 11 | 11 | 10 | 9 |
| **Necessary amount of mortar per anchor in [mm] on the scale on the cartridge** | | | | | | | | | | | | |
| cartridge 150 ml, 1.69 ml/mm | [mm] | 7 | 8 | 9 | 10 | 11 | 13 | 18 | 20 | 20 | 22 | 25 |
| cartridge 330 ml, 1.69 ml/mm | [mm] | 7 | 8 | 9 | 10 | 11 | 13 | 18 | 20 | 20 | 22 | 25 |
| cartridge 420 ml, 2.73 ml/mm | [mm] | 5 | 5 | 6 | 6 | 7 | 8 | 12 | 12 | 13 | 14 | 16 |

## Anchor rod W-VIZ-A DYNAMIC

(WIT-VM 100)

| Anchor rod dia. | | M12 | | M16 | | | M20 |
|---|---|---|---|---|---|---|---|
| **Anchorage depth** | $h_{ef}$ = [mm] | **100** | **125** | **170** | | | |
| **Fixture thickness** | $t_{fix}$ [mm] | **25** | **50** | **25** | **30** | **50** | **50** |
| **Drill-hole dia.** | [mm] | 14 | 18 | 24 | | | |
| **Amount of mortar*** | [ml] | 12.2 | 15.2 | 18.5 | 19.3 | 22.5 | 44.6 |
| *Including ...% for discard, waste and other factors** | | 25% | | 25% | | | 20% |
| **Number of anchors per cartridge** | | | | | | | |
| cartridge 150 ml | [qty.] | 9 | 7 | 5 | 5 | 4 | 2 |
| cartridge 330 ml | [qty.] | 20 | 16 | 13 | 13 | 11 | 6 |
| cartridge 420 ml | [qty.] | 31 | 25 | 20 | 19 | 16 | 8 |
| **Necessary amount of mortar per anchor in [mm] on the scale on the cartridge** | | | | | | | |
| cartridge 150 ml, 1.69 ml/mm | [mm] | 8 | 10 | 12 | 12 | 14 | 27 |
| cartridge 330 ml, 1.69 ml/mm | [mm] | 8 | 10 | 12 | 12 | 14 | 27 |
| cartridge 420 ml, 2.73 ml/mm | [mm] | 5 | 6 | 7 | 5 | 9 | 17 |

** Less mortar could be wasted depending on the number of serial drill holes, type of application and experience. The percentage can be adapted individually.

# MASONRY

**With sleeve SH, hollow stones and solid bricks**
**Metrical threaded rods W-VI-A**
**Internal threaded rods W-VI-IG**
(WIT-VM 250, WIT-PM 200, WIT-EA 200)

| **W-VI-A dia.**<br>**W-VI-IG dia.** | | **M8** | **M8/M10** | | **M12/M16** | | | **IG M6** | **IG M8**<br>**IG M10** |
|---|---|---|---|---|---|---|---|---|---|
| **Sleeve SH** | | **12x80** | **16x85** | **16x130** | **20x85** | **20x130** | **20x200** | **16x85** | **20x85** |
| **Drill-hole dia.** | $d_0$ [mm] | 12 | 16 | 16 | 20 | 20 | 20 | 16 | 20 |
| **Drill-hole depth** | $h_0$ [mm] | 85 | 90 | 135 | 90 | 135 | 205 | 90 | 90 |
| **Amount of mortar*** | [ml] | 11.2 | 24.9 | 38 | 41.1 | 62.9 | 96.7 | 24.9 | 41.1 |
| *Including ...% for discard, waste and other factors** | | 30% | 25% | 25% | 20% | 20% | 20% | 25% | 20% |
| **Number of anchors per cartridge** | | | | | | | | | |
| cartridge 150 ml | [qty.] | 9 | 4 | 2 | 2 | 1 | 1 | 4 | 2 |
| cartridge 300 ml | [qty.] | 23 | 10 | 6 | 6 | 4 | 2 | 10 | 6 |
| cartridge 330 ml | [qty.] | 25 | 11 | 7 | 7 | 4 | 3 | 11 | 7 |
| cartridge 420 ml | [qty.] | 33 | 15 | 10 | 9 | 6 | 3 | 15 | 9 |
| **Necessary amount of mortar per anchor in [mm] on the scale on the cartridge** | | | | | | | | | |
| cartridge 150 ml,<br>1.69 ml/mm | [mm] | 7 | 15 | 23 | 25 | 38 | 58 | 15 | 25 |
| cartridge 300 ml,<br>1.74 ml/mm | [mm] | 7 | 15 | 22 | 24 | 37 | 56 | 15 | 24 |
| cartridge 330 ml,<br>1.69 ml/mm | [mm] | 7 | 15 | 23 | 25 | 38 | 58 | 15 | 25 |
| cartridge 420 ml,<br>2.73 ml/mm | [mm] | 5 | 10 | 14 | 16 | 24 | 36 | 10 | 16 |

**Without sleeve SH, solid bricks**
**Metrical threaded rods W-VI-A**
**Internal threaded rods W-VI-IG**
(WIT-VM 250, WIT-PM 200, WIT-EA 200)

| **W-VI-A dia.**<br>**W-VI-IG dia.** | | **M8** | **M10** | **M12** | **M16** | **IG M6** | **IG M8** | **IG M10** |
|---|---|---|---|---|---|---|---|---|
| **Drill-hole dia.** | $d_0$ [mm] | 10 | 12 | 14 | 18 | 12 | 14 | 18 |
| **Drill-hole depth** | $h_0$ [mm] | 80 | 90 | 100 | 100 | 90 | 100 | 100 |
| **Amount of mortar*** | [ml] | 4.1 | 6.6 | 10.0 | 16.6 | 6.6 | 10.0 | 16.6 |
| *Including ...% for discard, waste and other factors** | | 35% | 30% | 25% | 25% | 30% | 25% | 25% |
| **Number of anchors per cartridge** | | | | | | | | |
| cartridge 150 ml | [qty.] | 26 | 16 | 11 | 6 | 16 | 11 | 6 |
| cartridge 300 ml | [qty.] | 63 | 39 | 26 | 15 | 39 | 26 | 15 |
| cartridge 330 ml | [qty.] | 70 | 43 | 29 | 17 | 43 | 29 | 17 |
| cartridge 420 ml | [qty.] | 92 | 57 | 38 | 22 | 57 | 38 | 22 |
| **Necessary amount of mortar per anchor in [mm] on the scale on the cartridge** | | | | | | | | |
| cartridge 150 ml,<br>1.69 ml/mm | [mm] | 3 | 4 | 6 | 10 | 4 | 6 | 10 |
| cartridge 300 ml,<br>1.74 ml/mm | [mm] | 3 | 4 | 6 | 10 | 4 | 6 | 10 |
| cartridge 330 ml,<br>1.69 ml/mm | [mm] | 3 | 4 | 6 | 10 | 4 | 6 | 10 |
| cartridge 420 ml,<br>2.73 ml/mm | [mm] | 2 | 3 | 4 | 7 | 3 | 4 | 7 |

** Less mortar could be wasted depending on the number of serial drill holes, type of application and experience. The percentage can be adapted individually.

# ACCESSORIES


# SLEEVES

**masonry: sleeve SH**



**WIT-VM 250, WIT-PM 200, WIT-EA 200**

| | Drill-hole dia. $d_0$ [mm] | Drill-hole depth $h_0$ [mm] | Effective anchorage depth $h_{ef}$ [mm] | Suitable for threaded rod W-VI-A, W-VI-IG or commercial standard rods with inspection certificate 3.1 | Art.-No. | PU [qty.] |
|---|---|---|---|---|---|---|
| **SH 12 x 80** | 12 | 85 | 80 | M8 | **0903 44 123** | 20 |
| **SH 16 x 85** | 16 | 90 | 85 | M8 and M10; IG-M6x80 | **0903 44 164** | |
| **SH 16 x 130** | 16 | 135 | 130 | M8 and M10 | **0903 44 165** | |
| **SH 20 x 85** | 20 | 90 | 85 | M12 and M16; IG-M8x80, IG-M10x80 | **0903 44 203** | |
| **SH 20 x 130** | 20 | 135 | 130 | M12 and M16 | **0903 44 204** | |
| **SH 20 x 200** | 20 | 205 | 200 | M12 and M16 | **0903 44 205** | |

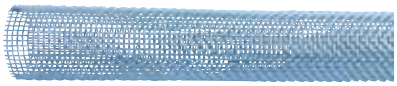
**masonry: Push-through sleeve**



**WIT-PM 200, WIT-EA 200**

| | Drill-hole dia. $d_0$ [mm] | Drill-hole depth $h_0$ [mm] | Effective anchorage depth $h_{ef}$ [mm] | Suitable for threaded rod W-VI-A, W-VI-IG or commercial standard rods with inspection certificate 3.1 | Art.-No. | PU [qty.] |
|---|---|---|---|---|---|---|
| **SH 16 x 130/330** | 16 | 340 | 130 | M8 and M10 | **0903 44 163** | 10 |

**Masonry: Metal-sleeve (1 m)**



**No approval; suitable with WIT-PM 200, WIT-VM 250, WIT-EA 200**

| | Drill-hole dia. $d_0$ [mm] | Threaded rod | Art.-No. | PU [qty.] |
|---|---|---|---|---|
| **11 x 1000** | 12 | M6 | **0903 44 128** | 1 |
| **14 x 1000** | 16 | M8, M10 | **0903 44 168** | |
| **20 x 1000** | 20 | M10, M12 | **0903 44 208** | |

# DRILL-HOLE CLEANING

**Cleaning brushes WIT-RB for concrete**
**Connection thread M8**

**WIT-VM 100, WIT-UH 300, WIT-VM 250, WIT-PM 200, WIT-PE 500, WIT-EA 200**

| Diameter | | Drill-hole dia. | Cleaning brush | Extension | Machine chuck M8 SDS-plus |
|---|---|---|---|---|---|
| External | Internal | $d_0$ [mm] | Art.-No. PU [qty.] = 1 | Art.-No. PU [qty.] = 1 | Art.-No. PU [qty.] = 1 |
| M8 | M6 | 10 | 0903 489 510 | 0905 489 111 | 0903 489 101 |
| M10 | M8 | 12 | 0903 489 512 | | |
| M12 | M10 | 14 | 0903 489 514 | | |
| M16 | M12 | 18 | 0903 489 518 | | |
| M20 | M16 | 22 | 0903 489 522 | | |
| M20 | M16 | 24 | 0903 489 525 | | |
| M24 | M20 | 28 | 0903 489 528 | | |
| M30 | – | 35 | 0903 489 535 | | |

**Cleaning brushes for masonry**
**Connection thread M6**

**WIT-VM 250, WIT-PM 200, WIT-EA 200**



| Dia. | Sleeve | Drill-hole dia. $d_0$ [mm] | Cleaning brush Art.-No. PU [qty.] = 1 | Handle Art.-No. PU [qty.] = 1 | Machine chuck M6 Art.-No. PU [qty.] = 1 |
|---|---|---|---|---|---|
| M8 | Without sleeve | 10 | 0905 499 021 | 0905 499 103 | hexagonal: 0905 499 101<br>SDS plus: 0905 499 102 |
| | With sleeve SH 12 | 12 | 0905 499 022 | | |
| | Withh sleeve SH 16 | 16 | 0905 499 025 | | |
| M10 IG-M6 | Without sleeve | 12 | 0905 499 022 | | |
| | Withh sleeve SH 16 | 16 | 0905 499 025 | | |
| M12 IG-M8 | Without sleeve | 14 | 0905 499 023 | | |
| | With sleeve SH 20 | 20 | 0905 499 026 | | |
| M16 IG-M10 | Without sleeve | 18 | 0905 499 024 | | |
| | With sleeve SH 20 | 20 | 0905 499 026 | | |

**Cleaning brushes WIT-RB for REBAR**
**Connection thread M8**

**WIT-UH 300, WIT-PE 1000, WIT-VM 250, WIT-PE 500**



| REBAR dia. [mm] | Drill-hole dia. $d_0$ [mm] | Cleaning brush Art.-No. PU [qty.] = 1 | Extension 2 x 345 mm Art.-No. PU [qty.] = 1 | Machine chuck M8 SDS-plus Art.-No. PU [qty.] = 1 |
|---|---|---|---|---|
| 8 | 12 | 0903 489 008 | 0903 489 111 | 0903 489 101 |
| 10 | 14 | 0903 489 010 | | |
| 12 | 16 | 0903 489 012 | | |
| 14 | 18 | 0903 489 014 | | |
| 16 | 20 | 0903 489 016 | | |
| 20 | 25 | 0903 489 020 | | |
| 24 | 32 | 0903 489 025 | | |
| 25 | 32 | 0903 489 025 | | |
| 28 | 35 | 0903 489 028 | | |
| 32 | 40 | 0903 489 540 | | |

**Blow out pump**

| Art.-No. | PU [qty.] |
|---|---|
| **0903 990 001** | 1 |

**M8 reducer pipe**
To reduce the diameter of the blow out pump from 10 mm to 8 mm

| Art.-No. | PU [qty.] |
|---|---|
| **0905 499 202** | 1 |

**Suction bell**



| Art.-No. | PU [qty.] |
|---|---|
| **0903 990 010** | 1 |

**Accessories for cleaning with compressed air**


| REBAR dia. [mm] | Threaded rod dia. | Drill-hole dia. $d_o$ [mm] | Compressed air nozzle WIT-DD **Art.-No.** PU [qty.] = 1 (only for WIT-PE 500) | Pneumatic hose WIT-SDD (pre-assembled) **Art.-No.** PU [qty.] = 1 | Thread connection for compressed air nozzle **Art.-No.** PU [qty.] = 1 | Hand slide valve (pre-assembled) **Art.-No.** PU [qty.] = 1 |
|---|---|---|---|---|---|---|
| **8** | | 12 | **0903 489 210** | Dia. 10 mm x 2 m **0699 903 7** | **0903 489 291 M8** | **0699 903 38** |
| **10** | | 14 | | | | |
| **12** | | 16 | **0903 489 214** | | | |
| **14** | | 18 | | | | |
| **16** | | 20 | **0903 489 217** | | | |
| | **M20** | 24 | | | | |
| **20** | | 25 | | | | |
| **22** | | 28 | | | | |
| | **M24** | 28 | **0903 489 227** | Dia. 20 mm x 3 m **0699 903 13** | **0903 489 292 M16** | |
| **24** | **M27** | 32 | | | | |
| **25** | | 32 | | | | |
| | **M30** | 35 | | | | |
| **32** | | 40 | | | | |

# MORTAR INJECTION

**Piston plug (only REBAR)**

**WIT-UH 300, WIT-PE 1000, WIT-VM 250, WIT-PE 500**

| REBAR dia. [mm] | Threaded rod dia. | Drill-hole dia. | Piston plug No. | Art.-No. | PU [qty.] |
|---|---|---|---|---|---|
| 8 | | **$d_0$ = 12 mm** (hammer drilling) | – | **No piston plug necessary** | – |
| 10 | | **$d_0$ = 14 mm** (hammer drilling) | No. 14 | **0903 488 055** | 10 |
| 12 | | **$d_0$ = 16 mm** (hammer drilling, pneumatic drilling) | No. 16 | **0903 488 056** | |
| 14 | | **$d_0$ = 18 mm** (hammer drilling, pneumatic drilling) | No. 18 | **0903 488 057** | |
| 16 | | **$d_0$ = 20 mm** (hammer drilling, pneumatic drilling) | No. 20 | **0903 488 058** | |
| | **M20** | **$d_0$ = 24 mm** | No. 24 | **0903 488 051** | |
| 20 | | **$d_0$ = 25 mm** (hammer drilling); **$d_0$ = 26 mm** (pneumatic drilling) | No. 25 | **0903 488 059** | |
| 22 | **M24** | **$d_0$ = 28 mm** (hammer drilling, pneumatic drilling) | No. 28 | **0903 488 052** | |
| 24 | **M27** | **$d_0$ = 32 mm** (hammer drilling, pneumatic drilling) | No. 32 | **0903 488 053** | |
| 25 | | **$d_0$ = 32 mm** (hammer drilling, pneumatic drilling) | No. 32 | **0903 488 053** | |
| 28 | | **$d_0$ = 35 mm** (hammer drilling, pneumatic drilling) | No. 35 | **0903 488 060** | |
| 32 | | **$d_0$ = 40 mm** (hammer drilling, pneumatic drilling) | No. 40 | **0903 488 061** | |

**Mixer nozzles**

| | | Suitable for cartridge size | Art.-No. | PU [qty.] |
|---|---|---|---|---|
| **Mixer nozzle Fill & Clean for WIT-VM 100, WIT-VM 250, WIT-PM 200** |  | coaxial (1:10): 150 ml, 330 ml, 420 ml<br>foil-tube (1:10): 300 ml | **0903 420 001** | 10 |
| **Mixer nozzle 18 W For WIT-PE 500** |  | Side-by-side (1:3): 385 ml, 585 ml, 1400 ml | **0903 488 101** | 10 |
| **Mixer nozzle WIT-UH 300 For WIT-UH 300** |  | coaxial (1:10): 320 ml, 420 ml<br>peeler (1:10): 280 ml<br>side-by-side (1:10): 360 ml, 825 ml | **0903 488 102** | 20 |

**Extensions for mixer nozzles**

| | | Art.-No. | PU [qty.] |
|---|---|---|---|
| **Mixer nozzle extension – rigid WIT-MV 10 x 200 mm** |  | **0903 420 004** | 10 |
| **Mixer nozzle extension – rigid WIT-MV 10 x 2000 mm** | | **0903 488 121** | 20 |
| **Mixer nozzle extension – flexible, WIT-MV 10 x 2000 mm** |  | **0903 488 123** | 10 |
| **Mixer nozzle extension – rigid, WIT-MV 16 x 2000 mm** |  | **0903 488 122** | 20 |
| **Mixer nozzle extension – flexible, WIT-MV 16 x 2000 mm** |  | **0895 812** | 1 |

# APPLICATION GUNS

| Application guns, manual | | | | |
|---|---|---|---|---|
| | | **Suitable for cartridges** | **Art.-No.** | **PU [qty.]** |
| **Application gun WIT, 330 ml** |  | coaxial (1:10): 150 ml, 320 ml, 330 ml<br>foil-tube (1:10): 300 ml | **0891 003** | 1 |
| **Application gun HandyMax** |  | coaxial (1:10): 150 ml, 330 ml<br>foil-tube (1:10): 300 ml | **0891 007** | |
| **Application gun for foil-tube** |  | foil-tube (1:10): 300 ml | **0891 000 001** | |
| **Application gun WIT, 420 ml** |  | coaxial (1:10): 420 ml | **0891 038 0** | |
| **Application gun WIT-PE 500, 385 ml** |  | side-by-side (1:3): 385 ml | **0891 009** | |
| **Application gun WIT-Multi** |  | coaxial (1:10): 150 ml, 320 ml, 330 ml, 420 ml<br>foil-tube (1:10): 300 ml<br>side-by-side (1:3): 385 ml, 585 ml | **0891 003 105** | |

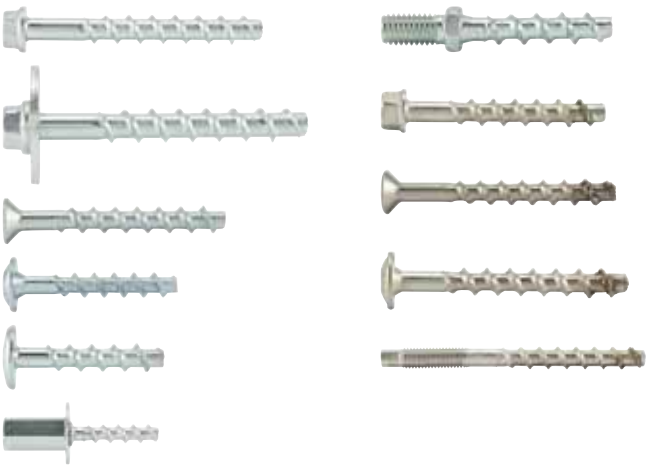
| Application gun, cordless | | | | |
|---|---|---|---|---|
| | | **Suitable for cartridges** | **Art.-No.** | **PU [qty.]** |
| **Cordless application gun 330 ml (DB 2K Typ B997sM)** |  | coaxial (1:10): 150 ml, 330 ml<br>foil-tube (1:10): 300 ml | **0891 003 330*** | 1 |
| **Cordless application gun 420 ml (DB 2K Typ B985M)** | | coaxial (1:10): 420 ml | **0891 003 420*** | |
| **Cordless application gun 385 ml + 585 ml (DB 2K Typ B944K)** | | side-by-side (1:3): 385 ml, 585 ml | **0891 003 585*** | |
| **Cordless application gun 825 ml (DB 2K Typ B998M)** | | side-by-side (1:10): 825 ml | **0891 003 825*** | |

Memory function: By actuating the memory function, the application gun repeats a pre-recorded application cycle, ensuring that exactly the right quantity of mortar is injected into the drill hole in series application
Adjustable speed :Infinitely controllable with adjustment wheel in handle
* incl. battery and charger 18 V 2.0 Ah-Li-Ion (in case)

| Application guns, pneumatic | | | | |
|---|---|---|---|---|
| | | **Suitable for cartridges** | **Art.-No.** | **PU [qty.]** |
| **Pneumatic application gun WIT-PE 500, 385 ml + 585 ml (TS444KX)** |  | side-by-side (1:3): 385 ml, 585 ml | **0891 017** | 1 |
| **Pneumatic application gun WIT-PE 500, 1400 ml (TS471)** | | side-by-side (1:3): 1400 ml | **0891 015** | |
| **Pneumatic application gun 420 ml (TS485XM)** | | coaxial (1:10): 420 ml | **0891 004 420** | |
| **Pneumatic application gun 825 ml (TS498X)** | | side-by-side (1:10): 825 ml | **0891 004 825** | |

# MECHANICAL ANCHORS

# CONCRETE SCREW W-BS



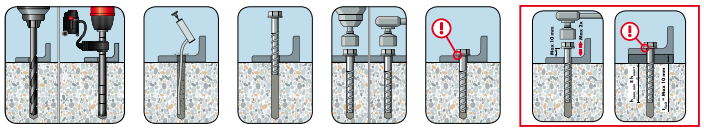
**Approvals and certificates**


**Type of installation**

| Pre-positioned | In-place | Stand-off |
|---|---|---|
| - | ✓ | - |

## Application references

## Installation



## Loads

| Thread size | | | | 6 | | 8 | | | 10 | | | 12 | | | 14 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Effective anchorage depth** | | $h_{ef}$ | [mm] | 31 | 44 | 35 | 43 | 52 | 43 | 60 | 68 | 50 | 67 | 80 | 58 | 79 | 92 |
| **Non-cracked Concrete** | | | | | | | | | | | | | | | | | |
| **Tension** | W-BS-S, SK; /S; /A4; /HCR | $N_{rec}$ | [kN] | 1.9 | 4.3 | 3.6 | 5.7 | 7.6 | 5.7 | 9.5 | 12.4 | 7.6 | 12.8 | 16.8 | 10.3 | 16.4 | 20.7 |
| **Shear** | | $V_{rec}$ | [kN] | 4.0 | 4.0 | 4.9 | 6.6 | 8.8 | 6.6 | 19.4 | 19.4 | 8.3 | 22.9 | 22.9 | 10.3 | 32.0 | 32.0 |
| **Cracked Concrete** | | | | | | | | | | | | | | | | | |
| **Tension** | W-BS-S, SK; /S; /A4; /HCR | $N_{rec}$ | [kN] | 1.0 | 1.9 | 2.4 | 4.3 | 5.7 | 4.3 | 7.6 | 9.2 | 5.7 | 9.0 | 11.7 | 7.2 | 11.5 | 14.5 |
| **Shear** | | $V_{rec}$ | [kN] | 2.8 | 4.0 | 3.4 | 4.6 | 6.1 | 4.6 | 15.2 | 18.4 | 5.8 | 18.0 | 22.9 | 7.2 | 23.0 | 28.9 |

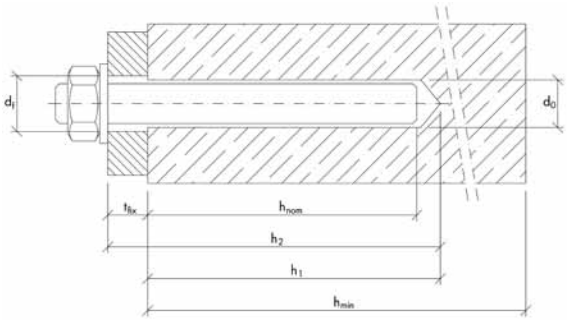
[1] Loads are valid for single anchors. Normal spaced reinforcement in ≥ C20/25. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included. The material safety factor depends on the failure mode.
[2] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.

| **Clearance-hole in fixture** | $d_f$ | [mm] | 8 | | 12 | | | 14 | | | 16 | | | 18 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Drill depth** | $h_1$ | [mm] | 45 | 60 | 55 | 65 | 75 | 65 | 85 | 95 | 75 | 95 | 110 | 85 | 110 | 125 |
| **Minimum thickness of concrete member** | $h_{min}$ | [mm] | 100 | | 100 | | 120 | 100 | 130 | 130 | 120 | 130 | 150 | 130 | 150 | 170 |
| **Minimum edge distance** | $c_{min}$ | [mm] | 40 | | 40 | 50 | | 50 | | | 50 | | 70 | 50 | 70 | |

# CONCRETE SCREW W-BS

| Type | Anchor length l [mm] | Fixture thickness for $t_{fix}$ [mm] $h_{ef,1}$ | $h_{ef,2}$ | $h_{ef,3}$ | Art. no. Carbon steel galvanized | Carbon steel zinc-flake coating | Stainless steel A4 | Drill hole diameter $d_o$ [mm] | Drill hole depth for through installation $h_2$ [mm] | Installation torque $T_{inst} \leq$ [Nm] | Adjustability | Wrench Size/ Drive SW/ Torx [mm] | Approval ETA-16-0043* | Sesimic C1/C2** | Head specification [mm] | P. Qty. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W-BS hexagon head with pressed-on washer, Type S  | | | | | | | | | | | | | | | | |
| W-BS 5 | 40 | 5 | – | – | 5929 125 005 | 5929 325 005 | – | 5.0 | 45 | 8 | – | SW10 | – | – | Ø 12.5 | 100 |
| | 50 | 15 | – | – | 5929 125 015 | 5929 325 015 | – | 5.0 | 55 | 8 | – | SW10 | – | – | Ø 12.5 | 100 |
| | 60 | 25 | – | – | 5929 125 025 | 5929 325 025 | – | 5.0 | 65 | 8 | – | SW10 | – | – | Ø 12.5 | 100 |
| W-BS 6 | 40 | 5 | – | – | 5929 126 005 | 5929 326 005 | – | 6.0 | 45 | 10 | – | SW13 | – | – | Ø 15.0 | 100 |
| | 50 | 15 | 10 | – | 5929 126 015 | 5929 326 015 | 5929 226 015 | 6.0 | 55 | 10 | – | SW13 | ✓ | – | Ø 15.0 | 100 |
| | 60 | 25 | 20 | 5 | 5929 126 025 | 5929 326 025 | 5929 226 025 | 6.0 | 65 | 10 | – | SW13 | ✓ | – | Ø 15.0 | 100 |
| | 80 | 45 | 40 | 25 | 5929 126 045 | 5929 326 045 | – | 6.0 | 85 | 10 | – | SW13 | ✓ | – | Ø 15.0 | 100 |
| | 100 | 65 | 60 | 45 | 5929 126 065 | 5929 326 065 | – | 6.0 | 105 | 10 | – | SW13 | ✓ | – | Ø 15.0 | 100 |
| W-BS 8 | 50 | 5 | – | – | 5929 128 005 | 5929 328 005 | – | 8.0 | 60 | 20 | ✓ | SW13 | ✓ | C1+C2 | Ø 16.0 | 50 |
| | 60 | 15 | 5 | – | 5929 128 015 | 5929 328 015 | – | 8.0 | 70 | 20 | ✓ | SW13 | ✓ | C1+C2 | Ø 16.0 | 50 |
| | 70 | 25 | 15 | 5 | 5929 128 025 | 5929 328 025 | 5929 228 025 | 8.0 | 80 | 20 | ✓ | SW13 | ✓ | C1+C2 | Ø 16.0 | 50 |
| | 80 | 35 | 25 | 15 | 5929 128 035 | 5929 328 035 | 5929 228 035 | 8.0 | 90 | 20 | ✓ | SW13 | ✓ | C1+C2 | Ø 16.0 | 50 |
| | 90 | 45 | 35 | 25 | 5929 128 045 | 5929 328 045 | – | 8.0 | 100 | 20 | ✓ | SW13 | ✓ | C1+C2 | Ø 16.0 | 50 |
| | 100 | 55 | 45 | 35 | 5929 128 055 | 5929 328 055 | – | 8.0 | 110 | 20 | ✓ | SW13 | ✓ | C1+C2 | Ø 16.0 | 50 |
| | 120 | 75 | 65 | 55 | 5929 128 075 | 5929 328 075 | – | 8.0 | 130 | 20 | ✓ | SW13 | ✓ | C1+C2 | Ø 16.0 | 50 |
| | 140 | 95 | 85 | 75 | 5929 128 095 | 5929 328 095 | – | 8.0 | 150 | 20 | ✓ | SW13 | ✓ | C1+C2 | Ø 16.0 | 50 |
| | 160 | 115 | 105 | 95 | 5929 128 115 | 5929 328 115 | – | 8.0 | 170 | 20 | ✓ | SW13 | ✓ | C1+C2 | Ø 16.0 | 50 |
| W-BS 10 | 60 | 5 | – | – | 5929 121 005 | 5929 321 005 | – | 10.0 | 70 | 40 | ✓ | SW15 | ✓ | C1+C2 | Ø 20.0 | 25 |
| | 80 | 25 | 5 | – | 5929 121 025 | 5929 321025 | – | 10.0 | 90 | 40 | ✓ | SW15 | ✓ | C1+C2 | Ø 20.0 | 25 |
| | 90 | 35 | 15 | 5 | 5929 121 035 | 5929 321 035 | 5929 221 035 | 10.0 | 100 | 40 | ✓ | SW15 | ✓ | C1+C2 | Ø 20.0 | 25 |
| | 100 | 45 | 25 | 15 | 5929 121 045 | 5929 321 045 | 5929 221 045 | 10.0 | 110 | 40 | ✓ | SW15 | ✓ | C1+C2 | Ø 20.0 | 25 |
| | 120 | 65 | 45 | 35 | 5929 121 065 | 5929 321 065 | 5929 221 065 | 10.0 | 130 | 40 | ✓ | SW15 | ✓ | C1+C2 | Ø 20.0 | 25 |
| | 140 | 85 | 65 | 55 | 5929 121 085 | 5929 321 085 | – | 10.0 | 150 | 40 | ✓ | SW15 | ✓ | C1+C2 | Ø 20.0 | 25 |
| | 160 | 105 | 85 | 75 | 5929 121 105 | 5929 321 105 | – | 10.0 | 170 | 40 | ✓ | SW15 | ✓ | C1+C2 | Ø 20.0 | 25 |
| W-BS 12 | 80 | 15 | – | – | 5929 122 015 | 5929 322 015 | – | 12.0 | 90 | 60 | ✓ | SW17 | ✓ | C1+C2 | Ø 23.0 | 25 |
| | 110 | 45 | 25 | 10 | 5929 122 045 | 5929 322 045 | – | 12.0 | 120 | 60 | ✓ | SW17 | ✓ | C1+C2 | Ø 23.0 | 25 |
| W-BS 14 | 80 | 5 | – | – | 5929 124 005 | 5929 324 005 | – | 14.0 | 90 | 80 | ✓ | SW21 | ✓ | C1+C2 | Ø 28.0 | 25 |
| | 110 | 35 | 10 | – | 5929 124 035 | 5929 324 035 | – | 14.0 | 120 | 80 | ✓ | SW21 | ✓ | C1+C2 | Ø 28.0 | 25 |
| | 130 | 55 | 30 | 15 | 5929 124 055 | 5929 324 055 | – | 14.0 | 140 | 80 | ✓ | SW21 | ✓ | C1+C2 | Ø 28.0 | 25 |
| W-BS hexagon head with big U-washer, Type S  | | | | | | | | | | | | | | | | |
| W-BS 10 | 180 | 125 | 105 | 95 | 5929 121 125 | 5929 321 125 | – | 10.0 | 190 | 40 | ✓ | SW15 | ✓ | C1+C2 | Ø 44.0 | 25 |
| | 200 | 145 | 125 | 115 | 5929 121 145 | 5929 321 145 | – | 10.0 | 210 | 40 | ✓ | SW15 | ✓ | C1+C2 | Ø 44.0 | 25 |
| | 240 | 185 | 165 | 155 | 5929 121 185 | 5929 321 185 | – | 10.0 | 250 | 40 | ✓ | SW15 | ✓ | C1+C2 | Ø 44.0 | 15 |
| | 280 | 225 | 205 | 195 | 5929 121 225 | 5929 321 225 | – | 10.0 | 290 | 40 | ✓ | SW15 | ✓ | C1+C2 | Ø 44.0 | 15 |
| | 320 | 265 | 245 | 235 | 5929 121 265 | 5929 321 265 | – | 10.0 | 330 | 40 | ✓ | SW15 | ✓ | C1+C2 | Ø 44.0 | 15 |

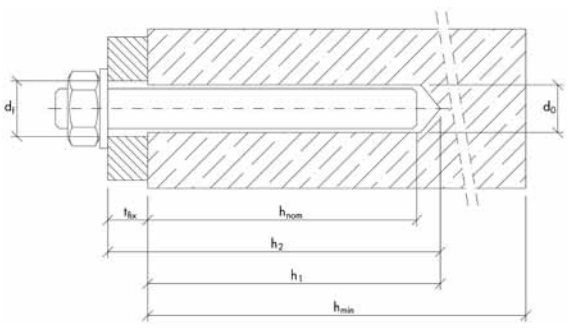
* Size 5 and 6 approved for multiple attachment ETA-16/0128
** Seismic C2 not for stainless steel A4



# CONCRETE SCREW W-BS

| | Anchor length | Fixture thickness for | | | Art. no. | | | Drill hole diameter | Drill hole depth for through installation | Installation torque | Adjustability | Wrench Size/ Drive | Approval | | Head specification | P. Qty. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $h_{ef,1}$ | $h_{ef,2}$ | $h_{ef,3}$ | | | | | | | | | | | | |
| **Type** | **l [mm]** | **$t_{fix}$ [mm]** | | | **Carbon steel galvanized** | **Carbon steel zinc-flake coating** | **Stainless steel A4** | **$d_o$ [mm]** | **$h_2$ [mm]** | **$T_{inst}$ ≤ [Nm]** | | **SW/ Torx [mm]** | **ETA-16-0043** | **Sesimic C1/C2*** | **[mm]** | |
| W-BS countersunk head, Type SK  | | | | | | | | | | | | | | | | |
| W-BS 5 | 40 | 5 | – | – | **5929 135 005** | – | – | 5.0 | 45 | 8 | – | TX25 | – | – | Ø 12.0 | 100 |
| | 50 | 15 | – | – | **5929 135 015** | – | – | 5.0 | 55 | 8 | – | TX25 | – | – | Ø 12.0 | 100 |
| | 60 | 25 | – | – | **5929 135 025** | – | – | 5.0 | 65 | 8 | – | TX25 | – | – | Ø 12.0 | 100 |
| W-BS 6 | 40 | 5 | – | – | **5929 136 005** | – | – | 6.0 | 45 | 10 | – | TX30 | – | – | Ø 13.0 | 100 |
| | 50 | 15 | 10 | – | **5929 136 015** | – | **5929 236 015** | 6.0 | 55 | 10 | – | TX30 | ✓ | – | Ø 13.0 | 100 |
| | 60 | 25 | 20 | 5 | **5929 136 025** | – | – | 6.0 | 65 | 10 | – | TX30 | ✓ | – | Ø 13.0 | 100 |
| | 65 | 30 | 25 | 10 | – | – | **5929 236 030** | 6.0 | 70 | 10 | – | TX30 | ✓ | – | Ø 13.0 | 100 |
| | 80 | 45 | 40 | 25 | **5929 136 045** | – | – | 6.0 | 85 | 10 | – | TX30 | ✓ | – | Ø 13.0 | 100 |
| | 85 | 50 | 45 | 30 | – | – | **5929 236 050** | 6.0 | 90 | 10 | – | TX30 | ✓ | – | Ø 13.0 | 100 |
| | 100 | 65 | 60 | 45 | **5929 136 065** | – | – | 6.0 | 105 | 10 | – | TX30 | ✓ | – | Ø 13.0 | 100 |
| | 105 | 70 | 65 | 50 | – | – | **5929 236 070** | 6.0 | 110 | 10 | – | TX30 | ✓ | – | Ø 13.0 | 100 |
| | 120 | 85 | 80 | 65 | **5929 136 085** | – | – | 6.0 | 125 | 10 | – | TX30 | ✓ | – | Ø 13.0 | 100 |
| | 140 | 105 | 100 | 85 | **5929 136 105** | – | – | 6.0 | 145 | 10 | – | TX30 | ✓ | – | Ø 13.0 | 100 |
| | 160 | 125 | 120 | 105 | **5929 136 125** | – | – | 6.0 | 165 | 10 | – | TX30 | ✓ | – | Ø 13.0 | 100 |
| W-BS 8 | 80 | 35 | 25 | 15 | **5929 138 035** | – | **5929 238 035** | 8.0 | 90 | 20 | ✓ | TX40 | ✓ | C1+C2 | Ø 20.0 | 50 |
| W-BS 10 | 90 | 35 | 15 | 5 | **5929 131 035** | – | **5929 231 035** | 10.0 | 100 | 40 | ✓ | TX50 | ✓ | C1+C2 | Ø 22.0 | 25 |

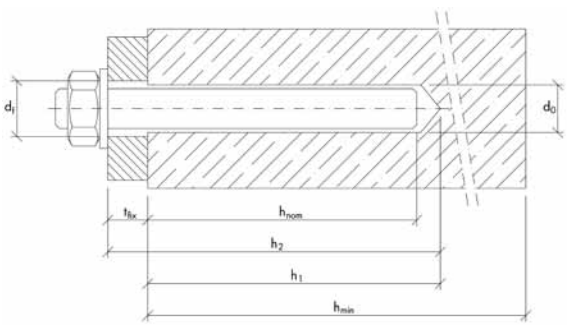
* Seismic C2 not for stainless steel A4



# CONCRETE SCREW W-BS

| | Anchor length | Fixture thickness for | | | Art. no. | | | Drill hole diameter | Drill hole depth for through installation | Installation torque | Adjustability | Wrench Size/ Drive | Approval | | Head specification | P. Qty. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $h_{ef,1}$ | $h_{ef,2}$ | $h_{ef,3}$ | | | | | | | | | | | | |
| **Type** | **l [mm]** | **$t_{fix}$ [mm]** | | | **Carbon steel galvanized** | **Carbon steel zinc-flake coating** | **Stainless steel A4** | **$d_o$ [mm]** | **$h_2$ [mm]** | **$T_{inst}$ ≤ [Nm]** | | **SW/ Torx [mm]** | **ETA-16-0043** | **Sesimic C1/C2*** | **[mm]** | |
| W-BS panhead, Type P  | | | | | | | | | | | | | | | | |
| W-BS 5 | 40 | 5 | – | – | **5929 145 005** | – | – | 5.0 | 45 | 8 | – | TX30 | – | – | Ø 14.0 | 100 |
| | 50 | 15 | – | – | **5929 145 015** | – | – | 5.0 | 55 | 8 | – | TX30 | – | – | Ø 14.0 | 100 |
| | 60 | 25 | – | – | **5929 145 025** | – | – | 5.0 | 65 | 8 | – | TX30 | – | – | Ø 14.0 | 100 |
| W-BS 6 | 40 | 5 | – | – | **5929 146 005** | – | – | 6.0 | 45 | 10 | – | TX30 | – | – | Ø 15.0 | 100 |
| | 50 | 15 | 10 | – | **5929 146 015** | – | **5929 246 015** | 6.0 | 55 | 10 | – | TX30 | ✓ | – | Ø 15.0 | 100 |
| | 60 | 25 | 20 | 5 | **5929 146 025** | – | **5929 246 025** | 6.0 | 65 | 10 | – | TX30 | ✓ | – | Ø 15.0 | 100 |
| | 80 | 45 | 40 | 25 | **5929 146 045** | – | **5929 246 045** | 6.0 | 85 | 10 | – | TX30 | ✓ | – | Ø 15.0 | 100 |
| | 100 | 65 | 60 | 45 | **5929 146 065** | – | **5929 246 065** | 6.0 | 105 | 10 | – | TX30 | ✓ | – | Ø 15.0 | 100 |
| W-BS big panhead, Type P  | | | | | | | | | | | | | | | | |
| W-BS 6 | 40 | 5 | – | – | **5929 156 005** | – | – | 6.0 | 45 | 10 | – | TX30 | – | – | Ø 18.0 | 100 |
| | 60 | 25 | 20 | 5 | **5929 156 025** | – | – | 6.0 | 65 | 10 | – | TX30 | ✓ | – | Ø 18.0 | 100 |
| W-BS coupling nut, Type I  | | | | | | | | | | | | | | | | |
| W-BS 6 | 35 | 0 | – | – | **5929 176 001** | – | – | 6.0 | 40 | 10 | – | SW13 | – | – | M8/ M10 socket | 50 |
| | 55 | – | – | 0 | **5929 176 002** | – | – | 6.0 | 60 | 10 | – | SW13 | ✓ | – | M8/ M10 socket | 50 |
| W-BS stair bolt with hexagon gear, Type ST  | | | | | | | | | | | | | | | | |
| W-BS 6 | 35 | 0 | – | – | **5929 186 000** | – | – | 6.0 | 40 | 10 | – | SW10 | – | – | M8x16 | 100 |
| | 55 | 20 | 15 | 0 | **5929 186 020** | – | – | 6.0 | 60 | 10 | – | SW10 | ✓ | – | M8x16 | 100 |
| | 75 | 40 | 35 | 20 | **5929 186 040** | – | – | 6.0 | 80 | 10 | – | SW10 | ✓ | – | M8x16 | 100 |
| | 95 | 60 | 55 | 40 | **5929 186 060** | – | – | 6.0 | 100 | 10 | – | SW10 | ✓ | – | M8x16 | 100 |
| W-BS 8 | 105 | 40 | 30 | 20 | – | – | **5929 268 040** | 8.0 | 95 | 20 | ✓ | SW7 | ✓ | C1 | M10x30 | 50 |
| W-BS 10 | 140 | 60 | 40 | 30 | – | – | **5929 261 060** | 10.0 | 125 | 40 | ✓ | SW9 | ✓ | C1 | M12x35 | 25 |
| | 160 | 80 | 60 | 50 | – | – | **5929 261 080** | 10.0 | 145 | 40 | ✓ | SW9 | ✓ | C1 | M12x55 | 25 |

* Seismic C2 not for stainless steel A4



# FIXANCHOR W-FAZ

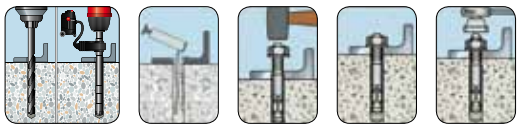
**Approvals and certificates**

**Type of installation**

| Pre-positioned | In-place | Stand-off |
|---|---|---|
| – | ✓ | ✓ |

## Application references

## Installation



## Loads

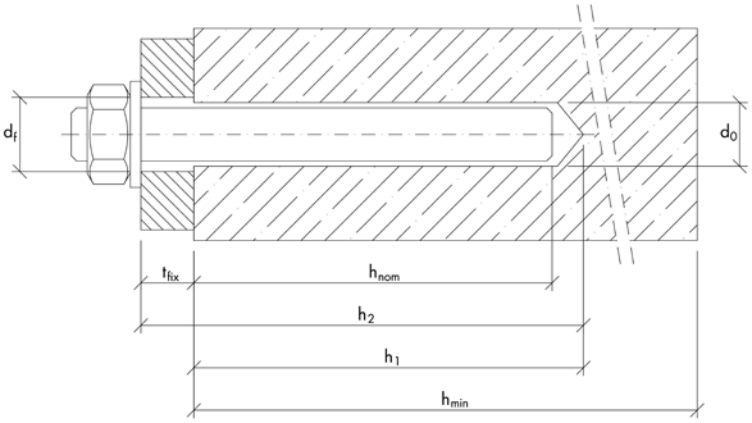
| Thread size | | | | M8 | | M10 | | M12 | | M16 | | M20 | M24 | | M27 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Effective anchorage depth** | | $h_{ef}$ | [mm] | 35 | 46 | 40 | 60 | 50 | 70 | 65 | 85 | 100 | 115 | 125 | 125 |
| **Non-cracked Concrete** | | | | | | | | | | | | | | | |
| **Tensile** | W-FAZ/S | $N_{rec}$ | [kN] | 3.6 | 5.7 | 4.3 | 7.6 | 8.3 | 11.9 | 12.3 | 16.7 | 23.4 | 28.9 | – | 32.7 |
| | W-FAZ/A4 | | | 3.6 | 5.7 | 4.3 | 7.6 | 8.3 | 11.9 | 12.3 | 16.7 | 23.4 | – | 32.7 | – |
| **Shear** | W-FAZ/S | $V_{rec}$ | [kN] | 7.0 | 7.0 | 11.5 | 11.5 | 17.1 | 17.1 | 29.5 | 31.4 | 37.1 | 65.1 | – | 91.7 |
| | W-FAZ/A4 | | | 7.4 | 7.4 | 11.4 | 11.4 | 17.1 | 17.1 | 29.5 | 31.4 | 43.9 | – | 70.6 | – |
| **Minimum edge distance** | W-FAZ/S | $c_{min}$ | [mm] | 40 | 50 | 65 | 50 | 100 | 75 | 170 | 80 | 130 | 100 | – | 180 |
| | W-FAZ/A4 | | | | | | 60 | | | | | | – | | |
| **Cracked concrete** | | | | | | | | | | | | | | | |
| **Tensile** | W-FAZ/S | $N_{rec}$ | [kN] | 2.4 | 2.4 | 3.6 | 4.3 | 5.8 | 7.6 | 8.6 | 11.9 | 16.4 | 20.2 | – | 22.9 |
| | W-FAZ/A4 | | | 2.4 | 2.4 | 3.6 | 4.3 | 5.8 | 7.6 | 8.6 | 11.9 | 16.4 | – | 19.0 | – |
| **Shear** | W-FAZ/S | $V_{rec}$ | [kN] | 7.0 | 7.0 | 10.0 | 11.5 | 13.9 | 17.1 | 20.6 | 30.8 | 37.1 | 56.6 | – | 64.2 |
| | W-FAZ/A4 | | | 7.4 | 7.4 | 10.0 | 11.4 | 13.9 | 17.1 | 20.6 | 30.8 | 43.9 | – | 64.2 | – |
| **Minimum edge distance** | W-FAZ/S | $c_{min}$ | [mm] | 40 | 40 | 65 | 45 | 65 | 60 | 100 | 60 | 95 | 100 | – | 180 |
| | W-FAZ/A4 | | | | | | 55 | | | | | | – | 125 | – |

[1] Loads are valid for single anchors. Normal spaced reinforcement in ≥ C20/25. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included. The material safety factor depends on the failure mode.
[2] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.

| **Clearance-hole in fixture** | $d_f$ | [mm] | 9 | | 12 | | 14 | | 18 | | 22 | 26 | | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Drill depth** | $h_1$ | [mm] | 49 | 60 | 55 | 75 | 70 | 90 | 90 | 110 | 125 | 145 | 155 | 160 |
| **Minimum thickness of concrete member** | $h_{min}$ | [mm] | 80 | 100 | 80 | 120 | 100 | 140 | 140 | 170/160 | 200 | 230 | 250 | 250 |

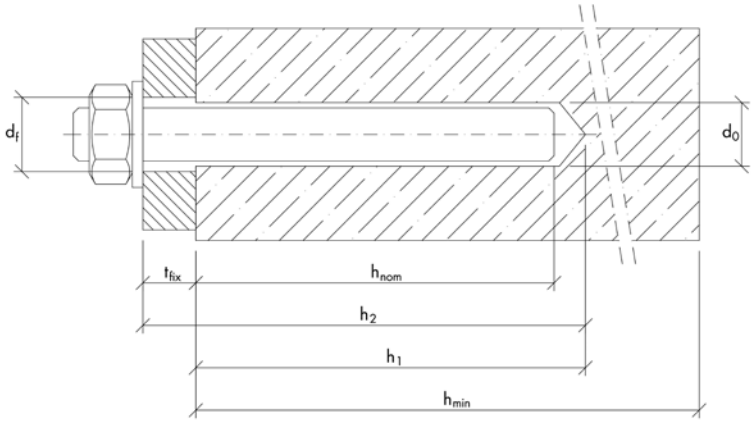
# FIXANCHOR W-FAZ

| | Anchor length | Fixture thickness for | | Art. no. | | | | Drill hole dia-meter | Drill hole depth for through installa-tion | Installation torque | | Wrench Size | Approval | | Thread length | P. Qty. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $h_{ef,std}$ | $h_{ef,red}$ | | | | | | | | | | | | | |
| | l | $t_{fix}$ | | Carbon steel | Carbon steel | Stainless steel | High corr. resist. | | | | | | | | | |
| Type | [mm] | [mm] | [mm] | galvanized | sherardized | A4 | HCR | $d_o$ [mm] | $h_2$ [mm] | $T_{inst} \leq$ [Nm] | | SW [mm] | ETA-99/0011 | Sesimic C1/C2 | M x l [mm] | [qty.] |
| W-FAZ |  | | | | | | | | | | | | | | | |
| M8 | 65 | 0 | 11 | 5928 258 011 | – | 5928 458 011 | 5928 658 011 | 8 | 60 | 20 | 20 | 13 | ✓ | - | M8x22 | 100 |
| | 75 | 10 | 21 | 5928 208 010 | – | 5928 408 010 | 5928 608 010 | | 70 | | | | ✓ | C1+C2 | M8x32 | |
| | 80 | 15 | 26 | 5928 208 015 | – | 5929 408 015 | 5928 608 015 | | 75 | | | | ✓ | C1+C2 | M8x37 | |
| | 95 | 30 | 41 | 5928 208 030 | – | 5930 408 030 | 5928 608 030 | | 90 | | | | ✓ | C1+C2 | M8x52 | |
| | 115 | 50 | 61 | 5928 208 050 | – | 5931 408 050 | 5928 608 050 | | 110 | | | | ✓ | C1+C2 | M8x72 | |
| | 165 | 100 | 111 | 5928 208 100 | – | 5932 408 100 | – | | 160 | | | | ✓ | C1+C2 | M8x122 | 50 |
| M10 | 70 | 0 | 10 | 5928 251 010 | – | 5928 451 010 | 5928 651 010 | 10 | 75 | 25 | 35 | 17 | ✓ | - | M10x22 | 50 |
| | 80 | 0 | 20 | 5928 251 020 | – | 5928 451 020 | – | | 75 | | | | ✓ | - | M10x32 | |
| | 90 | 10 | 30 | 5928 210 010 | 5928 710 010 | 5928 410 010 | 5928 610 010 | | 85 | | | | ✓ | C1+C2 | M10x42 | |
| | 95 | 15 | 35 | 5928 210 015 | 5928 710 015 | 5928 410 015 | 5928 610 015 | | 90 | | | | ✓ | C1+C2 | M10x47 | |
| | 100 | 20 | 40 | 5928 210 020 | 5928 710 020 | 5928 410 020 | – | | 95 | | | | ✓ | C1+C2 | M10x52 | |
| | 110 | 30 | 50 | 5928 210 030 | 5928 710 030 | 5928 210 030 | 5928 610 030 | | 105 | | | | ✓ | C1+C2 | M10x62 | |
| | 130 | 50 | 70 | 5928 210 050 | 5928 710 050 | 5928 410 050 | 5928 610 050 | | 125 | | | | ✓ | C1+C2 | M10x82 | |
| | 155 | 75 | 95 | 5928 210 075 | 5928 710 075 | 5928 410 075 | – | | 145 | | | | ✓ | C1+C2 | M10x107 | |
| | 180 | 100 | 120 | 5928 210 100 | – | 5928 410 100 | – | | 175 | | | | ✓ | C1+C2 | M10x132 | |
| | 230 | 150 | - | 0904 521 005 | – | – | – | | 225 | | | | ✓ | - | M10x80 | 25 |
| M12 | 85 | 0 | 10 | 5928 252 010 | – | 5928 452 010 | 5928 652 010 | 12 | 90 | 45 | 50 | 19 | ✓ | - | M12x26 | 25 |
| | 95 | 0 | 20 | 5928 252 020 | – | 5928 452 020 | – | | 90 | | | | ✓ | - | M12x36 | |
| | 110 | 15 | 35 | 5928 212 015 | 5928 712 015 | 5928 412 015 | 5928 612 015 | | 105 | | | | ✓ | C1+C2 | M12x51 | |
| | 115 | 20 | 40 | 5928 212 020 | 5928 712 020 | 5928 412 020 | 5928 612 020 | | 110 | | | | ✓ | C1+C2 | M12x56 | |
| | 125 | 30 | 50 | 5928 212 030 | – | 5928 412 030 | 5928 612 030 | | 120 | | | | ✓ | C1+C2 | M12x66 | |
| | 145 | 50 | 70 | 5928 212 050 | 5928 712 050 | 5928 412 050 | 5928 612 050 | | 140 | | | | ✓ | C1+C2 | M12x86 | |
| | 160 | 65 | 85 | 5928 212 065 | 5928 712 065 | 5928 412 065 | – | | 155 | | | | ✓ | C1+C2 | M12x101 | |
| | 180 | 85 | 105 | 5928 212 085 | 5928 712 085 | 5928 412 085 | – | | 175 | | | | ✓ | C1+C2 | M12x121 | |
| | 200 | 105 | 125 | 5928 212 105 | 5928 712 105 | 5928 412 105 | – | | 195 | | | | ✓ | C1+C2 | M12x141 | 25 |
| | 220 | 125 | - | 0904 521 217 | – | 0904 621 206 | – | | 215 | | | | ✓ | - | M12x80 | |
| | 240 | 145 | - | 0904 521 218 | – | – | – | | 235 | | | | ✓ | - | M12x80 | 20 |
| | 255 | 160 | - | 0904 521 219 | – | 0904 621 207 | – | | 250 | | | | ✓ | - | M12x80 | |
| | 275 | 180 | - | – | – | 0904 621 208 | – | | 270 | | | | ✓ | - | M12x80 | |
| | 285 | 190 | - | – | 5928 712 190 | 0904 621 209 | – | | 280 | | | | ✓ | - | M12x80 | |
| | 300 | 205 | - | – | – | 0904 621 210 | – | | 305 | | | | ✓ | - | M12x80 | |
| | 325 | 230 | - | – | – | 0904 621 211 | – | | 320 | | | | ✓ | - | M12x80 | |



# FIXANCHOR W-FAZ

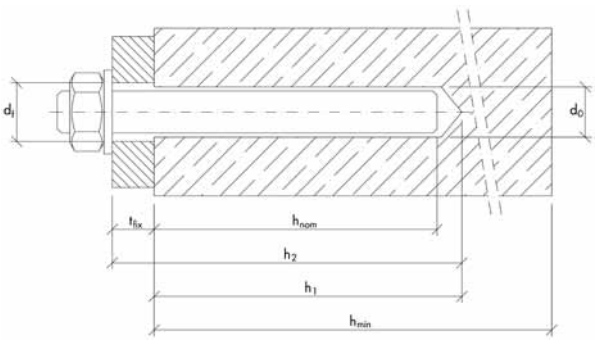
| | Anchor length | Fixture thickness for | | Art. no. | | | | Drill hole dia-meter | Drill hole depth for through installa-tion | Installation torque | | Wrench Size | Approval | | Thread length | P. Qty. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $h_{ef,std}$ | $h_{ef,red}$ | | | | | | | | | | | | | |
| | l | $t_{fix}$ | | Carbon steel | Carbon steel | Stainless steel | High corr. resist. | | | | | | | | | |
| Type | [mm] | [mm] | [mm] | galvanized | sherardized | A4 | HCR | $d_o$ [mm] | $h_2$ [mm] | $T_{inst}$ ≤ [Nm] | | SW [mm] | ETA-99/0011 | Sesimic C1/C2 | M x l [mm] | [qty.] |
| M16 | 115 | 0 | 15 | **5928 256 015** | – | **5928 456 015** | – | 16 | 110 | 90 | 110 | 24 | ✓ | – | M16x26 | 20 |
| | 125 | 5 | 25 | **5928 216 005** | – | **5928 416 005** | – | | 115 | | | | ✓ | C1+C2 | M16x36 | |
| | 135 | 15 | 35 | **5928 216 015** | **5928 716 015** | **5928 416 015** | – | | 125 | | | | ✓ | C1+C2 | M16x56 | |
| | 145 | 25 | 45 | **5928 216 025** | **5928 716 025** | **5928 416 025** | **5928 616 025** | | 135 | | | | ✓ | C1+C2 | M16x66 | |
| | 170 | 50 | 70 | **5928 216 050** | **5928 716 050** | **5928 416 050** | **5928 616 050** | | 160 | | | | ✓ | C1+C2 | M16x91 | |
| | 200 | 80 | 100 | **5928 216 080** | **5928 716 080** | **5928 416 080** | – | | 190 | | | | ✓ | C1+C2 | M16x121 | 10 |
| | 220 | 100 | - | **0904 521 603** | **5928 716 220** | **0904 616 100** | **5928 016 100** | | 200 | | | | ✓ | - | M16x80 | |
| | 260 | 140 | - | **0904 521 604** | **5928 716 260** | – | – | | 250 | | | | ✓ | - | M16x80 | |
| | 280 | 160 | - | – | – | **0904 616 160** | – | | 270 | | | | ✓ | - | M16x80 | |
| | 300 | 180 | - | **0904 521 605** | **5928 716 300** | **0904 616 180** | – | | 290 | | | | ✓ | - | M16x80 | |
| | 325 | 205 | - | – | – | **0904 616 205** | – | | 315 | | | | ✓ | - | M16x80 | |
| | 340 | 220 | - | – | – | **0904 616 220** | – | | 330 | | | | ✓ | - | M16x80 | |
| M20 | 165 | 30 | - | **5928 220 030** | **5928 720 030** | **5928 420 030** | **5928 620 030** | 20 | 155 | 160 | 200 | 30 | ✓ | C1+C2 | M20x50 | 10 |
| | 195 | 60 | - | **5928 220 060** | **5928 720 060** | **5928 420 060** | – | | 185 | | | | ✓ | C1+C2 | M20x70 | |
| | 265 | 130 | - | **0904 522 003** | – | **0904 620 130** | – | | 255 | | | | ✓ | - | M20x80 | 5 |
| | 285 | 150 | - | **0904 522 004** | – | **0904 620 150** | – | | 275 | | | | ✓ | - | M20x80 | |
| M24 | 190 | 30 | - | **0904 522 401** | – | – | – | 24 | 175 | 200 | 290 | 36 | ✓ | - | M24x55 | 10 |
| | 200 | 30 | - | – | – | **0904 624 030** | – | | 185 | | | | ✓ | - | M24x58 | |
| | 220 | 60 | - | **0904 522 402** | – | – | – | | 205 | | | | ✓ | - | M24x85 | 5 |
| | 230 | 60 | - | – | – | **0904 624 060** | – | | 215 | | | | ✓ | - | M24x88 | |
| | 235 | 75 | - | **0904 522 403** | – | – | – | | 220 | | | | ✓ | - | M24x100 | |
| | 245 | 75 | - | – | – | **0904 624 075** | – | | 230 | | | | ✓ | - | M24x103 | |
| | 260 | 100 | - | **0904 522 404** | – | – | – | | 245 | | | | ✓ | - | M24x125 | |
| M27 | 210 | 30 | - | **0904 522 701** | – | – | – | 28 | 190 | 300 | - | 41 | ✓ | - | M27x62 | 5 |
| | 240 | 60 | - | **0904 522 702** | – | – | – | | 220 | | | | ✓ | - | M27x92 | |
| | 280 | 100 | - | **0904 522 703** | – | – | – | | 260 | | | | ✓ | - | M27x132 | |



# FIXANCHOR W-FAZ

| | Anchor length | Fixture thickness for | | Art. no. | | | | Drill hole dia-meter | Drill hole depth for through installa-tion | Installation torque | | Wrench Size | Approval | | Thread length | P. Qty. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $h_{ef,std}$ | $h_{ef,red}$ | | | | | | | | | | | | | |
| | l | $t_{fix}$ | | Carbon steel | Carbon steel | Stainless steel | High corr. resist. | | | | | | | | | |
| **Type** | [mm] | [mm] | [mm] | galvanized | sherardized | A4 | HCR | $d_o$ [mm] | $h_2$ [mm] | $T_{inst}$ ≤ [Nm] | | SW [mm] | ETA-99/0011 | Sesimic C1/C2 | M x l [mm] | [qty.] |
| W-FAZ with big U-washer | | | | | | | | M8: 24 x 2<br>M10: 30 x 2,5<br>M12: 27 x 3<br>M16: 50 x 3 | | | | | | | | |
| M8 | 75 | 10 | 21 | 5928 308 010 | – | 5928 508 010 | – | 8 | 70 | 20 | 20 | 13 | ✓ | C1+C2 | M8x32 | 100 |
| | 80 | 15 | 26 | 5928 308 015 | – | 5928 508 015 | – | 8 | 75 | | | | ✓ | C1+C2 | M8x37 | |
| | 95 | 30 | 41 | 5928 308 030 | – | 5928 508 030 | – | 8 | 90 | | | | ✓ | C1+C2 | M8x52 | |
| | 115 | 50 | 61 | – | – | 5928 508 050 | – | 8 | 110 | | | | ✓ | C1+C2 | M8x72 | |
| M10 | 90 | 10 | 30 | 5928 310 010 | – | 5928 510 010 | – | 10 | 85 | 25 | 35 | 17 | ✓ | C1+C2 | M10x42 | 50 |
| | 95 | 15 | 35 | 5928 310 015 | – | 5928 510 015 | – | | 90 | | | | ✓ | C1+C2 | M10x47 | |
| | 110 | 30 | 50 | 5928 310 030 | – | 5928 510 030 | – | | 105 | | | | ✓ | C1+C2 | M10x62 | |
| | 130 | 50 | 70 | 5928 310 050 | – | 5928 510 050 | – | | 125 | | | | ✓ | C1+C2 | M10x82 | |
| | 180 | 100 | 120 | 5928 310 100 | – | – | – | | 175 | | | | ✓ | C1+C2 | M10x132 | |
| M12 | 110 | 15 | 35 | 5928 312 015 | – | 5928 512 015 | – | 12 | 105 | 45 | 50 | 19 | ✓ | C1+C2 | M12x51 | 25 |
| | 125 | 30 | 50 | 5928 312 030 | – | 5928 512 030 | – | | 120 | | | | ✓ | C1+C2 | M12x66 | |
| | 145 | 50 | 70 | 5928 312 050 | – | 5928 512 050 | – | | 140 | | | | ✓ | C1+C2 | M12x86 | |
| | 200 | 105 | 125 | 5928 312 105 | – | – | – | | 195 | | | | ✓ | C1+C2 | M12x141 | |
| | 220 | 125 | - | 0904 531 212 | – | – | – | | 215 | | | | ✓ | - | M12x80 | |
| | 240 | 145 | - | 0904 531 213 | – | – | – | 12 | 235 | 45 | 50 | 19 | ✓ | - | M12x80 | 20 |
| | 255 | 160 | - | 0904 531 214 | – | 5928 112 005 | – | | 250 | | | | ✓ | - | M12x80 | |
| | 285 | 190 | - | 0904 531 215 | – | – | – | | 280 | | | | ✓ | - | M12x80 | |
| | 325 | 230 | - | 0904 531 216 | – | – | – | | 320 | | | | ✓ | - | M12x80 | |
| M16 | 145 | 25 | 45 | 5928 316 025 | – | 5928 516 025 | – | 16 | 135 | 90 | 110 | 24 | ✓ | C1+C2 | M16x66 | 20 |
| | 170 | 50 | 70 | 5928 316 050 | – | – | – | | 160 | | | | ✓ | C1+C2 | M16x91 | |

| | Anchor length | Fixture thickness for | | Art. no. | | | | Drill hole dia-meter | Drill hole depth for through installa-tion | Installation torque | | Wrench Size | Approval | | Thread length | P. Qty. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $h_{ef,std}$ | $h_{ef,red}$ | | | | | | | | | | | | | |
| | l | $t_{fix}$ | | Carbon steel | Carbon steel | Stainless steel | High corr. resist. | | | | | | | | | |
| **Type** | [mm] | [mm] | [mm] | galvanized | sherardized | A4 | HCR | $d_o$ [mm] | $h_2$ [mm] | $T_{inst}$ ≤ [Nm] | | SW [mm] | ETA-99/0011 | Sesimic C1/C2 | M x l [mm] | [qty.] |
| W-FAZ with big U-washer DIN EN ISO 7094 | | | | | | | | M12: 44 x 4<br>M16: 56 x 5 | | | | | | | | |
| M12 | 200 | 105 | 125 | 5928 362 105 | – | – | – | 12 | 195 | 45 | – | 19 | ✓ | C1+C2 | M12x80 | 25 |
| | 220 | 125 | - | 0904 531 222 | – | – | – | | 215 | | | | - | - | M12x80 | |
| | 240 | 145 | - | 0904 531 223 | – | | | | 235 | | | | - | - | M12x80 | 20 |
| | 255 | 160 | - | 0904 531 224 | – | – | – | | 250 | | | | - | - | M12x80 | |
| | 285 | 190 | - | 0904 531 225 | – | – | – | | 280 | | | | - | - | M12x80 | |
| M16 | 220 | 100 | - | 0904 531 622 | – | – | – | 16 | 210 | 90 | – | 24 | - | - | M16x80 | 10 |
| | 260 | 140 | - | 0904 531 623 | – | – | – | | 250 | | | | - | - | M16x80 | |
| | 300 | 180 | - | 0904 531 624 | – | – | – | | 290 | | | | - | - | M16x80 | |



# HIGH-PERFORMANCE ANCHOR W-HAZ

**Approvals and certificates**

| Type of installation | | |
|---|---|---|
| Pre-positioned | In-place | Stand-off |
| – | ✓ | – |

## Application references

## Installation

## Loads

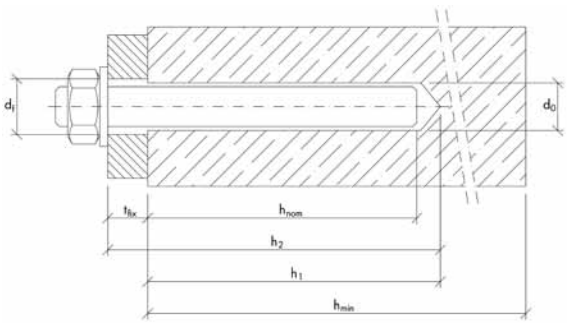
| Thread size | | | | 10/M6 | 12/M8 | 15/M10 | 18M12 | 24/M16 | 24/M16L | 28/M20 | 32/M24 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Effective anchorage depth** | | $h_{ef}$ | [mm] | 50 | 60 | 71 | 80 | 100 | 115 | 125 | 150 |
| **Non-cracked Concrete** | | | | | | | | | | | |
| **Tension** | S SK B; /S | $N_{rec}$ | [kN] | 7.6 | 9.5 | 14.0 | 16.8 | 23.4 | 28.9 | 32.7 | 43.0 |
| | S SK B; /A4 | | [kN] | – | 7.6 | 11.9 | 16.7 | | – | – | – |
| **Shear** | B; /S | $V_{rec}$ | [kN] | 9.1 | 14.3 | 20.6 | 33.5 | 46.9 | 52.0 | 65.5 | 86.1 |
| | B; /A4 | | [kN] | – | 13.7 | 21.1 | | | – | – | – |
| | S SK; /S | | [kN] | 10.3 | 17.1 | 27.4 | 33.5 | 46.9 | 57.8 | 65.5 | 86.1 |
| | S SK; /A4 | | [kN] | – | 12.6 | 19.4 | 32.6 | | – | – | – |
| **Cracked concrete** | | | | | | | | | | | |
| **Tension** | S SK B; /S | $N_{rec}$ | [kN] | 2.4 | 5.7 | 7.6 | 11.7 | 16.4 | 20.2 | 22.9 | 30.1 |
| | S SK B; /A4 | | [kN] | – | 4.3 | | | | – | – | – |
| **Shear** | B; /S | $V_{rec}$ | [kN] | 9.1 | 14.3 | 19.6 | 23.5 | 32.8 | 40.4 | 45.8 | 60.2 |
| | B; /A4 | | [kN] | – | 13.7 | | | | – | – | – |
| | S SK; /S | | [kN] | 10.3 | 15.2 | 19.6 | 23.5 | 32.8 | 40.4 | 45.8 | 60.2 |
| | S SK; /A4 | | [kN] | – | 12.6 | 19.4 | | | – | – | – |

[1] Loads are valid for single anchors. Normal spaced reinforcement in ≥ C20/25. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included. The material safety factor depends on the failure mode.
[2] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Clearance-hole in fixture** | | $d_f$ | [mm] | 12 | 14 | 17 | 20 | 26 | 26 | 31 | 35 |
| **Drill depth** | | $h_1$ ≥ | [mm] | 65 | 80 | 95 | 105 | 130 | 145 | 160 | 180 |
| **Minimum thickness of concrete member** | | $h_{min}$ | [mm] | 100 | 120 | 140 | 160 | 200 | 230 | 250 | 300 |

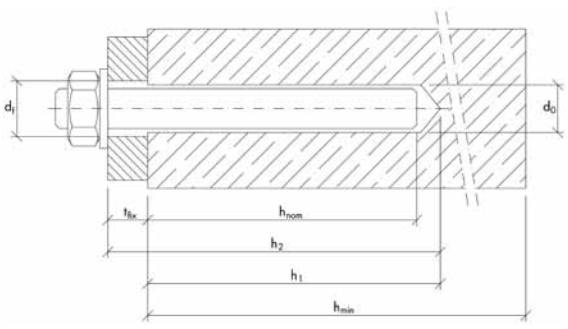
# HIGH-PERFORMANCE ANCHOR W-HAZ

| | Anchor length | Fixture thickness for | Art. no. | | Drill hole diameter | Drill hole depth for through installation | Installation torque | | Wrench size | Approval | | P. Qty. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type | l [mm] | $t_{fix}$ [mm] | Carbon steel galvanized | Stainless steel A4 | $d_o$ [mm] | $h_2$ [mm] | $T_{inst}$ [Nm] | | SW [mm] | ETA-02/0031 | Sesimic C1/C2 | [qty.] |
| W-HAZ-B threaded bolt |  | | | | | | | | | | | |
| M6 | 67 | 0 | 0905 210 101 | – | 10 | 65 | 15 | – | 10 | ✓ | - | 100 |
| | 77 | 10 | 0905 210 102 | – | | 75 | | | | ✓ | - | 50 |
| | 97 | 30 | 0905 210 103 | – | | 95 | | | | ✓ | - | 50 |
| | 117 | 50 | 0905 210 104 | – | | 115 | | | | ✓ | - | 50 |
| | 167 | 100 | 0905 210 105 | – | | 165 | | | | ✓ | - | 50 |
| M8 | 80 | 0 | 0905 212 101 | 5932 612 101 | 12 | 80 | 30 | 35 | 13 | ✓ | C1+C2 | 50 |
| | 90 | 10 | 0905 212 102 | 5932 612 102 | | 90 | | | | ✓ | C1+C2 | 50 |
| | 110 | 30 | 0905 212 103 | 5932 612 103 | | 110 | | | | ✓ | C1+C2 | 50 |
| | 130 | 50 | 0905 212 104 | 5932 612 104 | | 130 | | | | ✓ | C1+C2 | 25 |
| | 180 | 100 | 0905 212 105 | 5932 612 105 | | 180 | | | | ✓ | C1+C2 | 25 |
| M10 | 95 | 0 | – | 5932 615 101 | 15 | 95 | - | 55 | 17 | ✓ | C1+C2 | 25 |
| | 96 | 0 | 0905 215 101 | – | | 95 | 50 | - | | ✓ | C1+C2 | 25 |
| | 110 | 15 | – | 5932 615 102 | | 110 | - | 55 | | ✓ | C1+C2 | 25 |
| | 111 | 15 | 0905 215 102 | – | | 110 | 50 | - | | ✓ | C1+C2 | 25 |
| | 120 | 25 | – | 5932 615 103 | | 120 | - | 55 | | ✓ | C1+C2 | 25 |
| | 121 | 25 | 0905 215 103 | – | | 120 | 50 | - | | ✓ | C1+C2 | 25 |
| | 140 | 45 | – | 5932 615 104 | | 140 | - | 55 | | ✓ | C1+C2 | 25 |
| | 141 | 45 | 0905 215 104 | – | | 140 | 50 | - | | ✓ | C1+C2 | 25 |
| | 190 | 95 | – | 5932 615 105 | | 190 | - | 55 | | ✓ | C1+C2 | 25 |
| | 191 | 95 | 0905 215 105 | – | | 190 | 50 | - | | ✓ | C1+C2 | 25 |
| M12 | 112 | 0 | 0905 218 101 | 5932 618 101 | 18 | 105 | 80 | 90 | 19 | ✓ | C1+C2 | 20 |
| | 122 | 10 | 0905 218 102 | 5932 618 102 | | 115 | | | | ✓ | C1+C2 | 20 |
| | 131 | 20 | – | 5932 618 103 | | 125 | - | | | ✓ | C1+C2 | 20 |
| | 132 | 20 | 0905 218 103 | – | | 125 | 80 | - | | ✓ | C1+C2 | 20 |
| | 151 | 40 | – | 5932 618 104 | | 145 | - | 90 | | ✓ | C1+C2 | 20 |
| | 152 | 40 | 0905 218 104 | – | | 145 | 80 | - | | ✓ | C1+C2 | 20 |
| | 182 | 70 | 0905 218 105 | 5932 618 105 | | 175 | | 90 | | ✓ | C1+C2 | 20 |
| | 212 | 100 | 0905 218 106 | – | | 205 | | - | | ✓ | C1+C2 | 10 |
| M16 | 137 | 0 | 0905 224 101 | 5932 624 101 | 24 | 130 | 160 | 170 | 24 | ✓ | C1+C2 | 10 |
| | 157 | 20 | 0905 224 102 | 5932 624 102 | | 150 | | | | ✓ | C1+C2 | 10 |
| | 187 | 50 | 0905 224 103 | 5932 624 103 | | 180 | | | | ✓ | C1+C2 | 10 |
| | 237 | 100 | 0905 224 104 | – | | 230 | | – | | ✓ | C1+C2 | 5 |
| M16L | 152 | 0 | 0905 224 101 | – | | 145 | | | | ✓ | C1+C2 | 10 |
| | 182 | 30 | 0905 224 102 | – | | 175 | | | | ✓ | C1+C2 | 10 |
| | 202 | 50 | 0905 224 103 | – | | 195 | | | | ✓ | C1+C2 | 10 |
| M20 | 181 | 10 | 0905 228 101 | – | 28 | 170 | 280 | – | 30 | ✓ | C1+C2 | 10 |
| | 201 | 30 | 0905 228 102 | – | | 190 | | | | ✓ | C1+C2 | 10 |
| | 231 | 60 | 0905 228 103 | – | | 220 | | | | ✓ | C1+C2 | 5 |
| | 271 | 100 | 0905 228 104 | – | | 260 | | | | ✓ | C1+C2 | 5 |



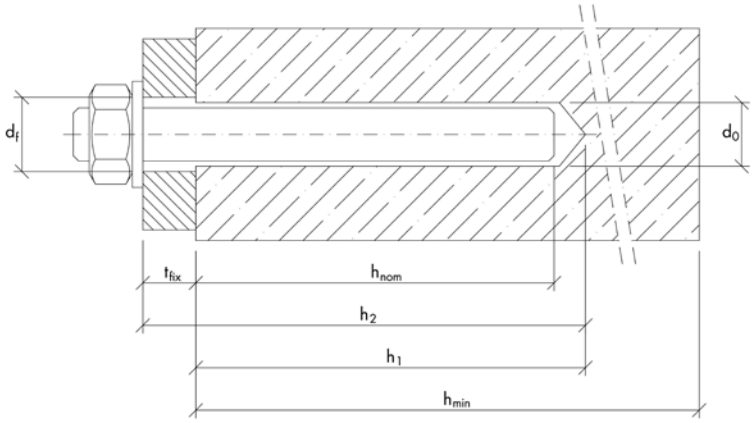
# HIGH-PERFORMANCE ANCHOR W-HAZ

| | Anchor length | Fixture thickness for | Art. no. | | Drill hole diameter | Drill hole depth for through installation | Installation torque | | Wrench | Approval | | P. Qty. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Type** | **l [mm]** | **$t_{fix}$ [mm]** | **Carbon steel galvanized** | **Stainless steel A4** | **$d_o$ [mm]** | **$h_2$ [mm]** | **$T_{inst}$ [Nm]** | | **SW [mm]** | **ETA-02/0031** | **Sesimic C1/C2** | **[qty.]** |
| W-HAZ-S hexagon head screw |  | | | | | | | | | | | |
| M6 | 65 | 0 | **0905 210 001** | – | 10 | 65 | 15 | – | 10 | ✓ | – | 100 |
| | 75 | 10 | **0905 210 002** | – | | 75 | | | | ✓ | – | 50 |
| | 95 | 30 | **0905 210 003** | – | | 95 | | | | ✓ | – | 50 |
| | 115 | 50 | **0905 210 004** | – | | 115 | | | | ✓ | – | 50 |
| M8 | 75 | 0 | **0905 212 001** | **5932 612 001** | 12 | 80 | 30 | 30 | 13 | ✓ | C1+C2 | 50 |
| | 85 | 10 | **0905 212 002** | **5932 612 002** | | 90 | | | | ✓ | C1+C2 | 50 |
| | 105 | 30 | **0905 212 003** | **5932 612 003** | | 110 | | | | ✓ | C1+C2 | 50 |
| | 125 | 50 | **0905 212 004** | **5932 612 004** | | 130 | | | | ✓ | C1+C2 | 25 |
| M10 | 91 | 0 | **0905 215 001** | **5932 615 001** | 15 | 95 | 50 | 50 | 17 | ✓ | C1+C2 | 25 |
| | 106 | 15 | **0905 215 002** | **5932 615 002** | | 110 | | | | ✓ | C1+C2 | 25 |
| | 116 | 25 | **0905 215 003** | **5932 615 003** | | 120 | | | | ✓ | C1+C2 | 25 |
| | 136 | 45 | **0905 215 004** | **5932 615 004** | | 140 | | | | ✓ | C1+C2 | 25 |
| | 186 | 95 | **0905 215 005** | **5932 615 005** | | 190 | | | | ✓ | C1+C2 | 25 |
| M12 | 107 | 0 | **0905 218 001** | – | 18 | 105 | 80 | – | 19 | ✓ | C1+C2 | 20 |
| | 108 | 0 | – | **5932 618 001** | | 105 | – | 80 | | ✓ | C1+C2 | 20 |
| | 117 | 10 | **0905 218 002** | – | | 115 | 80 | – | | ✓ | C1+C2 | 20 |
| | 118 | 10 | – | **5932 618 002** | | 115 | – | 80 | | ✓ | C1+C2 | 20 |
| | 127 | 20 | **0905 218 003** | – | | 125 | 80 | – | | ✓ | C1+C2 | 20 |
| | 128 | 20 | – | **5932 618 003** | | 125 | – | 80 | | ✓ | C1+C2 | 20 |
| | 147 | 40 | **0905 218 004** | – | | 145 | 80 | – | | ✓ | C1+C2 | 20 |
| | 148 | 40 | – | **5932 618 004** | | 145 | – | 80 | | ✓ | C1+C2 | 20 |
| | 177 | 70 | **0905 218 005** | – | | 175 | 80 | – | | ✓ | C1+C2 | 20 |
| | 178 | 70 | – | **5932 618 005** | | 175 | – | 80 | | ✓ | C1+C2 | 20 |
| M16 | 130 | 0 | **0905 224 001** | **5932 624 001** | 24 | 130 | 160 | 170 | 24 | ✓ | C1+C2 | 10 |
| | 150 | 20 | **0905 204 002** | **5932 624 002** | | 150 | | | | ✓ | C1+C2 | 10 |
| | 180 | 50 | **0905 224 003** | **5932 624 003** | | 180 | | | | ✓ | C1+C2 | 10 |
| M16L | 150 | 0 | **0905 221 001** | – | | 145 | | – | | ✓ | C1+C2 | 10 |
| | 180 | 30 | **0905 224 002** | – | | 175 | | | | ✓ | C1+C2 | 10 |
| | 200 | 50 | **0905 224 003** | – | | 195 | | | | ✓ | C1+C2 | 10 |
| M20 | 172 | 10 | **0905 228 001** | – | 28 | 170 | 280 | – | 30 | ✓ | C1+C2 | 10 |
| | 192 | 30 | **0905 228 002** | – | | 190 | | | | ✓ | C1+C2 | 10 |
| | 222 | 60 | **0905 228 003** | – | | 220 | | | | ✓ | C1+C2 | 5 |
| | 262 | 100 | **0905 228 004** | – | | 260 | | | | ✓ | C1+C2 | 5 |

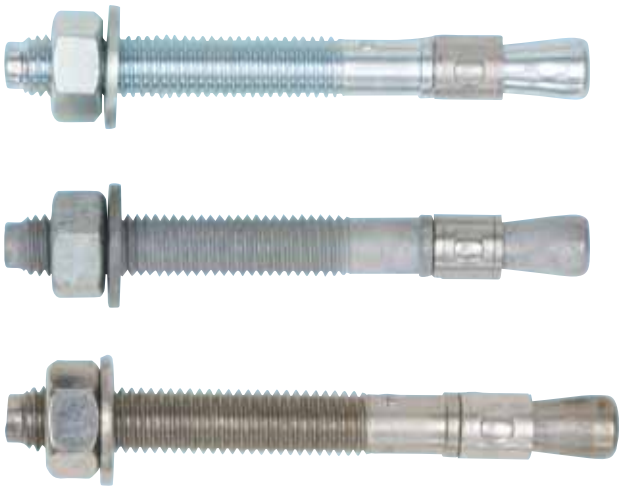


# HIGH-PERFORMANCE ANCHOR W-HAZ

| | Anchor length | Fixture thickness for | Art. no. | | Drill hole diameter | Drill hole depth for through installation | Installation torque | | for SK use hex bit | Approval | | Countersunk head geometry | P. Qty. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type | l [mm] | $t_{fix}$ [mm] | Carbon steel galvanized | Stainless steel A4 | $d_o$ [mm] | $h_2$ [mm] | $T_{inst}$ [Nm] | | SW [mm] | ETA-02/0031 | Sesimic C1/C2 | $t_{sk}$ [mm] | [qty.] |
| W-HAZ-SK countersunk washer and countersunk screw | | | | | | | | | | | | | |
| M6 | 70 | 10 | 0905 210 201 | – | 10 | 75 | 10 | – | 4 | ✓ | - | 16.5x4 | 50 |
| | 85 | 25 | 0905 210 202 | – | | 90 | | | | ✓ | - | | 50 |
| | 100 | 40 | 0905 210 203 | – | | 105 | | | | ✓ | - | | 50 |
| M8 | 80 | 10 | 0905 212 201 | 5932 612 201 | 12 | 90 | 25 | 17.5 | 5 | ✓ | C1+C2 | 20.5x5 | 50 |
| | 95 | 25 | 0905 212 202 | 5932 612 202 | | 105 | | | | ✓ | C1+C2 | | 50 |
| | 120 | 50 | 0905 212 203 | 5932 612 203 | | 130 | | | | ✓ | C1+C2 | | 25 |
| M10 | 100 | 10 | 0905 215 201 | 5932 615 201 | 15 | 105 | 55 | 42.5 | 6 | ✓ | C1+C2 | 24.5x6 | 25 |
| | 110 | 25 | 0905 215 202 | 5932 615 202 | | 120 | | | | ✓ | C1+C2 | | 25 |
| | 120 | 35 | 0905 215 203 | 5932 615 203 | | 130 | | | | ✓ | C1+C2 | | 25 |
| | 135 | 50 | 0905 215 204 | 5932 615 204 | | 145 | | | | ✓ | C1+C2 | | 25 |
| M12 | 115 | 20 | 0905 218 203 | 5932 618 203 | 18 | 125 | 70 | 50 | 8 | ✓ | C1+C2 | 29.5x7 | 20 |
| | 135 | 40 | 0905 218 204 | 5932 618 204 | | 145 | | | | ✓ | C1+C2 | | 20 |



# FIXANCHOR W-FA



**Approvals and certificates**


uncracked concrete

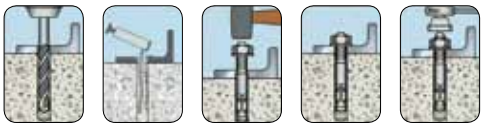
cracked concrete

**Type of installation**

| Pre-positioned | In-place | Stand-off |
|---|---|---|
| – | ✓ | ✓ |

## Application references

## Installation



## Loads

| **Thread size** | | | | **M6** | | **M8** | | **M10** | | **M12** | | **M16** | | **M20** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Effective anchorage depth** | | $h_{ef}$ | [mm] | 30 | 40 | 35 | 44 | 42 | 48 | 50 | 65 | 64 | 82 | 78 | 100 |
| **Non-cracked Concrete** | | | | | | | | | | | | | | | |
| **Tension** | W-FA/S, F | $N_{rec}$ | [kN] | 2.9 | 4.1 | 4.9 | 5.7 | 6.4 | 7.6 | 8.3 | 12.3 | 12.0 | 17.4 | 16.1 | 23.4 |
| | W-FA/A4; /HCR | | [kN] | 2.9 | 3.6 | 4.3 | 5.7 | 5.7 | 7.6 | 8.3 | 11.9 | 12.0 | 17.4 | 16.1 | 23.4 |
| **Shear** | W-FA/S, F | $V_{rec}$ | [kN] | 2.9 | 2.9 | 4.9 | 6.3 | 6.4 | 7.8 | 8.3 | 14.3 | 23.6 | 23.6 | 32.3 | 37.1 |
| | W-FA/A4; /HCR | | [kN] | 3.8 | 4.0 | 4.9 | 6.8 | 6.4 | 7.8 | 8.3 | 15.4 | 24.0 | 28.6 | 32.3 | 43.9 |

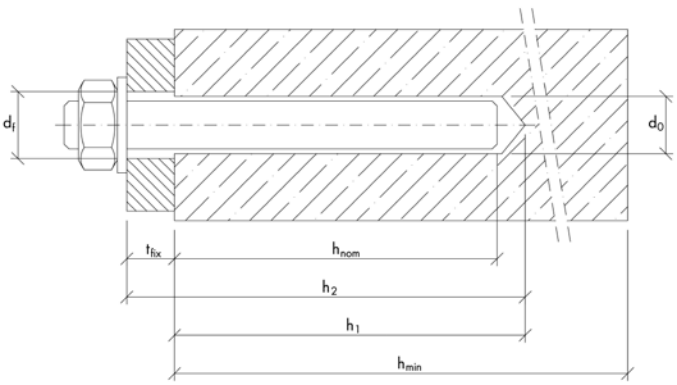
[1] Loads are valid for single anchors. Normal spaced reinforcement in ≥ C20/25. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included. The material safety factor depends on the failure mode.
[2] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.

| **Clearance-hole in fixture** | | $d_f$ | [mm] | 7 | | 9 | | 12 | | 14 | | 18 | | 22 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Drill depth** | | $h_1$ | [mm] | 45 | 55 | 55 | 65 | 65 | 70 | 75 | 90 | 95 | 110 | 110 | 130 |
| **Minimum thickness of concrete member** | W-FA/S | $h_{min}$ | [mm] | 80 | 100 | 80 | 100 | 100 | 100 | 100 | 130 | 130 | 170 | 160 | 200 |
| | W-FA/A4; /HCR | | | | | | | | | | | | 160 | | |
| **Minimum edge distance** | W-FA/S | $c_{min}$ | [mm] | 40 | 40 | 45 | 45 | 65 | 65 | 100 | 90 | 100 | 105 | 140 | 125 |
| | W-FA/A4; /HCR | | [mm] | | 35 | 60 | | | 55 | | 70 | 110 | 80 | | 100 |

# FIXANCHOR W-FA

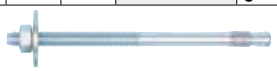
| | Anchor length | Fixture thickness for | | Art. no. | | | | Drill hole dia-meter | Drill hole depth for through installa-tion | Installation torque | | | Wrench Size | Approval | Thread length | | P. Qty. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $h_{ef,std}$ | $h_{ef,red}$ | Carbon steel | Carbon steel | Stainless steel | High corr. resist. | | | galv. | hot-dipped galv. | A4/ HCR | | | | | |
| | l | $t_{fix}$ | | | | | | | | | | | | | | | |
| Type | [mm] | [mm] | [mm] | galvanized | hot-dipped galv. | A4 | HCR | $d_o$ [mm] | $h_2$ [mm] | $T_{inst} \leq$ [Nm] | | | SW [mm] | ETA-02/0001 | M x l [mm] | | [qty.] |
| W-FA |  | | | | | | | | | | | | | | | | |
| M6 | 40 | 5 | - | 5932 006 040 | 5932 906 040 | 0904 411 061 | on demand | 6 | 60 | 8 | 8 | 6 | 10 | - | M6x16 | | 100 |
| | 67 | 10 | 20 | 5932 006 067 | – | 0904 411 065* | 5932 206 020* | | 65 | | | | | ✓ | M6x30 | | |
| | 82 | 25 | 35 | 5932 006 082 | – | 0904 411 066* | 5932 206 035* | | 80 | | | | | | M6x35 | M6x20 HCR only | |
| | 97 | 40 | 50 | 5932 006 097 | – | 0904 411 067* | on demand | | 95 | | | | | | M6x35 | | |
| M8 | 50 | 5 | - | 5932 008 050 | – | – | – | 8 | 70 | 15 | 15 | 15 | 13 | - | M8x22 | | 100 |
| | 75 | 10 | 19 | 5932 008 075 | – | 0904 411 083 | – | | 75 | | | | | ✓ | M8x40 | | |
| | 80 | 15 | 24 | 5932 008 080 | 5932 908 080 | 0904 411 084 | – | | 80 | | | | | | M8x45 | | |
| | 90 | 25 | 34 | 5932 008 090 | – | – | – | | 90 | | | | | | M8x55 | | |
| | 95 | 30 | 39 | 5932 008 095 | 5932 908 095 | 0904 411 087 | – | | 95 | | | | | | M8x60 | | |
| | 110 | 45 | 54 | 5932 008 110 | – | 0904 411 089 | – | | 110 | | | | | | M8x75 | | |
| | 120 | 55 | 64 | 5932 008 120 | 5932 908 120 | – | – | | 120 | | | | | | M8x85 | | |
| M10 | 60 | 10 | - | 5932 010 060 | – | – | – | 10 | 80 | 30 | 30 | 25 | 17 | - | M10x25 | | 50 |
| | 85 | 10 | 16 | 5932 010 085 | – | 0904 411 002 | – | | | | | | | ✓ | M10x40 | | |
| | 90 | 15 | 21 | 5932 010 090 | 5932 910 090 | 0904 411 003 | – | | 85 | | | | | | M10x45 | | |
| | 95 | 20 | 26 | 5932 010 095 | – | 0904 411 004 | – | | 90 | | | | | | M10x50 | | |
| | 105 | 30 | 36 | 5932 010 105 | 5932 910 105 | 0904 411 005 | – | | 100 | | | | | | M10x60 | | |
| | 120 | 45 | 51 | 5932 010 120 | 5932 910 120 | 0904 411 006 | – | | 115 | | | | | | M10x75 | | |
| | 145 | 70 | 76 | 5932 010 145 | – | – | – | | 140 | | | | | | M10x80 | | |
| | 175 | 100 | 106 | 5932 010 175 | – | – | – | | 170 | | | | | | M10x80 | | |
| | 215 | 140 | 146 | 5932 010 215 | – | – | – | | 210 | | | | | | M10x80 | | 25 |
| M12 | 75 | 5 | - | 5932 012 075 | – | – | – | 12 | 95 | 50 | 50 | 40 | 19 | ✓ | M12x30 | | 25 |
| | 105 | 10 | 25 | 5932 012 105 | – | – | – | | 100 | | | | | | M12x60 | | |
| | 110 | 15 | 30 | 5932 012 110 | 5932 910 110 | 0904 411 204 | – | | 105 | | | | | | M12x65 | | |
| | 115 | 20 | 35 | 5932 012 115 | – | – | – | | 110 | | | | | | M12x70 | | |
| | 125 | 30 | 45 | 5932 012 125 | 5932 910 125 | 0904 411 206 | – | | 120 | | | | | | M12x80 | | |
| | 145 | 50 | 65 | 5932 012 145 | 5932 910 145 | – | – | | 140 | | | | | | M12x100 | | |
| | 160 | 65 | 80 | 5932 012 160 | – | – | – | | 155 | | | | | | M12x100 | | |
| | 180 | 85 | 100 | 5932 012 180 | 5932 910 180 | 0904 411 209 | – | | 175 | | | | | | M12x100 | M12x80 A4 only | |
| M12 | 200 | 105 | 120 | 5932 012 200 | – | 0904 411 210 | – | 12 | 195 | 50 | 50 | 40 | 19 | ✓ | M12x100 | M12x80 A4 only | 25 |
| | 220 | 125 | 140 | 5932 012 220 | – | – | – | | 215 | | | | | | M12x80 | | |
| | 240 | 145 | 160 | 5932 012 240 | – | – | – | | 235 | | | | | | M12x80 | | 20 |
| | 255 | 160 | 175 | 5932 012 255 | – | – | – | | 250 | | | | | | M12x80 | | |

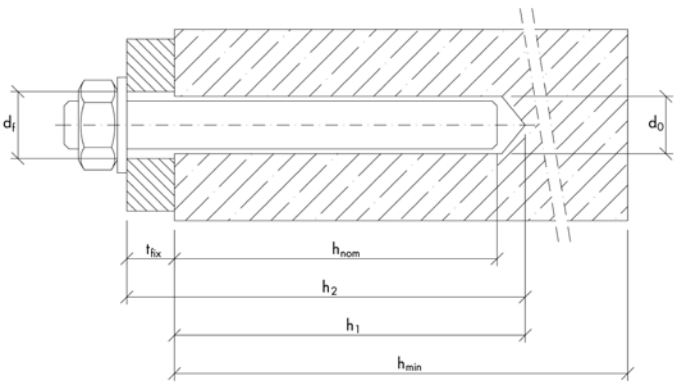
* additional ETA 06/0162 for multiple attachments



# FIXANCHOR W-FA

| | Anchor length | Fixture thickness for | | Art. no. | | | | Drill hole dia-meter | Drill hole depth for through installa-tion | Installation torque | | | Wrench Size | Approval | Thread length | | P. Qty. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $h_{ef,std}$ | $h_{ef,red}$ | Carbon steel | Carbon steel | Stainless steel | High corr. resist. | | | galv. | hot-dipped galv. | A4/ HCR | | | | | |
| | l | $t_{fix}$ | | | | | | | | | | | | | | | |
| Type | [mm] | [mm] | [mm] | galvanized | hot-dipped galv. | A4 | HCR | $d_o$ [mm] | $h_2$ [mm] | $T_{inst} \leq$ [Nm] | | | SW [mm] | ETA-02/0001 | M x l [mm] | | [qty.] |
| M16 | 115 | 13 | - | **5932 016 115** | – | – | – | 16 | 123 | 100 | 100 | 90 | 24 | ✓ | M16x60 | | 20 |
| | 130 | 10 | 28 | **5932 016 130** | – | – | – | | 120 | | | | | | M16x70 | | |
| | 150 | 30 | 48 | **5932 016 150** | **5932 916150** | **0904 411 604** | | | 140 | | | | | | M16x90 | | |
| | 180 | 60 | 78 | **5932 016 180** | – | – | – | | 170 | | | | | | M16x110 | | |
| | 200 | 80 | 98 | **5932 016 200** | – | – | – | | 190 | | | | | | | | 10 |
| | 220 | 100 | 118 | **5932 016 220** | – | **0904 411 607** | | | 210 | | | | | | M16x80 | | |
| | 250 | 130 | 148 | **5932 016 250** | – | – | – | | 240 | | | | | | M16x80 | | |
| | 285 | 165 | 183 | **5932 016 285** | – | – | – | | 275 | | | | | | M16x80 | | |
| | 320 | 200 | 218 | **5932 016 320** | – | – | – | | 310 | | | | | | M16x80 | | |
| | 340 | 220 | 238 | **5932 016 340** | – | – | – | | 330 | | | | | | M16x80 | | |
| M20 | 150 | 5 | 27 | **5932 020 150** | – | – | – | 20 | 135 | 200 | 200 | 160 | 30 | ✓ | M20x70 | | 10 |
| | 180 | 35 | 57 | **5932 020 180** | – | **0904 411 002** | – | | 165 | | | | | | M20x70 | | |
| | 205 | 60 | 82 | **5932 020 205** | – | – | – | | 195 | | | | | | M20x70 | | |
| | 240 | 95 | 117 | **5932 020 240** | – | – | – | | 225 | | | | | | M20x70 | | |

| | Anchor length | Fixture thickness for | | Art. no. | | | | Drill hole dia-meter | Drill hole depth for through installa-tion | Installation torque | | | Wrench Size | Approval | Thread length | | P. Qty. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $h_{ef,std}$ | $h_{ef,red}$ | Carbon steel | Carbon steel | Stainless steel | High corrosion resistant steel | | | galv. | hot-dipped galv. | A4/ HCR | | | | | |
| | l | $t_{fix}$ | | | | | | | | | | | | | | | |
| Type | [mm] | [mm] | [mm] | galvanized | hot-dipped galv. | A4 | HCR | $d_o$ [mm] | $h_2$ [mm] | $T_{inst} \leq$ [Nm] | | | SW [mm] | ETA-02/0001 | M x length [mm] | | [qty.] |
| W-FA big U-washer |  | | | | | | | | | | | | | | | | |
| M12 | 160 | 65 | 80 | **5932 112 160** | – | – | – | 12 | 155 | 50 | - | - | 19 | ✓ | M12x100 | | 10 |
| | 180 | 85 | 100 | **5932 112 180** | – | – | – | | 175 | | | | | | M12x100 | | |
| | 200 | 105 | 120 | **5932 112 200** | – | – | – | | 195 | | | | | | M12x100 | | |
| | 220 | 125 | 140 | **5932 112 220** | – | – | – | | 215 | | | | | | M12x80 | | |
| | 240 | 145 | 160 | **5932 112 240** | – | – | – | | 235 | | | | | | M12x80 | | 20 |
| | 255 | 160 | 175 | **5932 112 255** | – | – | – | | 250 | | | | | | M12x80 | | |
| | 285 | 190 | 205 | **5932 112 285** | – | – | – | | 280 | | | | | | M12x80 | | |
| | 325 | 230 | 245 | **5932 112 325** | – | – | – | | 320 | | | | | | M12x80 | | |
| | 355 | 260 | 275 | **5932 112 355** | – | – | – | | 350 | | | | | | M12x80 | | 10 |
| M16 | 220 | 100 | 118 | **5932 116 220** | – | – | – | 16 | 210 | 100 | - | - | 24 | ✓ | M16x80 | | 10 |
| | 250 | 130 | 148 | **5932 116 250** | – | – | – | | 240 | | | | | | M16x80 | | |
| | 285 | 165 | 183 | **5932 116 285** | – | – | – | | 275 | | | | | | M16x80 | | |
| | 320 | 200 | 218 | **5932 116 320** | – | – | – | | 310 | | | | | | M16x80 | | |



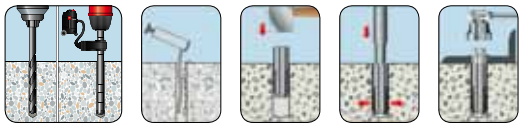
# DROP-IN ANCHOR W-ED

**Approvals and certificates**


| Type of installation | | |
|---|---|---|
| Pre-positioned | In-place | Stand-off |
| ✓ | - | - |

## Application references

## Installation



## Loads

| Thread size | | | | M6x30 | M8x30 | M8x40 | M10x30 | M10x40 | M12x50/80 | M16x65/80 | M20x80 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Effective anchorage depth** | | $h_{ef}$ | [mm] | 30 | 30 | 40 | 30 | 40 | 50 | 65 | 80 |
| **Non-cracked Concrete** | | | | | | | | | | | |
| **Tension** | W-ED/S | $N_{rec}$ | [kN] | 3.2 | 3.2 | 3.6 | 3.2 | 4.9 | 6.9 | 10.2 | 14.0 |
| | W-ED/A4; /HCR | | [kN] | 3.8 | 3.8 | 4.3 | - | 5.9 | 8.3 | 12.3 | 16.8 |
| **Shear** | W-ED/S | $V_{rec}$ | [kN] | 2.9 | 3.2 | 3.9 | 3.2 | 4.1 | 10.4 | 18.0 | 27.9 |
| | W-ED/A4; /HCR | | [kN] | 3.2 | 4.9 | 4.9 | - | 6.1 | 11.5 | 19.2 | 30.4 |

[1] Loads are valid for single anchors. Normal spaced reinforcement in ≥ C20/25. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included. The material safety factor depends on the failure mode.
[2] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Clearance-hole in fixture** | W-ED/S; /A4; /HCR | $d_f$ | [mm] | 7 | 9 | 9 | 12 | 12 | 14 | | 18 | | 22 |
| **Drill depth** | W-ED/S | $h_0$ | [mm] | 30 | 30 | 40 | 30 | 40 | 50 | 80 | 65 | 80 | 80 |
| **Min. thickness of concrete member** | W-ED/A4; /HCR | $h_{min}$ | [mm] | 100 | 100 | 100 | 120 | 120 | 130 | | 160 | | 200 |
| | W-ED/S | | | | | | – | 130 | 140 | | | | 250 |
| **Min. edge distance** | W-ED/S | $c_{min}$ | [mm] | 95 | 95 | 95 | 115 | 135 | 165 | | 200 | | 260 |
| | W-ED/A4; /HCR | | | 80 | | | – | | | | | | |

# DROP-IN ANCHOR W-ED

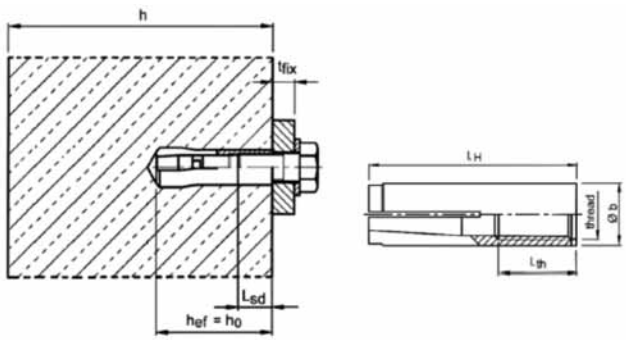
| | Anchor length | lip | Art. no. | | Drill hole diameter | Drill hole depth | Installation torque | Minimum screw-in depth | Maximum screw-in depth | Approval | | P. Qty. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Type** | **l [mm]** | **[mm]** | **Carbon steel galvanized** | **Stainless steel A4** | **$d_o$ [mm]** | **$h_o$ [mm]** | **$T_{inst} \leq$ [Nm]** | **$L_{sd\,min}$ [mm]** | **$L_{th}$ [mm]** | **ETA-02/0044** | **ETA-05/0120** | |
|  | | | | | | | | | | | | |
| M5 | 25 | – | **0904 5** | **–** | 8.0 | 25 | 3 | 6 | 10 | – | – | 100 |
| M6 | 30 | – | **0904 010 06** | **0904 030 06** | | 30 | 4 | 7 | 13 | ✓ | ✓ | |
| M8 | 30 | – | **0904 010 08** | **0904 030 08** | 10.0 | 30 | 8 | 9 | 13 | ✓ | ✓ | |
| | 40 | – | **0904 010 081** | **0904 030 081** | | 40 | 8 | 9 | 20 | ✓ | ✓ | |
| M10 | 40 | – | **0904 010 10** | **0904 030 10** | 12.0 | 40 | 15 | 11 | 15 | ✓ | ✓ | 50 |
| M12 | 50 | – | **0904 010 12** | **0904 030 12** | 15.0 | 50 | 35 | 13 | 18 | ✓ | ✓ | |
| M16 | 65 | – | **0904 010 16** | **0904 030 16** | 20.0 | 65 | 60 | 18 | 23 | ✓ | ✓ | 25 |
| M20 | 80 | – | **0904 010 20** | **0904 030 20** | 25.0 | 80 | 120 | 22 | 34 | ✓ | ✓ | |
|  | | | | | | | | | | | | |
| M6 | 25 | ✓ | **0904 040 006** | **–** | 8.0 | 25 | 4 | 6 | 12 | – | ✓ | 100 |
| M8 | 25 | ✓ | **0904 040 008** | **–** | 10.0 | 25 | 8 | 8 | | – | ✓ | |
| | 30 | ✓ | **0904 040 08** | **–** | | 30 | | 9 | 13 | ✓ | ✓ | |
| | 40 | ✓ | **0904 040 081** | **–** | | 40 | | | 20 | ✓ | ✓ | |
| M10 | 25 | ✓ | **0904 040 100** | **–** | 12.0 | 25 | 15 | 10 | 12 | – | ✓ | 50 |
| | 30 | ✓ | **0904 040 101** | **–** | | 30 | | | | ✓ | ✓ | |
| | 40 | ✓ | **0904 040 10** | **–** | | 40 | | 11 | 15 | ✓ | ✓ | |
| M12 | 25 | ✓ | **0940 040 120** | **–** | 15.0 | 25 | 35 | 12 | 12 | – | ✓ | |
| | 50 | ✓ | **0940 040 12** | **–** | | 50 | | 13 | 18 | ✓ | ✓ | |

### Loads when used for fixing a redundant non-structural system

| **Thread size** | | | | | **M6** | | **M8** | | | **M10** | | | **M12** | | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Effective anchorage depth** | | | $h_{ef}$ | [mm] | **25** | **30** | **25** | **30** | **40** | **25** | **30** | **40** | **25** | **50** | **65** |
| **Solid Concrete Slabs** | | | | | | | | | | | | | | | |
| **Load in any direction** | C12/15 – C16/20 | S/A4 | $F_{rec}$ | [kN] | 1.2 | – | 1.2 | – | – | 1.7 | – | – | 1.7 | – | – |
| | C20/25 – C50/60 | | | | 1.7 | 1.2 | 1.9 | 1.7 | 2.0 | 2.1 | 2.0 | 2.0 | 2.1 | 2.4 | 6.3 |
| **Precast Pre-stressed Hollow Core Slabs** | | | | | | | | | | | | | | | |
| **Load in any direction** | C30/37 – C50/60 | S/A4 | $F_{rec}$ | [kN] | 1.7 | – | 1.9 | – | – | 2.1 | – | – | 2.1 | – | – |

[1] Loads are valid for anchors in indeterminate non-structural applications. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included.
[2] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.

| **Clearance-hole in fixture** | | $d_f$ | [mm] | 7 | | 9 | | | 12 | | | 14 | | 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Drill depth** | | $h_0$ | [mm] | 25 | 30 | 25 | 30 | 40 | 25 | 30 | 40 | 25 | 50 | 65 |
| **Minimum thickness of concrete member** | | $h_{min}$ | [mm] | 80 | 100 | 80 | 100 | 100 | 80 | 120 | 120 | 80 | 130 | 160 |
| **Minimum edge distance** | S/A4 | $c_{min}$ | [mm] | 60 | 95/80 | 100 | 95 | 95 | 100 | 115/– | 135 | 130 | 165 | 200 |
| **Minimum edge distance, precast** | | $c_{min}$ | [mm] | 150 | – | 150 | – | – | 150 | – | – | 150 | – | – |



# ACCESSORIES FOR DROP-IN ANCHOR W-ED

**Marking/expander tool with hand guard (visual installation check)**

| For Drop-in anchor | Art.no. | P.Qty. |
|---|---|---|
| M6 x 25 | **0904 022 060** | 1 |
| M6 x 30 | **0904 022 06** | |
| M8 x 25 | **0904 022 080** | |
| M8 x 30 | **0904 022 08** | |
| M8 x 40 | **0904 022 081** | |
| M10 x 25 | **0904 022 100** | |
| M10 x 30 | **0904 022 101** | |
| M10 x 40 | **0904 022 10** | |
| M12 x 25 | **0904 022 120** | |
| M12 x 50 | **0904 022 12** | |
| M16 x 65 | **0904 022 16** | |
| M20 x 80 | **0904 022 20** | |

**Machine expander tool (no visual installation check)**

| For Drop-in anchor | Art.no. | P.Qty. |
|---|---|---|
| M8 x 30 | **0904 023 08** | 1 |
| M10 x 40 | **0904 023 10** | |
| M12 x 50 | **0904 023 12** | |

**Stop drill bit with clip-on expander tool**

| For Drop-in anchor | Art.no. | P.Qty. |
|---|---|---|
| M6 x 25 | **0904 024 060** | 1 |
| M6 x 30 | **0904 024 06** | |
| M8 x 25 | **0904 024 080** | |
| M8 x 30 | **0904 024 08** | |
| M8 x 40 | **0904 024 081** | |
| M10 x 25 | **0904 024 100** | |
| M10 x 30 | **0904 024 101** | |
| M10 x 40 | **0904 024 10** | |

**Expander tool (no visual installation check)**

| For Drop-in anchor | Art.no. | P.Qty. |
|---|---|---|
| M5 x 25[1)] | **0904 05** | 1 |
| M6 x 30 | **0904 020 06** | |
| M8 x 30 | **0904 020 08** | |
| M8 x 40 | **0904 020 081** | |
| M10 x 30 | **0904 020 101** | |
| M10 x 40 | **0904 020 10** | |
| M12 x 50 | **0904 020 12** | |
| M16 x 65 | **0904 020 16** | |
| M20 x 80 | **0904 020 20** | |

[1)] ohne Zulassung

**Stop drill bit**

| For Drop-in anchor | Art.no. | P.Qty. |
|---|---|---|
| M6 x 25 | **0904 025 060** | 1 |
| M6 x 30 | **0904 025 06** | |
| M8 x 25 | **0904 025 080** | |
| M8 x 30 | **0904 025 08** | |
| M8 x 40 | **0904 025 081** | |
| M10 x 25 | **0904 025 100** | |
| M10 x 30 | **0904 025 101** | |
| M10 x 40 | **0904 025 10** | |
| M12 x 25 | **0904 025 120** | |
| M12 x 50 | **0904 025 12** | |

# HAMMER-IN ANCHOR W-NA

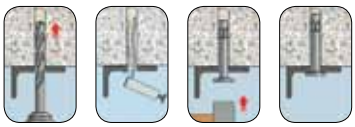
**Approvals and certificates**

**Type of installation**

| Pre-positioned | In-place | Stand-off |
|---|---|---|
| ✓ | ✓ | - |

## Application references

## Installation



## Loads

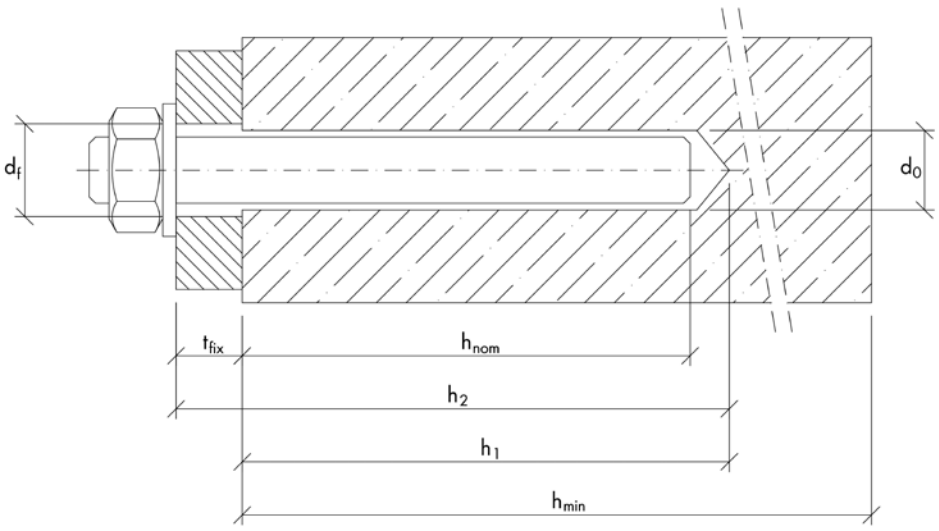
| Thread size | | | | W-NA 6 | W-NA-K<br>W-NA 8<br>W-NA-M | W-NA-O | W-NA 6 | W-NA-K<br>W-NA 8<br>W-NA-M | W-NA-O |
|---|---|---|---|---|---|---|---|---|---|
| **Effective anchorage depth** | | $h_{ef}$ | [mm] | 25 | | | 30 | | |
| **Non-cracked Concrete** | | | | | | | | | |
| **Tension** | C12/15 | $F_{rec}$ | [kN] | 1.4 | 1.4 | 0.7 | 1.9 | 1.9 | 0.7 |
| **Tension** | C20/25 to C50/60 | $F_{rec}$ | [kN] | 2.1 | 2.1 | 0.7 | 2.8 | 2.8 | 0.7 |
| **Optimized for minimum edge distance c ≥ 50 mm & s ≥ 100 mm** | | | | | | | | | |
| **Tension** | C12/15 | $F_{rec}$ | [kN] | 0.7 | 0.7 | 0.7 | 0.9 | 0.9 | 0.7 |
| **Tension** | C20/25 to C50/60 | $F_{rec}$ | [kN] | 0.9 | 0.9 | 0.7 | 1.2 | 1.2 | 0.7 |

[1] Loads are valid for single anchors. Normal spaced reinforcement in ≥ C20/25. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included. The material safety factor depends on the failure mode.
[2] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.
[3] Diameter of clearance hole in fixture for W-NA-8 shall be taken as df ≤ 9 mm.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Clearance-hole in fixture** | | $d_f$ | [mm] | 7 | 7[3] | 7 | 7 | 7[3] | 7 |
| **Nominal drill hole diameter** | | $d_0$ | [mm] | 6 | 6 | 6 | 6 | 6 | 6 |
| **Drill depth** | | $h_1$ ≥ | [mm] | 35 | 35 | 35 | 40 | 40 | 40 |
| **Min. thickness of concrete member** | | $h_{min}$ | [mm] | 80 | 80 | 80 | 80 | 80 | 80 |

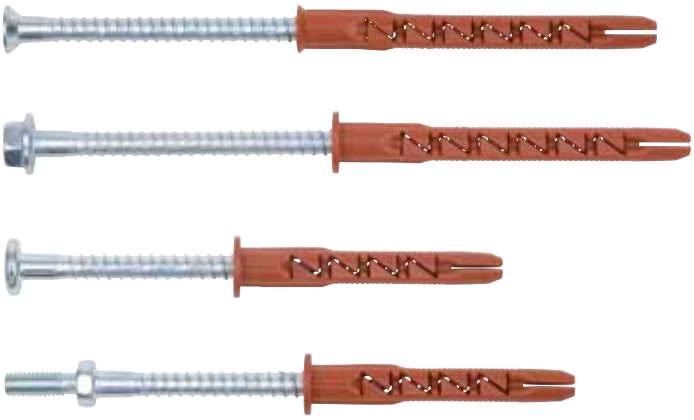
# HAMMER-IN ANCHOR W-NA

| | Total length | Fixture thickness for | | Art. no. | | | Drill hole diameter | Drill hole depth for through installation | Installation torque | Wrench Size | Approval | Head specification | P. Qty. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $h_{ef,std}$ | $h_{ef,red}$ | | | | | | | | | | |
| **Type** | **l [mm]** | **$t_{fix}$ [mm]** | | **Carbon steel galvanized** | **Stainless steel A4** | **High corrosion resistant steel HCR** | **$d_o$ [mm]** | **$h_2$ [mm]** | **$T_{inst} \leq$ [Nm]** | **SW [mm]** | **ETA-11/0339** | | |
| W-NA 6 thread M6 | 44 | 0 | 5 | **0905 362 005** | **–** | **–** | 6 | 40 | 4 | 10 | ✓ | M6 | 200 |
| | 49 | 5 | 10 | **0905 362 010** | **0905 372 005** | **0905 382 005** | | 45 | | | ✓ | | |
| | 54 | 10 | 15 | **0905 362 015** | **–** | **–** | | 50 | | | ✓ | | |
| W-NA 6 nail head | 39 | 0 | 5 | **0905 361 005** | **–** | **–** | 6 | 40 | – | – | ✓ | Nail head | 200 |
| | 44 | 5 | 10 | **0905 361 010** | **0905 371 005** | **0905 381 005** | | 45 | | | ✓ | | |
| | 69 | 30 | 35 | **0905 361 035** | **0905 371 030** | **0905 381 030** | | 70 | | | ✓ | | |
| | 89 | 50 | 55 | **0905 361 055** | **–** | **–** | | 90 | | | ✓ | | 100 |
| W-NA 6 coupling nut | 58 | – | 0 | **0905 361 008** | **–** | **–** | 6 | 35 | – | 13 | ✓ | M8/M10 socket | 100 |
| | 63 | 0 | – | **0905 361 009** | **–** | **–** | | 40 | | | ✓ | | |



# GENERAL FIXINGS

# FRAME FIXING W-UR



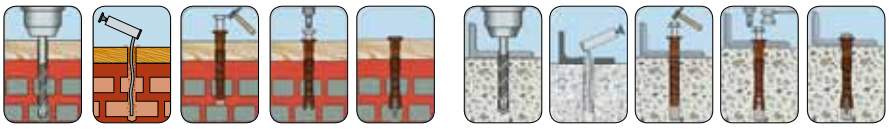
**Approvals and certificates**

**Type of installation**

| Pre-positioned | In-place | Stand-off |
|---|---|---|
| – | ✓ | – |

## Application references

## Installation



## Loads in Concrete

| Screw Diameter | | | | Ø 8 | | Ø 10 | |
|---|---|---|---|---|---|---|---|
| **Nominal embedment depth** | | $h_{nom}$ | [mm] | 50 | 70 | 50 | 70 |
| **Concrete C12/15** | | | | | | | |
| **Tension** | W-UR /S | $N_{rec}$ | [kN] | 1.19 | 1.59 | 0.79 | 0.99 |
| **Shear** | | $V_{rec}$ | [kN] | 3.37 | 3.37 | 5.37 | 5.37 |
| **Tension** | W-UR /A4 | $N_{rec}$ | [kN] | 1.19 | 1.59 | 0.79 | 0.99 |
| **Shear** | | $V_{rec}$ | [kN] | 3.16 | 3.16 | 4.99 | 4.99 |
| **Edge distance** | W-UR/S; /A4 | $c_{min}$ | [mm] | 60 | 60 | 70 | 70 |
| **Concrete ≥ C16/20** | | | | | | | |
| **Tension** | W-UR /S | $N_{rec}$ | [kN] | 1.59 | 2.38 | 1.19 | 1.59 |
| **Shear** | | $V_{rec}$ | [kN] | 3.37 | 3.37 | 5.37 | 5.37 |
| **Tension** | W-UR /A4 | $N_{rec}$ | [kN] | 1.59 | 2.38 | 1.19 | 1.59 |
| **Shear** | | $V_{rec}$ | [kN] | 3.16 | 3.16 | 4.99 | 4.99 |
| **Edge distance** | W-UR/S; /A4 | $c_{min}$ | [mm] | 40 | 40 | 50 | 50 |

[1] Loads are valid for anchors in indeterminate non-structural applications. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included.
[2] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.
[3] The loads given are valid for the bricks and blocks which have been given. The loads can be taken for bricks and blocks of larger sizes, larger compressive strength of the masonry unit and same configuration of the cavities. The loads of the injection anchor may be determined by the so-called „"job site tests"" according to ETAG029 and TR053.

# FRAME FIXING W-UR

## Loads in Masonry

| Brick and Block | Type | Size | Compressive strength | Density | Drilling method | Screw Diameter | Nominal Embedment depth | Edge distance | In any direction[1),2)] |
|---|---|---|---|---|---|---|---|---|---|
| | | [mm] | $f_b \geq$ [N/mm²] | $\rho \geq$ [kg/dm³] | | | $h_{nom}$ | $c_{min}$ [mm] | $F_{rec}$ [kN] |
| Fired clay brick Mz | solid | 240x115x71 | 20 | 1.8 | Hammer | Ø 8 | 50 | 100 | 0.57 |
| | | | | | | Ø 8 | 70 | 100 | 0.57 |
| | | | | | | Ø 10 | 50 | 250 | 0.43 |
| | | | | | | Ø 10 | 70 | 100 | 0.86 |
| Fired clay brick Hlz | perforated | 240x115x113 | 12 | 1.2 | Rotary | Ø 8 | 50 | 100 | 0.26 |
| | | | | | | Ø 8 | 70 | 100 | 0.43 |
| | | | | | | Ø 10 | 50 | 250 | 0.14 |
| | | | | | | Ø 10 | 70 | 100 | 0.43 |
| Light aggregate block Vbl | Solid | 500x365x238 | 2 | 0.6 | Hammer | Ø 8 | 70 | 100 | 0.34 |
| | | | | | | Ø 10 | 70 | 100 | 0.43 |
| Hollow brick concrete 2K Hbn | hollow | 495x200x190 | 4 | 1.2 | Rotary | Ø 8 | 70 | 100 | 0.43 |
| Calcium silicate brick KS | solid | 240x115x71 | 20 | 2.0 | Hammer | Ø 8 | 50 | 100 | 0.71 |
| | | | | | | Ø 8 | 70 | 100 | 0.71 |
| | | | | | | Ø 10 | 50 | 50 | 0.43 |
| | | | | | | Ø 10 | 70 | 100 | 0.86 |
| Calcium silicate block KSL | hollow | 373x240x238 | 12 | 1.4 | Rotary | Ø 10 | 50 | 60 | 0.21 |
| | | | | | | Ø 10 | 70 | 100 | 0.43 |
| Aerated concrete block AAC | solid | 499x175x249 | 6 | 0.3 | Hammer | Ø 8 | 70 | – | 0.89 |
| | | | | | | Ø 10 | 70 | – | 0.93 |

[1)] Loads are valid for anchors in indeterminate non-structural applications. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included.
[2)] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.
[3)] The loads given are valid for the bricks and blocks which have been given. The loads can be taken for bricks and blocks of larger sizes, larger compressive strength of the masonry unit and same configuration of the cavities. The loads of the injection anchor may be determined by the so-called „"job site tests"" according to ETAG029 and TR053.

| Type | Total Length | Fixture thickness | Art. no. | | Drive | P. Qty |
|---|---|---|---|---|---|---|
| | l [mm] | $t_{fix}$ [mm] | Carbon steel galvanized | Stainless steel A4 | | |
| W-UR countersunk head | |  | | | | |
| Ø 8 | 60 | 10 | **0912 808 402** | – | AW 30 | 50 |
| | 80 | 30/10 | **0912 808 403** | – | AW 30 | 50 |
| | 100 | 50/30 | **0912 808 404** | – | AW 30 | 50 |
| | 120 | 70/50 | **0912 808 405** | – | AW 30 | 50 |
| | 140 | 90/70 | **0912 808 406** | – | AW 30 | 50 |
| | 160 | 110/90 | **0912 808 407** | – | AW 30 | 50 |
| | 60 | 10 | – | **0912 808 502** | AW 30 | 50 |
| | 80 | 30/10 | – | **0912 808 503** | AW 30 | 50 |
| | 100 | 50/30 | – | **S-procurement** | AW 30 | 50 |
| | 120 | 70/50 | – | **S-procurement** | AW 30 | 50 |
| Ø 10 | 80 | 10 | **0912 810 401** | **0912 810 501** | AW 40 | 50 |
| | 100 | 30 | **0912 810 402** | **0912 810 502** | AW 40 | 50 |
| | 115 | 45 | **0912 810 403** | **0912 810 503** | AW 40 | 50 |
| | 135 | 65 | **0912 810 404** | **0912 810 504** | AW 40 | 50 |
| | 160 | 90 | **0912 810 405** | **0912 810 505** | AW 40 | 50 |
| | 185 | 115 | **0912 810 406** | **0912 810 506** | AW 40 | 50 |
| | 200 | 130 | **0912 810 407** | **0912 810 507** | AW 40 | 50 |
| | 230 | 160 | **0912 810 408** | – | AW 40 | 50 |
| | 260 | 190 | **0912 810 409** | – | AW 40 | 50 |
| | 290 | 220 | **0912 810 410** | – | AW 40 | 50 |
| | 320 | 250 | **0912 810 411** | – | AW 40 | 50 |

# FRAME FIXING W-UR

| Type | Total Length | Fixture thickness | Art. no. | | Drive | P. Qty |
|---|---|---|---|---|---|---|
| | l [mm] | $t_{fix}$ [mm] | Carbon steel galvanized | Stainless steel A4 | | |
| W-UR Hex-bolt screw and pressed-on washer  | | | | | | |
| Ø 8 | 60 | 10 | **0912 808 602** | – | AW 25, SW 10 | 50 |
| | 80 | 30/10 | **0912 808 603** | – | AW 25, SW 10 | 50 |
| | 100 | 50/30 | **0912 808 604** | – | AW 25, SW 10 | 50 |
| | 120 | 70/50 | **0912 808 605** | – | AW 25, SW 10 | 50 |
| | 60 | 10 | – | **0912 808 702** | SW 10 | 50 |
| | 80 | 30/10 | – | **0912 808 703** | SW 10 | 50 |
| | 100 | 50/30 | – | **S-procurement** | SW 10 | 50 |
| | 120 | 70/50 | – | **S-procurement** | SW 10 | 50 |
| Ø 10 | 80 | 10 | **0912 810 601** | – | AW 40 & SW 13 | 40 |
| | 100 | 30 | **0912 810 602** | – | AW 40 & SW 13 | 40 |
| | 115 | 45 | **0912 810 603** | – | AW 40 & SW 13 | 40 |
| | 135 | 65 | **0912 810 604** | – | AW 40 & SW 13 | 40 |
| | 160 | 90 | **0912 810 605** | – | AW 40 & SW 13 | 40 |
| | 185 | 115 | **0912 810 606** | – | AW 40 & SW 13 | 40 |
| | 200 | 130 | **0912 810 607** | – | AW 40 & SW 13 | 40 |
| | 230 | 160 | **0912 810 608** | – | AW 40 & SW 13 | 40 |
| | 80 | 10 | – | **0912 810 701** | SW 13 | 40 |
| | 100 | 30 | – | **0912 810 702** | SW 13 | 40 |
| | 115 | 45 | – | **0912 810 703** | SW 13 | 40 |
| | 135 | 65 | – | **0912 810 704** | SW 13 | 40 |
| | 160 | 90 | – | **0912 810 705** | SW 13 | 40 |
| W-UR Panhead  | | | | | | |
| Ø 8 | 60 | 10 | **0912 808 802** | – | AW 30 | 50 |
| | 80 | 30/10 | **0912 808 803** | – | AW 30 | 50 |
| | 60 | 10 | – | **0912 808 902** | AW 30 | 50 |
| | 80 | 30/10 | – | **0912 808 903** | AW 30 | 50 |
| W-UR stair bolt M6  | | | | | | |
| Ø 8 | 60 | 10 | **0912 808 202** | – | SW 10 | 50 |
| | 80 | 30/10 | **0912 808 203** | – | SW 10 | 50 |
| | 60 | 10 | – | **0912 808 302** | SW 10 | 50 |
| | 80 | 30/10 | – | **0912 808 303** | SW 10 | 50 |
| | 60 | 10 | **0912 808 252** | – | SW 10 | 50 |
| | 80 | 30/10 | **0912 808 253** | – | SW 10 | 50 |

# FRAME FIXING W-FRA

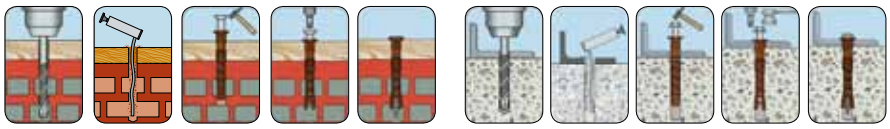
**Approvals and certificates**

**Type of installation**

| Pre-positioned | In-place | Stand-off |
|---|---|---|
| – | ✓ | – |

## Application references

## Installation



## Loads in Concrete

| Screw Diameter | | | | Ø 8 | | Ø 10 |
|---|---|---|---|---|---|---|
| **Nominal embedment depth** | | $h_{nom}$ | [mm] | 50 | 70 | 70 |
| **Concrete C12/15** | | | | | | |
| **Tension** | W-FRA /S | $N_{rec}$ | [kN] | 0.99 | 1.19 | 1.19 |
| **Shear**[1),2)] | | $V_{rec}$ | [kN] | 3.54 | 3.54 | 6.91 |
| **Tension** | W-FRA /A4 | $N_{rec}$ | [kN] | 0.99 | 1.19 | 1.19 |
| **Shear**[1),2)] | | $V_{rec}$ | [kN] | 2.61 | 2.61 | 3.89 |
| **Edge distance** | W-FRA /S; /A4 | $c_{min}$ | [mm] | 70 | 80 | 80 |
| **Concrete ≥ C16/20** | | | | | | |
| **Tension** | W-FRA /S | $N_{rec}$ | [kN] | 1.39 | 1.79 | 1.59 |
| **Shear**[1),2)] | | $V_{rec}$ | [kN] | 3.54 | 3.54 | 6.91 |
| **Tension** | W-FRA /A4 | $N_{rec}$ | [kN] | 1.39 | 1.79 | 1.59 |
| **Shear**[1),2)] | | $V_{rec}$ | [kN] | 2.61 | 2.61 | 3.89 |
| **Edge distance** | W-FRA /S; /A4 | $c_{min}$ | [mm] | 50 | 60 | 60 |

[1)] Loads are valid for anchors in indeterminate non-structural applications. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included.
[2)] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.
[3)] The loads given are valid for the bricks and blocks which have been given. The loads can be taken for bricks and blocks of larger sizes, larger compressive strength of the masonry unit and same configuration of the cavities. The loads of the injection anchor may be determined by the so-called „"job site tests"" according to ETAG029 and TR053.

# FRAME FIXING W-FRA

### Loads in Masonry

| Brick and Block | Type | Compressive strength | Density | Drilling method | Screw Diameter | Nominal Embedment depth | Edge distance | In any direction[1),2)] |
|---|---|---|---|---|---|---|---|---|
| | | $f_b \geq$ [N/mm²] | $\rho \geq$ [kg/dm³] | | | $h_{nom}$ [mm] | $c_{min}$ [mm] | $F_{rec}$ [kN] |
| Clay brick German Mz | solid | 20 | 2.0 | Hammer | Ø 8 | 50 | 100 | 0.86 |
| | | | | | Ø 8 | 70 | 100 | 0.86 |
| | | | | | Ø 10 | 70 | 100 | 1.00 |
| Porotherm 25P + W | hollow | 15 | 0.8 | Rotary | Ø 8 | 70 | 100 | 0.34 |
| | | | | | Ø 10 | 70 | 100 | 0.26 |
| Hollow lightweight aggregate concrete element | hollow | 2 | 0.8 | Rotary | Ø 8 | 70 | 100 | 0.43 |
| | | | | | Ø 10 | 70 | 100 | 0.43 |
| Calcium silicate brick KS | solid | 20 | 2.0 | Hammer | Ø 8 | 50 | 100 | 0.86 |
| | | | | | Ø 8 | 70 | 100 | 0.86 |
| | | | | | Ø 10 | 70 | 100 | 1.00 |
| Calcium silicate block KSL | hollow | 12 | 1.6 | Rotary | Ø 8 | 70 | 100 | 0.71 |
| | | | | | Ø 10 | 70 | 100 | 0.71 |
| Aerated concrete block AAC 7 | solid | 7 | 0.7 | Rotary | Ø 8 | 70 | 100 | 0.71 |
| | | | | | Ø 10 | 70 | 100 | 0.54 |

[1)] Loads are valid for anchors in indeterminate non-structural applications. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included.
[2)] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.
[3)] The loads given are valid for the bricks and blocks which have been given. The loads can be taken for bricks and blocks of larger sizes, larger compressive strength of the masonry unit and same configuration of the cavities. The loads of the injection anchor may be determined by the so-called „"job site tests"" according to ETAG029 and TR053.

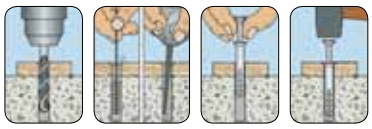
| Type | Total Length | Fixture thickness | Art. no. | | | Drive | P. Qty |
|---|---|---|---|---|---|---|---|
| | l [mm] | $t_{fix}$ [mm] | Carbon steel galvanized | Carbon steel hot-dip galvanized | Stainless steel A4 | | |
| | | | | | | | |
| W-FRA 10 | 80 | 10 | **0912 910 401** | – | **0912 910 501** | TX40 | 50 |
| | 100 | 30 | **0912 910 402** | – | **0912 910 502** | TX40 | 50 |
| | 120 | 50 | **0912 910 403** | – | **0912 910 503** | TX40 | 50 |
| | 140 | 70 | **0912 910 404** | – | **0912 910 504** | TX40 | 50 |
| | 160 | 90 | **0912 910 405** | – | **0912 910 505** | TX40 | 50 |
| | 180 | 110 | **0912 910 406** | – | – | TX40 | 50 |
| | 200 | 130 | **0912 910 407** | – | – | TX40 | 50 |
| | 230 | 160 | **0912 910 408** | – | – | TX40 | 50 |
| | 260 | 190 | **0912 910 409** | – | – | TX40 | 50 |
| | 300 | 230 | **0912 910 410** | – | – | TX40 | 50 |
| | | | | | | | |
| W-FRAH 10 | 80 | 10 | **0912 910 601** | **0912 910 801** | **0912 910 701** | TX40 – SW 13 | 50 |
| | 100 | 30 | **0912 910 602** | **0912 910 802** | **0912 910 702** | TX40 – SW 13 | 50 |
| | 120 | 50 | **0912 910 603** | **0912 910 803** | **0912 910 703** | TX40 – SW 13 | 50 |
| | 140 | 70 | **0912 910 604** | – | **0912 910 704** | TX40 – SW 13 | 50 |
| | 160 | 90 | **0912 910 605** | – | **0912 910 705** | TX40 – SW 13 | 50 |
| | 18 | 110 | **0912 910 606** | – | – | TX40 – SW 13 | 25 |
| | 20 | 130 | **0912 910 607** | – | – | TX40 – SW 13 | 25 |
| | 23 | 160 | **0912 910 608** | – | – | TX40 – SW 13 | 25 |
| | 26 | 190 | **0912 910 609** | – | – | TX40 – SW 13 | 50 |
| | 30 | 230 | **0912 910 610** | – | – | TX40 – SW 13 | 50 |

# NAIL ANCHOR W-ND

| Type of installation | | |
|---|---|---|
| Pre-positioned | In-place | Stand-off |
| – | ✓ | – |

## Application references

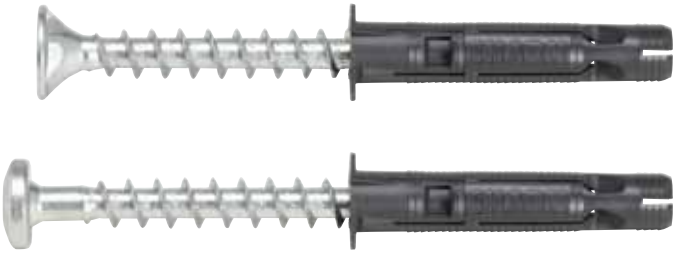

## Installation

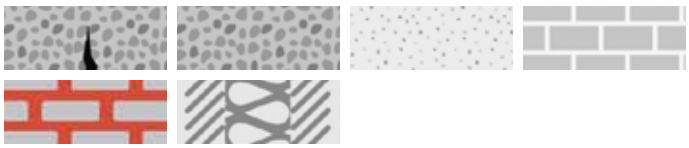


## Performance data

| Anchor Type | Anchor-Ø | Anchor length | fixture thickness $t_{fix}$ | Art. No. | Collar-Ø | Drive | P. Qty |
|---|---|---|---|---|---|---|---|
| | [mm] | [mm] | [mm] | | [mm] | | |
| FK – Flathead | 5 | 35 | 5 | **5907 105 035** | 9 | Z2 | 2400/200 |
| | 6 | 40 | 10 | **5907 106 040** | 12 | | 4000/1000 |
| | | 60 | 30 | **5907 106 060** | | | 3000/1000 |
| SK – Countersunk | 6 | 40 | 10 | **5907 206 040** | 10 | | 2400/200 |
| | | 60 | 30 | **5907 206 060** | | | 1600/200 |
| | | 80 | 50 | **5907 206 080** | | | 1200/100 |
| | 8 | 60 | 20 | **5907 208 060** | 13 | | 800/100 |
| | | 80 | 40 | **5907 208 080** | | | 800/100 |
| | | 100 | 60 | **5907 208 100** | | | 600/100 |

# SHARK PRO





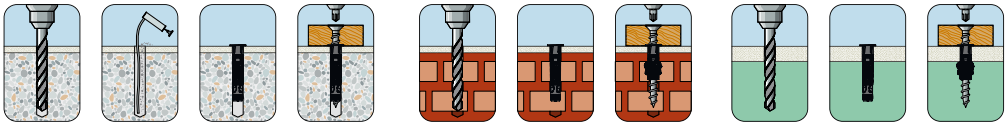
**Approvals and certificates**

**Type of installation**

| Pre-positioned | In-place | Stand-off |
|---|---|---|
| ✓ | ✓ | - |

## Application references

## Installation



## Loads in Concrete

| **Screw Diameter** | | | | **Ø 6** | **Ø 8** | **Ø 10** | **Ø 12** | **Ø 12** | **Ø 14** |
|---|---|---|---|---|---|---|---|---|---|
| **Nominal embedment depth** | | $h_{nom}$ | [mm] | 34 | 45 | 55 | 57 | 65 | 75 |
| **Concrete C12/15** | | | | | | | | | |
| **Tension**[1),2)] | Shark Pro /S | $N_{rec}$ | [kN] | 0.36 | 0.36 | 1.19 | 1.59 | 1.59 | 1.98 |
| **Shear**[1),2)] | | $V_{rec}$ | [kN] | 1.62 | 2.59 | 4.67 | 6.79 | 6.79 | 8.55 |
| **Tension**[1),2)] | Shark Pro /A4 | $N_{rec}$ | [kN] | 0.36 | 0.36 | 1.19 | 1.59 | 1.59 | 1.98 |
| **Shear**[1),2)] | | $V_{rec}$ | [kN] | 1.13 | 1.82 | 3.27 | 4.76 | 4.76 | 5.99 |
| **Edge distance** | Shark Pro /S; /A4 | $c_{min}$ | [mm] | 110 | 110 | 110 | 210 | 210 | 210 |
| **Concrete ≥ C16/20** | | | | | | | | | |
| **Tension**[1),2)] | Shark Pro /S | $N_{rec}$ | [kN] | 0.36 | 0.48 | 1.59 | 1.98 | 1.98 | 2.38 |
| **Shear**[1),2)] | | $V_{rec}$ | [kN] | 1.62 | 2.59 | 4.67 | 6.79 | 6.79 | 8.55 |
| **Tension**[1),2)] | Shark Pro /A4 | $N_{rec}$ | [kN] | 0.36 | 0.48 | 1.59 | 1.98 | 1.98 | 2.38 |
| **Shear**[1),2)] | | $V_{rec}$ | [kN] | 1.13 | 1.82 | 3.27 | 4.76 | 4.76 | 5.99 |
| **Edge distance** | Shark Pro /S; /A4 | $c_{min}$ | [mm] | 80 | 80 | 80 | 150 | 150 | 150 |

[1)] Loads are valid for anchors in indeterminate non-structural applications. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included.
[2)] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.
[3)] The loads given are valid for the bricks and blocks which have been given. The loads can be taken for bricks and blocks of larger sizes, larger compressive strength of the masonry unit and same configuration of the cavities. The loads of the injection anchor may be determined by the so-called „"job site tests"" according to ETAG029 and TR053.

# SHARK PRO

## Loads in Masonry

| Brick and Block | Type | Size | Compressive strength | Density | Drilling method | Screw size | Embedment depth | Edge distance | In any direction[1),2)] |
|---|---|---|---|---|---|---|---|---|---|
| | | l x b x h [mm] | $f_b \geq$ [N/mm²] | $\rho \geq$ [kg/dm³] | | | $h_{nom}$ [mm] | $c_{min}$ [mm] | $N_{rec}$ [kN] |
| Solid brick Mz | solid | 240 x 115 x 71 | 20 | 1.8 | Hammer | Ø 10 | 55 | 100 | 0.43 |
| | | | | | | Ø 12 | 65 | 250 | 0.43 |
| | | | | | | Ø 12 | 65 | 100 | 0.14 |
| Fired clay brick Hlz | perforated | 373 x 175 x 238 | 20 | 1.2 | Rotary | Ø 12 | 65 | 100 | 0.43 |
| Light aggregate block Vbl | solid | 240 x 115 x 71 | 6 | 1.2 | Hammer | Ø 10 | 55 | 100 | 0.14 |
| Calcium silicate brick KS | solid | 240 x 115 x 71 | 20 | 2.0 | Hammer | Ø 10 | 55 | 100 | 0.34 |
| | | | | | | Ø 10 | 55 | 250 | 0.57 |
| Calcium silicate block KSL | hollow | 248 x 240 x 238 | 12 | 1.4 | Rotary | Ø 10 | 55 | 100 | 0.57 |
| | | | | | | Ø 12 | 65 | 100 | 0.57 |
| Aerated concrete block AAC 6 | solid | 499 x 175 x 249 | 6 | 0.3 | Hammer | Ø 10 | 55 | 100 | 0.71 |
| | | | | | | Ø 12 | 65 | 100 | 0.71 |

[1)] Loads are valid for anchors in indeterminate non-structural applications. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included.
[2)] Loads for anchorages close to edge and/or with small spacing have to be reduced and should be calculated based on performance data given in the ETA.
[3)] The loads given are valid for the bricks and blocks which have been given. The loads can be taken for bricks and blocks of larger sizes, larger compressive strength of the masonry unit and same configuration of the cavities. The loads of the injection anchor may be determined by the so-called „"job site tests"" according to ETAG029 and TR053.

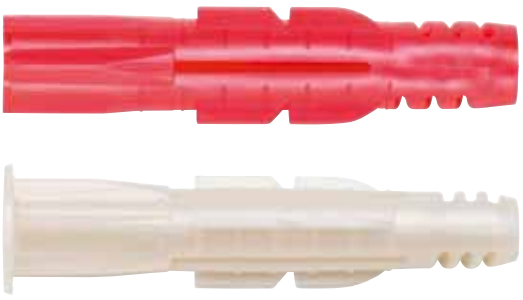
## SHARK PRO/ASSY-D Screw Countersunkhead

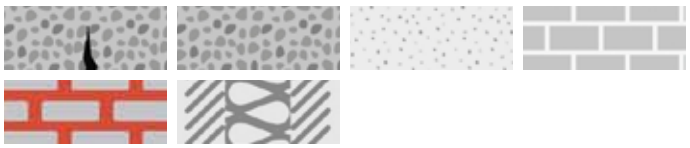
| Anchor size | Screw geometry | Fixture thickness | Art. no. SHARK PRO | Art. no. ASSY-D | Drill hole diameter | Drill depth | Installation depth | Drive | Approval for multiple-use in non-structural applications | Head Specification |
|---|---|---|---|---|---|---|---|---|---|---|
| Ø x l [mm] | Ø x l [mm] | $t_{fix}$ [mm] | Polyamide Plastic | Carbon steel galvanized | $d_0$ [mm] | $h_1$ [mm] | $h_{nom}$ [mm] | AW | | [mm] |
| 6x35 | 5x50 | 1–10 | **5906 206 35** | **0151 020 503** | 6 | $l_s$ + 5 mm – $t_{fix}$ | 34 | AW 20 | ETA-12/0042 | Ø 9,6 |
| | 5x60 | 1–20 | | **0151 020 505** | | | | | | |
| | 5x70 | 10–30 | | **0151 020 506** | | | | | | |
| 8x46 | 6x60 | 1–10 | **5906 208 46** | **0151 020 601** | 8 | | 45 | AW 30 | | Ø 12 |
| | 6x80 | 10–30 | | **0151 020 603** | | | | | | |
| | 6x100 | 30–50 | | **0151 020 605** | | | | | | |
| 10x56 | 8x80 | 1–20 | **5906 210 56** | **0151 020 802** | 10 | | 55 | AW 40 | | Ø 15 |
| | 8x100 | 20–40 | | **0151 020 803** | | | | | | |
| 12x66 | 10x80 | 1–10 | **5906 212 66** | **0151 021 001** | 12 | | 65 | | | Ø 18,5 |
| | 10x100 | 1–30 | | **0151 021 003** | | | | | | |
| | 10x120 | 20–50 | | **0151 021 005** | | | | | | |
| 14x76 | 12x90 | 1–10 | **5906 214 76** | **0151 021 201** | 14 | | 75 | AW 50 | | Ø 22,5 |
| | 12x110 | 1–30 | | **0151 021 203** | | | | | | |
| | 12x130 | 20–50 | | **0151 021 205** | | | | | | |

## SHARK PRO/ASSY-D Screw Panhead

| Anchor size | Screw geometry | Fixture thickness | Art. no. Plastic Anchor SHARK PRO | Art. no. ASSY-D screw Sunkhead galvanized | Drill hole diameter | Drill depth | Installation depth | Drive | Approval for multiple-use in non-structural applications | Head Specification |
|---|---|---|---|---|---|---|---|---|---|---|
| Ø x l [mm] | Ø x l [mm] | $t_{fix}$ [mm] | Polyamide Plastic | Carbon steel galvanized | $d_0$ [mm] | $h_1$ [mm] | $h_{nom}$ [mm] | AW | | [mm] |
| 6x35 | 5x50 | 1–10 | **5906 206 35** | **0153 020 503** | 6 | l + 5 mm – $t_{fix}$ | 34 | AW 20 | ETA-12/0042 | Ø 10 |
| | 5x60 | 1–20 | | **0153 020 505** | | | | AW 20 | | |
| 8x46 | 6x60 | 1–10 | **5906 208 46** | **0153 020 601** | 8 | | 45 | AW 30 | | Ø 12 |
| | 6x80 | 10–30 | | **0153 020 603** | | | | AW 30 | | |
| 10x56 | 8x80 | 1–20 | **5906 210 56** | **0153 020 802** | 10 | | 55 | AW 40 | | Ø 14,5 |
| 12x66 | 10x100 | 1–30 | **5906 212 66** | **0153 021 003** | 12 | | 65 | AW 40 | | Ø 18,6 |
| 14x76 | 12x90 | 1–10 | **5906 214 76** | **0153 021 201** | 14 | | 75 | AW 50 | | Ø 21,5 |
| | 12x110 | 1–30 | | **0153 021 203** | | | | AW 50 | | |

# ZEBRA SHARK





HALOGENFREI

**Approvals and certificates**

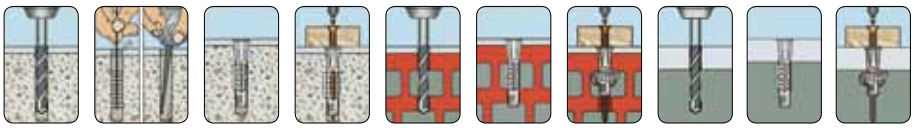
ZEBRA QUALITY

**Type of installation**

| Pre-positioned | In-place | Stand-off |
|---|---|---|
| ✓ | – | – |

## Application references

## Installation



## Performance data

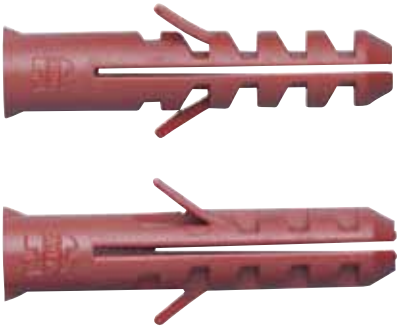
| Screw Diameter [mm] | | | Ø 5 | Ø 6 | Ø 7[1] | Ø 7[1] | Ø 8 | Ø 10 | Ø 12 | Ø 14 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Installation depth** | hs | [mm] | 30 | 35 | 35 | 50 | 50 | 60 | 70 | 75 |
| **Concrete ≥ B25; C20/25** | | | | | | | | | | |
| **In any direction[1]** | $F_{rec}$ | [kN] | 0.2 | 0.3 | 0.3 | 0.3 | 0.4 | 1 | 1.1 | 1.3 |
| **Masonry** | | | | | | | | | | |
| Solid bricks ≥ Mz12; KS12 | $F_{rec}$ | [kN] | 0.2 | 0.3 | 0.3 | 0.3 | 0.35 | 0.4 | 0.45 | 0.45 |
| Clay hollow brick ≥ Hlz 12[3] | $F_{rec}$ | [kN] | 0.1 | 0.15 | 0.15 | 0.15 | 0.2 | 0.25 | 0.25 | 0.3 |
| Hollow sand-lime bricks ≥ KSL12[3] | $F_{rec}$ | [kN] | 0.2 | 0.2 | 0.2 | 0.2 | 0.4 | 0.4 | 0.5 | 0.6 |
| Aerated concrete PB2; PP2[3] | $F_{rec}$ | [kN] | 0.04 | 0.1 | 0.12 | 0.12 | 0.15 | 0.2 | 0.2 | 0.3 |
| Gypsum plasterboard d = 12,5 mm | $F_{rec}$ | [kN] | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Gypsum plasterboard d = 25 mm | $F_{rec}$ | [kN] | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 |
| Pumice stone | $F_{rec}$ | [kN] | 0.11 | 0.13 | 0.15 | 0.15 | 0.18 | 0.23 | 0.25 | 0.28 |

[1] Ø 7 mm still without preformed thread.
[2] These values apply when using wood screws with the largest screw diameter.
[3] The borehole is to be created with a rotary drill (without impact or hammer effect).
[4] Loads are valid for anchors in indeterminate non-structural applications.

# ZEBRA SHARK

| Anchor Ø | Total Length | Screw-Ø | Art. no. Zebra Shark Anchor without collar | Art. no. Zebra Shark Anchor with collar | Drill-hole diameter [mm] | Drill depth [mm] | Installation depth [mm] | P. Qty |
|---|---|---|---|---|---|---|---|---|
| 5 | 31 | 3,5 | 0906 005 31 | | 5 | 40 | 30 | 200 |
| | 32 | | | 0906 005 32 | | | | 200 |
| 6 | 36 | 4,5 | 0906 006 36 | | 6 | 45 | 35 | 200 |
| | 37 | | | 0906 006 37 | | | | 200 |
| 7 | 36 | 5 | 0906 007 36 | | 7 | 45 | 35 | 100 |
| | 37 | | | 0906 007 37 | | | | 100 |
| 7 | 51 | 5 | 0906 007 51 | | 7 | 60 | 50 | 100 |
| | 52 | | | 0906 007 52 | | | | 100 |
| 8 | 51 | 6 | 0906 008 51 | | 8 | 60 | 50 | 200 |
| | 52 | | | 0906 008 52 | | | | 200 |
| 10 | 61 | 7 | 0906 010 61 | | 10 | 70 | 60 | 100 |
| | 62 | | | 0906 010 62 | | | | 100 |
| 12 | 71 | 8-10 | 0906 012 71 | | 12 | 80 | 70 | 25 |
| | 72 | | | 0906 012 72 | | | | 25 |
| 14 | 75 | 10-12 | 0906 014 75 | | 14 | 85 | 75 | 20 |
| | 76 | | | 0906 014 76 | | | | 20 |

# NYLON PLUG



| Type of installation | | |
|---|---|---|
| Pre-positioned | In-place | Stand-off |
| ✓ | ✓ | - |

## Installation

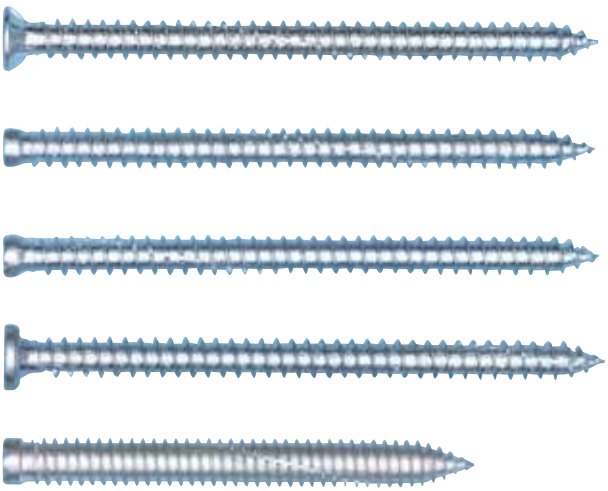
## Loads

| Plug Diameter | | | | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 14 | Ø 16 | Ø 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Concrete ≥ B25; C20/25** | | | | | | | | | | | | |
| **In any direction** | W-ND | $F_{rec}$ | [kN] | 0.15 | 0.25 | 0.38 | 0.60 | 0.90 | 1.40 | 1.90 | 2.30 | 3.00 |
| **Solid brick ≥ Mz12** | | | | | | | | | | | | |
| **In any direction** | W-ND | $F_{rec}$ | [kN] | 0.14 | 0.25 | 0.30 | 0.50 | - | - | - | - | - |
| **Sand-lime brick ≥ KS12** | | | | | | | | | | | | |
| **In any direction** | W-ND | $F_{rec}$ | [kN] | 0.14 | 0.25 | 0.30 | 0.50 | - | - | - | - | - |

[1] Loads are valid for anchors in indeterminate non-structural applications. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included.

| Description | Screw Length | Art. no. | Drill hole diameter | Drill depth | Edge distance | Installation depth |
|---|---|---|---|---|---|---|
| | l [mm] | | $d_0$ [mm] | $h_1$ [mm] | c [mm] | $h_{nom}$ [mm] |
| 4 x 20 | 20 | **0903 4 20** | 6 | 30 | 20 | 20 |
| 5 x 25 | 25 | **0903 5 25** | | 35 | 25 | 25 |
| 6 x 30 | 30 | **0903 6 30** | | 40 | 30 | 30 |
| 8 x 40 | 40 | **0903 8 40** | 8 | 50 | 40 | 40 |
| 8 x 40 M6 | 40 | **0903 8 406** | | 50 | 40 | 40 |
| 10 x 50 | 50 | **0903 10 50** | | 65 | 50 | 50 |
| 12 x 60 | 60 | **0903 12 60** | 10 | 75 | 60 | 60 |
| 14 x 75 | 75 | **0903 14 75** | | 85 | 70 | 75 |
| 16 x 80 | 80 | **0903 16 80** | 12 | 95 | 80 | 80 |
| 20 x 90 | 90 | **0903 20 90** | | 105 | 100 | 90 |

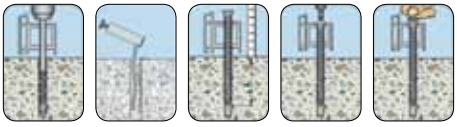
# AMO III



| Type of installation | | |
|---|---|---|
| Pre-positioned | In-place | Stand-off |
| – | ✓ | – |

## Application references

## Installation



## Loads

| Fire Resistance [min] | 30 | 60 | 90 | 120 |
|---|---|---|---|---|
| **Tension Load** | **max. N [kN]** | | | |
| AMO III-Screw Ø 7,5 mm (Type 1 and Type 3) | ≤ 0.80 | ≤ 0.55 | ≤ 0.45 | ≤ 0.40 |
| **Shear load and oblique tension force up to 30°** | **max. F/max. V [kN]** | | | |
| AMO III-Screw Ø 7,5 mm (Type 2) | ≤ 0,50 | ≤ 0,50 | ≤ 0,50 | ≤ 0,50 |
| AMO III-Screw Ø 11,5 mm | | | | |

[1] Loads are valid for anchors in indeterminate non-structural applications.

# AMO III

| Type | Total Length | Head Diameter | Art. no. | | | Drive | P. Qty. |
|---|---|---|---|---|---|---|---|
| | l [mm] | [mm] | Steel, Yellow Galvanized | Galvanized steel, blue passivated | A2 | | |
| AMO III Ø 7,5 Type 1 | 72 | Ø 12 | 0234 130 72 | 0234 730 72 | – | AW 30 | 200 |
| | 82 | | 0234 130 82 | 0234 730 82 | – | | 200 |
| | 92 | | 0234 130 92 | 0234 730 92 | – | | 200 |
| | 102 | | 0234 130 102 | 0234 730 102 | – | | 200 |
| | 112 | | 0234 130 112 | 0234 730 112 | – | | 200 |
| | 122 | | 0234 130 122 | 0234 730 122 | – | | 200 |
| | 132 | | 0234 130 132 | 0234 730 132 | – | | 200 |
| | 152 | | 0234 130 152 | 0234 730 152 | – | | 200 |
| | 182 | | 0234 130 182 | 0234 730 182 | – | | 200 |
| | 212 | | 0234 130 212 | 0234 730 212 | – | | 100 |
| AMO III Ø 7,5 Type 2 | 102 | Ø 7,5 | 0234 225 102 | 0234 825 102 | – | AW 25 | 200 |
| | 112 | | 0234 225 112 | 0234 825 112 | – | | 200 |
| | 122 | | 0234 225 122 | 0234 825 122 | – | | 200 |
| | 132 | | 0234 225 132 | 0234 825 132 | – | | 200 |
| | 152 | | 0234 225 152 | 0234 825 152 | – | | 200 |
| | 182 | | 0234 225 182 | 0234 825 182 | – | | 200 |
| | 212 | | 0234 225 212 | 0234 825 212 | – | | 100 |
| AMO III Ø 7,5 Type 2 | 72 | Ø 8,0 | 0234 230 72 | 0234 830 72 | – | AW 30 | 200 |
| | 82 | | 0234 230 82 | 0234 830 82 | – | | 200 |
| | 92 | | 0234 230 92 | 0234 830 92 | – | | 200 |
| | 102 | | 0234 230 102 | 0234 830 102 | – | | 200 |
| | 112 | | 0234 230 112 | 0234 830 112 | – | | 200 |
| | 122 | | 0234 230 122 | 0234 830 122 | – | | 200 |
| | 132 | | 0234 230 132 | 0234 830 132 | – | | 200 |
| | 152 | | 0234 230 152 | 0234 830 152 | – | | 200 |
| | 182 | | 0234 230 182 | 0234 830 182 | – | | 200 |
| | 212 | | 0234 230 212 | 0234 830 212 | – | | 100 |
| | 252 | | – | 0234 830 252 | – | | 100 |
| | 302 | | – | 0234 830 302 | – | | 100 |
| AMO III Ø 7,5 Type 2 | 112 | Ø 8,0 | – | – | 0239 230 112 | AW 30 | 100 |
| | 132 | | – | – | 0239 230 132 | | 100 |
| | 152 | | – | – | 0239 230 152 | | 100 |
| | 182 | | – | – | 0239 230 182 | | 100 |
| AMO III Ø 7,5 Type 3 | 32 | Ø 12,5 | 0234 330 32 | 0234 930 32 | – | AW 30 | 200 |
| | 42 | | 0234 330 42 | 0234 930 42 | – | | 200 |
| | 52 | | 0234 330 52 | 0234 930 52 | – | | 200 |
| | 62 | | 0234 330 62 | 0234 930 62 | – | | 200 |
| | 72 | | 0234 330 72 | 0234 930 72 | – | | 200 |
| | 82 | | 0234 330 82 | 0234 930 82 | – | | 200 |
| | 92 | | 0234 330 92 | 0234 930 92 | – | | 200 |
| | 102 | | 0234 330 102 | 0234 930 102 | – | | 200 |
| | 112 | | 0234 330 112 | 0234 930 112 | – | | 200 |
| | 122 | | 0234 330 122 | 0234 930 122 | – | | 200 |
| | 132 | | 0234 330 132 | 0234 930 132 | – | | 200 |
| | 152 | | 0234 330 152 | 0234 930 152 | – | | 200 |
| | 182 | | 0234 330 182 | 0234 930 182 | – | | 200 |
| | 212 | | 0234 330 212 | 0234 930 212 | – | | 100 |
| AMO III Ø 11,5 | 112 | Ø 11,5 | 0234 115 112 | 0234 840 112 | – | AW 40 | 50 |
| | 132 | | 0234 115 132 | 0234 840 132 | – | | 50 |
| | 152 | | 0234 115 152 | 0234 840 152 | – | | 50 |
| | 182 | | 0234 115 182 | 0234 840 182 | – | | 50 |

# GYPSUMBOARD FIXING W-GS

**Type Z**

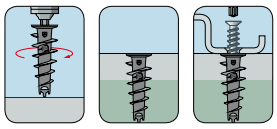
**Type Z/L**

**Type K**

| Type of installation | | |
|---|---|---|
| Pre-positioned | In-place | Stand-off |
| ✓ | – | – |

## Application references

## Installation



## Performance data

| Anchor Type | | | | Type Z | Type Z/L | Type K |
|---|---|---|---|---|---|---|
| Recommended tension load | Gypsum Plasterboard d ≥ 12.5 mm | $N_{rec}$ | [kN] | 0.10 | 0.10 | 0.10 |
| | Gypsum Plasterboard d ≥ 25 mm | | [kN] | 0.10 | 0.12 | 0.10 |
| | Gypsum fiber boards | | [kN] | 0.12 | 0.12 | – |
| Recommended shear load | Gypsum Plasterboard d ≥ 12.5 mm | $V_{rec}$ | [kN] | 0.12 | 0.12 | 0.12 |
| | Gypsum Plasterboard d ≥ 25 mm | | [kN] | 0.15 | 0.15 | 0.12 |
| | Gypsum fiber boards | | [kN] | 0.15 | 0.15 | – |

[1] Loads are valid for anchors in indeterminate non-structural applications. Material safety factor $\gamma_M$ and safety factor for action $\gamma_L$ = 1.4 are included.

| Description | Screw Length | Min. member thickness | Thread-Ø screw | Art. no. | Hole-Ø in member | Edge distance | P. Qty |
|---|---|---|---|---|---|---|---|
| | l [mm] | d [mm] | ds [mm] | | $d_{mem}$ [mm] | c [mm] | |
| W-GS Type Z | 33 | 9.5 | 4.5 | **0903 252 1** | 6.5 | 50 | 200 |
| W-GS Type Z/L | 39 | 9.5 | 4.5 | **0903 253 1** | 6.5 | 50 | 200 |
| W-GS Type K | 33 | 9.5 | 4.5–5.0 | **0903 251 1** | 6.5 | 50 | 200 |

# NOTES

# NOTES

# CONSTRUCTION FIXINGS

**Anchor technology**
**Edition 10**

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