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Guide to anchor selection

Mounting type	Suitable for building materials									Authorization (Details on the individual pages)						Material					Assembly	
	Concrete	Natural stone	Solid brick	Lime sand Solid stone	High hole Brick	Lime sand Perforated brick	Hollow block	Plasterboard, fiberboards	Aerated concrete, lightweight concrete	Cunning Concrete	Uncracked Concrete	Masonry	Aerated concrete	Prestressed hollow core plates		Steel galvanized	Stainless steel A2	Stainless steel A4	Plastic	other Materials	Plug-in assembly	Push-through assembly
General	x	x	x	x															x		x	x
	x	x	x	x	x	x			x										x		x	
	x	x	x	x	x	x	x	x											x		x	x
	x	x	x	x	x	x	x	x											x		x	x
	x	x	x	x	x	x	x	x											x		x	
	x	x	x	x	x	x	x		x										x		x	x
	x		x	x	x	x			x							x					x	
	x	x	x	x																x	x	x
	x	x	x	x		x															x	
									x							x					x	
									x										x		x	
Frame and slats	x	x	x	x	x	x	x		x	x	x	x	x	x		x		x	x			x
	x	x	x	x	x	x	x		x							x	x		x			x
	x		x	x												x			x			x
	x	x	x	x															x			x
	x	x	x	x												x						x
Slabs and cavity								x												x	x	
								x											x		x	
							x	x								x			(Uni)		x	
								x								x					x	
	Styrofoam and rigid foam boards																		x		x	
	depending on the dowel system																		x		x	x
	for thin walls															x					x	
Sani-Window frame	x		x	x	x	x	x		x							x						x
	x	x	x	x												x						x
	x	x	x	x												x			x		x	

Lightweight fasteners

Guide to anchor selection

Mounting type	Suitable for building materials								Authorization (Details on the individual pages)							Material					Assembly	
	Concrete	Natural stone	Solid brick	Solid sand-lime brick	Perforated brick	Perforated sand-lime brick	Hollow block	Aerated concrete Lightweight concrete	Dynamic loads	Cracked concrete	Uncracked concrete	Multiple fastening	Facade fastening	Masonry	Prestressed concrete hollow core slabs	Steel, galvanized	Stainless steel A2	Stainless steel A4	Plastic	other materials	Pre-mounting	Push-through mounting
Heavy-duty steel fasteners	x											x				x						x
	x											x				x		x			x	x
	x														x	x					x	
	x										x	x			x	x					x	
	x										x	x			x			x			x	
	x									x	x					x					x	x
	x									x	x							x			x	x
	x								x	x	x					x					x	x
	x								x	x	x							x			x	x
	x									x	x					x					x	x
	x									x	x							x			x	x
	x										x					x					x	x
	x										x							x			x	x
	x									x	x					x						x
	x	x	x	x		x	x			x	x	x		x	x	x					x	x
	x	x	x	x		x	x			x	x							x				x
Heavy-duty fasteners Chemistry	x	x	x	x	x	x	x	x								x					x	

Information on the composite and injection systems can be found

Heavy-duty fasteners

	Article description	Article no.	from page
	Ceiling nail Dowel	0904 006 ...	62
	Nail anchor	0904 00. ...	65
	Hollow ceiling anchor Easy	0908 7.. ...	69
	Drop-in anchor E/ES (ED-DW-15*)	0904 8.. ...	71
	Drop-in anchor E/ES A4	0904 9.. ...	79
	Bolt anchor BZ3	0910 3.. ...	82
	Bolt anchor BZ3 A4	0909 4.. ...	85
	Wedge anchor BZ3 dynamic	0909 8.. ...	88
	Wedge anchor BZ3 dynamic A4	0909 9.. ...	90
	Bolt anchor BZ plus	0910 2.. ...	93
	Bolt anchor BZ plus A4	0910 5.. ...	96
	Bolt anchor B	0909 9.. ...	100
	Bolt anchor B A4	0909 9.. ...	103
	Heavy-duty anchor SZ-S / SZ-B / SZ-SK	0908 0/1/3.. ...	105
	Multi-Monti plus screw anchor, steel	0901	108
	IMulti-Monti screw anchor, stainless steel A4	0901	124

You on page 130

	Accessories for steel anchors / injection technology	0911 - 0914	189
	Overviews of fire protection fasteners		193

* Special fastening without approval, with DYWIDAG® thread

Nylon dowel RND

High retention values in solid building materials

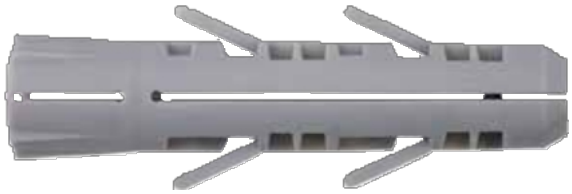
Product description:
With its outstanding properties, the RND nylon anchor offers very high holding values in solid building materials such as concrete and solid bricks. This is made possible by the high material content and the double-split expansion body. The flexible plug neck, which adapts perfectly to the drill hole, guarantees easy installation. Several active anti-rotation locks prevent rotation during installation.

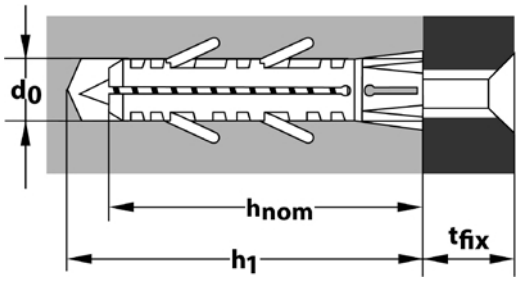
Advantages:
- Very high retention values in solid building materials due to high material content
- Up to 30 % higher holding values than other expansion anchors
- 4 Sword anti-rotation lock - no turning in the drill hole
- Screw-in centering ensures the spreading function
- Can be used with various screw diameters and screw types

Area of application:
For fixing pictures, letterboxes, curtain rails, towel rails, wall cabinets, cable trays, lamps, metal brackets, shelves, pipe clips, skirting boards, wall shelves, etc.
in concrete, solid building

materials Material: PA -

polyamide





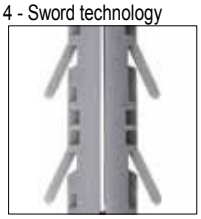
The high proportion of material

Guarantees very high holding values compared to other expansion anchors

The flexible dowel neck

Adapts ideally to the drill hole and guarantees a firm hold

4 - Sword technology

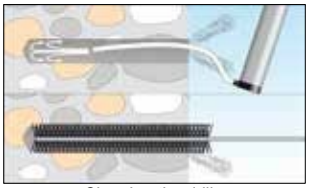


Reliably prevents rotation in the drill hole and also provides extreme hold

The center point

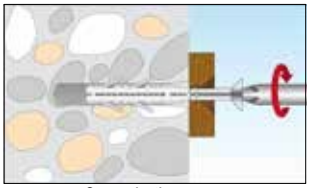
enables the simple Inserting the dowel into the drill hole

Drilling

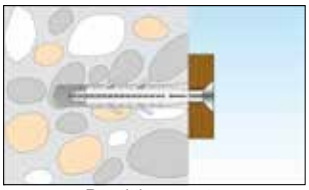


Cleaning the drill hole

Set dowels



Screw in the screw



Result in concrete

Item no.	Dowel diameter x dowel length (l)	Drill core diameter (d 0)	Drill hole depth (h 1)	Setting depth (h nom)	Required wood screw diameter (d screw wood)	PU
0903 005 025	5 x 25 mm	5 mm	35 mm	25 mm	3 - 4 mm	300
0903 006 030	6 x 30 mm	6 mm	45 mm	30 mm	3.5 - 5 mm	200
0903 008 040	8 x 40 mm	8 mm	55 mm	40 mm	4 - 6 mm	100
0903 010 050	10 x 50 mm	10 mm	70 mm	50 mm	6 - 8 mm	50
0903 012 060	12 x 60 mm	12 mm	80 mm	60 mm	8 - 10 mm	25
0903 014 070	14 x 70 mm	14 mm	95 mm	70 mm	10 - 12 mm	20
0903 016 080	16 x 80 mm	16 mm	105 mm	80 mm	12 mm	10

Recommended loads in kN

Dimension	Concrete C 20/25	Solid brick
5 x 25	0.40 kN	0.20 kN
6 x 30	0.70 kN	0.35 kN
8 x 40	0.90 kN	0.50 kN
10 x 50	2.00 kN	0.80 kN
12 x 60	2.20 kN	1.20 kN
14 x 70	2.30 kN	-
16 x 80	2.50 kN	-

The specified holding values refer to the use of wood screws with a maximum diameter. The anchoring depth of the anchor must be observed. The drilling method and drill hole cleaning must be adapted to the building material. The recommended loads only apply for installation in the building material, not for installation in joints. Approved anchors must be used for safety-relevant fixings.

Nylon dowel RND in cardboard box

Item no.	Type designation	Dowel diameter x dowel length (l)	Contents/piece	PU
0903 006 031	RND 6	6 x 30 mm	2.000	1
0903 008 041	RND 8	8 x 40 mm	1.000	1
0903 010 051	RND 10	10 x 50 mm	500	1
0903 012 061	RND 12	12 x 60 mm	250	1

Nylon dowel RND Quattro

More support thanks to 4-fold spreading

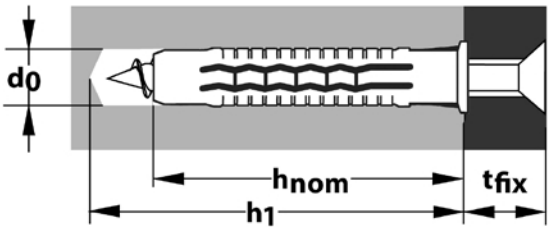
Product description:
The RND Quattro is the versatile nylon plug that achieves very high holding values in various substrates thanks to its 4-fold expansion. The anti-rotation locks effectively prevent rotation in the drill hole. Additional flexibility is provided by the elastic plug collar, which enables pre- and push-through installation.

Advantages:
- 4-fold expansion for very high holding values in concrete and masonry.
- Elastic dowel collar enables pre- and through-mounting.
- Anti-rotation locks prevent rotation in the drill hole.
- Can be used with various screw diameters and screw types.
- Screw-in centering ensures the spreading function.
- The cardboard boxes not only serve as packaging, but are also ideal as storage containers.

Area of application:
For fixing pictures, letterboxes, curtain rails, towel rails, wall cabinets, cable trays, lamps, metal brackets, shelves, pipe clips, skirting boards, wall shelves, etc. in concrete, solid and perforated

bricks Material: PA -

polyamide



The 4-fold spread

Guarantees high loads with even load distribution

The closed center point

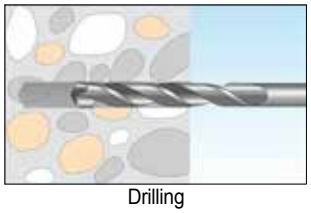
enables easy insertion into the drill hole and provides optimum guidance for the screw.

The elastic dowel collar

enables push-through and push-in installation with one dowel

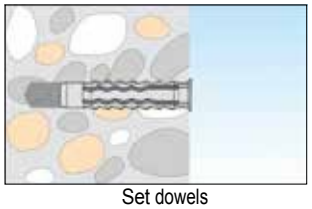
The anti-twist devices

prevent rotation in the drill hole

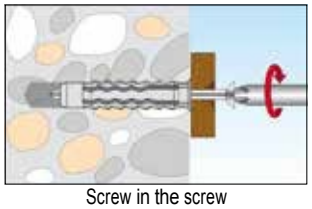


Drilling

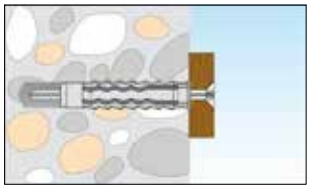
Cleaning the drill hole



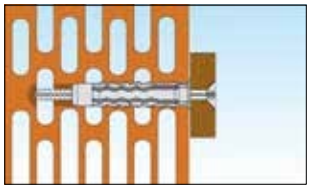
Set dowels



Screw in the screw



Result in concrete



Result in perforated brick

Long versions: 6 x 45 and 8 x 50 mm

Item no.	Dowel diameter x dowel length (l)	Drill core diameter (d 0)	Drill hole depth (h 1)	Setting depth (h nom)	Required wood screw diameter (d wood screw)	PU
0903 305 125	5 x 25 mm	5 mm	35 mm	25 mm	3 - 4 mm	200
0903 306 130	6 x 30 mm	6 mm	45 mm	30 mm	4 - 5 mm	200
0903 306 145	6 x 45 mm	6 mm	60 mm	45 mm	4 - 5 mm	150
0903 308 140	8 x 40 mm	8 mm	55 mm	40 mm	4.5 - 6 mm	100
0903 308 150	8 x 50 mm	8 mm	65 mm	50 mm	4.5 - 6 mm	100
0903 310 150	10 x 50 mm	10 mm	65 mm	50 mm	6 - 8 mm	50
0903 312 160	12 x 60 mm	12 mm	80 mm	60 mm	8 - 10 mm	25
0903 314 170	14 x 70 mm	14 mm	90 mm	70 mm	10 - 12 mm	15

Recommended loads in kN

Dimension	Concrete C 20/25	Solid stone	Lime sandstone	Perforated brick	Aerated concrete
5 x 25	0.45 kN	0.45 kN	0.45 kN	0.15 kN	0.12 kN
6 x 30/45	1.10 kN	0.90 kN	0.70 kN	0.20 kN	0.12 kN
8 x 40/50	1.20 kN	1.00 kN	1.00 kN	0.40 kN	0.19 kN
10 x 50	1.90 kN	1.10 kN	1.80 kN	0.45 kN	0.30 kN
12 x 60	2.70 kN	1.50 kN	2.10 kN	0.50 kN	0.40 kN
14 x 70	3.00 kN	1.80 kN	2.30 kN	0.60 kN	0.55 kN

The specified holding values refer to the use of wood screws with a maximum diameter. The anchoring depth of the anchor must be observed. The drilling method and drill hole cleaning must be adapted to the building material. The recommended loads only apply for installation in the building material, not for installation in joints. Approved anchors must be used for safety-relevant fixings.

Nylon plug RND Quattro in a bulk box

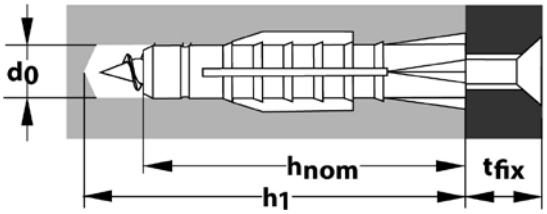
Item no.	Type designation	Dowel diameter x dowel length (l)	Contents/piece	PU
0903 006 131	RND Quattro 6	6 x 30 mm	1.600	1
0903 008 141	RND Quattro 8	8 x 40 mm	800	1
0903 010 151	RND Quattro 10	10 x 50 mm	400	1

All-purpose dowel without collar

Universal use for fastenings in a wide variety of substrates

Product description:
The all-purpose plug is a real all-rounder, as it can be used in many building materials and therefore covers a wide range of applications. It offers high holding values, stability and is very easy to install. Thanks to its triple-split plug body and special plastic, the all-purpose plug reliably knots or expands as required. The plug can be used for push-in and push-through installation.
The anti-rotation locks on the plug neck and plug body effectively prevent it from turning in the drill hole.

Advantages:
- Can be used universally in concrete, solid and perforated bricks as well as in plasterboard and gypsum fiberboard
- Processing can be carried out with hanger bolts, wood screws, chipboard screws and hook screws
- The three-part spreader body adapts perfectly to the substrate and guarantees positive and non-positive anchoring
- Anti-rotation locks on the dowel neck prevent rotation in solid and perforated stone
- In solid building materials, the spreading effect creates a frictional connection; in perforated bricks and behind plasterboard, the knotting creates a positive connection



Area of application:
For fixing suspensions, pictures, metal sheets, letterboxes, coat rails, curtain rails, towel rails, lights, metal brackets, shelves, pipe clips, skirting boards, temperature sensors, etc.
in
Concrete, lightweight concrete, solid brick, vertically perforated brick, sand-lime and sand-lime perforated brick, clinker, plasterboard, plasterboard

Required screw length (l s): Mounting part thickness (+ plaster/insulation material thickness)
+ dowel length + screw diameter

Material: PE - polyethylene

The threaded head

enables the screws to be screwed in easily and guarantees reliable knotting

The three-part spreader body

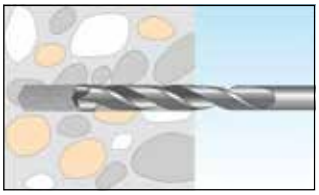
adapts perfectly to the substrate and guarantees positive and non-positive anchoring

The all-purpose plug without collar

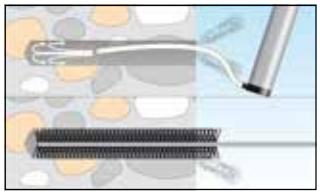
is particularly suitable for through-hole mounting

The twist locks

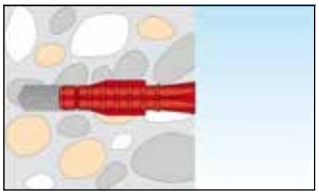
prevent rotation in the drill hole



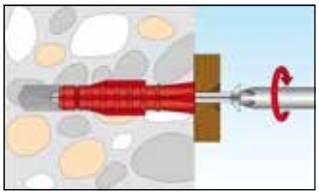
Drilling



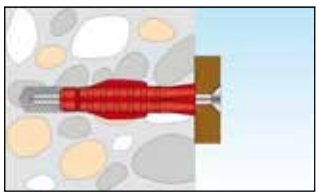
Cleaning the drill hole

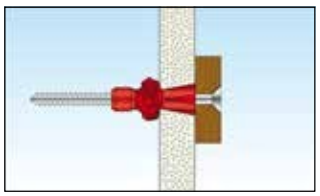


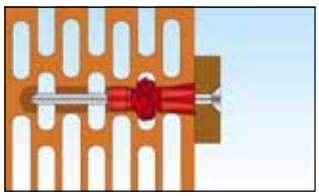
Set dowels



Screw in the screw


Result in concrete


Result behind panels


Result in perforated stone

Item no.	Dowel diameter x dowel length (l)	Drill core diameter (d 0)	Drill hole depth (h 1)	Setting depth (h nom)	Required wood screw diameter (d wood screws)	PU
0906 85 31	5 x 31 mm	5 mm	45 mm	31 mm	3 - 4 mm	200
0906 86 36	6 x 36 mm	6 mm	50 mm	36 mm	4 - 5 mm	200
0906 87 51	7 x 51 mm	7 mm	70 mm	51 mm	4.5 - 5 mm	100
0906 88 51	8 x 51 mm	8 mm	70 mm	51 mm	5 - 6 mm	100
0906 810 61	10 x 61 mm	10 mm	85 mm	61 mm	6 - 8 mm	50
0906 812 71	12 x 71 mm	12 mm	95 mm	71 mm	8 - 10 mm	25
0906 814 75	14 x 75 mm	14 mm	100 mm	75 mm	10 - 12 mm	20

Recommended loads in kN

Dimension	Concrete C 20/25	Solid brick MZ12/KSV12	Perforated brick HLZ12	Hollow block made of lightweight concrete HBL2/HBL4	Plasterboard 12.5 mm	Gypsum fiberboard 12.5 mm
5 x 31	0.25 kN	0.15 kN	0.15 kN	0.10 kN	0.06 kN	0.15 kN
6 x 36	0.50 kN	0.35 kN	0.25 kN	0.15 kN	0.10 kN	0.20 kN
7 x 51	0.60 kN	0.50 kN	0.25 kN	0.25 kN	0.10 kN	0.20 kN
8 x 51	1.00 kN	0.80 kN	0.30 kN	0.30 kN	0.10 kN	0.30 kN
10 x 61	1.50 kN	0.80 kN	0.35 kN	0.25 kN	-	0.30 kN
12 x 71	1.60 kN	1.20 kN	0.40 kN	0.30 kN	-	-
14 x 75	2.00 kN	1.40 kN	0.40 kN	0.35 kN	-	-

The specified holding values refer to the use of wood screws with a maximum diameter. The anchoring depth of the anchor must be observed. The drilling method and drill hole cleaning must be adapted to the building material. The recommended loads only apply for installation in the building material, not for installation in joints. Approved anchors must be used for safety-relevant fixings.

All-purpose dowel range

Article no. 0956 906

Fitting:

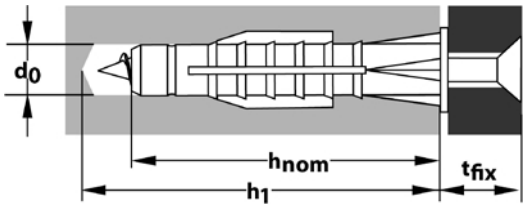
All-purpose dowel	All-purpose dowel with collar
100 pieces 6 x 36 mm	100 pieces 6 x 36 mm
50 pieces 8 x 51 mm	50 pieces 8 x 51 mm
30 pieces 10 x 61 mm	40 pieces 10 x 61 mm

All-purpose dowel with collar

Universal use for fastenings in a wide variety of substrates

Product description:
The all-purpose plug is a real all-rounder, as it can be used in many building materials and therefore covers a wide range of applications. It offers high holding values, stability and is very easy to install. Thanks to its triple-split plug body and special plastic, the all-purpose plug reliably knots or expands as required. The plug can be used for push-in installation. Rotation in the drill hole is effectively prevented by the anti-rotation locks on the plug neck and plug body.

Advantages:
- Can be used universally in concrete, solid and perforated bricks as well as in plasterboard and gypsum fiberboard
- Processing can be carried out with hanger bolts, wood screws, chipboard screws and hook screws
- The three-part spreader body adapts perfectly to the substrate and guarantees positive and non-positive anchoring
- Anti-rotation locks on the dowel neck prevent rotation in solid and perforated stone
- In solid building materials, the spreading effect creates a frictional connection; in perforated bricks and behind plasterboard, the knotting creates a positive connection
- The dowel collar prevents the dowel from slipping deeper into the drill hole



Area of application:
For fixing suspensions, pictures, metal sheets, letterboxes, coat r a i l s , curtain rails, towel rails, lights, metal brackets, shelves, pipe clips, skirting boards, temperature sensors, etc.
in
Concrete, lightweight concrete, solid brick, vertically perforated brick, sand-lime and sand-lime perforated brick, clinker, plasterboard, plasterboard

Required screw length (l s): Mounting part thickness (+ plaster/insulation material thickness)
+ dowel length + screw diameter

Material: PE - polyethylene

The threaded head

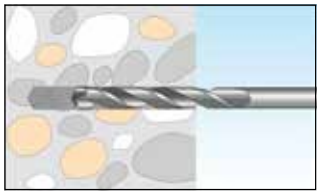
enables the screws to be screwed in easily and guarantees reliable knotting

The three-part spreader body

adapts perfectly to the substrate and guarantees positive and non-positive anchoring

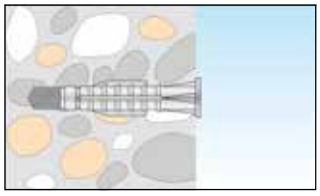
The collar and the twist locks

Prevent deep grooving and turning in the drill hole

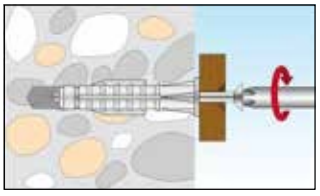


Drilling

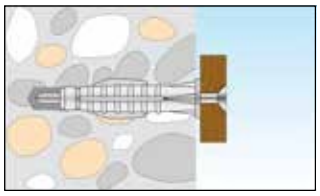
Cleaning the drill hole

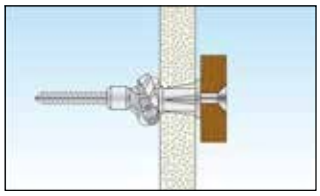


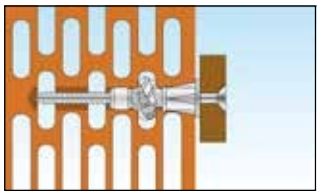
Set dowels



Screw in the screw


Result in concrete


Result behind panels


Result in perforated brick

Item no.	Dowel diameter x dowel length (l)	Drill core diameter (d 0)	Drill hole depth (h 1)	Setting depth (h nom)	Required wood screw diameter (d wood screws)	PU
0906 95 32	5 x 31 mm	5 mm	45 mm	31 mm	3 - 4 mm	200
0906 96 37	6 x 36 mm	6 mm	36 mm	50 mm	4 - 5 mm	200
0906 97 52	7 x 51 mm	7 mm	70 mm	51 mm	4.5 - 5 mm	100
0906 98 52	8 x 51 mm	8 mm	70 mm	51 mm	5 - 6 mm	100
0906 910 62	10 x 61 mm	10 mm	85 mm	61 mm	6 - 8 mm	50
0906 912 72	12 x 71 mm	12 mm	95 mm	71 mm	8 - 10 mm	25
0906 914 76	14 x 75 mm	14 mm	100 mm	75 mm	10 - 12 mm	20

Recommended loads in kN

Dimension	Concrete C 20/25	Solid brick MZ12/KSV12	Perforated brick HLZ12	Hollow block made of lightweight concrete HBL2/HBL4	Plasterboard 12.5 mm	Gypsum fiberboard 12.5 mm
5 x 31	0.25 kN	0.15 kN	0.15 kN	0.10 kN	0.06 kN	0.15 kN
6 x 36	0.50 kN	0.35 kN	0.25 kN	0.15 kN	0.10 kN	0.20 kN
7 x 51	0.60 kN	0.50 kN	0.25 kN	0.25 kN	0.10 kN	0.20 kN
8 x 51	1.00 kN	0.80 kN	0.30 kN	0.30 kN	0.10 kN	0.30 kN
10 x 61	1.50 kN	0.80 kN	0.35 kN	0.25 kN	-	0.30 kN
12 x 71	1.60 kN	1.20 kN	0.40 kN	0.30 kN	-	-
14 x 75	2.00 kN	1.40 kN	0.40 kN	0.35 kN	-	-

The specified holding values refer to the use of wood screws with a maximum diameter. The anchoring depth of the anchor must be observed. The drilling method and drill hole cleaning must be adapted to the building material. The recommended loads only apply for installation in the building material, not for installation in joints. Approved anchors must be used for safety-relevant fixings.

All-purpose dowel range

Article no. 0956 906

Fitting:

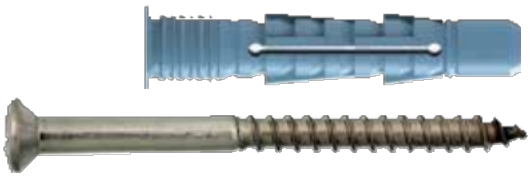
All-purpose dowel	All-purpose dowel with collar
100 pieces 6 x 36 mm 50 pieces 8 x 51 mm 30 pieces 10 x 61 mm	100 pieces 6 x 36 mm 50 pieces 8 x 51 mm 40 pieces 10 x 61 mm

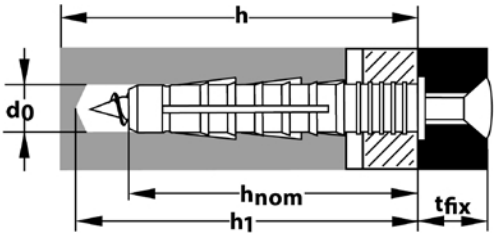
Sealing all-purpose plug WR

The sealing fastening solution for wet areas

Product description:
The sealing function of the WR all-purpose anchor with associated screw has been independently tested in accordance with ETAG 022 and DIN 18534 and is suitable for use in water exposure classes W0-I to W3-I.

For mounting in tiled areas in bathrooms: e.g. shower rails, soap dishes, towel rails, bath handles, etc.





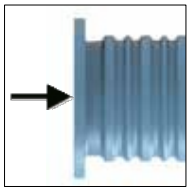
Advantages:
- Double sealing lips for optimum sealing between dowel and building material without the use of silicone
- Optimized all-purpose geometry to simplify knotting
- Special HDPE material: no change in material properties on contact with water
- Collar collar protects the tile during installation
- Eight wedge locking devices on the anchor prevent it from turning in the drill hole
- Stainless steel screw prevents unsightly rust formation
- Independently tested by the Institute for Wall and Floor Coverings "Säurefliesner-Vereinigung e.V."

Note:
The dowels must be used in combination with the supplied screw.

Area of application:
For fixing to tiled walls and floors in private and commercial rooms such as bathrooms, showers, kitchens, etc.

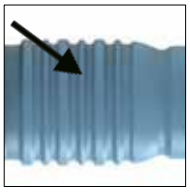
Material: HDPE - high-density polyethylene

The collar band



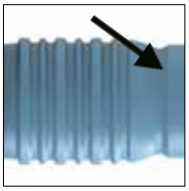
protects the tile when the assembly.

The double sealing lip



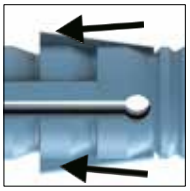
for optimum sealing between the dowel and the building material, without the use of silicone.

The undercut sealing lip



for optimal Sealing between anchor and screw inside the anchor.

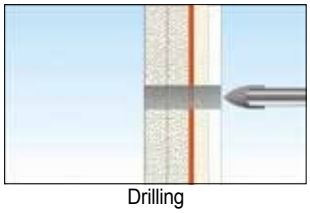
The wedge locking devices

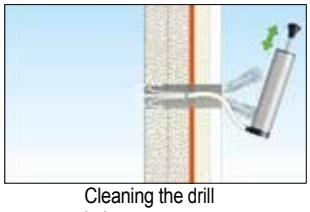


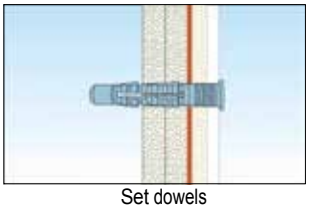
prevent the co turn in the building material.

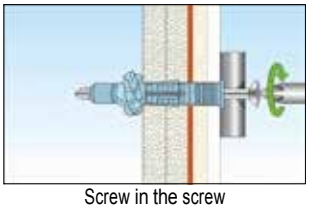
The coordinated mother area

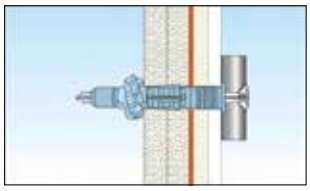
for noticeable strength increase with optimum knotting.

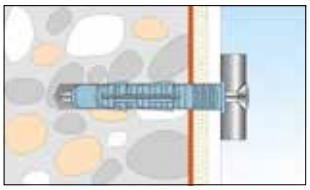

Drilling


Cleaning the drill hole


Set dowels


Screw in the screw


Result behind slabs


Result in concrete

Watch the installation video:

Item no.	Dowel diameter x dowel length (l)	Drill core diameter (d 0)	Borehole depth (h 1)	Setting depth (h nom)	Supplied wood screw DIN7995, A2, PZ2, Ø x l	PU *
0906 706 038	6 x 38 mm	6 mm	55 mm	38 mm	4 x 50 mm	80
0906 708 050	8 x 50 mm	8 mm	75 mm	50 mm	6 x 70 mm	40

* including the associated screws

Recommended loads in kN

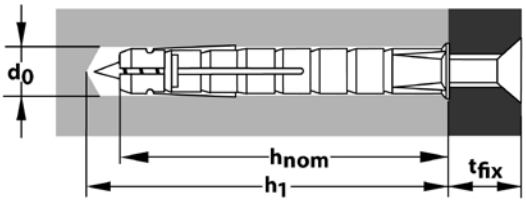
Dimension incl. screw A2	Concrete C 20/25	Solid brick KS 12	Perforated brick ≥ Hlz12 Bulk density 1 kg/dm³	Aerated concrete ≥ PB2, PP2	Plasterboard 18 mm	Plasterboard 2x 12.5 mm	Gypsum fiberboard 2x 12.5 mm
6 x 38	0.4 kN	0.3 kN	0.25 kN	0.25 kN	0.15 kN	0.20 kN	0.25 kN
8 x 50	0.8 kN	0.4 kN	0.35 kN	0.30 kN	0.20 kN	0.25 kN	0.25 kN

The specified retention values refer to the building material with tiles. Drilling methods and drill hole cleaning must be adapted to the building material. Approved anchors must be used for safety-relevant fixings. The generally applicable national regulations for the use of anchors in wet areas must be observed.

Perforated dowel

For fixing components in perforated brick, lightweight and aerated concrete

Product description:
The perforated brick plug is the ideal fixing solution for perforated brick and aerated concrete, but is also suitable for concrete and solid brick. Thanks to the long expansion range and the very high holding values, the perforated brick plug offers secure and reliable fixing. The force is distributed evenly and gently in the stone in four directions. The multiple expansion is made possible by two two-part expansion bodies, offset at 90° to each other, with movable rotating wings and a flexible dowel neck. The plug neck enables easy bridging of plaster, tiles, screed, etc., which makes this expansion plug particularly versatile. The rotating wings reliably prevent rotation in the drill hole.



Advantages:
- Ideal for perforated brick, aerated concrete, crumbly and porous building materials and mixed masonry
- Extremely high retention values in perforated bricks
- Two spreading zones for even force distribution in four directions
- Rotary vane locks prevent rotation in the drill hole
- 100 % nylon
- Long expansion area over several bars for secure anchoring
- High temperature resistance from -40 °C to +100 °C
- Resistant to chemical influences
- Front and through-hole mounting possible

Area of application:
For fastening
Suspensions, pictures, sheet metal, letterboxes, coat rails, curtain rails, towel rails, lights, metal brackets, shelves, pipe clamps, skirting boards, temperature sensors, etc.
in
Perforated brick, solid brick, concrete, lightweight concrete, aerated concrete, etc. Material: PE - polyethylene

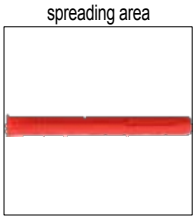
The underhead anti-rotation device

effectively prevents spinning during Attach the screw.

The two spreading zones

guarantee even force distribution in four directions.

The long spreading area



enables secure anchoring via several bars in perforated stones.

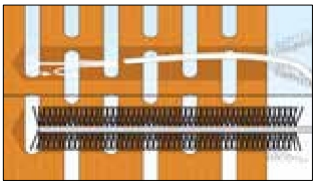
The slotted dowel neck

gives when setting in the Drill hole, allowing easy bridging of plaster, tiles, screed, etc.

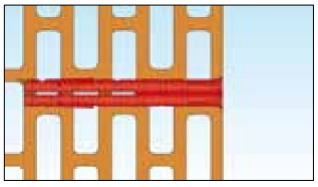
The turning sash lock

effectively prevents the Turning in the borehole.

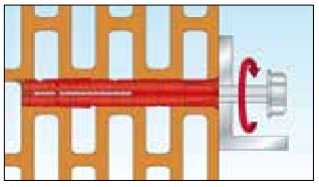
1 Drill



2 Clean thoroughly



3 Insert dowel



4 Tighten the screw

Installation instructions:

- Drill core diameter = dowel diameter, drill hole depth = see table
- In perforated bricks and aerated concrete, only rotary drilling without impact
- Screw length = dowel length + clamping length + screw diameter
- Processing can be carried out with hanger bolts, wood screws, chipboard screws and screw hooks

Item no.	Dowel diameter x dowel length (l)	Drill core diameter (d 0)	Drill hole depth (h 1)	Setting depth (h nom)	Required wood screw diameter (d wood screws)	PU
0906 606 070	6 x 70 mm	6 mm	80 mm	70 mm	4.5 - 5 mm	100
0906 608 090	8 x 90 mm	8 mm	100 mm	90 mm	5 - 6 mm	50
0906 610 090	10 x 90 mm	10 mm	100 mm	90 mm	6 - 8 mm	25
0906 612 090	12 x 90 mm	12 mm	100 mm	90 mm	8 - 10 mm	25

Recommended loads in kN

Dimension	Concrete C 20/25	Solid brick MZ 12	Perforated brick ≥ Hlz12 Bulk density 1 kg/dm³	Aerated concrete ≥ PB2, PP2
6 x 70	1.50 kN	1.20 kN	0.30 kN	0.15 kN
8 x 90	2.00 kN	1.20 kN	0.50 kN	0.20 kN
10 x 90	2.50 kN	1.40 kN	0.60 kN	0.25 kN
12 x 90	3.00 kN	1.60 kN	0.85 kN	0.25 kN

The specified holding values refer to the use of wood screws with a maximum diameter. The anchoring depth of the anchor must be observed. The drilling method and drill hole cleaning must be adapted to the building material. The recommended loads only apply for installation in the building material, not for installation in joints. Approved anchors must be used for safety-relevant fixings.

Dowel assortment

Article no. 0956 906 6

Fitting:

6 x 70 100 pieces	8 x 90 50 pieces
10 x 90 50 pieces	12 x 90 25 pieces

Metal aerated concrete dowels

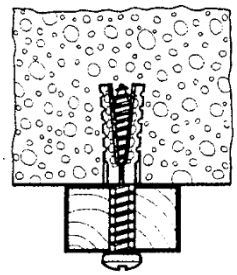
Material: galvanized steel

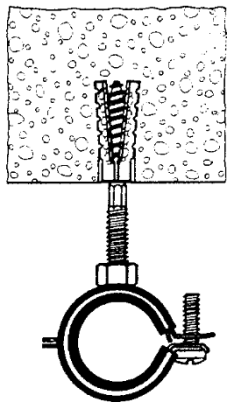
For fastening
Cable and pipe clamps, water pipes, etc.

in
Aerated concrete (gas concrete), solid plasterboard, pumice stone, lightweight concrete, perforated and solid bricks, sand-lime bricks and concrete

Installation instructions:
- In low-strength aerated concrete (PB2), direct hammering without pre-drilling is possible with the dimensions 5 x 30, 6 x 32 and 8 x 38
- All other dimensions and building materials must be pre-drilled (without impact)
- Screw length = dowel length + clamping length + screw diameter

Advantages:
- Secure screw guidance thanks to ribbed structure
- External toothing guarantees high pull-out values





Article no.	Designation	Dimension [mm]	Drill core Ø [mm]	Screw Ø [mm]	PU
0904 05 30	MGD 5	5 x 30	5 - 7	4,0 - 5,0	200
0904 06 32	MGD 6	6 x 32	7 - 9	5,0 - 6,0	200
0904 08 38	MGD 8	8 x 38	10 - 12	6,0 - 8,0	200
0904 08 60	MGD 8 L	8 x 60	10 - 12	6,0 - 8,0	200
0904 10 60	MGD 10	10 x 60	12 - 14	8,0 - 10,0	100

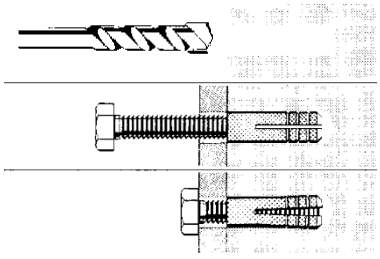
Recommended load in kN

Size	MGD 5	MGD 6	MGD 8	MGD 8 L	MGD 10
Screw Ø [mm]	5,0	6,0	8,0	8,0	10,0
Drill core Ø [mm]	3,0	4,0	6,0	6,0	8,0
Recommended load [kN] in PB 2	0,12	0,2	0,4	0,5	0,5
Recommended load [kN] in PB 4	0,35	0,4	0,7	1,0	1,2

Brass expansion dowel

Material: Brass bright

For fastening
Threaded rods, cable trays, pipelines, mounting rails, ventilation ducts, metal structures, grilles, etc.
in
Concrete, brick masonry, natural stone, clinker, sand-lime brick, hardwood, solid stone



Installation instructions:
- Drill hole
- Screw the threaded screw into the dowel and pre-expand it slightly
- Insert the dowel with the screw into the drilled hole until the screw head rests on the object to be fastened
- Screw in the screw completely - the anchor can be loaded immediately
- Important: Place dowels flush with the anchoring base, i.e. under plaster and insulation layers!

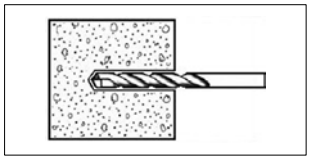
Article no.	Designation	Thread [mm]	Drill core Ø [mm]	Outer Ø [mm]	Length [mm]	Recommended working load kN/ concrete C 20/25	PU
0907 86	MS 6	M 6	8	7,5	24	0,65	100
0907 88	MS 8	M 8	10	10,0	30	1,1	100
0907 810	MS 10	M 10	12	12,0	34	1,6	100
0907 812	MS 12	M 12	16	15,5	41	2,2	50
0907 816	MS 16	M 16	20	19,5	45	3,3	50

Cable tie dowel

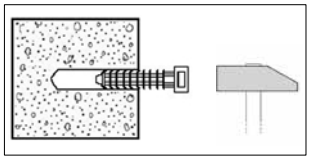
For quick fastening of cable ties in concrete and solid masonry, as well as hollow bricks

Material: Polyamide 6.6, black
Areas of application: Indoor use

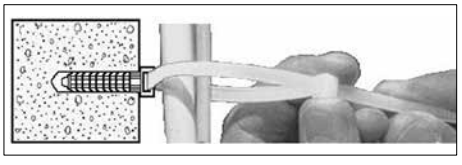
Installation instructions:



Drill hole Ø 8 x 40 mm



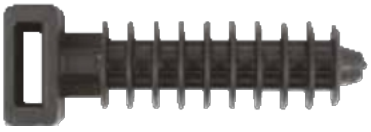
Drive in the cable tie dowel as far as it will go



Insert and fasten cable strap up to 9 mm wide

All dimensions in mm / packing units (PU) in pieces

Article no.	Max. Cable bandwidth	Dimension	Borehole	PU
0902 502 9	9	10 x 43	8 x 40	100



Aerated concrete screw TSM-PB

Special screw for aerated concrete

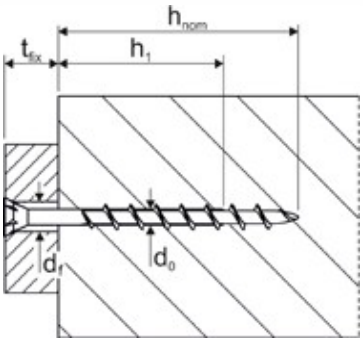
Material: Steel

Surface: galvanized

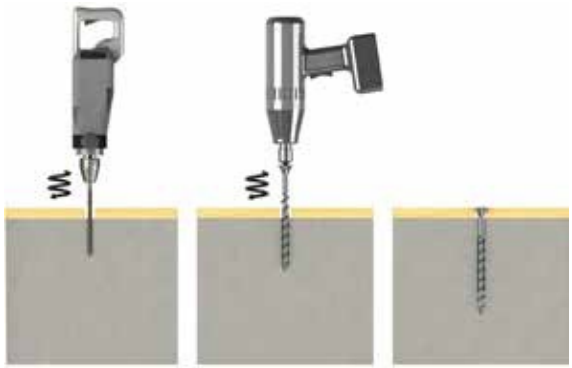
For mounting
of substructures made of wood, metal or plastics
in
Aerated concrete ≥ PP2

Note:
Always adhere to the drill hole diameter and drill hole depth! When using a screwdriver (battery or 220V), a screw-in test must be carried out before use due to the strongly fluctuating strength of the facing bricks (PP) and ceiling tiles. The slip clutch of the screwdriver must release as soon as the screw head is flush with the component to be fastened. Apply the tightening torque using a torque wrench. Do not use impact wrenches!

Advantages:
- Quick and easy installation
- Small drilling diameter
- Immediately loadable - no waiting times
- The screw cuts its own thread in the substrate
- Fastening can be completely dismantled again
- Attractive appearance thanks to countersunk and hexagonal head



Item no.	Dowel Ø x length	Fastening height max. (t fixed)	Drill bit nominal Ø (d 0)	Drill hole depth (h1)	Setting depth (h nom)	Internal drive	External drive	Head shape	recommended. Tensile load kN	Torque during anchoring (T inst)	Through hole in the component to be tapped (d f)	VPE/ pcs.
0902 408 011	8 x 110 mm	30 mm	4 mm	40 mm	80 mm	TX 25		SeKo, Millingr.	0,3	4 Nm	9 mm	100
0902 410 011	10 x 110 mm	10 mm	4 mm	50 mm	100 mm	TX 30		SeKo, Millingr.	0,4	6 Nm	10 mm	100
0902 410 016	10 x 160 mm	60 mm	4 mm	50 mm	100 mm	TX 30		SeKo, Millingr.	0,4	6 Nm	10 mm	100
0902 410 110	10 x 110 mm	10 mm	4 mm	50 mm	100 mm		SW 10	6-point, flange	0,4	6 Nm	10 mm	100
0902 410 160	10 x 160 mm	60 mm	4 mm	50 mm	100 mm		SW 10	6-point, flange	0,4	6 Nm	10 mm	100



Assembly with pre-drilling

Cellular concrete dowel GB

Special dowels for aerated concrete

The centering tip enables precise and easy hammering into the drill hole.

The trilobular shape prevents rotation in the drill hole.

The 3-edge Spreading guarantees the best hold in aerated concrete.

The wedge segments ensure optimum hold after spreading.

Material: Polyamide PA 6, halogen-free

For fastening
Letterboxes, windows, curtain rails, towel rails, wall cabinets, cable trays, lamps, metal brackets, shelves, pipe clips, skirting boards, etc.

in
Aerated concrete

Installation instructions:
- Drill core diameter = Ø centering tip, drill hole depth = see table
- Rotating, **without** impact, drilling
- Higher contact pressure for higher loads with wood screws
- Screw length = dowel length + clamping length + screw diameter

Advantages:
- Can be used with various screw types and diameters
- Due to the trilobular shape, the segments dig into the aerated concrete when the anchor is driven in and reliably prevent the anchor from turning with the concrete
- After screwing in the screw, the 3 flanks transfer the expansion pressure optimally to the aerated concrete and guarantee high pull-out forces
- Resistant to rotting, weathering and ageing

The RECA aerated concrete anchor can be used with all standard screws on the market (preliminary tests are recommended):

Wood screws

Chipboard screws

Metric screws

Cellular concrete dowel GB

Article no.	Designation	Dimension [mm]	Drill hole [mm]	Matching screws		PU
				Wood/chip Ø [mm]	Metric* Ø [mm]	
0902 310 55	AR 10	10 x 55	10 x 65	4,5 - 6	M 6	50
0902 312 60	AR 12	12 x 60	12 x 70	7 - 8	M 8	50
0902 314 75	AR 14	14 x 75	14 x 90	10	M 10	25

* Due to the metric thread, increased resistance to screwing in is to be expected.

Recommended loads and distances for anchoring in aerated concrete

When using wood screws with max. diameter

Aerated concrete dowels			AR 10	AR 12	AR 14
Recommended load of a single anchor for tension, compression, shear load and diagonal tension at any angle					
PB 2, PP 2	recom. N	[kN]	0,3	0,3	0,5
PB 4, PP 4	recom. N	[kN]	0,5	0,5	1,1
Center and edge distances					
Center distance PB2, PP2	a ≥	[mm]	100	150	150
Center distance PB4, PP4, P3.3	a >	[mm]	100	200	150
Edge distance PB2, PP2	$_{ar}$ ≥	[mm]	80	100	100
Edge distance PB4, PP4, P3.3	$_{ar}$ >	[mm]	80	150	150
Minimum component thickness	d ≥	[mm]	100	120	130
Assembly data					
Drill core diameter	$_{do}$	[mm]	10	12	14
Drill hole depth	t >	[mm]	65	70	90
Anchoring depth	$_{hv}$ >	[mm]	55	60	75
Through hole in the component to be connected	$_{df}$ ≤	[mm]	-	8	11

Multifunctional frame plug MFR

For the universal installation of façade substructures and add-on parts made of wood and metal in many common substrates.

- Diameter: 8 mm, 10 mm, 14 mm
- Lengths: 60 - 320 mm
- Screw material: Galvanized steel, stainless steel A4
- Material dowel sleeve: Polyamide PA 6

For the attachment of:

- Façade substructures made of wood and metal
- Window and door frames
- Fire doors and gates
- Metal brackets, rails, consoles
- Wall units, cladding, frames
- Squared timbers and sleepers

Advantages:

- Approved for use in concrete, masonry, aerated concrete and prestressed concrete hollow core slabs
- Patented quadruple spreader for a secure hold
- Immediately loadable - no waiting times
- Versatile in use
- Extensive product range
- Two setting depths (Ø10 mm)
- Dowel and screw already pre-assembled
- Fire protection R90 (see ETA)
- Tested and approved by Hörmann for fire protection doors in solid building materials
- Flat collar design - prevents the formation of contact corrosion

Suitable building materials:

- Concrete
- Aerated concrete
- Solid brick, vertically perforated brick
- Solid sand-lime brick, perforated sand-lime brick
- Solid block made of lightweight concrete
- Hollow block made of lightweight concrete
- Prestressed concrete hollow core slab

MFR SB TX Countersunk collar plug with countersunk head screw

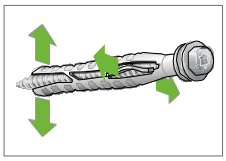
Galvanized steel / stainless steel A4 Item no. 0905 96. ...

MFR SB SSKS Countersunk collar dowel with hexagon head screw with pressed-on washer

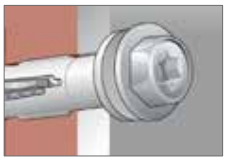
Galvanized steel / stainless steel A4 Item no. 0905 97. ...

MFR FB SSKS Flat collar dowel with hexagon head screw with pressed-on washer

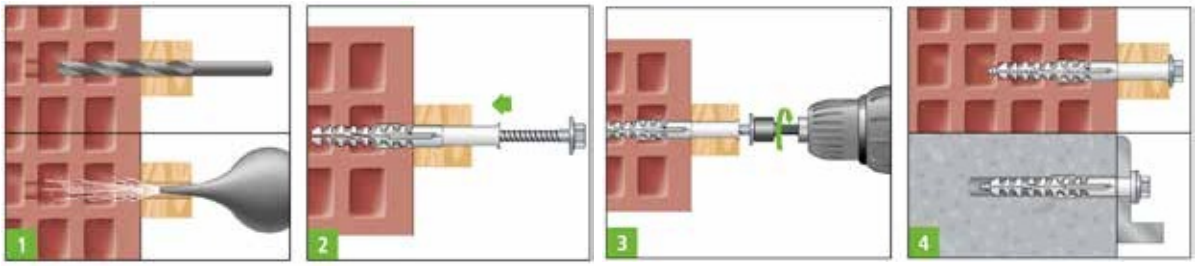
Galvanized steel / stainless steel A4 Item no. 0905 98. ...



Fire protection R90



Assembly

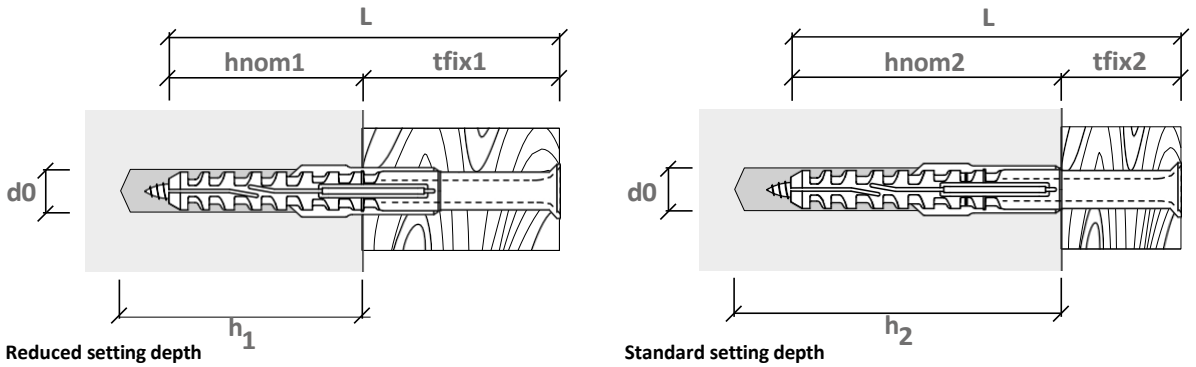


Note: In perforated bricks and aerated concrete, only drill while turning, without impact.

SPECIAL FEATURE MFR Ø10 MM

One dowel - two setting depths (50 mm or 70 mm)

- Depending on requirements for more flexibility
- Reduced warehousing and cost savings



MFR SB TX - Countersunk collar anchor with countersunk head screw

Dowel size	Galvanized steel Article no.	Stainless steel A4 Article no.	Borehole diameter d0 [mm]	Borehole depth h1 / h2 ≥ [mm]	Anchoring depth hnom 1 / hnom 2 ≥ [mm]	Dowel length L [mm]	Attachment thickness tfix 1 / tfix 2 ≤ [mm]	Drive	PU
8-60	0905 961 060	0905 964 060	8	60	50	60	10	TX 30	100
8-80	0905 961 080	0905 964 080	8	60	50	80	30	TX 30	100
8-100	0905 961 100	0905 964 100	8	60	50	100	50	TX 30	50
8-120	0905 961 120	-	8	60	50	120	70	TX 30	50
10-60	0905 962 060	0905 965 060	10	60	50	60	10	TX 30	50
10-80	0905 962 080	0905 965 080	10	60 / 80	50 / 70	80	30 / 10	TX 40	50
10-100	0905 962 100	0905 965 100	10	60 / 80	50 / 70	100	50 / 30	TX 40	50
10-115	0905 962 120	0905 965 120	10	60 / 80	50 / 70	115	65 / 45	TX 40	50
10-135	0905 962 135	0905 965 135	10	60 / 80	50 / 70	135	85 / 65	TX 40	50
10-160	0905 962 160	0905 965 160	10	60 / 80	50 / 70	160	110 / 90	TX 40	50
10-200	0905 962 200	0905 965 200	10	60 / 80	50 / 70	200	150 / 130	TX 40	50
10-240	0905 962 240	-	10	60 / 80	50 / 70	240	190 / 170	TX 40	50
10-280	0905 962 280	-	10	60 / 80	50 / 70	280	230 / 210	TX 40	50
10-320	0905 962 320	-	10	60 / 80	50 / 70	320	270 / 250	TX 40	50
14-110	0905 963 110	-	14	85	70	110	40	TX 50	25
14-140	0905 963 140	-	14	85	70	140	70	TX 50	25
14-170	0905 963 170	-	14	85	70	170	100	TX 50	25
14-200	0905 963 200	-	14	85	70	200	130	TX 50	25
14-230	0905 963 230	-	14	85	70	230	160	TX 50	25
14-270	0905 963 270	-	14	85	70	270	200	TX 50	25

MFR SB SSKS - Countersunk collar anchor with hexagon head screw with pressed-on washer

Dowel size	Galvanized steel Article no.	Stainless steel A4 Article no.	Borehole diameter d0 [mm]	Borehole depth h1 / h2 ≥ [mm]	Anchoring depth hnom 1 / hnom 2 ≥ [mm]	Dowel length L [mm]	Attachment thickness tfix 1 / tfix 2 ≤ [mm]	Drive	PU
8-60	0905 971 060	0905 974 060	8	60	50	60	10	SW10/TX 30	100
8-80	0905 971 080	0905 974 080	8	60	50	80	30	SW10/TX 30	100
8-100	0905 971 100	0905 974 100	8	60	50	100	50	SW10/TX 30	50
8-120	0905 971 120	-	8	60	50	120	70	SW10/TX 30	50
10-60	0905 972 060	0905 975 060	10	60	50	60	10	SW13/TX 40	50
10-80	0905 972 080	0905 975 080	10	60 / 80	50 / 70	80	30 / 10	SW13/TX 40	50
10-100	0905 972 100	0905 975 100	10	60 / 80	50 / 70	100	50 / 30	SW13/TX 40	50
10-115	0905 972 120	0905 975 120	10	60 / 80	50 / 70	115	65 / 45	SW13/TX 40	50
10-135	0905 972 135	0905 975 135	10	60 / 80	50 / 70	135	85 / 65	SW13/TX 40	50
10-160	0905 972 160	0905 975 160	10	60 / 80	50 / 70	160	110 / 90	SW13/TX 40	50
10-200	0905 972 200	0905 975 200	10	60 / 80	50 / 70	200	150 / 130	SW13/TX 40	50
10-240	0905 972 240	-	10	60 / 80	50 / 70	240	190 / 170	SW13/TX 40	50
14-80	0905 973 080	-	14	85	70	80	10	SW17/TX 50	25
14-110	0905 973 110	-	14	85	70	110	40	SW17/TX 50	25
14-140	0905 973 140	-	14	85	70	140	70	SW17/TX 50	25
14-170	0905 973 170	-	14	85	70	170	100	SW17/TX 50	25
14-200	0905 973 200	-	14	85	70	200	130	SW17/TX 50	25
14-230	0905 973 230	-	14	85	70	230	160	SW17/TX 50	25
14-270	0905 973 270	-	14	85	70	270	200	SW17/TX 50	25

Washer Ø: 8 = 17 mm, 10 = 19 mm, 14 = 22 mm

MFR FB SSKS - Flat collar dowel with hexagon head screw with pressed-on washer

Dowel size	Galvanized steel Article no.	Stainless steel A4 Article no.	Borehole diameter d0 [mm]	Borehole depth h1 / h2 ≥ [mm]	Anchoring depth hnom 1 / hnom 2 ≥ [mm]	Dowel length L [mm]	Attachment thickness tfix 1 / tfix 2 ≤ [mm]	Drive	PU
8-60	0905 981 060	0905 984 060	8	60	50	60	10	SW10/TX 30	100
8-80	0905 981 080	0905 984 080	8	60	50	80	30	SW10/TX 30	100
10-60	0905 982 060	0905 985 060	10	60	50	60	10	SW13/TX 40	50
10-80	0905 982 080	0905 985 080	10	60 / 80	50 / 70	80	30 / 10	SW13/TX 40	50
10-100	0905 982 100	0905 985 100	10	60 / 80	50 / 70	100	50 / 30	SW13/TX 40	50
14-80	0905 983 080	-	14	85	70	80	10	SW17/TX 50	25
14-110	0905 983 110	-	14	85	70	110	40	SW17/TX 50	25
14-140	0905 983 140	-	14	85	70	140	70	SW17/TX 50	25

Washer Ø: 8 = 17 mm, 10 = 19 mm, 14 = 22 mm

TECHNICAL DATA

Load capacities MFR F_{zul}

Type	Depth of organization	Concrete		Solid brick		Solid sand-lime brick		Perforated brick	Perforated sand-lime brick	Hollow block stone	Aerated concrete			Prestressed concrete hollow slabs	Permissible bending moment for galvanized screw
		≥ C16/20		Mz 10	Mz 20	KS 10	KS 20	HLz 12	KSL 12	Hbn 25	P2	P4	P6		
	hnom [mm]	Nzul [kN]	Vzul [kN]	Fzul [kN]	Fzul [kN]	Fzul [kN]	Fzul [kN]	Fzul [kN]			Fzul [kN]	Fzul [kN]	Fzul [kN]		
MFR 8	50	0,71	3,31	0,26	0,43	0,57	0,86	0,14	0,21	0,34	-	-	-	1,39	5,03
MFR 10	50	0,99	4,86	0,71	1,00	0,71	1,14	0,34	0,43	0,71	-	-	-	-	8,74
MFR 10	70	1,59	4,86	0,57	0,86	0,57	0,86	0,21	0,26	0,21	0,14	0,43	0,71	0,48	8,74
MFR 14	70	1,79	8,69	0,86	1,29	0,86	1,29	0,21	0,34	-	0,11	0,43	0,71	-	20,97

F_{zul} or N_{zul}, V_{zul} : F_{zul} = permissible load in all directions, N_{zul} = permissible tensile load, V_{zul} = permissible shear load according to the ETA assessment for galvanized screws. Values apply to the average temperature range in the wall of max. + 24° C (short-term + 40° C). At a maximum long-term temperature of +50° C (short-term +80° C), the load-bearing capacities are reduced. See ETA assessment. For further information on masonry (brick types and sizes), see ETA assessment.

Center and edge distances

Type	Depth of organization	Distances	Concrete ≥ C16/20	Solid brick Mz / solid brick KS		Perforated brick HLz / perforated sand-lime brick KSL		Aerated concrete					
								P2		P4		P6	
	hnom [mm]		[mm]	Individually bad [mm]	Dowel group [mm]	Single dowel [mm]	Dowel group [mm]	Individually bad [mm]	Dowel group [mm]	Individually bad [mm]	Dowel group [mm]	Individually bad [mm]	Dowel group [mm]
MFR 8	50	min. Center distance $a / s2_{,min}$ parallel to the edge	50	250	400	250	400	-	-	-	-	-	-
MFR 10	50		50	250	400	250	200	-	-	-	-	-	-
MFR 10	70		50	250	400	250	400	250	200	250	300	250	400
MFR 14	70		100	250	400	250	480*/400	250	200	250	300	250	400
MFR 8	50	min. Center distance $a / s1_{,min}$ Perpendicular to the edge	50	250	200	250	200	-	-	-	-	-	-
MFR 10	50		50	250	200	250	200	-	-	-	-	-	-
MFR 10	70		50	250	200	250	200	250	100	250	150	250	200
MFR 14	70		100	250	200	250	240*/200	250	100	250	150	250	200
MFR 8	50	min. Edge distance cmin	60	100	100	100	100	-	-	-	-	-	-
MFR 10	50		60	65	100	100	100	-	-	-	-	-	-
MFR 10	70		60	100	100	100	100	50	50	75	75	100	100
MFR 14	70		100	100	100	120*/100	120*/100	50	50	75	75	100	100
MFR 8	50	min. component thickness hmin	100	depending on the stone format		depending on the stone format		-	-	-	-	-	-
MFR 10	50		100					-	-	-	-	-	-
MFR 10	70		110					100	100	100	100	100	100
MFR 14	70		120					100	100	100	100	100	100

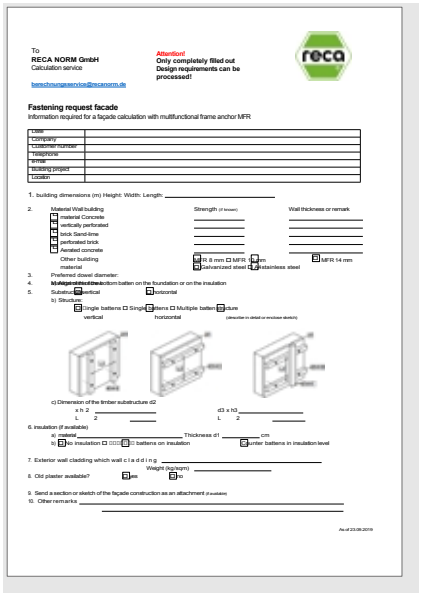
* Values apply to HLz

BERECHNUNGSSERVICE FÜR FASSADEN

It's as simple as that:

1. Complete the **"Façade fixing request"** calculation template.
2. Send **to berechnungsservice@recanorm.de.**
3. You will receive the desired design proposal within **48 hours.**

Download the calculation template at:
https://www.recanorm.de/de/wp-content/uploads/sites/4/2020/06/Vorlage_Befestigungsanfrage_Fassade.pdf



To
RECA NORM GmbH
Calculation service
berechnungsservice@recanorm.de

Attention!
Only completely filled out Design requirements can be processed!

Fastening request facade
Information required for a façade calculation with multifunctional frame anchor MFR

Date	
Company	
Customer number	
Telephone	
Email	
Building project	
Location	

1. building dimensions (m) Height: Width: Length: _____

2. Material Wall building — Strength (if known) — Wall thickness or remark
☐ material Concrete
☐ vertically perforated
☐ brick Sand-lime
☐ perforated brick
☐ Aerated concrete
Other building material
☐ MFR 8 mm ☐ MFR ____ mm ☒ MFR 14 mm
☐ Galvanized steel ☐ Stainless steel

3. Preferred dowel diameter:
4. Mounting rail on the bottom batten on the foundation or on the insulation
5. Substructure ☐ vertical ☐ horizontal
b) Structure
☐ Single battens ☐ Single battens ☐ Multiple battens ☒ Structure
vertical horizontal (describe in detail or enclose sketch)

c) Dimension of the timber substructure d2
x h 2 _____ d3 x h3 _____
L 2 _____ L 2 _____

6. insulation (if available)
a) material _____ Thickness d1 _____ cm
b) ☐ No insulation ☐ ☐☐☐ ☐ battens on insulation ☐ under battens in insulation level

7. Exterior wall cladding which wall c l a d d i n g _____
Weight (kg/sqm) _____

8. Old plaster available? ☒ yes ☒ no

9. Send a section or sketch of the façade construction as an attachment (if available)

10. Other remarks _____

As of 23.09.2019

EVO-Grip nail anchor

The specialists for quick and versatile fastening

The rounded striking surface ensures centric force application and therefore optimum power transmission.

The recessed screw drive protects the drive when hammering in. Dowel remains removable.

The sturdy screw nail prevents buckling in the event of strong stress and therefore assembly breakdowns.

The reinforced dowel head prevents the **dowel from** slipping through the Component. Creates optimum clamping effect.

The tapered dowel shaft makes it easy to drive in. Acts as a "Crumple zone" for pulling the component closer.

Material: Polyamide PA 6, halogen-free

All EVO-Grip nail anchors can be used in concrete, solid brick, sand-lime brick, aerated concrete, vertically perforated brick, lightweight concrete, perforated sand-lime brick, screed, plasterboard, etc.

The impact protection inside prevents premature spreading. Can be pre-assembled with a hammer.

The 5-fold spreading zone
2- for solid bricks.
3- for hollow bricks.
Secure anchoring in almost all building materials.
Universally applicable.

Recommended loads for EVO-Grip nail anchors in kN

Size	5*	6	8
Concrete ≥ C20 / 25	0,17	0,26	0,40
Solid brick MZ 12	0,20	0,30	0,35
Sand-lime brick KSV 12	0,20	0,30	0,35
Aerated concrete (gas concrete) PP2	0,04	0,05	0,08
Aerated concrete (gas concrete) PP4	0,08	0,10	0,12
Perforated brick HLZ 12	0,13	0,15	0,20
Lightweight concrete solid block pumice V2	0,15	0,16	0,18
Sand-lime perforated brick KSL 12	0,10	0,12	0,13

* no data available for the dimension 5 x 25

EVO-Grip nail anchor with flat head

Application: Fastening of drywall profiles, angles, plates, sheets, cable ducts and any components for non-recessed mounting

Material - nail: galvanized steel

All dimensions in mm

Article no.	Dimension	Clamping strength	Minimum setting depth	Drill hole Ø x length	Drive Z (PZD)	VPE/ outer carton
0903 805 025	5 x 25	1	25	5 x 30	2	250/3000
0903 805 030	5 x 30	5	25	5 x 30	2	250/3000
0903 805 040	5 x 40	15	25	5 x 30	2	250/3000
0903 805 050	5 x 50	25	25	5 x 30	2	200/2400
0903 806 030	6 x 30	5	30	6 x 35	2	250/3000
0903 806 040	6 x 40	10	30	6 x 35	2	200/2400
0903 806 060	6 x 60	30	30	6 x 35	2	200/1200
0903 806 080	6 x 80	50	30	6 x 35	2	200/1200

Material - nail: stainless steel

A2 All dimensions in mm

Article no.	Dimension	Clamping strength	Minimum setting depth	Drill hole Ø x length	Drive Z (PZD)	VPE/ outer carton
0903 826 040	6 x 40	10	30	6 x 35	2	200/2400

EVO-Grip nail anchor with countersunk head

Application: Fastening of substructures, squared timber, battens, sheet metal and any components for recessed mounting

Material - nail: galvanized steel

All dimensions in mm

Article no.	Dimension	Clamping strength	Minimum setting depth	Drill hole Ø x length	Drive Z (PZD)	VPE/ outer carton
0903 816 040	6 x 40	10	30	6 x 35	2	200/2400
0903 816 060	6 x 60	30	30	6 x 35	2	200/1200
0903 816 080	6 x 80	50	30	6 x 35	2	200/1200
0903 818 060	8 x 60	20	40	8 x 45	3	150/900
0903 818 080	8 x 80	40	40	8 x 45	3	150/900
0903 818 100	8 x 100	60	40	8 x 45	3	100/600
0903 818 120	8 x 120	80	40	8 x 45	3	100/600
0903 818 135	8 x 135	95	40	8 x 45	3	100/600
0903 818 160	8 x 160	120	40	8 x 45	3	100/600

Material - nail: stainless steel

A2 All dimensions in mm

Article no.	Dimension	Clamping strength	Minimum setting depth	Drill hole Ø x length	Drive Z (PZD)	VPE/ outer carton
0903 836 060	6 x 60	30	30	6 x 35	2	200/1200
0903 836 080	6 x 80	50	30	6 x 35	2	200/1200
0903 838 060	8 x 60	20	40	8 x 45	3	150/900
0903 838 080	8 x 80	40	40	8 x 45	3	150/900
0903 838 100	8 x 100	60	40	8 x 45	3	100/600
0903 838 120	8 x 120	80	40	8 x 45	3	100/600

EVO-Grip nail anchor with flat head and connecting thread

Application: For screwing on pipe clamps, plastic clips, etc.
Material - Nail: Steel,

galvanized All dimensions in mm

Article no.	Dimension	Clamping strength	Minimum setting depth	Drill hole Ø x length	Thread	VPE/ outer carton
0903 886 040	6 x 40	10	30	6 x 35	M 6	150/1800
0903 888 045	8 x 45	10	40	8 x 45	M 8	150/900

EVO-Grip nail anchor with mushroom head

Application: Fastening of wall connection profiles, roof wall profiles, chimney seals, wall covers, skylight domes, roof seals, flange fastenings, etc.
Material - Nail: Steel,

galvanized All dimensions in mm

Article no.	Dimension	Clamping strength	Minimum setting depth	Drill hole Ø x length	Drive Z (PZD)	VPE/ outer carton
0903 845 030	5 x 30	5	25	5 x 30	2	250/3000
0903 845 040	5 x 40	15	25	5 x 30	2	200/2400
0903 846 040	6 x 40	10	30	6 x 35	2	150/1800
0903 846 060	6 x 60	30	30	6 x 35	2	200/1200

Material - Nail: Stainless

steel A2 All dimensions in mm

Article no.	Dimension	Clamping strength	Minimum setting depth	Drill hole Ø x length	Drive Z (PZD)	VPE/ outer carton
0903 856 040	6 x 40	10	30	6 x 35	2	150/1800

EVO-Grip nail anchor tinsmith with tinsmith sealing washer

Application: Fastening of roof flashings, sheet metal, with simultaneous sealing of the dowel hole
Material - Nail: Stainless steel A2
Material - Washer: Stainless steel

A2 All dimensions in mm

Article no.	Dimension	Washer Ø	Clamping strength	Minimum setting depth	Drill hole Ø x length	Drive Z (PZD)	VPE/ outer carton
0903 866 040	6 x 40	15	10	30	6 x 35	2	100/1200
0903 866 041	6 x 40	20	10	30	6 x 35	2	100/1200

Material - Nail: Stainless steel A2 copper-plated
Material - Washer: Copper-plated stainless steel A2

All dimensions in mm

Article no.	Dimension	Washer Ø	Clamping strength	Minimum setting depth	Drill hole Ø x length	Drive Z (PZD)	VPE/ outer carton

0903 876 040	6 x 40	15	10	30	6 x 35	2	100/1200
0903 876 041	6 x 40	20	10	30	6 x 35	2	100/1200

Standard nail anchor

Material: Polyamide PA 6, halogen-free

All standard nail anchors can be used in concrete, solid brick, sand-lime brick, limited use in aerated concrete, lightweight concrete

Standard nail anchor with flat head

Application: Z. E.g. fastening drywall profiles, angles, panels, sheet metal, cable ducts and any components for non-recessed installation

Material - Nail: Steel,

galvanized All dimensions in mm

Article no.	Dimension	Clamping strength	Minimum setting depth	Drill hole Ø x length*	Drive Z (PZD)	PU
0903 605 030	5 x 30	5	25	5 x 30	2	250
0903 605 040	5 x 40	15	25	5 x 30	2	250
0903 606 030	6 x 30	1	30	6 x 35	2	250
0903 606 035	6 x 35	5	30	6 x 36	2	200
0903 606 040	6 x 40	10	30	6 x 36	2	200
0903 606 060	6 x 60	30	30	6 x 36	2	200

* Minimum borehole depth

Standard nail anchor with countersunk head

Application: Z. E.g. fastening of substructures, squared timber, battens, sheet metal and any components for countersunk installation

Material - Nail: Steel,

galvanized All dimensions in mm

Article no.	Dimension	Clamping strength	Minimum setting depth	Drill hole Ø x length*	Drive Z (PZD)	PU
0903 616 040	6 x 40	10	30	6 x 36	2	200
0903 616 060	6 x 60	30	30	6 x 36	2	200
0903 616 080	6 x 80	50	30	6 x 36	2	200
0903 618 060	8 x 60	20	40	8 x 48	3	150
0903 618 080	8 x 80	40	40	8 x 48	3	150
0903 618 100	8 x 100	60	40	8 x 48	3	100

* Minimum borehole depth

Recommended loads for standard nail anchors in kN (at maximum setting depth)

Size	5	6	8
Concrete ≥ C20 / 25	0,15	0,20	0,40
Solid brick MZ 20	0,15	0,20	0,35

Universal expanding nail USN

The universal and visually appealing mounting solution

The universal and visually appealing mounting solution

The USN is a quick fastening solution in almost all common building materials. It is ideal for fastening wall connection profiles, cross-cut strips, kick plates, cable ducts, junction boxes and lightweight components of all kinds up to 5 kg. The setting depth of 35 mm is very shallow. Higher pull-out values can be achieved by setting the plug deeper.

During installation, simply drill a Ø 6 mm hole and hammer in the USN. The patented elastic V-shaped spring elements provide a high expansion force. The sturdy construction made of high-quality glass fiber-reinforced nylon - "Made in Germany" - makes the expanding nail resistant to ageing, weathering and UV radiation. Electrical contact protection is provided as it is a pure plastic product.

In many outdoor applications, the USN is visible, which is why it has a visually attractive head with a high-quality EPDM seal.

The USN is available in seven colors and 2 different lengths.

Area of application:
For fixing in concrete, natural stone, solid brick, solid sand-lime brick, solid brick made of lightweight concrete, aerated concrete (PP6), vertically perforated brick, perforated sand-lime brick, hollow block made of lightweight concrete.

Note:
In perforated bricks and aerated concrete, only rotary drilling without impact.
For insulated facades, use insulating panel screws IPS or insulating panel screw anchors IPSD.

Advantages:
- Innovative, thermal bridge-free direct fastening of wall connection profiles, metal sheets, etc.
- Use in almost all common building materials with good pull-out values
- Patented elastic V-shaped spring elements ensure a high spreading force
- Spreader nail made of glass fiber reinforced nylon with EPDM seal
- Visually attractive head, various colors and lengths
- Electrical contact protection through the use of plastic
- Simple disassembly by knocking off or drilling out the head


Telegrey 1 RAL 7045


Signal white RAL 9003


Traffic black RAL 9017

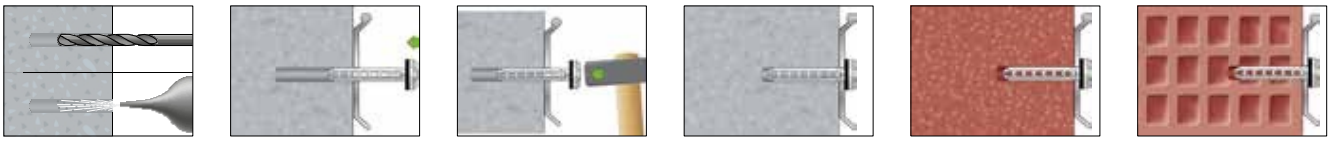

Copper brown RAL 8004


Anthracite gray RAL 7016

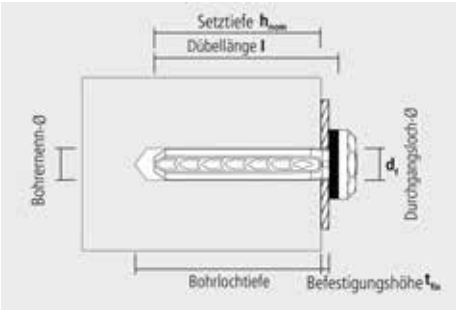

Sepia brown RAL 8014


Chocolate brown RAL 8017

Assembly



Type designation: USN Drill
core diameter: 6 mm
Drill hole depth: 40 mm
Setting depth (h nom): 35
mm
Through hole in the component to be connected (d f): 8/10 mm Head
diameter: 15 mm
Head height: 3.5 mm
Material: PA 6 GF30 - polyamide
Gasket material: Ethylene-propylene-diene-terpolymer-rubber-EPDM Dowel
diameter: 6 mm



Article no.	Color	Dowel diameter x dowel length (l)	Fastening height max. (t fixed)	Dowel length (l)	PU
0903 906 401	Telegrey RAL 7045	6 x 40 mm	5 mm	40 mm	100 pcs
0903 906 402	Signal white RAL 9003	6 x 40 mm	5 mm	40 mm	100 pcs
0903 906 403	Traffic black RAL 9017	6 x 40 mm	5 mm	40 mm	100 pcs
0903 906 404	Copper brown RAL 8004	6 x 40 mm	5 mm	40 mm	100 pcs
0903 906 405	Anthracite gray RAL 7016	6 x 40 mm	5 mm	40 mm	100 pcs
0903 906 406	Sepia brown RAL 8014	6 x 40 mm	5 mm	40 mm	100 pcs
0903 906 407	Chocolate brown RAL 8017	6 x 40 mm	5 mm	40 mm	100 pcs
0903 906 601	Telegrey RAL 7045	6 x 60 mm	25 mm	60 mm	100 pcs
0903 906 602	Signal white RAL 9003	6 x 60 mm	25 mm	60 mm	100 pcs
0903 906 603	Traffic black RAL 9017	6 x 60 mm	25 mm	60 mm	100 pcs
0903 906 604	Copper brown RAL 8004	6 x 60 mm	25 mm	60 mm	100 pcs
0903 906 605	Anthracite gray RAL 7016	6 x 60 mm	25 mm	60 mm	100 pcs
0903 906 606	Sepia brown RAL 8014	6 x 60 mm	25 mm	60 mm	100 pcs
0903 906 607	Chocolate brown RAL 8017	6 x 60 mm	25 mm	60 mm	100 pcs

Recommended loads in kN

In all directions including safety factor 7

Size	USN 6 x 40	USN 6 x 60
Concrete ≥ C 20/25	0,10	0,13
Perforated brick ≥ Hlz 12 Bulk density ≥ $^{1kg/cm3}$	0,08	0,09
Poroton ≥ T10	0,05	0,06
Poroton ≥ T 8	0,05	0,06
Aerated concrete ≥ P6	0,04	0,04

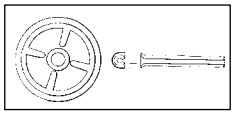
Express nails

Material: Hardened spring steel, galvanized

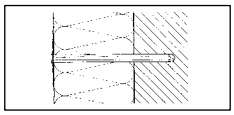
For fastening
Window frames, lath substructures, sheet metal profiles, insulation material, etc.
in
Concrete, solid brick, solid sand-lime brick, pressure-resistant natural stone

Advantages:
- Quick and easy installation
- Hardened spring steel
- Immediately loadable
- No interlocking in the packaging due to attached beading
- Easy positioning thanks to integrated centering tip
- More temperature-resistant than polyamide dowels
- The RECA express nail Ø 6 is suitable for installing insulation by attaching the sheet metal roundels

Inseparable fastening element by attaching the sheet metal roundels.



Insulation material can be attached easily, quickly and securely in this way.



Installation instructions:
Quickest and easiest installation: Drill hole - hammer in express nail - done. Nominal dowel Ø = nominal drill Ø

Article no.	Designation	Ø [mm]	Length [mm]	Drill nominal Ø [mm]	Minimum setting depth [mm]	PU
0904 686 030*	Express nails EPN galvanized*	6	30	6	27	100
0904 686 040	Express nails EPN galvanized	6	40	6	30	100
0904 686 050	Express nails EPN galvanized	6	50	6	30	100
0904 686 060	Express nails EPN galvanized	6	60	6	30	100
0904 686 080	Express nails EPN galvanized	6	80	6	30	100
0904 688 070	Express nails EPN galvanized	8	70	8	40	100
0904 688 090	Express nails EPN galvanized	8	90	8	40	100
0904 688 110	Express nails EPN galvanized	8	110	8	40	100
0904 688 130	Express nails EPN galvanized	8	130	8	40	50
0904 688 150	Express nails EPN galvanized	8	150	8	40	50

* without beading

Recommended loads in kN

Size	EPN 6	EPN 8
Concrete ≥ C20 / 25	0,7	1,0
Solid brick	0,5	0,8
Solid sand-lime brick	0,6	0,9

The specified values can be increased by deepening the express nail.

Sheet metal rondelle Ø 70 mm, galvanized:

Article no.	Hole Ø mm	PU
0904 706 085	8,5	100

Drive-in plasterboard dowel

Special dowels for fastenings in plasterboard and lightweight panels

Product description:
The plasterboard plug is driven into the plasterboard with a hammer. In conjunction with chipboard screws (Ø 3.5-4.5 mm), components can be fastened quickly and securely.

Advantages:
- Simple and quick attachment
- No pre-drilling necessary
- Centering tip for optimum setting behavior
- for wood screws Ø 3.5 - 4.5 mm
- No twisting in the wall
- Collar prevents the dowel from being pulled through
- Dowel expands when the screw is screwed in

Area of application:
For fastening
Electrical installations, lighting, pictures, light shelves, etc., on plasterboard, lightweight panels

Note:
Suitable for plasterboard up to 12.5 mm thick.
Recommended tensile load in plasterboard 12.5 mm: 0.08 kN safety factor 3

Dowel length (l): 30 mm Head diameter: 12 mm
Required chipboard screw diameter: 3.5 - 4.5 mm Material: steel
Surface: Galvanized

Item no.	PU
0905 801 020	200 PCS.

Plasterboard dowels ZD and K

Product description:
For quick and easy installation in plasterboard/gypsum fiberboard, without pre-drilling and without additional setting tools

Advantages:
- Quick installation - without special setting tools and pre-drilling
- Centering tip guarantees easy positioning and drilling into the panel
- Innovative 1/4" drive enables the dowel to be set with a PZ bit, TX bit etc.
- Power is transmitted via the 1/4" inch hexagon socket of the bit
- Plasterboard dowel and the screw can be screwed in with the same bit
- Component can be fastened with wood or chipboard screws
- Form-fit fastening

Area of application:
For attaching lightweight add-on parts, e.g. electrical installations, l i g h t i n g , pictures, lightweight shelving, etc.

Note:
Screw flush directly into the plasterboard with low torque

Watch the installation video:

Installation is possible with any 1/4" hexagon bit, regardless of the drive.

Plasterboard dowel ZD

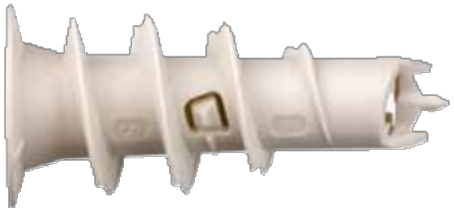
Special dowels for fastenings in plasterboard/gypsum fiberboard

- High zinc die-cast quality

Plasterboard dowel K

Special dowels for fastenings in plasterboard

- High plastic quality



Innovative drive.
Optimum power transmission thanks to the hexagon of the bit.

Drive sizes
Many bits with 1/4"
Drive can be used.
The same bit can be used for dowels and screws.

Center point
For perfect positioning and screwing into plasterboard,
without pre-drilling.

Anti-rotation device
Prevents the plug from turning back when the screw is removed.

Dowel head diameter: 14.5 mm

Item no.	Type designation	Required chipboard screw diameter	Dowel length (l)	Required wood screw diameter (d screw wood)	Recommended tensile load in plasterboard 12.5 mm	Recommended tensile load in plasterboard 2 x 12.5 mm	Temperature resistance max.	Temperature stability min.	Material	PU
0905 801 030	ZD	4.5 mm	39 mm	4 - 4.5 mm	0.1 kN	0.12 kN	80 °C	-40 °C	Zinc die casting	100
0905 801 035	K	4.5 - 5 mm	33 mm	4 - 4.5 mm	0.1 kN	0.1 kN	80 °C	-40 °C	Plastic	100

Metal cavity dowel

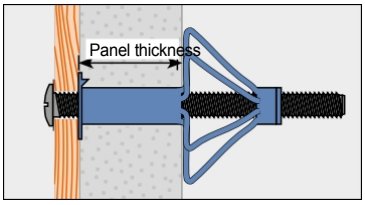
The special anchor for maximum loads in plasterboard and lightweight panels

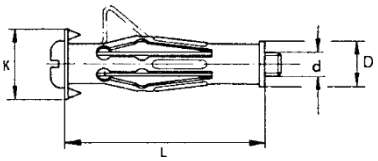
For fastening
Electrical installations, lighting, pictures, light to medium-heavy shelving, pipe clamps, brackets, frames and slats, etc.
in
Plasterboard, lightweight boards, fiber cement boards, hollow bricks

Material
Sleeve: galvanized sheet steel, screw: galvanized steel

Advantages:
- Quick and easy installation
- Safety due to sturdy sheet steel sleeve
- Safety thanks to large spreader elements
- Anti-rotation lock on the dowel collar
- Flexible thanks to combined Pozidriv / slotted drive in the lens head
- Screw can be replaced by all metric screws and threaded rods of the same diameter after expansion of the anchor

Installation instructions:
- Drill diameter according to table must be adhered to
- We recommend spreading the dowel with one of our installation pliers





Article no.	Dowel designation	Screw	Execution	Drive	Drill core Ø [mm]	Panel thickness [mm]	Lengt h L [mm]	Ø K [mm]	PU
0905 204 14	MHD 4x32/9	M 4 x 41	Lens head	PZ 2 / SZ	8	4 - 9	34	13,5	100
0905 204 15	MHD 4x38/16	M 4 x 47	Lens head	PZ 2 / SZ	8	8 - 16	40	13,5	100
0905 204 26	MHD 4x46/22	M 4 x 54	Lens head	PZ 2 / SZ	8	16 - 22	47	13,5	100
0905 204 40	MHD 4x59/38	M 4 x 67	Lens head	PZ 2 / SZ	8	32 - 38	60	13,5	100
0905 205 12	MHD 5x37/13	M 5 x 43.5	Lens head	PZ 2 / SZ	10	5 - 13	37	16,0	100
0905 205 16	MHD 5x52/18	M 5 x 60	Lens head	PZ 2 / SZ	10	5 - 18	53	16,0	100
0905 205 32	MHD 5x65/32	M 5 x 74	Lens head	PZ 2 / SZ	10	18 - 32	65	16,0	100
0905 205 45	MHD 5x80/45	M 5 x 89	Lens head	PZ 2 / SZ	10	32 - 45	81	16,0	100
0905 206 12	MHD 6x37/12	M 6 x 45	Lens head	PZ 3 / SZ	12	5 - 12	37	17,5	100
0905 206 16	MHD 6x52/18	M 6 x 60	Lens head	PZ 3 / SZ	12	5 - 18	53	17,5	100
0905 206 32	MHD 6x65/32	M 6 x 74	Lens head	PZ 3 / SZ	12	18 - 32	66	17,5	100
0905 206 45	MHD 6x80/45	M 6 x 88	Lens head	PZ 3 / SZ	12	32 - 45	81	17,5	100
0905 208 16	MHD 8x55/18	M 8 x 65	Hexagon head	SW 13	14	5 - 18	55	22	100
0905 208 32	MHD 8x65/32	M 8 x 75	Hexagon head	SW 13	14	16 - 32	67	22	100
0905 208 45	MHD 8x80/45	M 8 x 90	Hexagon head	SW 13	14	32 - 45	82	22	100

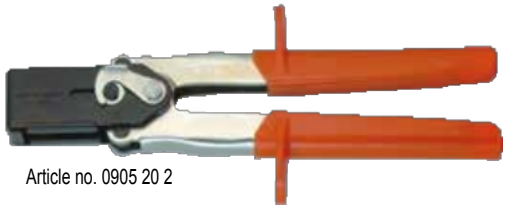
Recommended loads in kN

Size	Plasterboard d ≥ 12 mm	Chipboard d ≥ 10.0 mm	Hardboard MDF d ≥ 10.0 mm
MHD 4	0,20	0,25	0,20
MHD 5	0,20	0,25	0,20
MHD 6	0,20	0,25	0,30
MHD 8	0,20	0,25	0,30

Assembly pliers for metal cavity plugs

Article no.	Designation	PU
0905 20 1	Assembly pliers for metal cavity dowels M 4 - M 8	1
0905 20 2	Installation pliers, straight, for metal cavity dowels M 4 - M 8	1

Article no. 0905 20 1

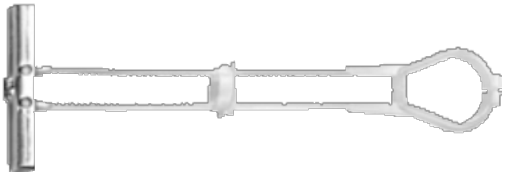


Article no. 0905 20 2

Uni cavity dowel

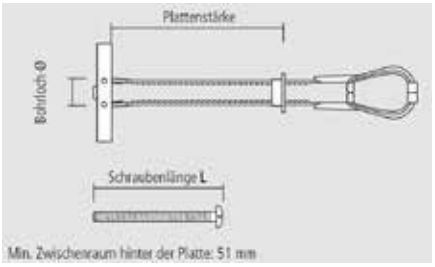
Universal fastening solution in panel materials

Material: galvanized steel / plastic



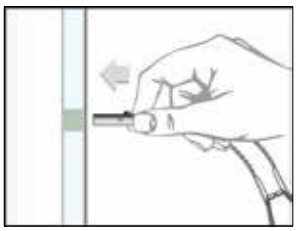
For fastening
Lighting, wall pictures, rails, shelves, etc.
in
Plasterboard, lightweight boards, fiber cement boards, hollow bricks

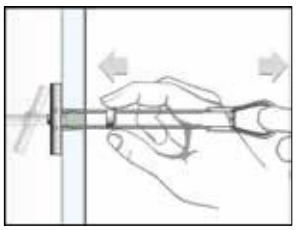
Advantages:
- Universally applicable for panel thicknesses from 10 - 70 mm
- Quick and easy installation without setting tools
- Good retention values due to large load application area
- All head shapes of metric screws can be used
- Immediately loadable

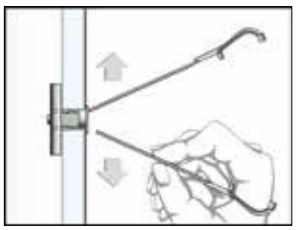


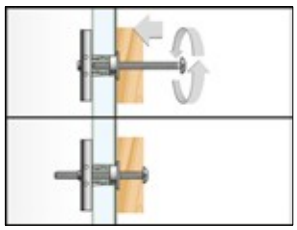
Installation instructions:
Minimum gap behind the panel: 51 mm
Apply screws by hand with low contact pressure. Screws are not included in the scope of delivery. Panel thickness: 10 - 70 mm

Article no.	Thread type x dowel Ø	Drill nominal Ø mm	Recommended tensile load in plasterboard ≥ 12 mm	PU
0905 100 004	M 4	13	0.15 kN	40
0905 100 005	M 5	13	0.2 kN	30
0905 100 006	M 6	13	0.2 kN	30
0905 100 008	M 8	18 / 19	0.2 kN	20









Spring plugs

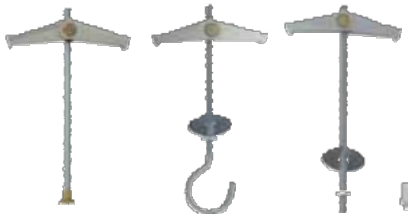
Material: galvanized steel

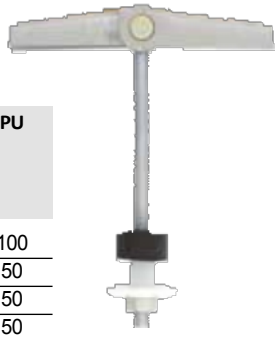
For mounting with the version
Sleeve nut: metal, wood and plastic profiles, curtain rails, etc.
Hooks: lamps, lights, hanging baskets, ceiling decorations, hanging shelves, etc.
6-kt. nut: spacer assemblies, shelves, wardrobes, lamps, ventilation, ducts, washbasins, suspended WCs, urinals, pipe suspensions, etc.

in
all materials with sufficient cavity depths - see table for minimum cavity depths

Installation instructions:
The minimum cavity depths and drill diameters must be observed. For M 10, the pre-assembled rubber plug is used to fill the large drill hole.

Advantages:
- Spring plugs require shallower cavity depths than tilt plugs
- Due to the spring force, the dowel expands automatically in any position
- Immediately loadable





Article no.	Designation	Thread x total l. mm	Thread length mm	Drill-nominal- Ø	required Cavity depth mm	Outer Ø washer mm	Breaking forces in kN	PU
0904 203 085	m. Sleeve nut	M 3 x 85	85	11	30		1,0	100
0904 204 095	m. Sleeve nut	M 4 x 95	90	14	40		2,0	50
0904 304 095	w. 6-ct. nut	M 4 x 95	90	14	40	20	2,0	50
0904 104 095	m. hook	M 4 x 95	70	14	40	20	0,3*	50
0904 310 180	w. 6-ct. nut	M 10 x 180	180	30	90		11,0	* 25

Breaking forces: These are the breaking forces of the anchor. The load-bearing capacity of the ceiling or wall is not taken into account * Hook bends open

Tilting dowel

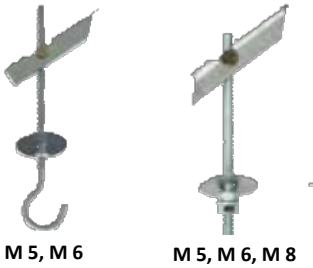
Material: galvanized steel

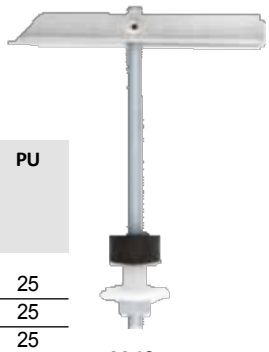
For mounting with the version
Hooks: lamps, lights, hanging baskets, ceiling decorations, hanging shelves, etc.
6-kt. nut: spacer assemblies, shelves, wardrobes, lamps, ventilation, ducts, washbasins, suspended WCs, urinals, pipe suspensions, etc.

in
all materials with sufficient cavity depths - see table for minimum cavity depths

Installation instructions:
The minimum cavity depths and drill diameters must be observed. With M 10, the pre-assembled rubber plug is used to fill the large drill hole.

Advantages:
- Automatic locking in the underground
- As the threaded rods are adjustable, a gradient (pipe) can be created by screwing them in at different depths
- Immediately loadable





Article no.	Designation	Thread x total l. mm	Thread length mm	Drill nominal Ø mm	required Cavity depth mm	Outer Ø washer mm	Breaking forces in kN	PU
0904 505 100	w. 6-ct. nut	M 5 x 100	100	15	70	30	5,0	25
0904 405 130	m. hook	M 5 x 130	80	15	70	30	0,8*	25
0904 506 100	w. 6-ct. nut	M 6 x 100	100	17	70	30	6,3	25
0904 406 130	m. hook	M 6 x 130	90	17	70	30	1,0*	25
0904 508 100	w. 6-ct. nut	M 8 x 100	100	20	75	30	13,0	25
0904 510 180	w. 6-ct. nut	M 10 x 180	180	30	140		12,0	25

Breaking forces: These are the breaking forces of the anchor. The load-bearing capacity of the substrate is not taken into account. * Hook bends open

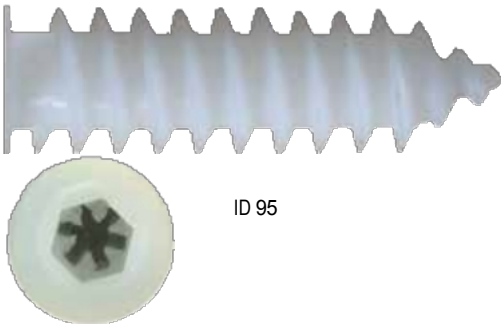
Insulating dowel ID

The special plug for fastenings in polystyrene and rigid foam boards

Material: Polyethylene PE

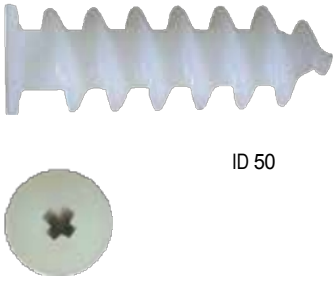
For fastening
Electrical installations, lighting, house signs, letterboxes, motion detectors, etc.
in
polystyrene and rigid foam boards as well as other thermal insulation composite systems.

Installation instructions:
Remove plaster and other surface materials from the fixing base to the size of the plug collar (see table) and screw in the plug flush without pre-drilling using a low torque.
Maximum screw-in depth of the screw: ID 50 = 40 mm
ID 95 = 70 mm



ID 95

Advantages:
- Can be used outdoors and in damp areas in conjunction with stainless steel screws
- Elaborate spacer installations in the masonry are no longer necessary
- Avoidance of thermal bridges
- Temperature-neutral -20 °C to +100 °C
- Simple processing
- Quick and inexpensive mounting
- With the 95 mm long insulating plug, the screw diameter of 8 mm, with the RECA nylon plug 0903 008 40 reduced to screw diameters of 4 - 5 mm are ⇨ universal application possibilities
- A setting tool is included with each VPE



ID 50

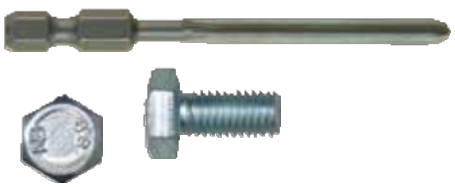
Insulating dowel ID including setting tool

Article no.	Designation	Dimension [mm]	Suitable screw Ø [mm]	PU*
0902 001 050	ID 50	18 x 50	4,0 - 5,0 / M 4	50
0902 001 095	ID 95	30 x 95	8,0 / M 8**	25

* Including a setting tool
** The screw diameter can be reduced to 4 - 5 mm with item no. 0903 008 40.
For M 8 screws, screw at least 35 mm into the anchor.

Setting tool

Article no.	Designation	PU
0902 001 051	Bit 1/4" PH 2, length 70 mm for ID 50	3
0057 8 30	DIN 933 vz, M 8 x 30 for ID 95	200

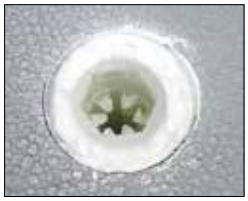


Recommended loads in kN

Size	ID 50	ID 95
Polystyrene EPS CPS 15 / PS 50	0,04	0,08
Polystyrene XPS	0,12	0,20

Assembly ID 50:

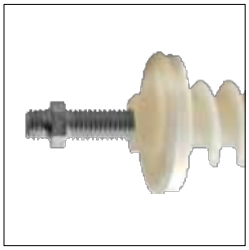
Assembly ID 95:



Pre-assembled insulating dowel ID 95 VM

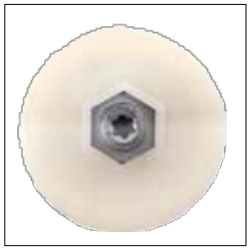
For quick and easy fastening of downpipe clamps in external thermal insulation composite systems (ETICS)

Special grub screw
in A2 or with zinc flake coating for long-term corrosion protection



Adjustable
Adjustment range up to 25 mm

Integrated drill tip
No need to pre-drill in plaster



Versatile drives
Dowel can be installed with socket wrench insert SW 17, SW 13 or TX 25 bit

EPDM seal on injection-molded cover rosette
Captive cover and optimum seal

Material

Insulating dowel:	PA
Gasket:	EPDM
Grub screw:	Steel, zinc flake coated or stainless steel

For fastening

Downpipe clamps, signs, lighting and other components

in

External thermal insulation composite systems (ETICS), e.g. rigid foam boards, polystyrene boards,
Styrofoam boards, Heraklith boards and in wood fiber insulation boards
(pre-drill with 13 mm in this case)

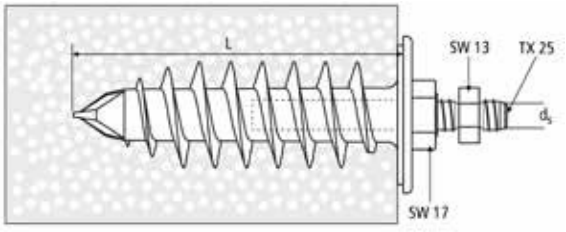
Versions: ID 95 VM M8 / M10 / M10 A2

Versions: ID 95 VM

Advantages:

- Perfect solution for fixing rainwater downpipe clamps in ETICS: simple, flexible, quick and adjustable
- Thermal bridge-free fastening directly in the insulation material
- Pre-assembled special threaded pin, no individual parts to lose
- Ideal distance of 30 mm of the downpipe from the wall
- Can be adjusted by hand by a further 25 mm
- Special grub screw optionally with zinc flake coating or made of A2 stainless steel for optimum corrosion protection
- Integrated sealing washer made of weather-resistant cellular rubber, no additional sealing required
- No pre-drilling. Robust, self-drilling (ETICS plaster ≤ 7 mm) nylon plug

For insulation thicknesses ≥ 100 mm
Dowel length: 95 mm
Sealing rosette Ø: 44.5 mm
Internal thread: M 10
Screw-in depth grub screw: min. 20 mm / max. 50 mm

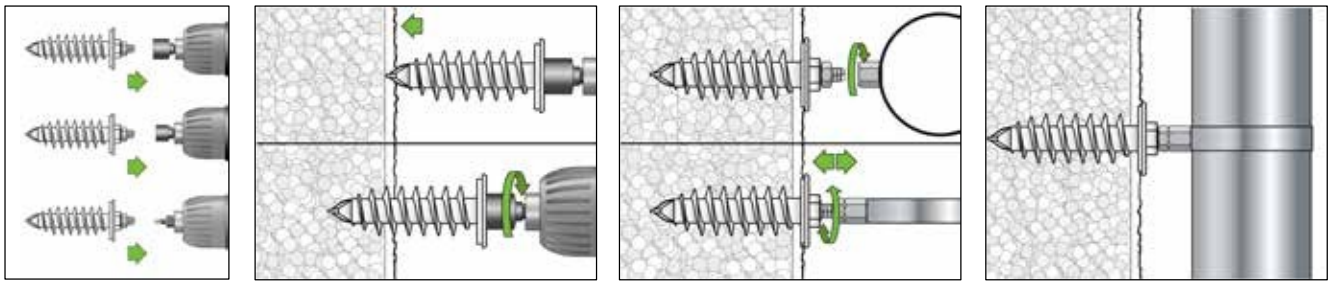


Article no.	Designation	Connection weight d_S	Material/ Gew.stift	Surface/ Grub screw	Drive	Contents	PU
0902 002 295	ID 95 VM M 8	M 8	Steel	Zinc-coated slats	TX 25, SW 13, SW 17	4 bags of 4 pieces ID 95 VM incl. grub screws and installation instructions	16
0902 002 395	ID 95 VM M 10	M 10	Steel	Zinc-coated slats	TX 25, SW 13, SW 17		16
0902 002 595	ID 95 VM M 10 A2	M 10	Stainless steel A2	blank	TX 25, SW 13, SW 17		16
0902 002 695	ID 95 VM	Without grub screw			SW 17	16x ID 95 VM	16

Recommended load in kN

Material	kN
Polystyrene EPS (PS 15/PS 20)	0,1
Polystyrene XPS	0,2

Assembly

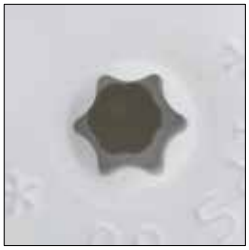


The insulating plug can be installed using an SW 13, SW 17 or TX 25 socket wrench bit. The special threaded pin can be screwed out up to 25 mm. Note: If the plug starts to turn, fix it in place with an open-end wrench SW 17.

Insulating panel screw IPS / IPS H

For quick and easy direct fastening in external thermal insulation composite systems (ETICS)

TX drive
Quick and easy setting



Head hole drilling
Possibility of additional fastening with Ø 3.5 mm chipboard screws

EPDM seal
Optimum, age-resistant seal

Strongly pronounced threads
High retention values in ETICS

Tapered drill tip
No pre-drilling in plaster

Material

Screw: Polyamide (PA6GF30) Seal:
Cellular rubber EPDM Black

For fastening

Wall connection profiles, sheet metal, plinth protection strips, cornice covers, lighting, letterboxes, signs, etc.

in

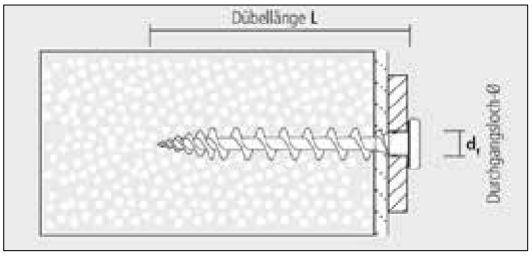
External thermal insulation composite systems (ETICS), e.g. rigid foam boards, polystyrene boards, polystyrene boards, wood fiber insulation boards, perimeter insulation, etc.

Advantages:

- Fast direct mounting
- Push-through mounting
- No pre-drilling in plaster
- No thermal bridges
- TX 25 drive
- Various colors
- EPDM seal included

Note:

For very hard plaster layers, pre-drill/punch with 5 mm.

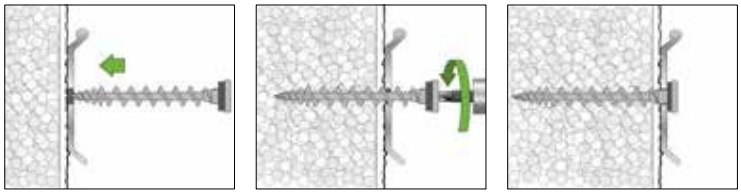


Insulating panel screw IPS

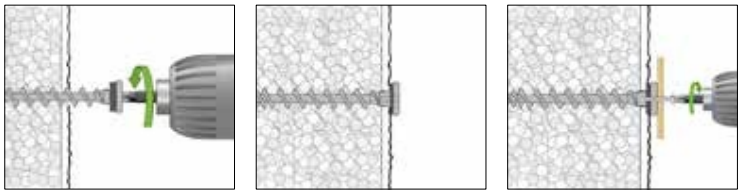
Ideal for polystyrene panels ≥ 80mm

Assembly

Push-through installation wall connection profile



Pre-mounting (easy fastening with a screw)



Can be used with screws Ø 3.5 mm; screw length 10 mm + mounting part thickness

Telegrey RAL 7045

Signal white 9003

Traffic black RAL 9017

Copper brown RAL 8004

Anthracite gray RAL 7016

Sepia brown RAL 8014

Chocolate brown RAL 8017

Recommended load in kN

Material, unplastered	kN
Polystyrene EPS (PS 15, PS 20)	0,04

Note: Loads can increase with plastered panels!

For insulation thicknesses ≥ 80 mm

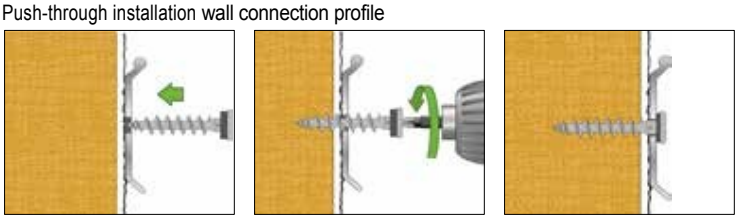
Article no.	Dowel length (L) mm	Head Ø mm	Color	Through hole in the component to be connected ($_{df}$) mm	Minimum component thickness mm	PU
0902 010 001	80	16	Telegrey RAL 7045	8 - 10	80	100
0902 010 002	80	16	Signal white RAL 9003	8 - 10	80	100
0902 010 003	80	16	Traffic black RAL 9017	8 - 10	80	100
0902 010 004	80	16	Copper brown RAL 8004	8 - 10	80	100
0902 010 005	80	16	Anthracite gray RAL 7016	8 - 10	80	100
0902 010 006	80	16	Sepia brown RAL 8014	8 - 10	80	100
0902 010 007	80	16	Chocolate brown RAL 8017	8 - 10	80	100

Insulating panel screw IPS H

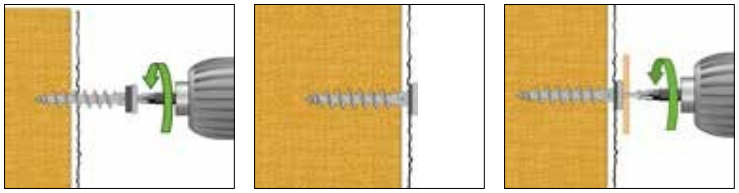
Especially for wood fiber insulation boards and perimeter insulation ≥ 60mm

Assembly

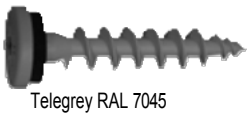
Push-through installation wall connection profile



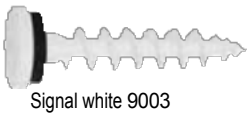
Pre-mounting (easy fastening with a screw)



Can be used with screws Ø 3.5 mm; screw length 10 mm + mounting part thickness



Telegrey RAL 7045



Signal white 9003

Traffic black RAL 9017

Anthracite gray RAL 7016

Recommended load in kN

Material, unplastered	kN
Wood fiber insulation boards	0,1
Perimeter insulation	0,07

Note: Loads can increase with plastered panels!

For insulation thicknesses ≥ 60 mm

Article no.	Dowel length (L) mm	Head Ø mm	Color	Through hole in the component to be connected ($_{df}$) mm	Minimum component thickness mm	PU
0902 011 001	60	16	Telegrey RAL 7045	8 - 10	60	100
0902 011 002	60	16	Signal white RAL 9003	8 - 10	60	100
0902 011 003	60	16	Traffic black RAL 9017	8 - 10	60	100
0902 011 005	60	16	Anthracite gray RAL 7016	8 - 10	60	100

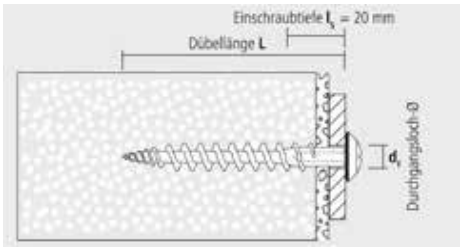
Insulating panel screw anchor IPSD / IPSD H

For quick and easy direct fastening in external thermal insulation composite systems (ETICS) with tinsmith and chipboard screws

TX drive / Perfectly matched thread geometry. Allows easy screwing in.

Strongly pronounced threads.
High retention values in ETICS.

Tapered drill tip
No need to pre-drill in plaster.



Advantages:

- Tapered drill tip - no need to pre-drill in plaster
- Strongly pronounced threads - Good retention values in ETICS
- Perfectly matched internal geometry - easy screwing in of sheet metal and chipboard screws

Areas of application:
For fixing wall end profiles, metal sheets, skirting boards, cornice covers, lighting, letterboxes, signs, etc.

in
External thermal insulation composite systems (ETICS), e.g. rigid foam boards, polystyrene boards, Styrodur boards, wood fiber insulation boards, perimeter insulation, etc.

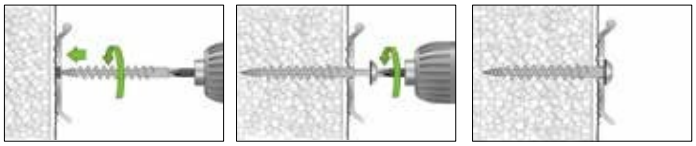
Note:
For very hard plaster layers, pre-drill/punch with 5 mm. Screws are not included in the scope of delivery.

Insulating panel screw anchor IPSD

Ideal for polystyrene panels ≥ 80mm

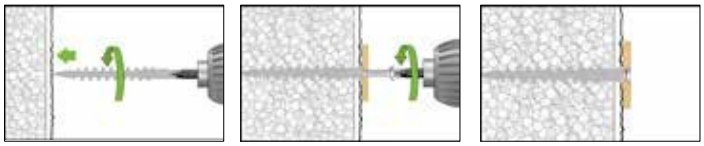
Assembly

Pre-assembly wall connection profile



Recommended tinsmith screw 4.5 x 25 mm push-in

installation with chipboard screw



Can be used with screws Ø 4.0 mm; screw length 15-20 mm + mounting part thickness

Recommended load in kN

Material	kN
Polystyrene EPS (PS 15, PS 20)	0,04

Note: Loads can increase with plastered panels!

For insulation thicknesses ≥ 80 mm.

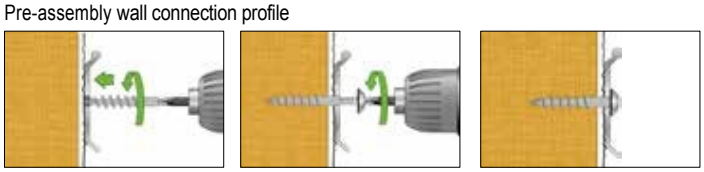
Article no.	Dowel length (L) mm	Drive TX	for screws / mm		Through hole in the component to be connected ($_{df}$) mm	Minimum component thickness mm	PU
			Tinsmith screw	Chipboard screw Ø			
0902 010 100	80	25	4,5 x 25	4,0	8 - 10	80	100

Insulating panel screw anchor IPSD H

Especially for wood fiber insulation boards and perimeter insulation ≥ 60mm

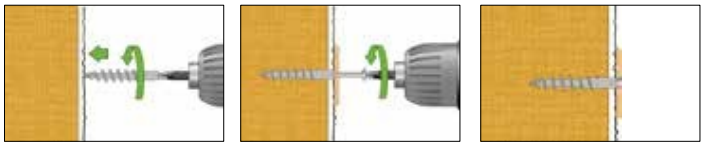
Assembly

Pre-assembly wall connection profile



Recommended tinsmith screw 4.5 x 25 mm

push-in installation with chipboard screw



Can be used with screws Ø 4.0 mm; screw length 15-20 mm + mounting part thickness

Recommended load in kN

Material, unplastered	kN
Wood fiber insulation boards	0,1
Perimeter insulation	0,07

Note: Loads can increase with plastered panels!

For insulation thicknesses ≥ 60 mm.

Article no.	Dowel length (L) mm	Drive TX	for screws / mm		Through hole in the component to be connected ($_{df}$) mm	Minimum component thickness mm	PU
			Tinsmith screw	Chipboard screw Ø			
0902 011 100	55	25	4,5 x 25	4,0	8 - 10	60	100

Dimos Mini Sets / Stone

Thermally separated distance mounting system
- the ideal solution for light loads on thermally insulated façades

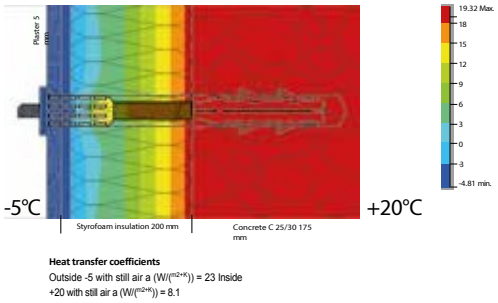
Product description:
The Dimos Mini system offers the perfect fixing solution, especially when using soft insulation materials such as rock wool.

Advantages:
- For insulation thicknesses from 50-200 mm
- Variable connection options
- No thermal bridges
- Especially suitable for soft insulation materials such as rock wool
- No pressure load on the façade
- Slim head geometry for invisible fastenings

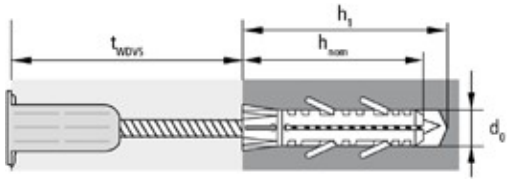
Area of application:
For fixing e.g. downpipes, signs, blind guides, letterboxes, lighting, shutter strips etc. to insulated walls.

Note:
When used with a mounting threaded pin, ideal for fastening drop tube clamps, for example.
When used without a mounting grub screw, components can be fastened in the decoupling element with M6 threaded screws.
When used without a mounting grub screw, it can be fixed with wood screws Ø 3-4.5 mm using the enclosed 5x25 mm dowel.
Flexible cover cap, optionally available.

Thermal image



Heat transfer coefficients
Outside -5 with still air a (W/(m²*K)) = 23 Inside
+20 with still air a (W/(m²*K)) = 8.1



Watch the installation video:

Recommended loads in kN

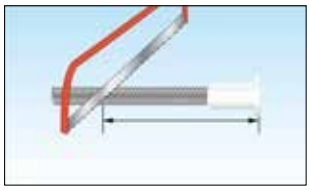
Material	Concrete C20/25	Solid stone Mz 12	Perforated brick ≥ Hlz 12, bulk density ≥ 1 kg/cm³	Aerated concrete P4
Tensile values in kN*	1	0,5	0,2	0,4

* The maximum recommended tensile load when used with a 5/25 dowel in the decoupling element is limited to 0.35 kN.

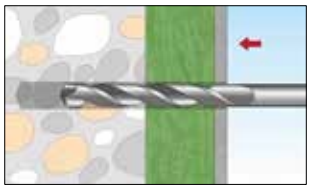
Material	EPS 20	XPS 20	PUR	Wood fiber insulation board	Rock wool
Transverse tension values in kN**	0,15	0,15	0,15	0,15	0,15

** Applies to insulation materials with plaster thicknesses ≥ 5mm

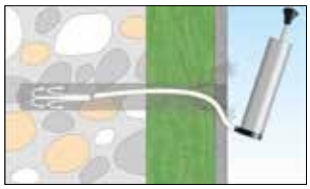
- The anchoring depth of the anchor must be observed.
- Drilling methods and borehole cleaning must be adapted to the building material.
- Approved dowels must be used for safety-relevant fixings.



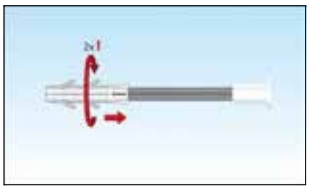
Shorten the threaded rod to the required length. The sawing aid included in each package provides assistance.



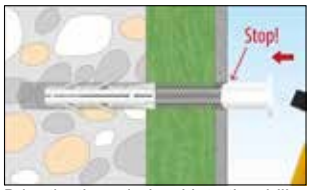
Drill a Ø 14 mm hole in the building material.
Drill hole depth: 90 mm + t_{ETICS}



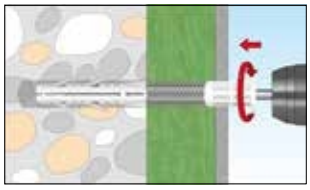
Clean the borehole.



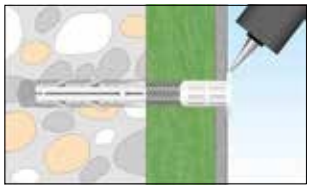
Screw the 14/70 mm dowel onto the threaded rod with a maximum of two turns.



Drive the threaded rod into the drill hole until the white decoupling element touches the plaster.

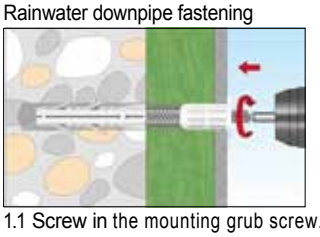


Screw in until the collar of the decoupling element is flush with the plaster. Seal the gap between the plaster and the decoupling element with a suitable sealant.

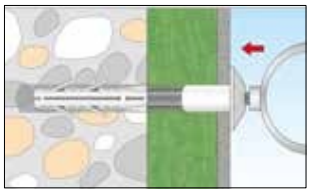


Seal the gap between the plaster and the decoupling element with a suitable sealant.

Application example 1
Rainwater downpipe fastening

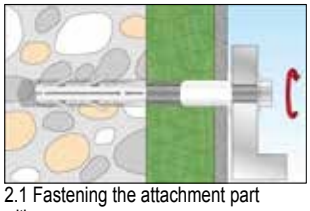


1.1 Screw in the mounting grub screw.



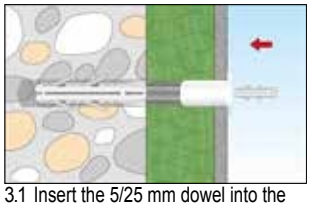
1.2 Attach the cover cap and fit the pipe clamp. Optional cover cap, M8: item no. 0902 002 008 / M10: 0902 002 010

Application example 2
Mounting with M6 screw for miscellaneous

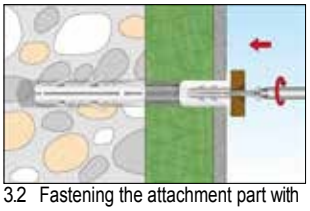


2.1 Fastening the attachment part with
M6 screw.

Application example 3
Mounting with screw for miscellaneous



3.1 Insert the 5/25 mm dowel into the decoupling
hammer in the ventilation element.



3.2 Fastening the attachment part with a screw Ø 3.0 - 4.5 mm.

Article no.	Adapter connection thread / internal drive	Insulation thickness min./max. (t_{ETICS})	Internal drive Dowel	Content note	Dowel diameter x dowel length (l)	Trench depth (h_{nom})	Nominal drill diameter (d_0)	Borehole depth (h_1)	Surface	PU*
0902 022 120	M8 / TX25	50-120 mm	TX50	M8x120 Dowel 14x70 Dowel 5x25 Adapter M8/M6	14 x 70 mm	70 mm	14 mm	90 mm	Galvanized	20 PCS.
0902 022 200	M8 / TX25	50-200 mm	TX50	M8x200 Dowel 14x70 Dowel 5x25 Adapter M8/M6	14 x 70 mm	70 mm	14 mm	90 mm	Galvanized	20 PCS.
0902 023 120	M10 / TX25	50-120 mm	TX50	M8x120 Dowel 14x70 Dowel 5x25 Adapter M10/M6	14 x 70 mm	70 mm	14 mm	90 mm	Galvanized	20 PCS.
0902 023 200	M10 / TX25	50-200 mm	TX50	M8x200 Dowel 14x70 Dowel 5x25 Adapter M10/M6	14 x 70 mm	70 mm	14 mm	90 mm	Galvanized	20 PCS.

* TX50 bit is included with every VPE

Dimos Mini Sets / Wood

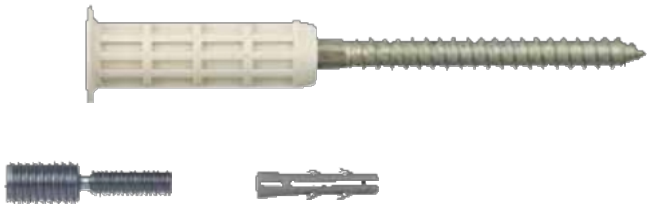
Thermally separated spacer mounting system. The ideal solution for light loads on buildings in timber frame construction with plaster base boards 50-80 mm

Product description:
The Dimos Mini System / Wood offers the perfect fastening solution especially for timber frame construction with insulation made of wood fiber insulation boards

Advantages:
- For wood fiber insulation boards from 50-80 mm
- Quick and easy installation
- Variable connection options
- No thermal bridges
- No pressure load on the façade
- Slim head geometry for invisible fastenings

Area of application:
For fixing e.g. downpipes, signs, blind guides, letterboxes, lighting, lightning conductors etc. to insulated walls

Note:
When used with a mounting threaded pin, ideal for fastening drop tube clamps, for example.
When used without a mounting grub screw, components can be fastened in the decoupling element with M6 threaded screws.
When used without a mounting grub screw, fixing with wood screws Ø 3-4.5 mm is possible with the enclosed 5x25 mm dowel Flexible cover cap, optionally available



Watch the installation video:

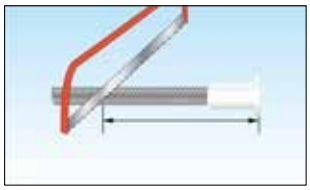
Recommended loads in kN

Material	Wood C20/25
Tensile values in kN*	1

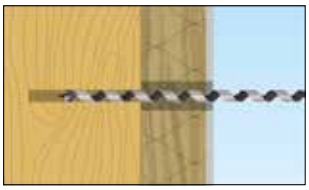
* The maximum recommended tensile load when used with a 5/25 dowel in the decoupling element is limited to 0.35 kN.

Material	Wood
Transverse tension values in kN	0,15

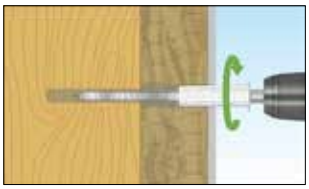
- The anchoring depth of the anchor must be observed.
- Drilling methods and borehole cleaning must be adapted to the building material.
- Approved dowels must be used for safety-relevant fixings.



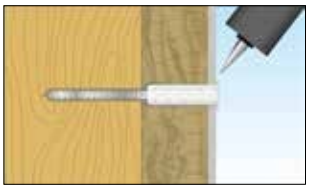
Drill a Ø 14 mm hole in the insulation.
Drill hole depth: 50 mm



Drill a Ø 5 mm hole in the wood.
Drill hole depth: ≥ 30 mm + t_{WDVS}

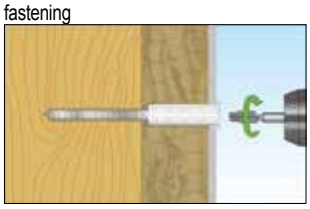


Screw in until the collar of the decoupling element is flush with the plaster.

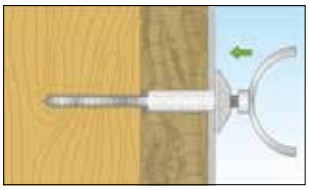


Seal the gap between the plaster and the decoupling element with a suitable sealant.

Application example 1
Rainwater downpipe fastening

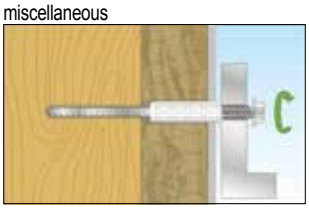


1.1 Screw in the mounting grub screw.



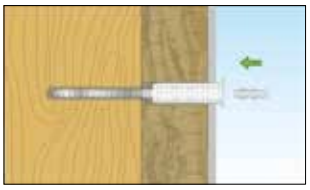
1.2 Attach the cover cap and fit the pipe clamp. Optional cover cap, M8: item no. 0902 002 008 / M10: 0902 002 010

Application example 2
Mounting with M6 screw for miscellaneous

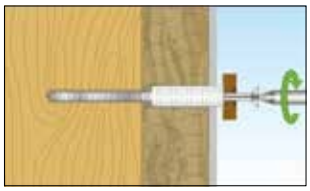


2.1 Fastening of the attachment part with M6 screw.

Application example 3
Mounting with screw for miscellaneous



3.1 Drive dowel 5/25 into the decoupling element.



3.2 Fasten the attachment part with a screw Ø 3.0 - 4.5.

Article no.	Adapter connection thread / internal drive	Insulation thickness min./max. (t_{ETICS})	Internal drive Dowel	Content note	Anchorage depth (l_{ef})	Drill bit nominal diameter (d_0)	Borehole depth (h_1)	Surface	PU*
0902 024 110	M8 / TX25	50-80 mm	TX50	Ø 8x110 Dowel 5x25 Adapter M8/M6	30 mm	14 mm	50 mm	Galvanized	20 PCS.
0902 025 110	M10 / TX25	50-80 mm	TX50	Ø 8x110 Dowel 5x25 Adapter M10/M6	30 mm	14 mm	50 mm	Galvanized	20 PCS.

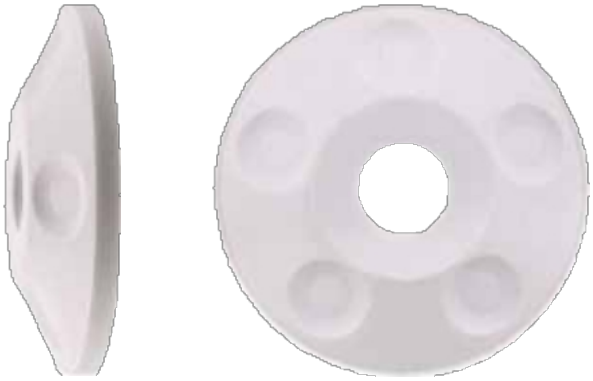
* TX50 bit is included with every VPE

Flexible cover cap

Quick and clean joint cover by sliding the cover cap over the threaded connection

Advantages:
- Easy handling
- Slide onto threaded connection
- Clean wall connection
- Flexible protection against rain and splashing water
- No cumbersome unscrewing required
- Available for M8 and M10

Area of application:
Optimum covering of joints that occur, for example, when fixing downpipe clamps, signs, lighting or similar between the connection thread and the substrate.







Outer diameter (20): 40 mm
Material (30): Thermoplastic elastomers

Item no.	Nominal diameter (10)	PU
0902 002 008	8 mm	50 pcs
0902 002 010	10 mm	50 pcs

Dimos

The distance mounting system for load bridging in full thermal insulation

Material: POM natural

For fastening
Canopies, pergolas, awnings, shutters, brackets, downpipes, chimneys, signs, lighting, letterboxes, etc.

in
Various substrates if an insulation layer has to be bridged

Installation instructions:
1. Create a suitable spacer sleeve by sawing the yard goods to size
2. Possibly insert RECA Dimos into the insulation as a centering aid
3. Create dowel hole
4. Pre-install dowels
5. Installing RECA Dimos
6. Fastening the console

Advantages:
- Reliable power transmission on various surfaces
- Can be used independently of anchors, for example with bolt anchors and composite mortar systems
- Suitable for various dowel and anchor rod diameters up to M16
- Thanks to its slim shape, RECA Dimos in Ø 40 mm is covered by most brackets
- RECA Dimos in Ø 80 mm for large-area pressure transmissions
- Quick and easy installation
- Large insulation thicknesses can be bridged by RECA Dimos
- Immediately loadable - no waiting times

1. Drill a hole in the insulation.

2. Drill a hole in the substrate (use RECA Dimos as a centering aid if necessary).

3. Saw to length.

4. for pre-assembly: Pre-install the dowels, install the RECA Dimos.

5. For push-through installation: Install the bracket with RECA Dimos.

6. Fasten the bracket in accordance with the installation instructions for the anchor used.

RECA Dimos

Article no.	Designation	Length [mm]	Outer Ø [mm]	Inner Ø [mm]	Drill hole Ø [mm]	PU
0902 641 000	Dimos 40/18/1000	1.000	40	18	≥ 42	1
0902 681 000	Dimos 80/30/1000	1.000	80	27	≥ 85	1

RECA *diaflex* AllCut

Article no. 0662 191 ...

Turbo screw

Self-tapping screw for dowel-free installation of window and door frames

Material: Case-hardened steel, galvanized

For fastening
z. e.g. window and door frames made of wood, plastic and aluminum
in
Concrete, lightweight concrete, solid bricks, sand-lime bricks, aerated concrete, natural stone and other pressure-resistant solid materials, as well as vertically perforated bricks, perforated sand-lime bricks, hollow blocks made of lightweight concrete

Installation instructions:
Observe drilling diameters and screw-in depths for various building materials according to the table.

Advantages:
- Easy screwing in due to cutting groove in the thread
- Low-tension and low-expansion connection
- Continuous thread suitable for all window frame types and wall types
- Optimum power transmission and low ejection forces on the bit thanks to TX drive

Turbo screw flat head K11 - TX 30

Surface	galvanized	
Nominal Ø d	7,5	
Head Ø dK	11	
Drive	TX 30	
Length l	Article no.	PU
42	0233 775 042	100
72	0233 775 072	100
92	0233 775 092	100
112	0233 775 112	100
132	0233 775 132	100
152	0233 775 152	100
182	0233 775 182	100
212	0233 775 212	100
252	0233 775 252	100
302	0233 775 302	100
suitable bit	0702 333 002	12

Matching press-on caps (without studs) for K11 turbo screws

Article no.	Color	RAL no.	PU
0590 11	pure white	9010	100
0590 110	nut brown	8011	100

Turbo screw semicircular head K12.5 - TX 30

Surface	galvanized	
Nominal Ø d	7,5	
Head Ø dK	12,5	
Drive	TX 30	
Length l	Article no.	PU
42	0233 675 042	100
72	0233 675 072	100
92	0233 675 092	100
112	0233 675 112	100
132	0233 675 132	100
152	0233 675 152	100
182	0233 675 182	100
212	0233 675 212	100
suitable bit	0702 333 002	12

Turbo screw cylinder head K8 - TX 30

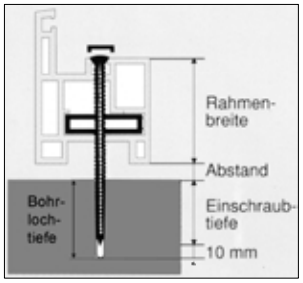
Surface	galvanized	
Nominal Ø d	7,5	
Head Ø dK	8	
Drive	TX 30	
Length l	Article no.	PU
72	0233 975 072	100
92	0233 975 092	100
112	0233 975 112	100
132	0233 975 132	100
152	0233 975 152	100
182	0233 975 182	100
212	0233 975 212	100
252	0233 975 252	100
302	0233 975 302	100
suitable bit	0702 333 002	12

Turbo screw cylinder head K7.5 - TX 25

Surface	galvanized	
Nominal Ø d	7,5	
Head Ø dK	7,5	
Drive	TX 25	
Length l	Article no.	PU
72	0233 875 072	100
92	0233 875 092	100
112	0233 875 112	100
132	0233 875 132	100
152	0233 875 152	100
182	0233 875 182	100
212	0233 875 212	100
suitable bit	0702 332 502	12

Screw length = frame width + distance + screw-in depth

Underground	Concrete	Sand-lime brick (solid brick)	Solid brick	Pumice	Aerated concrete	Lightweight concrete	Lattice tile
Screw-in depth:	30 mm	40 mm	40 mm	50 mm	50 mm	60 mm	60 mm
Drill core Ø:	6.5 mm	6.0 mm	6.0 mm	6.0 mm	-	6.0 mm	6.0 mm



Metal frame dowels

For stable and quick installation of window and door frames

The MRD 10 metal frame anchor is used for fixing all types of frames and substructures made of wood or metal in concrete or solid brick substrates.

Material - Sleeve: Sheet steel with aluminum-zinc coating
Material - screw: galvanized steel
Cone: Case-hardened galvanized steel

For fastening
Window and door frames made of wood, plastic and aluminum, etc.

in
Concrete, solid brick, sand-lime brick, natural stone and other pressure-resistant solid materials

Installation instructions:
Drill core diameter = dowel diameter.
Drilling holes in masonry without impact.

Advantages:
- Impact shoulder on the screw head prevents premature expansion when tapping in
- Cone lock reliably prevents rotation and falling out of the sleeve
- Countersunk head for easy countersinking in the window frame

Metal frame dowel MRD 10

Article no.	Designation	Dim. [mm]	Max. Clamping thickness [mm]	Drive screw	PU
0906 210 072	MRD 10 10/72	10 x 72	30	PZ 3	100
0906 210 092	MRD 10 10/92	10 x 92	50	PZ 3	100
0906 210 112	MRD 10 10/112	10 x 112	70	PZ 3	100
0906 210 132	MRD 10 10/132	10 x 132	90	PZ 3	100
0906 210 152	MRD 10 10/152	10 x 152	110	PZ 3	100
0906 210 182	MRD 10 10/182	10 x 182	140	PZ 3	100
0906 210 202	MRD 10 10/202	10 x 202	160	PZ 3	100

Recommended loads and characteristic values for metal frame anchors

Characteristic values		MRD 10
Drill hole	[mm]	10 x 55
Min. anchoring depth	[mm]	40
Max. Tightening torque	[Nm]	8
Recommended loads		
Concrete ≥ C20/25	[kN]	0,6
Solid brick ≥ Mz 12	[kN]	0,6
Sand-lime brick ≥ Ks 12	[kN]	0,3
Perforated brick*≥ Hlz 12	[kN]	0,5
Aerated concrete ≥ PB 2, PP 2	[kN]	0,1

* depending on the formation and strength of the stones

Cover caps for metal frame dowels MRD 10

Article no.	Designation	Color	Execution*	PU
0906 415 01	Cover cap	white	flat	100
0906 417 01	Cover cap	white	overlapping	100
0906 417 03	Cover cap	light brown	overlapping	100
0906 417 04	Cover cap	dark brown	overlapping	100

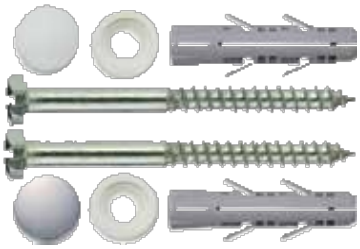
* flat = for recessed mounting
overlapping = for non-recessed mounting

WC fixtures

With the previous installation with slotted screw and dowel, it was almost impossible to install the toilet seat optimally and securely due to lack of space.
Too little space on the object prevents a tight fit between the tool and the screw. This can result in inadequate fastening and easy slipping, which can damage the ceramic object.
The hexagon head also makes it possible to work with a reversible ratchet as a drive tool to save space. Increased performance during assembly, as no contact pressure is required. Safety for correct fastening thanks to effortless, good power transmission.

with hexagon head screws

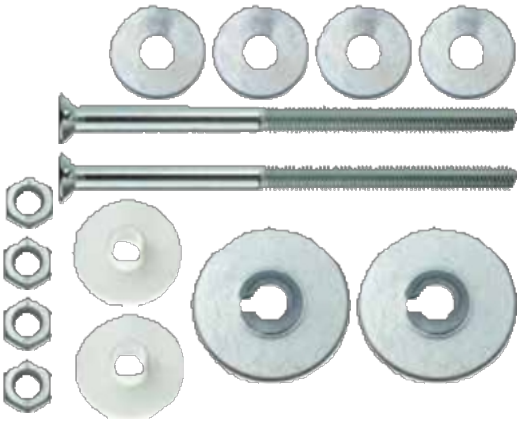
Article no.	Contents
0903 999 570	2 dowels 8 x 40 2 pcs. washers 2 pcs. screws DIN 571 with slot 6 x 70 2 pcs. cover caps white
0903 999 571	2 dowels 8 x 40 2 pcs. washers 2 pcs. screws DIN 571 with slot 6 x 70 2 pcs. cover caps chrome



Special fastening

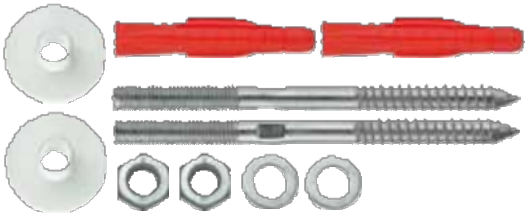
Special fastening for thin walls in sanitary and general installation areas. Due to the large rear support (of the washer 65 mm), objects such as
For example, washbasins, consoles, etc. can be easily mounted on thin walls (push-through mounting).

Article no.	Contents
0905 900 690	2 pcs. countersunk screws DIN 604 with lug M 10 x 160 2 pcs. washers Ø 65 mm with mounting for lug bolts 4 pcs. nuts M 10 4 washers Ø 34 mm 2 plastic washers with collar



Washbasin mounting set 10 pcs.

Article no.	Contents	PU/set
0905 920 100	2 dowels 14 x 75 2 pcs. washers 2 hanger bolts M 10 x 140 2 pcs. collar sleeves M 10 2 pcs. hexagon nuts M 10	15



Ceiling nail Dowel

The ceiling nail anchor is the quick solution for fixings in concrete

Material: galvanized steel

For fastening
e.g. suspended ceilings, metal profiles, perforated strips, wire hangers, nonius hangers, wooden strips, wooden battens, squared timber, can be used for multiple fastenings of non-load-bearing systems in concrete

in
reinforced, unreinforced, cracked and non-cracked normal concrete with a strength class of at least C20/25 and at most C50/60.

Installation instructions:
The dowel is expanded by hammering in the expansion wedge with a hammer.

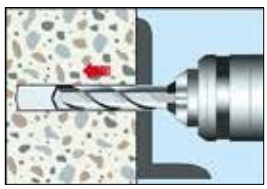
Advantages:
- Quick and easy installation.
- Small drilling diameter and low anchoring depth.
- Enables push-through mounting.
- Multiple fastening.
- High load capacity.

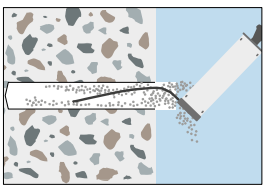
ETA-23/0246

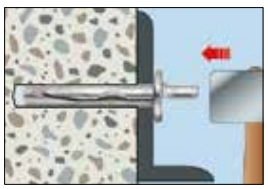
European Technical Assessment for use as multiple fastening of non-structural systems in concrete

F30-F120

Article no.	Designation	Drill core Ø (mm)	Max. Clamping thickness (mm)	PU
0904 006 040	DN-6-40	6	≤ 5,0	100
0904 006 070	DN-6-70	6	≤ 35,0	100







Extract from the conditions of use of the European Technical Assessment ETA-23/0246 for use in redundant non-structural systems

Permissible loads according to EN 1992-4 without the influence of center distances and edge distances. The total safety factor (γ_M and γ_F) was taken into account. The permissible loads per fixing point are to be taken from the corresponding national regulations of the EOTA member countries.

and may be below the permissible load of the anchor.

Loads and characteristic values			**DN 6x40/5**	**DN 6x70/35**
			Concrete C20/25 to	C50/60
Permissible load at any angle	Permitted F	[kN]	2,4	2,4
Load under fire exposure (C20/25 to C50/60)				
Permissible load R30	Permitted F	[kN]	0,7	0,7
Permissible load R60	Permitted F	[kN]	0,6	0,6
Permissible load R90	Permitted F	[kN]	0,5	0,5
Permissible load R120	Permitted F	[kN]	0,4	0,4
Center and edge distances				
Anchoring depth	hef	[mm]	32	32
Minimum center distance	smin	[mm]	200	200
Minimum edge distance	cmin	[mm]	150	150
Minimum component thickness	hmin	[mm]	80	80
Assembly data				
Drill hole diameter	do	[mm]	6	6
Drill hole depth	h1 ≤	[mm]	40	40
Cultivation part thickness	tfix ≥	[mm]	5	35
Head diameter		[mm]	15	15

RECA Dowel Service - We take care of it!

Dowel service

Better safe than sorry.

You provide us with the calculated anchor verification or the loads acting on the anchor. You will then receive a fixing proposal from us, based on your data, with our alternative dowels.
We also carry out pull-out tests on site and draw up a load report for you.

berechnungsservice@recanorm.de

Dowel training/seminar

Basics and fastening systems relevant to building authorities in the
Craft.

The training is aligned with the topics of DIN EN 1090 and the specifications of the German Institute for Building Technology (DIBt) "Competence requirements for anchor fitters". We would also be happy to train you and your fitters directly in your company.

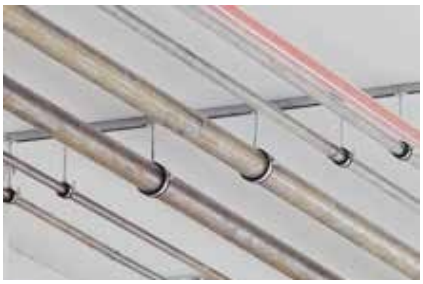
kundenschulung@recanorm.de

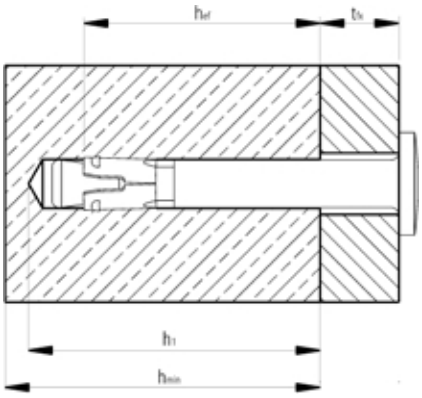
Nail anchor N

For ceiling suspensions, pipes, cladding, cable trays.
The nail anchor combines the advantages of a bolt anchor with simple installation, as the nail anchor is only hammered into the drill hole through the attachment. Subsequent application of a torque is not necessary, even with the threaded version.

Multiple fixing of non-structural systems in concrete: European Technical Approval ETA- 11/0240.

Fire resistance: R30, R60, R90, R120 (anchoring base concrete C20/25 to C50/60)
Technical Report TR 020 "Assessment of anchorages in concrete with regard to fire resistance" (included in ETA-11/0240).





- Quick and easy installation
- Low drilling effort due to reduced anchoring depth of 25 mm
- Simple setting process: simply hammer in - no torque required
- No special drilling tool and no setting tool required
- Push-through mounting
- Very small edge and center distances possible
- Elegant and visually appealing
- Load-controlled anchor expansion through load application
- Permissible load up to 2.81 kN
- Only one product for two dimensions: M8/M10 stepped thread (N-M)

ETA-11/0240

F30-F120

Nail anchor N galvanized steel, with M6 connection thread

Item no.	Dowel diameter x Dowel length (l)	Drill nominal diameter (d 0)	Fastening height max. (t fixed)	Borehole depth (h 0)	Effective embedment depth (h ef)	Fastening height max. reduced (t fix ,red)	Drilling hole depth reduced (h 0.red)	Effective trench depth reduced (h ef,red)	Through hole in the component to be connected (d f)	Minimum component thickness (h min)	PU
0904 000 644	6 x 44 mm	6 mm	0 mm	40 mm	30 mm	5 mm	35 mm	25 mm	7 mm	80 mm	200 PCS.
0904 000 649	6 x 49 mm	6 mm	5 mm	40 mm	30 mm	10 mm	35 mm	25 mm	7 mm	80 mm	200 PCS.
0904 000 654	6 x 54 mm	6 mm	10 mm	40 mm	30 mm	15 mm	35 mm	25 mm	7 mm	80 mm	200 PCS.

Nail anchor N stainless steel A4, with M6 connecting thread

Item no.	Dowel diameter x Dowel length (l)	Drill nominal diameter (d 0)	Fastening height max. (t fixed)	Borehole depth (h 0)	Effective embedment depth (h ef)	Fastening height max. reduced (t fix ,red)	Drilling hole depth reduced (h 0.red)	Effective trench depth reduced (h ef,red)	Through hole in the component to be connected (d f)	Minimum component thickness (h min)	PU
0904 003 649	6 x 49 mm	6 mm	5 mm	40 mm	30 mm	10 mm	35 mm	25 mm	7 mm	80 mm	200 PCS.

Nail anchor N-M galvanized steel, with stepped internal thread M8 / M 10

Item no.	Dowel diameter x Dowel length (l)	Drill nominal diameter (d 0)	Borehole depth (h 0)	Effective embedment depth (h ef)	Through hole in the component to be connected (d f)	Minimum component thickness (h min)	Surface	Material	Dowel diameter	Dowel length (l)	PU
0904 002 658	6 x 58 mm	6 mm	35 mm	25 mm	7 mm	80 mm	Galvanized	Steel	6 mm	58 mm	100 PCS.
0904 002 663	6 x 63 mm	6 mm	40 mm	30 mm	7 mm	80 mm	Galvanized	Steel	6 mm	63 mm	100 PCS.

Nail anchor N-K galvanized steel, with nail head

Nail head diameter: 13 mm

Item no.	Dowel diameter x Dowel length (l)	Drill nominal diameter (d 0)	Fastening height max. (t fixed)	Borehole depth (h 0)	Effective embedment depth (h ef)	Fastening height max. reduced (t fix ,red)	Drilling hole depth reduced (h 0.red)	Effective trench depth reduced (h ef,red)	Through hole in the component to be connected (d f)	Minimum component thickness (h min)	PU
0904 001 639	6 x 39 mm	6 mm	0 mm	40 mm	30 mm	5 mm	35 mm	25 mm	7 mm	80 mm	200 PCS.
0904 001 644	6 x 44 mm	6 mm	5 mm	40 mm	30 mm	10 mm	35 mm	25 mm	7 mm	80 mm	200 PCS.
0904 001 669	6 x 69 mm	6 mm	30 mm	40 mm	30 mm	35 mm	35 mm	25 mm	7 mm	80 mm	200 PCS.
0904 001 689	6 x 89 mm	6 mm	50 mm	40 mm	30 mm	55 mm	35 mm	25 mm	7 mm	80 mm	100 PCS.

Nail anchor N-K stainless steel A4 , with nail head

Nail head diameter: 13 mm

Item no.	Dowel diameter x Dowel length (l)	Drill nominal diameter (d 0)	Fastening height max. (t fixed)	Borehole depth (h 0)	Effective embedment depth (h ef)	Fastening height max. reduced (t fix ,red)	Drilling hole depth reduced (h 0.red)	Effective trench depth reduced (h ef,red)	Through hole in the component t o be connected (d f)	Minimum component thickness (h min)	PU
0904 004 644	6 x 44 mm	6 mm	5 mm	40 mm	30 mm	10 mm	35 mm	25 mm	7 mm	80 mm	200 PCS.
0904 004 669	6 x 69 mm	6 mm	30 mm	40 mm	30 mm	35 mm	35 mm	25 mm	7 mm	80 mm	200 PCS.

Setting tool for nail anchor N-K

- SDS plus holder
- With centering tip for secure fit

Article no. 0904 001 004

ETA-11/0240

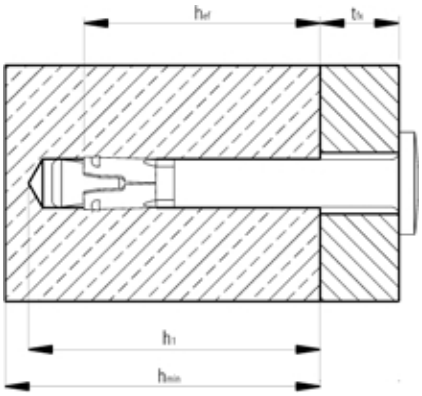
Extract from the conditions of use of the European Technical Assessment ETA-11/0240 for use in redundant non-structural systems

Permissible loads according to EN 1992-4 without the influence of center distances and edge distances. The total safety factor (γ_M and γ_F) was taken into account. The permissible loads per fixing point can be found in the corresponding national regulations of the EOTA member states and may be below the permissible load of the anchor. For load-bearing capacities under fire exposure, see end of catalog.

Loads and characteristic values	Nail anchor galvanized steel, stainless steel A4, HCR		NN-K		N-M			
			cracked / non-cracked concrete					
Anchoring depth	h_{ef}	[mm]	25	30	25	30	25	30
Permissible load (Fig. 1)	C12/15 permissible F	[kN]	1,43	1,90	1,43	1,90	1,43[1)]	1,90[1)]
	C20/25 - C50/60 permissible F	[kN]	2,14	2,81	2,14	2,81	2,14[1)]	2,81[1)]
Permissible load (Fig. 2)	C12/15 permissible F	[kN]	0,71	0,95	0,71	0,95	0,71[1)]	0,95[1)]
	C20/25 - C50/60 permissible F	[kN]	0,95	1,19	0,95	1,19	0,95[1)]	1,19[1)]
Permissible bending moment	Permitted M	[Nm]	5,3	5,3	7,3/7,7[2)]	7,3/7,7[2)]	7,3	7,3
Minimum component thickness	h_{min}	[mm]	80	80	80	80	80	80
Assembly data								
Drill hole diameter	d_o	[mm]	6	6	6	6	6	6
Through hole in the attachment part	d_f	[mm]	7	7	7	7	-	-
Nail head diameter		[mm]	-	-	13	13	-	-
Drill hole depth	h_1	[mm]	35	40	35	40	35	40
Torque when anchoring	T_{inst} <	[Nm]	4	4	-	-	-	-

1) For the N-M version, a verification for shear load with lever arm must be carried out if shear force is present.

2) Galvanized steel / stainless steel A4, HCR



Corresponding center and edge distances [mm]:

The permissible resistance F applies to one fixing point. A fixing point can be

- **Single dowel,**
- **Dowel pair** with center distance s ≥ 50 mm or
- **Group of four** with s ≥ 50 mm

If the center distance of the dowels in a fixing point is greater than or equal to the corresponding center distance between the fixing points, the characteristic resistances apply to each individual dowel.

Figure 1: Maximum load capacity

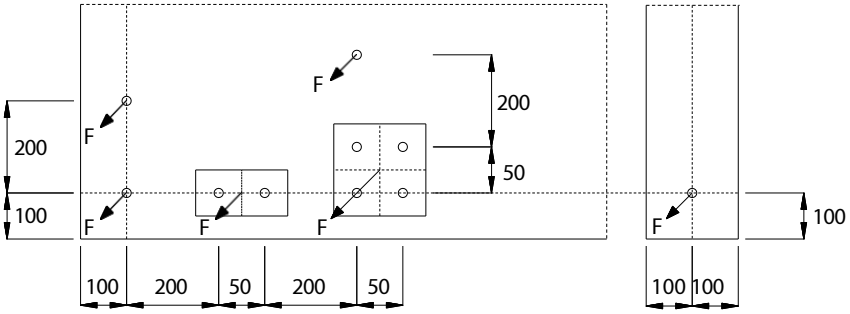
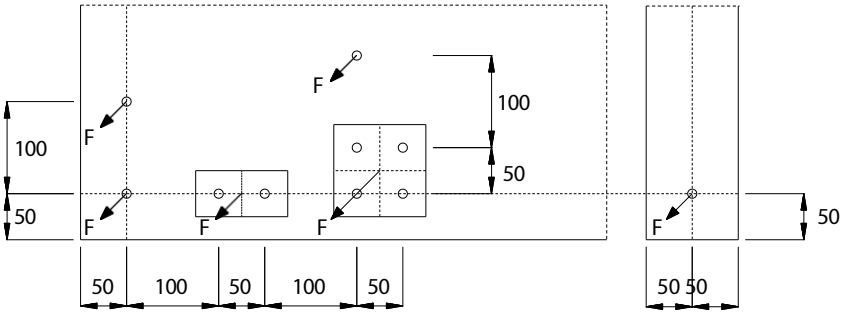


Figure 2: Minimum edge and center distances



Hollow ceiling anchor Easy

The anchor with internal thread for prestressed concrete hollow ceilings

The Easy hollow floor anchor with expansion cone and expansion sleeve is made from one piece and specially developed for use in prestressed concrete hollow slab ceilings. When the screw or nut is tightened, the cone is released from the anchor sleeve and pulled into it. As a result, the anchor expands in the cavity and creates a positive fit. In accordance with general building approval Z-21.1-1785, the anchor may also be used if the expansion area is not in a cavity. The hollow ceiling anchor can be used both underneath the ceiling and from above, on the floor.

Material: Steel
Surface: galvanized

For fastening
Suspensions in heating, sanitary and ventilation systems; suspended ceilings; other fixings with threaded rods or screws.

in
≥ C45/55 or B55; pre-stressed
Anchoring is only possible in prestressed concrete hollow core slabs,
as well as for statically comparable anchorages up to 1.0kN/m².

DIBt approval
for prestressed concrete hollow core slabs

G4070019
(M 8-M 12)

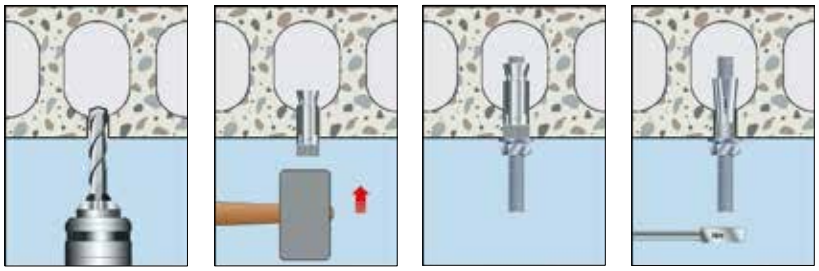
Suction drilling according to approval / evaluation possible

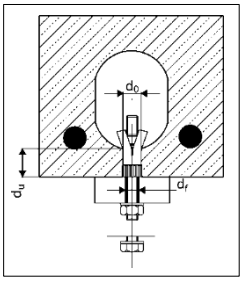
F30-F120

Advantages:
- Virtually free choice of fixing point due to secure function in the hollow chamber and in solid concrete (observe distance to the prestressing strands)
- Can be used flexibly with threaded rods and nuts or with hexagon head screws
- Simple installation, no special tools required
- Immediately loadable - no waiting times
- High permissible loads
- No drill hole cleaning required for processing and installation
- Approved for use in dry indoor areas

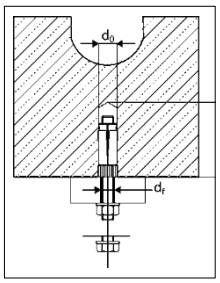
RECA hollow ceiling anchor Easy in expanded state.

Assembly





Hollow chamber: When the nut or bolt is tightened, the cone is pulled into the sleeve, which spreads out in the hollow chamber.



Solid zone: When tightening the nut or screw, the **solid zone** cone the sleeve against the borehole wall.

Article no.	Short designation	Thread Ø [mm]	Length h_{nom} [mm]	Drill core Ø [mm]	PU
0908 706 30	Easy M 6	M 6	40	10	50
0908 708 35	Easy M 8	M 8	45	12	50
0908 710 40	Easy M 10	M 10	53	16	50
0908 712 45	Easy M 12	M 12	58	18	25

Extract from the conditions of use of approval Z-21.1-1785

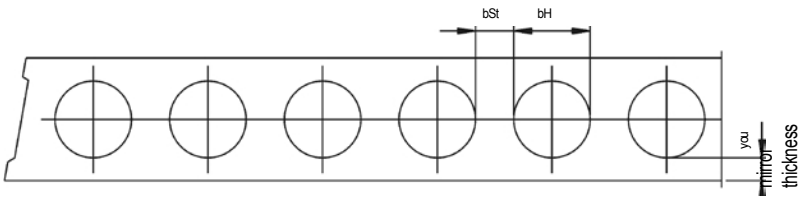
Permissible loads without influence of center and edge distances. Overall safety factor according to ETAG 001 taken into account (γM and γ_F). For load-bearing capacities under fire exposure, see end of catalog.

Loads and characteristic values			EasyM				6M				8M				10M 12			
			Prestressed concrete hollow core slabs ≥ C45/55															
Mirror thickness	d_b	[mm] ≥	25	30	40	50	25	30	40	50	25	30	40	50	25	30	40	50
Single dowel																		
Permissible load1) (for c ≥ c_{cr})	F1)	[kN]	0,7	0,9	2 ,0	2,9	0,7	0,9	2 ,0	3,6	0,9	1,2	3 ,0	3,6	1,0	1,2	3 ,0	4,3
Edge distance	c_{cr}	[mm]	150				150				150				150			
Permissible load1) (at c_{min})	F1)	[kN]	0,35	0,8	1 ,8	2,4	0,35	0,8	1 ,8	3,0	0,8	1,0	2 ,7	3,0	0,8	1,0	2 ,7	3,6
Minimum edge distance	c_{min}	[mm]	100				100				100				100			
Center distance	s_{cr}	[mm]	300				300				300				300			
Dowel pair2)																		
Permissible load1) (for c ≥ c_{cr})	F1)	[kN]	0,7	1,4	2 ,6	3,9	0,7	1,4	2 ,6	4,8	1,1	2,0	4 ,8	4,8	1,2	2,0	4 ,8	5,7
Minimum center distance	s_{min}	[mm]	70	80	100	100	70	80	100	100	70	80	100	100	70	80	100	100
Edge distance	c_{cr}	[mm]	150				150				150				150			
Permissible load1) (at c_{min})	F1)	[kN]	0,35	1,25	2,35	3,2	0,35	1,25	2,35	4,0	0,9	1,8	4 ,3	4,3	1,0	1,8	4 ,3	4,8
Minimum center distance	s_{min}	[mm]	70	80	100	100	70	80	100	100	70	80	100	100	70	80	100	100
Minimum edge distance	c_{min}	[mm]	100				100				100				100			
Permissible bending moments																		
Threaded rod / screw, steel 5.8		[Nm]	-				10,7				21,4				37,4			
Threaded rod / screw, steel 8.8		[Nm]	4,4				17,1				34,2				59,8			
Assembly data																		
Sleeve length (without cone)	L	[mm]	30				35				40				45			
Minimum screw length	min l_s	[mm]	42 + t_{fix}				47 + t_{fix}				55 + t_{fix}				61 + t_{fix}			
Minimum bolt length	min l_b	[mm]	47 + t_{fix}				53 + t_{fix}				63 + t_{fix}				71 + t_{fix}			
Steel strength of the screws/threaded rods			8.8				5.8				5.8				5.8			
Drill hole diameter	d_o	[mm]	10				12				16				18			
Through hole in the attachment part	d_f	[mm]	7				9				12				14			
Drill hole depth	h_0	[mm]	50				55				60				70			
Torque when anchoring	T_{inst}	[Nm]	10				20				30				40			

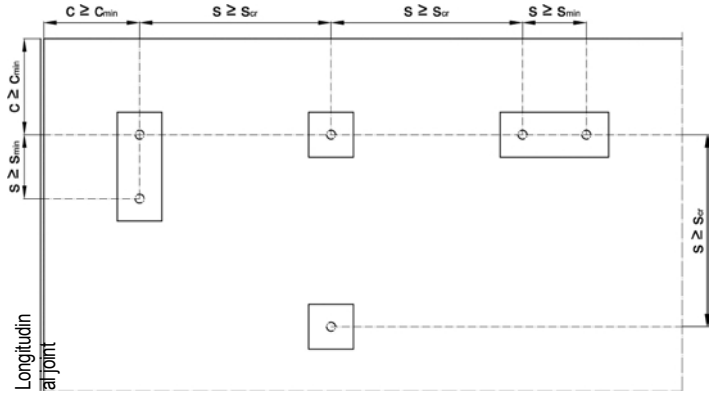
1) For edge distances c_{min} < c ≤ c_{cr}, the recommended loads can be determined by linear interpolation.

2) The permissible loads apply to the anchor pair. The permissible load for the anchor with the highest load must not exceed the values specified for individual anchors. For anchor pairs with center distances min s_{min} < s < s_{cr}, the permissible load may be interpolated linearly, whereby twice the permissible load for single anchors may be used for the limit value at s = s_{cr} for the anchor pair with centric load application.

Condition: b_H [**4.2 x** b_{St}



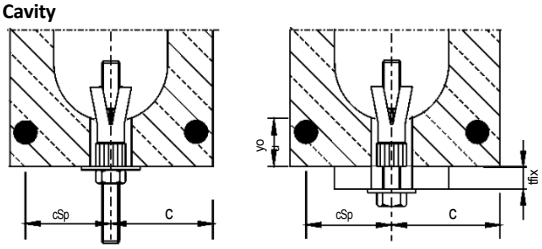
Arrangement of the anchors



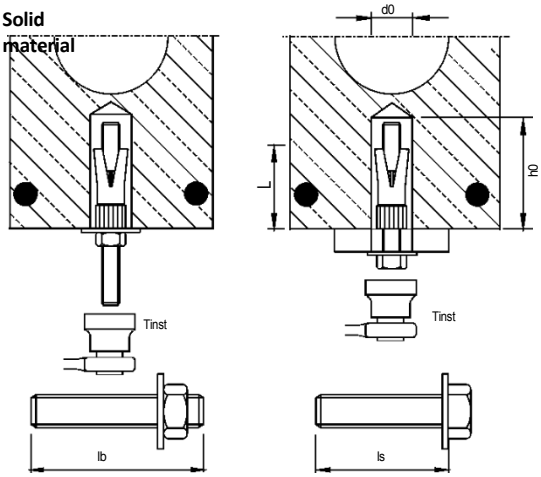
Use with threaded rod

Use with screw

Cavity



Solid material



t_{fix} = mounting part thickness d_u = mirror thickness b_H = cavity width

b_{St} = web width c_{Sp} = center distance to the tensioning wire c = edge distance

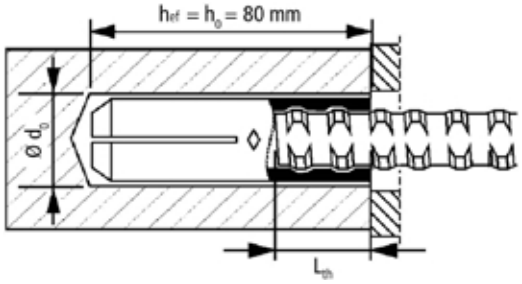
Drop-in anchor ED-DW 15 with DYWIDAG® internal thread

Product description:
Drop-in anchor with DYWIDAG® 1) internal thread DW 15 for
r e t r o f i t t i n g anchor rods.

1) DYWIDAG® is a registered trademark of Walter Bau AG

Advantages:
- Secure mounting thanks to dirt-resistant thread
- After removing the anchor rod, the anchor does not protrude from the drill hole

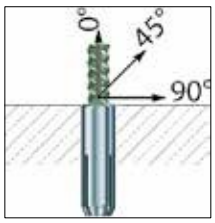
Areas of application:
- Can be used in non-cracked concrete C12/15 to max. C50/60 or pressure-resistant natural stone
- Fastening formwork in in-situ concrete construction
- Fixing corner elements when concreting upstands
- Fastening temporary fall protection systems



Material: Steel Surface:
Galvanized

Item no.	Designation	Dowel Ø	Dowel length (l)	Drill core diameter (d 0)	PU
0904 815 080	ED-DW 15x80	22 mm	80 mm	22 mm	25 PCS.

Setting tool for drive-in anchor ED-DW 15: Article no. 0904 801 680



Recommended loads for drop-in anchor ED-DW 15. Overall safety factor according to ETAG 001 taken into account (γ_M and γ_F).

Loads and characteristic values	Diagonal draft angle		0°	15°	30°	45°	60°	75°	90°
			uncracked concrete						
Recommended load	C12/15 rec. F [kN]		17,3	16,9	16,8	17,4	18,7	20,6	22,6
	> C20/25 rec. F [kN]		19,3	18,7	18,3	18,6	19,5	21,1	22,6
Anchoring depth	hef	[mm]	80						
Minimum center distance	smin	[mm]	600						
Minimum edge distance	cmin	[mm]	300						
Minimum component thickness	hmin	[mm]	160						
Assembly data									
Drill hole diameter	do	[mm]	22						
Drill hole depth	h0	[mm]	80						
Thread length	Lth	[mm]	35						
Rod/screw DW15 Minimum screw-in depth		[mm]	28						

Drop-in anchor E / ES

For non-cracked concrete and use as multiple fastening of non-load-bearing systems in cracked concrete

Drive-in anchor E

Drop-in anchor ES

Drop-in anchor ES (short)

ETA-02/0020
M6-M20 1)

ETA-05/0116
M6-M16

approved
M10-M201)

M8-M16 2)

R30-R120
M6-M20

M6-M163)

Material: Steel
Surface finish: galvanized
Load range: **1.2 kN - 28.6 kN**
Concrete quality: **C20/25 - C50/60**

Description
The E/ES drive-in anchor is approved for multiple fixing of non-load-bearing systems in cracked and non-cracked concrete. The dimensions with an anchoring depth of 30 mm or more are also approved as single anchors in non-cracked concrete. The drive-in anchors with an anchoring depth of 25 mm, on the other hand, are approved in prestressed concrete hollow core slabs.

The E/ES drive-in anchor is inserted into the drill hole in a push-in installation and reliably expanded in the drill hole using a hand or machine expansion tool. The use of a marking expansion tool creates a visible mark on the anchor sleeve, which confirms correct installation.

Application examples
Suspensions in the heating, sanitary and ventilation sector, anchoring with threaded rods and screws, flat steel, sectional steel.

Advantages
- Approved for use as multiple fixings in cracked and non-cracked concrete
- Approved as multiple fastening in prestressed concrete hollow core slabs
- Approved as a single anchor for anchoring in non-cracked concrete (anchoring depth ≥ 30 mm)
- Low drilling depth, therefore low risk of hitting reinforcement (anchoring depth 25 mm)
- Fast, efficient and effortless installation thanks to collar drill and SDS plus machine setting tool
- Simple visual assembly check using marking tool
- Many possible applications thanks to the use of standard metric screws and threaded rods
- FM approval for the installation of sprinkler systems (M10-M201))
- Suitable for use in the installation of sprinkler systems, in accordance with the requirements of Schadenverhütung VDS, GmbH (M8-M161))
- Fire protection tested in concrete C20/25 to C50/60

1) Only applies to anchoring depth hef ≥ 30 mm
2) Not for applications in prestressed concrete hollow core slabs
3) Only for the use of non-load-bearing systems

Drive-in anchor

E-steel

galvanized

Approved for

concrete

Designation	Article number	Drill hole Ø x depth mm	Thread Ø x length mm	PU Piece
E M 5 x 25[1)]	0904 85	8 x 25	M5 x 10	100
E M 6 x 30	0904 86	8 x 30	M6 x 13	100
E M 8 x 30	0904 88	10 x 30	M8 x 13	100
E M 10 x 40	0904 810	12 x 40	M10 x 15	50
E M 12 x 50	0904 812	15 x 50	M12 x 18	50
E M 16 x 65	0904 816	20 x 65	M16 x 23	25

[1)]Not part of the valuation.

Drop-in anchor ES

Galvanized steel, approved for concrete

With collar for setting flush with the surface

Designation	Article number	Drill hole Ø x depth mm	Thread Ø x length mm	PU Piece
ES M 6x25	0904 806 025	8 x 25	M6 x 12	100
ES M 8 x 25	0904 808 025	10 x 25	M8 x 12	100
ES M 8 x 30	0904 808 030	10 x 30	M8 x 13	100
ES M 10 x 25	0904 810 025	12 x 25	M10 x 12	50
ES M 10 x 40	0904 810 040	12 x 40	M10 x 15	50
ES M 12 x 25	0904 812 025	15 x 25	M12 x 12	50
ES M 12 x 50	0904 812 050	15 x 50	M12 x 18	50
ES M 16 x 65	0904 816 065	20 x 65	M16 x 23	25

Marking spreader tool

For drive-in anchor E and ES
With hand guard

Designation	Article number	PU Piece
E-MSH 6 x 25	0904 876 025	1
E-MSH 8 x 25	0904 878 025	1
E-MSH 8 x 30	0904 878 030	1
E-MSH 10 x 25	0904 871 025	1
E-MSH 10 x 40	0904 871 040	1
E-MSH 12 x 25	0904 871 225	1
E-MSH 12 x 50	0904 871 250	1
E-MSH 16 x 65	0904 871 665	1

Standard spreading tool

For drive-in anchors E and ES

Designation	Article number	PU Piece
E-SW 5 x 25	0904 805	1
E-SW 6 x 25	0904 800 625	1
E-SW 6 x 30	0904 806	1
E-SW 8 x 25	0904 800 825	1
E-SW 8 x 30	0904 808	1
E-SW 10 x 25	0904 801 025	1
E-SW 10 x 40	0904 801 0	1
E-SW 12 x 25	0904 801 225	1
E-SW 12 x 50	0904 801 2	1
E-SW 16 x 65	0904 801 6	1

Collar drill

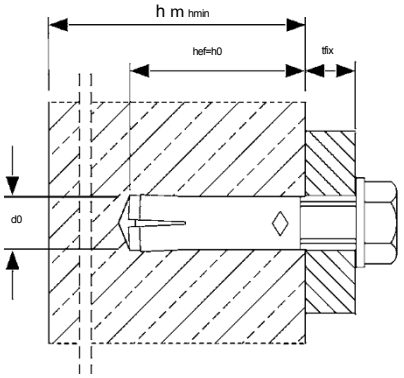
For drive-in anchors E and ES
With SDS plus adapter

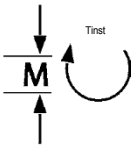
Designation	Article number	Drilling Ø x drilling depth [mm]	Suitable for drive-in anchors	PU Piece
BB 8 x 25	0904 890 625	8 x 25	ES M 6 x 25	1
BB 8 x 30	0904 890 630	8 x 30	E/ES M 6 x 30	1
BB 10 x 25	0904 890 825	10 x 25	ES M 8 x 25	1
BB 10 x 30	0904 890 830	10 x 30	E/ES M 8 x 30	1
BB 12 x 25	0904 891 025	12 x 25	ES M 10 x 25	1
BB 12 x 40	0904 891 040	12 x 40	E/ES M 10 x 40	1
BB 15 x 25	0904 891 225	15 x 25	ES M 12 x 25	1
BB 15 x 50	0904 891 250	15 x 50	E/ES M 12 x 50	1

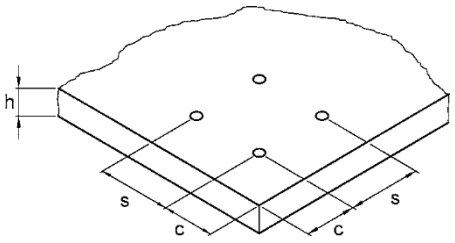
Machine spreading tool

For drive-in anchors E and ES
With SDS plus adapter

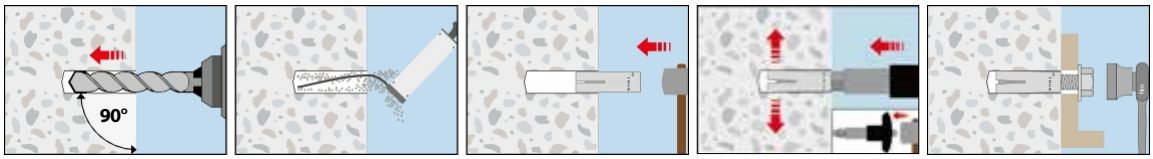
Designation	Article number	PU Piece
E-SW 6 x 25 SDS	0904 850 625	1
E-SW 8 x 25 SDS	0904 850 825	1
E-SW 8 x 30 SDS	0904 850 830	1
E-SW 10 x 25 SDS	0904 851 025	1
E-SW 10 x 40 SDS	0904 851 040	1
E-SW 12 x 25 SDS	0904 851 225	1
E-SW 12 x 50 SDS	0904 851 250	1







Assembly



Extract from the conditions of use of the European Technical Assessment ETA-02/0020 for use in n o n - c r a c k e d concrete (option 7)

Permissible loads according to EN 1992-4 without the influence of center distances and edge distances. The overall safety factor (γ_M and γ_F) was taken into account. For load-bearing capacities under fire exposure, see end of catalog.

Loads and	characteristic values	Drop-in anchor		E/ESM5x25[1,2)]	M6x30[1)]	M8x30[1)]	M8x40	M10x30[1)]	M10x40	M12x50	M16x65
							uncracked concrete				
Permissible tensile load (screw 5.6 to 8.8)	C20/25	permissible N	[kN]	1,4	3,2	3,2	3,6	3,2	4,9	6,9	10,2
	C25/30	permissible N	[kN]	1,5	3,6	3,6	3,8	3,6	5,5	7,7	11,4
	C30/37	permissible N	[kN]	1,7	3,6	3,9	4,0	3,9	6,0	8,5	12,5
	C40/50	permissible N	[kN]	1,9	3,6	4,5	4,4	4,5	7,0	9,8	14,5
	C50/60	permissible N	[kN]	2,1	3,6	5,1	4,7	5,1	7,8	10,9	16,2
Permissible shear load (screw 5.6)	≥ C20/25	permissible V	[kN]	1,5	2,1	3,8	3,9	3,8	4,1	9,0	16,8
Permissible shear load (screw 5.8)	≥ C20/25	permissible V	[kN]	2,0	2,9	3,8	3,9	3,8	4,1	11,1	18,0
Permissible shear load (screw 8.8)	≥ C20/25	permissible V	[kN]	2,0	2,9	3,8	3,9	3,8	4,1	11,1	18,0
Permissible bending moment (screw 5.6)		Permitted M	[Nm]	-	3,3	8,1	8,1	15,8	15,8	27,8	71,0
Permissible bending moment (screw 5.8)		Permitted M	[Nm]	-	4,3	10,9	10,9	21,1	21,1	37,1	94,9
Permissible bending moment (screw 8.8)		Permitted M	[Nm]	-	6,9	17,1	17,1	33,7	34,3	60,0	152,0
Center and edge distances											
Anchoring depth		h_{ef}	[mm]	25	30	30	40	30	40	50	65
Characteristic center distance		$s_{cr,N}$	[mm]	75	90	90	120	90	120	150	195
Characteristic edge distance		$c_{cr,N}$	[mm]	37,5	45	45	60	45	60	75	97,5
Minimum center distance		s_{min}	[mm]	60	55	60	80	100	100	120	150
Minimum edge distance		c_{min}	[mm]	95	95	95	95	115	135	165	200
Minimum component thickness		h_{min}	[mm]	100	100	100	100	120	120	130	160
Assembly data											
Drill hole diameter		d_o	[mm]	8	8	10	10	12	12	15	20
Through hole in the attachment part		d_f	[mm]	6	7	9	9	12	12	14	18
Drill hole depth		h_0	[mm]	25	30	30	40	30	40	50	65
Torque when anchoring		$T_{inst} \leq$	[Nm]	3	4	8	8	15	15	35	60
Minimum screw-in depth		l_{sd}	[mm]	6	7	9	9	10	11	13	18
Maximum screw-in depth		l_{tfh}	[mm]	10	13	13	20	12	15	18	23

[1)]Application only for statically indeterminate systems. [2)] Not part of the European Technical Assessment. [3)]E/ES M12x50 [4)]E M16x55

Extract from the conditions of use of the European Technical Assessment ETA-05/0116 for use in redundant non-structural systems

Permissible loads according to EN 1992-4 without the influence of center distances and edge distances. The total safety factor ((γ_M and γ_F) was taken into account. The permissible loads per fixing point can be taken from the corresponding national regulations of the EOTA member states and may be below the permissible load of the anchor.

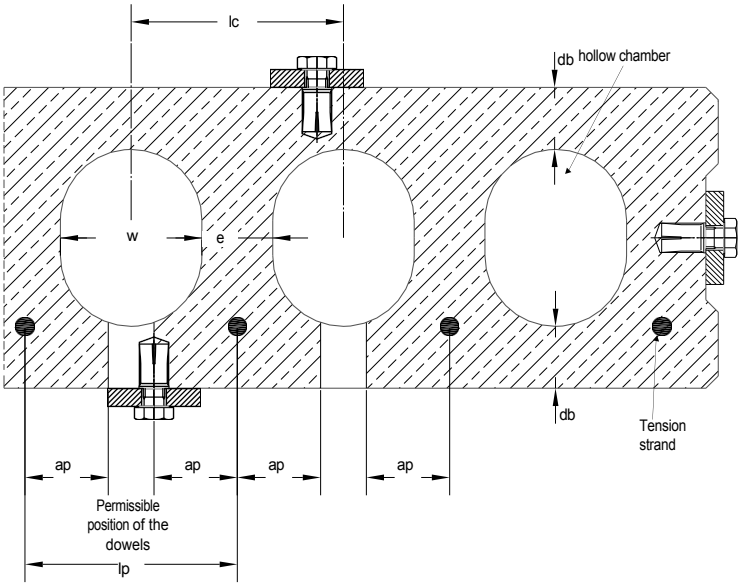
Loads and		characteristic values	Locking anchor E/ES		M6x25	M6x30		M8x25	M8x30	M10x25	M10x40	M12x25	M12x50	M16x65
								cracked and non-cracked concrete						
Permissible load (C12/15 and C16/20)		Permitted F	[kN]	1,2	-	1,2	-	1,7	-	1,7	-	-		
Permissible load (C20/25 to C50/60)		Permitted F	[kN]	1,7	1,2	1,9	1,7	2,1	2,0	2,1	2,4	6,3		
Permissible bending moment (screw 4.6)		Permitted M	[Nm]	2,6	2,6	6,4	6,4	12,8	12,8	22,2	22,2	56,9		
Permissible bending moment (screw 5.6)		Permitted M	[Nm]	3,3	3,3	8,1	8,1	15,8	15,8	27,8	27,8	71,0		
Permissible bending moment (screw 5.8)		Permitted M	[Nm]	4,3	4,3	10,9	10,9	21,1	21,1	37,1	37,1	94,9		
Permissible bending moment (screw 8.8)		Permitted M	[Nm]	6,9	6,9	17,1	17,1	34,3	34,3	60,0	60,0	152,0		
Center and edge distances														
Anchoring depth		h_{ef}	[mm]	25	30	25	30	25	40	25	50	65		
Characteristic center distance		s_{cr}	[mm]	75	130	75	180	75	170	75	170	400		
Characteristic edge distance		c_{cr}	[mm]	38	65	38	90	38	85	38	85	200		
Minimum center distance1)		s_{min}	[mm]	30	55	50	60	60	100	100	120	150		
Minimum edge distance1)		c_{min}	[mm]	60	95	100	95	100	135	110	165	200		
Standard component thickness/minimum component thickness		$h_{min\ 2}$ /$h_{min\ 1}$	[mm]	100/80	100	100/80	100	100/80	120	100/80	130	160		
Assembly data														
Drill hole diameter		d_o	[mm]	8	8	10	10	12	12	15	15	20		
Through hole in the attachment part		d_f	[mm]	7	7	9	9	12	12	14	14	18		
Drill hole depth		h_0	[mm]	25	30	25	30	25	40	25	50	65		
Torque when anchoring		$T_{inst} \leq$	[Nm]	4	4	8	8	15	15	35	35	60		
Minimum screw-in depth1)		l_{sd}	[mm]	6	7	8	9	10	11	12	13	18		
Maximum screw-in depth1)		l_{tfh}	[mm]	12	13	12	13	12	15	12	18	23		
Loads under fire exposure (C20/25 to C50/60)														
(for screw ≥ 4.8)	Permissible load R30	Permitted F	[kN]	0,4	0,4	0,6	0,9	0,6	1,5	0,6	1,5	4,0		
	Permissible load R60	Permitted F	[kN]	0,35	0,35	0,6	0,9	0,6	1,5	0,6	1,5	4,0		
	Permissible load R90	Permitted F	[kN]	0,3	0,3	0,6	0,6	0,6	1,1	0,6	1,5	3,0		
	Permissible load R120	Permitted F	[kN]	0,25	0,3	0,5	0,5	0,5	0,9	0,5	1,2	2,4		
(for screw ≥ 5.6)	Permissible load R30	Permitted F	[kN]	0,4	0,8	0,6	0,9	0,6	1,5	0,6	1,5	4,0		
	Permissible load R60	Permitted F	[kN]	0,35	0,8	0,6	0,9	0,6	1,5	0,6	1,5	4,0		
	Permissible load R90	Permitted F	[kN]	0,3	0,4	0,6	0,9	0,6	1,5	0,6	1,5	3,7		
	Permissible load R120	Permitted F	[kN]	0,25	0,3	0,5	0,5	0,5	1,0	0,5	1,2	2,4		

Extract from the conditions of use of the European Technical Assessment ETA-05/0116
Use as multiple fastening of non-load-bearing systems according to ETAG 001, Part 6. Overall safety factor according to ETAG 001 taken into account (γ_M and γ_F). The maximum permissible load per fixing point may be less than the permissible load of the anchor, depending on national regulations. The permissible loads per fixing point are regulated for the respective countries in ETAG 001, Part 6.

Loads and	characteristic values Drop-in anchor ES M6 x 25M8					x 25M10 x	25M12 x 25
	Clampir	clay hollow plate	ceilings	C30/37 ↑	C50/60		
Mirror thickness	d_b >	[mm]		35 (30[1])			
Permissible load	F permissibl e.	[kN]	1,7	1,9	2,1	2,1	
Permissible bending moment (steel 4.6)	Permitted M	[Nm]	2,6	6,4	12,8	22,2	
Permissible bending moment (steel 4.8)	Permitted M	[Nm]	3,5	8,6	17,1	29,7	
Permissible bending moment (steel 5.6)	Permitted M	[Nm]	3,3	8,1	15,8	27,8	
Permissible bending moment (steel 5.8)	Permitted M	[Nm]	4,3	10,9	21,1	37,1	
Permissible bending moment (steel 8.8)	Permitted M	[Nm]	6,9	17,1	34,3	60,0	
Center and edge distances							
Center distance	s_{cr} = s_{min}	[mm]		200			
Edge distance	c_{cr} = c_{min}	[mm]		150			
Assembly data							
Drill hole diameter	d_o	[mm]	8	10	12	15	
Through hole in the attachment part	d_f	[mm]	7	9	12	14	
Drill hole depth	h_0 >	[mm]	25	25	25	25	
Installation torque	T_{inst} <	[Nm]	4	8	15	35	

[1] Drill hole must not cut into a hollow chamber.

Permissible anchor positions for prestressed concrete hollow core slabs



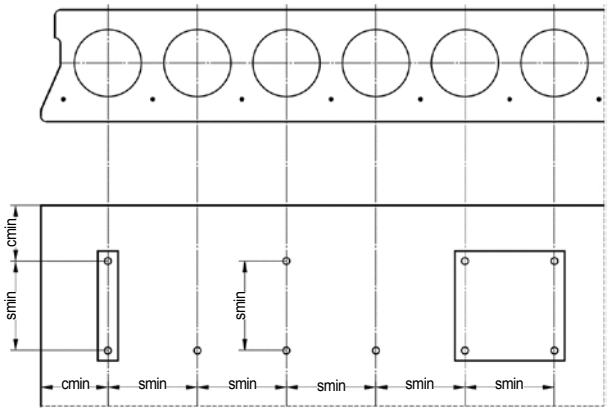
w / e ≤ 4.2

w Cavity width

e Web width

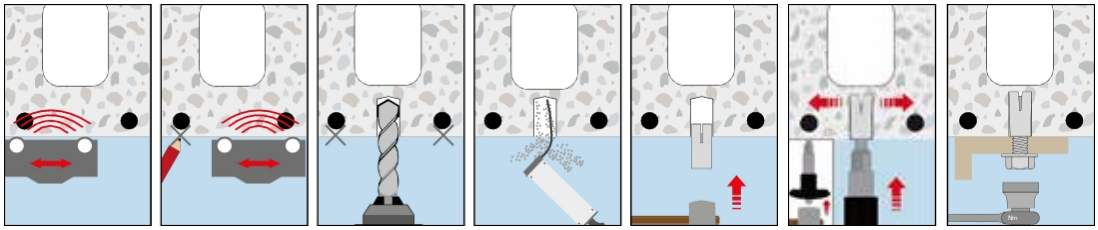
Distance between cavity axes	$l_c \geq 100$ mm
Distance between prestressing strands	$l_p \geq 100$ mm
Distance between clamping strand and drill hole	$a_p \geq 50$ mm

Minimum edge and center distances for prestressed concrete hollow core slabs



Minimum edge distance	cmin ≥ 150 mm
Minimum center distance	smin ≥ 200 mm

Assembly



Drop-in anchor ED

Galvanized steel, for fastening core drilling equipment

Description

The ED drive-in anchor was developed for temporary fastening or fastening machines that are to be removed later. The ED M12 D version with reinforced anchor sleeve is especially recommended for fastening core drilling equipment.

Application examples

Fastening of concrete processing machines such as core drills or concrete saws etc.

Substrate: **Concrete C20/25 - C 50/60**

Designation	Article number	Drill hole Ø x depth mm	Thread Ø x length mm	PU Piece
ED M 12 x 50 D	0904 812 16	16 x 50	M12 x 18	50

Recommended loads for drop-in anchor ED.

Overall safety factor according to ETAG 001 taken into account (γ_M and γ_F).

Loads and characteristic values	Drop-in anchor ED		M 12x50 D
Recommended tensile load (screw 5.6 to 8.8)	C20/25 rec. N	[kN]	7,1
Recommended shear load (screw 5.6)	> C20/25 rec. V	[kN]	9,0
Recommended shear load (screw 5.8/8.8)	> C20/25 rec. V	[kN]	12,0
Recommended bending moment (screw 5.6)	recom. M	[Nm]	27,8
Recommended bending moment (screw 5.8)	recom. M	[Nm]	37,1
Recommended bending moment (screw 8.8)	recom. M	[Nm]	60,0
Center and edge distances			
Anchoring depth	h_{ef}	[mm]	50
Characteristic center distance	$s_{cr,N}$	[mm]	150
Characteristic edge distance	$c_{cr,N}$	[mm]	75
Minimum center distance	s_{min}	[mm]	120
Minimum edge distance	c_{min}	[mm]	165
Minimum component thickness	h_{min}	[mm]	130
Assembly data			
Drill hole diameter	d_o	[mm]	16
Through hole in the attachment part	d_f	[mm]	14
Drill hole depth	h_0	[mm]	50
Torque when anchoring	T_{inst}	[Nm]	35
Minimum screw-in depth	L_{sd}	[mm]	13
Maximum screw-in depth	L_{th}	[mm]	18

Machine spreading tool

For drive-in anchor ED
With SDS plus socket

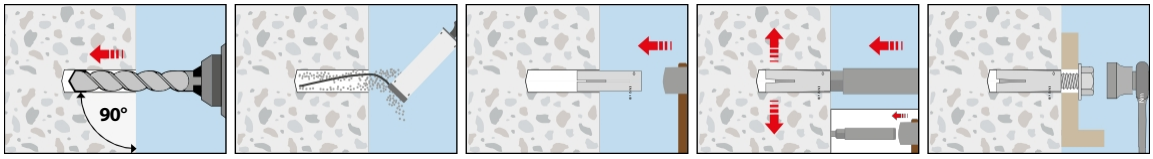
Designation	Article number	PU Piece
E-SW 12 x 50 SDS	0904 851 250	1

Standard spreading tool

for drive-in anchor ED

Designation	Article number	PU Piece
E-SW 12 x 50	0904 801 2	1

Assembly



Drop-in anchor E/ES A4

Stainless steel A4

Drop-in anchor E A4

Drop-in anchor ES A4

Load range: **1.2 kN - 30.4 kN**

Concrete quality: **C20/25 - C50/60**

Description

The E/ES A4 drive-in anchor is approved as a single anchor in non-cracked concrete and for multiple fixing of non-load-bearing systems in cracked and non-cracked concrete.

The E/ES A4 drive-in anchor is inserted into the drill hole in a push-in installation and reliably expanded in the drill hole using a hand or machine expansion tool. The use of a marking expansion tool creates a visible mark on the anchor sleeve, which confirms correct installation. Coated screws must be used to remove the attachment.

Advantages

- Approved for use as multiple fixings in cracked and non-cracked concrete
- Approved as a single anchor for anchoring in non-cracked concrete
- With collar drill and machine setting tool SDS plus, fast, Efficient and energy-saving assembly
- Simple visual assembly check using marking tool
- Many possible applications thanks to the use of commercially available metric screws and threaded rods
- FM approval for the installation of sprinkler systems (M10-M20)
- Suitable for use for the installation of sprinkler systems in accordance with the requirements of Schadenverhütung VDS, GmbH
- Fire protection tested in concrete C20/25 to C50/60

Application examples

Suspensions in the heating, sanitary and ventilation sector, as well as outdoor fixings.

Drop-in anchor E A4Stainless steel A4

Approved for concrete

Designation	Article number	Drill hole Ø x depth mm	Thread Ø x length mm	PU Piece
E M 6 x 30 A4	0904 96	8 x 30	M6 x 13	100
E M 8 x 30 A4	0904 98	10 x 30	M8 x 13	100
E M 10 x 40 A4	0904 910	12 x 40	M10 x 15	50
E M 12 x 50 A4	0904 912	15 x 50	M12 x 18	50
E M 16 x 65 A4	0904 916	20 x 65	M16 x 23	25

Drop-in anchor ES A4

Stainless steel A4, approved for concrete

With collar for flush-fitting installation

Designation	Article number	Drill hole Ø x depth mm	Thread Ø x length mm	PU Piece
ES M 8 x 30 A4	0904 908 030	10 x 30	M8 x 13	100
ES M 10 x 40 A4	0904 910 040	12 x 40	M10 x 15	50
ES M 12 x 50 A4	0904 912 050	15 x 50	M12 x 18	50

[1)] Only for use as multiple fastening of non-load-bearing systems.

Marking spreader tool

For drive-in anchor E and ES
With hand guard

Designation	Article number	PU Piece
E-MSH 6 x 30	0904 876 030	1
E-MSH 8 x 30	0904 878 030	1
E-MSH 10 x 40	0904 871 040	1
E-MSH 12 x 25	0904 871 225	1
E-MSH 12 x 50	0904 871 250	1
E-MSH 16 x 65	0904 871 665	1

Standard spreading tool

For drive-in anchors E and ES

Designation	Article number	PU Piece
E-SW 6 x 30	0904 806	1
E-SW 8 x 30	0904 808	1
E-SW 10 x 40	0904 801 0	1
E-SW 12 x 50	0904 801 2	1
E-SW 16 x 65	0904 801 6	1

Collar drill

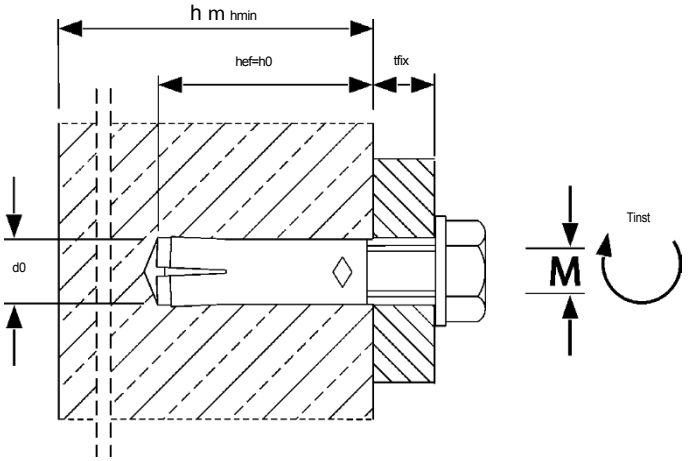
For drive-in anchors E and ES

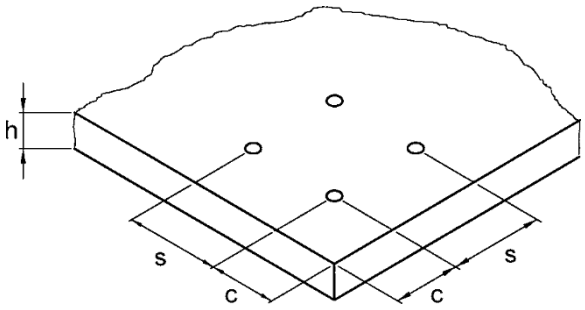
Designation	Article number	Drilling Ø x drilling depth [mm]	Suitable for drive-in anchors	PU Piece
BB 8 x 30	0904 890 630	8 x 30	E/ES M 6 x 30	1
BB 10 x 30	0904 890 830	10 x 30	E/ES M 8 x 30	1
BB 12 x 40	0904 891 040	12 x 40	E/ES M 10 x 40	1
BB 15 x 50	0904 891 250	15 x 50	E/ES M 12 x 50	1

Machine spreading tool

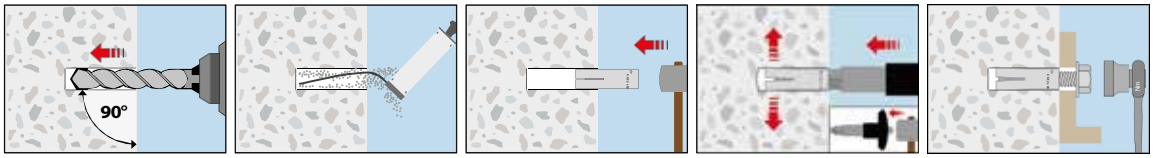
For drive-in anchors E and ES
With SDS plus adapter

Designation	Article number	PU Piece
E-SW 8 x 30 SDS	0904 850 830	1
E-SW 10 x 40 SDS	0904 851 040	1
E-SW 12 x 50 SDS	0904 851 250	1





Assembly



Extract from the conditions of use of the European Technical Assessment ETA-02/0020 for u s e in non-cracked concrete (option 7)

Permissible loads according to EN 1992-4 without the influence of center distances and edge distances. The overall safety factor (γM and $_{\gamma}$F) was taken into account. For load-bearing capacities under fire exposure, see end of catalog.

Loads and characteristic values	Drop-in anchor E A4 / HCR M6x30[1] M8x30[1]					M8x40	M10x40	M12x50	M16x65
						uncracked concrete			
Permissible tensile load	C20/25	permissible N	[kN]	3,8	3,8	5,2	5,9	8,3	12,3
	C25/30	permissible N	[kN]	4,3	4,3	5,6	6,6	9,3	13,7
	C30/37	permissible N	[kN]	4,7	4,7	5,9	7,2	10,1	15,0
	C40/50	permissible N	[kN]	5,4	5,4	6,4	8,4	11,7	17,4
	C50/60	permissible N	[kN]	5,4	6,1	6,9	9,3	13,1	19,4
Permissible shear load	≥ C20/25	permissible V	[kN]	3,2	4,9	4,9	6,1	11,5	19,2
Permissible bending moment (screw	A4-70)	Permitted M	[Nm]	5,0	11,9	11,9	23,8	42,1	106,7
Center and edge distances									
Anchoring depth		hef	[mm]	30	30	40	40	50	65
Characteristic center distance		scr, N	[mm]	90	90	120	120	150	195
Characteristic edge distance		ccr, N	[mm]	45	45	60	60	75	97,5
Minimum center distance		smin	[mm]	50	60	80	100	120	150
Minimum edge distance		cmin	[mm]	80	95	95	135	165	200
Minimum component thickness		hmin	[mm]	100	100	100	130	140	160
Assembly data									
Drill hole diameter		do	[mm]	8	10	10	12	15	20
Through hole in the attachment part		df	[mm]	7	9	9	12	14	18
Drill hole depth		h0	[mm]	30	30	40	40	50	65
Torque when anchoring		Tinst ≤	[Nm]	4	8	8	15	35	60
Minimum screw-in depth		Lsd	[mm]	7	9	9	11	13	18
Maximum screw-in depth		Lth	[mm]	13	13	20	15	18	23

[1] Application only for statically indeterminate systems. Size M 5 not part of the evaluation.
You can find the practical dimensioning program at https://www.recanorm.de/de/loesungen/schulungen-seminare/Berechnungssoftware

Extract from the conditions of use of the European Technical Assessment ETA-05/0116 for use in redundant non-structural systems

Permissible loads according to EN 1992-4 without the influence of center distances and edge distances. The total safety factor (γM and $_{\gamma}$F) was taken into account. The permissible loads per fixing point are to be taken from the corresponding national regulations of the EOTA member states. and may be below the permissible load of the anchor.

Loads and	characteristic valuesLocking anchor E A4 / HCR			M6x30	M8x30	M10x40	M12x50	M16x65
				cracked and non-cracked concrete				
Permissible load (C20/25 to C50/60)	Permitted F	[kN]	1,2	1,7	2,0	2,4	6,3	
Permissible bending moment (A4-70)	Permitted M	[Nm]	5,0	11,9	23,8	42,1	106,7	
Center and edge distances								
Anchoring depth	hef	[mm]	30	30	40	50	65	
Characteristic center distance	scr	[mm]	130	180	170	170	400	
Characteristic edge distance	ccr	[mm]	65	90	85	85	200	
Minimum center distance	smin	[mm]	50	60	100	120	150	
Minimum edge distance	cmin	[mm]	80	95	135	165	200	
Minimum component thickness	hmin	[mm]	100	100	130	140	160	
Assembly data								
Drill hole diameter	do	[mm]	8	10	12	15	20	
Through hole in the attachment part	df	[mm]	7	9	12	14	18	
Drill hole depth	h0	[mm]	30	30	40	50	65	
Torque when anchoring	Tinst ≤	[Nm]	4	8	15	35	60	
Minimum screw-in depth	Lsd	[mm]	7	9	11	13	18	
Maximum screw-in depth	Lth	[mm]	13	13	15	18	23	
Loads under fire exposure								
Permissible load R30	Permitte	[kN]	0,8	0,9	1,5	1,5	4,0	

	d F						
Permissible load R60	Permitte d F	[kN]	0,8	0,9	1,5	1,5	4,0
Permissible load R90	Permitte d F	[kN]	0,4	0,9	1,5	1,5	3,7
Permissible load R120	Permitte d F	[kN]	0,3	0,5	1,0	1,2	2,4
Characteristic center distance	$s_{cr,fi}$	[mm]	130	180	170	200	400
Characteristic edge distance	$c_{cr,fi}$	[mm]	65	90	85	100	200

You can find the practical dimensioning program at https://www.recanorm.de/de/loesungen/schulungen-seminare/Berechnungssoftware

BZ3 Bolt anchor steel vz

HOLDS. COMMITMENTLESS. STRONG

Advantages:

- The bolt anchor with maximum permissible loads and variable anchoring depth
- European Technical Assessment ETA-19/0619 for use in cracked and non-cracked concrete (option 1), under seismic action of categories C1 and C2 and for use under fire exposure (R30-R120)
- For higher loads under seismic action, the annular gap between the bolt anchor and the attachment can be filled using the VS filling disk and injection mortar
- Low minimum anchoring depths
- New calculation method depending on the anchorage depth and the thickness of the concrete component
- The high degree of flexibility enables optimum adaptation to the assembly situation and thus increases cost-effectiveness
- Also available in extra-short versions
- Fewer turns until the tightening torque is reached
- Colored marking of the minimum anchoring depth
- Shock approval from the Federal Office for Civil Protection, Switzerland (from standard anchoring depth)

Area of application:

Anchoring of medium to heavy loads in cracked and non-cracked concrete: Supports, steel girders, railing fastenings, cable trays, pipe trays, timber constructions, brackets, fastenings in earthquake zones, etc.

Note:

The BZ3 bolt anchor also allows the optional use of the special HM cap nut. Thanks to its closed shape, the HM cap nut prevents warping and opens up new design possibilities for architecturally sophisticated applications.

ETA-19/0619

Option 1 for cracked concrete

SEISMIC

Seismic C1 & C2 from 40 mm anchoring depth

Fire-tested according to standard temperature curve F30-F120

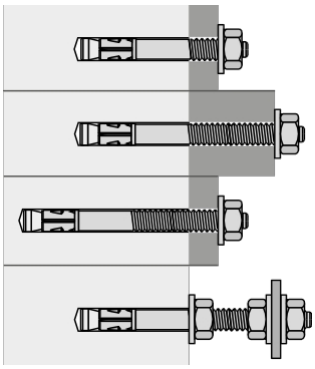
Suitable for the installation of sprinkler systems in concrete

ZIVILSCHUTZ

Shock approval from the Federal Office for Civil Protection, Bern, Switzerland from standard anchoring depth

The stepless, variable anchoring depth

allows the setting depth to be precisely adapted to the user's requirements. Setting with minimum anchoring depth reduces drilling and setting effort as well as the risk of hitting reinforcement. Stepless, deeper setting increases the permissible load and allows the anchoring depth to be adjusted with millimeter precision. The new option of increasing permissible loads beyond the standard anchoring depth means that fastenings can be carried out that were previously not possible with a bolt anchor.



Small anchoring depth and small clamping thickness

Small anchoring depth and large, flexible clamping thickness

Large anchoring depth and small clamping thickness

Distance mounting

Bolt anchor BZ3

Designation	Item number	Drill hole Ø d_0 mm	Standard anchoring depth: Clamp-strength $t_{fix,std}$ mm	Standard anchoring depth: Anchor-depth $h_{ef,std}$ mm	Minimum anchoring depth: Clamp-strength $t_{fix,max}$ mm	Minimum anchoring depth: Anchor-depth $h_{ef,min}$ mm	Variable anchoring depth: Usable length B mm	Clamping hole depth thickness t_{fix} mm	Clamping hole depth h_1 mm	Setting depth h_{nom}	Seismic C1 / C2	Dowel length l mm	Thread mm	Package contents Piece
BZ3 M8x60/0-5	0910 308 060	8	-	-	5	35	40	B -stitch	h_{ef} + 10	h_{ef} + 8	- / -	60	M8x18	100
BZ3 M8x65/0-10	0910 308 065	8	-	-	10	35	45	B -stitch	h_{ef} + 10	h_{ef} + 8	3 / 31)	65	M8x23	100
BZ3 M8x75/0-20	0910 308 075	8	10	45	20	35	55	B -stitch	h_{ef} + 10	h_{ef} + 8	3 / 31)	75	M8x33	100
BZ3 M8x80/0-25	0910 308 080	8	15	45	25	35	60	B -stitch	h_{ef} + 10	h_{ef} + 8	3 / 31)	80	M8x38	100
BZ3 M8x95/0-40	0910 308 095	8	30	45	40	35	75	B -stitch	h_{ef} + 10	h_{ef} + 8	3 / 31)	95	M8x53	100
BZ3 M8x115/5-60	0910 308 115	8	50	45	60	35	95	B -stitch	h_{ef} + 10	h_{ef} + 8	3 / 31)	115	M8x73	100
BZ3 M8x165/55-110	0910 308 165	8	100	45	110	35	145	B -stitch	h_{ef} + 10	h_{ef} + 8	3 / 31)	165	M8x123	50
BZ3 M10x70/0-10	0910 310 070	10	-	-	10	40	50	B -stitch	h_{ef} + 11	h_{ef} + 9	3 / 3	70	M10x25	50
BZ3 M10x80/0-20	0910 310 080	10	-	-	20	40	60	B -stitch	h_{ef} + 11	h_{ef} + 9	3 / 3	80	M10x35	50
BZ3 M10x90/0-30	0910 310 090	10	10	60	30	40	70	B -stitch	h_{ef} + 11	h_{ef} + 9	3 / 3	90	M10x45	50
BZ3 M10x95/0-35	0910 310 095	10	15	60	35	40	75	B -stitch	h_{ef} + 11	h_{ef} + 9	3 / 3	95	M10x50	50
BZ3 M10x100/0-40	0910 310 100	10	20	60	40	40	80	B -stitch	h_{ef} + 11	h_{ef} + 9	3 / 3	100	M10x55	50
BZ3 M10x110/0-50	0910 310 110	10	30	60	50	40	90	B -stitch	h_{ef} + 11	h_{ef} + 9	3 / 3	110	M10x65	50
BZ3 M10x130/10-70	0910 310 130	10	50	60	70	40	110	B -stitch	h_{ef} + 11	h_{ef} + 9	3 / 3	130	M10x85	50
BZ3 M10x155/35-95	0910 310 155	10	75	60	95	40	135	B -stitch	h_{ef} + 11	h_{ef} + 9	3 / 3	155	M10x110	50
BZ3 M10x180/60-120	0910 310 180	10	100	60	120	40	160	B -stitch	h_{ef} + 11	h_{ef} + 9	3 / 3	180	M10x135	50
BZ3 M12x85/0-10	0910 312 085	12	-	-	10	50	60	B -stitch	h_{ef} + 13	h_{ef} + 10	3 / 3	85	M12x29	25
BZ3 M12x95/0-20	0910 312 095	12	-	-	20	50	70	B -stitch	h_{ef} + 13	h_{ef} + 10	3 / 3	95	M12x39	25
BZ3 M12x105/0-30	0910 312 105	12	10	70	30	50	80	B -stitch	h_{ef} + 13	h_{ef} + 10	3 / 3	105	M12x49	25
BZ3 M12x110/0-35	0910 312 110	12	15	70	35	50	85	B -stitch	h_{ef} + 13	h_{ef} + 10	3 / 3	110	M12x54	25
BZ3 M12x115/0-40	0910 312 115	12	20	70	40	50	90	B -stitch	h_{ef} + 13	h_{ef} + 10	3 / 3	115	M12x59	25
BZ3 M12x125/0-50	0910 312 125	12	30	70	50	50	100	B -stitch	h_{ef} + 13	h_{ef} + 10	3 / 3	125	M12x69	25
BZ3 M12x145/0-70	0910 312 145	12	50	70	70	50	120	B -stitch	h_{ef} + 13	h_{ef} + 10	3 / 3	145	M12x89	25
BZ3 M12x160/10-85	0910 312 160	12	65	70	85	50	135	B -stitch	h_{ef} + 13	h_{ef} + 10	3 / 3	160	M12x104	25
BZ3 M12x180/30-105	0910 312 180	12	85	70	105	50	155	B -stitch	h_{ef} + 13	h_{ef} + 10	3 / 3	180	M12x124	25
BZ3 M12x200/50-125	0910 312 200	12	105	70	125	50	175	B -stitch	h_{ef} + 13	h_{ef} + 10	3 / 3	200	M12x134	25
BZ3 M16x105/0-5	0910 316 105	16	-	-	5	65	70	B -stitch	h_{ef} + 17	h_{ef} + 14	3 / 3	105	M16x29	20
BZ3 M16x115/0-15	0910 316 115	16	-	-	15	65	80	B -stitch	h_{ef} + 17	h_{ef} + 14	3 / 3	115	M16x39	20
BZ3 M16x125/0-25	0910 316 125	16	5	85	25	65	90	B -stitch	h_{ef} + 17	h_{ef} + 14	3 / 3	125	M16x49	20
BZ3 M16x135/0-35	0910 316 135	16	15	85	35	65	100	B -stitch	h_{ef} + 17	h_{ef} + 14	3 / 3	135	M16x59	20
BZ3 M16x145/0-45	0910 316 145	16	25	85	45	65	110	B -stitch	h_{ef} + 17	h_{ef} + 14	3 / 3	145	M16x69	20
BZ3 M16x170/0-70	0910 316 170	16	50	85	70	65	135	B -stitch	h_{ef} + 17	h_{ef} + 14	3 / 3	170	M16x94	20
BZ3 M16x200/5-100	0910 316 200	16	80	85	100	65	165	B -stitch	h_{ef} + 17	h_{ef} + 14	3 / 3	200	M16x124	10

1) Seismic C1 and C2 for anchoring depth h_{ef} ≥ 40mm

Cap nut HM

- Galvanized steel, extra high version
- For visually demanding requirements
- Protection against injuries

Designation	Article number	Thread	Nut height mm	Width across flats SW	Suitable for	Package contents
Cap nut HM M10	0910 300 010	M10	22	17	BZ3 M10	20
Cap nut HM M12	0910 300 012	M12	26,5	19	BZ3 M12	20

Bolt anchor setting tool BSW

- Setting tool for bolt anchors M6 - M16
- With SDS plus holder

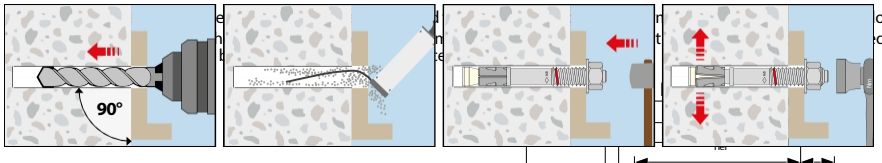
Designation	Article number	Suitable for bolt anchors	Length mm	Package contents piece
BSW M6-M16	0910 000 140	BZ3 / BZ plus/ B M6 - M16	140	1

ETA-19/0619

Extract from the conditions of use of the European Technical Assessment ETA-19/0619 for use in cracked and non-cracked concrete (Option 1)

Permissible loads according to EN 1992-4 without the influence of center distances and edge distances. The overall safety factor (γ_M and γ_F) was taken into account. For load-bearing capacities under fire exposure, see end of catalog.

Loads and characteristic values	Bolt anchor BZ3			M8			M10			M12			M16		
Minimum anchoring depth1)		$h_{ef,min}$	[mm]	35			40			50			65		
Standard anchoring depth		$h_{ef,std}$	[mm]		45			60			70			85	
Maximum anchoring depth		$h_{ef,max}$	[mm]			90			100			125			160
									more cunning	Concrete					
Permissible tensile load	C20/25zul	. N	[kN]	3,4	4,5	4,5	4,1	7,1	7,1	5,8	9,6	10,5	8,6	12,9	14,3
	C25/30zul	. N	[kN]	3,8	5,0	5,0	4,6	7,6	7,6	6,5	10,7	11,7	9,6	14,4	15,4
	proved N	C30/37ap	[kN]	4,2	5,4	5,4	5,1	8,0	8,0	7,1	11,8	12,8	10,5	15,7	16,4
	C40/50zul	. N	[kN]	4,8	6,1	6,1	5,9	8,6	8,6	8,2	13,6	14,8	12,2	18,1	18,1
	proved N	C50/60ap	[kN]	5,4	6,8	6,8	6,6	9,1	9,1	9,2	15,2	16,6	13,6	19,5	19,5
									uncracked concrete						
Permissible tensile load1	C20/25	permissible N	[kN]	4,9	6,7	6,7	5,9	10,9	11,4	8,3	13,7	14,3	12,3	18,4	23,8
	C25/30	permissible N	[kN]	5,4	7,4	7,4	6,6	12,2	12,6	9,3	15,3	16,0	13,7	20,5	24,9
	C30/37	permissible N	[kN]	5,9	8,1	8,1	7,3	13,3	13,7	10,1	16,8	17,5	15,0	22,5	25,9
	C40/50	permissible N	[kN]	6,9	9,4	9,4	8,4	14,5	14,5	11,7	19,4	20,2	17,4	26,0	27,4
	C50/60	permissible N	[kN]	7,7	9,4	9,4	9,4	14,5	14,5	13,1	21,4	21,4	19,4	28,7	28,7
									cracked concrete						
Permissible transverse load	C20/25	permissible V	[kN]	9,0	9,0	9,0	12,9	15,3	15,3	17,4	21,9	21,9	30,9	34,3	34,3
	≥ C25/30	permissible V	[kN]	9,0	9,0	9,0	14,4	15,3	15,3	19,4	21,9	21,9	34,3	34,3	34,3
									uncracked concrete						
Permissible shear load	C20/25	permissible V	[kN]	9,0	9,0	9,0	15,3	15,3	15,3	21,9	21,9	21,9	34,3	34,3	34,3
	≥ C25/30	permissible V	[kN]	9,0	9,0	9,0	15,3	15,3	15,3	21,9	21,9	21,9	34,3	34,3	34,3
Permissible bending moment		Permitted M	[Nm]	17,1	17,1	17,1	34,3	34,3	34,3	60,0	60,0	60,0	137,1	137,1	137,1
Center and edge distances2)															
Anchoring depth		h_{ef}	[mm]	35	45	90	40	60	100	50	70	125	65	85	160
Minimum component thickness		h_{min}	[mm]	80	80	135	80	90	150	100	105	187,5	120	127,5	240
Minimum center distance		s_{min}	[mm]	35	35	35	40	40	40	50	50	50	65	65	65
Minimum edge distance		c_{min}	[mm]	40	40	40	45	45	45	55	55	55	65	65	65
Assembly data															
Drill hole diameter		d_o	[mm]	8	8	8	10	10	10	12	12	12	16	16	16
Through hole in the attachment part		$d_f \leq$	[mm]	9	9	9	12	12	12	14	14	14	18	18	18
Drill hole depth		h_1	[mm]	45	55	100	51	71	111	63	83	138	82	102	177
Torque when anchoring		T_{inst}	[Nm]	15	15	15	40	40	40	60	60	60	110	110	110
Width across flats		SW	[mm]	13	13	13	17	17	17	19	19	19	24	24	24
Height of the hexagon nut			[mm]	6,5	6,5	6,5	8	8	8	10	10	10	13	13	13
Height of the cap nut			[mm]	-	-	-	22	22	22	26,5	26,5	26,5	-	-	-
Outer diameter x height of the Washer BZ3			[mm]	16x1,6	16x1,6	16x1,6	20x2	20x2	20x2	24x2,5	24x2,5	24x2,5	30x3	30x3	30x3
Outer diameter x height of washer BZ3-U			[mm]	24x2	24x2	24x2	30x2,5	30x2,5	30x2,5	37x3	37x3	37x3	50x3	50x3	50x3



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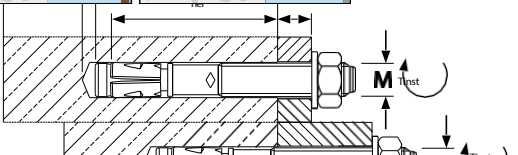
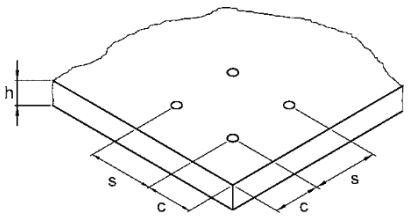
dge distance cannot be applied





Assembly

BZ3 Stainless steel A4 bolt anchor

HOLDS. COMMITMENTLESS. STRONG

Advantages:

- The bolt anchor with maximum permissible loads and variable anchoring depth
- European Technical Assessment ETA-19/0619 for use in cracked and non-cracked concrete (option 1), under seismic action of categories C1 and C2 and for use under fire exposure (R30-R120)
- For higher loads under seismic action, the annular gap between the bolt anchor and the attachment can be filled using the VS filling disk and injection mortar
- Low minimum anchoring depths
- New calculation method depending on the anchorage depth and the thickness of the concrete component
- The high degree of flexibility enables optimum adaptation to the assembly situation and thus increases cost-effectiveness
- Also available in extra-short versions
- Fewer turns until the tightening torque is reached
- Colored marking of the minimum anchoring depth
- Shock approval from the Federal Office for Civil Protection, Switzerland (from standard anchoring depth)

ETA-19/0619

Option 1 for cracked concrete

SEISMIC

Seismic C1 & C2 from 40 mm anchoring depth

Fire-tested according to standard temperature curve F30-F120

Suitable for the installation of sprinkler systems in concrete

ZIVILSCHUTZ

Shock approval from the Federal Office for Civil Protection, Bern, Switzerland from standard anchoring depth

EDELSTAHL® Rostfrei

Area of application:

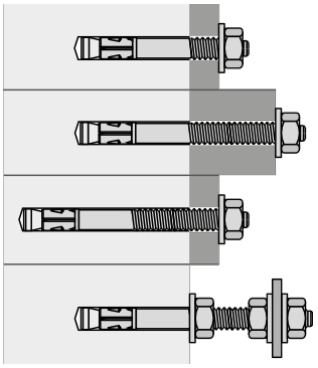
Anchoring of medium to heavy loads in cracked and non-cracked concrete: Supports, steel girders, railing fastenings, cable trays, pipe trays, timber constructions, brackets, fastenings in earthquake zones, etc.

Note:

The BZ3 bolt anchor also allows the optional use of the special HM cap nut. Thanks to its closed shape, the HM cap nut prevents warping and opens up new design possibilities for architecturally sophisticated applications.

The stepless, variable anchoring depth

allows the setting depth to be precisely adapted to the user's requirements. Setting with minimum anchoring depth reduces drilling and setting effort as well as the risk of hitting reinforcement. Stepless, deeper setting increases the permissible load and allows the anchoring depth to be adjusted with millimeter precision. The new option of increasing permissible loads beyond the standard anchoring depth means that fastenings can be carried out that were previously not possible with a bolt anchor.



Small anchoring depth and small clamping thickness

Small anchoring depth and large, flexible clamping thickness

Large anchoring depth and small clamping thickness

Distance mounting

Bolt anchor BZ3 A4

Designation	Item number	Drill hole Ø d_0 mm	Standard anchoring depth: Clamping anchor strength $t_{fix,std}$ mm	Standard anchoring depth: anchor depth $h_{ef,std}$ mm	Minimum anchoring depth: Clamping anchor strength $t_{fix,max}$ mm	Minimum anchoring depth: anchor depth $h_{ef,min}$ mm	Variable anchoring depth: Usable length B mm	Variable anchoring depth: Clamping hole thickness t_{fix} mm	Variable anchoring depth: Depth h_1 mm	Setting depth h_{nom}	Seismic C1 / C2	Dowel length l mm	Thread mm	Package contents Piece
BZ3 M8x60/0-5 A4	0910 408 060	8	-	-	5	35	40	B -stitch	h_{ef} + 10	h_{ef} + 8	- / -	60	M8x18	100
BZ3 M8x65/0-10 A4	0910 408 065	8	-	-	10	35	45	B -stitch	h_{ef} + 10	h_{ef} + 8	3 / 31)	65	M8x23	100
BZ3 M8x75/0-20 A4	0910 408 075	8	10	45	20	35	55	B -stitch	h_{ef} + 10	h_{ef} + 8	3 / 31)	75	M8x33	100
BZ3 M8x80/0-25 A4	0910 408 080	8	15	45	25	35	60	B -stitch	h_{ef} + 10	h_{ef} + 8	3 / 31)	80	M8x38	100
BZ3 M8x95/0-40 A4	0910 408 095	8	30	45	40	35	75	B -stitch	h_{ef} + 10	h_{ef} + 8	3 / 31)	95	M8x53	100
BZ3 M8x115/5-60 A4	0910 408 115	8	50	45	60	35	95	B -stitch	h_{ef} + 10	h_{ef} + 8	3 / 31)	115	M8x73	100
BZ3 M8x165/55-110 A4	0910 408 165	8	100	45	110	35	145	B -stitch	h_{ef} + 10	h_{ef} + 8	3 / 31)	165	M8x123	50
BZ3 M10x70/0-10 A4	0910 410 070	10	-	-	10	40	50	B -stitch	h_{ef} + 11	h_{ef} + 9	3 / 3	70	M10x25	50
BZ3 M10x80/0-20 A4	0910 410 080	10	-	-	20	40	60	B -stitch	h_{ef} + 11	h_{ef} + 9	3 / 3	80	M10x35	50
BZ3 M10x90/0-30 A4	0910 410 090	10	10	60	30	40	70	B -stitch	h_{ef} + 11	h_{ef} + 9	3 / 3	90	M10x45	50
BZ3 M10x95/0-35 A4	0910 410 095	10	15	60	35	40	75	B -stitch	h_{ef} + 11	h_{ef} + 9	3 / 3	95	M10x50	50
BZ3 M10x100/0-40 A4	0910 410 100	10	20	60	40	40	80	B -stitch	h_{ef} + 11	h_{ef} + 9	3 / 3	100	M10x55	50
BZ3 M10x110/0-50 A4	0910 410 110	10	30	60	50	40	90	B -stitch	h_{ef} + 11	h_{ef} + 9	3 / 3	110	M10x65	50
BZ3 M10x130/10-70 A4	0910 410 130	10	50	60	70	40	110	B -stitch	h_{ef} + 11	h_{ef} + 9	3 / 3	130	M10x85	50
BZ3 M10x155/35-95 A4	0910 410 155	10	75	60	95	40	135	B -stitch	h_{ef} + 11	h_{ef} + 9	3 / 3	155	M10x110	50
BZ3 M10x180/60-120 A4	0910 410 180	10	100	60	120	40	160	B -stitch	h_{ef} + 11	h_{ef} + 9	3 / 3	180	M10x135	50
BZ3 M12x85/0-10 A4	0910 412 085	12	-	-	10	50	60	B -stitch	h_{ef} + 13	h_{ef} + 10	3 / 3	85	M12x29	25
BZ3 M12x95/0-20 A4	0910 412 095	12	-	-	20	50	70	B -stitch	h_{ef} + 13	h_{ef} + 10	3 / 3	95	M12x39	25
BZ3 M12x105/0-30 A4	0910 412 105	12	10	70	30	50	80	B -stitch	h_{ef} + 13	h_{ef} + 10	3 / 3	105	M12x49	25
BZ3 M12x110/0-35 A4	0910 412 110	12	15	70	35	50	85	B -stitch	h_{ef} + 13	h_{ef} + 10	3 / 3	110	M12x54	25
BZ3 M12x115/0-40 A4	0910 412 115	12	20	70	40	50	90	B -stitch	h_{ef} + 13	h_{ef} + 10	3 / 3	115	M12x59	25
BZ3 M12x125/0-50 A4	0910 412 125	12	30	70	50	50	100	B -stitch	h_{ef} + 13	h_{ef} + 10	3 / 3	125	M12x69	25
BZ3 M12x145/0-70 A4	0910 412 145	12	50	70	70	50	120	B -stitch	h_{ef} + 13	h_{ef} + 10	3 / 3	145	M12x89	25
BZ3 M12x160/10-85 A4	0910 412 160	12	65	70	85	50	135	B -stitch	h_{ef} + 13	h_{ef} + 10	3 / 3	160	M12x104	25
BZ3 M12x180/30-105 A4	0910 412 180	12	85	70	105	50	155	B -stitch	h_{ef} + 13	h_{ef} + 10	3 / 3	180	M12x124	25
BZ3 M12x200/50-125 A4	0910 412 200	12	105	70	125	50	175	B -stitch	h_{ef} + 13	h_{ef} + 10	3 / 3	200	M12x134	25
BZ3 M16x115/0-15 A4	0910 416 115	16	-	-	15	65	80	B -stitch	h_{ef} + 17	h_{ef} + 14	3 / 3	115	M16x39	20
BZ3 M16x125/0-25 A4	0910 416 125	16	5	85	25	65	90	B -stitch	h_{ef} + 17	h_{ef} + 14	3 / 3	125	M16x49	20
BZ3 M16x135/0-35 A4	0910 416 135	16	15	85	35	65	100	B -stitch	h_{ef} + 17	h_{ef} + 14	3 / 3	135	M16x59	20
BZ3 M16x145/0-45 A4	0910 416 145	16	25	85	45	65	110	B -stitch	h_{ef} + 17	h_{ef} + 14	3 / 3	145	M16x69	20
BZ3 M16x170/0-70 A4	0910 416 170	16	50	85	70	65	135	B -stitch	h_{ef} + 17	h_{ef} + 14	3 / 3	170	M16x94	20
BZ3 M16x200/5-100 A4	0910 416 200	16	80	85	100	65	165	B -stitch	h_{ef} + 17	h_{ef} + 14	3 / 3	200	M16x124	10

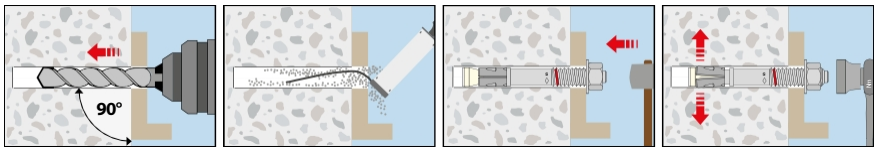
1) Seismic C1 and C2 for anchoring depth h_{ef} ≥ 40mm BZ3 HCR available on request

Cap nut HM A4

- Stainless steel A4, extra high version
- For visually demanding requirements
- Protection against injuries

Designation	Article number	Thread	Nut height mm	Width across flats SW	Suitable for	Package contents
Cap nut HM M10 A4	0910 400 010	M10	22	17	BZ3 M10 A4	20
Cap nut HM M12 A4	0910 400 012	M12	26,5	19	BZ3 M12 A4	20

Assembly



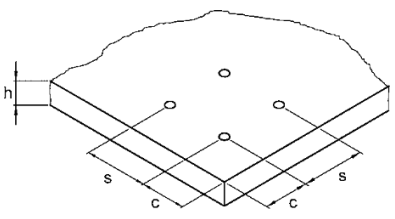
Extract from the conditions of use of the European Technical Assessment ETA-19/0619 for use in cracked and non-cracked concrete (Option 1)

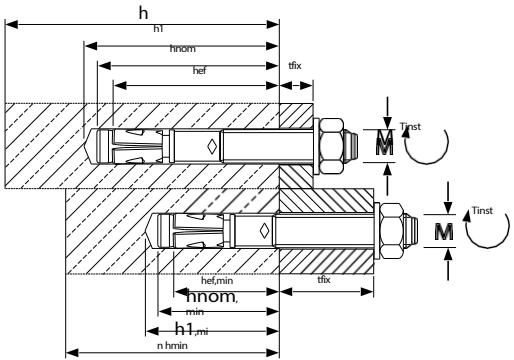
Permissible loads according to EN 1992-4 without the influence of center distances and edge distances. The overall safety factor (γ_M and γ_F) was taken into account. For load-bearing capacities under fire exposure, see end of catalog.

Loads and characteristic values		**Bolt anchor BZ3 A4**						**M8**			**M10**			**M12**		**M16**
Minimum anchoring depth[1]		$h_{ef,min}$	[mm]	35			40			50			65			
Standard anchoring depth		$h_{ef,std}$	[mm]		45			60			70			85		
Maximum anchoring depth		$h_{ef,max}$	[mm]			90			100			125				160
									more cunning	Concrete						
Permissible tensile load	C20/25	permissible N	[kN]	3,4	4,5	4,5	4,1	7,6	8,1	5,8	9,6	10,5	8,6	12,9	16,7
	C25/30	permissible N	[kN]	3,8	5,0	5,0	4,6	8,5	9,1	6,5	10,7	11,5	9,6	14,4	18,0
	C30/37	permissible N	[kN]	4,2	5,5	5,5	5,1	9,3	9,9	7,1	11,8	12,5	10,5	15,7	19,2
	C40/50	permissible N	[kN]	4,8	6,3	6,3	5,9	10,8	11,4	8,2	13,6	14,2	12,2	18,2	21,2
	C50/60	permissible N	[kN]	5,4	7,1	7,1	6,6	12,0	12,8	9,2	15,2	15,6	13,6	20,3	23,0
									uncracked concrete							
Permissible tensile load[1]	C20/25	permissible N	[kN]	4,9	7,1	9,4	5,9	10,9	11,9	8,3	13,7	20,0	12,3	18,4	23,8
	C25/30	permissible N	[kN]	5,4	7,9	9,4	6,6	12,2	12,9	9,3	15,3	21,0	13,7	20,5	24,9
	C30/37	permissible N	[kN]	5,9	8,7	9,4	7,3	13,3	13,8	10,1	16,8	21,4	15,0	22,5	25,8
	C40/50	permissible N	[kN]	6,9	9,4	9,4	8,4	14,5	14,5	11,7	19,4	21,4	17,4	26,0	27,3
	C50/60	permissible N	[kN]	7,7	9,4	9,4	9,4	14,5	14,5	13,1	21,4	21,4	19,4	28,5	28,5
									cracked concrete							
Permissible shear load	C20/25	permissible V	[kN]	9,2	9,6	9,6	11,6	15,9	15,9	19,1	22,7	22,7	29,2	39,7	39,7
	≥ C25/30	permissible V	[kN]	9,6	9,6	9,6	13,0	15,9	15,9	21,4	22,7	22,7	32,7	39,7	39,7
									uncracked concrete							
Permissible shear load	C20/25	permissible V	[kN]	9,6	9,6	9,6	15,9	15,9	15,9	22,7	22,7	22,7	39,7	39,7	39,7
	≥ C25/30	permissible V	[kN]	9,6	9,6	9,6	15,9	15,9	15,9	22,7	22,7	22,7	39,7	39,7	39,7
Permissible bending moment		Permitted M	[Nm]	15,4	15,4	15,4	31,4	31,4	31,4	56,6	56,6	56,6	127,4	127,4	127,4
Center and edge distances[2]																
Anchoring depth		h_{ef}	[mm]	35	45	90	40	60	100	50	70	125	65	85	160
Minimum component thickness		h_{min}	[mm]	80	80	135	80	90	150	100	105	187,5	120	127,5	240
Minimum center distance		s_{min}	[mm]	35	35	35	40	40	40	50	50	50	65	65	65
Minimum edge distance		c_{min}	[mm]	40	40	40	45	45	45	55	55	55	65	65	65
Assembly data																
Drill hole diameter		d_o	[mm]	8	8	8	10	10	10	12	12	12	16	16	16
Through hole in the attachment part		$d_f \leq$	[mm]	9	9	9	12	12	12	14	14	14	18	18	18
Drill hole depth		h_1	[mm]	45	55	100	51	71	111	63	83	138	82	102	177
Torque when anchoring		T_{inst}	[Nm]	15	15	15	40	40	40	55	55	55	100	100	100
Width across flats		SW	[mm]	13	13	13	17	17	17	19	19	19	24	24	24
Height of the hexagon nut			[mm]	6,5	6,5	6,5	8	8	8	10	10	10	13	13	13
Height of the cap nut			[mm]	-	-	-	22	22	22	26,5	26,5	26,5	-	-	-
Outer diameter x height of washer BZ3 A4			[mm]	16x1,6	16x1,6	16x1,6	20x2	20x2	20x2	24x2,5	24x2,5	24x2,5	30x3	30x3	30x3
Outer diameter x height of washer BZ3-U A4			[mm]	24x2	24x2	24x2	30x2,5	30x2,5	30x2,5	37x3	37x3	37x3	50x3	50x3	50x3

[1] Fasteners with anchoring depths h_{ef} < 40 mm are restricted to the use of statically indeterminate components under indoor conditions

[2] For anchor groups and anchorages close to the edge, the minimum values of component thickness, axial spacing and edge distance cannot be applied simultaneously, but must be determined in accordance with ETA-19/0619 Table B2.





BZ3 dynamic bolt anchor

With approval for fatigue loading

Product description:
The BZ3 dynamic bolt anchor is the world's first mechanical expansion anchor with an assessment/approval (ETA-20/0117) for fatigue loading. It is quick to install and can be statically loaded immediately. This makes it an economical alternative to injection systems and undercut anchors.

ETA-20/0117
Fatigue stress

ETA-19/0619
Option1 for cracked concrete

SEISMIC
Seismic C1 & C2

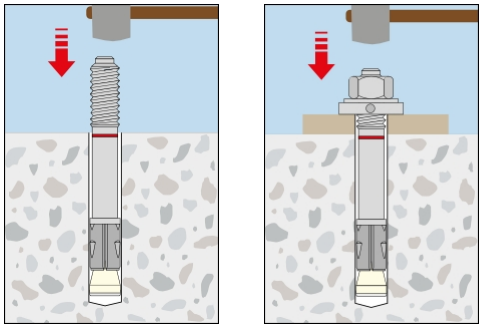
DYNAMIC

Fire-tested according to standard temperature curve F30-F120

Advantages:
- European Technical Assessment in cracked and non-cracked concrete under fatigue loading
- Also approved for use under seismic action of category C1 and C2 and under the influence of fire (R30-R120)
- Quick and easy installation, immediately statically loadable
- Anchoring depth color-coded
- Flexible application, for push-through and push-in mounting
- When using a suction drill, there is no need to blow out the drill hole and the generation of drilling dust is avoided
- Very low anchorage depths and minimum component thicknesses
- Small center and edge distances
- Economical alternative to injection and undercut systems

Area of application:
Anchoring of light to medium-heavy loads under fatigue stress in cracked and non-cracked concrete:
Crane systems, industrial robots, elevator guides, conveyor systems, etc.

Suitable for push-in and push-through mounting



Bolt anchor BZ3 dynamic, steel vz

- Galvanized steel
- Approved for loads with fatigue stress
- Each pack of BZ3 dyn M10 and BZ3 dyn M12 contains 5 mixer reducers, each pack of BZ3 dyn M16 contains 2 mixer reducers

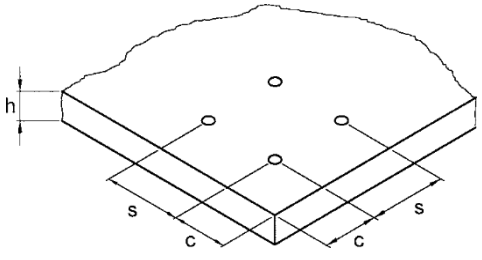
Designation	Item number	Clamp thickness $t_{fix,min}$ mm	Clamp thickness $t_{fix,max}$ mm	Anchoring depth h_{ef} mm	Borehole -Ø d_0 mm	Borehole depth $h_1 \geq$ mm	Drill hole depth due to attachment h_d mm	Dowel length l mm	Thread mm	Package contents Piece
BZ3 dyn M10x100/5-10	0910 810 100	5	10	60	10	71	81	100	M10x26	25
BZ3 dyn M10x120/10-30	0910 810 120	10	30	60	10	71	101	120	M10x31	25
BZ3 dyn M10x140/30-50	0910 810 140	30	50	60	10	71	121	140	M10x51	25
BZ3 dyn M12x115/6-10	0910 812 115	6	10	70	12	83	93	115	M12x31	25
BZ3 dyn M12x135/10-30	0910 812 135	10	30	70	12	83	113	135	M12x35	25
BZ3 dyn M12x155/30-50	0910 812 155	30	50	70	12	83	133	155	M12x55	25
BZ3 dyn M16x155/8-25	0910 816 155	8	25	85	16	102	127	155	M16x37	10
BZ3 dyn M16x180/25-50	0910 816 180	25	50	85	16	102	152	180	M16x54	10

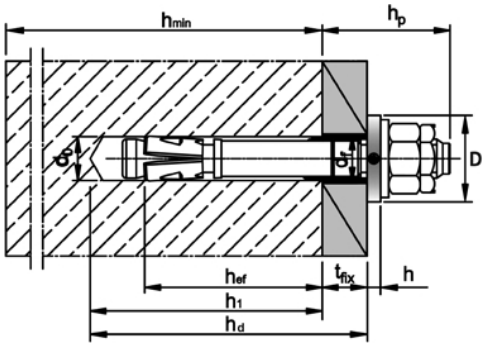
ETA-20/0117

Extract from the conditions of use of the European Technical Assessment ETA-20/0117 for use under fatigue loading in cracked and non-cracked concrete

Permissible loads according to EN 1992-4 without the influence of center distances and edge distances. The overall safety factor (γ_M and γ_F) was taken into account. For load-bearing capacities under fire exposure, see end of catalog.

Loads and characteristic values	Bolt anchor BZ3 dynamic			M10	M12	M16
Single fastening					cracked and non-cracked concrete	
Permissible tensile load	≥ C20/25	permissible N	[kN]	3,4	4,6	7,2
Permissible shear load	≥ C20/25	permissible V	[kN]	1,9	3,0	5,6
Fastening group					cracked and non-cracked concrete	
Permissible tensile load per anchor	≥ C20/25	permissible N	[kN]	1,7	2,3	3,6
Permissible shear load per anchor	≥ C20/25	permissible V	[kN]	0,9	1,5	2,8
Center and edge distances						
Anchoring depth		h_{ef}	[mm]	60	70	85
Minimum component thickness		h_{min}	[mm]	90	105	127,5
Minimum center distance		s_{min}	[mm]	40	50	65
Minimum edge distance		c_{min}	[mm]	45	55	65
Assembly data						
Drill hole diameter		d_o	[mm]	10	12	16
Through hole in the attachment part		$d_f \leq$	[mm]	12	14	18
Drill hole depth		$h_1 \geq$	[mm]	71	83	102
Torque when anchoring		T_{inst}	[Nm]	40	60	110
Width across flats		SW	[mm]	17	19	24
Outer diameter x height of the Backfill disk		D x h	[mm]	26x5	28x5	34x5
Protrusion		h_p	[mm]	21,5 + t_{fix}	25,5 + t_{fix}	29,5 +t_{fix}





Wedge anchor BZ3 A4 dynamic, stainless steel A4

- Stainless steel A4
- Approved for loads with fatigue stress
- Each pack of BZ3 dyn M10 and BZ3 dyn M12 contains 5 mixer reducers, each pack of BZ3 dyn M16 contains 2 mixer reducers

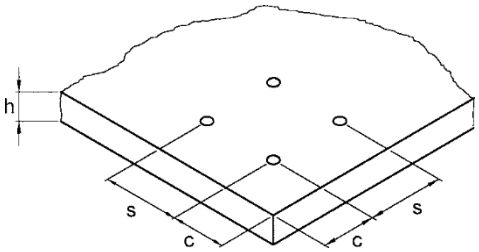
Designation	Item number	Clamp thickness $t_{fix,min}$ mm	Clamp thickness $t_{fix,max}$ mm	Anchoring depth h_{ef} mm	Borehole-Ø d_0 mm	Borehole depth $h_1 \geq$ mm	Drill hole depth due to attachment h_d mm	Dowel length l mm	Thread mm	Package contents Piece
BZ3 dyn M10x100/5-10 A4	0910 910 100	5	10	60	10	71	81	100	M10x26	25
BZ3 dyn M10x120/10-30 A4	0910 910 120	10	30	60	10	71	101	120	M10x31	25
BZ3 dyn M10x140/30-50 A4	0910 910 140	30	50	60	10	71	121	140	M10x51	25
BZ3 dyn M12x115/6-10 A4	0910 912 115	6	10	70	12	83	93	115	M12x31	25
BZ3 dyn M12x135/10-30 A4	0910 912 135	10	30	70	12	83	113	135	M12x35	25
BZ3 dyn M12x155/30-50 A4	0910 912 155	30	50	70	12	83	133	155	M12x55	25
BZ3 dyn M16x155/8-25 A4	0910 916 155	8	25	85	16	102	127	155	M16x37	10
BZ3 dyn M16x180/25-50 A4	0910 916 180	25	50	85	16	102	152	180	M16x54	10

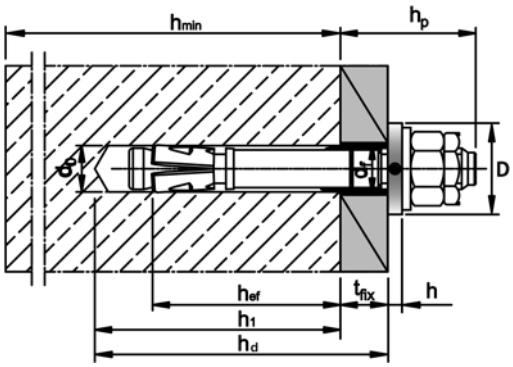
ETA-20/0117

Extract from the conditions of use of the European Technical Assessment ETA-20/0117 for use under fatigue loading in cracked and non-cracked concrete

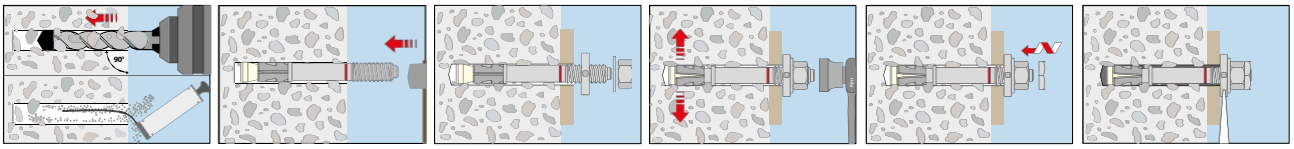
Permissible loads according to EN 1992-4 without the influence of center distances and edge distances. The overall safety factor (γ_M and γ_F) was taken into account. For load-bearing capacities under fire exposure, see end of catalog.

Loads and BZ3 dynamic A4	**characteristic values**	**Bolt anchor**	**M10**	**M12**	**M16**
Single fastening				cracked and non-cracked concrete	
Permissible tensile	load ≥ C20/25 per [kN]	N	2,4	3,9	6,8
Permissible shear V	load ≥ C20/25 [kN]	permissible	1,1	2,1	4,4
Fastening group				cracked and non-cracked concrete	
Permissible tensile load per	anchor ≥ C20/25 per [kN]	N	1,2	1,96	3,4
Permissible shear load per V	anchor ≥ C20/25 [kN]	permissible	0,55	1,04	2,2
Center and edge distances					
Anchoring depth	h_{ef}	[mm]	60	70	85
Minimum component thickness	h_{min}	[mm]	90	105	127,5
Minimum center distance	s_{min}	[mm]	40	50	65
Minimum edge distance	c_{min}	[mm]	45	55	65
Assembly data					
Drill hole diameter	d_o	[mm]	10	12	16
Through hole in the attachment part $t_f \leq$	[mm]		12	14	18
	Borehole depth $h_1 \geq$ [mm]		71	83	102
Anchoring torque	T_{inst}	[Nm]	40	55	100
Width across flats	SW	[mm]	17	19	24
Outer diameter x height of the backfill disk	D x h	[mm]	26x5	28x5	34x5
Protrusion	h_p	[mm]	21,5 + t_{fix}	25,5 + t_{fix}	29,5 + t_{fix}

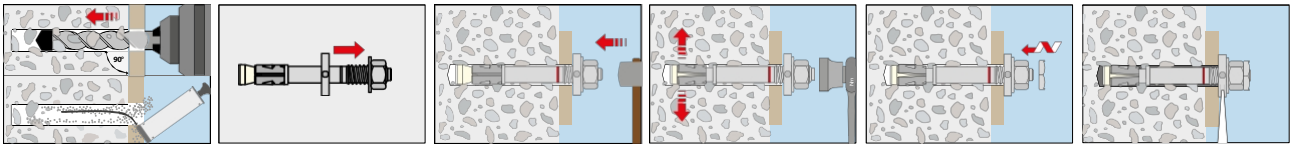




Pre-mounting



Push-through mounting



This is used to fill the annular gap in the BZ3 dynamic bolt anchor using the filling disk:

Injection system VMH

in the coaxial cartridge

Item no.	Type designation	Contents	PU
0911 006 330	Injection mortar VMH 320	320 ml	1/12

Item no.	Type designation	Contents	PU
0911 006 420	Injection mortar VMH 420	420 ml	1/12

Backfill disk VS

In galvanized steel and stainless steel A4

- Enables larger through-holes in the add-on part
- Increased permissible shear loads under seismic action
- For Ø M 8 to M 24

Article no. 0914 600 ...

Galvanized steel

Stainless steel A4

Bolt anchor BZ plus

For fast and reliable fastening of medium to heavy loads in cracked and non-cracked concrete

The BZ plus bolt anchor is a force-controlled expanding anchor for quick installation. When the hexagon nut is tightened, the bolt is pulled into the expansion clip and reliably braces it against the wall of the drilled hole. Both approved anchoring depths allow flexible use with a long thread. The reduced anchoring depth saves time and reduces installation work when drilling.

material	Steel (expanding clip stainless steel A2)
Surface finish	galvanized
Load range	2.4 kN - 65.1 kN
Concrete quality	C20/25 - C50/60

Application examples

Anchoring of medium to heavy loads in cracked and non-cracked concrete: columns, steel beams, railing fastenings, cable trays, pipe trays, timber structures, brackets. Fastenings in earthquake zones, etc.

Advantages

- High permissible loads, small center and edge distances
- Quick and easy installation
- Immediately loadable - no waiting times
- Two anchoring depths for more flexibility

European Technical Assessment, for anchoring in concrete

Fire protection tested

F30-F120 1)

Meets the requirements of VdS

Federal Office for Civil Defense BZS 05- 6011)

ZIVILSCHUTZ 1)

Factory Mutual1)

FM approved1) M10 - M16

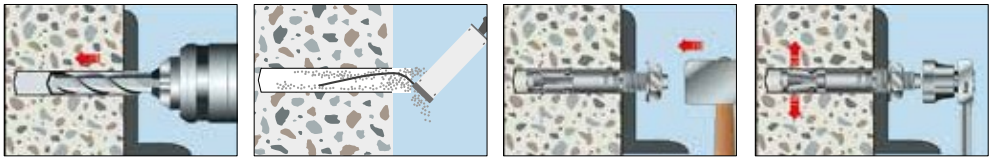
Approved for use under seismic effects of category C1 and C21)

SEISMIC 1)

Suction drilling according to approval / evaluation possible

1) Only applies to standard anchoring depth

Assembly



		Standard anchoring depth					Reduced anchoring depth						
Designation	**Article number**	**Clamping strength t_{fix} mm**	**Drill hole Ø x depth mm**	**Setting depth h_{nom} mm**	**Anchoring depth h_{ef} mm**	**Seismic C1 / C2**	**Clamping thickness $t_{fix,red}$ mm**	**Drill hole Ø x depth mm**	**Setting depth $h_{nom,red}$ mm**	**Anchoring depth $h_{ef,red}$ mm**	**Dowel length l mm**	**Thread mm**	**Package contents Piece**
BZ 8-6/60 s	0910 208 060	-	-	-	-	-	6	8x49	41	35	60	M8x17	100
BZ 8-11/65 s	0910 208 065	-	-	-	-	-	11	8x49	41	35	65	M8x22	100
BZ 8-10-21/75	0910 208 075	10	8x60	52	46	✓	21	8x49	41	35	75	M8x32	100
BZ 8-15-26/80	0910 208 080	15	8x60	52	46	✓	26	8x49	41	35	80	M8x37	100
BZ 8-30-41/95	0910 208 095	30	8x60	52	46	✓	41	8x49	41	35	95	M8x52	100
BZ 8-50-61/115	0910 208 115	50	8x60	52	46	✓	61	8x49	41	35	115	M8x72	100
BZ 8-100-111/165	0910 208 165	100	8x60	52	46	✓	111	8x49	41	35	165	M8x122	50
BZ 10-10/70 s	0910 210 070	-	-	-	-	-	10	10x55	48	40	70	M10x22	50
BZ 10-20/80 s	0910 210 080	-	-	-	-	-	20	10x55	48	40	80	M10x32	50
BZ 10-10-30/90	0910 210 090	10	10x75	68	60	✓	30	10x55	48	40	90	M10x42	50
BZ 10-15-35/95	0910 210 095	15	10x75	68	60	✓	35	10x55	48	40	95	M10x47	50
BZ 10-20-40/100	0910 210 100	20	10x75	68	60	✓	40	10x55	48	40	100	M10x52	50
BZ 10-30-50/110	0910 210 110	30	10x75	68	60	✓	50	10x55	48	40	110	M10x62	50
BZ 10-50-70/130	0910 210 130	50	10x75	68	60	✓	70	10x55	48	40	130	M10x82	50
BZ 10-75-95/155	0910 210 155	75	10x75	68	60	✓	95	10x55	48	40	155	M10x107	50
BZ 12-10/85 s	0910 212 085	-	-	-	-	-	10	12x70	60	50	85	M12x26	25
BZ 12-20/95 s	0910 212 095	-	-	-	-	-	20	12x70	60	50	95	M12x36	25
BZ 12-10-30/105	0910 212 105	10	12x90	80	70	✓	30	12x70	60	50	105	M12x46	25
BZ 12-15-35/110	0910 212 110	15	12x90	80	70	✓	35	12x70	60	50	110	M12x51	25
BZ 12-20-40/115	0910 212 115	20	12x90	80	70	✓	40	12x70	60	50	115	M12x56	25
BZ 12-30-50/125	0910 212 125	30	12x90	80	70	✓	50	12x70	60	50	125	M12x66	25
BZ 12-50-70/145	0910 212 145	50	12x90	80	70	✓	70	12x70	60	50	145	M12x86	25
BZ 12-65-85/160	0910 212 160	65	12x90	80	70	✓	85	12x70	60	50	160	M12x101	25
BZ 12-85-105/180	0910 212 180	85	12x90	80	70	✓	105	12x70	60	50	180	M12x121	25
BZ 12-105-125/200	0910 212 200	105	12x90	80	70	✓	125	12x70	60	50	200	M12x135	25
BZ 12-125/220	0910 212 220	125	12x90	80	70	-	-	-	-	-	220	M12x80	25
BZ 12-145/240	0910 212 240	145	12x90	80	70	-	-	-	-	-	240	M12x80	20
BZ 16-5/105 s	0910 216 105	-	-	-	-	-	5	16x90	77	65	105	M16x26	20
BZ 16-15/115 s	0910 216 115	-	-	-	-	-	15	16x90	77	65	115	M16x36	20
BZ 16-15-35/135	0910 216 135	15	16x110	97	85	✓	35	16x90	77	65	135	M16x56	20
BZ 16-25-45/145	0910 216 145	25	16x110	97	85	✓	45	16x90	77	65	145	M16x66	20
BZ 16-50-70/170	0910 216 170	50	16x110	97	85	✓	70	16x90	77	65	170	M16x91	20
BZ 16-80-100/200	0910 216 200	80	16x110	97	85	✓	100	16x90	77	65	200	M16x121	10
BZ 16-100/220	0910 216 220	100	16x110	97	85	-	-	-	-	-	220	M16x80	10
BZ 20-30/165	0910 220 165	30	20x125	114	100	✓	-	-	-	-	165	M20x50	10
BZ 20-60/195	0910 220 195	60	20x125	114	100	✓	-	-	-	-	195	M20x70	10
BZ 24-30/190	0910 224 190	30	24x145	133	115	-	-	-	-	-	190	M24x55	10
BZ 24-60/220	0910 224 220	60	24x145	133	115	-	-	-	-	-	220	M24x85	5

Machine setting tool SDS plus for bolt anchors M 6 - M 16

- SDS plus holder

length: 140 mm

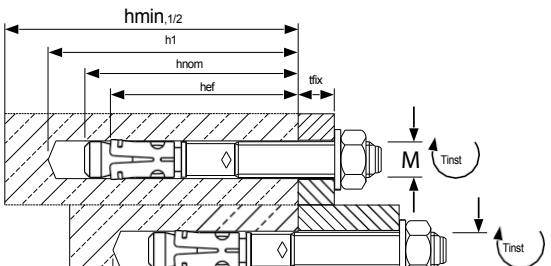
Article no. 0910 000 140

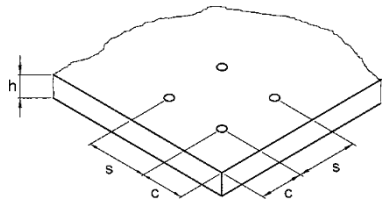
Extract from the conditions of use of the European Technical Assessment ETA-99/0010 for use in cracked and non-cracked concrete (option 1)

Permissible loads according to EN 1992-4 without the influence of center distances and edge distances. The overall safety factor (γM and γF) was taken into account. For load-bearing capacities under fire exposure, see end of catalog.

Loads and characteristic values Bolt anchor BZ plus				M8		M10		M12				M16	M20	M24
Standard anchoring depth		h_{ef}	[mm]	**46**	**-**	**60**	**-**	**70**	**-**	**85**	**-**	**100**	**115**	
Reduced anchoring depth		$h_{ef,red}$	[mm]	**-**	**35**	**-**	**40**	**-**	**50**	**-**	**65**	**-**	**-**	
							cracked concrete							
Permissible tensile load	C20/25	permissible N	[kN]	2,4	2,4	4,3	3,6	7,6	5,8	11,9	8,6	16,4	20,2	
	C25/30	permissible N	[kN]	2,7	2,7	4,8	4,0	8,5	6,5	13,3	9,6	18,3	22,6	
	C30/37	permissible N	[kN]	2,9	2,9	5,2	4,4	9,3	7,1	14,6	10,5	20,1	24,8	
	C40/50	permissible N	[kN]	3,4	3,4	6,1	5,1	10,8	8,2	16,8	12,2	23,2	28,6	
	C50/60	permissible N	[kN]	3,8	3,8	6,8	5,6	12,0	9,2	18,8	13,6	25,9	32,0	
							uncracked concrete							
Permissible tensile load	C20/25	permissible N	[kN]	5,7	3,6	7,6	4,3	11,9	8,3	16,7	12,3	23,4	28,9	
	C25/30	permissible N	[kN]	6,4	4,0	8,5	4,8	13,3	9,3	18,6	13,7	26,2	32,3	
	C30/37	permissible N	[kN]	7,0	4,4	9,3	5,2	14,6	10,1	20,4	15,0	28,7	35,4	
	C40/50	permissible N	[kN]	7,5	5,1	10,8	6,1	16,8	11,7	23,6	17,4	33,1	40,9	
	C50/60	permissible N	[kN]	7,5	5,6	12,0	6,8	18,8	13,1	26,4	19,4	37,0	45,7	
							cracked / non-cracked concrete							
Permissible shear load	C20/25	permissible V	[kN]	7,0	7,0	11,5	10,0/11,5	17,1	13,9/17,1	30,8/31,4	20,6/29,5	37,1	56,6/65,1	
	≥ C25/30	permissible V	[kN]	7,0	7,0	11,5	11,1/11,5	17,1	15,6/17,1	31,4	23,1/31,4	37,1	63,3/65,1	
Permissible bending moment		Permitted M	[Nm]	13,1	13,1	26,9	26,9	46,9	46,9	123,4	123,4	195	513,1	
Center and edge distances														
Anchoring depth		h_{ef}	[mm]	46	35	60	40	70	50	85	65	100	115	
Characteristic center distance		$s_{cr,N}$	[mm]	138	105	180	120	210	150	255	195	300	345	
Characteristic edge distance		$c_{cr,N}$	[mm]	69	52,5	90	60	105	75	127,5	97,5	150	172,5	
Minimum center and edge distances for standard component thickness														
							cracked concrete							
Standard component thickness		$h_{min,1}$	[mm]	100	-	120	-	140	-	170	-	200	230	
Minimum center distance / for edge distance c_{smin} / c			[mm]	40/70	-	45/70	-	60/100	-	60/100	-	95/150	100/180	
Minimum edge distance / for center distance s_{cmin} / s			[mm]	40/80	-	45/90	-	60/140	-	60/180	-	95/200	100/220	
							uncracked concrete							
Minimum center distance / for edge distance c_{smin} / c			[mm]	40/80	-	45/70	-	60/120	-	65/120	-	90/180	100/180	
Minimum edge distance / for center distance s_{cmin} / s			[mm]	50/100	-	50/100	-	75/150	-	80/150	-	130/240	100/220	
Minimum center and edge distances for minimum component thickness														
							cracked concrete							
Minimum thickness $s_{min,2}$ / $h_{min,3}$ [mm]		component		80	80	100	80	120	100	140	140	-	-	
Minimum center distance / for edge distance c		s_{min} / c	[mm]	40/70	50/60	45/90	50/100	60/100	50/160	70/160	65/170	-	-	
Minimum edge distance / for center distance s		c_{min} / s	[mm]	40/80	40/185	50/115	65/180	60/140	65/250	80/180	100/250	-	-	
							uncracked concrete							
Minimum center distance / for edge distance c		s_{min} / c	[mm]	40/80	50/60	60/140	50/100	60/120	50/160	80/180	65/170	-	-	
Minimum edge distance / for center distance s		c_{min} / s	[mm]	50/100	40/185	90/140	65/180	75/150	100/185	90/200	170/65	-	-	
Assembly data														
Drill hole diameter		d_o	[mm]	8	8	10	10	12	12	16	16	20	24	
Through hole in the attachment part		d_f	[mm]	9	9	12	12	14	14	18	18	22	26	
Drill hole depth		h_1	[mm]	60	49	75	55	90	70	110	90	125	145	
Torque when anchoring, galvanized steel		T_{inst}	[Nm]	20	20	25	25	45	45	90	90	160	200	
Torque when anchoring, diffusion galvanized steel		T_{inst}	[Nm]	16	16	22	22	40	40	90	90	160	260	
Width across flats		SW	[mm]	13	13	17	17	19	19	24	24	30	36	

You can find the practical dimensioning program at https://www.recanorm.de/de/loesungen/schulungen-seminare/Berechnungssoftware

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Bolt anchor BZ plus A4

For fast and reliable fastening of medium to heavy loads in cracked and non-cracked concrete

The BZ plus bolt anchor is a force-controlled expanding anchor for quick installation. When the hexagon nut is tightened, the bolt is pulled into the expansion clip and reliably braces it against the wall of the drilled hole.

material	Stainless steel A4
Surface finish	Anchor bolt, expansion clip and washer blank, Hexagon nut specially coated
Load range	2.4 kN - 43.9 kN
Concrete quality	C20/25 - C50/60

Application examples

Anchoring of medium to heavy loads indoors and outdoors, both in cracked and non-cracked concrete: columns, steel beams, façade substructures, railing fastenings, gates, pipe routes, timber structures, consoles, stadium seating, fastenings in earthquake zones, etc.

Advantages

- High permissible loads, small center and edge distances
- Quick and easy installation
- Immediately loadable - no waiting times
- The special coating of the nut reliably prevents cold welding of the bolt thread
- The plastic-coated cone ensures re-spreading in the event of cracking of the concrete
- Two anchoring depths for more flexibility

EDELSTAHL Rostfrei

European Technical Assessment, for anchoring in concrete

ETA-99/0010

Fire protection tested1)

F30-F120 1)

Meets the requirements of VdS

ZIVILSCHUTZ 1)

Federal Office for Civil Defense BZS 05- 6011)

FM approved1) M10 - M16

Factory Mutual1)

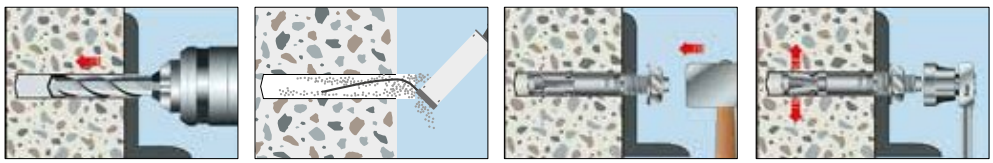
SEISMIC 1)

Approved for use under seismic effects of category C1 and C21)

Suction drilling according to approval / evaluation possible

1) Only applies to standard anchoring depth

Assembly



		Standard anchoring depth					Reduced anchoring depth						
Designation	Article number	Clamping strength h_{tfix} mm	Drill hole Ø x depth mm	Setting depth h_{nom} mm	Anchoring depth h_{ef} mm	Seismic C1 / C2	Clamping thickness $t_{fix,red}$ mm	Drill hole Ø x depth mm	Setting depth $h_{nom,red}$ mm	Anchoring depth $h_{ef,red}$ mm	Dowel length l mm	Thread mm	Package contents Piece
BZ 8-6/60 s A4	0910 508 060	-	-	-	-	-	6	8x49	41	35	60	M8x17	100
BZ 8-11/65 s A4	0910 508 065	-	-	-	-	-	11	8x49	41	35	65	M8x22	100
BZ 8-10-21/75 A4	0910 508 075	10	8x60	52	46	✓	21	8x49	41	35	75	M8x32	100
BZ 8-15-26/80 A4	0910 508 080	15	8x60	52	46	✓	26	8x49	41	35	80	M8x37	100
BZ 8-30-41/95 A4	0910 508 095	30	8x60	52	46	✓	41	8x49	41	35	95	M8x52	100
BZ 8-50-61/115 A4	0910 508 115	50	8x60	52	46	✓	61	8x49	41	35	115	M8x72	100
BZ 10-10/70 s A4	0910 510 070	-	-	-	-	-	10	10x55	48	40	70	M10x22	50
BZ 10-20/80 s A4	0910 510 080	-	-	-	-	-	20	10x55	48	40	80	M10x32	50
BZ 10-10-30/90 A4	0910 510 090	10	10x75	68	60	✓	30	10x55	48	40	90	M10x42	50
BZ 10-15-35/95 A4	0910 510 095	15	10x75	68	60	✓	35	10x55	48	40	95	M10x47	50
BZ 10-20-40/100 A4	0910 510 100	20	10x75	68	60	✓	40	10x55	48	40	100	M10x52	50
BZ 10-30-50/110 A4	0910 510 110	30	10x75	68	60	✓	50	10x55	48	40	110	M10x62	50
BZ 10-50-70/130 A4	0910 510 130	50	10x75	68	60	✓	70	10x55	48	40	130	M10x82	50
BZ 12-10/85 s A4	0910 512 085	-	-	-	-	-	10	12x70	60	50	85	M12x26	25
BZ 12-20/95 s A4	0910 512 095	-	-	-	-	-	20	12x70	60	50	95	M12x36	25
BZ 12-10-30/105 A4	0910 512 105	10	12x90	80	70	✓	30	12x70	60	50	105	M12x46	25
BZ 12-15-35/110 A4	0910 512 110	15	12x90	80	70	✓	35	12x70	60	50	110	M12x51	25
BZ 12-20-40/115 A4	0910 512 115	20	12x90	80	70	✓	40	12x70	60	50	115	M12x56	25
BZ 12-30-50/125 A4	0910 512 125	30	12x90	80	70	✓	50	12x70	60	50	125	M12x66	25
BZ 12-50-70/145 A4	0910 512 145	50	12x90	80	70	✓	70	12x70	60	50	145	M12x86	25
BZ 12-65-85/160 A4	0910 512 160	65	12x90	80	70	✓	85	12x70	60	50	160	M12x101	25
BZ 12-85-105/180 A4	0910 512 180	85	12x90	80	70	✓	105	12x70	60	50	180	M12x121	25
BZ 12-105-125/200 A4	0910 512 200	105	12x90	80	70	✓	125	12x70	60	50	200	M12x135	25
BZ 12-125/220 A4	0910 512 220	125	12x90	80	70	-	-	-	-	-	220	M12x80	25
BZ 12-160/255 A4	0910 512 255	160	12x90	80	70	-	-	-	-	-	255	M12x80	20
BZ 12-190/285 A4	0910 512 285	190	12x90	80	70	-	-	-	-	-	285	M12x80	20
BZ 12-230/325 A4	0910 512 325	230	12x90	80	70	-	-	-	-	-	325	M12x80	20
BZ 16-15/115 s A4	0910 516 115	-	-	-	-	-	15	16x90	77	65	115	M16x36	20
BZ 16-5-25/125 A4	0910 516 125	5	16x110	97	85	✓	25	16x90	77	65	125	M16x46	20
BZ 16-15-35/135 A4	0910 516 135	15	16x110	97	85	✓	35	16x90	77	65	135	M16x56	20
BZ 16-25-45/145 A4	0910 516 145	25	16x110	97	85	✓	45	16x90	77	65	145	M16x66	20
BZ 16-50-70/170 A4	0910 516 170	50	16x110	97	85	✓	70	16x90	77	65	170	M16x91	20
BZ 16-80-100/200 A4	0910 516 200	80	16x110	97	85	✓	100	16x90	77	65	200	M16x121	10
BZ 16-100/220 A4	0910 516 220	100	16x110	97	85	-	-	-	-	-	220	M16x80	10
BZ 20-30/165 A4	0910 520 165	30	20x125	114	100	✓	-	-	-	-	165	M20x50	10
BZ 20-60/195 A4	0910 520 195	60	20x125	114	100	✓	-	-	-	-	195	M20x70	10

Machine setting tool SDS plus for bolt anchors M 6 - M 16

- SDS plus holder

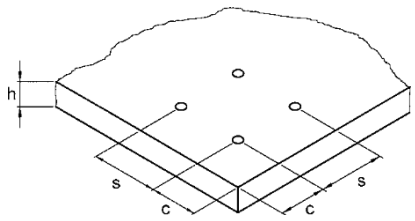
length: 140 mm

Article no. 0910 000 140

Extract from the conditions of use of the European Technical Assessment ETA-99/0010 for use in cracked and non-cracked concrete (option 1)

Permissible loads according to EN 1992-4 without the influence of center distances and edge distances. The overall safety factor (γ_M and γ_F) was taken into account. For load-bearing capacities under fire exposure, see end of catalog.

Loads and characteristic values Bolt anchor BZ plus A4				**M8**		**M10**		**M12**		**M16**		**M20**
Standard anchoring depth		h_{ef}	[mm]	**46**	**-**	**60**	**-**	**70**	**-**	**85**	**-**	**100**
Reduced anchoring depth		$h_{ef,red}$	[mm]	**-**	**35**	**-**	**40**	**-**	**50**	**-**	**65**	**-**
							cracked concrete					
Permissible tensile load	C20/25	permissible N	[kN]	2,4	2,4	4,3	3,6	7,6	5,8	11,9	8,6	16,4
	C25/30	permissible N	[kN]	2,7	2,7	4,8	4,0	8,5	6,5	13,3	9,6	18,3
	C30/37	permissible N	[kN]	2,9	2,9	5,2	4,4	9,3	7,1	14,6	10,5	20,1
	C40/50	permissible N	[kN]	3,4	3,4	6,1	5,1	10,8	8,2	16,8	12,2	23,2
	C50/60	permissible N	[kN]	3,8	3,8	6,8	5,6	12,0	9,2	18,8	13,6	25,9
							uncracked concrete					
Permissible tensile	load	C20/25 permissible N	[kN]	5,7	3,6	7,6	4,3	11,9	8,3	16,7	12,3	23,4
		C25/30 permissible N	[kN]	6,4	4,0	8,5	4,8	13,3	9,3	18,6	13,7	26,2
		C30/37 permissible N	[kN]	7,0	4,4	9,3	5,2	14,6	10,1	20,4	15,0	28,7
		C40/50 permissible N	[kN]	7,6	5,1	10,8	6,1	16,8	11,7	23,6	17,4	33,1
		C50/60 permissible N	[kN]	7,6	5,6	12,0	6,8	18,8	13,1	26,4	19,4	37,0
							cracked / non-cracked concrete					
Permissible shear load	C20/25	permissible V	[kN]	7,4	7,4	11,4	10,0/11,4	17,1	13,9/17,1	30,8/31,4	20,6/29,5	43,9
	≥ C25/30	permissible V	[kN]	7,4	7,4	11,4	11,1/11,4	17,1	15,6/17,1	31,4	23,1/31,4	43,9
Permissible bending moment		Permitted M	[Nm]	14,9	14,9	29,7	29,7	52,6	52,6	114,3	114,3	231,6
Center and edge distances												
Anchoring depth		h_{ef}	[mm]	46	35	60	40	70	50	85	65	100
Characteristic center distance		$s_{cr,N}$	[mm]	138	105	180	120	210	150	255	195	300
Characteristic edge distance		$c_{cr,N}$	[mm]	69	52,5	90	60	105	75	127,5	97,5	150
Minimum center and edge distances for standard component thickness												
							cracked concrete					
Standard component thickness		$h_{min,1}$	[mm]	100	-	120	-	140	-	160	-	200
Minimum center distance / for edge distance c_{smin} / c			[mm]	40/70	-	50/75	-	60/100	-	60/100	-	95/150
Minimum edge distance / for center distance s_{cmin} / s			[mm]	40/80	-	55/90	-	60/140	-	60/180	-	95/200
							uncracked concrete					
Minimum center distance / for edge distance c_{smin} / c			[mm]	40/80	-	50/75	-	60/120	-	65/120	-	90/180
Minimum edge distance / for center distance s_{cmin} / s		$h_{min,2}$	[mm]	50/100	-	60/120	-	75/150	-	80/150	-	130/240
Minimum center and edge distances for minimum component thickness												
							cracked concrete					
Minimum component thickness		$h_{min,2}$ /	[mm]	80	80	100	80	120	100	140	140	-
Minimum center distance / for edge distance c		s_{min} / c	[mm]	40/70	50/60	45/90	50/100	60/100	50/160	70/160	65/170	-
Minimum edge distance / for center distance s		c_{min} / s	[mm]	40/80	40/185	50/115	65/180	60/140	65/250	80/180	100/250	-
							uncracked concrete					
Minimum center distance / for edge distance c		s_{min} / c	[mm]	40/80	50/60	60/140	50/100	60/120	50/160	80/180	65/170	-
Minimum edge distance / for center distance s		c_{min} / s	[mm]	50/100	40/185	90/140	65/180	75/150	100/185	90/200	170/65	-
Assembly data												
Drill hole diameter		d_o	[mm]	8	8	10	10	12	12	16	16	20
Through hole in the attachment part		d_f	[mm]	9	9	12	12	14	14	18	18	22
Drill hole depth		h_o	[mm]	60	49	75	55	90	70	110	90	125
Torque when anchoring		T_{inst}	[Nm]	20	20	35	35	50	50	110	110	200
Width across flats		SW	[mm]	13	13	17	17	19	19	24	24	30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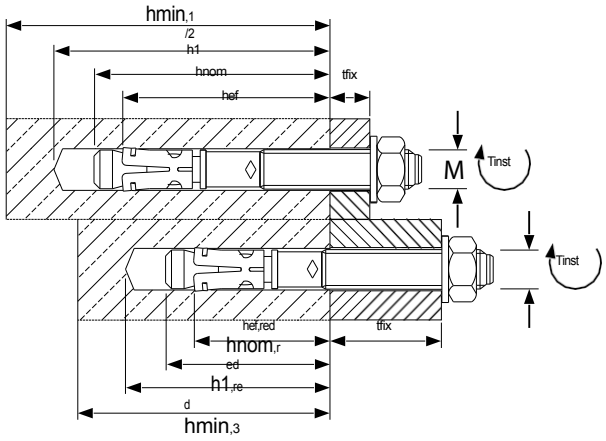
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Bolt anchor B

The ideal anchor for quick and reliable fixings in non-cracked concrete

Thanks to its three anchoring depths, the Wedge Anchor B adapts flexibly to the respective installation requirements.

The use of minimum anchoring depth reduces the drilling and installation effort as well as the risk of hitting the reinforcement.

Material: Steel (spreader clip stainless steel A2)
Surface finish: galvanized

For fastening medium to heavy loads indoors
Supports, beams, metal structures, brackets, cable trays, mounting rails, etc.
in
uncracked normal concrete of strength class ≥ C20/25 and ≤ C50/60.

Load ranges: **Tensile load: 2 .9 - 41.4 kN**
Shear load: 2.9 - 37.1 kN

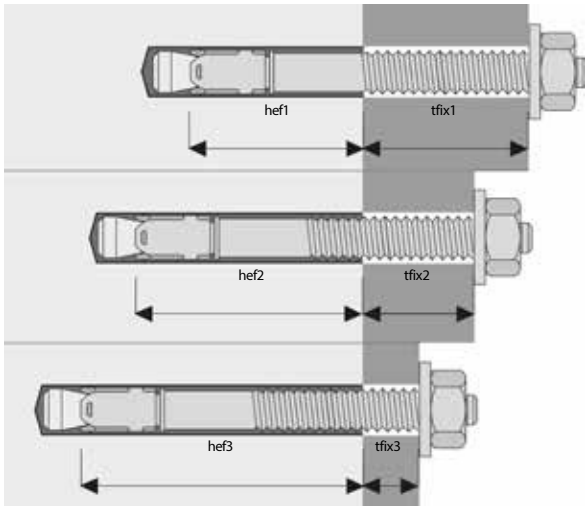
Advantages:

- High permissible loads with small center and edge distances
- Quick and easy push-through installation
- Flexible use with different clamping thicknesses thanks to long thread
- Permissible reduced anchoring depths, e.g. for reinforcement hits or low loads
- Three anchoring depths for flexible use
- FM approval for the installation of sprinkler systems (M10 to M16)
- An impact cap prevents damage to the thread when hammering into the drill hole

European Technical Assessment,
for anchoring in non-cracked concrete

Fire protection tested F30-F120

Factory Mutual JI3002567 (M 10-M 16)



Minimum anchoring depth

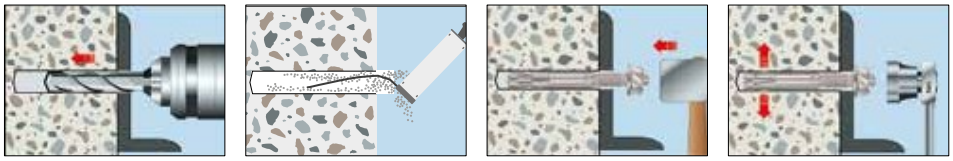
Standard anchoring depth

Maximum anchoring depth

			Standard anchoring depth		Minimum anchoring depth		Maximum anchoring depth					
Designation	**Item number**	**Borehole Ø d_0 mm**	**Clamping thickness t_{fix2} mm**	**Anchoring depth h_{ef2} mm**	**Clamping thickness t_{fix1} mm**	**Anchoring depth h_{ef1} mm**	**Clamping thickness t_{fix3} mm**	**Anchoring depth h_{ef3} mm**	**Setting depth h_1 mm**	**Dowel length l mm**	**Thread ØxL mm**	**Package contents Piece**
B 6-5/401[1)]	0909 006 005	6	-	-	5	18	-	-	hef + 9	40	M6x16	100
B 6-10-20/67	0909 006 010	6	10	40	20	30	-	-	hef + 9	67	M6x30	100
B 6-25-35/82	0909 006 025	6	25	40	35	30	5	60	hef + 9	82	M6x35	100
B 8-5/501[1)]	0909 008 005	8	-	-	5	24	-	-	hef + 11	50	M8x22	100
B 8-10-19/75	0909 008 010	8	10	44	19	35	-	-	hef + 12	75	M8x40	100
B 8-15-24/80	0909 008 015	8	15	44	24	35	-	-	hef + 12	80	M8x45	100
B 8-20-29/85	0909 008 020	8	20	44	29	35	-	-	hef + 12	85	M8x50	100
B 8-25-34/90	0909 008 025	8	25	44	34	35	-	-	hef + 12	90	M8x55	100
B 8-30-39/95	0909 008 030	8	30	44	39	35	4	70	hef + 12	95	M8x60	100
B 8-45-54/110	0909 008 045	8	45	44	54	35	19	70	hef + 12	110	M8x75	100
B 8-55-64/120	0909 008 055	8	55	44	64	35	29	70	hef + 12	120	M8x85	100
B 10-10/601[1)]	0909 010 006	10	-	-	10	25	-	-	hef + 15	60	M10x25	50
B 10-10-16/85	0909 010 010	10	10	48	16	42	-	-	hef + 14	85	M10x40	50
B 10-15-21/90	0909 010 015	10	15	48	21	42	-	-	hef + 14	90	M10x45	50
B 10-20-26/95	0909 010 020	10	20	48	26	42	-	-	hef + 14	95	M10x50	50
B 10-30-36/105	0909 010 030	10	30	48	36	42	-	-	hef + 14	105	M10x60	50
B 10-45-51/120	0909 010 045	10	45	48	51	42	13	80	hef + 14	120	M10x75	50
B 10-50-56/125	0909 010 050	10	50	48	56	42	18	80	hef + 14	125	M10x80	50
B 10-70-76/145	0909 010 070	10	70	48	76	42	38	80	hef + 14	145	M10x80	50
B 10-100-106/175	0909 010 100	10	100	48	106	42	68	80	hef + 14	175	M10x80	50
B 10-140-146/215	0909 010 140	10	140	48	146	42	108	80	hef + 14	215	M10x80	25
B 12-5/751[1)]	0909 012 005	12	-	-	5	38	-	-	hef + 17	75	M12x30	25
B 12-13/95	0909 012 009	12	-	-	13	50	-	-	hef + 17	95	M12x50	25
B 12-10-25/105	0909 012 010	12	10	65	25	50	-	-	hef + 17	105	M12x60	25
B 12-15-30/110	0909 012 015	12	15	65	30	50	-	-	hef + 17	110	M12x65	25
B 12-20-35/115	0909 012 020	12	20	65	35	50	-	-	hef + 17	115	M12x70	25
B 12-30-45/125	0909 012 030	12	30	65	45	50	-	-	hef + 17	125	M12x80	25
B 12-50-65/145	0909 012 050	12	50	65	65	50	15	100	hef + 17	145	M12x100	25
B 12-65-80/160	0909 012 065	12	65	65	80	50	30	100	hef + 17	160	M12x100	25
B 12-85-100/180	0909 012 085	12	85	65	100	50	50	100	hef + 17	180	M12x100	25
B 12-105-120/200	0909 012 105	12	105	65	120	50	70	100	hef + 17	200	M12x100	25
B 12-125-140/220	0909 012 125	12	125	65	140	50	90	100	hef + 17	220	M12x80	25
B 12-145-160/240	0909 012 145	12	145	65	160	50	110	100	hef + 17	240	M12x80	20
B 12-160-175/255	0909 012 160	12	160	65	175	50	125	100	hef + 17	255	M12x80	20
B 16-13/115	0909 016 015	16	-	-	13	64	-	-	hef + 20	115	M16x60	20
B 16-30-48/150	0909 016 030	16	30	82	48	64	-	-	hef + 20	150	M16x90	20
B 16-60-78/180	0909 016 060	16	60	82	78	64	22	120	hef + 20	180	M16x110	20
B 16-80-98/200	0909 016 080	16	80	82	98	64	42	120	hef + 20	200	M16x110	10
B 16-100-118/220	0909 016 100	16	100	82	118	64	62	120	hef + 20	220	M16x80	10
B 16-130-148/250	0909 016 130	16	130	82	148	64	92	120	hef + 20	250	M16x80	10
B 16-165-183/285	0909 016 165	16	165	82	183	64	127	120	hef + 20	285	M16x80	10
B 20-20-42/165	0909 020 020	20	20	100	42	78	5	115	hef + 21	165	M20x70	10

[1)] Not part of the European Technical Assessment.

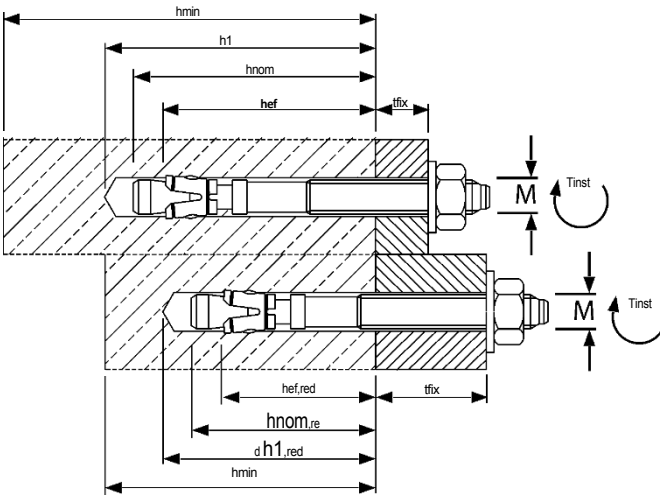
Assembly

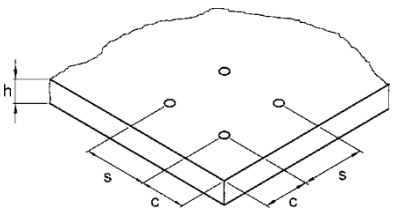


Extract from the conditions of use of the European Technical Assessment ETA-01/0013 for use in non-cracked concrete (Option 7)
Permissible loads according to EN 1992-4 without the influence of center distances and edge distances. The overall safety factor (γM and γF). For load-bearing capacities under fire exposure, see end of catalog.

Loads and characteristic values	Bolt anchor B			M 6			M8			M 10			M 12			M 16			M 20	
Minimum anchoring depth		h_{ef1}	[mm]	30[1]			35[1]			42			50			64			78	
Standard anchoring depth		h_{ef2}	[mm]	40			44			48			65			82			100	
Maximum anchoring depth		h_{ef3}	[mm]	60			70			80			100			120			115	
				uncracked concrete																
Permissible tensile load	C20/25	permis sible N	[kN]	3,1	4,1	4,1	4,9	6,2	6,2	6,4	7,8	7,8	8,3	12,3	12,4	12,0	17,4	19,0	16,1	23,4	26,2
	C25/30	permis sible N	[kN]	3,5	4,1	4,1	5,4	6,9	6,9	7,1	8,7	8,7	9,3	13,7	13,8	12,9	18,7	20,5	18,0	26,2	29,3
	C30/37	permis sible N	[kN]	3,8	4,1	4,1	5,9	7,3	7,3	7,8	9,5	9,6	10,1	15,0	15,2	13,7	19,9	21,8	19,8	28,7	32,1
	C40/50	permis sible N	[kN]	4,1	4,1	4,1	6,9	7,3	7,3	9,0	11,0	11,0	11,7	16,7	16,7	15,1	21,8	23,9	22,8	33,1	37,0
	C50/60	permis sible N	[kN]	4,1	4,1	4,1	7,3	7,3	7,3	10,1	12,3	12,3	13,1	16,7	16,7	16,2	23,5	25,8	25,5	37,0	41,4
Permissible shear load	≥ C20/25	permis sible V	[kN]	2,9	2,9	2,9	6,3	6,3	6,3	9,7	9,7	9,7	14,3	14,3	14,3	23,6	23,6	23,6	37,1	37,1	37,1
Permissible bending moment		Permitted M	[Nm]	5,1	5,1	5,1	13,1	13,1	13,1	25,7	25,7	25,7	44,6	44,6	44,6	99,9	99,9	99,9	195,0	195,0	195,0
Minimum component thickness, center and edge distances																					
Anchoring depth		h_{ef}	[mm]	30	40	60	35	44	70	42	48	80	50	65	100	64	82	120	78	100	115
Minimum component thickness		h_{min}	[mm]	80	100	120	80	100	126	100	100	132	100	130	165	130	170	208	160	200	215
Characteristic center distance		$s_{cr,N}$	[mm]	90	120	180	105	132	210	126	144	240	150	195	300	192	246	360	234	300	345
Characteristic edge distance		$c_{cr,N}$	[mm]	45	60	90	52,5	66	105	63	72	120	75	97,5	150	96	123	180	117	150	172,5
Minimum center distance		s_{min}	[mm]	35	35	35	40	40	40	55	55	55	100	75	75	100	90	90	140	105	105
Minimum edge distance		c_{min}	[mm]	40	40	40	45	45	45	65	65	65	100	90	90	100	105	105	140	125	125
Assembly data																					
Drill hole diameter		d_o	[mm]	6	6	6	8	8	8	10	10	10	12	12	12	16	16	16	20	20	20
Through hole in the attachment part		$d_f \leq$	[mm]	7	7	7	9	9	9	12	12	12	14	14	14	18	18	18	22	22	22
Drill hole depth		$h_1 \geq$	[mm]	45	55	75	55	65	91	65	70	102	75	90	125	95	110	148	110	130	145
Torque when anchoring		T_{inst}	[Nm]	8	8	8	15	15	15	30	30	30	50	50	50	100	100	100	200	200	200
Width across flats		SW	[mm]	10	10	10	13	13	13	17	17	17	19	19	19	24	24	24	30	30	30
Height of the hexagon nut		m	[mm]	5	5	5	6,5	6,5	6,5	8	8	8	10	10	10	13	13	13	16	16	16
Outer diameter x Height of the washer B		d2 x s [mm]		12 x 1,6	12 x 1,6	12 x 1,6	16 x 1,6	16 x 1,6	16 x 1,6	20 x 2	20 x 2	20 x 2	24 x 2,5	24 x 2,5	24 x 2,5	30 x 3	30 x 3	30 x 3	37 x 3	37 x 3	37 x 3
Outer diameter x Height of washer B-U		d2 x s [mm]		-	-	-	-	-	-	-	-	-	44 x 4	44 x 4	44 x 4	56 x 5	56 x 5	6 x 5	-	-	-

[1] For anchoring statically indeterminate systems.
You can find the practical dimensioning program at https://www.recanorm.de/de/loesungen/schulungen-seminare/Berechnungssoftware





Machine setting tool SDS plus for bolt anchors M 6 - M 16

- SDS plus holder

length: 140 mm

Article no. 0910 000 140

Bolt anchor B A4

The ideal anchor for quick and reliable fixings in non-cracked concrete

The B A4 bolt anchor is particularly suitable for time-saving push-through installation in non-cracked concrete. The reduced setting depth extends its use, e.g. for reinforcement hits and low loads.

Material: Stainless steel A4
Surface: blank

For fastening medium to heavy loads indoors
Supports, beams, metal structures, brackets, cable trays, mounting rails, etc.

in
non-cracked normal concrete of strength class ≥ C20/25 and ≤ C50/60, also outdoors or in damp rooms, if there are no particularly aggressive conditions.

Advantages:
- High permissible loads, small center and edge distances
- Quick and easy push-through installation
- Immediately loadable - no waiting times
- The long thread allows the use of one plug for different clamping thicknesses
- Permissible reduced anchoring depths, e.g. for reinforcement hits or low loads
- Three anchoring depths for flexible use
- FM approval for the installation of sprinkler systems (M10 to M16)

EDELSTAHL Rostfrei

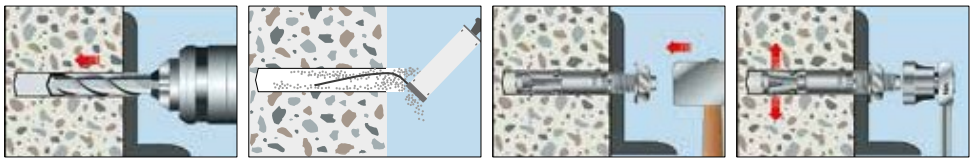
European Technical Assessment, for anchoring in non-cracked concrete

F30-F120

Fire protection tested F30-F120

Factory Mutual JI3002567 (M 10-M 16)

Assembly



			Standard anchoring depth		Minimum anchoring depth		Maximum anchoring depth					
Designation	Item number	Borehole Ø d_0 mm	Clamping thickness t_{fix2} mm	Anchoring depth h_{ef2} mm	Clamping thickness t_{fix1} mm	Anchoring depth h_{ef1} mm	Clamping thickness t_{fix3} mm	Anchoring depth h_{ef3} mm	Setting depth h_1 mm	Dowel length l mm	Thread ØxL mm	Package contents Piece
B 8-5/50 A4[1)]	0909 908 005	8	-	-	5	24	-	-	h_{ef} + 11	50	M8x22	100
B 8-10-19/75 A4	0909 908 010	8	10	44	19	35	-	-	h_{ef} + 12	75	M8x40	100
B 8-15-24/80 A4	0909 908 015	8	15	44	24	35	-	-	h_{ef} + 12	80	M8x45	100
B 8-20-29/85 A4	0909 908 020	8	20	44	29	35	-	-	h_{ef} + 12	85	M8x50	100
B 8-30-39/95 A4	0909 908 030	8	30	44	39	35	4	70	h_{ef} + 12	95	M8x60	100
B 10-10-16/85 A4	0909 910 010	10	10	48	16	42	-	-	h_{ef} + 14	85	M10x40	50
B 10-15-21/90 A4	0909 910 015	10	15	48	21	42	-	-	h_{ef} + 14	90	M10x45	50
B 10-20-26/95 A4	0909 910 020	10	20	48	26	42	-	-	h_{ef} + 14	95	M10x50	50
B 10-30-36/105 A4	0909 910 030	10	30	48	36	42	-	-	h_{ef} + 14	105	M10x60	50
B 10-50-56/125 A4	0909 910 050	10	50	48	56	42	18	80	h_{ef} + 14	125	M10x80	50
B 12-15-30/110 A4	0909 912 015	12	15	65	30	50	-	-	h_{ef} + 17	110	M12x65	25
B 12-20-35/115 A4	0909 912 020	12	20	65	35	50	-	-	h_{ef} + 17	115	M12x70	25
B 12-30-45/125 A4	0909 912 030	12	30	65	45	50	-	-	h_{ef} + 17	125	M12x80	25
B 12-50-65/145 A4	0909 912 050	12	50	65	65	50	15	100	h_{ef} + 17	145	M12x100	25
B 16-30-46/150 A4	0909 916 030	16	30	80	46	64	-	-	h_{ef} + 20	150	M16x90	20

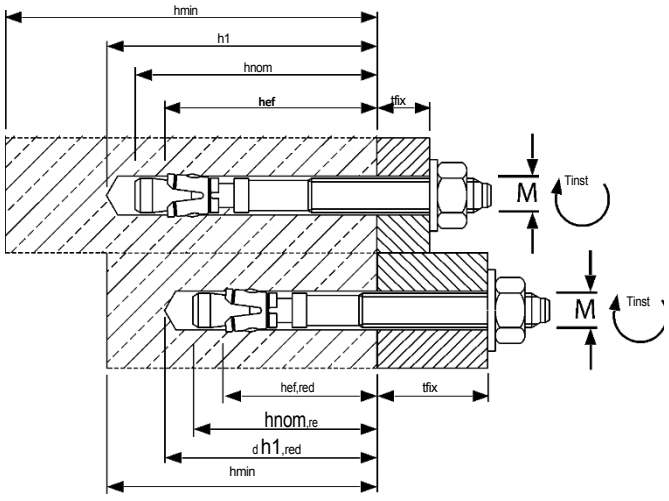
[1)] Not part of the European Technical Assessment.

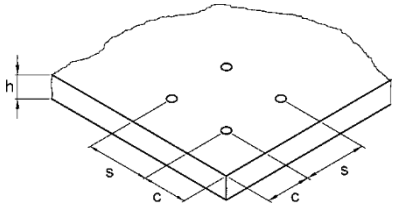
Extract from the conditions of use of the European Technical Assessment ETA-01/0013 for use in non-cracked concrete (Option 7)

Permissible loads according to EN 1992-4 without the influence of center distances and edge distances. The overall safety factor (γ_M and γ_F). For load-bearing capacities under fire exposure, see end of catalog.

Loads and characteristic values	**Wedge anchor B A4 / HCR**			**M8**	**M10**		**12**	**M16**							
Minimum anchoring depth		h_{ef1}	[mm]	**351)**			**42**			**50**			**64**		
Standard anchoring depth		h_{ef2}	[mm]		**44**			**48**			**65**			**80**	
Maximum anchoring depth		h_{ef3}	[mm]			**70**			**80**			**100**			**120**
				uncracked concrete											
Permissible tensile load	C20/25 permissible N		[kN]	4,3	6,8	7,1	5,7	7,8	7,8	8,3	11,9	11,9	12,0	16,8	20,0
	C25/30 permissible N		[kN]	4,8	7,6	8,0	6,4	8,7	8,7	9,3	13,3	13,3	13,4	18,7	22,4
	C30/37 permissible N		[kN]	5,2	8,4	8,6	7,0	9,5	9,6	10,1	14,6	14,6	14,7	20,5	24,5
	C40/50 permissible N		[kN]	6,1	8,6	8,6	8,1	11,0	11,0	11,7	16,8	16,8	17,0	23,7	28,3
	C50/60 permissible N		[kN]	6,8	8,6	8,6	9,0	12,3	12,3	13,1	18,8	18,8	19,0	26,5	31,6
Permissible shear load	≥ C20/25 permissible V		[kN]	6,9	6,9	6,9	10,9	10,9	10,9	15,4	15,4	15,4	28,6	28,6	28,6
Permissible bending moment		Permitted M	[Nm]	13,7	13,7	13,7	28,0	28,0	28,0	48,6	48,6	48,6	113,7	113,7	113,7
Minimum component thickness, axle and	**Edge distances**														
Anchoring depth		h_{ef}	[mm]	35	44	70	42	48	80	50	65	100	64	80	120
Minimum component thickness		h_{min}	[mm]	80	100	126	100	100	132	100	130	165	130	160	200
Characteristic center distance		$s_{cr,N}$	[mm]	105	132	210	126	144	240	150	195	300	192	240	360
Characteristic edge distance		$c_{cr,N}$	[mm]	52,5	66	105	63	72	120	75	97,5	150	96	120	180
Minimum center distance		s_{min}	[mm]	60	35	35	55	45	45	100	60	60	110	80	80
		for c ≥	[mm]	60	65	65	65	70	70	100	100	100	110	120	120
Minimum edge distance		c_{min}	[mm]	60	45	45	65	55	55	100	70	70	110	80	80
		for s ≥	[mm]	60	110	110	55	80	80	100	100	100	110	140	140
Assembly data															
Drill hole diameter		d_o	[mm]	8	8	8	10	10	10	12	12	12	16	16	16
Through hole in the attachment part		d_f ≤	[mm]	9	9	9	12	12	12	14	14	14	18	18	18
Drill hole depth		h_1 ≥	[mm]	55	65	91	65	70	102	75	90	125	95	110	148
Torque when anchoring		T_{inst}	[Nm]	15	15	15	25	25	25	50	50	50	100	100	100
Width across flats		SW	[mm]	13	13	13	17	17	17	19	19	19	24	24	24
Height of the hexagon nut		m	[mm]	6,5	6,5	6,5	8	8	8	10	10	10	13	13	13
Outer diameter x height of the washer		d2 x s	[mm]	16 x 1,6	16 x 1,6	16 x 1,6	20 x 2	20 x 2	20 x 2	24 x 2,5	24 x 2,5	24 x 2,5	30 x 3	30 x 3	30 x 3

1)For anchoring statically indeterminate systems.





Heavy-duty anchor SZ

For medium to heavy-duty fastenings in cracked and non-cracked concrete

European Technical Assessment, for anchoring in concrete

Fire protection tested F30-F120

Meets the requirements of VdS (M 8-M 20)

Federal Office for Civil Defense BZS D03-203

Seismic approval (M 16-M 20)

ICC approval (M 16-M 20) ESR-3137

Suction drilling according to approval / evaluation possible

The SZ heavy-duty anchor is a force-controlled expanding sleeve anchor for quick push-through installation. The wide range of types enables use in many applications.

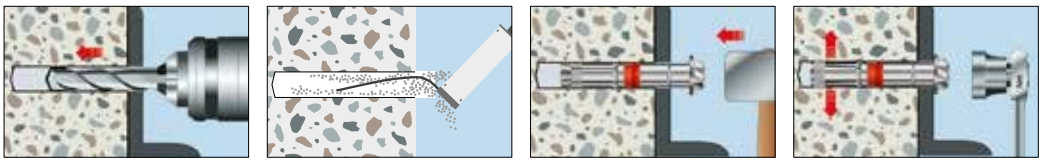
Material: Steel
Surface: galvanized

For fastening
Base plates, supports, beams, metal structures, railings, brackets, cable trays, pipelines, etc.
in
Normal concrete of strength class -> C20/25 and <- C50/60.

Advantages:

- Very high tensile and transverse loads, small center and edge distances
- Quick and easy push-through installation
- Immediately loadable - no waiting times
- Anchor can be removed flush with the surface
  (only the cone and expanding sleeve remain in the drill hole)
- Expert technical assessment for fastenings in steel fiber reinforced concrete
- Variable anchoring depths for even higher shear loads
- Screw version (SZ-S) and countersunk head version (SZ-SK) with high-quality finish

Assembly



Type SZ-S

Type SZ-B

Designation	Item number		max. clamping strength1)	Borehole ø	Borehole depth2)	Drilling depth due to attachment	Setting depth2)	min. Anchoring depth - max. effective anchoring depth	Dowel lengt h l		Seismic C1 / C2	Thread	Package contents
	Type SZ-S	Type SZ-B	$t_{fix,max}$ mm	d0 mm	h1 mm	hf mm	hnom mm	$h_{ef,min}$ - $h_{ef,max}$ mm	Type SZ-S mm	Type SZ-B mm			Piece
SZ 10-10	0908 006 010	-	10	10	65 - 75	75	60-70	50 - 60	75	77	-	M 6	50
SZ 10-30	0908 006 030	-	30	10	65 - 91	95	60-86	50 - 76	95	97	-	M 6	50
SZ 12-10	0908 008 010	0908 108 010	10	12	80 - 90	90	70 - 80	60 - 70	85	90	✓	M 8	50
SZ 12-30	0908 008 030	0908 108 030	30	12	80 - 110	110	70 - 100	60 - 90	105	110	✓	M 8	50
SZ 12-50	0908 008 050	-	50	12	80 - 120	130	70 - 110	60 - 100	125	130	✓	M 8	25
SZ 15-15	0908 010 015	-	15	15	95 - 110	110	85 - 100	71 - 86	106	111	✓	M 10	25
SZ 15-25	0908 010 025	0908 110 025	25	15	95 - 120	120	85 - 110	71 - 96	116	121	✓	M 10	25
SZ 15-45	0908 010 045	-	45	15	95 - 134	140	85 - 124	71 - 110	136	141	✓	M 10	25
SZ 18-10	0908 012 010	-	10	18	105 - 115	115	95 - 105	80 - 90	117	122	✓	M 12	20
SZ 18-20	0908 012 020	0908 112 020	20	18	105 - 125	125	95 - 115	80 - 100	127	132	✓	M 12	20
SZ 18-40	0908 012 040	0908 112 040	40	18	105 - 145	145	95 - 135	80 - 120	147	152	✓	M 12	20
SZ 24-20	0908 016 020	0908 116 020	20	24	130 - 144	150	120 - 134	100 - 114	150	157	✓	M 16	10
SZ 24-50	-	0908 116 050	50	24	130 - 144	180	120 - 134	100 - 114	180	187	✓	M 16	10
SZ 24-100	-	0908 116 100	100	24	130 - 144	230	120 - 134	100 - 114	-	237	✓	M 16	5

Type SZ-SK

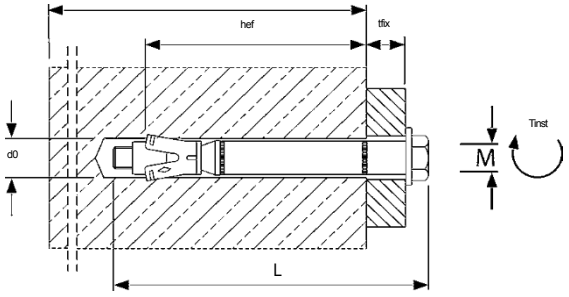
Designation	Item number	max. clamping strength1)	Borehole ø	Borehole depth2)	Drilling depth due to attachment	Setting depth2)	min. Anchoring depth - max. effective anchoring depth	Dowel lengt h l	Seismic C1 / C2	Thread	Package contents
		$t_{fix,max}$ mm	d0 mm	h1 mm	hf mm	hnom mm	$h_{ef,min}$ - $h_{ef,max}$ mm	mm			Piece
SZ-SK 10-10	0908 306 010	10	10	65 - 67	75	60 - 62	50 - 52	70	-	M 6	50
SZ-SK 10-25	0908 306 025	25	10	65 - 91	90	60 - 86	50 - 76	85	-	M 6	50
SZ-SK 12-10	0908 308 010	10	12	80	90	70	60	80	✓	M 8	50
SZ-SK 12-25	0908 308 025	25	12	80 - 85	105	70 - 85	60 - 75	95	✓	M 8	50
SZ-SK 12-50	0908 308 050	50	12	80 - 120	130	70 - 110	60 - 100	120	✓	M 8	25
SZ-SK 15-10	0908 310 010	10	15	95	105	84	71	95	✓	M 10	25
SZ-SK 15-25	0908 310 025	25	15	95 - 106	120	85 - 96	71 - 82	110	✓	M 10	25
SZ-SK 18-20	0908 312 020	20	18	105 - 107	125	95 - 97	80 - 82	115	✓	M 12	20

Extract from the conditions of use of the European Technical Assessment ETA-02/0030 for use in cracked and non-cracked concrete (option 1)

Permissible loads according to EN 1992-4 without the influence of center distances and edge distances. The overall safety factor (γ_M and γ_F) was taken into account. For load-bearing capacities under fire exposure, see page 194.

Loads and characteristic values				**Heavy-duty anchor SZ**							
				SZ M 6M8	**10SZ 12**	**SZ 15 M 10**	**SZ M 12M 16**	**18SZ 24**	**SZ 24L M 16**	**SZ 28 M 20**	**SZ 32 M 24**
Anchoring depth range $h_{ef,min}$ - $h_{ef,max}$			[mm]	50 - 7660	- 100	71 - 110	80 - 130	100 - 114	115 - 150	125 - 185	150 - 210
Permissible tensile load for $h_{ef,min}$ - $h_{ef,max}$							cracked concrete				
	C20/25	permissible N	[kN]	2,4	5,7	7,6	11,7	16,4	20,2	22,9	30,1
	C25/30	permissible N	[kN]	2,7	6,4	8,5	13,1	18,3	22,6	25,6	33,7
	C30/37	permissible N	[kN]	2,9	7,0	9,3	14,4	20,1	24,8	28,1	36,9
	C40/50	permissible N	[kN]	3,4	8,1	10,8	16,6	23,2	28,6	32,4	42,6
	C50/60	permissible N	[kN]	3,8	9,0	12,0	18,6	25,9	32,0	36,2	47,6
							uncracked concrete				
Permissible tensile load for $h_{ef,min}$ - $h_{ef,max}$	C20/25	permissible N	[kN]	7,6	9,5	14,0	16,8	23,4	28,9	32,7	43,0
	C25/30	permissible N	[kN]	7,6	10,6	15,7	18,7	26,2	32,3	36,6	48,1
	C30/37	permissible N	[kN]	7,6	11,7	17,2	20,5	28,7	35,4	40,1	52,7
	C40/50	permissible N	[kN]	7,6	13,5	19,8	23,7	33,1	40,9	46,3	60,9
	C50/60	permissible N	[kN]	7,6	13,8	21,9	26,5	37,0	45,7	51,8	68,0
Permissible shear load for $h_{ef,min}$ - $h_{ef,max}$							cracked concrete				
SZ-S and SZ-SK	C20/25	permissible V	[kN]	10,3	15,2-17,1	19,6-27,4	23,5-41,7	32,8-39,9	40,4-60,2	45,8-82,5	60,2-99,8
	≥C25/30	permissible V	[kN]	10,3	17,0-17,1	21,9-27,4	26,2-41,7	36,7-44,6	45,2-67,4	51,2-85,7	67,4-111,6
SZ-B	C20/25	permissible V	[kN]	9,1	14,3	19,6-20,6	23,5-36,0	32,8-39,9	40,4-52,0	45,8-69,7	60,2-99,8
	≥C25/30	permissible V	[kN]	9,1	14,3	20,6	26,2-36,0	36,7-44,6	45,2-52,0	51,2-69,7	67,4-111,6
Permissible shear load for $h_{ef,min}$ - $h_{ef,max}$							uncracked concrete				
SZ-S and SZ-SK	C20/25	permissible V	[kN]	10,3	17,1	27,4	33,5-41,7	46,9-57,0	57,8-72,0	65,5-85,7	86,1-114,3
	≥C25/30	permissible V	[kN]	10,3	17,1	27,4	37,5-41,7	52,4-63,8	64,6-72,0	73,2-85,7	96,2-114,3
SZ-B	C20/25	permissible V	[kN]	9,1	14,3	20,6	33,5-36,0	46,9-52,0	52,0	65,5-69,7	86,1-114,3
	≥C25/30	permissible V	[kN]	9,1	14,3	20,6	36,0	52,0	52,0	69,7	96,2-114,3
Permissible bending moment for $h_{ef,min}$ - $h_{ef,max}$							cracked / non-cracked concrete				
Permissible bending moment		Permitted M	[Nm]	6,9	17,1	34,3	60,0	152,0	152,0	296,6	513,1
Center and edge distances											
Anchoring depth range $h_{ef,min}$ - $h_{ef,max}$			[mm]	50 - 76	60 - 100	71 - 110	80 - 130	100 - 114	115 - 150	125 - 185	150 - 210
Minimum component thickness for $h_{ef,min}$ - $h_{ef,max}$		h_{min}	[mm]	100 - 126	120 - 160	140 - 179	160 - 210	200 - 214	230 - 265	250 - 310	300 - 360
Characteristic center distance		$s_{cr,N}$	[mm]	150 - 228	180 - 300	213 - 330	240 - 390	300 - 342	345 - 450	375 - 555	450 - 630
Characteristic edge distance		$c_{cr,N}$	[mm]	75 - 114	90 - 150	106,5 - 165	120 - 195	150 - 171	172,5 - 225	187,5 - 277,5	225 - 315
							cracked concrete				
Minimum center distance / for edge distance c		s_{min} /c	[mm]	50/50	50/80	60/120	70/140	100/180	100/180	125/300	150/300
Minimum edge distance / for center distance s		c_{min} /s	[mm]	50/50	55/100	60/120	70/160	100/220	100/220	200/350	150/300
							uncracked concrete				
Minimum center distance / for edge distance c		s_{min} /c	[mm]	50/80	60/100	60/120	70/140	100/180	100/180	125/300	150/300
Minimum edge distance / for center distance s		c_{min} /s	[mm]	50/100	60/120	60/120	70/160	100/220	100/220	200/350	150/300
Assembly data											
Drill hole diameter		d_o	[mm]	10	12	15	18	24	24	28	32
Through hole in the attachment part		$d_f \leq$	[mm]	12	14	17	20	26	26	31	35
Borehole depth range for $h_{ef,min}$ - $h_{ef,max}$		h_o	[mm]	65 - 91	80 - 120	95 - 134	105 - 155	130 - 144	145 - 180	160 - 220	180 - 240
Installation data SZ-S and SZ-B											
Torque when anchoring		T_{inst}	[Nm]	15	30	50	80	160	160	280	280
Width across flats			SW	10	13	17	19	24	24	30	36
Outer diameter of the disk			[mm]	18	20	25	30	40	40	50	50
Installation data SZ-SK											
Torque when anchoring		T_{inst}	[Nm]	10	25	55	70	-	-	-	-
Width across flats, hexagon socket			SW	4	5	6	8	-	-	-	-
Thickness of the countersunk washer			[mm]	4	5	6	7	-	-	-	-
Outer diameter of the countersunk washer			[mm]	16,5	20,5	24,5	29,5	-	-	-	-
Minimum mounting part thickness for maximum shear force (permissible v_{max}) / without shear force			[mm]	8 / 4	10 / 5	14 / 6	18 / 7	-	-	-	-

h m h_{min}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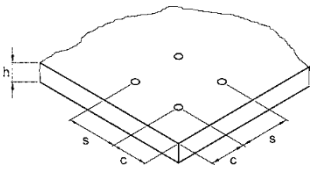
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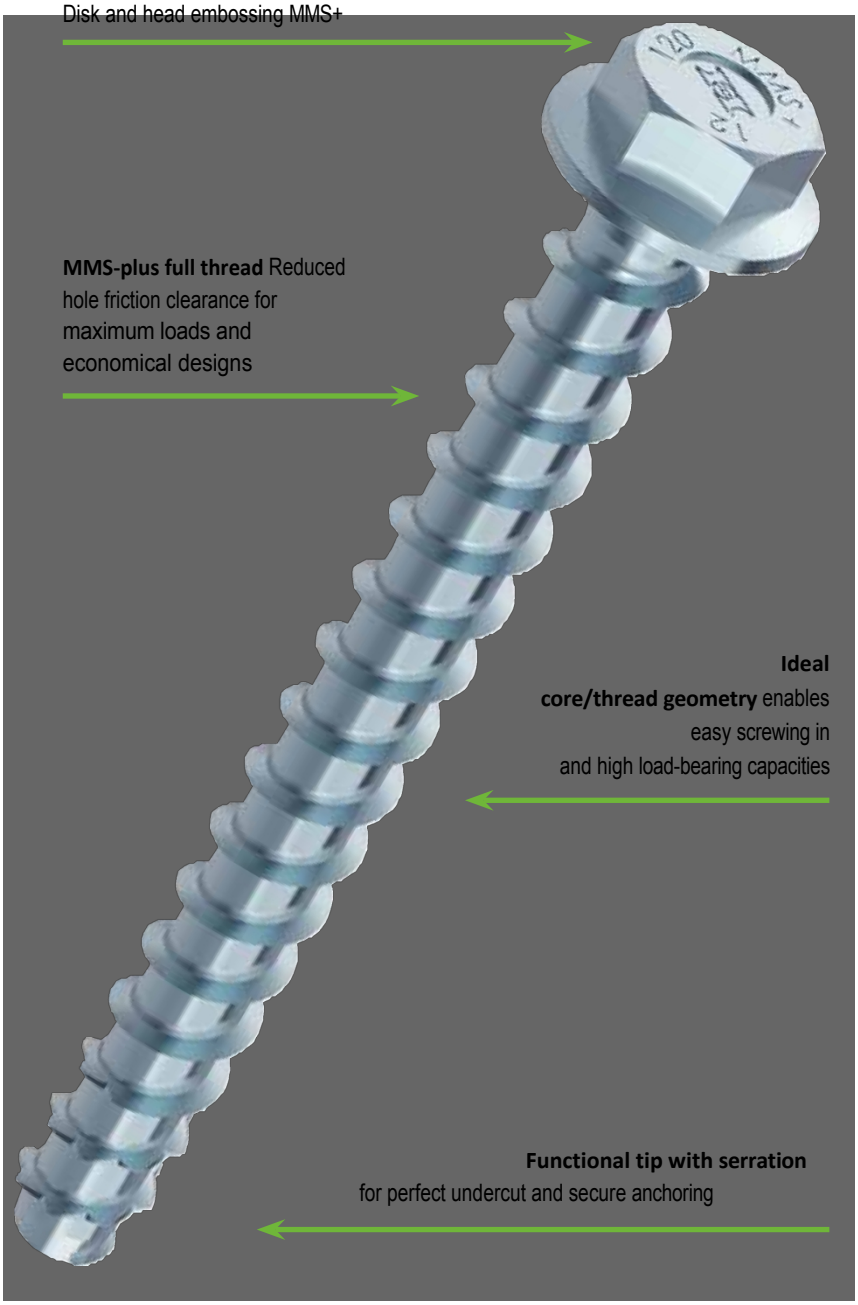
MULTI-MONTI®-plus screw anchor

The dowel-free fastening technology for concrete and masonry

Click here for the movie!

New screw head
Hexagon head with pressed-on
Disk and head embossing MMS+



MMS-plus full thread Reduced hole friction clearance for maximum loads and economical designs

Ideal core/thread geometry enables easy screwing in and high load-bearing capacities

Functional tip with serration
for perfect undercut and secure anchoring

Product information

- Hexagon head with pressed-on washer
- Optimized concrete thread with more effective
- area Additional load class per diameter and improved installation safety
- Can be set by machine and loaded
- immediately Extended product range z. e.g. with plug-in anchor MMS-plus V
- Larger approved range for ETA Option 1 from MMS-plus 6, including seismic
- Fire expertise for concrete

ETA-15/0784

C1 Ø 10-20 m

C2 Ø 16-20 m

ETA-15/0785

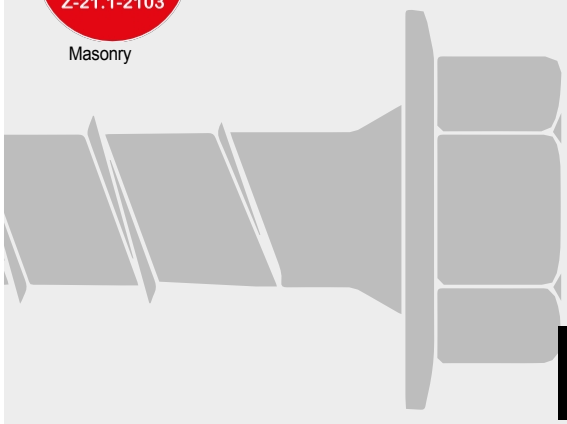
F30-F120

Mit allgemeiner bauaufsichtlicher ZULASSUNG Mehrfachverwendung

Suction drilling possible according to approval/ evaluation

Mit allgemeiner bauaufsichtlicher ZULASSUNG Z-21.1-2103

Masonry



Column assembly

Pipe assembly

Formwork prop assembly

Permissible maximum loads of a single anchor for fixing in cracked and non-cracked concrete according to ETA-15/0784

Note: The entire assessment must be taken into account for the assessment!

Dowel size				**MMS-plus 6**		**MMS-plus 7.5**		**MMS-plus 10**		**MMS-plus 12**		**MMS-plus 16**		**MMS-plus 20**
				gvz		gvz		gvz		gvz		gvz		gvz
Screw-in depth gauge =			mm	35	45	35	55	50	65	75	90	100	115	140
Maximum permissible tensile load*) "N_{zul}" of a single anchor without edge influence1)														
Cracked concrete C20/253)			kN	0,5	0,7	1,0	1,9	2,9	4,4	5,9	7,9	9,8	14,8	21,7
Uncracked concrete C20/253)			kN	2,6	3,8	1,9	7,6	5,8	9,6	11,6	15,9	18,3	23,2	33,0
Maximum permissible shear force*) "V_{zul}" of a single anchor without edge influence2)														
Cracked concrete C20/253)			kN	2,2	2,35)	2,2	3,55)	3,5	5,8	7,1	13,85)	22,2	28,05)	39,9
Uncracked concrete C20/253)			kN	2,35)	2,35)	3,1	3,55)	5,1	7,85)	10,1	13,85)	28,75)	28,75)	48,75)
Permissible bending moment*) "M_{zul}"														
			Nm	3,8		8,1		19,7		38,2		118,6		265,3
Component dimensions and installation parameters														
Drill core diameter	d0	=	mm	5,0		6,0		8,0		10,0		14,0		18,5
Drill hole depth	h1	≥	mm	40	50	40	65	60	75	85	100	115	130	155
Screw-in depth gauge ≥			mm	35	45	35	55	50	65	75	90	100	115	140
Calculated anchoring depth	hef	=	mm	26	35	26	43	36	50	57	70	77	90	114
Min. center distance	smin	=	mm	30		35		35		40		60		80
Min. edge distance	cmin	=	mm	30		30		35		40		60		80
Minimum component thicknessin =			mm	100		100		100	115	125	150	180		200
Through hole in the component to be connected	df	≤	mm	7		9		12,5		14,5		19		23
Recommended maximum power output Setting tool4)	Tmax	=	Nm	75	100	120		250		250		600		800
Installation torque for Connection thread (MMS-plus V)	Tinst	≤	Nm	-		15		20		30		55	70	140

1) This means c ≥ 1.5 * $_{hef}$ and s ≥ 3 * $_{hef}$

2) This means c ≥ 10 * $_{hef}$

3) The concrete is assumed to be normally reinforced. Higher resistances may be possible with higher concrete strengths.

4) The power output and the tightening torque are specified in the approval notice, so compliance with this specification is therefore relevant for approval.

5) Steel failure is decisive.

*) On the resistance side, the partial safety factors of the dowel resistances and the material partial safety factors of the design methods
A according to Annex C of ETAG 001 or CEN/TS 1992-4 was taken into account. A partial safety factor of $_{\gamma G=1}$.35 was taken into account on the action side. For combined loading, anchor groups and axial or edge influences, please observe the specifications for the design methods
A according to ETAG 001 Annex C or CEN/TS 1992-4 or our design aid.

MULTI-MONTI®-plus

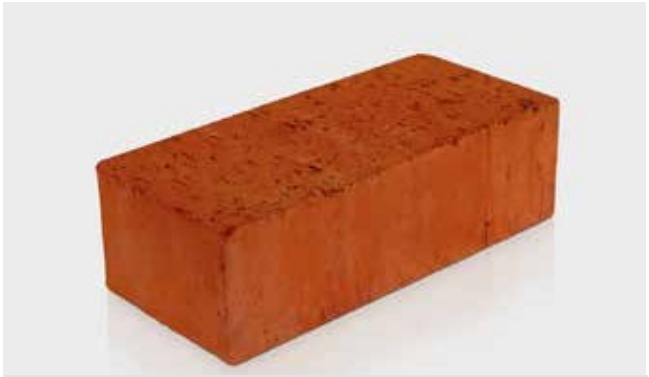
The first approved screw anchor for masonry

- With general type approval (aBG)
- Approved for masonry bricks, solid sand-lime bricks, perforated sand-lime bricks and lightweight concrete
- Fire certificates for use in masonry
- Optimum thread for secure and quick fastening in masonry
- Installation without borehole cleaning permitted
- Two setting depths for more flexibility
- Can be set by machine and loaded immediately

Mit allgemeiner bauaufsichtlicher ZULASSUNG Z-21.1-2103

F30-F120

Now also approved for:



Bricks

Solid sand-lime brick

Sand-lime perforated brick

Lightweight concrete

Approved range for masonry

MMS-plus SS

Hexagon head with pressed-on washer
Galvanized steel blue
Lengths: 35-160 mm
Ø: 6 / 7.5 / 10 / 12 / 16 / 20 mm
Article no. 0901 0.. ...

MMS-plus V

Push-in anchor with metric connection thread
Galvanized steel blue
Lengths: 80-220 mm
Ø: 7.5 / 10 / 12 / 16 / 20 mm
Article no. 0901 5. ...

MMS-plus F

Countersunk head
Galvanized steel blue, T-Drive
Lengths: 40-160 mm
Ø: 6 / 7.5 / 10 / 12 mm
Article no. 0901 3. ...

MMS-plus MS

Mounting rail anchor with flat round head
Galvanized steel blue, T-Drive
Lengths: 35-60 mm
Ø: 7.5 mm
Article no. 0901 297 ...

MMS-plus ST

Hanger bolt with metric connection thread
Galvanized steel blue
Lengths: 55-120 mm
Ø: 6 / 7.5 / 10 mm
Article no. 0901 4.. ...

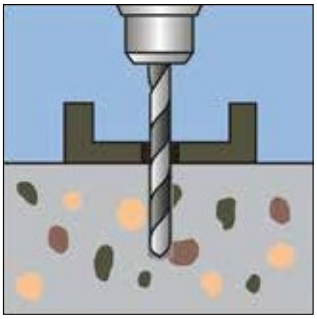
MMS-plus I

Internally threaded anchor Galvanized steel blue Lengths: 40-75 mm
Ø: 6 / 7.5 / 10 mm
Article no. 0901 1. ...

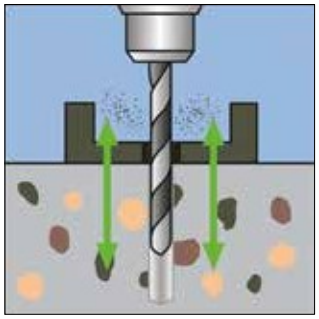
MMS-plus P

PanHead, round head
Galvanized steel blue
T-Drive, lengths: 35-70 mm
Ø: 6 / 7.5 / 10 mm
Article no. 0901 2. ...

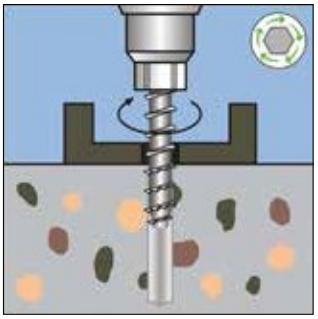
The right assembly



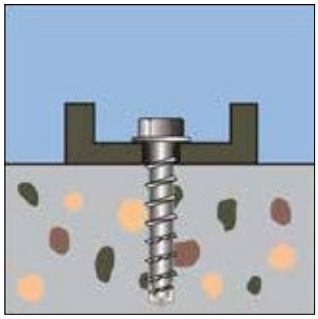
1. drill



2. clean the drill hole



3. screw in



4. finished

Installation parameters / Characteristic load-bearing capacity

Bricks

Type of brick: Solid brick MZ
Format: ≥ NF
Bulk density: ≥ 1.8 kg/dm3
Compressive strength:≥ 36 N/mm2-
Manual installation Dimensions: ≥ 240 x 115 x 71 mm

Recommended setting tool:
- Drill screwdriver

DIN V 105-100/DIN EN771-1

MULTI-MONTI®-plus Ø	6	7,5	10	12
Screw-in depth h_{nom} [mm]	35/45	35/55	65	75
Min. center distance s_{min} [mm]	80	80	80	80
Min. edge distance c_{min} [mm]	80	80	80	80
Characteristic load capacity N_{RC} [kN]	0,9/1,5	0,75/1,2	2,5	1,5
Characteristic load capacity V_{RK} [kN]	0,9/1,5	0,75/1,2	2,5	1,5

Solid sand-lime brick

Type of stone: Solid stone KS
Format: ≥ NF
Bulk density: ≥ 2.0 kg/dm3
Compressive strength:≥ 20 N/mm2-
Manual installation Dimensions: ≥ 240 x 115 x 71 mm

Recommended setting tool:
- Drill screwdriver

DIN V 106/DIN EN771-2

MULTI-MONTI®-plus Ø	6	7,5	10	12
Screw-in depth h_{nom} [mm]	35/45	35/55	65	75
Min. center distance s_{min} [mm]	80	80	80	80
Min. edge distance c_{min} [mm]	80	80	80	80
Characteristic load capacity N_{RC} [kN]	1,5	0,9/1,2	0,9	0,9
Characteristic load capacity V_{RK} [kN]	1,5	0,9/1,2	0,9	0,9

Sand-lime perforated brick

Type of stone: Perforated stone KSL
Format: ≥ 3 DF
Bulk density: ≥ 1.4 kg/dm3
Compressive strength:≥ 12 N/mm2-
Manual installation Dimensions: ≥ 240 x 115 x 113 mm

Recommended setting tool:
- Drill screwdriver

DIN V 106/DIN EN771-2

MULTI-MONTI®-plus Ø	6	7,5	10	12
Screw-in depth h_{nom} [mm]	35/45	35/55	65	75
Min. center distance s_{min} [mm]	80	80	80	80
Min. edge distance c_{min} [mm]	58	58	58	58
Characteristic load capacity $_{NRC}$ [kN]	0,9	0,9	1,5	1,5
Characteristic load capacity $_{VRK}$ [kN]	0,9	0,9	1,5	1,5

Lightweight concrete

Type of stone: Solid block VBL
Format: ≥ 2 DF
Bulk density: ≥ 0.8 kg/dm3
Compressive strength:≥ 4 N/mm2-
Manual installation Dimensions: ≥ 248 x 115 x115 mm

Recommended setting tool:
- Drill screwdriver

DIN V 18152-100/DIN EN771-3

MULTI-MONTI®-plus Ø	6	7,5	10	12
Screw-in depth h_{nom} [mm]	-	-	65	75
Min. center distance s_{min} [mm]	-	-	80	80
Min. edge distance c_{min} [mm]	-	-	80	80
Characteristic load capacity $_{NRC}$ [kN]	-	-	0,75	0,75
Characteristic load capacity $_{VRK}$ [kN]	-	-	0,75	0,75

Characteristic resistance in masonry under fire

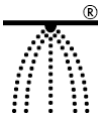
F30-F120

Size MMS-plus				Ø 6	Ø 7,5	Ø 10	Ø 12
Screw-in depth in masonry hnom [mm]				≥ 35	≥ 35	≥ 55	≥ 75
Characteristic resistance for tension and shear in masonry bricks							
Characteristic resistance	R30	NRK,fi	[kN]	0,26	0,42	0,53	0,63
	R60						
	R90						
	R120			0,21	0,30	0,42	0,50
Characteristic resistance for tension and shear in solid sand-lime brick/perforated sand-lime brick							
Characteristic resistance	R30	NRK,fi	[kN]	0,34	0,47	0,80	1,30
	R60						
	R90						
	R120			0,24	0,30	0,60	0,90

MMS-plus SS hexagon head with pressed-on washer

Material: Steel,
hardened Surface:
Galvanized, blue
Note: Screw into masonry by hand or cordless screwdriver (without impact)

Ø 6-12

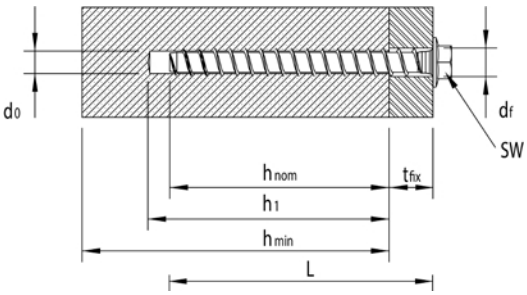


Ø 6-10 mm

Ø 10-20 m

Ø 16-20 m


Suction drilling possible



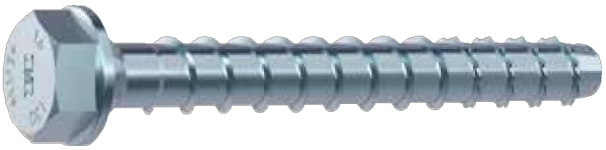
Article no.	Dimension D x L mm	Drill-Ø dO mm	Clamping thickness tfix mm	Washer Ø mm	Drive Width across flats	VPE / Piece
0901 006 040	6,0 x 40	5,0	5	11,0	8	100
0901 006 050	6,0 x 50	5,0	5/15	11,0	8	100
0901 006 060	6,0 x 60	5,0	15/25	11,0	8	100
0901 006 070	6,0 x 70	5,0	25/35	11,0	8	100
0901 006 080	6,0 x 80	5,0	35/45	11,0	8	50
0901 075 035	7,5 x 35	6,0	1	14,0	10	100
0901 075 040	7,5 x 40	6,0	5	14,0	10	100
0901 075 050	7,5 x 50	6,0	15	14,0	10	50
0901 075 060	7,5 x 60	6,0	5/25	14,0	10	50
0901 075 070	7,5 x 70	6,0	15/35	14,0	10	50
0901 075 080	7,5 x 80	6,0	25/45	14,0	10	50
0901 075 100	7,5 x 100	6,0	45/65	14,0	10	50
0901 075 120	7,5 x 120	6,0	65/85	14,0	10	50
0901 075 140	7,5 x 140	6,0	85/105	14,0	10	50
0901 010 060	10,0 x 60	8,0	10	19,0	13	25
0901 010 070	10,0 x 70	8,0	5/20	19,0	13	25
0901 010 080	10,0 x 80	8,0	15/30	19,0	13	25
0901 010 090	10,0 x 90	8,0	25/40	19,0	13	25
0901 010 100	10,0 x 100	8,0	35/50	19,0	13	25
0901 010 120	10,0 x 120	8,0	55/70	19,0	13	25
0901 010 140	10,0 x 140	8,0	75/90	19,0	13	25
0901 010 160	10,0 x 160	8,0	95/110	19,0	13	25
0901 012 080	12,0 x 80	10,0	5	22,0	15	25
0901 012 090	12,0 x 90	10,0	1/15	22,0	15	25
0901 012 100	12,0 x 100	10,0	10/25	22,0	15	25
0901 012 120	12,0 x 120	10,0	30/45	22,0	15	25
0901 012 140	12,0 x 140	10,0	50/65	22,0	15	25
0901 012 160	12,0 x 160	10,0	70/85	22,0	15	25
0901 016 120*	16,0 x 120	14,0	5/20	30,0	21	10
0901 016 130*	16,0 x 130	14,0	15/30	30,0	21	10
0901 016 140*	16,0 x 140	14,0	25/40	30,0	21	10
0901 016 160*	16,0 x 160	14,0	45/60	30,0	21	10
0901 020 160*	20,0 x 160	18,0	20	38,0	24	6
0901 020 180*	20,0 x 180	18,0	40	38,0	24	6
0901 020 200*	20,0 x 200	18,0	60	38,0	24	6

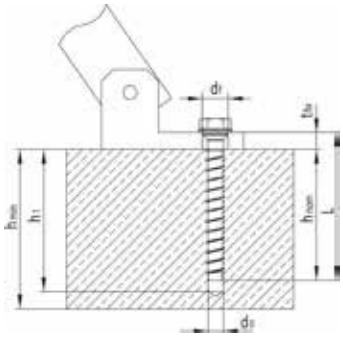
* Not tested for fastenings under fire exposure.

MMS-plus SSK hexagon head - special anchor for push-pull props

Head with pressed-on washer and cone - with approval

- Use in young concrete
- Reusable
- Large width across flats SW24
- Suitable for through holes Ø 17-23 mm





ETA-15/0784

F30-F120

C1 C2

Suction drilling possible

Drive: SW24

Article no.	Dimension D x L mm	Drill-Ø dO mm	Clamping thickness tfix mm	Washer Ø mm	Through hole, dO mm	Design resistance in kN with concrete compressive strength f c,cube				VPE / Piece
						≥ 10N/mm2	≥ 15N/mm2	≥ 20N/mm2	≥ 25N/mm2	
0901 016 131	16 x 130	14	15	29,5	17-23	12,5	15,3	17,7	19,8	10

MMS-plus S sleeper anchor with hexagon head and washer DIN 440

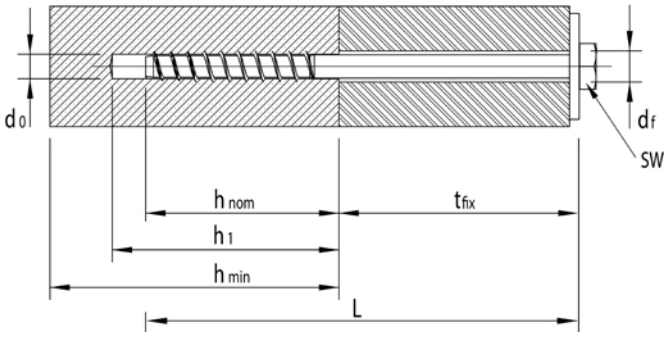
With approval for concrete

Material: Steel,

hardened Surface:

Galvanized, blue Drive:

Hexagon head



ETA-15/0784

F30-F120

C1

Suction drilling possible

Article no.	Dimension D x L mm	Drill-Ø dO mm	Clamping thickness tfix mm	Washer Ø mm	Drive Width across flats	VPE / Piece
0901 012 180	12,0 x 180	10,0	90/105	43,5	19	25
0901 012 200	12,0 x 200	10,0	110/125	43,5	19	25
0901 012 240	12,0 x 240	10,0	150/165	43,5	19	25
0901 012 280	12,0 x 280	10,0	190/205	43,5	19	25
0901 012 320	12,0 x 320	10,0	230/245	43,5	19	25

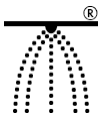
MMS-plus V plug-in anchor with metric connection thread

Material: Steel,
hardened Surface:
Galvanized, blue
Note: Screw into masonry by hand or cordless screwdriver (without impact)

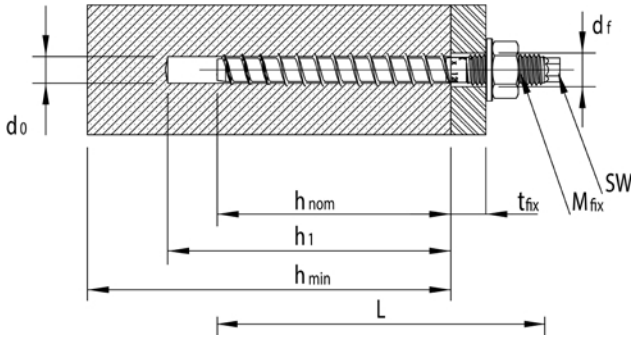
Ø 7,5-12

Ø 6-10 mm

Ø 10-20 m




Suction drilling possible



Article no.	Dimension D x L mm	Drill-Ø dO mm	Clamping thickness tfix mm	Connection thread Mfix	Drive Width across flats	VPE / Piece
0901 575 080	7,5 x 80	6,0	15/35	M8 x 20	5,5	50
0901 575 100	7,5 x 100	6,0	35/55	M8 x 40	5,5	50
0901 510 090	10,0 x 90	8,0	15/30	M10 x 20	7	25
0901 510 110	10,0 x 110	8,0	35/50	M10 x 40	7	25
0901 510 130	10,0 x 130	8,0	55/70	M10 x 60	7	25
0901 512 110	12,0 x 110	10,0	20	M12 x 30	8	25
0901 512 120	12,0 x 120	10,0	15/30	M12 x 25	8	25
0901 512 140	12,0 x 140	10,0	35/50	M12 x 45	8	25
0901 516 150	16,0 x 150	14,0	20/35	M16 x 40	12	10
0901 516 200	16,0 x 200	14,0	70/85	M16 x 75	12	10
0901 520 190	20,0 x 190	18,0	30	M20 x 40	15	6
0901 520 220	20,0 x 220	18,0	60	M20 x 70	15	6

MMS-plus F countersunk head

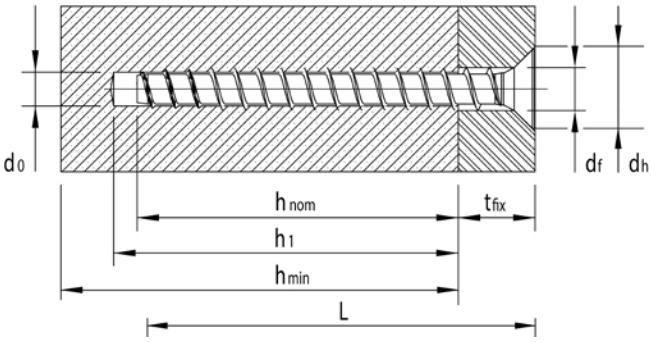
Material: Steel, hardened
Surface: Galvanized, blue Drive:
Hexalobular socket
(TX)
Note: Screw into masonry by hand or cordless screwdriver (without impact)

ETA-15/0784

Mit allgemeiner bauaufsichtlicher ZULASSUNG Z-21.1-2103
Ø 6-12

Mit allgemeiner BAUARTGE-NEHMIGUNG Mehrfachverwendung

F30-F120



ETA-15/0785
Ø 6-10 mm

C1
Ø 10-20 m

®

Suction drilling possible

Article no.	Dimension D x L mm	Drill-Ø dO mm	Clamping thickness tfix mm	Head Ø mm	Drive	VPE / Piece
0901 306 040	6,0 x 40	5,0	5	11,5	TX 30	100
0901 306 050	6,0 x 50	5,0	5/15	11,5	TX 30	100
0901 306 060	6,0 x 60	5,0	15/25	11,5	TX 30	100
0901 306 070	6,0 x 70	5,0	25/35	11,5	TX 30	100
0901 306 080	6,0 x 80	5,0	35/45	11,5	TX 30	50
0901 306 100	6,0 x 100	5,0	55/65	11,5	TX 30	50
0901 306 120	6,0 x 120	5,0	75/85	11,5	TX 30	50
0901 306 140	6,0 x 140	5,0	95/105	11,5	TX 30	50
0901 375 045	7,5 x 45	6,0	10	15,5	TX 40	100
0901 375 050	7,5 x 50	6,0	15	15,5	TX 40	100
0901 375 060	7,5 x 60	6,0	5/25	15,5	TX 40	50
0901 375 070	7,5 x 70	6,0	15/35	15,5	TX 40	50
0901 375 080	7,5 x 80	6,0	25/45	15,5	TX 40	50
0901 375 100	7,5 x 100	6,0	45/65	15,5	TX 40	50
0901 375 120	7,5 x 120	6,0	65/85	15,5	TX 40	50
0901 375 140	7,5 x 140	6,0	85/105	15,5	TX 40	50
0901 375 160	7,5 x 160	6,0	105/125	15,5	TX 40	50
0901 310 060	10,0 x 60	8,0	10	19,5	TX 45	25
0901 310 070	10,0 x 70	8,0	5/20	19,5	TX 45	25
0901 310 080	10,0 x 80	8,0	15/30	19,5	TX 45	25
0901 312 090	12,0 x 90	10,0	15	24,0	TX 50	25
0901 312 100	12,0 x 100	10,0	10/25	24,0	TX 50	25
0901 312 120	12,0 x 120	10,0	30/45	24,0	TX 50	25

MMS-plus P PanHead, round head

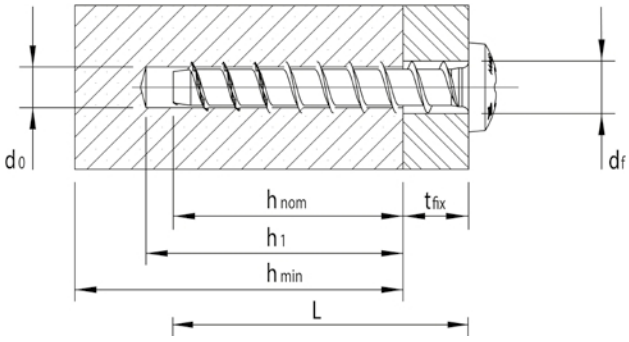
Material: Steel, hardened
Surface: Galvanized, blue
Drive: Hexalobular socket (TX)
Note: Screw into masonry by hand or cordless screwdriver (without impact)

ETA-15/0784

Mit allgemeiner bauaufsichtlicher ZULASSUNG Z-21.1-2103
Ø 6-10

Mit allgemeiner BAUARTGE-NEHMIGUNG Mehrfachver-wendung

F30-F120



ETA-15/0785
Ø 6-10 mm

C1
Ø 10-20 m

®

Suction drilling possible

Article no.	Dimension D x L mm	Drill-Ø dO mm	Clamping thickness tfix mm	Head Ø mm	Drive	VPE / Piece
0901 206 035	6,0 x 35	5,0	1	11,0	TX 30	100
0901 206 040	6,0 x 40	5,0	5	11,0	TX 30	100
0901 206 050	6,0 x 50	5,0	5/15	11,0	TX 30	100
0901 206 060	6,0 x 60	5,0	15/25	11,0	TX 30	100
0901 275 035	7,5 x 35	6,0	1	14,5	TX 30	100
0901 275 040	7,5 x 40	6,0	5	14,5	TX 30	100
0901 275 050	7,5 x 50	6,0	15	14,5	TX 30	100
0901 275 060	7,5 x 60	6,0	5/25	14,5	TX 30	50
0901 210 060	10,0 x 60	8,0	10	19,5	TX 40	25
0901 210 070	10,0 x 70	8,0	5/20	19,5	TX 40	25

MMS-plus MS mounting rail anchor with flat round head

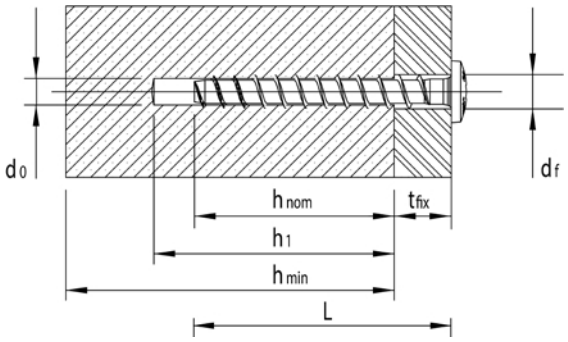
Material: Steel, hardened
Surface: Galvanized, blue Drive:
Hexalobular socket
(TX)
Note: Screw into masonry by hand or cordless screwdriver (without impact)

ETA-15/0784
Mit allgemeiner bauaufsichtlicher ZULASSUNG Z-21.1-2103
Ø 7,5

ETA-15/0785
Ø 6-10 mm

F30-F120

Suction drilling possible



Article no.	Dimension D x L mm	Drill-Ø dO mm	Clamping thickness tfix mm	Head Ø mm	Drive	VPE / Piece
0901 297 535	7,5 x 35	6,0	1	17,0	TX 30	100
0901 297 540	7,5 x 40	6,0	5	17,0	TX 30	100
0901 297 545	7,5 x 45	6,0	10	17,0	TX 30	100
0901 297 550	7,5 x 50	6,0	15	17,0	TX 30	100
0901 297 560	7,5 x 60	6,0	25	17,0	TX 30	50

MMS-plus ST hanger bolt with metric connection thread

Material: Steel,
hardened Surface:
Galvanized, blue Drive:
Hexagon head
Note: Screw into masonry by hand or cordless screwdriver (without impact)

ETA-15/0784
Mit allgemeiner bauaufsichtlicher ZULASSUNG Z-21.1-2103
Ø 6-10

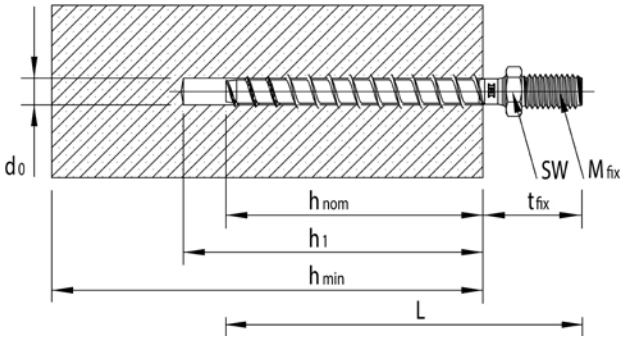
Mit allgemeiner BAUARTGE-NEHMIGUNG Mehrfachver-wendung

F30-F120

ETA-15/0785
Ø 6-10 mm

C1
Ø 10-20 m

Suction drilling possible



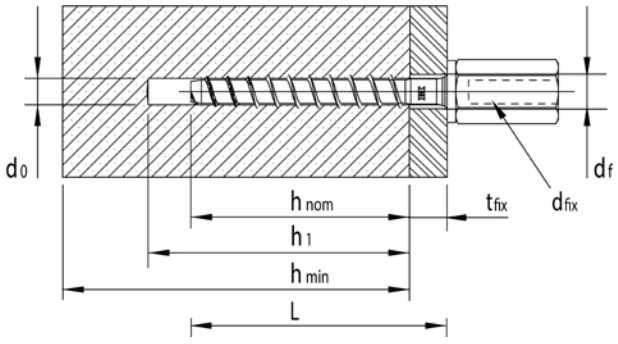
MMS-plus ST 6.0 Connection thread M6 x 5 mm
MMS-plus ST 7.5 Connection thread M8 x 14 mm
MMS-plus ST 10.0 Connection thread M10 x 11 mm

Article no.	Dimension D x L mm	Drill-Ø dO mm	Clamping thickness tfix mm	Head Ø mm	Drive Width across flats	VPE / Piece
0901 406 055	6,0 x 55	5,0	1/10/20	10,0	10	100
0901 406 065	6,0 x 65	5,0	10/20/30	10,0	10	50
0901 475 060	7,5 x 60	6,0	8/18	10,0	10	50
0901 475 070	7,5 x 70	6,0	18/28	10,0	10	50
0901 475 080	7,5 x 80	6,0	8/28/38	10,0	10	50
0901 475 100	7,5 x 100	6,0	28/48/58	10,0	10	50
0901 475 120	7,5 x 120	6,0	48/68/78	10,0	10	50
0901 410 075	10,0 x 75	8,0	10	13,0	13	25
0901 410 085	10,0 x 85	8,0	5/20	13,0	13	25

MMS-plus I Internally threaded anchor

Material: Steel,
hardened Surface:
Galvanized, blue Drive:
Hexagon head
Note: Screw into masonry by hand or cordless screwdriver (without impact)

ETA-15/0784
Ø 6-10
ZULASSUNG Z-21.1-2103
BAUARTGE-NEHMIGUNG Mehrfachver-wendung
F30-F120
ETA-15/0785
Ø 6-10 mm
C1
Ø 10-20 m
Suction drilling possible



* Combination thread M8/M10 x 23 mm
MMS-plus I 6.0 internal thread M6 x 15 mm
MMS-plus I 7.5 internal thread M8 x 12 mm
MMS-plus I 10.0 internal thread M10 x 13 mm

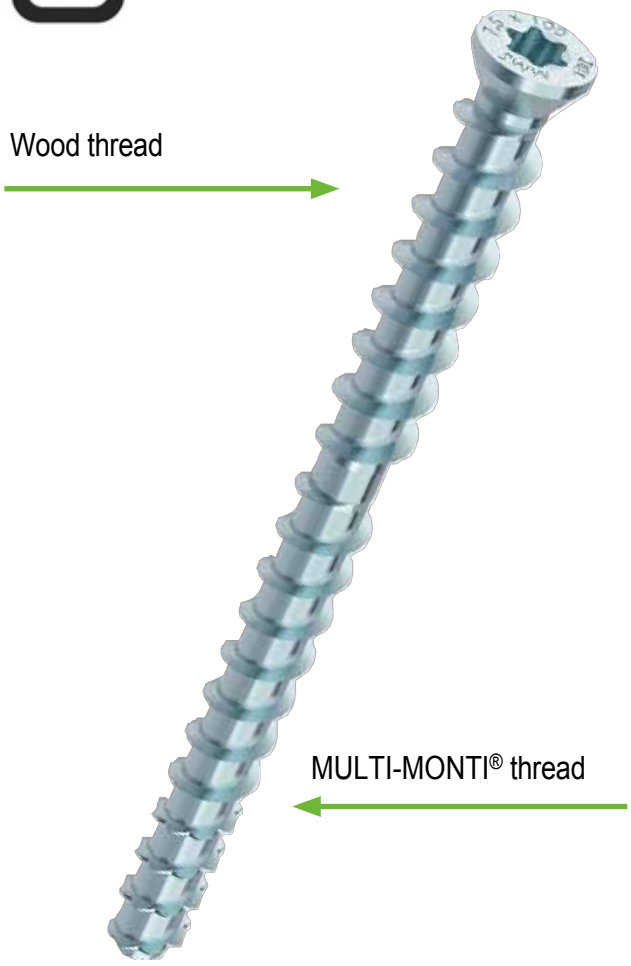
Article no.	Dimension D x L mm	Drill-Ø dO mm	Clamping thickness tfix mm	Head Ø mm	Drive Width across flats	VPE / Piece
0901 106 040	6,0 x 40	5,0	5	11,0	10	100
0901 175 040	7,5 x 40	6,0	5	14,5	13	50
0901 175 041*	7,5 x 40	6,0	5	14,5	13	40
0901 175 060	7,5 x 60	6,0	5/25	14,5	13	50
0901 175 061*	7,5 x 60	6,0	5/25	14,5	13	40
0901 110 060	10,0 x 60	8,0	10	19,5	13	25
0901 110 075	10,0 x 75	8,0	10/25	19,5	13	25

MMS-TC TimberConnect

When fixing timber components to concrete, screw anchors, expansion anchors, adhesive anchors or mortared-in threaded rods were previously used. An alternative to these solutions is the MMS-TC. It consists of a MULTI-MONTI® concrete thread and is supplemented with a timber thread for fastening timber components. The screw anchor is mechanically screwed into drill holes with the same core diameter as the concrete and wood thread. The small head can be countersunk into the wood. One screw anchor is sufficient for all timber thicknesses. The load introduction into the timber is verified using Eurocode 5, which means that the bending verification according to ETAG 001 Annex C, as required for conventional anchors, can be dispensed with for shear loads when using the MMS-TC. In addition to higher tensile loads, this also results in significantly higher transverse loads that are not dependent on the thickness of the component.

The verifications in accordance with approval Z-21.1-1879 for the MULTI-MONTI® -TC are based on ETAG (concrete) and DIN 1052 (timber connection).

Suction drilling possible

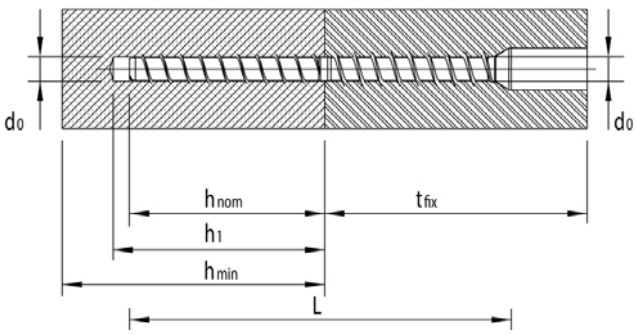


Advantages

- Ideally suited for fixing wooden components in solid masonry and concrete
- Transmission of high tensile and shear forces without additional design effort
- The MMS-TC can be countersunk into the wood, so one product is sufficient for many wood thicknesses
- Machine processing
- Small drilling diameters
- All the advantages of the MULTI-MONTI mounting system®
  - No torque control
  - Small edge distances
  - No curing times

Material: Steel, hardened

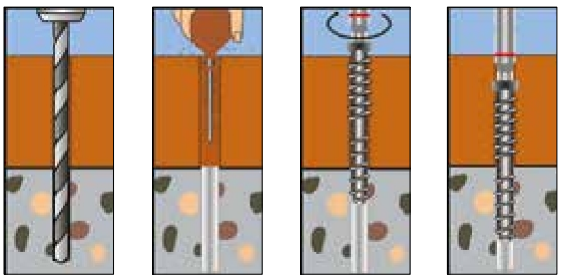
Finish: Galvanized, blue Drive: Hexagon socket TX



Article no.	Dimension D x L mm	Drill-Ø dO mm	Clamping thickness tfix mm	Head Ø mm	Drive	PU / Piece
0901 597 510	7,5 x 100	6,0	40 - 140	10,0	TX 30	50
0901 591 013	10,0 x 130	8,0	60 - 200	16,0	TX 45	25
0901 591 216	12,0 x 160	10,0	80 - 300	17,5	TX 50	25

Set correctly: Fitting the MMS-TC with the correct screw depth is no problem with the right setting tool (see product range overview). The surface of the setting tool is provided with a scale for the screw depth. The thickness of the attachment can be adjusted on the tool using the rubber ring. This gives the screw the optimum screw-in depth.

The right assembly



1. drill
2. clean the drill hole
3. screw in 4. finished

Setting tools for MMS-TC sleeper anchors

Article no.	Execution	Drive size	Use with	VPE / Piece
0901 597 530	MMS-TC TX 30 setting tool	Bit drive	MMS-TC 7.5	1
0901 591 045	MMS-TC TX 45 setting tool	1/2" socket wrench drive	MMS-TC 10	1
0901 591 250	MMS-TC TX 50 setting tool	1/2" socket wrench drive	MMS-TC 12	1

Accessories

Test sleeves

For multiple use of the MULTI-MONTI® -plus

Test sleeves for checking the thread diameter for multiple use of MMS-plus 10 to MMS-plus 20 for temporary fixings.

Screw suitable for further use

Sleeve can be pushed on completely, screw for
No longer suitable for further use

Article no.	Dowel size	Sleeve Ø mm	Sleeve length mm	VPE / Piece
0901 000 010	MMS-plus 10	9,5	24	1
0901 000 012	MMS-plus 12	11,5	32	1
0901 000 016	MMS-plus 16	15,5	36	1
0901 000 020	MMS-plus 20	19,5	58	1

MULTI-MONTI®-plus screw anchor stainless steel A4

The dowel-free fastening technology for concrete and masonry indoors and outdoors

Material: Stainless steel A4 - 1.4401 Surface: Bright / Tip: Phosphated
Note: Screw into masonry by hand or with a cordless screwdriver (without impact)

European Technical Assessment

Fire protection tested according to DI 4102-2 MPA Braunschweig
F30-F120

fulfills the requirements of VdS

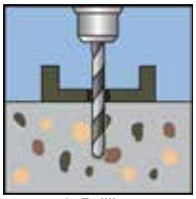
Area of application:
For fastening
Railings, grilles, beams, brackets, metal structures, formwork supports, cable trays, pipelines, mounting rails, ventilation ducts, suspended ceilings, sprinkler systems, etc.
on
Normal concrete with a strength class of at least C20/25 and at most C50/60

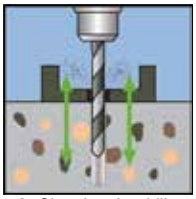
Advantages

- Shallow borehole depths and small borehole diameters
- Saw teeth in the front area of the anchor ensure minimum screw-in torques
- No spreading effect, therefore small center and edge distances
- Quick and easy push-through installation, machine installation is possible without any problems
- Immediately loadable - no waiting times
- Fastening can be completely dismantled again
- No torque control necessary
- Versatile use thanks to numerous variants
- Attractive appearance thanks to hexagonal and countersunk head

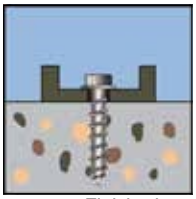






1. Drilling

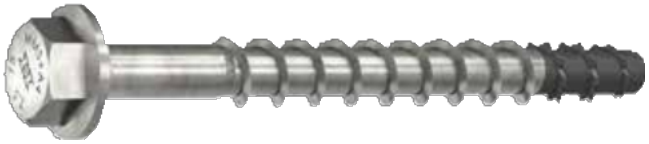

2. Cleaning the drill hole

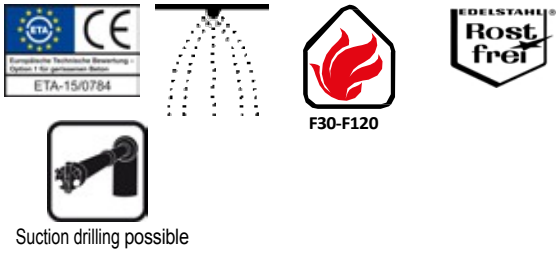

3. Screw in

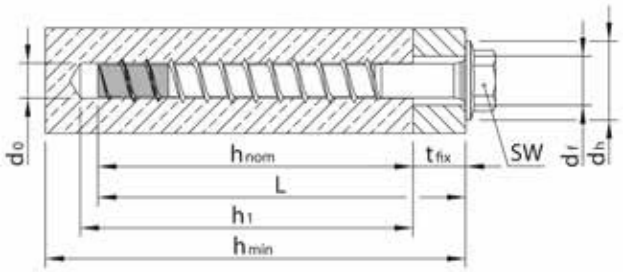

4. Finished

MMS-plus SS A4 hexagon head with pressed-on washer

Material: Stainless steel A4 - 1.4401 Surface: Bright / Tip: Phosphated
Note: Screw into masonry by hand or with a cordless screwdriver (without impact)



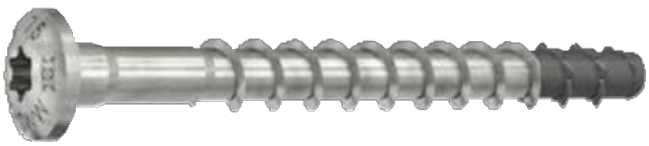


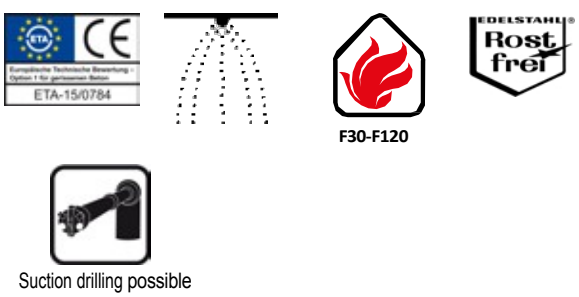


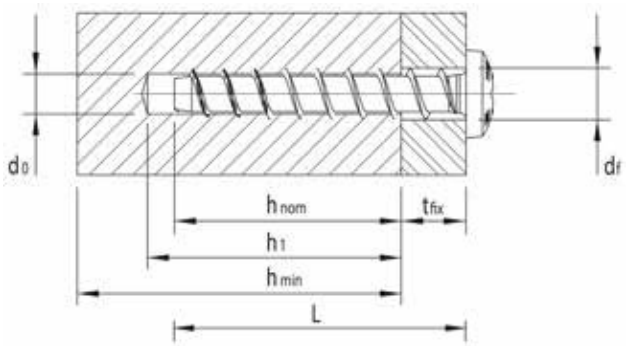
Item no.	Dowel diameter x dowel length (l)	Drill core diameter (d 0)	Clamping thickness tfix mm	Disc diameter	Drive Width across flats	PU
0901 675 040	7.5 x 40 mm	6 mm	5	14.5 mm	SW10	50
0901 675 045	7.5 x 45 mm	6 mm	10	14.5 mm	SW10	50
0901 675 055	7.5 x 55 mm	6 mm	5/20	14.5 mm	SW10	50
0901 675 065	7.5 x 65 mm	6 mm	15/30	14.5 mm	SW10	50
0901 675 075	7.5 x 75 mm	6 mm	5/25/40	14.5 mm	SW10	50
0901 675 085	7.5 x 85 mm	6 mm	15/35/50	14.5 mm	SW10	50
0901 675 105	7.5 x 105 mm	6 mm	35/55/70	14.5 mm	SW10	50
0901 610 065	10 x 65 mm	8 mm	5	19.5 mm	SW13	25
0901 610 075	10 x 75 mm	8 mm	15	19.5 mm	SW13	25
0901 610 085	10 x 85 mm	8 mm	10/25	19.5 mm	SW13	25
0901 610 095	10 x 95 mm	8 mm	20/35	19.5 mm	SW13	25
0901 610 105	10 x 105 mm	8 mm	30/45	19.5 mm	SW13	25
0901 612 095	12 x 95 mm	10 mm	5	22.5 mm	SW15	25
0901 612 105	12 x 105 mm	10 mm	15	22.5 mm	SW15	25
0901 612 120	12 x 120 mm	10 mm	15/30	22.5 mm	SW15	25
0901 612 135	12 x 135 mm	10 mm	30/45	22.5 mm	SW15	25

MMS-plus P A4 Pan Head

Material: Stainless steel A4 - 1.4401 Surface: Bright / Tip: Phosphated
Note: Screw into masonry by hand or with a cordless screwdriver (without impact)



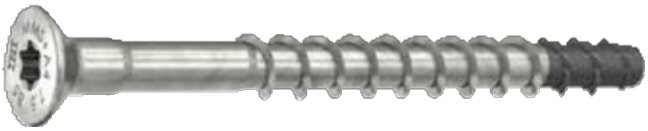




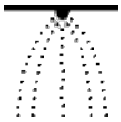
Item no.	Dowel diameter x dowel length (l)	Drill core diameter (d 0)	Clamping thickness tfix mm	Internal drive	Head diameter (d h)	PU
0901 775 040	7.5 x 40 mm	6 mm	5	TX 30	13.6 mm	50
0901 775 045	7.5 x 45 mm	6 mm	10	TX 30	13.6 mm	50
0901 775 055	7.5 x 55 mm	6 mm	5/20	TX 30	13.6 mm	50
0901 775 065	7.5 x 65 mm	6 mm	15/30	TX 30	13.6 mm	50
0901 775 075	7.5 x 75 mm	6 mm	5/25/40	TX 30	13.6 mm	50
0901 775 085	7.5 x 85 mm	6 mm	15/35/50	TX 30	13.6 mm	50
0901 775 095	7.5 x 95 mm	6 mm	25/45/60	TX 30	13.6 mm	50
0901 775 115	7.5 x 115 mm	6 mm	45/65/80	TX 30	13.6 mm	50

MMS-plus F A4 countersunk head

Material: Stainless steel A4 - 1.4401 Surface: Bright / Tip: Phosphated
Note: Screw into masonry by hand or with a cordless screwdriver (without impact)

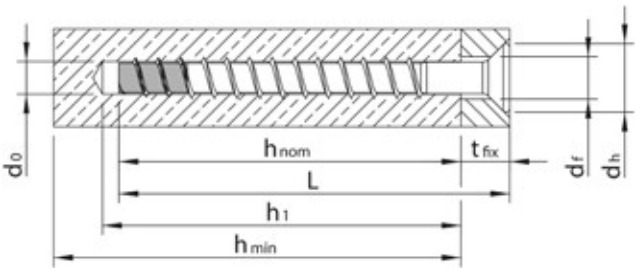


Areas of application:
Visually appealing head shape, ideal for flush-mounted fastenings



F30-F120

Suction drilling possible



Item no.	Dowel diameter x dowel length (l)	Drill core diameter (d 0)	Clamping thickness tfix mm	Internal drive	Head diameter	PU
0901 875 040	7.5 x 40 mm	6 mm	5	TX30	13.6 mm	50
0901 875 045	7.5 x 45 mm	6 mm	10	TX30	13.6 mm	50
0901 875 055	7.5 x 55 mm	6 mm	5/20	TX30	13.6 mm	50
0901 875 065	7.5 x 65 mm	6 mm	15/30	TX30	13.6 mm	50
0901 875 075	7.5 x 75 mm	6 mm	5/25/40	TX30	13.6 mm	50
0901 875 085	7.5 x 85 mm	6 mm	15/35/50	TX30	13.6 mm	50
0901 875 095	7.5 x 95 mm	6 mm	25/45/60	TX30	13.6 mm	50
0901 875 105	7.5 x 105 mm	6 mm	35/55/70	TX30	13.6 mm	50
0901 875 125	7.5 x 125 mm	6 mm	55/75/90	TX30	13.6 mm	50
0901 810 065	10 x 65 mm	8 mm	5	TX40	17 mm	25
0901 810 080	10 x 80 mm	8 mm	5/20	TX40	17 mm	25
0901 810 090	10 x 90 mm	8 mm	15/30	TX40	17 mm	25
0901 810 100	10 x 100 mm	8 mm	25/40	TX40	17 mm	25
0901 812 095	12 x 95 mm	10 mm	5	TX50	21 mm	25
0901 812 105	12 x 105 mm	10 mm	15	TX50	21 mm	25
0901 812 120	12 x 120 mm	10 mm	15/30	TX50	21 mm	25
0901 812 130	12 x 130 mm	10 mm	25/40	TX50	21 mm	25

Extract from the conditions of use of the assessment/approval **ETA-15/0784**. Permissible loads without influence of center distances and edge distances.

			MULTI-MONTI-plus A4						
Size			**7,5**			**10**		**12**	
Maximum permissible tensile load*) "Nzul" of a single anchor without edge influence1)									
Screw-in depth (standard)	hnom	[mm]	40	55	75	70	85	100	115
Characteristic load-bearing capacity in non-cracked concrete C20/253	Nzul	[kN]	2,2	1,8	5,3	4,9	10,3	10,3	16,3
Characteristic load-bearing capacity in cracked concrete C20/253	Nzul	[kN]	1,4	0,8	1,6	2,4	4,4	5,9	7,9
Maximum permissible tensile load*) "Nzul" of a single anchor without edge influence1)									
Screw-in depth (reduced)	hnom	[mm]	35	50	65	60	75	90	105
Characteristic load-bearing capacity in non-cracked concrete C20/253	Nzul	[kN]	1,6	1,6	4,1	4,1	8,4	7,9	12,8
Characteristic load-bearing capacity in cracked concrete C20/253	Nzul	[kN]	1	0,6	1,2	2	3,4	4,7	6,4
Characteristic load capacity	$M^0_{Rk,s}$	[kN]	13,3			32,1		61,1	
Component dimensions and installation parameters									
Nominal boron diameter	d_0	[mm]	6			8		10	
Hole depth with cleaning (standard)	$h_1 \geq$	[mm]	45	60	85	80	95	110	125
Drill hole depth without cleaning (standard)	$h_1 \geq$	[mm]	h +2xd_{nom0}						
Hole depth with adjustment (standard)	$h1_{,adj} \geq$	[mm]	-	hnom$_{,adj,}$0+10mm					
Borehole depth with adjustment without borehole cleaning (standard)	$h1_{,adj} \geq$	[mm]	-	hnom$_{,adj,0+2xd0}$					
Screw-in depth (standard)	hnom	[mm]	40	55	75	70	85	100	115
Calculated anchoring depth (standard)	hef	[mm]	23	36	49	44	56	65	77
Hole depth with cleaning (reduced)	$h_1 \geq$	[mm]	40	55	75	70	85	100	115
Hole depth without cleaning (reduced)	$h_1 \geq$	[mm]	h +2xd_{nom0}						
Hole depth with adjustment (reduced)	$h1_{,adj} \geq$	[mm]	-	hnom$_{,adj,}$0+10 mm					
Borehole depth with adjustment without borehole cleaning (reduced)	$h1_{,adj} \geq$	[mm]	-	hnom$_{,adj,0+2xd0}$					
Screw-in depth (reduced)	hnom	[mm]	35	50	65	60	75	90	105
Calculated anchoring depth (reduced)	hef	[mm]	19	32	40	35	48	56	69
Minimum component thickness	hmin	[mm]	100			115	125	150	
min. Center distance	smin	[mm]	35			35		40	
min. Edge distance	cmin	[mm]	30			35		40	

1) This means c ≥ 1.5 * hef and s ≥ 3 * hef

2) This means c ≥ 10 * hef

3) The concrete is assumed to be normally reinforced. Higher resistances may be possible with higher concrete strengths.

*) On the resistance side, the partial safety factors of the anchor resistances and the material partial safety factors of design method A according to Annex C of ETAG 001 or CEN/TS 1992-4 are taken into account. On the action side, a partial safety factor of γG = 1.35 was taken into account.

For combined loads, anchor groups and axial or edge influences, please observe the specifications for design methods A in accordance with ETAG 001 Annex C or CEN/TS 1992-4 or our design aid.

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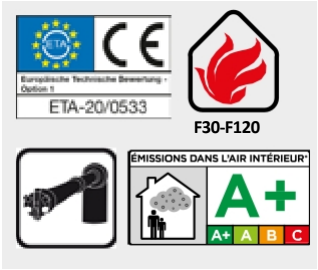
Guide to heavy-duty fastening Chemistry

			 Bonded anchor VZ	 Injection system VMZ	 Injection system VMZ dynamic	 Injection system VMH	 Injection system VMU plus	 Injection system VMU plus polar	 Injection system VM-EA	 Injection system VM-Multi plus	 Injection system VM-Winter
Article no.			0913	0914	0914 6	0911 006	0911	0911	0911	0912	0911 020
Mounting type	Suitable for building materials	Concrete	x	x	x	x	x	x	x	x	x
		Natural stone					x	x	x	x	x
		Solid brick					x	x	x	x	x
		Solid sand-lime brick					x	x	x	x	x
		Perforated brick					x	x	x	x	x
		Perforated sand-lime brick					x	x	x	x	x
		Hollow block					x	x	x	x	x
		Aerated concrete Lightweight concrete					x	x	x	x	x
	Authorization *(Details on the individual pages)*	Dynamic loads			x						
		Cracked concrete	x	x	x	x	x	x			
		Uncracked concrete	x	x	x	x	x	x	x		
		Masonry					x	x	x		
		Subsequent reinforcement connection				x	x				
	Material	Steel, galvanized	x	x	x	x	x	x	x	x	x
		Stainless steel A4	x	x		x	x	x	x		
	Assembly	Pre-mounting	x	x		x	x	x	x	x	x
		Push-through mounting		x	x						
		Suitable for diamond drilled holes	x	x	x						
		Approved for suction-drilled holes	x	x		x					

Bonded anchor VZ

The new composite anchor VZ, consisting of the styrene-free composite mortar cartridge VZ-P and anchor rod V-A, has the European Technical Assessment for cracked and non-cracked concrete



Assembly:

- Installation is quick and easy: after inserting the composite mortar cartridge into the cleaned drill hole, the V-A anchor rod is driven in using a hammer drill
- As the bond reaction is only started when the anchor rod is driven in, the bonded mortar cartridge and anchor rod can be set independently of each other and work interruptions are possible without any problems
- This makes the VZ composite anchor ideal for series installation.
- The very short curing time enables heavy components to be fixed quickly without long waiting times.

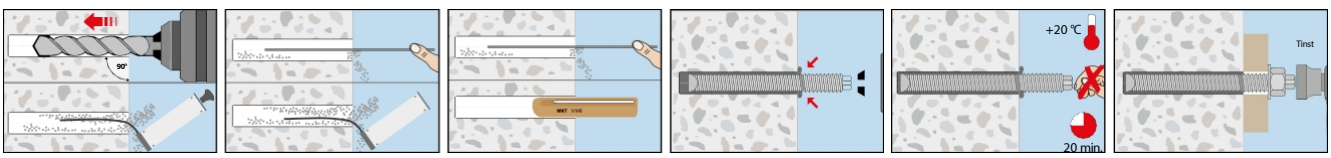
Processing:

The VZ bonded anchor can be used in concrete temperatures from -20 °C to +40 °C. This means it can be used indoors and outdoors all year round and is also ideal for use in cold stores.

Advantages

- European Technical Assessment in cracked and non-cracked concrete
- High, permissible loads with low anchorage depths and component thicknesses
- Small center distances and very small edge distances
- Fire assessments for all sizes
- Approved processing from -20 °C to +40 °C Substrate temperature
- Very fast, reliable curing, therefore hardly any waiting time until installation
- No longer curing times in damp concrete
- Anchor rods V-A with external hexagon for quick and easy installation; a suitable adapter for clamping in a drill chuck is included in every pack
- When using the SB suction drill bit, subsequent cleaning of the drill hole is not necessary
- Styrene-free

Assembly



Mortar cartridge VZ-P

Building authority approval in cracked and non-cracked concrete

Item number	l mm	d mm	for	Drill-Ø mm	PU ST
0913 000 008	85	9	M 8	10	10
0913 000 010	90	11	M 10	12	10
0913 000 012	95	13	M 12	14	10
0913 000 016	95	17	M 16	18	10
0913 000 020	145	17	M 20	22	10

Anchor rod V-A

Item number	Designation	Dimension mm	Clamping thicknes s mm	Anchoring depth mm	PU ST
Material: Steel 5.8, galvanized					
0913 108 110	V-A 8-20/110	M 8 x 110	20	80	10
0913 110 130	V-A 10-30/130	M 10 x 130	30	90	10
0913 110 190	V-A 10-90/190	M 10 x 190	90	90	10
0913 112 160	V-A 12-35/160	M 12 x 160	35	110	10
0913 112 210	V-A 12-85/210	M 12 x 210	85	110	10
0913 112 220	V-A 12-95/220	M 12 x 220	95	110	10
0913 116 165	V-A 16-20/165	M 16 x 165	20	125	10
0913 116 190	V-A 16-45/190	M 16 x 190	45	125	10
0913 116 250	V-A 16-105/250	M 16 x 250	105	125	10
0913 116 300	V-A 16-155/300	M 16 x 300	155	125	10
0913 120 220	V-A 20-20/220	M 20 x 220	20	170	10
0913 120 260	V-A 20-60/260	M 20 x 260	60	170	10
Material: A4 stainless steel					
0913 208 110	V-A 8-20/110 A4	M 8 x 110	20	80	10
0913 210 130	V-A 10-30/130 A4	M 10 x 130	30	90	10
0913 210 190	V-A 10-90/190 A4	M 10 x 190	90	90	10
0913 212 160	V-A 12-35/160 A4	M 12 x 160	35	110	10
0913 216 190	V-A 16-45/190 A4	M 16 x 190	45	125	10
0913 216 250	V-A 16-105/250 A4	M 16 x 250	105	125	10
0913 220 260	V-A 20-60/260 A4	M 20 x 260	60	170	10

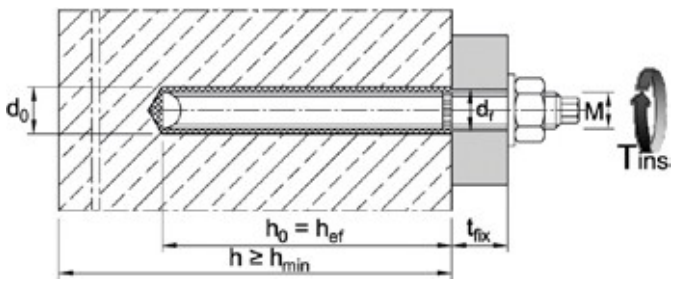
Extract from the conditions of use of the European Technical Assessment ETA-20/0533

Permissible loads without influence of center and edge distances in dry or damp concrete for temperature range I -40°C to +24°C/40°C1) and for temperature range II -40°C to +50°C/+80°C1). Total safety factor according to ETAG taken into account (γ_M and γ_F).

Loads and characteristic values									
Bonded anchor VZ, anchor rod V-A steel 5.8					**M8**	**M10**	**M12**	**M16**	**M20**
Anchoring depth			hef	[mm]	80	90	110	125	170
Permissible tensile load							cracked concrete		
Temperature range	24°C/40°C1)	C20/25	Permitted N	[kN]	4,0	7,3	11,5	18,7	30,3
	50°C/80°C1)	C20/25	Permitted N	[kN]	3,6	6,2	9,9	15,0	25,4
Permissible tensile load							uncracked concrete		
Temperature range	24°C/40°C1)	C20/25	Permitted N	[kN]	8,0	13,8	20,0	27,3	43,3
	50°C/80°C1)	C20/25	Permitted N	[kN]	6,8	12,3	18,1	27,3	43,3
Permissible shear load							cracked and non-cracked concrete		
Temperature range	24°C/40°C1)	C20/25	Permitted V	[kN]	6,3	9,7	14,3	26,9	41,7
	50°C/80°C1)	C20/25	Permitted V	[kN]	6,3	9,7	14,3	26,9	41,7
Bonded anchor VZ, anchor rod V-A stainless steel ≥	**A4-70, ≥ HCR-70**								
Permissible tensile load							cracked concrete		
Temperature range	24°C/40°C1)	C20/25	Permitted N	[kN]	4,0	7,3	11,5	18,7	30,3
	50°C/80°C1)	C20/25	Permitted N	[kN]	3,6	6,2	9,9	15,0	25,4
Permissible tensile load							uncracked concrete		
Temperature range	24°C/40°C1)	C20/25	Permitted N	[kN]	8,0	14,6	21,4	27,3	43,3
	50°C/80°C1)	C20/25	Permitted N	[kN]	6,8	12,3	18,1	27,3	43,3
Permissible shear load							cracked and non-cracked concrete		
Temperature range	24°C/40°C1)	C20/25	Permitted V	[kN]	7,4	11,4	17,1	31,4	49,1
	50°C/80°C1)	C20/25	Permitted V	[kN]	7,4	11,4	17,1	31,4	49,1
Minimum component thickness, center and edge distances									
Minimum component thickness			hmin	[mm]	110	120	140	160	220
Minimum center distance			smin	[mm]	40	50	60	75	90
Minimum edge distance			cmin	[mm]	40	45	45	50	55
Assembly data									
Drill hole diameter			d0	[mm]	10	12	14	18	22
Through hole in the attachment part			df ≤	[mm]	9	12	14	18	22
Drill hole depth			h0	[mm]	80	90	110	125	170
Assembly torque			Tinst ≤	[Nm]	10	20	40	80	150
Width across flats (nut)			SW	[mm]	13	17	19	24	30
Width across flats (anchor rod)			SW	[mm]	5	6	8	12	14

1)max. long-term temperature / max. short-term temperature.

2)36.0 kN in non-cracked concrete If required: The practical design program at www.mkt.de.



Curing times composite anchor VZ

Cartridge temperature during processing: -15°C to +40°C

Temperature (°C) in the			**boreholeminimum curing time**
-20°C	to	-16°C	17 h
-15°C	to	-11°C	7 h
-10°C	to	-6°C	4 h
-5°C	to	-1°C	3 h
0°C	to	+4°C	50 min
+5°C	to	+ 9°C	25 min
+10°C	to	+19°C	15 min
+20°C	to	+29°C	6 min
+30°C	to	+40°C	6 min

Injection system VMZ

For medium to heavy-duty fastenings in cracked and non-cracked concrete

The VMZ injection system is a bonded expansion anchor consisting of a two-component, styrene-free bonded mortar and a special anchor rod with
Nut and washer. The force is transmitted mechanically via the interlocking of the individual anchor rod cones in the mortar and further via a combination of holding and frictional forces in the concrete.

For anchoring heavy loads such as steel beams, steel supports, railings (including bridges), brackets, facades, etc.
in cracked and non-cracked normal concrete of strength class ≥ C20/25 and ≤ C50/60.

Advantages:

- High load-bearing capacities in cracked and non-cracked concrete due to expansion cones of the anchor r
- Low expansion pressure, therefore low center and edge distances
- Installation in dry and wet concrete, drilling $Ø_{do} \geq$ 14 mm also possible in water-filled drill hole
- After curing, largely sealed drill hole
- High temperature resistance (permanently up to +72 °C, temporarily up to +120 °C)
- Opened cartridges can be reused after resealing with the sealing cap
- Can also be used in concrete < C20/25 and in pressure-resistant natural stone without building authority approval
- For hammer-drilled boreholes, also under seismic action (SEISMIC C1 and C2)
- Diamond drilled holes (for VMZ-A from M 10 / for VMZ-IG from M 12) possible

ETA- 04/0092
European Technical Assessment, for anchoring in cracked concrete

Fire protection tested

F30-F120
ZIVILSCHUTZ
Federal Office for Civil Protection BZS D03-203

from VMZ 50 M8
SEISMIC
Earthquake approval: C1 and C2 for M10-M24

1200°C
ZTV
M10-M24 HCR

BBA
UKTA - 22/6210
Option 1 for cracked concrete
M10-M24

ÉMISSIONS DANS L'AIR INTÉRIEUR
A+

EDELSTAHL Rostfrei

Injection mortar VMZ

- Vinyl ester resin, styrene-free
- Coaxial cartridge, suitable for Handymax, VM and Standard dispensing guns
- With static mixer
- Shelf life: 18 months

Designation	Article no.	Contents	PU
Injection mortar VMZ 330	0914 001 330	330 ml	1
Injection mortar VMZ 420	0914 001 420	420 ml	1


With millimeter scale for exact dosing

Curing times for injection mortar VMZ

Cartridge temperature during application min. + 5°C.

Temperature (°C) in the borehole	Processing time	Curing time	
		dry concrete	Damp concrete
-15°C to -10°C	45 min	7 d	14 d1)
-9°C to -5°C	45 min	10:30 h	21:00 h1)
-4°C to -1°C	45 min	6:00 h	12:00 h1)
0°C to +4°C	20 min	3:00 h	6:00 h
+5°C to +9°C	12 min	2:00 h	4:00 h
+10°C to +19°C	6 min	1:20 h	2:40 h
+20°C to +29°C	4 min	45 min	1:30 h
+30°C to +34°C	2 min	25 min	50 min
+35°C to +39°C	1.4 min	20 min	40 min
+40°C	1.4 min	15 min	30 min

1) It must be ensured that no ice build-up occurs in the drill hole. The drill hole must be created and cleaned immediately before inserting the anchor.

Anchor rod VMZ-A

Material: galvanized steel
For use in dry indoor areas

Designation	Article number	Drill hole Ø x depth mm	Setting depth mm	Seismic C1 / C2	Max. Clamping thickness mm	Dowel length mm	Thread mm	PU Piece
VMZ-A 50 M8-15/80	0914 508 080	10x55	52	-	15	80	M8x22	10
VMZ-A 60 M10-10/85	0914 510 085	12x65	63	✓	10	85	M10x18	10
VMZ-A 60 M10-20/95	0914 510 095	12x65	63	✓	20	95	M10x27	10
VMZ-A 60 M10-30/105	0914 510 105	12x65	63	✓	30	105	M10x27	10
VMZ-A 60 M10-60/135	0914 510 135	12x65	63	✓	60	135	M10x47	10
VMZ-A 80 M12-10/110	0914 512 110	14x85	84	✓	10	110	M12x21	10
VMZ-A 80 M12-25/125	0914 512 125	14x85	84	✓	25	125	M12x36	10
VMZ-A 80 M12-50/150	0914 512 150	14x85	84	✓	50	150	M12x46	10
VMZ-A 100 M12-25/145	0914 512 145	14x105	104	✓	25	145	M12x36	10
VMZ-A 100 M12-60/180	0914 512 180	14x105	104	✓	60	180	M12x56	10
VMZ-A 125 M16-30/180	0914 516 180	18x133	130	✓	30	180	M16x44	10
VMZ-A 125 M16-60/210	0914 516 210	18x133	130	✓	60	210	M16x55	10
VMZ-A 170 M20-25/230	0914 520 230	24x180	180	✓	25	230	M20x33	5
VMZ-A 170 M20-50/255	0914 520 255	24x180	180	✓	50	255	M20x46	5

Material: A4 stainless steel

- Can also be used outdoors or in damp rooms if there are no particularly aggressive conditions
- The special coating on the nut prevents cold welding of the bolt thread

Designation	Article number	Drill hole Ø x depth mm	Setting depth mm	Seismic C1 / C2	Max. Clamping thickness mm	Dowel length mm	Thread mm	PU Piece
VMZ-A 50 M8-15/80 A4	0914 908 080	10x55	52	-	15	80	M8x22	10
VMZ-A 60 M10-10/85 A4	0914 910 085	12x65	63	✓	10	85	M10x18	10
VMZ-A 60 M10-20/95 A4	0914 910 095	12x65	63	✓	20	95	M10x27	10
VMZ-A 60 M10-30/105 A4	0914 910 105	12x65	63	✓	30	105	M10x27	10
VMZ-A 60 M10-60/135 A4	0914 910 135	12x65	63	✓	60	135	M10x47	10
VMZ-A 80 M12-10/110 A4	0914 912 110	14x85	84	✓	10	110	M12x21	10
VMZ-A 80 M12-25/125 A4	0914 912 125	14x85	84	✓	25	125	M12x36	10
VMZ-A 80 M12-50/150 A4	0914 912 150	14x85	84	✓	50	150	M12x46	10
VMZ-A 100 M12-25/145 A4	0914 912 145	14x105	104	✓	25	145	M12x36	10
VMZ-A 100 M12-60/180 A4	0914 912 180	14x105	104	✓	60	180	M12x56	10
VMZ-A 100 M12-100/220 A4	0914 912 220	14x105	104	✓	100	220	M12x84	10
VMZ-A 125 M16-30/180 A4	0914 916 180	18x133	130	✓	30	180	M16x44	10
VMZ-A 125 M16-60/210 A4	0914 916 210	18x133	130	✓	60	210	M16x55	10
VMZ-A 170 M20-50/255 A4	0914 920 255	24x180	180	✓	50	255	M20x46	5
VMZ-A 200 M24-50/290 LG A4	0914 924 290	26x215	212	✓	50	290	M24x75	5

Anchor rod VMZ-A for fastening according to reference drawing GEL 14

For railing post fastening on bridges, especially for retrofitting and new construction of copings and cornices (GEL 14)

Advantages:

- Low drilling effort due to optimally matched anchoring depths
- The selected clamping thicknesses can compensate for most cap inclinations and unevenness
- Sample dimensioning (dowel dimensioning) according to GEL 14 available

Material: A4 stainless steel

Designation	Article no.	Dimension mm	Clamping thickness mm	Anchoring depth mm	PU
VMZ-A70 M12-40/130 A4	0914 912 130	M 12 x 130	40	70	10

Extract from the conditions of use of the European Technical Assessment ETA-04/0092 for use in cracked and non-cracked concrete (option 1)

Permissible loads according to EN 1992-4 without the influence of center and edge distances in dry or wet concrete for the tem-temperature range -40°C to +50°C (briefly up to +80°C). The overall safety factor (γ_M and γ_F) was taken into account. For further details and temperature ranges see ETA. For load-bearing capacities under fire exposure, see end of catalog.

Loads and characteristic values Injection system VMZ , steel vz / stainless steel A4 / HCR M8-M24				**50 M8**	**60 M10**	**70 M12**	**80 M12**	**100 M12**	**125 M16**	**170 M20 170 M20 LG**	**200 M 24 200 M 24 LG**
						cracked concrete					
Permissible tensile load	C20/25	permissible N	[kN]	5,8	7,6	9,6	11,7	16,4	22,9	36,3	46,4
	C25/30	permissible N	[kN]	6,5	8,5	10,7	13,1	18,3	25,6	40,6	51,9
	C30/37	permissible N	[kN]	7,1	9,3	11,8	14,3	20,1	28,1	44,5	56,8
	C40/50	permissible N	[kN]	8,2	10,8	13,6	16,6	23,2	32,4	51,4	65,6
	C50/60	permissible N	[kN]	8,6	11,9	15,2	18,5	25,9	36,2	57,4	73,3
						uncracked concrete					
Permissible tensile load	C20/25	permissible N	[kN]	8,3	10,9	13,7	16,8	23,4	32,7	51,9	66,2
	C25/30	permissible N	[kN]	8,6	11,9	15,3	18,7	26,2	36,6	58,0	74,1
	C30/37	permissible N	[kN]	8,6	11,9	16,8	20,5	27,1	40,1	63,6	81,1
	C40/50	permissible N	[kN]	8,6	11,9	19,4	23,7	27,1	46,3	73,4	92,4
	C50/60	permissible N	[kN]	8,6	11,9	21,7	25,7	27,1	51,8	78,6	92,4
						cracked / non-cracked concrete					
Permissible shear load	≥ C20/25	permissible V	[kN]	8,6	13,1	19,2/19,4	19,4	19,4	36,0	72,7/74,9	89,1
Permissible shear load version LG	≥ C20/25	permissible V	[kN]	8,6	13,1	19,2/19,4	19,4	19,4	36,0	49,1	70,3
Permissible bending moment		Permitted M	[Nm]	17,1	34,3	60,0	60,0	60,0	152,0	259,4	448,0
Center and edge distances											
Anchoring depth		h_{ef} ≥	[mm]	50	60	70	80	100	125	170	200
Characteristic center distance		$s_{cr,N}$	[mm]	150	180	210	240	300	375	510	600
Characteristic edge distance		$c_{cr,N}$	[mm]	75	90	105	120	150	187,5	255	300
						cracked concrete					
Minimum component thickness		h_{min}	[mm]	80	100	110	110	130	170	230	270
Minimum center distance		s_{min}	[mm]	40	40	55	40	50	60	80	80
Minimum edge distance		c_{min}	[mm]	40	40	55	50	50	60	80	80
						uncracked concrete					
Minimum component thickness		h_{min}	[mm]	80	100	110	110	130	170	230	270
Minimum center distance		s_{min}	[mm]	40	50	55	55	801)	60	80	105
Minimum edge distance Push-through installation Push-through installation2)		c_{min}	[mm]	40	50	55	55	551)	60	80	105
Assembly data											
Drill hole diameter		d_o	[mm]	10	12	14	14	14	18	24	26
Through hole in the attachment part		d_f ≤	[mm]	9	12	14	14	14	18	24 (223))	26
Through hole in the attachment part		d_f ≤	[mm]	- 4)	14	16	16	16	20	26	28
Drill hole depth		h_o ≥	[mm]	55	65	75	85	105	133	180	215
Torque when anchoring		T_{inst} ≤	[Nm]	10	15	25	25	30	50	80	120
Width across flats		SW	[mm]	13	17	19	19	19	24	30	36
Borehole filling quantity, scaling on cartridge 345			[mm]	3	4	4	5	6	9	17	21
Mortar requirement per drill hole3)			[ml]	4,1	6,1	6,8	8,6	9,2	14,5	30,1	36,6
Additional mortar required per drill hole for push-through installation per 10 mm mounting thickness			[ml/ 10mm]	-	1,0	1,2	1,2	1,2	1,6	2,9	2,6
Drill holes per cartridge3) VMZ 150/VMZ 280			[Piece]	26/58	18/39	16/35	12/27	11/26	7/16	3/7	3/6
Drill holes per cartridge3) VMZ 345			[Piece]	73	49	44	34	32	20	10	8
Drill holes per cartridge3) VMZ 420			[Piece]	92	62	55	44	41	26	12	10

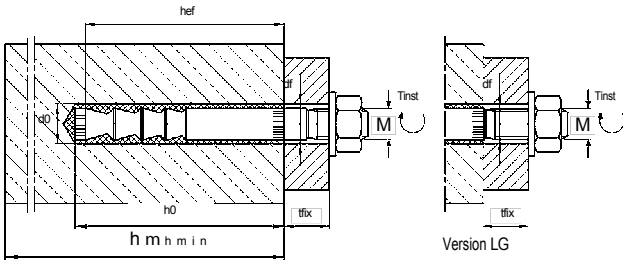
1) For edge distance c ≥ 80 mm, minimum center distance s_{min} = 55 mm

2) Only push-through installation. For push-through installation, an additional quantity of mortar is required to fill the through-hole.

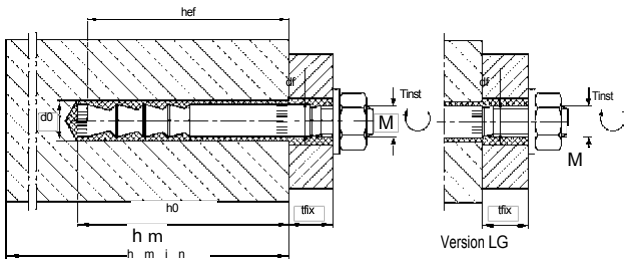
3) Cannot be used for push-through mounting.

4) 14 mm with distance mounting

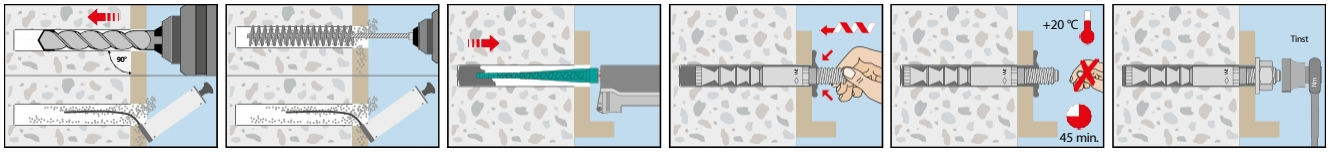
Pre-mounting



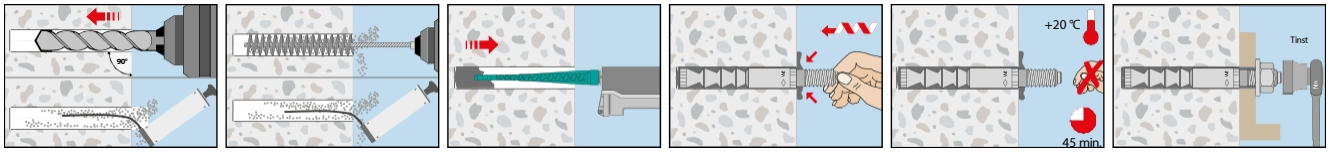
Push-through mounting



Push-through mounting



Pre-mounting



Backfill disk VS

Advantages

The backfill disk makes it possible to backfill the annular gap at a later date.

- Enables larger through-holes in the add-on part
- Increased permissible shear loads under seismic action

Galvanized steel

Stainless steel A4

Application

For subsequent filling of through-holes in conjunction with the BZ3 and BZ plus bolt anchors and the VMZ, VMH, VMU plus injection systems.

Note

When selecting dowels, bear in mind that the clamping thickness is reduced by up to 6 mm!

There are 10 mixer reducers per pack of 20, 5 per pack of 10 and 2 per pack of 4.

Designation	Article number	Designation	Article number	Suitable for thread	Inside Ø	Outer Ø	Slice thickness	Reduction of the clamping thickness t_{fix} for		Package contents
								BZ3, BZ plus, BSZ	VMZ, VMH, VMU plus, VME plus	
Galvanized steel		Stainless steel A4			mm	mm	mm	mm	mm	Piece
VS M8, steel vz	0914 600 008	VS M8 A4	0914 600 908	M8	9	23	5	5	3,4	20
VS M10, steel vz	0914 600 010	VS M10 A4	0914 600 910	M10	12	26	5	5	3	20
VS M12, steel vz	0914 600 012	VS M12 A4	0914 600 912	M12	14	28	5	5	2,5	20
VS M16, steel vz	0914 600 016	VS M16 A4	0914 600 916	M16	17	34	5	5	2	10
VS M20, steel vz	0914 600 020	VS M20 A4	0914 600 920	M20	21	41	5	5	2	10
VS M24, steel vz	0914 600 024	VS M24 A4	0914 600 924	M24	25	48	6	6	2	4

Internally threaded sleeves

Additional advantages:

- Can be used flexibly with threaded rods, washers and nuts or screws from strength class 8.8 (VMZ-IG steel, galvanized) or from strength class A4-70 (VMZ-IG A4)
- Fastening can be detached flush with the surface again
- One VMZ female threaded sleeve for different clamping thicknesses

Flexible due to use with threaded rods/pieces or screws with freely selectable head shape (attractive appearance), e.g:

... and many others.

Female threaded sleeves VMZ-IG

Material: Steel, galvanized (screws, threaded rod, nuts from strength class 8.8) For use in dry indoor areas

Designation	Article number	Drill hole Ø x depth mm	Anchoring depth mm	Dowel length / setting depth mm	Thread	PU Piece
VMZ-IG 60 M8	0914 408 060	12 x 65	60	63	M8 x 16	10
VMZ-IG 80 M10	0914 410 080	14 x 85	80	84	M10 x 23	10
VMZ-IG 90 M12	0914 412 090	18 x 98	90	94	M12 x 24	10
VMZ-IG 125 M12	0914 412 125	18 x 133	125	130	M12 x 30	10
VMZ-IG 170 M16	0914 416 170	24 x 180	170	180	M16 x 32	5
VMZ-IG 170 M20	0914 420 170	26 x 185	170	182	M20 x 40	5

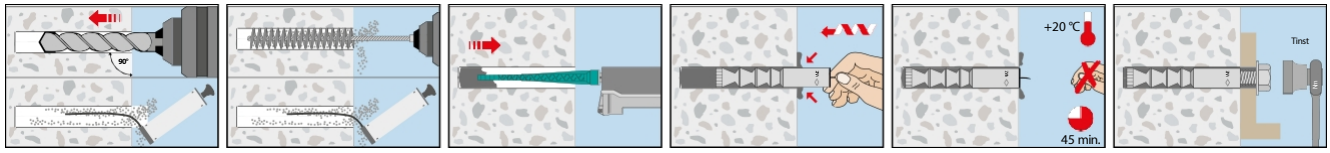
Material: A4 stainless steel (screws, threaded rods, nuts from strength class A4-70). Can also be used outdoors or in damp rooms if there are no particularly aggressive conditions.

EDELSTAHL Rostfrei

Designation	Article number	Drill hole Ø x depth mm	Anchoring depth mm	Dowel length / setting depth mm	Thread	PU Piece
VMZ-IG 60 M8 A4	0914 808 060	12 x 65	60	63	M8 x 16	10
VMZ-IG 80 M10 A4	0914 810 080	14 x 85	80	84	M10 x 23	10
VMZ-IG 90 M12 A4	0914 812 090	18 x 98	90	94	M12 x 24	10
VMZ-IG 125 M12 A4	0914 812 125	18 x 133	125	130	M12 x 30	10
VMZ-IG 170 M16 A4	0914 816 170	24 x 180	170	180	M16 x 32	5
VMZ-IG 170 M20 A4	0914 820 170	26 x 185	170	182	M20 x 40	5

The VMZ-IG female threaded sleeves are supplied with sealing plugs to prevent the thread from becoming contaminated during transportation and installation.

Assembly



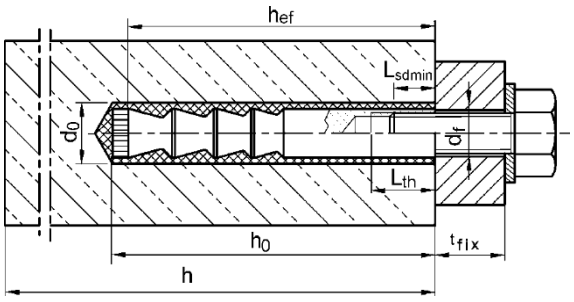
Extract from the conditions of use of the European Technical Assessment ETA-04/0092 for use in cracked and non-cracked concrete (option 1)

Permissible loads according to EN 1992-4 without influence of center and edge distances in dry or damp concrete for the temperature range -40°C to +50°C (briefly up to +80°C). The overall safety factor (γ_M and γ_F) was taken into account. For further details and temperature ranges see ETA.

Loads and characteristic valuesInjection system VMZ-IG, galvanized steel and stainless steel A4 / HCR

				60 M8	80 M10	90 M12	125 M12	170 M16	170 M20
VMZ-IG, steel, galvanized						cracked concrete			
Permissible tensile load	C20/25	permissible N	[kN]	7,6	11,7	14,0	22,9	36,3	36,3
						uncracked concrete			
Permissible tensile load	C20/25	permissible N	[kN]	9,0	16,7	20,0	31,9	51,9	51,4
						cracked and non-cracked concrete			
Permissible shear load	≥C20/25	permissible V	[kN]	5,4	10,3	19,4	19,4	36,0	30,9
Permissible bending moment		Permitted M	[Nm]	17,1	34,3	60,0	60,0	152,0	296,6
VMZ-IG, stainless steel A4 /HCR						cracked concrete			
Permissible tensile load	C20/25	permissible N	[kN]	7,6	11,7	14,0	22,4	36,3	36,3
						uncracked concrete			
Permissible tensile load	C20/25	permissible N	[kN]	9,0	15,7	20,0	22,4	41,9	44,8
						cracked and non-cracked concrete			
Permissible shear load	≥C20/25	permissible V	[kN]	5,4	9,1	13,7	13,7	25,1	26,9
Permissible bending moment		Permitted M	[Nm]	12,0	24,0	42,3	42,3	106,9	208,6
Center and edge distances									
Anchoring depth		h_{ef}	[mm]	60	80	90	125	170	170
Characteristic center distance		$s_{cr,N}$	[mm]	180	240	270	375	510	510
Characteristic edge distance		$c_{cr,N}$	[mm]	90	120	135	187,5	255	255
						cracked concrete			
Minimum component thickness		h_{min}	[mm]	100	110	130	170	230	230
Minimum center distance		s_{min}	[mm]	40	40	50	60	80	80
Minimum edge distance		c_{min}	[mm]	40	50	50	60	80	80
						uncracked concrete			
Minimum component thickness		h_{min}	[mm]	100	110	130	170	230	230
Minimum center distance		s_{min}	[mm]	50	55	50	60	80	80
Minimum edge distance		c_{min}	[mm]	50	55	50	60	80	80
Assembly data									
Drill hole diameter		d_o	[mm]	12	14	18	18	24	26
Through hole in the attachment part		d_f	[mm]	9	12	14	14	18	22
Drill hole depth		h_o	[mm]	65	85	98	133	180	185
Torque when anchoring		$T_{inst} \leq$	[Nm]	10	15	25	25	50	80
Minimum screw-in depth		L_{sdmin}	[mm]	9	12	14	14	18	22
Maximum screw-in depth		L_{th}	[mm]	16	23	24	30	32	40
Mortar requirement per drill hole			[ml]	6,1	8,6	11,1	14,5	30,1	33,3
Drill holes per cartridge VMZ 150/VMZ 280			Piece	18/39	12/27	9/21	7/16	3/7	3/7
Drill holes per cartridge VMZ 345			Piece	49	34	27	20	10	9
Drill holes per cartridge VMZ 420			Piece	62	44	34	26	12	11

The practical dimensioning program at www.recanorm.de/de/services/bemessungssoftware



Injection system VMZ dynamic

The special anchor for dynamic loads in concrete

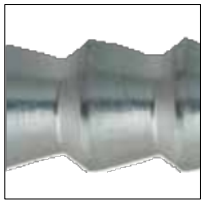
ETA-17/0194

F30-F120

M10-M24 HCR

DYNAMIC

Suction drilling according to approval / evaluation possible



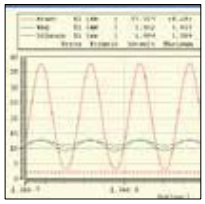
Rounded cones for better force transmission and to avoid the notch effect.

The plastic ring prevents the thread from getting dirty, making it easy to unscrew the nut.

Rounded thread transitions prevent the steel from cracking.

Special washer and rounded nut compensate for small inclinations and unevenness and thus avoid one-sided stress peaks.

Large, thick cover washer for large-area force transmission. The extra high nut, together with the counter nut, reliably prevents the screw connection from loosening in the event of vibrations.



Each production batch is tested for vibration resistance (fatigue strength).

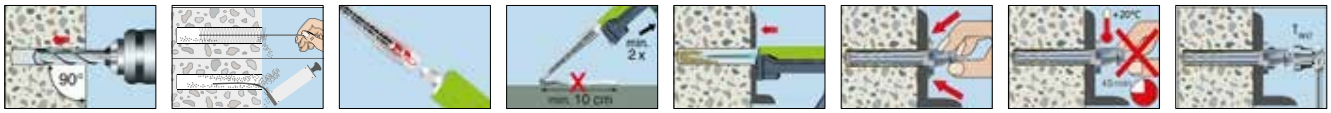
The VMZ dynamic injection system is a bonded expansion anchor for dynamic loads, consisting of the VMZ bonded mortar and a special anchor rod with nut and washer. Both components of the VMZ composite mortar are injected into the drill hole through a static mixer using an injection gun and the anchor rod is inserted by hand. The force is transmitted mechanically via the interlocking of the individual anchor rod cones in the mortar and further via a combination of holding and frictional forces in the concrete.

For anchoring heavy loads with fatigue-relevant effects with unlimited load cycles, e.g. elevator rails, conveyor or crane systems, robots, jib cranes, heavy machinery, fans, noise barriers, etc.
in cracked and non-cracked normal concrete of strength class C20/25 and C50/60.

Advantages:

- European technical assessment under fatigue loading in cracked and non-cracked normal weight concrete of strength classes C20/25 and C50/60
- Safety due to high tensile and shear loads
- Highest dynamic loads with separation of static and non-static loads and with consideration of the actual number of vibrations
- Usual processing with conventional injection mortar VMZ (may only be used with this system in accordance with the approval) and quick installation thanks to push-through installation
- Immediate installation check by allowing excess mortar to escape
- Also available for front mounting or as a combination version on request
- Available in A4 and HCR version on request
- Approved processing from -15°C

Assembly



Injection mortar VMZ

- Vinyl ester resin, styrene-free
- Coaxial cartridge, suitable for Handymax, VM and Standard dispensing guns
- With static mixer
- Shelf life: 18 months

Designation	Article no.	Contents	PU
Injection mortar VMZ 330	0914 001 330	330 ml	1
Injection mortar VMZ 420	0914 001 420	420 ml	1

Curing times for injection mortar VMZ

Cartridge temperature during application min. + 5°C.

Temperature (°C) in the borehole	Processing time	Curing time	
		dry concrete	Damp concrete
-15°C to -10°C	45 min	7 d	14 d1)
-9°C to -5°C	45 min	10:30 h	21:00 h1)
-4°C to -1°C	45 min	6:00 h	12:00 h1)
0°C to +4°C	20 min	3:00 h	6:00 h
+5°C to +9°C	12 min	2:00 h	4:00 h
+10°C to +19°C	6 min	1:20 h	2:40 h
+20°C to +29°C	4 min	45 min	1:30 h
+30°C to +34°C	2 min	25 min	50 min
+35°C to +39°C	1.4 min	20 min	40 min
+40°C	1.4 min	15 min	30 min

1)Ensure that no ice build-up occurs in the drill hole.
The drill hole must be created and cleaned immediately before the dowel is set.

Anchor rod VMZ-A dynamic for push-through installation

Material: galvanized steel
For use in dry indoor areas

Designation	Article no.	Ø mm	Length mm	Clamping thickness mm	Anchoring depth mm	PU
VMZ-A dyn 100 M12-25/160 vz	0914 612 155	M 12	160	25	100	10
VMZ-A dyn 100 M12-50/185 vz	0914 612 180	M 12	185	50	100	10
VMZ-A dyn 125 M16-30/200 vz	0914 616 195	M 16	200	30	125	10
VMZ-A dyn 125 M16-50/220 vz	0914 616 215	M 16	220	50	125	10
VMZ-A dyn 170 M20-50/280 vz	0914 620 275	M 20	280	50	170	5

Anchor rods in A4 and HCR versions for outdoor use on request!




Extract from the conditions of use of the European Technical Assessment ETA-17/0194 for use under fatigue loading in cracked and non-cracked concrete

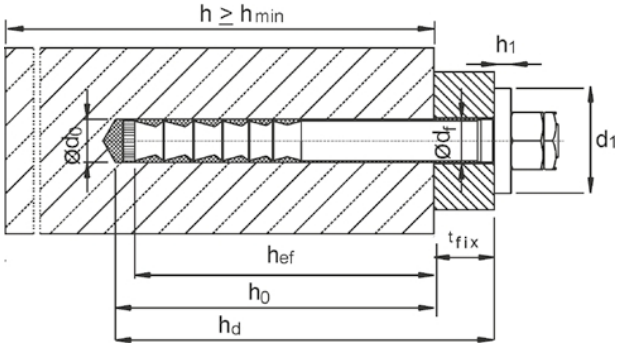
Permissible loads according to EN 1992-4 without the influence of center distances and edge distances in dry or damp concrete for the temperature range -40°C to +50°C (briefly up to +80°C). The overall safety factor (γ_M and γ_F) was taken into account. For further information and temperature ranges see ETA.

Loads and characteristic values **Injection system VMZ dynamic**

				100 M 12 galvanized	125 M 16 galvanized	170 M 20 galvanized
Anchoring depth		$h_{ef} >$	[mm]	100	125	170
Single fastening				cracked and non-cracked concrete		
Permissible tensile load	C20/25	N_{ZUL}	[kN]	14,9	22,2	32,2
Permissible shear force	C20/25	V_{ZUL}	[kN]	6,1	11,1	15,6
Fastening group				cracked and uncracked		r Concrete
Permissible tensile load per anchor	C20/25	N_{ZUL}	[kN]	11,8	19,9	25,5
Permissible shear force per dowel	C20/25	V_{ZUL}	[kN]	4,9	9,0	12,7
Center and edge distances						
Characteristic center distance		$s_{cr,N}$	[mm]	300	375	510
Characteristic edge distance		$c_{cr,N}$	[mm]	150	187,5	255
Minimum center distance		s_{min}	[mm]	50 (80)[2]	60	80
Minimum edge distance		c_{min}	[mm]	70 (75)[2]	80	110
Minimum component thickness		h_{min}	[mm]	130	170	230
Assembly data						
Drill hole diameter		d_o	[mm]	14	18	24
Borehole depth1[1]		h_o	[mm]	105	133	180
Through hole in the attachment part		d_f	[mm]	15	19	25
Torque when anchoring		T_{inst}	[Nm]	30	50	80
Width across flats		SW	[mm]	19	24	30
Minimum mounting part thickness		$t_{fix} >$	[mm]	12	16	20

[1] If the maximum clamping thickness $t_{fix\ is}$ not fully utilized, the drill hole depth must be increased by the corresponding amount and the plug set deeper.
[2] Values in brackets apply to non-cracked concrete.

The practical dimensioning program at www.recanorm.de/de/services/bemessungssoftware



Injection system VMU plus

The universal injection system for cracked and non-cracked concrete (ETA-11/0415), solid and perforated brickwork (ETA-13/0909) and post-installed reinforcement connections (ETA-11/0514)

The VMU plus injection system is a bonded anchor system consisting of the two-component, styrene-free VMU plus bonded mortar and various system components that must be used depending on the building material and application.

For anchoring heavy loads such as steel beams, steel supports, brackets, awnings, facades, canopies, etc.
in cracked and non-cracked normal concrete of strength class ≥ C20/25 and ≤ C50/60, masonry made of solid brick and perforated brick

Advantages:

- Only one injection mortar for almost all applications, thus more flexibility, less storage, greater application safety
- Approved for cracked (M 8 to M 30) and non-cracked concrete (M 8 to M 30)
- Approved for subsequent reinforcement connection (Ø 8 to Ø 32)
- Approved for use in damp concrete and water-filled drill holes - only when used with coaxial cartridges (M 8 to M 16)
- Approved for solid and perforated brickwork
- Approved for commercially available threaded rods with proof of strength (inspection certificate 3.1)
- Substrate temperature during application -10 °C to +40 °C (concrete)
- Ambient temperature after complete curing -40 °C to +120 °C (in concrete)
- Variable anchoring depths for more flexibility
- Fire protection test for all diameters
- Opened cartridges can continue to be used with a new static mixer
- Styrene-free 2-component mortar based on vinyl ester
- Approved for use under seismic loads of performance category C1 (M 8 to M 30)
- Products with the NSF logo have been tested and registered by the "National Sanitary Foundation", NSF for short. NSF is the only international registration that guarantees that the product can be used in the food industry without any health risks.

F30-F120

European Technical Assessment
ETA-11/0415
ETAG 001-1 Option 1

SEISMIC
C1
M 8 -M30

European Technical Assessment
ETA-11/0514
ETAG 001-1 ETAG 001-5

NSF

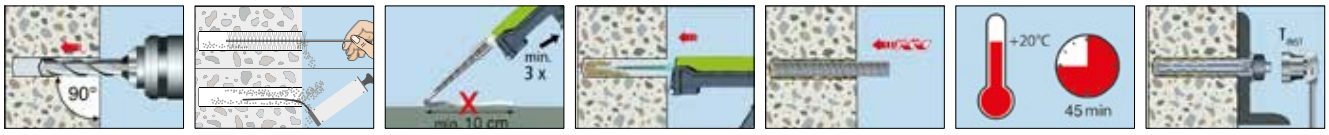
European Technical Assessment
ETA-13/0909
ETAG 029 Categories b,c and d

ICC ES
ESR - 4004

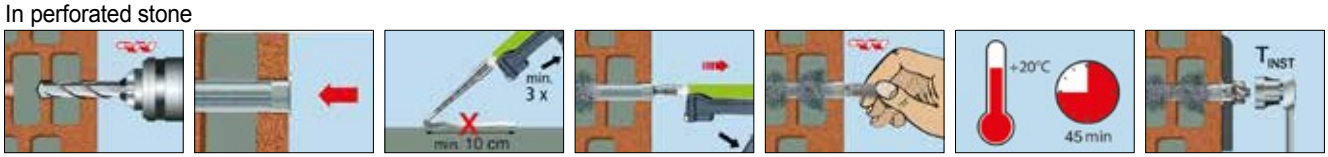
ÉMISSIONS DANS L'AIR INTÉRIEUR
A+
A+ A B C

Assembly

In concrete and solid stone



In perforated stone



Injection mortar VMU plus

- Vinyl ester resin, styrene-free
- With static mixer

With millimeter scale for exact dosing

Coaxial cartridge

- Shelf life: 18 months

Designation	Article no.	Contents	PU
Injection mortar VMU plus	0911 003 330	330 ml	1/12
Injection mortar VMU plus	0911 003 420	420 ml	1/12

Tubular foil cartridge

- Can also be used with silicone squeeze guns
- Shelf life: 12 months

Designation	Article no.	Contents	PU
Injection mortar VMU plus	0911 003 300	300 ml	1/12

Curing times for injection mortar VMU plus

Temperature (°C) in the borehole	Cartridges-1) temperature	Max. processing time	Curing time: Dry reason for installation	Curing time: Moist ground
-10°C - -6°C	+15°C - +40°C	90	min24	h48 h
-5°C - -1°C		90	min14	h28 h
0°C - + 4 ° C		45 min7	h14 h	
+5°C - +9°C	+5°C - +40°2C)	25 min2 h4h		
+10°C - +19°C	(+5°C - +25°C)	15	min80	min160 min
+20°C - +24°C6		min45	min90 min	
+25°C - + 2 9 ° C		6 min (4 min)2)	45 min (25 min)2)	90 min (50 min)2)
+30°C - +34°C		4 min (2.5 min)2))	25 min (15 min)2)	50 min (30 min)2)
+35°C - + 3 9 ° C	+5°C - +420,°C (≤ +20°C))	2 min (2.5 min)2)	20 min (15 min)2)	40 min (30 min)2)
+40°C		1.5 min (2.5 min)2)	15	min30 min

1) During processing
2) Values in brackets for reinforcement connection (ETA-11/0514)

Curing times Injection mortar VMU plus Polar

Cartridge temperature at the Processing from -20°C to + 10°C

Temperature (°C) in the borehole	Processing time	Curing time: Dry concrete	Curing time: Damp concrete
-20°C to -16°C	75 min	24 h	48 h
-15°C to -11°C	55 min	16 h	32 h
-10°C to -6°C	35 min	10 h	20 h
-5°C to -1°C	20 min	5 h	10 h
0°C to +4°C	10 min	2,5 h	5 h
+5°C to +9°C	6 min	80 min	160 min
+10°C	6 min	60 min	120 min

1) The injection mortar VMU plus Polar cannot be used for subsequent reinforcement connections in accordance with ETA-11/0415.

Accessories for VMU plus injection system in masonry

Anchor rod (without sieve sleeve) mm	Internal threaded rod (without sieve sleeve) mm	Sieve sleeve	Drill-Ø mm	Blow-out pump / blow-out gun	Cleaning brush RB	Mixer extension 1)
M8			10	VM-ABP 200	RB 10 M6	VM-XE 10
M10	VMU-IG M6	VM-SH 12 x 80	12	VM-AP 360 VM-ABP 200	RB 12 M6	VM-XE 10
M12	VMU-IG M8		14	VM-AP 360 VM-ABP 200	RB 14 M6	VM-XE 10
		VM-SH 16 x 85 VM-SH 16 x 130	16	VM-AP 360 VM-ABP 200	RB 16 M6	VM-XE 10
M16	VMU-IG M10		18	VM-AP 360 VM-ABP 200 / 250	RB 18 M6	VM-XE 10 VM-XLE 162)
		VM-SH 20 x 85 VM-SH 20 x 130 VM-SH 20 x 200	20	VM-AP 360 VM-ABP 200 / 250	RB 20 M6	VM-XE 10 VM-XLE 162)

1) If the static mixer does not reach the bottom of the drill hole (see usable length of static mixer), a VM-XE 10 mixer extension must be used.
2) Only in conjunction with static mixer VM-XL

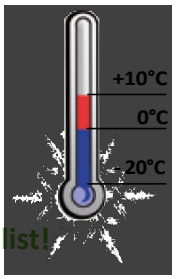
Accessories for VMU plus injection system in concrete

Anchor rod	Internally threaded rod	Reinforcing steel Ø	Drill-Ø	Blow-out pump / blow-out gun	Cleaning brush RB	Injection adapter VM-IA2[1]	Mixer extension2[2]
mm	mm	mm	mm				
M8			10	VM-AP3601[1] VM-ABP 200	RB 10 M6		VM-XE 10
M10	VMU-IG M6	8	12	VM-AP3601[1] VM-ABP 200	RB 12 M6 RB 12 M8		VM-XE 10
M12	VMU-IG M8	10	14	VM-AP3601[1] VM-ABP 200	RB 14 M6 RB 14 M8		VM-XE 10
		12	16	VM-AP3601[1] VM-ABP 200	RB 16 M6 RB 16 M8		VM-XE 10
M16	VMU-IG M10	14	18	VM-AP 3601[1] VM-ABP 200 / 250 / 500 / 1000	RB 18 M6 RB 18 M8	VM-IA 18	VM-XE 10, VM-XLE 163[3]
		16	20	VM-AP 3601[1] VM-ABP 200 / 250 / 500 / 1000	RB 20 M6 RB 20 M8	VM-IA 20	VM-XE 10, VM-XLE 163[3]
M20	VMU-IG M12	20	24	VM-ABP 250/ 500 / 1000	RB 24 M6	VM-IA 24	VM-XE 10, VM-XLE 163[3]
M24	VMU-IG M16		28	VM-ABP 250/ 500 / 1000	RB 28 M6	VM-IA 28	VM-XE 10, VM-XLE 163[3]
M27		25	32	VM-ABP 250/ 500 / 1000	RB 32 M6 RB 32 M8	VM-IA 32	VM-XE 10, VM-XLE 163[3]
M30	VMU-IG M20	28	35	VM-ABP 250/ 500 / 1000	RB 35 M6 RB 35 M8	VM-IA 35	VM-XE 10, VM-XLE 163[3]
		32	40	VM-ABP 250/ 500 / 1000	RB 40 M6	VM-IA 40	VM-XE 10, VM-XLE 163[3]

[1] Permissible in non-cracked concrete up to a maximum drilling depth of 10 times the outer diameter of the fastener (for cracked concrete and load reduction, see ETA)
[2] If the static mixer does not reach the bottom of the drill hole (see usable length of static mixer), a mixer extension must be used. From a drill diameter of 18 mm ($Ø_{d0} \geq 18$ mm), mixer extensions and injection adapters must be used for overhead installation and for drill hole depths > 250 mm
[3] Only in conjunction with static mixer VM-XL

Injection mortar VMU plus polar - with approval for concrete and masonry

- Vinyl ester resin, styrene-free
- With static mixer



The refrigeration specialist!

With millimeter scale for exact dosing

Tubular foil cartridge

- Can also be used with silicone squeeze guns
- Shelf life: 12 months

Designation	Article no.	Contents	PU
Injection mortar VMU plus polar	0911 004 300	300 ml	1/12

Coaxial cartridge

- Shelf life: 18 months

Designation	Article no.	Contents	PU
Injection mortar VMU plus polar	0911 004 330	330 ml	1/12
Injection mortar VMU plus polar	0911 004 420	420 ml	1/12

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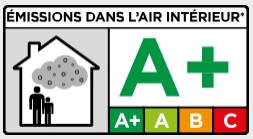


Anchor rods and internally threaded sleeves for applications in cracked and non-cracked concrete

Anchor rod VMU-A

Galvanized steel 5.8

Designation	Article number	Usable length in concrete mm	PU Piece
VMU-A 8x100	0911 508 100	90	10
VMU-A 8x110	0911 508 110	100	10
VMU-A 10x110	0911 510 110	100	10
VMU-A 10x130	0911 510 130	120	10
VMU-A 10x150	0911 510 150	140	10
VMU-A 12x120	0911 512 121	105	10
VMU-A 12x130	0911 512 131	115	10
VMU-A 12x135	0911 512 135	120	10
VMU-A 12x155	0911 512 155	140	10
VMU-A 12x175	0911 512 175	160	10
VMU-A 12x185	0911 512 185	170	10
VMU-A 12x210	0911 512 210	195	10
VMU-A 12x225	0911 512 225	210	10
VMU-A 12x265	0911 512 265	250	10
VMU-A 16x175	0911 516 175	155	10
VMU-A 16x205	0911 516 205	185	10
VMU-A 16x235	0911 516 235	215	10
VMU-A 20x240	0911 520 240	220	10

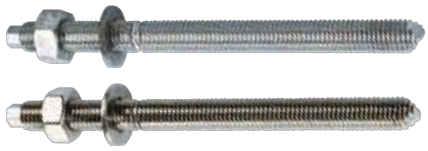
Anchor rod VMU-A A4

Stainless steel A4

Designation	Article number	Usable length in concrete mm	PU Piece
VMU-A 8x100 A4	0911 908 100	90	10
VMU-A 8x110 A4	0911 908 110	100	10
VMU-A 10x110 A4	0911 910 110	100	10
VMU-A 10x130 A4	0911 910 130	120	10
VMU-A 10x150 A4	0911 910 150	140	10
VMU-A 12x120 A4	0911 912 120	105	10
VMU-A 12x130 A4	0911 912 131	115	10
VMU-A 12x135 A4	0911 912 135	120	10
VMU-A 12x155 A4	0911 912 155	140	10
VMU-A 12x175 A4	0911 912 175	160	10
VMU-A 12x185 A4	0911 912 185	170	10
VMU-A 12x225 A4	0911 912 225	210	10
VMU-A 12x265 A4	0911 912 265	250	10
VMU-A 16x175 A4	0911 916 175	155	10
VMU-A 16x205 A4	0911 916 205	185	10
VMU-A 16x235 A4	0911 916 235	215	10
VMU-A 20x240 A4	0911 920 240	220	10

Anchor rods and internally threaded sleeves for applications in cracked and non-cracked concrete

Anchor rod V-A



Designation	Article no.	Dimension mm	Clamping thickness mm	Anchoring depth mm	PU Piece
Material: Steel 5.8, galvanized					
V-A M8-110	0913 108 110	M 8 x 110	20	80	10
V-A M10-130	0913 110 130	M 10 x 130	30	90	10
V-A M10-165	0913 110 165	M 10 x 165	65	90	10
V-A M12-160	0913 112 160	M 12 x 160	35	110	10
V-A M12-220	0913 112 220	M 12 x 220	95	110	10
V-A M12-300	0913 112 300	M 12 x 300	175	110	10
V-A M16-165	0913 116 165	M 16 x 165	20	125	10
V-A M16-190	0913 116 190	M 16 x 190	45	125	10
V-A M16-250	0913 116 250	M 16 x 250	105	125	10
V-A M20-260	0913 120 260	M 20 x 260	60	170	10
Material: A4 stainless steel					
V-A M8-110 A4	0913 208 110	M 8 x 110	20	80	10
V-A M10-130 A4	0913 210 130	M 10 x 130	30	90	10
V-A M12-160 A4	0913 212 160	M 12 x 160	35	110	10
V-A M16-190 A4	0913 216 190	M 16 x 190	45	125	10
V-A M20-260 A4	0913 220 260	M 20 x 260	60	170	10

Female threaded sleeve VMU-IG
Galvanized steel 5.8/stainless steel A4

Designation	Article number		Drill hole Ø x depth mm	Outer Ø x length mm	Screw-in depth min / max mm	PU Piece
	Galvanized steel 5.8	Stainless steel A4				
VMU-IG M6x80	0911 506 080	0911 906 080	12 x 80	10 x 80	8 / 20	10
VMU-IG M6x90	0911 506 090	0911 906 090	12 x 90	10 x 90	8 / 20	10
VMU-IG M8x80	0911 508 080	0911 908 080	14 x 80	12 x 80	8 / 20	10
VMU-IG M8x100	0911 58 100	0911 98 100	14 x 100	12 x 100	8 / 20	10
VMU-IG M10x80	0911 510 080	0911 910 080	18 x 80	16 x 80	10 / 25	10
VMU-IG M10x100	0911 510 100	0911 910 100	18 x 100	16 x 100	10 / 25	10

Anchor rods, internally threaded sleeves and perforated sleeves for applications in solid and perforated brickwork

Anchor rod VMU-A

Galvanized steel 5.8/stainless steel A4

Designation	Article number		Effective length	Solid brick without sieve sleeve		Solid or perforated brick with perforated sleeve VM-SH						PU
	Galvanized steel 5.8	Stainless steel A4		Drill hole Ø x depth	Maximum clamping thickness tfix	VM-SH 12 x 12 x	VM-SH 16 80x 8516 x	VM-SH 85x 9016 x	16VM-SH 130x 13520 x	20VM-SH 85x 9020 x	20VM-SH 20 130x 200 13520 x 205	
			mm	mm	mm	Drill hole Ø x depth mm / Maximum clamping thickness tfix mm						Piece
VMU-A 8 x 100	0911 508 100	0911 908 100	90	10 x 80	10	10	5	-	-	-	-	10
VMU-A 8 x 110	0911 508 110	0911 908 110	100	10 x 80	20	20	15	-	-	-	-	10
VMU-A 10 x 110	0911 510 110	0911 910 110	100	12 x 90	10	-	15	-	-	-	-	10
VMU-A 10 x 130	0911 510 130	0911 910 130	120	12 x 90	30	-	35	-	-	-	-	10
VMU-A 10 x 150	0911 510 150	0911 910 150	140	12 x 90	50	-	55	10	-	-	-	10
VMU-A 12 x 120	0911 512 121	0911 912 120	105	14 x 100	5	-	-	-	20	-	-	10
VMU-A 12 x 130	0911 512 131	0911 912 131	115	14 x 100	15	-	-	-	30	-	-	10
VMU-A 12 x 135	0911 512 135	0911 912 135	120	14 x 100	20	-	-	-	35	-	-	10
VMU-A 12 x 155	0911 512 155	0911 912 155	140	14 x 100	40	-	-	-	55	10	-	10
VMU-A 12 x 175	0911 512 175	0911 912 175	160	14 x 100	60	-	-	-	75	30	-	10
VMU-A 12 x 185	0911 512 185	0911 912 185	170	14 x 100	70	-	-	-	85	40	-	10
VMU-A 12 x 210	0911 512 210		195	14 x 100	95	-	-	-	110	65	-	10
VMU-A 12 x 225	0911 512 225	0911 912 225	210	14 x 100	110	-	-	-	125	80	10	10
VMU-A 12 x 265	0911 512 265	0911 912 265	250	14 x 100	150	-	-	-	165	120	50	10
VMU-A 16 x 175	0911 516 175	0911 916 175	155	18 x 100	55	-	-	-	70	25	-	10
VMU-A 16 x 205	0911 516 205	0911 916 205	185	18 x 100	85	-	-	-	100	55	-	10
VMU-A 16 x 235	0911 516 235	0911 916 235	215	18 x 100	115	-	-	-	130	85	15	10
VMU-A 20 x 240	0911 520 240	0911 920 240	220	22 x 100	120	-	-	-	-	-	-	10

Female threaded sleeve VMU-IG

Galvanized steel 5.8/stainless steel A4

Designation	Article number		Solid brick without sieve sleeve	Solid or perforated brick with perforated sleeve		Outer Ø x length	Screw-in depth	PU
	Galvanized steel 5.8	Stainless steel A4	Drill hole Ø x depth mm	VM-SH 16 x 85 Drill hole Ø x depth mm	VM-SH 20 x 85 Drill hole Ø x depth mm	mm	min / max mm	Piece
VMU-IG M6x80	0911 506 080	0911 906 080	-	16 x 90	-	10 x 80	8 / 20	10
VMU-IG M6x90	0911 506 090	0911 906 090	12 x 90	-	-	10 x 90	8 / 20	10
VMU-IG M8x80	0911 508 080	0911 908 080	-	-	20 x 90	12 x 80	8 / 20	10
VMU-IG M8x100	0911 58 100	0911 98 100	14 x 100	-	-	12 x 100	8 / 20	10
VMU-IG M10x80	0911 510 080	0911 910 080	-	-	20 x 90	16 x 80	10 / 25	10
VMU-IG M10x100	0911 510 100	0911 910 100	18 x 100	-	-	16 x 100	10 / 25	10

Sieve sleeve VM-SH

Polypropylene

Designation	Article number	Drill hole Ø x depth mm	For anchor rods	For internally threaded bolts	Suitable cleaning brush	PU Piece
VM-SH 12 x 80	0911 312 080	12 x 85	M8	-	RB 12 M6	10
VM-SH 16 x 85	0911 316 085	16 x 90	M8 / M10	VMU-IG M6 x 80	RB 16 M6	10
VM-SH 16 x 130	0911 316 130	16 x 135	M8 / M10	-	RB 16 M6	10
VM-SH 20 x 85	0911 320 085	20 x 90	M12 / M16	VMU-IG M8 x 80/VMU-IG M10 x 80	RB 20 M6	10
VM-SH 20 x 130	0911 320 130	20 x 135	M12 / M16	-	RB 20 M6	10
VM-SH 20 x 200	0911 320 200	20 x 205	M12 / M16	-	RB 20 M6	10

Threaded rods with test certificate 3.1

Threaded rods for approval-compliant use in conjunction with the VMU plus injection system

Application:

The European Technical Assessments ETA-11/0415 (VMU plus in cracked and non-cracked concrete) and ETA-13/0909 (VMU plus in masonry) permit the use of commercially available threaded rods with inspection certificate 3. according to DIN EN 10204:2005.

Advantages:

- Only one threaded rod for different clamping thicknesses, as individually adjustable
- Even large clamping thicknesses, for example for full thermal insulation, can be realized
- Threaded rods, length 1m, for cutting to size
- With inspection certificate 3.1 EN 10204 in each package (proof of strength)

Notes:

- The specifications of the corresponding approval must be complied with
- The anchor rod must be marked with the planned anchoring depth
- The inspection certificates 3.1 in accordance with DIN EN 10204:2005 are enclosed with each packaging unit and must be retained

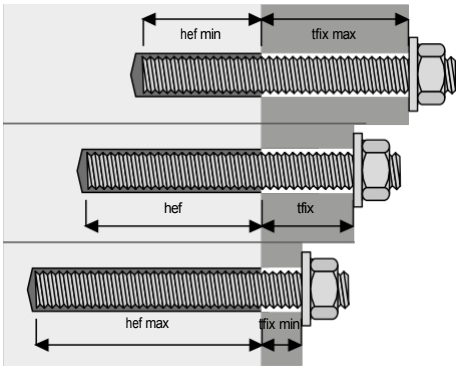
Anchor rods for the VMU plus injection system in concrete:

A flexible system means less storage

The variable anchoring depths of the VMU plus injection system allow the setting depths to be adapted to the required load. For low loads, this allows the use of shorter anchor rods with correspondingly lower drilling depths, while high loads can be introduced into the subsoil with correspondingly greater anchoring depths.

All anchor rod groups from the existing RECA range can be used with the VMU plus injection system. They can be set deeper or shallower depending on the existing load. The minimum and maximum possible anchoring depths are specified in the approval for each diameter and can also be found in the extract from the application conditions of the ETA-11/0415 assessment on the following pages.

Variable anchoring depth:



hef + tfix = Usable length of the threaded rod (without nut and washer)

Anchor rods for applications in cracked and non-cracked concrete

Anchor rod VM-A

Steel grade 5.8, galvanized

Designation	Article number	Thread	Length mm	PU Piece
VM-A 8x1000	0911 658 08	M8	1000	10
VM-A 10x1000	0911 658 10	M10	1000	10
VM-A 12x1000	0911 658 12	M12	1000	10
VM-A 16x1000	0911 658 16	M16	1000	10
VM-A 20x1000	0911 658 20	M20	1000	5
VM-A 24x1000	0911 658 24	M24	1000	5

Anchor rod VM-A

Stainless steel A4

Designation	Article number	Thread	Length mm	PU Piece
VM-A 8x1000 A4	0911 804 08	M8	1000	10
VM-A 10x1000 A4	0911 804 10	M10	1000	10
VM-A 12x1000 A4	0911 804 12	M12	1000	10
VM-A 16x1000 A4	0911 804 16	M16	1000	10
VM-A 20x1000 A4	0911 804 20	M20	1000	5
VM-A 24x1000 A4	0911 804 24	M24	1000	5

Extract from the conditions of use of the European Technical Assessment ETA-11/0415 for use in cracked and non-cracked concrete (Option 1)

Permissible loads according to EN 1992-4 without influence of center and edge distances in dry or wet concrete for temperature exposure range I -40°C to +24°C (short-term up to +40°C) and for temperature range II -40°C to +50°C (short-term up to +80°C). The influence of the permanent load with the factor Ψsus = 1.0 and the total safety factor (γ_M and γ_F) were taken into account. For further details and temperature ranges see ETA. For load-bearing capacities under fire exposure, see page 195.

Loads and characteristic values

Injection system VMU plus, anchor rod steel 5.8					**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
rangehef,min - hef,max		Anchoring depth [mm]			60 - 160	60 - 200	70 - 240	80 - 320	90 - 400	96 - 480	108 - 540	120 - 600
Permissible tensile load for hef,min - hef,max								cracked concrete				
Temperature 1)	range24°C/40°C	C20/25	permissible N	[kN]	2,9-7,7	3,7-12,5	5,8-19,7	8,8-35,1	11,7-54,9	12,9-79,0	15,3-109,5	18,0-133,3
	50°C/80°C 1)	C20/25	permissible N	[kN]	1,8-4,8	2,6-8,7	4,2-14,4	6,4-25,5	9,0-39,9	11,5-57,4	15,3-81,8	18,0-101,0
Permissible tensile load for hef,min - hef,max								uncracked concrete				
Temperature 1)	range24°C/40°C	C20/25	permissible N	[kN]	7,2-8,6	9,0-13,8	11,4-20,0	14,0-37,1	16,7-58,1	18,4-83,8	21,9-109,5	25,7-133,3
	50°C/80°C 1)	C20/25	permissible N	[kN]	5,4-8,6	6,7-13,8	9,4-20,0	14,0-37,1	16,7-58,1	18,4-83,8	21,9-109,5	25,7-133,3
Permissible shear load for hef,min - hef,max								cracked concrete				
Temperature 1)	range24°C/40°C	C20/25	permissible V	[kN]	5,7-6,3	9,0-9,7	13,8-14,3	21,1-26,9	28,0-42,3	30,8-60,6	36,8-78,9	43,1-96,0
	50°C/80°C 1)	C20/25	permissible V	[kN]	3,6-6,3	6,3-9,7	10,1-14,3	15,3-26,9	21,5-42,3	27,6-60,6	36,8-78,9	43,1-96,0
Permissible shear load for hef,min - hef,max								uncracked concrete				
Temperature 1)	range24°C/40°C	C20/25	permissible V	[kN]	6,3	9,7	14,3	26,9	40,0-42,3	44,1-60,6	52,6-78,9	61,6-96,0
	50°C/80°C 1)	C20/25	permissible V	[kN]	6,3	9,7	14,3	26,9	40,0-42,3	44,1-60,6	52,6-78,9	61,6-96,0
Injection system VMU plus, anchor rod steel 8.8												
Permissible tensile load for hef,min - hef,max								torn	r Concrete			
Temperature 1)	range24°C/40°C	C20/25	permissible N	[kN]	2,9-7,7	3,7-12,5	5,8-19,7	8,8-35,1	11,7-54,9	12,9-79,0	15,3-118,1	18,0-145,9
	50°C/80°C 1)	C20/25	permissible N	[kN]	1,8-4,8	2,6-8,7	4,2-14,4	6,4-25,5	9,0-39,9	11,5-57,4	15,3-81,8	18,0-101,0
Permissible tensile load for hef,min - hef,max								uncracked concrete				
Temperature 1)	range24°C/40°C	C20/25	permissible N	[kN]	7,2 - 13,8	9,0 - 21,9	11,4 - 31,9	14,0 - 59,516	,7 - 93,3	18,4 - 134,3	21,9 - 175,2	25,7 - 202,0
	50°C/80°C 1)	C20/25	permissible N	[kN]	5,4 - 13,8	6,7 - 21,9	9,4 - 31,9	14,0 - 57,416	,7 - 89,8	18,4 - 122,1	21,9 - 136,3	25,7 - 145,9
Permissible shear load for hef,min - hef,max								cracked concrete				
Temperature 1)	range24°C/40°C	C20/25	permissible V	[kN]	5,7-8,6	9,0-13,1	13,8-19,4	21,1-36,0	28,0-56,0	30,8-80,6	36,8-105,1	43,1-128,0
	50°C/80°C 1)	C20/25	permissible V	[kN]	3,6-8,6	6,3-13,1	10,1-19,4	15,3-36,0	21,5-56,0	27,6-80,6	36,8-105,1	43,1-128,0
Permissible shear load for hef,min - hef,max								uncracked concrete				
Temperature 1)	range24°C/40°C	C20/25	permissible V	[kN]	8,6	13,1	19,4	33,5 - 36,040	,0 - 56,0	44,1 - 80,6	52,6 - 105,1	61,6 - 128,0
	50°C/80°C 1)	C20/25	permissible V	[kN]	8,6	13,1	19,4	33,5 - 36,040	,0 - 56,0	44,1 - 80,6	52,6 - 105,1	61,6 - 128,0
Injection system VMU plus, anchor rod stainless steel A4-70, HCR-70												
Permissible tensile load for hef,min - hef,max								cracked concrete				
Temperature 1)	range24°C/40°C	C20/25	permissible N	[kN]	2,9 - 7,7	3,7 - 12,5	5,8 - 19,7	8,8 - 35,1	11,7 - 54,9	12,9 - 79,0	15,3 - 57,4	18,0 - 70,2
	50°C/80°C 1)	C20/25	permissible N	[kN]	1,8 - 4,8	2,6 - 8,7	4,2 - 14,4	6,4 - 25,5	9,0 - 39,9	11,5 - 57,4	15,3 - 57,4	18,0 - 70,2
Permissible tensile load for hef,min - hef,max								uncracked concrete				
Temperature 1)	range24°C/40°C	C20/25	permissible N	[kN]	7,2 - 9,9	9,0 - 15,7	11,4 - 22,5	14,0 - 42,	016,7 - 65,3	18,4 - 94,3	21,9 - 57,4	25,7 - 70,2
	50°C/80°C 1)	C20/25	permissible N	[kN]	5,4 - 9,9	6,7 - 15,7	9,4 - 22,5	14,0 - 42,	016,7 - 65,3	18,4 - 94,3	21,9 - 57,4	25,7 - 70,2
Permissible shear load for hef,min - hef,max								cracked concrete				
Temperature 1)	range24°C/40°C	C20/25	permissible V	[kN]	5,7 - 6,0	9,0 - 9,2	13,7	21,1 - 25,	228,0 - 39,4	30,8 - 56,8	34,5	42,0
	50°C/80°C 1)	C20/25	permissible V	[kN]	3,6 - 6,0	6,3 - 9,2	10,1 - 13,7	15,3 - 25,	221,5 - 39,4	27,6 - 56,8	34,5	42,0
Permissible shear load for hef,min - hef,max								uncracked concrete				
Temperature 1)	range24°C/40°C	C20/25	permissible V	[kN]	6,0	9,2	13,7	25,2	39,4	44,1 - 56,8	34,5	42,0
	50°C/80°C 1)	C20/25	permissible V	[kN]	6,0	9,2	13,7	25,2	39,4	44,1 - 56,8	34,5	42,0
Center and edge distances												
Minimum component thickness for hef,min - hef,max			hmin	[mm]	100-190	100-230	100-270	116-356	138-448	152-536	172-604	190-670
Minimum center distance			smin	[mm]	40	50	60	80	100	120	135	150
Minimum edge distance			cmin	[mm]	40	50	60	80	100	120	135	150
Assembly data												
Drill hole diameter			do	[mm]	10	12	14	18	24	28	32	35
Through hole in the attachment part for push-fit installation			df ≤	[mm]	9	12	14	18	22	26	30	33
Through-hole in the attachment part for push-through			df ≤	[mm]	12	14	16	20	25	30	33	38

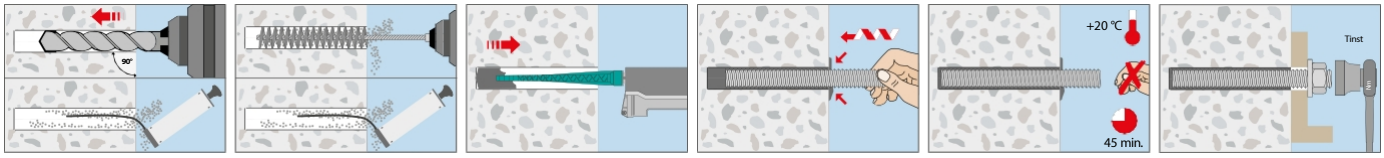
mounting										
Borehole depth range for $h_{ef,min}$ - $h_{ef,max}$	h_0	[mm]	60-160	60-200	70-240	80-320	90-400	96-480	108-540	120-600
Torque when anchoring	$T_{inst} \leq$	[Nm]	10	20	40	80	120	160	180	200
Mortar requirement per 100 mm drilling depth		[ml]	6,53	8,16	9,82	13,61	26,71	32,25	42,03	48,70

[1)]Max. Long-term temperature / max. short-term temperature

Higher concrete strengths can lead to higher permissible loads. Technical data for water-filled drill holes see European Technical Assessment.

The practical dimensioning program at www.recanorm.de/de/services/bemessungssoftware

Mounting threaded rod in concrete (or solid brick)



Extract from the conditions of use of the European Technical Assessment ETA-11/0415 for use in cracked and non-cracked concrete (Option 1)

Permissible loads according to EN 1992-4 without influence of center and edge distances in dry or damp concrete for temperature range I -40°C to +24°C (briefly up to +40°C) and for temperature range II -40°C to +50°C (briefly up to +80°C). The influence of the permanent load with the factor Ψsus = 1.0 and the total safety factor (γ_M and γ_F) were taken into account. For further details and temperature ranges see ETA.

Internally threaded rodIG M6 x 80 IG M6 x 90 IG M8 x 80 IG M8 x 100 IG M10 x 80 IG M10 x 100 IG M12 x125 IG M16 x 170 IG M20 x 200												
Anchoring depth h_{ef}		[mm]	80	90	80	100	80	100	125	170	200
Injection system VMU plus, internal threaded rod VMU-IG steel 5.8												
Permissible tensile load for heavy							cracked concrete				
Temperature range24°C/40°C [1] C20/25		permissible N [kN]	4,8	4,8	6,6	8,1	8,8	11,0	17,1	28,0	38,7
50°C/80°C [1] C20/25		permissible N [kN]	3,5	3,9	4,8	6,0	6,4	8,0	12,5	20,3	33,7
Permissible tensile load for heavy							uncracked concrete				
Temperature range24°C/40°C [1] C20/25		permissible N [kN]	4,8	4,8	8,1	8,1	13,8	13,8	20,0	36,2	55,2
50°C/80°C [1] C20/25		permissible N [kN]	4,8	4,8	8,1	8,1	13,8	13,8	20,0	36,2	48,6
Permissible shear load for heavy							cracked concrete				
Temperature range24°C/40°C [1] C20/25		permissible V [kN]	3,4	3,4	5,7	5,7	9,7	9,7	14,3	25,7	42,3
50°C/80°C [1] C20/25		permissible V [kN]	3,4	3,4	5,7	5,7	9,7	9,7	14,3	25,7	42,3
Permissible shear load for heavy							uncracked concrete				
Temperature range24°C/40°C [1] C20/25		permissible V [kN]	3,4	3,4	5,7	5,7	9,7	9,7	14,3	25,7	42,3
50°C/80°C [1] C20/25		permissible V [kN]	3,4	3,4	5,7	5,7	9,7	9,7	14,3	25,7	42,3
Injection system VMU plus, internal threaded rod VMU-IG stainless steel A4-70, HCR-70												
Permissible tensile load for heavy							cracked concrete				
Temperature range24°C/40°C [1] C20/25		permissible N [kN]	5,0	5,3	6,6	8,2	8,8	11,0	17,1	28,0	31,0
50°C/80°C [1] C20/25		permissible N [kN]	3,5	3,9	4,8	6,0	6,4	8,0	12,5	20,3	31,0
Permissible tensile load for heavy							uncracked concrete				
Temperature range24°C/40°C [1] C20/25		permissible N [kN]	5,3	5,3	9,9	9,9	14,0	15,7	22,5	42,0	31,0
50°C/80°C [1] C20/25		permissible N [kN]	5,3	5,3	9,9	9,9	14,0	15,7	22,5	42,0	31,0
Permissible shear load for heavy							cracked concrete				
Temperature range24°C/40°C [1] C20/25		permissible V [kN]	3,2	3,2	6,0	6,0	9,2	9,2	13,7	25,2	18,6
50°C/80°C [1] C20/25		permissible V [kN]	3,2	3,2	6,0	6,0	9,2	9,2	13,7	25,2	18,6
Permissible shear load for heavy							uncracked concrete				
Temperature range24°C/40°C [1] C20/25		permissible V [kN]	3,2	3,2	6,0	6,0	9,2	9,2	13,7	25,2	18,6
50°C/80°C [1] C20/25		permissible V [kN]	3,2	3,2	6,0	6,0	9,2	9,2	13,7	25,2	18,6
Center and edge distances												
Minimum component thickness for h_{ef}	h_{min}	[mm]	110	120	110	130	116	136	173	226	270
Minimum center distance	s_{min}	[mm]	50	50	60	60	80	80	100	120	150
Minimum edge distance	c_{min}	[mm]	50	50	60	60	80	80	100	120	150
Assembly data												
Drill hole diameter	d_o	[mm]	12	12	14	14	18	18	24	28	35
Through hole in the attachment part	$d_f \leq$	[mm]	7	7	9	9	12	12	14	18	22
Drill hole depth for h_{ef}	h_0	[mm]	80	90	80	100	80	100	125	170	200
Torque when anchoring	$T_{inst} \leq$	[Nm]	10	10	10	10	20	20	40	60	100
Mortar requirement per drill hole		[ml]	6,6	7,4	7,9	9,9	10,9	13,6	33,4	54,9	97,4

[1] Max. Long-term temperature / max. short-term temperature

Higher concrete strengths can lead to higher permissible loads. Technical data for water-filled drill holes see European Technical Assessment.

The practical dimensioning program at www.recanorm.de/de/services/bemessungssoftware

Injection system VMU plus, reinforcing steel B500B					**ø8**	**ø10**	**ø12**	**ø14**	**ø16**	**ø20**	**ø25**	**ø28**	**ø32**
rangehef,min - hef,max		Anchoring depth [mm]			60-160	60-200	70-240	75-280	80-320	90-400	100-500	112-560	128-640
Permissible tensile load for $h_{ef,min}$ - $h_{ef,max}$								cracked concrete					
Temperature [1]	range24°C/40°C	C20/25	permissible N	[kN]	2,9 - 7,7	3,7 - 12,5	5,8 - 19,7	7,2 - 26,	98,8 - 35,1	11,7 - 54,9	13,7 - 85,7	16,2 - 127,1	19,8 - 166,0
	50°C/80°C [1]	C20/25	permissible N	[kN]	1,8 - 4,8	2,6 - 8,7	4,2 - 14,4	5,2 - 19,	56,4 - 25,5	9,0 - 39,9	12,5 - 62,3	16,2 - 88,0	19,8 - 114,9
Permissible tensile load for $h_{ef,min}$ - $h_{ef,max}$								uncracked concrete					
Temperature [1]	range24°C/40°C	C20/25	permissible N	[kN]	7,2 - 13,8	9,0 - 21,6	11,4 - 31,2	12,7 - 42,4	14,0 - 55,4	16,7 - 86,6	19,5 - 135,2	23,1 - 169,6	28,3 - 217,0
	50°C/80°C [1]	C20/25	permis	[kN]	5,4 - 13,8	6,7 - 21,6	9,4 - 31,2	11,8 - 42,4	14,0 - 55,4	16,7 - 86,6	19,5 - 124,7	23,1 - 136,8	28,3 - 153,2

			sible N									
Permissible shear load for $h_{ef,min}$ - $h_{ef,max}$								cracked concrete				
Temperature 1)	range24°C/40°C	C20/25	permissible V	[kN]	5,7 - 6,5	9,0 - 10,1	13,8 - 14,5	17,3 - 19,8	21,1 - 25,9	28,0 - 40,4	32,8 - 63,1	38,9 - 79,2	47,5 - 103,4
	50°C/80°C 1)	C20/25	permissible V	[kN]	3,6 - 6,5	6,3 - 10,1	10,1 - 14,5	12,6 - 19,8	15,3 - 25,9	21,5 - 40,4	29,9 - 63,1	38,9 - 79,2	47,5 - 103,4
Permissible shear load for $h_{ef,min}$ - $h_{ef,max}$								uncracked concrete				
Temperature 1)	range24°C/40°C	C20/25	permissible V	[kN]	6,5	10,1	14,5	19,8	25,9	40,0 - 40,4	46,9 - 63,1	55,5 - 79,2	67,8 - 103,4
	50°C/80°C 1)	C20/25	permissible V	[kN]	6,5	10,1	14,5	19,8	25,9	40,0 - 40,4	46,9 - 63,1	55,5 - 79,2	67,8 - 103,4
Center and edge distances													
Minimum component thickness for $h_{ef,min}$ - $h_{ef,max}$			h_{min}	[mm]	100-190	100-230	102-272	111-316	120-360	138-448	164-564	182-630	208-720
Minimum center distance			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
Assembly data													
Drill hole diameter			d_o	[mm]	12	14	16	18	20	24	32	35	40
Borehole depth range for $h_{ef,min}$ - $h_{ef,max}$			h_o	[mm]	60 - 160	60 - 200	70 - 240	75-280	80 - 320	90 - 400	100 - 500	112 - 560	128-640
Mortar requirement per 100mm drilling depth				[ml]	8,46	10,12	11,78	13,44	15,09	18,41	40,03	44,22	57,32

1)Max. Long-term temperature / max. short-term temperature

Higher concrete strengths can lead to higher permissible loads. Technical data for water-filled drill holes see European Technical Assessment.

The practical dimensioning program at www.recanorm.de/de/services/bemessungssoftware

Extract from the conditions of use of the European Technical Assessment ETA-13/0909 for anchoring in masonry

Permissible loads without influence of center and edge distances to component edges. Butt and bed joints mortared. Temperature range -40°C to +24°C (up to +40°C for short periods) - Usage category dry/dry. The overall safety coefficient according to ETAG 029 (γ_M and γ_F) was taken into account. For further information and temperature ranges see ETA.

Injection system VMU plus, solid block without perforated sleeve1)

Mz-DF masonry bricks in accordance with EN 771-1, raw brick density ρ: 1.6 kg/dm3, minimum brick format: 240x115x55 mm (e.g. Unipor)

Anchor rods: Steel: ≥ FKL. 5.8, A4, HCR: ≥ FKL 70				M8	M10	M12	M16	IG-M6	IG-M8	IG-M10
Anchoring depth		h_{ef}	[mm]	80	90	100	100	90	100	100
Center distance		s_{cr}	[mm]	240	270	300	300	270	300	300
Minimum center distance		s_{min}	[mm]	120	120	120	120	120	120	120
Edge distance		c_{cr}	[mm]	120	135	150	150	135	150	150
Minimum edge distance		c_{min}	[mm]	60	60	60	60	60	60	60
Permissible tensile load for lithographic strength	$f_b \geq 10$ N/mm2	permissible N	[kN]	1,00	1,00	1,14	1,14	1,00	1,14	1,14
	$f_b \geq 20$ N/mm2	permissible N	[kN]	1,29	1,57	1,71	1,71	1,57	1,71	1,71
	$f_b \geq 28$ N/mm2	permissible N	[kN]	1,57	1,71	1,94	1,94	1,71	1,94	1,94
Admissible shear load for stone compression strength	$f_b \geq 10$ N/mm2	permissible V	[kN]	1,00	1,00	1,00	1,57	1,00	1,00	1,57
	$f_b \geq 20$ N/mm2	permissible V	[kN]	1,43	1,43	1,43	2,29	1,43	1,43	2,29
	$f_b \geq 28$ N/mm2	permissible V	[kN]	1,57	1,57	1,57	2,57	1,57	1,57	2,57
Drilling method							Hammer drilling			

Sand-lime brick

Anchor rods: Steel: ≥ FKL. 5.8, A4, HCR: ≥ FKL 70				M8	M10	M12	M16	IG-M6	IG-M8	IG-M10
Anchoring depth		h_{ef}	[mm]	80	90	100	100	90	100	100
Center distance		s_{cr}	[mm]	240	270	300	300	270	300	300
Minimum center distance		s_{min}	[mm]	120	120	120	120	120	120	120
Edge distance		c_{cr}	[mm]	120	135	150	150	135	150	150
Minimum edge distance		c_{min}	[mm]	60	60	60	60	60	60	60
Perm. tensile load for lithography Strength	$f_b \geq 10$ N/mm2	permissible N	[kN]	1,29	1,29	1,29	1,00	1,29	1,29	1,00
	$f_b \geq 20$ N/mm2	permissible N	[kN]	1,71	1,71	1,71	1,43	1,71	1,71	1,43
	$f_b \geq 27$ N/mm2	permissible N	[kN]	2,00	2,00	2,00	1,71	2,00	2,00	1,71
Admissible shear load for stone compression strength	$f_b \geq 10$ N/mm2	permissible V	[kN]	0,71	0,86	0,71	0,71	0,86	0,71	0,71
	$f_b \geq 20$ N/mm2	permissible V	[kN]	1,14	1,29	1,14	1,14	1,29	1,14	1,14
	$f_b \geq 27$ N/mm2	permissible V	[kN]	1,29	1,57	1,29	1,29	1,57	1,29	1,29
Drilling method							Hammer drilling			

Solid brick made of lightweight concrete LAC in accordance with EN 771-3, raw brick density ρ: 0.6 kg/dm3, minimum brick format: 300x123x248 mm (e.g. Bisotherm)

Anchor rods: Steel: ≥ FKL. 5.8, A4, HCR: ≥ FKL 70			M8	M10	M12	M16	IG-M6	IG-M8	IG-M10
Anchoring depth	h_{ef}	[mm]	80	90	100	100	90	100	100
Center distance	s_{cr}	[mm]	240	270	300	300	270	300	300
Minimum center distance	s_{min}	[mm]	120	120	120	120	120	120	120
Edge distance	c_{cr}	[mm]	120	135	150	150	135	150	150
Minimum edge distance	c_{min}	[mm]	60	60	60	60	60	60	60
Perm. tensile load for lithographic pressure $f_b \geq 2$ strength	N/mmper N	[kN]	0,86	0,86	1,0	0,86	0,86	1,0	0,86
Permissible shear load for lithography $f_b \geq 2$ N/mm2 strength	permissible V	[kN]	0,86	0,86	0,86	0,86	0,86	0,86	0,86
Drilling process						Rotary drilling			

Aerated concrete AAC6 in accordance with EN 771-4, raw block density ρ: 0.6 kg/dm3, minimum block size: 499x240x249 mm (e.g. Porit)

Anchor rods: Steel: ≥ FKL. 5.8, A4, HCR: ≥ FKL 70			M8	M10	M12	M16	IG-M6	IG-M8	IG-M10
Anchoring depth	h_{ef}	[mm]	80	90	100	100	90	100	100
Center distance	s_{cr}	[mm]	240	270	300	300	270	300	300
Minimum center distance	s_{min}	[mm]	100	100	100	100	100	100	100
Edge distance	c_{cr}	[mm]	120	135	150	150	135	150	150
Minimum edge distance	$c_{min,N}$	[mm]	75	75	75	75	75	75	75
	$c_{min,V,II2}$)	[mm]	75	75	75	75	75	75	75
	$c_{min,V,\_I\_3}$)	[mm]	120	135	150	150	135	150	150
Perm. tensile load for lithography $f_b \geq 6$ N/mm2 strength	permissible N	[kN]	0,89	1,43	1,79	2,32	1,43	1,79	2,32
Permissible shear load for lithography $f_b \geq 6$ N/mm2 strength	permissible V	[kN]	2,14	3,57	3,57	3,57	2,86	3,57	3,57
Drilling process						Rotary drilling			

Installation data in solid brick (without sieve sleeve)

Anchor rods: Steel: ≥ FKL. 5.8, A4, HCR: ≥ FKL 70			M8	M10	M12	M16	IG-M6	IG-M8	IG-M10
Drill hole diameter	d_o	[mm]	10	12	14	18	12	14	18
Borehole depth	h_o	[mm]	80	90	100	100	90	100	100
Minimum wall thickness	h_{min}	[mm]	110	120	130	130	120	130	130
Through-hole in the connecting component	$d_f \leq$	[mm]	9	12	14	18	7	9	12
Assembly torque	$T_{inst,max}$	[Nm]				2 (14 for masonry bricks Mz-DF)			
Mortar requirement per drill hole		[ml]	5,2	7,3	9,8	13,6	7,3	9,8	13,6

Drill holes per cartridge VMU plus 280 / 300	[Piece]	46 / 50	33 / 36	24 / 2618	/ 1933	/ 36	24 / 26	18 / 19
Drill holes per cartridge VMU plus 345 / 410	[piece]	59 / 71	42 / 51	31 / 38	22 / 27	42 / 51	31 / 38	22 / 27

[1)]Installation also permitted with perforated sleeve; for technical values see ETA-13/09092 [)]Minimum edge distance Cmin,v,II for shear loads parallel to the free edge [3)]Minimum edge distance Cmin,v,⊥ for shear loads perpendicular to the free edge

Extract from the conditions of use of the European Technical Assessment ETA-13/0909 for anchoring in masonry

Permissible loads without influence of center and edge distances to component edges. Butt and bed joints mortared. Temperature range -40°C to +24°C (up to +40°C for short periods) - Usage category dry/dry. The overall safety coefficient according to ETAG 029 (γ_M and γ_F) was taken into account. For further information and temperature ranges see ETA.

Injection system VMU plus, perforated brick with perforated sleeve

Porotherm Homebric perforated brick in accordance with EN 771-1, raw brick density ρ: 0.7 kg/dm3, minimum brick size: 500x200x299mm (e.g. Wienerberger)

Anchor rods: Steel: ≥ FKL. 5.8, A4, HCR: ≥ FKL				70M8	/ M10		/ M16 Sieve		IG-M6	IG-M8 / IG-M10
sleeves VM-SH12x80	16x85	16x130		20x85	20x130	Anchoring depth	h_{ef} [mm]	8085	16x85	20x85
				130	85	130			85	85
Center distance parallel to the bearing joint		$s_{cr,II}$	[mm]	500	500	500	500		500	500
	500								299	299
Center distance perpendicular to the bearing joint		$s_{cr,\perp}$	[mm]	299	299	299	299	299	100	100
Minimum center distance		s_{min}	[mm]	100	100	100	100	100	100	120
Edge distance		c_{cr}	[mm]	100	100	100	120	120	100	120
Minimum edge distance		c_{min} 1)	[mm]	100	100	100	120	120		
Permissible tensile load for lithographic strength	$f_b \geq 4$ N/mm2	permissible N	[kN]	0,26	0,26	0,34	0,26	0,34	0,26	0,26
	$f_b \geq 6$ N/mm2	permissible N	[kN]	0,26	0,26	0,34	0,26	0,34	0,26	0,26
	$f_b \geq 10$ N/mm2	permissible N	[kN]	0,34	0,34	0,43	0,34	0,43	0,34	0,34
	$f_b \geq 4$ N/mm2	permissible V	[kN]	0,57	0,57	0,57	0,71	0,71	0,57	0,71
	$f_b \geq 6$ N/mm2	permissible V	[kN]	0,71	0,71	0,71	0,86	0,86	0,71	0,86
Admissible shear load for stone compression strength	$f_b \geq 10$ N/mm2	permissible V	[kN]	0,86	0,86	1,00	1,14	1,14	0,86	1,14

HLz-16-DF vertically perforated brick in accordance with EN 771-1, raw brick density ρ: 0.8 kg/dm3, minimum brick size: 497x240x238 mm (e.g. Unipor)

Anchor rods: Steel: ≥ FKL. 5.8, A4, HCR: ≥ FKL 70				M8M8	/ M10M12		/ M16			IG-M6	IG-M8 / IG-M10
Sieve sleeves VM-SH12x80	16x85	16x130		20x85	20x130	20x200	Anchoring depth	h_{ef}	[mm]	16x85	20x85
	80			85	130	85	130	200		85	85
Center distance parallel to the bearing joint		$s_{cr,II}$	[mm]	497	497	497	497	497	497	497	497
	497									238	238
Center distance perpendicular to the bearing joint		$s_{cr,\perp}$	[mm]	238	238	238	238	238	238	100	100
Minimum center distance		s_{min}	[mm]	100	100	100	100	100	100	100	120
Edge distance		c_{cr}	[mm]	100	100	100	120	120	120	100	120
Minimum edge distance		c_{min} 1)	[mm]	100	100	100	120	120	120	0,71	0,71
Permissible tensile load for lithographic strength	$f_b \geq 6$ N/mm2	permissible N	[kN]	0,71	0,71	1,00	0,71	1,00	1,00		
	$f_b \geq 8$ N/mm2	permissible N	[kN]	0,86	0,86	1,29	0,86	1,29	1,29	0,86	0,86
	$f_b \geq 12$ N/mm2	permissible N	[kN]	1,00	1,00	1,43	1,00	1,43	1,43	1,00	1,00
	$f_b \geq 14$ N/mm2	permissible N	[kN]	1,14	1,14	1,57	1,14	1,57	1,57	1,14	1,14
	$f_b \geq 6$ N/mm2	permissible V	[kN]	0,71	1,29	1,29	1,43	1,71	1,71	1,29	1,43
	$f_b \geq 8$ N/mm2	permissible V	[kN]	0,86	1,57	1,57	1,71	2,00	2,00	1,57	1,71
	$f_b \geq 12$ N/mm2	permissible V	[kN]	1,14	1,86	1,86	2,00	2,57	2,57	1,86	2,00
Admissible shear load for stone compression strength	$f_b \geq 14$ N/mm2	permissible V	[kN]	1,14	1,86	1,86	2,00	2,57	2,57	1,86	2,00

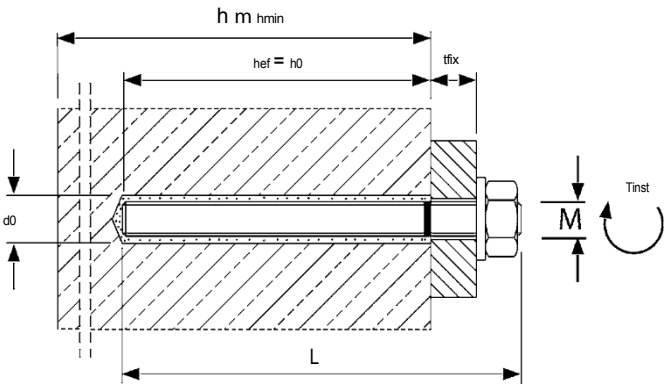
Perforated brick Doppio Uni according to EN 771-1, raw brick density ρ: 0.9 kg/dm3, minimum brick size: 250x120x120 mm (e.g. Wienerberger)

Anchor rods: Steel: ≥ FKL. 5.8, A4, HCR: ≥ FKL 70 Sieve				M8	M8 / M10		M12 / M16			IG-M6	IG-M8 / IG-M10
sleeves VM-SH				12x80	16x85	16x130	20x85	20x130	20x200	16x85	20x85
Anchoring depth		h_{ef}	[mm]	80	85	130	85	130	200	85	85
Center distance parallel to the bearing joint		$s_{cr,II}$	[mm]	250	250	250	250	250	250	250	250
Center distance perpendicular to the bearing joint		$s_{cr,\perp}$	[mm]	120	120	120	120	120	120	120	120
Min. center distance parallel to the bearing joint		$s_{min,II}$	[mm]	100	100	100	100	100	100	100	100
Min. center distance perpendicular to the bearing joint		$s_{min,\perp}$	[mm]	120	120	120	120	120	120	120	120
Edge distance		c_{cr}	[mm]	100	100	100	120	120	120	100	120
Minimum edge distance	c_{min} 1)	[mm]	$f_b \geq 10$ N/mm2	60	60	60	60	60	60	60	60
	permissible N	[kN]		0,17	0,17	0,17	0,17	0,17	0,17	0,17	0,17
Permissible tensile load for lithographic strength	$f_b \geq 16$ N/mm2	permissible N	[kN]	0,21	0,21	0,21	0,21	0,21	0,21	0,21	0,21
	$f_b \geq 20$ N/mm2	permissible N	[kN]	0,26	0,26	0,26	0,26	0,26	0,26	0,26	0,26
	$f_b \geq 28$ N/mm2	permissible N	[kN]	0,34	0,34	0,34	0,34	0,34	0,34	0,34	0,34
	$f_b \geq 10$ N/mm2	permissible V	[kN]	0,43	0,43	0,43	0,43	0,43	0,43	0,43	0,43
	$f_b \geq 16$ N/mm2	permissible V	[kN]	0,57	0,57	0,57	0,57	0,57	0,57	0,57	0,57
	$f_b \geq 20$ N/mm2	permissible V	[kN]	0,57	0,57	0,57	0,57	0,57	0,57	0,57	0,57
Admissible shear load for stone compression strength	$f_b \geq 28$ N/mm2	permissible V	[kN]	0,71	0,71	0,71	0,71	0,71	0,71	0,71	0,71

Perforated sand-lime brick KSL-3DF in accordance with EN 771-2, raw brick density ρ: 1.4 kg/dm3, minimum brick size: 240x175x113 mm (e.g. Wemding)

Anchor rods: Steel: ≥ FKL. 5.8, A4, HCR: ≥ FKL 70 Sieve											
sleeves VM-SH				Permissible tensile load for lithographic strength							
Anchoring depth		h_{ef}	[mm]								
Center distance parallel to the bearing joint		$s_{cr,II}$	[mm]								
Center distance perpendicular to the bearing joint		$s_{cr,\perp}$	[mm]								
Minimum center distance		s_{min}	[mm]								
Edge distance		c_{cr}	[mm]								
Minimum edge distance		c_{min} 1)	[mm]								
	$f_b \geq 8$ N/mm2	permissible N	[kN]	0,43	0,43	0,43	1,29	1,29	1,29	0,43	1,29

issible shear load for stone compression strength	**M8**	**M8 / M10**		**M12 / M16**			**IG-M6**	**IG-M8 / IG-M10**
	12x80	16x85	16x130	20x85	20x130	20x200	16x85	20x85
	80	85	130	85	130	200	85	85
[1)]For $V_{Rk,c}$: c_{min} according to ETAG 029, Annex C	240	240	240	240	240	240	240	240
	120	120	120	120	120	120	120	120
	120	120	120	120	120	120	120	120
	100	100	100	120	120	120	100	120
	60	60	60	60	60	60	60	60



Installation data and mortar consumption for reinforcement connection with VMU plus

Bar Ø	[mm]	8	10	12	14	16	20	22	24	25
Drill hole Ø	d_0 [mm]	12	14	16	18	20	25/26[1)]	28	32	32
Mortar requirement/	[ml]	7,5	9,0	10,6	12,1	13,6	21,2	28,3	42,2	37,6

[1)] Compressed air bore

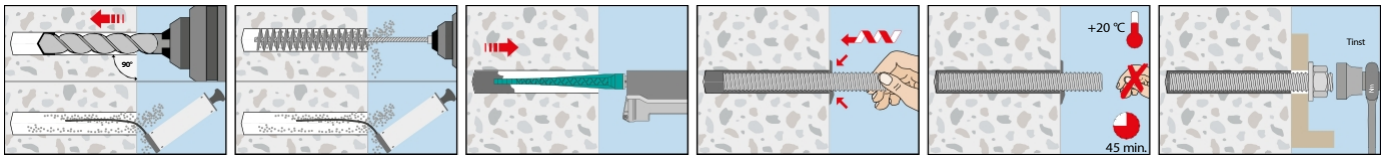
ETA-11/0514

Extract from the application conditions of the approvals ETA-11/0514 for retrofit ventilation connection with VMU plus

Normal concrete Strength class		C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
Rated value of bond stress f_{bd} [N/mm²]	Hammer and pneumatic drilling[1)]	1,6	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,3

[1)] Minimum anchorage length $l_{b,min}$ and $l_{s,min}$ according to DIN 1045-1:2001-07.
[2)] The values for f_{bd} are valid for good bonding conditions according to EN 1992-1-1:2004.

Mounting threaded rod in concrete (or solid brick)



Extract from the conditions of use of the European Technical Assessment ETA-13/0909 for anchoring in masonry

Permissible loads without influence of center and edge distances to component edges. Butt and bed joints mortared. Temperature range -40°C to +24°C (up to +40°C for short periods) - Usage category dry/dry. The overall safety coefficient according to ETAG 029 (γ_M and γ_F) was taken into account. For further information and temperature ranges see ETA.

Injection system VMU plus, perforated brick with perforated sleeve

Perforated sand-lime brick KSL-12DF in accordance with EN 771-2, raw brick density ρ: 1.4 kg/dm3, minimum brick size: 498x175x238 mm (e.g. Wemding)

Anchor rods: Steel: ≥ FKL. 5.8, A4, HCR: ≥ FKL 70				M8	M8 / M10		M12 / M16			IG-M6	IG-M8 / IG-M10
Sieve sleeves VM-SH				12x80	16x85	16x130	20x85	20x130		16x85	20x85
Anchoring depth		h_{ef}	[mm]	80	85	130	85	130		85	85
Center distance parallel to the bearing		$s_{cr,II}$	[mm]	498	498	498	498	498		498	498
Center distance perpendicular to the		$s_{cr,\perp}$	[mm]	238	238	238	238	238		238	238
Minimum center distance		s_{min}	[mm]	120	120	120	120	120		120	120
Edge distance		c_{cr}	[mm]	100	100	100	120	120		100	120
Minimum edge distance		c_{min}[1)]	[mm]	100	100	100	120	120		100	120
Perm. tensile load	$f_b \geq 10$ N/mm2	permissi	[kN]	0,17	0,17	0,71	0,43	0,71		0,17	0,43
for lithography Strength	$f_b \geq 12$ N/mm2	permissi	[kN]	0,21	0,21	0,86	0,43	0,86		0,21	0,43
	$f_b \geq 16$ N/mm2	permissi	[kN]	0,26	0,26	1,14	0,57	1,14		0,26	0,57
Permissible shear for lithography strength	$f_b \geq 10$ N/mm2	permissib	[kN]	0,71	1,57	1,57	1,57	1,57		1,57	1,57
	$f_b \geq 12$ N/mm2	permissible V	[kN]	0,86	1,86	1,86	1,86	1,86		1,86	1,86
	$f_b \geq 16$ N/mm2	permissib	[kN]	1,00	2,29	2,29	2,29	2,29		2,29	2,29

Perforated brick made of lightweight concrete Bloc creux B40 in accordance with EN 771-3, raw brick density ρ: 0.8 kg/dm3, minimum brick format: 494x200x190 mm (e.g. Sepa)

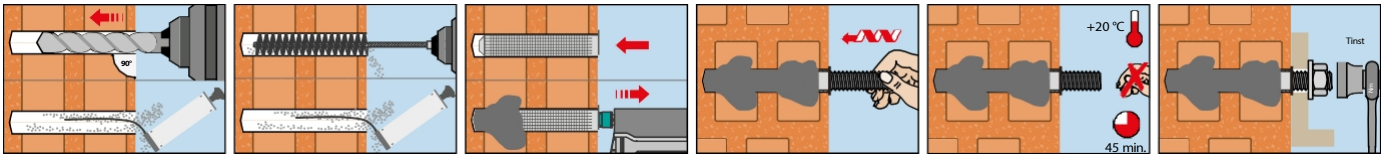
Anchor rods: Steel: ≥ FKL. 5.8, A4, HCR: ≥ FKL 70			M8	M8 / M10		M12 / M16			IG-M6	IG-M8 / IG-M10
Sieve sleeves VM-SH			12x80	16x85	16x130	20x85	20x130		16x85	20x85
Anchoring depth	h_{ef}	[mm]	80	85	130	85	130		85	85
Center distance parallel to the bearing joint	$s_{cr,II}$	[mm]	494	494	494	494	494		494	494
Center distance perpendicular to the bearing joint	$s_{cr,\perp}$	[mm]	190	190	190	190	190		190	190
Minimum center distance	s_{min}	[mm]	100	100	100	100	100		100	100
Edge distance	c_{cr}	[mm]	100	100	100	120	120		100	120
Minimum edge distance	c_{min}[1)]	[mm]	100	100	100	120	120		100	120
Permissible tensile load N/mm2 Compressive strength $f_{orfb} \geq 4$	permissible N	[kN]	0,34	0,34	0,34	0,34	0,34		0,34	0,34
Permissible shear load N/mm2 Compressive strength $f_{orfb} \geq 4$	permissible V	[kN]	0,86	0,86	0,86	0,86	0,86		0,86	0,86

Installation data in perforated brick with perforated sleeve

Anchor rods: Steel: ≥ FKL. 5.8, A4, HCR: ≥ FKL 70			M8	M8 / M10		M12 / M16			IG-M6	IG-M8 / IG-M10
Sieve sleeves VM-SH			12x80	16x85	16x130	20x85	20x130	20x200	16x85	20x85
Drill hole diameter	d_o	[mm]	12	16	16	20	20	20	16	20
Drill hole depth	h_o	[mm]	85	90	135	90	135	205	90	90
Minimum wall thickness	h_{min}	[mm]	115	115	145	115	175	240	115	115
Through hole in the component to be connected	$d_f \leq$	[mm]	9	9 / 12	9 / 12	14 / 18	14 / 18	14 / 18	7	9 / 12
Assembly torque	$T_{inst,max}$	[Nm]					2			
Mortar requirement per drill hole		[ml]	11,2	24,9	38,0	41,1	62,9	96,7	24,9	41,1
Drill holes per cartridge VMU plus 280 / 300		[Piece]	21 / 23	9 / 10	6 / 6	5 / 6	3 / 4	2 / 2	9 / 10	5 / 6
Drill holes per cartridge VMU plus 345 / 410		[Piece]	27 / 33	12 / 14	8 / 9	7 / 9	4 / 5	3 / 3	12 / 14	7 / 9
Drilling process							Rotary drilling			

1)For $V_{Rk,c}$:c_{min} according to ETAG 029, Annex C

Installation in perforated brick



Extract from the conditions of use of the European Technical Assessment ETA-11/0514 for post-installed reinforcement connection with VMU plus

Normal concrete Strength	classC12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
Rated value of bond stress[1] $f_{bd,PIR}$ [N/mm²] Hammer and pneumatic drilling	1,6	2,0	2,3	2,7	3,0	3,4	3,	74,0/3,[72)]	4,3/3,[72)]

[1)] The values for $f_{bd,PIR}$ are valid for good bonding conditions according to EN 1992-1-1:2004.
[2)] For bar diameters ø28 and ø32.

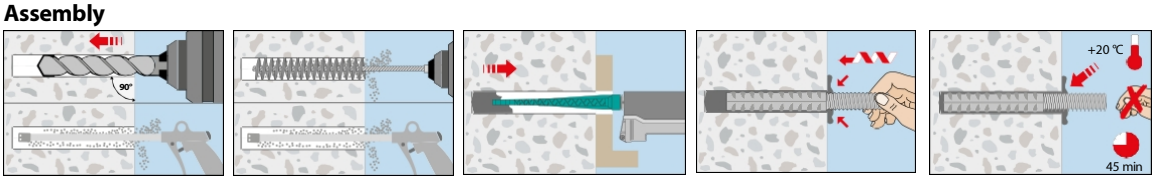
Installation data and mortar requirements Injection system VMU plus for reinforcement connection

Bar Ø	[mm]	8	10	12	14	16	20	22	24	25	28	32
Drill hole Ø	d_0 [mm]	12	14	16	18	20	25	28	32	32	35	40
Mortar requirement/ 100 mm setting depth	[ml]	8,46	10,12	11,78	13,44	15,09	23,11	30,4	44,65	40,03	44,22	57,32

Installation data injection system VMU plus with tie rod

Tie rod ZA / thread			**ZA M12**	**ZA M16**	**ZA M20**	**ZA M24**
Bar diameter		[mm]	12	16	20	25
Drill hole diameter	d_o	[mm]	16	20	25	32
Through hole in the attachment part	$d_f \leq$	[mm]	14	18	22	26
Effective setting depth	lv	[mm]	according to static calculation			
Torque when anchoring	Tinst ≤	[Nm]	50	100	150	150
Width across flats	SW	[mm]	19	24	30	36

Assembly



dimos anchor UNI-RT A4/galvanized and A4/A4

The universal, driving rain-proof solution for distance mounting with thermal break in external thermal insulation composite systems (ETICS)

Click here for the movie!

Product description:
The anchor rod with the glass fiber-reinforced thermal separation module pulls itself through the plaster into the insulation material in a self-cutting manner and ensures safe, fast installation that can also be carried out with RECA injection mortars. The EPDM seal seals the drill hole cleanly and is resistant to driving rain (see PfB test report).

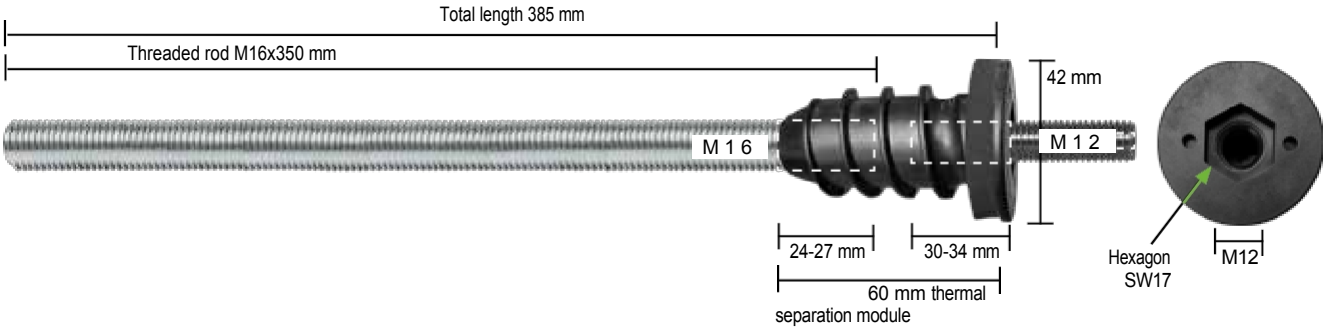
Advantages:
- Approved for perforated and solid bricks and concrete
- Suitable for medium to heavy loads
- High flexibility
- Simple, quick and safe installation
- Effective thermal separation
- Pre-assembled and weather-resistant EPDM seal
- External parts made of corrosion-resistant materials such as polyamide and A4 stainless steel
- Adjustable

Area of application:
Installation of e.g. awnings, small canopies, French windows, balconies, air conditioning systems, heat pumps, satellite dishes on thermally insulated facades in perforated and solid brick as well as concrete.

Note:
only in combination with RECA injection mortars VMU plus, VMU plus polar and VM-EA!

Outer diameter of sealing ring: 42 mm Outer diameter of thermal break module: 30 mm Core diameter of thermal break module: 26 mm Length of thermal break module: 60 mm
Material thermal break module: Polyamide PA 6 with glass fibers
Material sealing ring: Ethylene-propylene-diene-terpolymer-rubber-EPDM
Material connection thread: Stainless steel A4
Required injection mortar: VMU plus 300, VMU plus 330, VMU plus 420, VM-EA 300, VM-EA 330, VM-EA 420, VMU plus polar 300 ml, VMU plus polar 330 ml, VMU plus polar 420 ml Connection thread: M12
Through hole in the component to be connected (d f): 13 mm

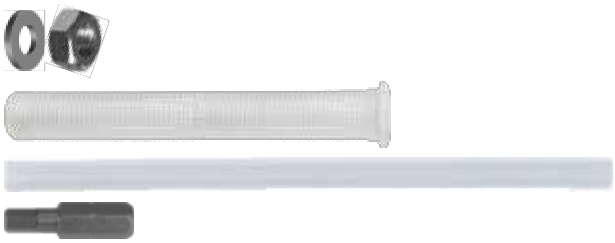
Item no.	Type designation	Insulation thickness min./max.	Length	Material threaded rod	Threaded rod surface	Screw-in depth of the threaded rod min./ max. (Lsd)	Drill core diameter min/max	PU
0911 416 250	dimos anchor UNI-RT	60-300 mm	392 mm	Stainless steel A4		24-27 mm	14 - 20 mm	4
0911 216 250	dimos anchor UNI-RT	60-300 mm	392 mm	Steel	Galvanized	24-27 mm	14 - 20 mm	4 / 20
0911 212 160	dimos anchor UNI-RT	60-220 mm	302 mm	Steel	Galvanized	24-27 mm	14 - 20 mm	4 / 20
0911 412 160	dimos anchor UNI-RT 12 A4	60-220 mm	302 mm	Stainless steel A4		24-27 mm	14 - 20 mm	4



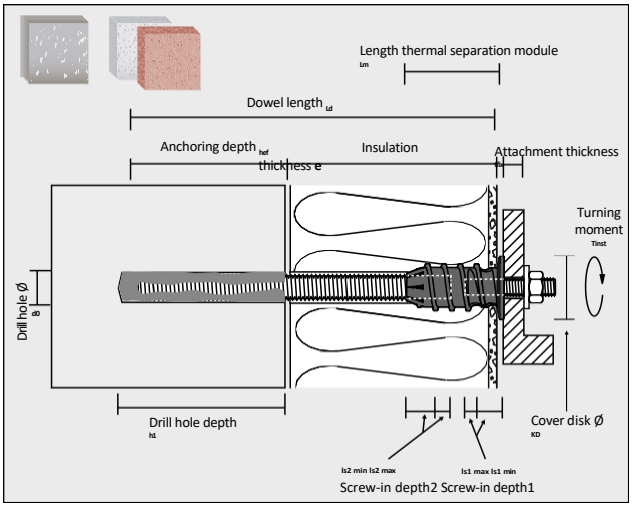
Contents set:

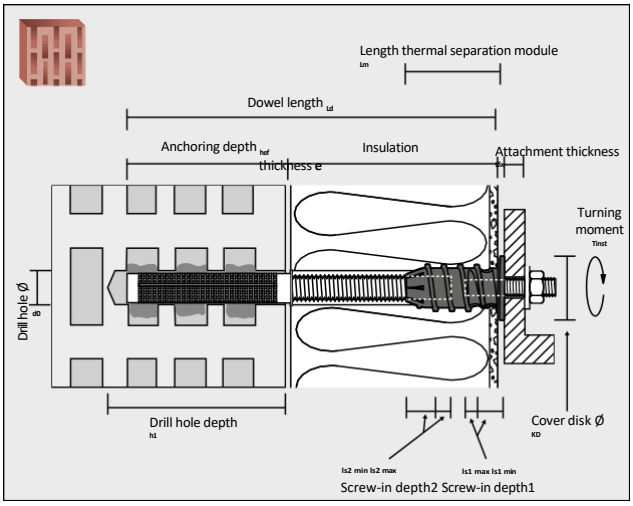
4x/20x threaded rod M16x350 galvanized or stainless steel A4 4x/20x thermal break module 60 mm with EPDM sealing ring 4x/20x grub screw M12x70 mm, DIN 913, stainless steel A4	
4x/20x washer M12 DIN 125, stainless steel A4	
4x/20x nut M12 DIN 934, stainless steel A4	
4x/20x sieve sleeve SH 20x130 (only required for perforated bricks)	
1x/4x	Mixing nozzle extension VM-XL, 245 mm
1x	Hexagon socket bit, size 6
0x	Injection mortar VMU plus, VMU plus polar or VM-EA is required for installation (see page 2)*.

*) the injection mortar must be ordered separately if required



Installation data:

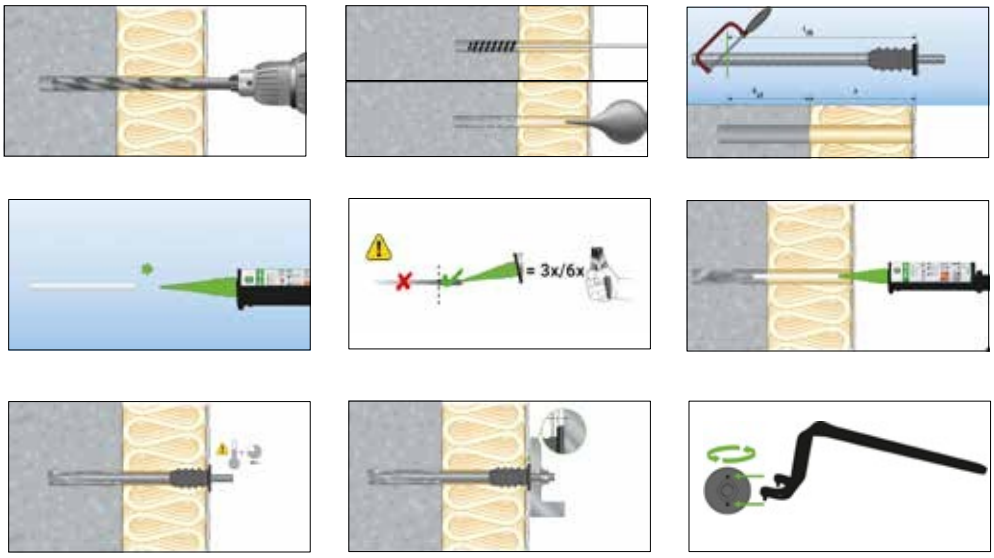




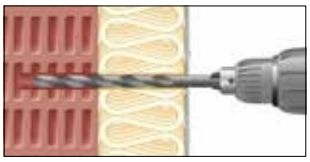
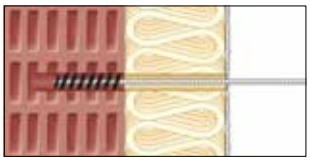
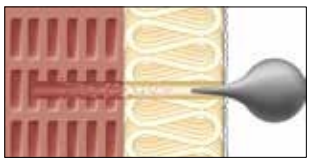
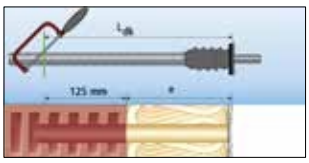
			Installation in concrete	Installation in aerated concrete/solid brick	Installation in perforated brick
Armature length	Ld	[mm]	3851)	3851)	3851)
Insulation thickness (incl. plaster)	e	[mm]	**60 - max. 300**	**60- max. 280**	**60 - max. 250**
Length of thermal break module (to lower edge of cover glass)	Lm	[mm]	60	60	60
Cover disk diameter	KD	[mm]	42	42	42
Threaded rod		[mm]	M16x3501)	M16x3501)	M16x3501)
Screw-in depth M16 threaded rod	ls2 min-max	[mm]	24-27	24-27	24-27
Drill hole diameter	d0	[mm]	18	18	20
Drill hole depth	h1 ≥	[mm]	90 + e	110 + e	140 + e
Anchoring depth	hef	[mm]	80	100	130
Sieve sleeve SH			-	-	20-130
Connection thread		[mm]	M123)	M123)	M123)
Screw-in depth of the M12 grub screw	ls1 min-max	[mm]	30-34	30-34	30-34
Cultivation part thickness	tfix ≤	[mm]	242)	242)	242)
Through hole in the attachment part to be connected	df ≤	[mm]	14	14	14
Torque	Tinst ≤	[Nm]	254)	254)	254)

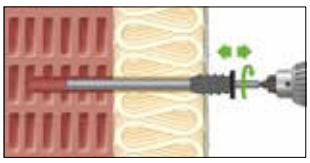
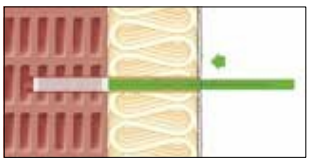
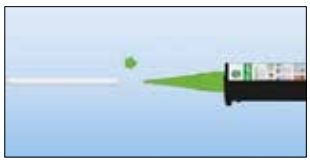
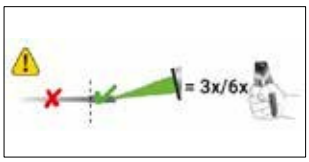
1) The M16 threaded rod must be cut to length as required.
For further technical values, see the respective ETA assessment/ETA approval of the injection system used.
2) When using the grub screw with L=70 mm, fully screwed in. Otherwise, use a longer grub screw or longer metric screw.
3) Alternatively, if M10 is required: M12/M10 grub screw adapter, 70 mm long, stainless steel A4, part no. 0911 210 070.
4) The torque applies to the thermal separation module. Observe any deviating max. installation torque in the ETA approval of the injection system used.

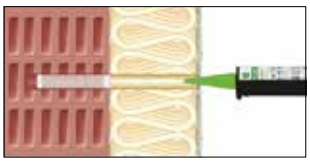
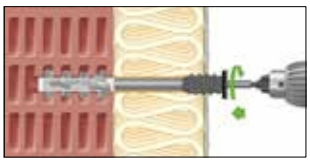
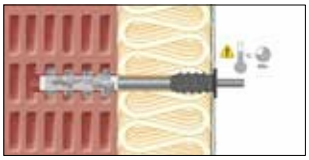
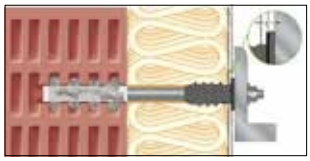
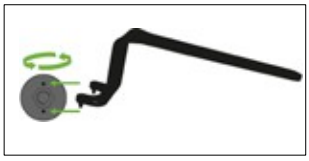
Processing in concrete:



Processing in masonry:

Ankerstange 8.8 Stahl | **VMU Plus / Plus Polar ETA-11/0415**

Anchoring base	Beton C20/25		Porenbeton 6N/mm²		Kalksandvollstein 27N/mm²		KS 3DF1??mm''	KJ 4?DF42?mm''			M F '0*mm'		HC-lJDF1??mm''		''''''''	₂ 3)	Vollstein LAC 2N/mm² 3)	
rankerungstiefe h_{ef} [mm]	70	80	100	100	100	100	130	130	130	130	100	100	130	130	130	130	130	l pp*y 4 3p
Achsabstand scr [mm]			300	300	300	300					300	300					390	300 JPD
Minimaler Achsabstand s_{min} [mm]	60	80	400	100	1Z0	120	120	120	] 20	120	120	120	100	100	100	J00	J20	] 2p y 4 2p
Achsabstand parallel zur Lagerfuge $s_{cr,ll}$ [mm]							240	240										
Achsabstand senkrecht zur Lagerfuge $s_{cr,\perp}$ [mm]							J20	J20										
c_{cr} [mm]			450	50	50	450	J20	J20	M0	?0	150	4S0	4?0	1?0				
Minimaler Randabstand	60	80	75	75	60	60	60	60	1?0	120	60	60	1?0	1?0	1?0	120	60	l 60 / **60**
Wall distance parallel to Lagerfuge $c_{min,v,ll}$ [mm]			75	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Randabstand senkrecht zur Lagerfuge $c_{min,v,\perp}$ [mm]	-		150	150														
Drehmoment beim Verankern T_{inst} [Nm]																		
									γ_M	γ_F								
Zulässige Zuglast zul. N	5.MtN	4.5tN	),8LN	?,3?LN	?,OXN	,7}	l }XN	l,7tN	0.8JtN	0,8JtN	),flt N	1.71XN	},A3?	}/3fN	0.34tN	0,#tN	0,LtN	0,?LN
Zulässige Drucklast zul. P	OJ4fN	#J41N	fD tN	Z37 tN	TOO fN	l l fN	1.71 fN	l fM	0.80 tN	0.801N	).f) tN	) l fN	l.A3fN	1.A3 fN	0.34 fN	0.34 tM	0 l tN	0 tN

Maximale Querlasten zul. V bei 3mm Verschiebung pro dimos Anker UNI-RT 12 / dimos Anker UNI-RT 16 bei Zweifachbefestigung,

Der Gesamtsicherheitsbeiwert nach TR077 (γ und γ) wurde berücksichtigt.

60	4.43 kN	2,J 4 kN	,43 kN	2, 44 kN	1.29 kN	J,29 kN	J,29 kN	J,29 kN	4.43 kN	4.86 kN	,43 kN	2.14 kN	1.43 kN	2.14 kN	0.86 kN	0.86 kN	0.86 kN	0.86 kN
80	4.43 kN	2.J 4 kN	,43 k N	2, 44 kN	1.29 kN	1.29 kN	J,29 kN	4.29 kN	4.43 kN	4.86 kN	,43 kN	2.14 kN	1.43 kN	2.14 kN	0.86 kN	0.86 kN	0.86 kN	0.86 k N
120	J,0J kN	J,84kN	J,01 kN	1.84ßN	1.01 kN	J,29kN	4.04 kN	4.29kN	J,0J kN	J,84kN	1.01 kN	1.84kN	1.01 kN	4.84kN	0.86kN	0.86kN	0.86 kN	0.86kN
140	0.8SkN	J.49kN	0.85 kN	7.49kN	0.8h kN	J,29kN	0.8SkN	J,29kN	0.8SkN	J,49kN	0.85 kN	1.49kN	0.85 kN	J,49kN	0.8SkN	0.86kN 0	.85 kN 0	.86kN
J60	0.69kN	J,J5kN	0.69 kN	7,J5 kN	0.69 kN	J,15 kN	0.69kN	J,J5kN	0.69kN	J,J5kN	0.69 kN	1,J5 kN	0.69 kN	J,15 kN	0.69kN	0.86kN	0.69 kN	0.86kN
J80	0.S4kN	0.80kN	0.54kN	0.80kN	0.54kN	0.80kN	0.54kN	0.80kN	0.S4kN	0.80kN	0.54kN	0.80kN	0.54kN	0.80kN	0.54kN	0.80kN	0.54 kN	0.80kN
200	0.38 kN	0.7J kN	0.38 kN	0.7J kN	0.38 kN	0.7J kN	0.38 kN	0.7J kN	0.38 kN	0.7J kN	0.38 kN	0.7J kN	0.38 kN	0.7J kN	0.38 kN	0.7J kN	0.38 kN	0.7J kN
220	0.22 kN	0.6J kN	0.22 kN	0.64 kN	0.22 kN	0.6J kN	0.22 kN	0.6J kN	0.22 kN	0.6J kN	0.22 kN	0.6J kN	0.22 kN	0.6J kN	0.22 kN	0.6J kN	0.22 kN	0.6J kN
240		0.5J kN		0.54 kN		0.5J kN		0.51 kN		0.54 kN		0.54 kN	-	0.5J kN		0.5J kN	-	0.54 kN
7S0		0.47kN	-	0.47kN		0.47kN		0.47kN	-	0.47kN	-	0.47kN	-	0.47kN		0.47kN	-	0.47âN
760		0.42kN	-	0.42kN		0.42kN		0.42kN	-	0.42kN	-	0.42kN	-	0.42kN		0.42kN	-	0.42kN
?S0		0.32kN	-	0.32kN	-	0.32kN	-	0.32kN	-	0.32kN	-	0.32kN	-	0.32kN	-	0.32kN	-	0.32kN
300		0.22kN	-	0.22kN	-	0.22kN	-	0.22kN	-	0.22kN	-	0.22kN	-	0.22kN	-	0.22kN	-	0.22kN

, fi0JA-J RO54, EOTA-TRO 77, TJA-23-0482 Ur den di mos An ker UNI-RJ 42J 46 sowiei e hen entsprechende fiTA-8 trfitt inien Ur fias jeneili9e Unler9 rundmalerial ren ist eine umfassenheBeiecfi nun9 zu erste l1en,fi te beispelswelse bombini ene lasten, Orm kbelastu n9cn, fiinlelltu n9 vn n Biegernornenlen in has

1) Zwischenwerte lassen sich interpolieren, wobei die Werte auf die maximale Querkrafttragfähigkeit begrenzt sind.

≙100kg

Maximale Querlasten zul. V bei 5mm Verschiebung pro dimos Anker UNI-RT 12 / dimos Anker UNI-RT 16 bei Zweifachbefestigung,

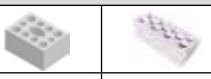
γ γ

Ankerstange 8.8 Stahl	VMU Plus / Plus Polar ETA-11/0415																	
																		
Verankerungsgrund	Beton C20/25		Porenbeton 6N/mm²		27N/mm² "		KS-3D l2Nmm'"		KS l2D£l7imm'"		Mz D**0*mm'		HŒ-16D£l?imm'"		""" 4Nmm"'		Vollstein LAC 2N/mm² 3)	
	Dämmdicke e [mm]																	
60	J,43 kN	2.74kN	1.43 kN	2.74kN	1.29ßN	1.29kN	1.29kN	1.29 kN	1.43 kN	1.86kN	1.43 kN	2.74kN	1.43 kN	2,J4kN	0.86kN	0.86 kN	0.86 kN	0.86kN
80	J,43 kN	2.74kN	1.43 kN	2.74kN	J,29kN	1.29kN	1.29kN	1.29 kN	1.43 kN	1.86kN	1.43 kN	2.74kN	1.43 kN	2,J4kN	0.86kN	0.86 kN	0.86 kN	0.86kN
100	J,43 kN	2.74kN	1.43 kN	2.74kN	J,29kN	J,29kN	1.29kN	1.29kN	1.43 kN	1.86 kN	1.43 kN	2.74kN	1.43 kN	2.74kN	0.86kN	0.86kN	0.86 kN	0.86 kN
120	J,43 kN	2.44kN	J,43 kN	2.74kN	J,29kN	J,29kN	1.29kN	1.29kN	1.43 kN	J,86 kN	1.43 kN	2.74kN	1.43 kN	2.74kN	0.86kN	0.86kN	0.86 kN	0.86 kN
140	J,29kN	2.44kN	J,29kN	2.74kN	J,29kN	J,29kN	J,29kN	J,29kN	J,29 kN	J,86 kN	),29kN	2.74kN	1.29 kN	2.74kN	0.86kN	0.86kN	0.86 kN	0.86 kN
160	J,06kN	J,76kN	J,06kN	J,76kN	J,06kN	J,29kN	J,06kN	J,29kN	J,06 kN	J,76 kN	),06kN	J,76kN	J,06 kN	J,76 kN	0.86kN	0.86kN	0.86 kN	0.86 kN
180	0.82 kN	J,27 kN	0.82 kN	J,27 kN	0.82 kN	J,27 kN	0.82 kN	J,27 kN	0.82 kN	J,27 kN	0.82 kN	J,27 kN	0.82 kN	J,27 kN	0.82 kN	0.8fikN	0.82 kN	0.86 kN
200	0.59kN	J,42 kN	0.59kN	J,42 kN	0.59kN	J,42 kN	0.59kN	J,42 kN	0.59 kN	J,42 kN	0.59kN	J,42 kN	0.59 kN	J,42 kN	0.59kN	0.8fikN	0.59 kN	0.86 kN
220	0.35 kN	0.97 kN	0.35 kN	0.97 kN	0.35 kN	0.97 kN	0.35 kN	0.97 kN	0.35 kN	0.97 kN	0.35 kN	0.97 kN	0.35 kN	0.97 kN	0.35 kN	0.8fikN	0.35 kN	0.86 kN
140		0.82 kN		0,ß2 kN		0.82 kN		0.82 kN		0.82 kN		0.82 kN		0.82 kN		0.82 kN		0.82 kN
250		0.74kN		0.74kN		0.74kN		0.74kN		0.74kN		0.74kN		0.74kN		0.74kN		0.74kN
260		0.67 kN		0.fi7 kN		0.67 kN		0.67 kN		0.67 kN		0.67 kN		0.67 kN		0.67 kN		0.67 kN
280		0.51 kN		0.51 kN		0.51 kN		0.51 kN		0.51 kN		0.51 kN		0.51 kN		0.51 kN		0.54 kN
300		0.3fikN		0.3fikN		0.3fikN		0.3fikN		0.36 kN		0.3fikN		0.3fikN		0.3fikN		0.36 kN

Gemäß den Normen EN 1992-4, EOTA-TR054, EOTA-TR077, ETA-23-0482 für de
Untergrundmaterial, Fugenfüllungen und -leerstellen im Mauerwerk sowie Rand
Alle Werte basieren auf dem Injektionssystem VMU Plus / VMU Plus polar
1) Zwischenwerte lassen sich interpolieren, wobei die Werte auf die maximale Q
2) Für weitere Temperaturbereiche verweisen wir auf die ETA-Bewertung ETA-1
3) Montage mit Siebhülse bei h_{ef} = 130mm
4) Die angegebenen Werte gelten bei Einhaltung der Montageangaben des Dis
5) Abhängig vom Untergrund gilt die ETA für das Injektionssystem VMU Plus / V
6) Die angegebenen Lasten sind Empfehlungen der RECA NORM GmbH und mü
7) Werte gültig für den charakteristischen Randebstand ccr
8) 1kN 100kg

Maximale Querlasten zul. V bei 3mm Verschiebung pro dimos Anker UNI-RT 12 / dimos Anker UNI-RT 16 bei Einfachbefestigung,

drehbarer Lagerung bei Nutzungskategorie trocken / trocken bei 24°C / 40°C 2)
Der Gesamtsicherheitsbeiwert nach TR077 (M und F) wurde berücksichtigt.

Ankerstange 8.8 Stahl	verwendeter Injektionsmörtel VMU Plus / Plus Polar ETA-11/0415						VMU Plus / Plus Polar ETA-13/0090											
																		
Verankerungsgrund	Beton C20/25		Porenbeton 6N/mm²		Kalksandvollstein 27N/mm²		KSL - 3DF 12N/mm² 3)		KSL - 12 DF 12N/mm² 3)		Mz - DF 20N/mm²		HLz - 16 DF 12N/mm² 3)		Bloc creux Leichtbeton 4N/mm² 3)		Vollstein LAC 2N/mm² 3)	
	UNI-RT 12	UNI-RT 16	UNI-RT 12	UNI-RT 16	UNI-RT 12	UNI-RT 16	UNI-RT 12	UNI-RT 16	UNI-RT 12	UNI-RT 16	UNI-RT 12	UNI-RT 16	UNI-RT 12	UNI-RT 16	UNI-RT 12	UNI-RT 16	UNI-RT 12	UNI-RT 16
	Dämmdicke e [mm]																	
120	0.36 kN	0.75 kN	0.36 kN	0.75 kN	0.36 kN	0.75 kN	0.36 kN	0.75 kN	0.36 kN	0.75 kN	0.36 kN	0.75 kN	0.36 kN	0.75 kN	0.36 ßN	0.75 ßN	0.36 kN	0.75 kN
140	o.31 kN	o,63ßN	o.3J kN	o.63kN	o.31 kN	o.63kN	o.31 kN	o.63kN	o.31 kN	o.63kN	o,31 ßN	o,s3kN	o.31 kN	o,s3kN	0.31 ßN	0,s3ßN	0.31 ßN	0,s3kN
160	0.25 kN	0.52 kN	0.25 kN	0.52 kN	0.2h kN	0.52 kN	0.25 kN	0.52 kN	0.25 kN	0.52 kN	0.25 kN	0.52 kN	0.25 kN	0.52 kN	0.2h kN	0.52 kN	0.25 kN	0.52 kN
180	0.20kN	0.41 kN	0.20kN	0.4J kN	0.20kN	0.41 kN	0.20kN	0.41 kN	0.20 kN	0.41 kN	0.20kN	0.41 kN	0.20 kN	0.47 kN	0.20kN	0.41 kN	0.20 kN	0.47 kN
200	0.14kN	0.36kN	0.74kN	0.36kN	0.74kN	0.36kN	0.74kN	0.36kN	0.74kN	0.36 kN	0.J4kN	0.36kN	0.74kN	0.36 kN	0.J4kN	0.36kN	0.J4kN	0.36 kN
220	0.09kN	0.31 kN	0.09kN	0.3J kN	0.09kN	0.31 kN	0.09kN	0.3J kN	0.09 kN	0.3) kN	0.09kN	0.3J kN	0.09 kN	0.37 kN	0.09kN	0.31 kN	0.09 kN	0.37 kN
£40		0.26kN		0.26kN		0.26kN		0.26kN		0.26 kN		0.26kN		0.26kN		0.26kN		0.26 kN
250		0.24kN		0.24kN		0.24kN		0.24kN		0.24kN		0.24kN		0.24kN		0.24kN		0.24 kN
260		0.2J kN		0.2J kN		0.2J kN		0.2s kN		0.24 kN		0.2J kN		0.2s kN		0.2J kN		0.24 kN
280		0.47 kN		0.47 kN		0.47 kN		0.47 kN		0.47 kN		0.47 kN		0.47 kN		0.J7 kN		0.47 kN
300		0.42 kN		0.42 kN		0.42 kN		0.42 kN		0.42 kN		0.42 kN		0.42 kN		0.J2 kN		0.42 kN

Maximale Querlasten zul. V bei 5mm Verschiebung pro dimos Anker UNI-RT 12 / dimos Anker UNI-RT 16 bei Einfachbefestigung,
drehbarer Lagerung bei Nutzungskategorie trocken / trocken bei 24°C / 40°C [2]
Der Gesamtsicherheitsbeiwert nach TR077 (γ_M und γ_F) wurde berücksichtigt.

Ankerstange 8.8 Stahl	verwendeter Injektionsmörtel VMU Plus / Plus Polar ETA-11/0415		verwendeter Injektionsmörtel VMU Plus / Plus Polar ETA-13/0909															
																		
Verankerungsgrund	Beton C20/25		Porenbeton 5N/mm²		Kalksandvollstein 27N/mm²		KSL - 3DF 12N/mm² [3]		KSL - 12 DF 12N/mm² [3]		Mz - DF 20N/mm²		HLz - 1δ DF 12N/mm² [3]		Bloc creux Leichtbeton 4N/mm² [3]		Vollstein LAC 2N/mm² [3]	
	UNI-RT 12	UNI-RT 16	UNI-RT 12	UNI-RT 16	UNI-RT 12	UNI-RT 16	UNI-RT 12	UNI-RT 16	UNI-RT 12	UNI-RT 16	UNI-RT 12	UNI-RT 16	UNI-RT 12	UNI-RT 16	UNI-RT 12	UNI-RT 16	UNI-RT 12	UNI-RT 16
Dämmdicke e [mm]																		
60	1,43 kN	1,86 kN	1,43 kN	1,86 kN	1,29 kN	1,29 kN	1,29 kN	1,29 kN	1,43 kN	1,86 kN	1,43 kN	1,86 kN	1,43 kN	1,86 kN	0,86 kN	0,86 kN	0,86 kN	0,86 kN
80	1,35 kN	1,86 kN	1,35 kN	1,86 kN	1,29 kN	1,29 kN	1,29 kN	1,29 kN	1,35 kN	1,86 kN	1,35 kN	1,86 kN	1,35 kN	1,86 kN	0,86 kN	0,86 kN	0,86 kN	0,86 kN
100	0,96 kN	1,66 kN	0,96 kN	1,66 kN	0,96 kN	1,29 kN	0,96 kN	1,29 kN	0,96 kN	1,66 kN	0,96 kN	1,66 kN	0,96 kN	1,66 kN	0,86 kN	0,86 kN	0,86 kN	0,86 kN
120	0,56 kN	1,19 kN	0,56 kN	1,19 kN	0,56 kN	1,19 kN	0,56 kN	1,19 kN	0,56 kN	1,19 kN	0,56 kN	1,19 kN	0,56 kN	1,19 kN	0,56 kN	0,86 kN	0,56 kN	0,86 kN
140	0,48 kN	1,00 kN	0,48 kN	1,00 kN	0,48 kN	1,00 kN	0,48 kN	1,00 kN	0,48 kN	1,00 kN	0,48 kN	1,00 kN	0,48 kN	1,00 kN	0,48 kN	0,86 kN	0,48 kN	0,86 kN
160	0,40 kN	0,82 kN	0,40 kN	0,82 kN	0,40 kN	0,82 kN	0,40 kN	0,82 kN	0,40 kN	0,82 kN	0,40 kN	0,82 kN	0,40 kN	0,82 kN	0,40 kN	0,82 kN	0,40 kN	0,82 kN
180	0,31 kN	0,64 kN	0,31 kN	0,64 kN	0,31 kN	0,64 kN	0,31 kN	0,64 kN	0,31 kN	0,64 kN	0,31 kN	0,64 kN	0,31 kN	0,64 kN	0,31 kN	0,64 kN	0,31 kN	0,64 kN
200	0,23 kN	0,56 kN	0,23 kN	0,56 kN	0,23 kN	0,56 kN	0,23 kN	0,56 kN	0,23 kN	0,56 kN	0,23 kN	0,56 kN	0,23 kN	0,56 kN	0,23 kN	0,56 kN	0,23 kN	0,56 kN
220	0,15 kN	0,49 kN	0,15 kN	0,49 kN	0,15 kN	0,49 kN	0,15 kN	0,49 kN	0,15 kN	0,49 kN	0,15 kN	0,49 kN	0,15 kN	0,49 kN	0,15 kN	0,49 kN	0,15 kN	0,49 kN
240	-	0,42 kN	-	0,42 kN	-	0,42 kN	-	0,42 kN	-	0,42 kN	-	0,42 kN	-	0,42 kN	-	0,42 kN	-	0,42 kN
250	-	0,38 kN	-	0,38 kN	-	0,38 kN	-	0,38 kN	-	0,38 kN	-	0,38 kN	-	0,38 kN	-	0,38 kN	-	0,38 kN
260	-	0,34 kN	-	0,34 kN	-	0,34 kN	-	0,34 kN	-	0,34 kN	-	0,34 kN	-	0,34 kN	-	0,34 kN	-	0,34 kN
280	-	0,27 kN	-	0,27 kN	-	0,27 kN	-	0,27 kN	-	0,27 kN	-	0,27 kN	-	0,27 kN	-	0,27 kN	-	0,27 kN
300	-	0,19 kN	-	0,19 kN	-	0,19 kN	-	0,19 kN	-	0,19 kN	-	0,19 kN	-	0,19 kN	-	0,19 kN	-	0,19 kN

Gemäß den Normen EN 1992-4, EOTA-TR054, EOTA-TR077, ETA-23-0482 für den dimos Anker UNI-RT 12/16 sowie den entsprechenden ETA-Richtlinien für das jeweilige Untergrundmaterialien ist eine umfassendeBerechnung zu erstellen,die beispielsweise kombinierte Lasten, Druckbelastungen, Einleitung von Biegemomenten in das Untergrundmaterial, Fugenfüllungen und -leerstellen im Mauerwerk sowie Rand- und Achsabstände berücksichtigt.

Alle Werte basieren auf dem Injektionssystem VMU Plus / VMU Plus polar

1) Zwischenwerte lassen sich interpolieren, wobei die Werte auf die maximale Querkrafttragfähigkeit begrenzt sind.

2) Für weitere Temperaturbereiche verweisen wir auf die ETA-Bewertung ETA-11/0415 & ETA-13/0909

3) Montage mit Siebhülse bei h_M = 130mm

4) Die angegebenen Werte gelten bei Einhaltung der Montageangaben des Distanzmontagesystems und des entsprechenden Injektionssystems

5) Abhängig vom Untergrund gilt die ETA für das Injektionssystem VMU Plus / VMU Plus polar

6) Die angegebenen Lasten sind Empfehlungen der RECA NORM GmbH und müssen durch einen auf dem Gebiet der Veankerungen, des Beton- und Mauerwerkbaus erfahrenen Ingenieurs geprüft werden

7) Werte gültig für den charakteristischen Randabstand ccr

8) 1kN ≙ 100kg

Reducer A4 M12 to M10 for dimos anchor

Diameter: 12 mm
Length: 70 mm
Material: A4 stainless
steel
Type designation: dimos anchor M12/M10 reducer Content note:
incl. washer and nut M10

Item no.	PU
0911 210 070	4

Two-hole nut driver for dimos anchor UNI-RT

Diameter: 25 mm
Length: 155 mm
Material: Hardened steel
Type designation: Two-hole nut driver for dimos anchor UNI-RT 12/16

Item no.	PU
0911 250 000	1

dimos anchor HB-T A4/GFK

The special solution for distance mounting in hollow blocks or porous perforated blocks with thermal separation in external thermal insulation composite systems (ETICS)

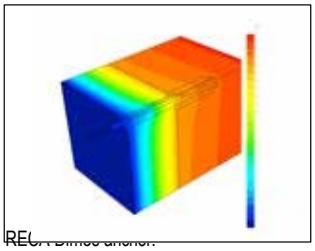
Europ. Techn. Bewertung
European Technical Assessment
ETA-23/0483

Product description:
The anchor rod/screen sleeve made of glass fiber reinforced polyamide with its large diameter of 37 mm is pushed through the insulating material into the perforated brick and ensures safe, fast and approved installation with RECA injection mortars.

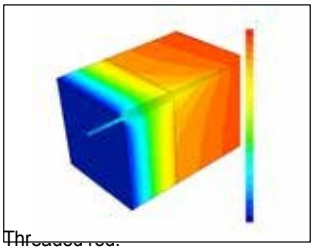
Advantages:
- Approved for perforated brick/hollow block
- Suitable for medium to heavy loads
- High flexibility
- Simple and safe installation
- Effective thermal separation
- External parts made of corrosion-resistant materials such as polyamide and A4 stainless steel

Area of application:
Installation of e.g. awnings, small canopies, French windows, balconies, air conditioning systems, heat pumps, satellite dishes on thermally insulated facades in hollow blocks and perforated bricks.

Note:
only in combination with RECA injection mortars VMU plus and VMU plus polar!

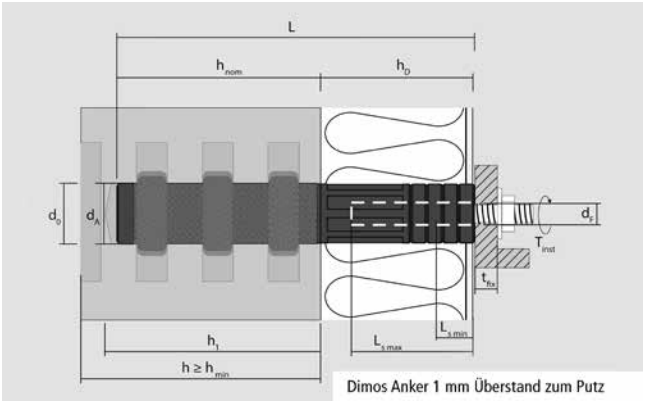


RECA Dimos anchor:
The insulating effect remains virtually undisturbed



Threaded rod:
Cold bridge clearly visible (cold yellow area draws inwards)

Type designation: dimos anchor HB-T
37 Dowel diameter: 37 mm Connection
thread diameter: 12 mm
Material thermal break module: Polyamide PA 6 with glass fibers Material
connection thread: Stainless steel A4
Injection mortar required: VMU plus 300, VMU plus 330, VMU plus 420, VMU plus polar 300 ml, VMU plus polar 330 ml, VMU plus polar 420 ml Composite mortar required per anchor: 140 ml
Connection thread: M12 Drill core diameter
min./max: 39 - 40 mm
Drill hole depth (h 1): 135 mm
Through hole in the component to be connected (d f): 13 mm Minimum component thickness masonry (h min): 240 mm for HLZ 12-.0 - 12 DF / 300 mm for HLZ 6-0.65 - 10DF
Edge distance min. (c min): 125 mm
Center distance min. (s min): 77 mm



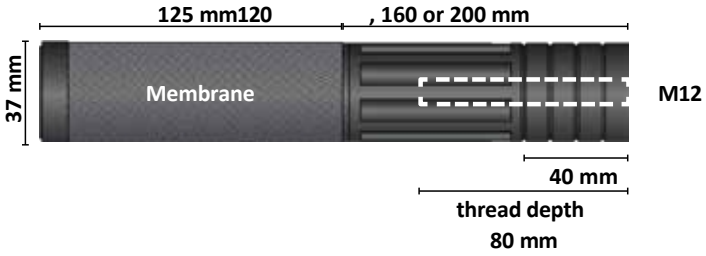
Dimos Anker 1 mm Überstand zum Putz

Item no.	Dowel length (l)	Insulation thickness min./max.	PU
0911 237 120	245 mm	80-120 mm	4
0911 237 160	285 mm	120-160 mm	4
0911 237 200	325 mm	160-200 mm	4

Contents set:

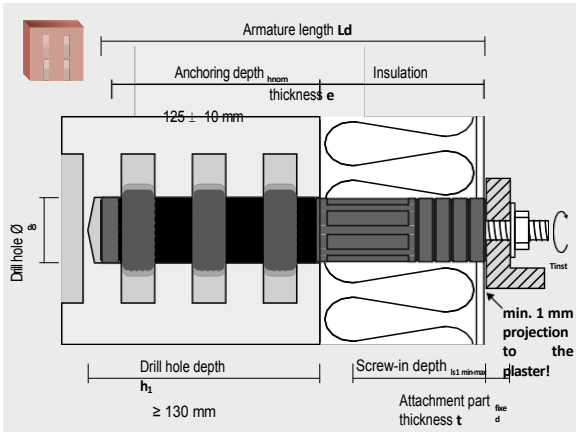
4x	dimos anchor HB-T 37 120 | 160 | 200
4x	Grub screw A4 M12x70
4x	Washer A4 M12 DIN 125
4x	Hexagon nut A4 M12 DIN 934
0x	Injection mortar VMU plus, VMU plus polar*

*) the injection mortar must be ordered separately if required



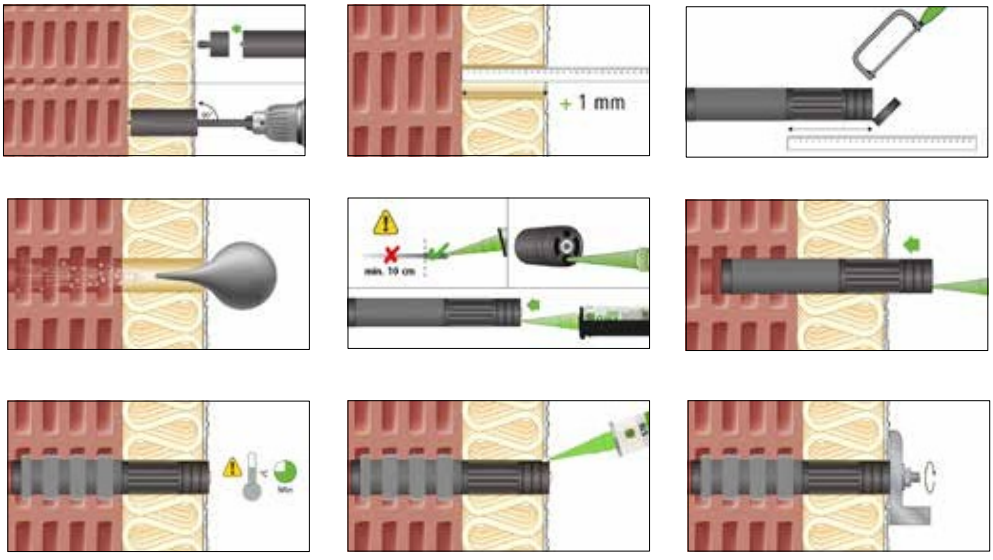
Installation data:

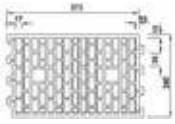
			Installation in perforated brick
Armature length	Ld	[mm]	245 | 285 | 325
Insulation thickness (incl. plaster)	e	[mm]	**80-120 | 120-160 | 1 6 0 - 2 0 0**
Drill hole diameter	d0	[mm]	39-40
Drill hole depth	h1 ≥	[mm]	135 + e
Anchoring depth	hnom	[mm]	125 +-10[1]
Connection thread		[mm]	M12[2]
Screw-in depth of the M12 grub screw	ls1 min-max	[mm]	35-80
Cultivation part thickness	tfix ≤	[mm]	353[3]
Through hole in the attachment part to be connected	df ≤	[mm]	13
Torque	Tinst ≤	[Nm]	20



1) h_{nom} can be reduced by 10 mm if necessary.
2) Alternatively, if M10 is required: M12/M10 grub screw adapter, 70 mm long, stainless steel A4, Item no. 0911 210 070.
3) When using the grub screw with L=70 mm, fully screwed in. Otherwise, use a longer grub screw or a longer metric screw.

Assembly:



Tragfähigkeiten und Verschiebungen / Durchbiegungen dimos Anker HB-T 37: geprüftes System mit Injektionsmörtel VMU Plus / Plus Polar ETA-13/0909				
Untergrund	**System**	**Dämmstoffdicke**	**Zulässige Last**	**Verschiebung / Durchbiegung bei zul. Last*)**
Zulässige Zuglast			**zul. N**	**δN0 / δN∞ [mm]**
Lochziegel T1.0-240 HLZ 12 (Format 12 DF)	Einzelbefestigung	alle	1,71	0,60/ 1,30
Lochziegel T10-300 HLZ 6 (Format 10 DF)	Einzelbefestigung	alle	0,86	0,60/ 1,20
Zulässige Drucklast			**zul. P**	**P0 / δP0 ∞ [mm]**
Lochziegel T1.0-240 HLZ 12 (Format 12 DF)	Einzelbefestigung	alle	1,71	0,60/ 1,30
Lochziegel T10-300 HLZ 6 (Format 10 DF)	Einzelbefestigung	alle	0,86	0,60/ 1,20
Zulässige Querlast			**zul. V**	**v0 / δv0 ∞ [mm]**
Lochziegel T1.0-240 HLZ 12 (Format 12 DF) 	Einzelbefestigung	0	0,86	0,20/ 0,30
		120	0,34	2,00/ 4,10
		160	0,34	2,10/ 4,30
		200	0,26	3,40/ 6,70
	Zweifachbefestigung[2)]	0	1,29	0,60/ 1,20
		120	0,51	1,60/ 3,20
		160	0,43	0,70/ 1,40
		200	0,34	1,40/ 2,90
Lochziegel T10-300 HLZ 6 (Format 10 DF) 	Einzelbefestigung	0	0,43	0,00/ 0,10
		120	0,26	1,30/ 2,60
		160	0,26	1,70/ 2,50
		200	0,17	2,00/ 4,00
	Zweifachbefestigung[2)]	0	0,17	0,10/ 0,20
		120	0,11	0,20/ 0,30
		160	0,11	0,20/ 0,30
		200	0,09	0,30/ 0,50

1) Zulässige Lasten inkl. Teilsicherheitsbeiwert der Einwirkungen von γF = 1,4
2) Achsabstand von 77mm (Standard-Markiesenkonsole).
*) Bewegung des dimos Ankers HB-T 37 in Lastrichtung bei Aufbringung der empf. Last.

Achs- und Randabstände				
dimos Anker HB-T 37, 120, 160, 200			**HLZ 12**	**HLZ 6**
Minimaler Achsabstand	s_{min}	[mm]	77 [1)]	77 [1)]
Minimaler Randabstand	c_{min}	[mm]	125	125
Minimale Bauteildicke	h_{min}	[mm]	240	300

1) Achsabstand von 77 mm (Standard-Markisenkonsole).

Accessories

Designation	Article no.	Ø mm	Length mm	PU
RECA Dimos anchor drill bit	0911 240 220	39	220	1
Tapping aid for RECA Dimos anchor drill bit	0911 245 000	34	50	1
Adapter 100 for RECA Dimos anchor drill bit	0911 245 100	M16	100	1
Adapter 200 for RECA Dimos anchor drill bit	0911 245 200	M16	200	1

Injection system VM-EA

The universal injection system for non-cracked concrete, damp concrete, water-filled drill holes, solid and perforated brickwork

ETA-16/0898

ETA-17/0006

M8-M16

The VM-EA injection system is an injection system for fixings in non-cracked concrete and masonry. It consists of a styrene-free injection mortar, based on epoxy acrylate, in a mortar cartridge, anchor rod VMU-A, V-A or commercially available threaded rod with acceptance test certificate 3.1 (e.g. VM-A) as well as a nut and washer. A perforated sleeve is also required for use in perforated brick.

Advantages

- Versatile injection system for various applications in concrete and masonry
- Approved for non-cracked concrete
- Approved for installation in damp concrete and in water-filled drill holes
- Approved for aerated concrete, solid and perforated brickwork, in dry and wet conditions
- Approved with anchor rods and for commercially available threaded rods with proof of strength (inspection certificate 3.1)
- Approved with shortenable push-through sieve sleeve VM-SH 16 x 130/330 for bridging insulation systems and other soft substrates
- Substrate temperature during application -5°C to +39°C
- Ambient temperature after complete curing -40°C to +80°C
- Variable anchoring depths for more flexibility
- Opened cartridges can continue to be used with a new static mixer
- Styrene-free

Application examples

Anchoring in non-cracked concrete:
Base plates, supports, wall brackets, fastening of waterstops.

Anchoring in masonry

Canopies, door and window frames, façade substructures, battens, gates, etc.
With the perforated sleeve VM-SH 16 x 130/330, fixings in perforated brick through insulation boards are possible

Curing times for injection mortar VM-EA

Cartridge temperature during processing from + 5°C to + 40°C

Temperature (°C) in the borehole	Max. Processing time	Curing time	
		Dryer Anchoring base	Moist Anchoring base
-5°C to - 1°C	90 min	6 h	12 h
0°C to + 4°C	45 min	3 h	6 h
+ 5°C to + 9°C	25 min	2 h	4 h
+ 10°C to + 14°C	20 min	100 min	200 min
+ 15°C to + 19°C	15 min	80 min	160 min
+ 20°C to + 29°C	6 min	45 min	90 min
+ 30°C to + 34°C	4 min	25 min	50 min
+ 35°C to + 39°C	2 min	20 min	40 min

Accessories for VM-EA injection system in concrete

Anchor rod	Internal threaded rod	Drilling-Ø	Blow-out pump /	Cleaning Blow-out gun brush RB	mixer-extension 2)
		mm			
M8		10	VM-AP 360 VM-ABP 200	RB 10 M6	VM-XE 10
M10	VMU-IG M6	12	VM-AP 360 VM-ABP 200	RB 12 M6 RB 12 M8	VM-XE 10
M12	VMU-IG M8	14	VM-AP 360 VM-ABP 200	RB 14 M6 RB 14 M8	VM-XE 10
M16	VMU-IG M10	18	VM-AP 360 VM-ABP 200 / 250 / 500 / 1000	RB 18 M6 RB 18 M8	VM-XE 10
M20	VMU-IG M12	22	VM-AP 3601) VM-ABP 250 / 500 / 1000	RB 24 M6	VM-XE 10
M24	VMU-IG M16	28	VM-AP 3601) VM-ABP 250 / 500 / 1000	RB 28 M6	VM-XE 10

1) Permissible up to a setting depth of 240mm (h_{ef} ≤ 240mm)

2) Required from a setting depth of 190 mm and if the static mixer does not reach the bottom of the drill hole

Accessories for VM-EA injection system in masonry

Anchor rod (without sieve sleeve)	Sieve sleeve Ø	Drill-Ø	Blow-out pump / blow-out gun	Cleaning brush RB	Mixer extension 1)
mm	mm	mm			
M8		10	VM-AP 360 VM-ABP 200	RB 10 M6	VM-XE 10
M10	VM-SH 12 x 80	12	VM-AP 360 VM-ABP 200	RB 12 M6 RB 12 M8	VM-XE 10
M12		14	VM-AP 360 VM-ABP 200	RB 14 M6 RB 14 M8	VM-XE 10
	VM-SH 16 x 85 VM-SH 16 x 130 VM-SH 16 x 130/330 1)	16	VM-AP 360 VM-ABP 200	RB 16 M6	VM-XE 10
M16		18	VM-AP 360 VM-ABP 200 / 250	RB 18 M6 RB 18 M8	VM-XE 10
	VM-SH 20 x 85 VM-SH 20 x 130 VM-SH 20 x 200	20	VM-AP 360 VM-ABP 200 / 250	RB 20 M6 RB 20 M8	VM-XE 10

1) Required if the static mixer does not reach the bottom of the drill hole or the bottom of the sieve sleeve

Injection mortar VM-EA, 300 ml tubular film cartridge

- With static mixer
- Can also be used with silicone squeeze guns
- Shelf life: 12 months

Designation	Article no.	Contents	PU
Injection mortar VM-EA 300	0911 005 300	300 ml	1/12

Injection mortar VM-EA, 330 ml

- With static mixer
- Shelf life: 18 months

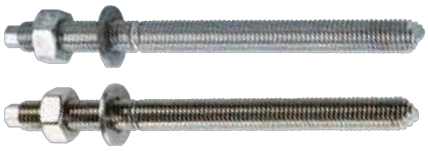
Designation	Article no.	Contents	PU
Injection mortar VM-EA 330	0911 005 330	330 ml	1/12

Injection mortar VM-EA, 420 ml

- With static mixer
- Shelf life: 18 months

Designation	Article no.	Contents	PU
Injection mortar VM-EA 420	0911 005 420	420 ml	1/12

Anchor rod V-A



Designation	Article no.	Dimension mm	Clamping thickness mm	Anchoring depth mm	PU
Material: Steel 5.8, galvanized					
V-A M8-110	0913 108 110	M 8 x 110	20	80	10
V-A M10-130	0913 110 130	M 10 x 130	30	90	10
V-A M10-165	0913 110 165	M 10 x 165	65	90	10
V-A M12-160	0913 112 160	M 12 x 160	35	110	10
V-A M12-220	0913 112 220	M 12 x 220	95	110	10
V-A M12-300	0913 112 300	M 12 x 300	175	110	10
V-A M16-165	0913 116 165	M 16 x 165	20	125	10
V-A M16-190	0913 116 190	M 16 x 190	45	125	10
V-A M16-250	0913 116 250	M 16 x 250	105	125	10
V-A M20-260	0913 120 260	M 20 x 260	60	170	10
Material: A4 stainless steel					
V-A M8-110 A4	0913 208 110	M 8 x 110	20	80	10
V-A M10-130 A4	0913 210 130	M 10 x 130	30	90	10
V-A M12-160 A4	0913 212 160	M 12 x 160	35	110	10
V-A M16-190 A4	0913 216 190	M 16 x 190	45	125	10
V-A M20-260 A4	0913 220 260	M 20 x 260	60	170	10

Anchor rods for applications in cracked and non-cracked concrete

Anchor rod VMU-A
Galvanized steel 5.8

Designation	Article number	Usable length in concrete mm	PU Piece
VMU-A 8x100	0911 508 100	90	10
VMU-A 8x110	0911 508 110	100	10
VMU-A 10x110	0911 510 110	100	10
VMU-A 10x130	0911 510 130	120	10
VMU-A 10x150	0911 510 150	140	10
VMU-A 12x120	0911 512 121	105	10
VMU-A 12x130	0911 512 131	115	10
VMU-A 12x135	0911 512 135	120	10
VMU-A 12x155	0911 512 155	140	10
VMU-A 12x175	0911 512 175	160	10
VMU-A 12x185	0911 512 185	170	10
VMU-A 12x210	0911 512 210	195	10
VMU-A 12x225	0911 512 225	210	10
VMU-A 12x265	0911 512 265	250	10
VMU-A 16x175	0911 516 175	155	10
VMU-A 16x205	0911 516 205	185	10
VMU-A 16x235	0911 516 235	215	10
VMU-A 20x240	0911 520 240	220	10

Anchor rod VMU-A A4
Stainless steel A4

Designation	Article number	Usable length in concrete mm	PU Piece
VMU-A 8x100 A4	0911 908 100	90	10
VMU-A 8x110 A4	0911 908 110	100	10
VMU-A 10x110 A4	0911 910 110	100	10
VMU-A 10x130 A4	0911 910 130	120	10
VMU-A 10x150 A4	0911 910 150	140	10
VMU-A 12x120 A4	0911 912 120	105	10
VMU-A 12x130 A4	0911 912 131	115	10
VMU-A 12x135 A4	0911 912 135	120	10
VMU-A 12x155 A4	0911 912 155	140	10
VMU-A 12x175 A4	0911 912 175	160	10
VMU-A 12x185 A4	0911 912 185	170	10
VMU-A 12x225 A4	0911 912 225	210	10
VMU-A 12x265 A4	0911 912 265	250	10
VMU-A 16x175 A4	0911 916 175	155	10
VMU-A 16x205 A4	0911 916 205	185	10
VMU-A 16x235 A4	0911 916 235	215	10
VMU-A 20x240 A4	0911 920 240	220	10

Anchor rods for applications in cracked and non-cracked concrete

Anchor rod VM-A
Steel grade 5.8, galvanized

Threaded rods, length 1m, for cutting to size

With inspection certificate 3.1 EN 10204 in each package (proof of strength)

Designation	Article number	Thread	Lengt h mm	PU Piece
VM-A 8x1000	0911 658 08	M8	1000	10
VM-A 10x1000	0911 658 10	M10	1000	10
VM-A 12x1000	0911 658 12	M12	1000	10
VM-A 16x1000	0911 658 16	M16	1000	10
VM-A 20x1000	0911 658 20	M20	1000	5
VM-A 24x1000	0911 658 24	M24	1000	5

Anchor rod VM-A
Stainless steel A4

Threaded rods, length 1m, for cutting to size

With inspection certificate 3.1 EN 10204 in each package (proof of strength)

Designation	Article number	Thread	Length mm	PU Piece
VM-A 8x1000 A4	0911 804 08	M8	1000	10
VM-A 10x1000 A4	0911 804 10	M10	1000	10
VM-A 12x1000 A4	0911 804 12	M12	1000	10
VM-A 16x1000 A4	0911 804 16	M16	1000	10
VM-A 20x1000 A4	0911 804 20	M20	1000	5
VM-A 24x1000 A4	0911 804 24	M24	1000	5

Sieve sleeve VM-SH
Polypropylene

Designation	Article number	Drill hole Ø x depth mm	For anchor rods	For internally threaded bolts	Suitable cleaning brush	PU Piece
VM-SH 12 x 80	0911 312 080	12 x 85	M8	-	RB 12 M6	10
VM-SH 16 x 85	0911 316 085	16 x 90	M8 / M10	VMU-IG M6 x 80	RB 16 M6	10
VM-SH 16 x 130	0911 316 130	16 x 135	M8 / M10	-	RB 16 M6	10
VM-SH 20 x 85	0911 320 085	20 x 90	M12 / M16	VMU-IG M8 x 80/VMU-IG M10 x 80	RB 20 M6	10
VM-SH 20 x 130	0911 320 130	20 x 135	M12 / M16	-	RB 20 M6	10
VM-SH 20 x 200	0911 320 200	20 x 205	M12 / M16	-	RB 20 M6	10

Perforated sleeve VM-SH for injection system VM-EA
Polypropylene

- The tie rods are held centrally in the sieve sleeve during installation
- The sieve sleeve collar can be shortened to the appropriate fastening height

Designation	Article number	Drill hole Ø x depth mm	Length mm	For anchor rods	eff. Anchoring depth (hef) mm	PU Piece
VM-SH 16 x 130/330	0911 316 330	16 x 135 + t fix1[1]	330	M8 / M10	130	10

t fix1[1] = shortened screen sleeve length -130 mm

Internally threaded rods and sieve sleeves for applications in solid and perforated brickwork

Accessories for VM-EA injection system in concrete

Anchor rod	Internal threaded rod	Drilling-Ø	Blow-out pump /	Cleaning Blow-out gun brush RB	mixer-extension [2]
		mm			
M8		10	VM-AP 360 VM-ABP 200	RB 10	M6VM-XE 10
M10	VMU-IG M6	12	VM-AP 360RB VM-ABP 200RB	12 M6 12 M8	VM-XE 10
M12	VMU-IG M8	14	VM-AP 360RB VM-ABP 200RB	14 M6 14 M8	VM-XE 10
M16	VMU-IG M10	18	VM-AP 360 VM-ABP 200 / 250 / 500 / 1000	RB 18 M6 18 M8	VM-XE 10
M20	VMU-IG M12	24	VM-AP 3601[1] VM-ABP 250 / 500 / 1000	RB 24	M6VM-XE 10
M24	VMU-IG M16	28	VM-AP 3601[1] VM-ABP 250 / 500 / 1000	RB 28	M6VM-XE 10

[1] Permissible up to a setting depth of 240mm ($h_{ef} \leq 240$mm)
[2] Required from a setting depth of 190 mm and if the static mixer does not reach the bottom of the drill hole

Accessories for VM-EA injection system in masonry

Anchor rod (without sieve sleeve)	Sieve sleeve Ø	Drill-Ø	Blow-out pump / blow-out gun	Cleaning brush RB	Mixer extension1[1]
mm	mm	mm			
M8		10	VM-AP 360 VM-ABP 200	RB 10	M6VM-XE 10
M10	VM-SH 12 x 80	12	VM-AP 360 VM-ABP 200	RB 12	M6VM-XE 10
M12		14	VM-AP 360 VM-ABP 200	RB 14	M6VM-XE 10
	VM-SH 16 x 85 VM-SH 16 x 130 VM-SH 16 x 130/330 [1]	16	VM-AP 360 VM-ABP 200	RB 16	M6VM-XE 10
M16		18	VMVM-AP 360 -ABP 200 / 250	RB 18	M6VM-XE 10
	VM-SH 20 x 85 VM-SH 20 x 130 VM-SH 20 x 200	20	VM-AP 360 VM-ABP 200 / 250	RB 20 XE 10	M6VM-

[1] Required if the static mixer does not reach the bottom of the drill hole or the bottom of the sieve sleeve

Extract from the conditions of use of the European Technical Assessment ETA-16/0898 for use in non-cracked concrete (Option 7)

Permissible loads according to EN 1992-4 without the influence of center and edge distances in dry or damp concrete for temperature range I -40°C to +24°C (briefly up to +40°C) and for temperature range II -40°C to +50°C (briefly up to +80°C). The influence of the permanent load with the factor Ψsus = 1.0 and the total safety factor (γ_M and γ_F) were taken into account. For further details and temperature ranges see ETA.

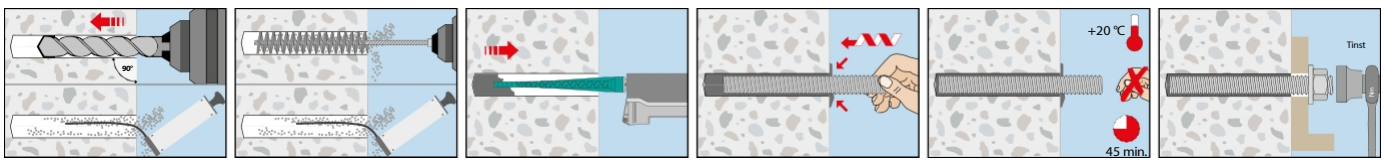
Loads and characteristic values				uncracked concrete					
Injection system VM-EA, anchor rod steel 5.8			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	
Anchoring depth range	$h_{ef,min}$ - $h_{ef,max}$	[mm]	60 - 160	60 - 200	80 - 240	80 - 320	100 - 400	96 - 480	
Permissible tensile load for	$h_{ef,min}$ - $h_{ef,max}$								
Temperature range	24°C/40°C [1]	C20/25 permissible N	[kN]	5.1 - 8.	76.0 - 13.	88.4 - 20.	112.8 - 37.416	.7 - 58.	318.4 - 84.0
	50°C/80°C [1]	C20/25 permissible N	[kN]	3.9 - 8.	74.5 - 13.	86.3 - 20.	19.6 - 37.413	.5 - 58.	317.2 - 84.0
Permissible shear load for	$h_{ef,min}$ - $h_{ef,max}$								
Temperature range	24°C/40°C [1]	C20/25 permissible V	[kN]	6,3	9,9	14,5	26,940	,0 - 42,	044,1 - 60,5
	50°C/80°C [1]	C20/25 permissible V	[kN]	6,3	9,9	14,	523,0 - 26,932	,3 - 42,	041,4 - 60,5
Injection system VM-EA, anchor rod steel 8.8									
Permissible tensile load for	$h_{ef,min}$ - $h_{ef,max}$								
Temperature range	24°C/40°C [1]	C20/25 permissible N	[kN]	5.1 - 13.	66.0 - 19.	98.4 - 28.712	.8 - 51.	116.7 - 79.818	
								.4 - 114.9	
	50°C/80°C [1]	C20/25 permissible N	[kN]	3.9 - 10.	44.5 - 15.	06.3 - 21.	59.6 - 38.	313.5 - 59.817	.2 - 86.2
Permissible shear load for	$h_{ef,min}$ - $h_{ef,max}$								
Temperature range	24°C/40°C [1]	C20/25 permissible V	[kN]	8,4	13,3	19,	330,6 - 35,940	,0 - 56,	044,1 - 80,7
	50°C/80°C [1]	C20/25 permissible V	[kN]	8,	410,8 - 13,	315,1 - 19,	323,0 - 35,932	,3 - 56,	041,4 - 80,7
Injection system VM-EA, anchor rod stainless steel A4-70, HCR-70									
Permissible tensile load for	$h_{ef,min}$ - $h_{ef,max}$								
Temperature range	24°C/40°C [1]	C20/25 permissible N	[kN]	5.1 - 9.	86.0 - 15.	58.4 - 22.612	.8 - 42.	116.7 - 65.618	
								.4 - 94.6	
	50°C/80°C [1]	C20/25 permissible N	[kN]	3.9 - 9.	84.5 - 15.	06.3 - 21.	59.6 - 38.	313.5 - 59.817	.2 - 86.2
Permissible shear load for	$h_{ef,min}$ - $h_{ef,max}$								
Temperature range	24°C/40°C [1]	C20/25 permissible V	[kN]	5,9	9,3	13,5	25,2	39,	444,1 - 56,7
	50°C/80°C [1]	C20/25 permissible V	[kN]	5,9	9,3	13,	523,0 - 25,	232,3 - 39,	441,4 - 56,7
Center and edge distances									
Minimum component thickness for	$h_{ef,min}$ - $h_{ef,max}$	h_{min}	[mm]	100 - 190	100 - 230	100 - 270	116 - 356	138 - 448	152 - 536
Minimum center distance		s_{min}	[mm]	40	50	60	80	100	120
Minimum edge distance		c_{min}	[mm]	40	50	60	80	100	120
Assembly data									
Drill hole diameter		d_o	[mm]	10	12	14	18	24	28
Through hole in the	attachment part	$t_f \leq$	[mm]	9	12	14	18	22	26
Borehole depth range for	$h_{ef,min}$ - $h_{ef,max}$	h_o	[mm]	60 - 160	60 - 200	70 - 240	80 - 320	90 - 400	96 - 480
Torque during anchoring		$T_{inst,max}$	[Nm]	10	20	40	80	120	160
Mortar requirement per 100 mm drilling depth			[ml]	6,53	8,16	9,82	13,61	26,71	32,25

[1] Max. Long-term temperature / max. short-term temperature Higher concrete strengths can lead to higher permissible loads.

Loads and characteristic values				uncracked concrete				
Internal threaded rod			**Internal thread M6 x 80**	**Internal thread M6 x 90**	**IG M8 x 80**	**IG M8 x 100**	**IG M10 x 80**	**IG M10 x 100**
Anchoring depth	h_{ef}	[mm]	80	90	80	100	80	100
Injection system VM-EA, internal threaded rod VMU-IG steel 5.8								
Permissible tensile load for	heavy							
Temperature range	24°C/40°C [1]	C20/25 permissible N [kN]	4,8	4,8	8,1	8,1	12,8	13,8
	50°C/80°C [1]	C20/25 permissible N [kN]	4,8	4,8	7,2	8,1	9,6	12,0
Permissible shear load for	heavy							
Temperature range	24°C/40°C [1]	C20/25 permissible V [kN]	3,4	3,4	5,7	5,7	9,7	9,7
	50°C/80°C [1]	C20/25 permissible V [kN]	3,4	3,4	5,7	5,7	9,7	9,7
Injection system VM-EA, internal threaded rod VMU-IG stainless steel A4-70, HCR-70								
Permissible tensile load for	heavy							
Temperature range	24°C/40°C [1]	C20/25 permissible N [kN]	5,3	5,3	9,6	9,9	12,8	15,7
	50°C/80°C [1]	C20/25 permissible N [kN]	5,3	5,3	7,2	9,0	9,6	12,0
Permissible shear load for	heavy							
Temperature range	24°C/40°C [1]	C20/25 permissible V [kN]	3,2	3,2	6,0	6,0	9,2	9,2
	50°C/80°C [1]	C20/25 permissible V [kN]	3,2	3,2	6,0	6,0	9,2	9,2
Center and edge distances								
Minimum component thickness for	h_{ef}	h_{min} [mm]	110	120	110	130	116	136
Minimum center distance		[mm]	50	50	60	60	80	80
Minimum edge distance	c_{min}	[mm]	50	50	60	60	80	80
Assembly data								
Drill hole diameter		d_o [mm]	12	12	14	14	18	18
Through hole in the	attachment part	$t_f \leq$ [mm]	7	7	9	9	12	12
Drill hole depth for	h_{ef}	d_0 [mm]	80	90	80	100	80	100
Anchoring	$T_{inst} \leq$ [Nm]		10	10	10	20	20	
Mortar requirement per drill hole		[ml]	6,6	7,4	7,9	9,9	10,9	13,6

[1] Max. Long-term temperature / max. short-term temperature Higher concrete strengths can lead to higher permissible loads.

Installation in concrete



Extract from the conditions of use of the European Technical Assessment ETA-17/0006 for anchoring in masonry

Permissible loads without influence of center and edge distances to component edges. Butt and bed joints mortared. Temperature range -40°C to +24°C (short-term up to +40°C) - use category dry/dry). The overall safety coefficient according to ETAG 029 (γ_M and γ_F) was taken into account. For further information and temperature ranges see ETA.

Injection system VM-EA, solid brick without perforated sleeve1)							
Solid brick Mz-DF according to EN 771-1, raw brick density ρ: 1.64 kg/dm3, minimum brick format: 240x115x55 mm (e.g. Unipor)							
Anchor rods: Steel: ≥ FKL. 5.8; A4, HCR: ≥ FKL 70				**M8**	**M10**	**M12**	**M16**
Anchoring depth		h_{ef}	[mm]	80	90	100	100
Center distance = Minimum center distance		$s_{cr} = s_{min}$	[mm]	240	270	300	300
Edge distance = Minimum edge distance		$c_{cr} = c_{min}$	[mm]	120	135	150	150
Permissible tensile load for lithographic strength	$f_b \geq 10$ N/mm2	permissible N	[kN]	0,4	0,4	0,4	0,7
	$f_b \geq 20$ N/mm2	permissible N	[kN]	0,7	0,7	0,6	1
	$f_b \geq 28$ N/mm2	permissible N	[kN]	0,9	0,9	0,7	1,3
Admissible shear load for stone compression strength	$f_b \geq 10$ N/mm2	permissible V	[kN]	0,9	1,0	1,4	1,4
	$f_b \geq 20$ N/mm2	permissible V	[kN]	1,3	1,6	2,1	2,1
	$f_b \geq 28$ N/mm2	permissible V	[kN]	1,6	1,9	2,6	2,6
Drilling method					Hammer drilling		
Torque when anchoring		$T_{inst,max}$	[Nm]	6	10	10	10
Sand-lime brick KS-NF according to EN 771-2, raw brick density ρ: 2.0 kg/dm3				**stone size: 240x115x71**	**mm (e.g. Wemding)**		
Anchor rods: Steel: ≥ FKL. 5.8; A4, HCR: ≥ FKL 70					**M10**	**M12**	**M16**
Anchoring depth		h_{ef}	[mm]	80	90	100	100
Center distance = Minimum center distance		$s_{cr} = s_{min}$	[mm]	240	270	300	300
Edge distance = Minimum edge distance		$c_{cr} = c_{min}$	[mm]	120	135	150	150
Permissible tensile load for lithographic strength	$f_b \geq 10$ N/mm2	permissible N	[kN]	0,9	0,9	1,1	0,9
	$f_b \geq 20$ N/mm2	permissible N	[kN]	1,3	1,3	1,6	1,3
	$f_b \geq 27$ N/mm2	permissible N	[kN]	1,6	1,6	1,9	1,6
Admissible shear load for stone compression strength	$f_b \geq 10$ N/mm2	permissible V	[kN]	0,9	0,9	1,0	1,0
	$f_b \geq 20$ N/mm2	permissible V	[kN]	1,3	1,3	1,4	1,4
	$f_b \geq 27$ N/mm2	permissible V	[kN]	1,4	1,6	1,7	1,7
Drilling method					Hammer drilling		
Torque during anchoring		$T_{inst,max}$	[Nm]	10	20	20	20
Lightweight solid concrete block in accordance with EN 771-3, raw block density ρ: 0.63 kg/dm3, minimum block format: 300x123x248 mm (e.g. Bisotherm)							
Anchor rods: Steel: ≥ FKL. 5.8; A4, HCR: ≥ FKL 70				**M8**	**M10**	**M12**	**M16**
Anchoring depth		h_{ef}	[mm]	80	90	100	100
Center distance = Minimum center		$s_{cr} = s_{min}$	[mm]	240	270	300	300
Edge distance = Minimum edge		$c_{cr} = c_{min}$	[mm]	120	135	150	150
Permissible tensile load for lithographic strength	$f_b \geq 2$ N/mm2	permissible N	[kN]	0,6	0,6	0,6	0,6
	$f_b \geq 2$ N/mm2	permissible V	[kN]	0,9	1,0	1,1	1,1
Admissible shear load for stone compression strength							
Drilling process					Rotary drilling		
Torque during anchoring		$T_{inst,max}$	[Nm]	6	6	10	14
Lightweight concrete solid block Leca Lex harkko RUH-200 in accordance with EN 771-3, raw block density ρ: 0.78 kg/dm3, minimum block size: 498x200x195 mm (e.g. Saint-Gobain Weber) Anchor rods: Steel: ≥ FKL. 5.8; A4, HCR: ≥ FKL					**70M8**	**M10**	**M12**
		M16 Anchoring depth 100	h_{ef}	[mm]	8090		100
Center distance = Minimum center		$s_{cr} = s_{min}$	[mm]	240	270	300	300
Edge distance = Minimum edge		$c_{cr} = c_{min}$	[mm]	120	135	150	150
Permissible tensile load for lithographic strength	$f_b \geq 3$ N/mm2	permissible N	[kN]	0,6	0,9	0,9	0,9
	$f_b \geq 3$ N/mm2	permissible V	[kN]	0,9	1,1	1,1	1,1
Admissible shear load for stone compression strength							
Drilling process					Rotary drilling		
Torque during anchoring		$T_{inst,max}$	[Nm]	6	12	14	16
Installation data in solid brick without sieve sleeve							
Anchor rods: Steel: ≥ FKL. 5.8; A4, HCR: ≥ FKL 70				**M8**	**M10**	**M12**	**M16**
Drill hole diameter		d_0	[mm]	10	12	14	18
Drill hole depth		h_0	[mm]	80	90	100	100
Drilling						methodSee stone data	
Minimum wall thickness		h_{min}	[mm]	110	120	130	130
Through hole in the component to be connected		$d_f \leq$	[mm]	9	12	14	18
Assembly torque		$T_{inst,max}$	[Nm]			See stone data	
Mortar requirement per drill hole			[ml]	5,2	7,3	9,8	13,6

Drill holes per cartridge	VM-EA 300	[piece]	50	36	26	19
	VM-EA 345	[piece]	59	42	31	22
	VM-EA 420	[piece]	73	52	39	28

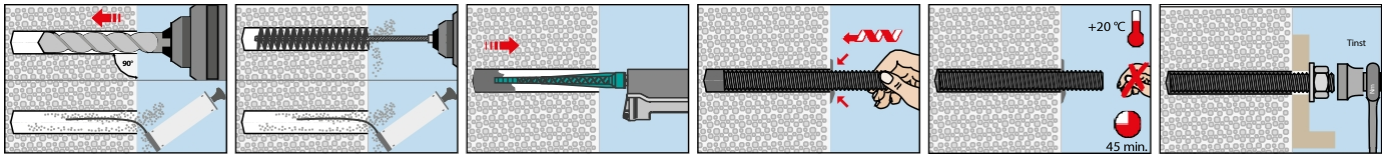
[1)]Installation with strainer sleeve see ETA-17/0006

Extract from the conditions of use of the European Technical Assessment ETA-17/0006 for anchoring in masonry

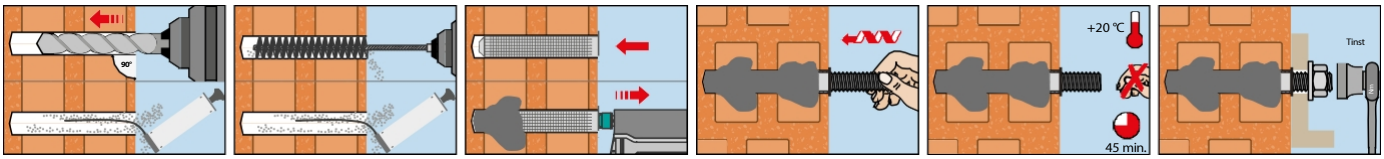
Permissible loads without influence of center and edge distances to component edges. Butt and bed joints mortared. Temperature range 24°C (briefly up to +40°C) - Use category dry/dry. The overall safety factor according to ETAG 029 (γ_M and γ_F) was taken into account. For further information and temperature ranges see ETA.

Injection system VM-EA, aerated concrete without perforated sleeve							
Aerated concrete block AAC2 in accordance with EN 771-4, raw block density ρ: 0.35 kg/dm3, minimum block size: 599x375x249 mm (e.g. Ytong)							
Anchor rods: Steel: ≥ FKL. 5.8; A4, HCR: ≥ FKL 70				**M8**	**M10**	**M12**	**M16**
Anchoring depth		h_{ef}	[mm]	80	90	100	100
Center distance = Minimum center	$distance_{cr} = s_{min}$		[mm]	240	270	300	300
Edge distance = Minimum edge	$distance_{ccr} = c_{min}$	[mm]	120	135	150	150	
Permissible tensile load for lithographic strength	$f_b \geq 2$ N/mm2	permissible N	[kN]	0,3	0,3	0,5	0,5
Permissible shear load for lithographic strength	$f_b \geq 2$ N/mm 2	permissible V	[kN]	0,5	0,7	0,9	1,3
Aerated concrete block AAC4 in accordance with EN 771-4, block impermeable				**e ρ: 0.50 kg/dm3, minimum brick size: 499x375 x249 mm (e.g. Ytong)**			
Anchor rods: Steel: ≥ FKL. 5.8; A4, HCR: ≥ FKL 70				**M8**	**M10**	**M12**	**M16**
Anchoring depth		h_{ef}	[mm]	80	90	100	100
Center distance = Minimum center distance		$s_{cr} = s_{min}$	[mm]	240	270	300	300
Edge distance = Minimum edge distance		$c_{cr} = c_{min}$	[mm]	120	135	150	150
Permissible tensile load for lithography	2	permissible N	[kN]	0,3	0,9	0,9	1,3
Permissible transverse strength load for lithography	$f_b \geq 4$ N/mm 2	permissible V	[kN]	0,5	0,7	0,9	1,3
Aerated concrete block AAC6 in accordance with EN 771-4, raw block densit[illegible] m block size: 499x240x24[illegible]							
Anchor rod: Steel: ≥ FKL. 5.8; A4, HCR: ≥ FKL	70			**M8**	**M10**	**M12**	**M16**
Anchoring depth		h_{ef}	[mm]	80	90	100	100
Center distance = Minimum center distance		$s_{cr} = s_{min}$	[mm]	240	270	300	300
Edge distance = Minimum edge distance		$c_{cr} = c_{min}$	[mm]	120	135	150	150
Permissible tensile load for lithography	$f_b \geq 6$ N/mm 2	permissible N	[kN]	0,7	1,1	1,6	2,0
Permissible transverse load for lithography	2	permissible V	[kN]	2,0	3,2	3,2	3,9
Assembly data in aerated concrete withou se							
Anchor rods: Steel: ≥ FKL. 5.8; A4, HCR: ≥ FKL 70				**M8**	**M10**	**M12**	**M16**
Drill hole diameter		d_o	[mm]	10	12	14	18
Drill hole depth		h_0	[mm]	80	90	100	100
Drilling method					Rotary drillin hren		
Minimum wall thickness		h_{min}	[mm]	110	120	130	130
Through-hole in the connected Component		$d_f \leq$	[mm]	9	12	14	18
Assembly torque		$T_{inst,max}$	[Nm]	2	2	2	2
Mortar requirement per drill hole			[ml]	5,2	7,3	9,8	13,6
Drill holes per cartridge		VM-EA 300	[Piece]	50	36	26	19
		VM-EA 345	[Piece]	59	42	31	22
		VM-EA 420	[Piece]	73	52	39	28

Installation in aerated concrete and solid brick without perforated sleeve



Installation in perforated brick with perforated sleeve



Extract from the conditions of use of the European Technical Assessment ETA-17/0006 for anchoring in masonry

Permissible loads without influence of center and edge distances to component edges. Butt and bed joints mortared. Temperature range -40°C to +24°C (briefly up to +40°C) - Use category dry/dry. The overall safety coefficient according to ETAG 029 (γ_M and γ_F) was taken into account. For further information and temperature ranges see ETA.

Injection system VM-EA, perforated brick with perforated sleeve

Perforated sand-lime brick KSL-3DF in accordance with EN 771-2, raw brick density ρ: 1.4 kg/dm³, brick size: 240x175x113 mm (e.g.

Anchor rods: Steel: ≥ FKL. 5.8; A4, HCR: ≥ FKL 70				M8	M8 / M10		M12/M16	M12			M16	
Sieve sleeves VM-SH				12x80	16x85	16x130 / 16x130/330	20x85	20x130	20x200	20x130	20x200	
Anchoring depth		h_{ef}	[mm]	80	85	130	85	130	200	130	200	
Center distance = Minimum center parallel to the bearing joint		$s_{min,II}$	[mm]	240	240	240	240	240	240	240	240	
Center distance = Minimum center perpendicular to the bearing joint		$s_{min,I}$	[mm]	113	113	113	113	113	113	113	113	
Edge distance = Minimum edge		c_{min}	[mm]	100	100	100	120	120	120	120	120	
Perm. tensile load for lithography Strength	permissible N	$f_b \geq 8$ N/mm²	[kN]	0,4	0,4	0,7	0,4	0,7	0,7	0,7	0,7	
	permissible N	$f_b \geq 12$ N/mm²	[kN]	0,6	0,6	1,0	0,6	1,0	1,0	1,0	1,0	
	permissible N	$f_b \geq 14$ N/mm²	[kN]	0,7	0,7	1,1	0,7	1,1	1,1	1,1	1,1	
Permissible for lithography strength	permissible V	$f_b \geq 8$ N/mm²	[kN]	0,6	0,7	0,9	0,9	0,9	0,9	1,1	1,1	
	permissible V	$f_b \geq 12$ N/mm²	[kN]	0,7	1,0	1,3	1,0	1,3	1,3	1,4	1,4	
	permissible V	$f_b \geq 14$ N/mm²	[kN]	0,9	1,1	1,4	1,3	1,4	1,4	1,7	1,7	
Torque during anchoring		$T_{inst,max}$	[Nm]	8	8	8	8	8	8	8	8	

Perforated sand-lime brick KSL-12DF in accordance with EN 771-2, raw brick density ρ: 1.4 kg/dm³, brick size: 498x175x238 mm (e.g.

Anchor rods: Steel: ≥ FKL. 5.8; A4, HCR: ≥ FKL 70				M8M8	/ M10		M12 / M16	
Sieve sleeves VM-SH				12x80	16x85	16x130 / 16x130/330	20x85	20x130
Anchoring depth		h_{ef}	[mm]	80	85	130	85	130
Center distance = Minimum center parallel to the bearing joint		$s_{cr} = s_{min,II}$	[mm]	498	498	498	498	498
Center distance = Minimum center perpendicular to the bearing joint		$s_{cr} =$	[mm]	238	238	238	238	238
Edge distance = Minimum edge		$c_{cr} = c_{min}$	[mm]	100	100	100	120	120
Perm. tensile for lithography strength	permissible N	$f_b \geq 10$ N/mm²	[kN]	0,1	0,3	1,0	0,3	1,0
	permissible N	$f_b \geq 12$ N/mm²	[kN]	0,1	0,4	1,3	0,4	1,3
	permissible N	$f_b \geq 16$ N/mm²	[kN]	0,1	0,6	1,6	0,6	1,6
Perm. shear load for lithography Strength	permissible V	$f_b \geq 10$ N/mm²	[kN]	0,9	1,7	2,0	1,7	2,0
	permissible V	$f_b \geq 12$ N/mm²	[kN]	1,0	2,0	2,3	2,0	2,3
	permissible V	$f_b \geq 16$ N/mm²	[kN]	1,1	2,6	2,9	2,4	2,9
Torque during anchoring		$T_{inst,max}$	[Nm]	2	4	4	4	4

HLz-16DF vertically perforated brick according to EN 771-1, brick density ρ: 0.83 kg/dm³, brick format: 497x238x240 mm (e.g. Unipor)

Anchor rods: Steel: ≥ FKL. 5.8; A4, HCR: ≥ FKL 70				M8	M8	M8	M10	M10	M12/M16		
Sieve sleeves VM-SH				12x80	16x85	16x130 16x130/330	16x85	16x130 16x130/330	20x85	20x130	20x200
Anchoring depth		h_{ef}	[mm]	80	85	130	85	130	85	130	200
Center distance = Minimum center parallel to the bearing joint		$s_{cr} = s_{min,II}$	[mm]	497	497	497	497	497	497	497	497
Center distance = Minimum center perpendicular to the bearing joint		$s_{cr} =$	[mm]	238	238	238	238	238	238	238	238
Edge distance = Minimum edge		$c_{cr} = c_{min}$	[mm]	100	100	100	100	100	120	120	120
Perm. tensile load for lithography strength	permissible N	$f_b \geq 6$ N/mm²	[kN]	0,3	0,4	0,7	0,4	0,7	0,6	0,7	0,7
	permissible N	$f_b \geq 9$ N/mm²	[kN]	0,3	0,6	0,9	0,6	0,9	0,7	0,9	0,9
	permissible N	$f_b \geq 12$ N/mm²	[kN]	0,4	0,7	1,0	0,7	1,0	1,0	1,0	1,0
	permissible N	$f_b \geq 14$ N/mm²	[kN]	0,4	0,7	1,0	0,7	1,0	1,0	1,0	1,0
	permissible N	$f_b \geq 16$ N/mm²	[kN]	0,7	1,1	1,1	1,1	1,7	1,1	1,7	1,7
Perm. shear load for lithography strength	permissible V	$f_b \geq 6$ N/mm²	[kN]	0,9	1,3	1,4	1,4	2,0	1,4	2,0	2,0
	permissible V	$f_b \geq 9$ N/mm²	[kN]	1,0	1,6	1,7	1,7	2,3	1,7	2,3	2,3
	permissible V	$f_b \geq 12$ N/mm²	[kN]	1,1	1,7	1,9	1,7	2,6	1,7	2,6	2,6
	permissible V	$f_b \geq 16$ N/mm²	[Nm]	6	6	6	6	6	6	6	6

Porotherm Homebric perforated brick in accordance with EN 771-1, raw brick density ρ: 0.68 kg/dm³, brick format: 500x200x299 mm (e.g.

Anchor rods: Steel: ≥ FKL. 5.8; A4, HCR: ≥ FKL 70				M8M8	/ M10		M12 / M16	
Sieve sleeves VM-SH				12x80	16x85	16x130 / 16x130/330	20x85	20x130
Anchoring depth		h_{ef}	[mm]	80	85	130	85	130
Center distance = Minimum center parallel to the bed joint		$s_{cr} = s_{min,II}$	[mm]	500	500	500	500	500
Center distance = Minimum center perpendicular to the bearing joint		$s_{cr} =$	[mm]	299	299	299	299	299
Edge distance = Minimum edge		$c_{cr} = c_{min}$	[mm]	100	100	100	120	120
Perm. tensile for lithography strength	permissible N	$f_b \geq 6$ N/mm²	[kN]	0,3	0,3	0,4	0,3	0,4
	permissible N	$f_b \geq 8$ N/mm²	[kN]	0,3	0,3	0,4	0,3	0,4
	permissible N	$f_b \geq 10$ N/mm²	[kN]	0,3	0,4	0,6	0,4	0,6
Perm. shear load for lithography Strength	permissible V	$f_b \geq 6$ N/mm²	[kN]	0,6	0,6	0,7	0,9	0,9
	permissible V	$f_b \geq 8$ N/mm²	[kN]	0,7	0,7	0,9	1,0	1,0
	permissible V	$f_b \geq 10$ N/mm²	[kN]	0,9	0,9	1,0	1,1	1,1
Torque during anchoring		$T_{inst,max}$	[Nm]	2	6	6	6	6

Extract from the conditions of use of the European Technical Assessment ETA-17/0006 for anchoring in masonry

Permissible loads without influence of center and edge distances to component edges. Butt and bed joints mortared. Temperature range -40°C to +24°C (up to +40°C for short periods) - Usage category dry/dry. The overall safety coefficient according to ETAG 029 (γM and γF) were taken into account. For further information and temperature ranges see ETA.

Injection system VM-EA, perforated brick with perforated sleeve

Perforated brick BGV Thermo in accordance with EN 771-1, brick density ρ: 0.62 kg/dm3, brick format: 500x200x314 mm (e.g. Leroux)

Anchor rods: Steel: ≥ FKL. 5.8; A4, HCR: ≥ FKL 70				M8	M8/M10	M8	M10	M12	M16M12	/ M16
Sieve sleeves VM-SH				12x80	16x85	16x130 16x130/330	16x130	20x85	20x85	20x130
Anchoring depth e		hef	[mm]	80	85	130	130	85	85	130
Center distance = M	inimum center distance parallel to the bearing	scr = smin,II	[mm]	500	500	500	500	500	500	500
	Center distance = Minimum center distance perpendicular to the bed	scr = smin,_I_	[mm]	314	314	314	314	314	314	314
Edge distance = M	inimum edge distance	ccr = cmin	[mm]	100	100	100	100	120	120	120
Perm. tensile load for lithography strength	fb ≥ 4 N/mm2	permissible N	[kN]	0,1	0,2	0,3	0,3	0,2	0,3	0,3
	fb ≥ 6 N/mm2	permissible N	[kN]	0,2	0,3	0,3	0,4	0,3	0,3	0,4
	fb ≥ 10 N/mm2	permissible N	[kN]	0,3	0,3	0,4	0,4	0,3	0,4	0,4
Permissible shear load for lithography strength	fb ≥ 4 N/mm2	permissible V	[kN]	0,6	0,6	0,7	0,7	0,6	0,6	0,7
	fb ≥ 6 N/mm2	permissible V	[kN]	0,6	0,7	0,9	0,9	0,9	0,9	0,9
	fb ≥ 10 N/mm2	permissible V	[kN]	0,9	1,0	1,1	1,1	1,0	1,0	1,1
Torque during anchoring		Tinst,max	[Nm]	2	4	4	4	4	4	4

Perforated brick Calibric Th according to EN 771-1, raw brick density ρ: 0.62 kg/dm3, brick format: 500x200x314 mm (e.g. Terreal)

Anchor rods: Steel: ≥ FKL. 5.8; A4, HCR: ≥ FKL 70				M8	M8/M10	M8	M10	M12	M16	M12	M16
Sieve sleeves VM-						16x130/330	16x130/330			20x130	20x130
Anchoring depth e		hef	[mm]	80	85	130	130	85	85	130	130
Center distance = M	inimum center distance parallel to the bea joint	scr = smin,II	[mm]	500	500	500	500	500	500	500	500
	inimal center erfuge perpendicular to t	distancecr = smin,_I_	[mm]	314	314	314	314	314	314	314	314
Edge distance = M	inimum edge distance	ccr = cmin	[mm]	100	100	100	100	120	120	120	120
Permissible tensile load for lithographic strength	fb ≥ 6 N/mm2	permissible N	[kN]	0,2	0,2	0,3	0,3	0,2	0,3	0,3	0,3
	fb ≥ 9 N/mm2	permissible N	[kN]	0,3	0,3	0,3	0,3	0,3	0,4	0,3	0,4
	fb ≥ 12 N/mm2	permissible N	[kN]	0,3	0,3	0,3	0,4	0,3	0,4	0,4	0,4
Admissible shear load for stone compression strength	fb ≥ 6 N/mm2	permissible V	[kN]	0,7	1,0	1,0	1,0	1,7	1,7	1,7	1,7
	fb ≥ 9 N/mm2	permissible V	[kN]	1,0	1,3	1,3	1,3	2,1	2,1	2,1	2,1
	fb ≥ 12 N/mm2	permissible V	[kN]	1,1	1,6	1,6	1,6	2,4	2,4	2,4	2,4
Torque be	n anchoring	Tinst,max	[Nm]	2	2	2	2	2	2	2	2

nbric according to EN 771-1, stone bulk density ρ: 0.74 kg/dm3, stone format: 560x200x274 mm (e.g. Imerys)

Perforated brick Urb

Anchor rods: Steel: ≥ FKL. 5.8; A4, HCR: ≥ FKL 70				M8	M8 / M10		M12 / M16	
Sieve sleeves VM-SH				12x80	16x85	16x130	20x85	20x130
Anchoring depth		hef	[mm]	80	85	130	85	130
Center distance = Minimum center distance parallel to the bearing joint		scr = smin,II	[mm]	560	560	560	560	560
Center distance = Minimum center distance perpendicular to the bearing joint		scr = smin,_I_	[mm]	274	274	274	274	274
Edge distance = Minimum edge		distancecr = cmin	[mm]	100	100	120	120	
Permissible tensile load for lithographic strength	fb ≥ 6 N/mm2	permissible N	[kN]	0,3	0,3	0,4	0,3	0,4
	fb ≥ 9 N/mm2	permissible N	[kN]	0,3	0,4	0,6	0,4	0,6
Admissible shear load for stone compression strength	fb ≥ 6 N/mm2	permissible V	[kN]	0,9	1,0	1,0	1,1	1,1
	fb ≥ 9 N/mm2	permissible V	[kN]	1,0	1,1	1,3	1,4	1,4
Torque during anchoring		Tinst,max	[Nm]	2	2	2	2	2

Perforated brick Blocchi Leggeri according to EN 771-1, brick density ρ: 0.55 kg/dm3, brick size: 250x120x250 mm (e.g. Wienerberger)

Anchor rods: Steel: ≥ FKL. 5.8; A4, HCR: ≥ FKL				70M8M8	/ M10 Perforated		M12 / M16		
sleeves VM-SH					16x130 16x130/330	20x85	20x130	20x200	
Anchoring depth e		hef	[mm]	80	85	130	85	130	200
Center distance = M	inimum center distance parallel to the bed joint	scr = smin,II	[mm]	250	250	250	250	250	250
	inimal center erfuge perpendicular to the la	distancecr = smin,_I_	[mm]	250	250	250	250	250	250
Edge distance = M	inimum edge distance	ccr = cmin	[mm]	100	100	100	120	120	120
Perm. tensile load	fb ≥ 4 N/mm2	permissible N	[kN]	0,1	0,1	0,1	0,1	0,1	0,1
	fb ≥ 6 N/mm2	permissible N	[kN]	0,1	0,1	0,2	0,1	0,2	0,2
	fb ≥ 8 N/mm2	permissible N	[kN]	0,2	0,2	0,2	0,2	0,2	0,2
	fb ≥ 4 N/mm2	permissible V	[kN]	0,6	0,6	0,6	0,6	0,6	0,6

for lithographic strength 182

Admissible shear load for stone compression strength

Torque be

Extract from the conditions of use of the European Technical Assessment ETA-17/0006 for anchoring in masonry

Permissible loads without influence of axial and edge distances to component edges. Butt and bed joints mortared. Temperature range -40°C to +24°C (briefly up to +40°C) - Use category dry/dry. The overall safety coefficient according to ETAG 029 (γ_M and γ_F) was taken into account. For further information and temperature ranges see ETA.

Perforated brick with sieve sleeve

Injection system VM-EA, perforated brick with perforated sleeve

Perforated brick Doppio Uni according to EN 771-1, raw brick density ρ: 0.92 kg/dm3, brick format: 250x120x120 mm (e.g. Wienerberger)

Anchor rods: Steel: ≥ FKL. 5.8; A4, HCR: ≥ FKL 70			M8	M8 / M10		M12 / M16		
Sieve sleeves VM-SH			12x80	16x85	16x130	20x85	20x130	20x200
Anchoring depth	h_{ef}	[mm]	80	85	130	85	130	200
Center distance = Minimum center distance parallel to the bearing joint	$s_{cr} = s_{min,II}$	[mm]	250	250	250	250	250	250
Center distance perpendicular to = Minimum center distance Bearing joint	$s_{cr} = s_{min,\perp}$	[mm]	120	120	120	120	120	120
Edge distance = Minimum edge distance	$c_{cr} = c_{min}$	[mm]	100	100	100	120	120	120
Perm. tensile load for lithography strength - $f_b \geq 10$ N/mm2	permissible N	[kN]	0,3	0,3	0,3	0,3	0,3	0,3
$f_b \geq 16$ N/mm2	permissible N	[kN]	0,3	0,3	0,3	0,4	0,4	0,4
$f_b \geq 20$ N/mm2	permissible N	[kN]	0,3	0,3	0,4	0,4	0,4	0,4
$f_b \geq 28$ N/mm2	permissible N	[kN]	0,4	0,4	0,4	0,6	0,6	0,6
Permissible shear load for lithography - $f_b \geq 10$ N/mm2	permissible V	[kN]	0,6	0,6	0,6	0,6	0,6	0,6
$f_b \geq 16$ N/mm2	permissible V	[kN]	0,7	0,7	0,7	0,7	0,7	0,7
$f_b \geq 20$ N/mm2	permissible V	[kN]	0,9	0,9	0,9	0,9	0,9	0,9
$f_b \geq 28$ N/mm2	permissible V	[kN]	1,0	1,0	1,0	1,0	1,0	1,0
Torque when anchoring	$T_{inst,max}$	[Nm]	4	4	4	4	4	4

Perforated lightweight concrete block Bloc creux B40 in accordance with EN 771-3, raw block density ρ: 0.8 kg/dm3, block format: 494x200x190 mm (e.g. Sepa)

Anchor rods: Steel: ≥ FKL. 5.8; A4, HCR: ≥ FKL 70			M8	M8 / M10		M12 / M16	
Sieve sleeves VM-SH			12x80	16x85	16x130	20x85	20x130
Anchoring depth	h_{ef}	[mm]	80	85	130	85	130
Center distance = Minimum center distance	$s_{cr} = s_{min,II}$	[mm]	494	494	494	494	494
Center distance = Minimum center distance	$s_{cr} = s_{min,\perp}$	[mm]	190	190	190	190	190
Edge distance = Minimum edge distance	$c_{cr} = c_{min}$	[mm]	100	100	100	120	120
Perm. tensile load for lithography strength $f_b \geq 4$ N/mm2	permissible N	[kN]	0,1	0,2	0,6	0,3	0,6
Perm. shear load for lithography strength $f_b \geq 4$ N/mm2	permissible V	[kN]	0,3	0,9	1,0	0,9	1,0
Torque during anchoring	$T_{inst,max}$	[Nm]	2	2	2	2	2

Leca Lex harkko RUH-200 perforated lightweight concrete block in accordance with EN 771-3, raw block density ρ: 0.7 kg/dm3, block format: 498x200x195 mm (e.g. Saint-Gobain Weber)

Anchor rods: Steel: ≥ FKL. 5.8; A4, HCR: ≥ FKL 70			M8	M8 / M10	M12	/ M16	
Sieve sleeves VM-SH			12x80	16x85	16x130	20x85	20x130
Anchoring depth	h_{ef}	[mm]	80	85	130	85	130
Center distance = Minimum center distance	$s_{cr} = s_{min,II}$	[mm]	498	498	498	498	498
Center distance = Minimum center distance perpendicular to the bed joint	$s_{cr} = s_{min,\perp}$	[mm]	195	195	195	195	195
Edge distance = Minimum edge distance	$c_{cr} = c_{min}$	[mm]	120	127	195	127	195
Perm. tensile load for lithography strength $f_b \geq 2,7$ N/mm2	permissible N	[kN]	0,6	0,6	0,7	0,7	0,7
Perm. shear load for lithography strength $f_b \geq 2,7$ N/mm2	permissible V	[kN]	0,7	1,0	1,0	1,0	1,0
Torque during anchoring	$T_{inst,max}$	[Nm]	8	8	8	8	8

Installation data in perforated brick with perforated sleeve

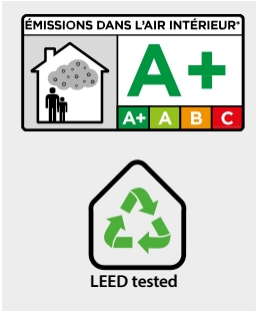
Anchor rods: Steel: ≥ FKL. 5.8; A4, HCR: ≥ FKL 70			M8	M8 / M10			M12 / M16		
Sieve sleeves VM-SH			12x80	16x85	16x130	16x130/330	20x85	20x130	20x200
Drill hole diameter	d_0	[mm]	12	16	16	16	20	20	20
Drill hole depth	h_0	[mm]	85	90	135	135 + t_{fix}	90	135	205
Drilling method						Rotary drilling			
Minimum wall thickness	h_{min}	[mm]	115	115	175	175	115	175	240
Through-hole in the connected component	$d_f \leq$	[mm]	9	9 / 12	9 / 12	9 / 12	14 / 18	14 / 18	14 / 18
Assembly torque	$T_{inst,max}$	[Nm]				See stone data			
Mortar requirement per drill sleeve		[ml]	11,2	24,9	38,0	38 - 68[1]	41,1	62,9	96,7
Drill holes per cartridge	VM-EA 300	[Piece]	23	10	6	3 - 6[1]	6	4	2
	VM-EA 345	[Piece]	27	12	8	4 - 8[1]	7	4	3
	VM-EA 420	[Piece]	33	15	10	5 - 10[1]	9	6	3

1) Depending on actual sleeve length

Injection system VM-Multi plus

Universally applicable 2-component composite mortar for medium to heavy-duty fastening in concrete, solid and perforated bricks

VM-Multi plus is a polyester resin-based composite mortar for heavy-duty, low expansion pressure fixings in all solid building materials. Reliable use in perforated bricks is also possible when using perforated sleeves.



With perforated sleeve suitable for anchoring in:
vertically perforated bricks, perforated sand-lime bricks, hollow blocks, hollow pumice blocks, hollow core slabs and other perforated and hollow chamber bricks

Without sieve sleeve suitable for anchoring in:
Concrete, lightweight concrete, solid brick, solid sand-lime brick, clinker, rock and other solid building materials

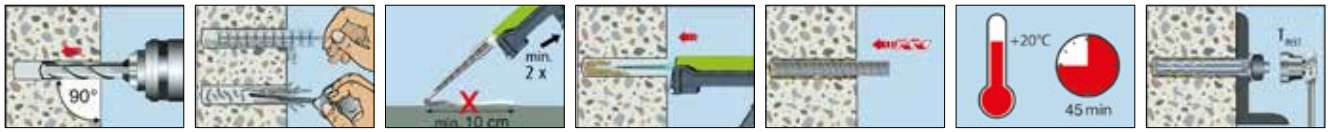
Advantages:

- Styrene-free, therefore less inherent odor
- Only one composite mortar for almost all building materials
- Versatile use with various connecting elements such as anchor and threaded rods, internally threaded sleeves, reinforcing bars, iron rods, pipes, hooks, screws, etc.
- Almost closed borehole
- After removing the static mixer, cleaning and resealing the cartridge head, the remaining amount of composite mortar can be used again
- Shelf life: 18 months

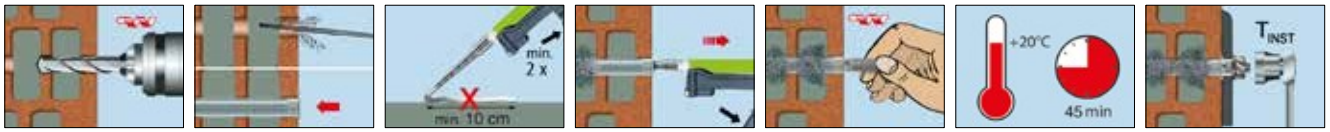
With millimeter scale
for exact dosing

Assembly

In concrete and solid stone



In perforated stone



Tip: If there are several fixing points, first prepare all the drill holes and then apply the composite mortar quickly and without delay.

Anchor rod / internally threaded sleeve			M 6	M 8	M 10	M 12	M 16	M 20	M 6 x 40 IG	M 8 x 70 IG	M 10 x 70 IG	M 12 x 70 IG
Assembly data in concrete and solid stone (without sieve sleeve)												
Drill core diameter	d_o	[mm]	8	10	12	14	18	22	10	14	16	18
Through hole in the component to be connected	$d_f \leq$	[mm]	7	9	12	14	18	22	7	9	12	14
Drill hole depth	$h_1 \geq$	[mm]	60	80	90	110	125	170	60	85	85	85
Drive	SW	[mm]	10	13	17	19	24	30	10	13	17	19
Material consumption*	Approx.	[ml]	3,0	5,2	7,3	10,8	17,0	30,4	3,9	8,4	10,0	11,6

Sieve sleeve			12 x 50	15 x 85	15 x 130	20 x 85
Assembly data In perforated stone (with perforated sleeve)						
Drill core diameter	d_o	[mm]	12	16	16	20
Drill hole depth	$h_1 \leq$	[mm]	60	95	140	95
Material consumption*	Approx.	[ml]	7	20	30	31

* Material consumption in approximate values under optimum application conditions, the pre-run was not taken into account

Injection mortar VM-Multi plus, 300 ml, in tubular film cartridge

- With static mixer
- Shelf life: 12 months

Designation	Article no.	Contents	PU
Injection mortar VM-Multi plus 300	0912 001 300	300 ml	12

Injection mortar VM-Multi plus, 330 ml

- With static mixer
- Shelf life: 18 months

Designation	Article no.	Contents	PU
Injection mortar VM-Multi plus 330	0912 001 330	330 ml	12

Injection mortar VM-Multi plus, 420 ml

- With static mixer
- Shelf life: 18 months

Designation	Article no.	Contents	PU
Injection mortar VM-Multi plus 420	0912 001 420	420 ml	12

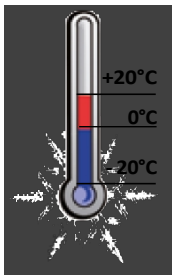
Curing times for injection mortar VMU-Multi plus

Substrate temperature		+5 °C	+10 °C	+20 °C	+30 °C	+35 °C
Processing time	[min]	25	15	6	4	2
Curing time	[min]	120	80	45	25	20

Cartridge temperature ≥ 5° C, drill hole ice-free

Injection system VM-Winter

Universally applicable composite mortar for the cold season



Advantages:

- Particularly suitable for low temperatures from -20 °C to +20 °C
- Temperature range applies to environment, substrate and cartridge
- Your advantages, even at low temperatures:
  - Low squeezing pressure
  - Fast curing, short waiting times
  - No need to keep the cartridges warm or preheat them
- For fastenings in solid brick, perforated brick and concrete
- Opened cartridges can be reused after resealing with the sealing cap
- Delivery including static mixer

With millimeter scale for exact dosing

Tubular foil cartridge

- Can also be used with silicone squeeze guns
- Shelf life: 12 months

Designation	Article no.	Contents	PU
Injection mortar VM-Winter	0911 020 300	300 ml	1

Coaxial cartridge

- Shelf life: 18 months

Designation	Article no.	Contents	PU
Injection mortar VM-Winter	0911 020 330	330 ml	1
Injection mortar VM-Winter	0911 020 420	420 ml	1

Curing times for VM-Winter injection mortar

Substrate temperature		-20 °C	-15 °C	-10 °C	-5 °C	0 °C	+5 °C	+10 °C	+15 °C	+20 °C
Processing time	[min]	90	75	60	50	25	10	6	3	1,5
Curing time		24 h	16 h	10 h	5 h	150 min	80 min	60 min	45 min	35 min

Cartridge temperature ≥ 5° C, drill hole ice-free

Plastic sieve sleeve KSH

- For fastening in perforated bricks
- With centering insert for adapting to different anchor rod sizes

Article no.	Outer Ø mm	Length mm	Suitable for anchor rods / internally threaded sleeves	PU
0912 512 050	12	50	M 6-M 8, M 6 IG	10
0912 516 085	16	85	M 8-M 10, M 8 IG	10
0912 516 130	16	130	M 8-M 10, M 8 IG	10
0912 520 085	20	85	M 12, M 10 IG	10

Metal sieve sleeve, by the meter

- For fastening in perforated bricks
- The screen sleeves can be adapted to the required length by cutting and crimping

Article no.	Outer Ø mm	Length mm	Suitable for anchor rods / internally threaded sleeves	PU
0912 600 121	10	1.000	M 6-M 8, M 6 IG	5
0912 600 161	14	1.000	M 8-M 10, M 8 IG	5
0912 600 221	20	1.000	M 12-M16, M 10 IG, M 12 IG	5

Anchor rod

Material: Steel 5.8, galvanized With nut and washer

Article no.	Diameter mm	Length mm	Suitable for sieve sleeves Outer Ø x length mm	PU
0912 206 070	M 6	70	12 x 50, 12 x 1,000	10
0912 208 100	M 8	100	12 x 50, 15 x 85, 12 x 1,000, 16 x 1,000	10
0912 210 110	M 10	110	15 x 85, 16 x 1,000	10
0912 212 115	M 12	115	20 x 85, 22 x 1,000	10

Female threaded sleeve (IG)

Material: galvanized steel

- Ribbed surface for a secure hold in the bonding mortar
- With centering ring

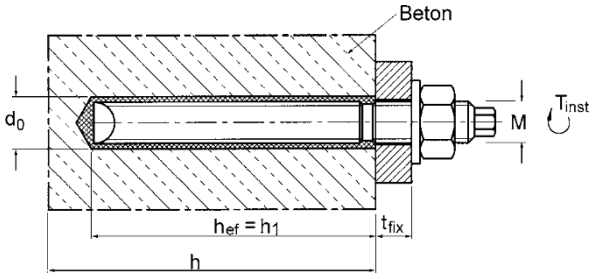
Article no.	Internal thread mm	Outer Ø x length mm	Suitable for sieve sleeves Outer Ø x length mm	PU
0912 406 051	M 6 x 40	8 x 51	12 x 50, 12 x 1,000	10
0912 408 081	M 8 x 70	12 x 81	16 x 85, 16 x 130, 16 x 1,000	10
0912 410 081	M 10 x 70	14 x 81	20 x 85, 22 x 1,000	10
0912 412 081	M 12 x 70	16 x 81	22 x 1.000	10

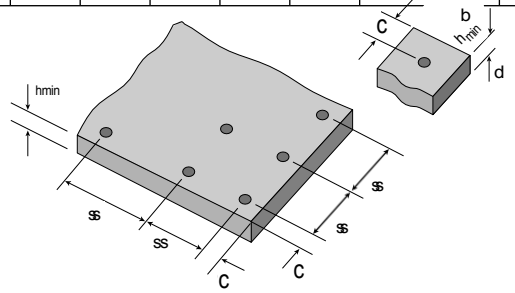
Recommended loads and distances for anchoring in concrete

VM-Multi / VM-Winter			M 8	M 10	M 12	M 16	M 20
Loads and characteristic values when using composite anchor rods V-A (steel 5.8 / stainless steel A4-70)							
Recommended centric tensile load of a single anchor without axis and edge influence							
Uncracked concrete C20/25	recom. N	[kN]	4,7	7,1	10	11,2	18,8
Recommended shear load of a single anchor without center and edge distances							
Uncracked concrete C20/25	recom. V	[kN]	5,1	8,6	12	22,3	34,9
Maximum bending moment	max. m	[Nm]	19,0	37,0	65	166	324
Center and edge distances							
Anchoring depth	h_{ef}	[mm]	80	90	110	125	170
Center distance	s	[mm]	160	180	220	250	340
Edge distance	c	[mm]	80	90	110	125	170
Minimum component thickness	h_{min}	[mm]	120	130	150	165	210
Assembly data							
Drill core diameter	d_o	[mm]	10	12	14	18	22
Drill hole depth	h_1	[mm]	80	90	110	125	170
Torque when anchoring	$T_{inst} \leq$	[Nm]	10	20	40	60	120
Width across flats	SW	[mm]	13	17	19	24	30

Recommended loads and distances for anchoring in masonry

Perforated brick			MZ	KS 12	≥ HLz 4	≥ HLz 6	≥ HLz 12	≥ KSL 4	≥ KSL 6	≥ KSL 12	≥ Hbl 2	≥ Hbl 4	≥ Hbn 4
Loads and characteristic values when using RECA anchor rods and internally threaded sleeves, for perforated bricks additionally perforated sleeve 15 x 85													
Recommended loads for tension, shear load and diagonal pull at any angle													
Borehole production using the rotary drilling method	recom. F	[kN]	-	-	0,6	0,8	1,0	0,6	0,8	1,4	0,5	0,8	0,8
Borehole production using the percussion drilling method	recom. F	[kN]	1,7	1,7	0,3	0,4	0,8	0,4	0,6	0,8	0,3	0,6	0,6
Center and edge distances													
Center distance	s	[mm]	100	100	100	100	100	100	100	100	200	200	200
Edge distance	c	[mm]	250	250	250	250	250	250	250	250	250	250	250





Injection system VMH

Modern hybrid mortar in combination with commercially available threaded rods with 3.1 certificate for the highest loads in cracked concrete

Product description:

The VMH injection system is a versatile injection anchor system for anchoring heavy loads in cracked and non-cracked concrete. It consists of a styrene-free hybrid injection mortar in a mortar cartridge and an anchor rod V-A, anchor rod VMU-A or an internally threaded sleeve VMU-IG. A commercially available anchor rod with strength certificate 3.1 or reinforcing steel can also be used. The variable anchoring depths enable optimum adaptation to the respective installation situation, even under seismic action.

Advantages:

- Highest load level in cracked and non-cracked concrete of strength classes C20/25 to C50/60
- Variable anchoring depths
- fast curing times (e.g. 30 min at +20 °C
- Wide range of approved anchor rods
- Substrate temperature during application -5°C to 40°C
- Styrene-free
- General type approval for use in coated FD / FDE concrete surfaces in LAU systems Z-74.8-204
- General type approval as concrete-concrete connector Z-21.8-2126

Application examples

Anchoring of heavy loads in cracked and non-cracked concrete: steel substructures, railings, base plates, supports, brackets, façade substructures.

Reinforcing steel in cracked and non-cracked concrete with shear forces: shear dowels, wall connection reinforcement, concreting joints

Chemical basis: 2-component resin Note on contents: Coaxial cartridge incl. static mixer Shelf life from production: 18 months

Item no.	Type designation	Contents	PU
0911 006 330	Injection mortar VMH 320	320 ml	1/12

Item no.	Type designation	Contents	PU
0911 006 420	Injection mortar VMH 420	420 ml	1/12

Anchor rods and internally threaded sleeves for applications in cracked and non-cracked concrete

Anchor rod VMU-A
Galvanized steel 5.8

Designation	Article number	Usable length in concrete mm	PU Piece
VMU-A 8x100	0911 508 100	90	10
VMU-A 8x110	0911 508 110	100	10
VMU-A 10x110	0911 510 110	100	10
VMU-A 10x130	0911 510 130	120	10
VMU-A 10x150	0911 510 150	140	10
VMU-A 12x120	0911 512 121	105	10
VMU-A 12x130	0911 512 131	115	10
VMU-A 12x135	0911 512 135	120	10
VMU-A 12x155	0911 512 155	140	10
VMU-A 12x175	0911 512 175	160	10
VMU-A 12x185	0911 512 185	170	10
VMU-A 12x210	0911 512 210	195	10
VMU-A 12x225	0911 512 225	210	10
VMU-A 12x265	0911 512 265	250	10
VMU-A 16x175	0911 516 175	155	10
VMU-A 16x205	0911 516 205	185	10
VMU-A 16x235	0911 516 235	215	10
VMU-A 20x240	0911 520 240	220	10

Anchor rod VMU-A A4
Stainless steel A4

Designation	Article number	Usable length in concrete mm	PU Piece
VMU-A 8x100 A4	0911 908 100	90	10
VMU-A 8x110 A4	0911 908 110	100	10
VMU-A 10x110 A4	0911 910 110	100	10
VMU-A 10x130 A4	0911 910 130	120	10
VMU-A 10x150 A4	0911 910 150	140	10
VMU-A 12x120 A4	0911 912 120	105	10
VMU-A 12x130 A4	0911 912 131	115	10
VMU-A 12x135 A4	0911 912 135	120	10
VMU-A 12x155 A4	0911 912 155	140	10
VMU-A 12x175 A4	0911 912 175	160	10
VMU-A 12x185 A4	0911 912 185	170	10
VMU-A 12x225 A4	0911 912 225	210	10
VMU-A 12x265 A4	0911 912 265	250	10
VMU-A 16x175 A4	0911 916 175	155	10
VMU-A 16x205 A4	0911 916 205	185	10
VMU-A 16x235 A4	0911 916 235	215	10
VMU-A 20x240 A4	0911 920 240	220	10

Anchor rods and internally threaded sleeves for applications in cracked and non-cracked concrete

Anchor rod V-A

Designation	Article no.	Dimension mm	Clamping thickness mm	Anchoring depth mm	PU Piece
Material: Steel 5.8, galvanized					
V-A M8-110	0913 108 110	M 8 x 110	20	80	10
V-A M10-130	0913 110 130	M 10 x 130	30	90	10
V-A M10-165	0913 110 165	M 10 x 165	65	90	10
V-A M12-160	0913 112 160	M 12 x 160	35	110	10
V-A M12-220	0913 112 220	M 12 x 220	95	110	10
V-A M12-300	0913 112 300	M 12 x 300	175	110	10
V-A M16-165	0913 116 165	M 16 x 165	20	125	10
V-A M16-190	0913 116 190	M 16 x 190	45	125	10
V-A M16-250	0913 116 250	M 16 x 250	105	125	10
V-A M20-260	0913 120 260	M 20 x 260	60	170	10
Material: A4 stainless steel					
V-A M8-110 A4	0913 208 110	M 8 x 110	20	80	10
V-A M10-130 A4	0913 210 130	M 10 x 130	30	90	10
V-A M12-160 A4	0913 212 160	M 12 x 160	35	110	10
V-A M16-190 A4	0913 216 190	M 16 x 190	45	125	10
V-A M20-260 A4	0913 220 260	M 20 x 260	60	170	10

Anchor rods and sieve sleeves for applications in solid and perforated brickwork

Anchor rod VMU-A

Galvanized steel 5.8/stainless steel A4

Designation	Article number		Effective length	Solid brick without sieve sleeve		Solid or perforated brick with perforated sleeve VM-SH						PU
	Galvanized steel 5.8	Stainless steel A4		Drill hole Ø x depth	Maximum clamping thickness tfix	VM-SH 12 x	VM-SH 16 80x	VM-SH 85x	16VM-SH 130x	20VM-SH 85x	20VM-SH 20 130x 200	
						Drill hole Ø x depth mm						
						12 x	8516 x	9016 x	13520 x	9020 x	13520 x 205	Piece
			mm	mm	mm	Maximum clamping thickness tfix mm						
VMU-A 8 x 100	0911 508 100	0911 908 100	90	10 x 80	10	10	5	-	-	-	-	10
VMU-A 8 x 110	0911 508 110	0911 908 110	100	10 x 80	20	20	15	-	-	-	-	10
VMU-A 10 x 110	0911 510 110	0911 910 110	100	12 x 90	10	-	15	-	-	-	-	10
VMU-A 10 x 130	0911 510 130	0911 910 130	120	12 x 90	30	-	35	-	-	-	-	10
VMU-A 10 x 150	0911 510 150	0911 910 150	140	12 x 90	50	-	55	10	-	-	-	10
VMU-A 12 x 120	0911 512 121	0911 912 120	105	14 x 100	5	-	-	-	20	-	-	10
VMU-A 12 x 130	0911 512 131	0911 912 131	115	14 x 100	15	-	-	-	30	-	-	10
VMU-A 12 x 135	0911 512 135	0911 912 135	120	14 x 100	20	-	-	-	35	-	-	10
VMU-A 12 x 155	0911 512 155	0911 912 155	140	14 x 100	40	-	-	-	55	10	-	10
VMU-A 12 x 175	0911 512 175	0911 912 175	160	14 x 100	60	-	-	-	75	30	-	10
VMU-A 12 x 185	0911 512 185	0911 912 185	170	14 x 100	70	-	-	-	85	40	-	10
VMU-A 12 x 210	0911 512 210		195	14 x 100	95	-	-	-	110	65	-	10
VMU-A 12 x 225	0911 512 225	0911 912 225	210	14 x 100	110	-	-	-	125	80	10	10
VMU-A 12 x 265	0911 512 265	0911 912 265	250	14 x 100	150	-	-	-	165	120	50	10
VMU-A 16 x 175	0911 516 175	0911 916 175	155	18 x 100	55	-	-	-	70	25	-	10
VMU-A 16 x 205	0911 516 205	0911 916 205	185	18 x 100	85	-	-	-	100	55	-	10
VMU-A 16 x 235	0911 516 235	0911 916 235	215	18 x 100	115	-	-	-	130	85	15	10
VMU-A 20 x 240	0911 520 240	0911 920 240	220	22 x 100	120	-	-	-	-	-	-	10

ETA-17/0716

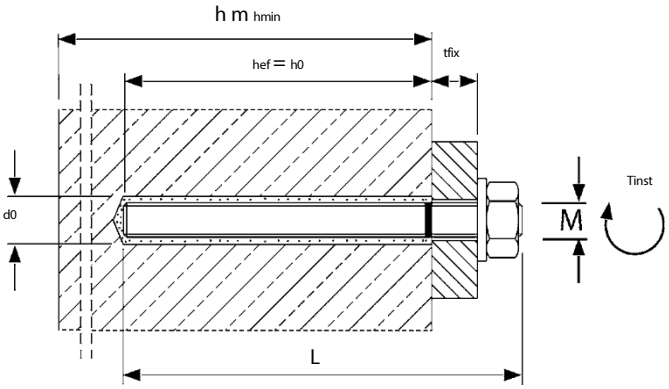
Extract from the conditions of use of the European Technical Assessment ETA-17/0716 for use in cracked and non-cracked concrete (Option 1)

Permissible loads according to EN 1992-4 for a service life of up to 50 years without the influence of center distances and edge distances in dry or damp conditions.
Concrete with compressed air cleaning in temperature range I -40°C to +24°C (briefly up to +40°C) and in temperature range II -40°C to +50°C (b r i e f l y up to +80°C). The influence of the permanent load with the factor Ψsus = 1.0 and the total safety factor (γM and $_{\gamma F}$) were taken into account.
For further details and temperature ranges see ETA. For load-bearing capacities under fire exposure, see page 195.

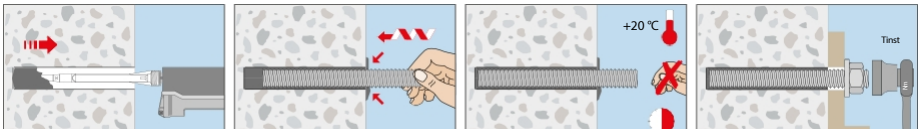
Loads and characteristic valuesInjection system VMH M8-M30 Temperature range I -40°C to +24°C/+40°C1) and temperature range II -40°C to +50°C/+80°C1)											
Anchor rods			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**	
Anchoring depth range hef,min - hef,max		[mm]	60 - 16060	-	20070 - 24080	- 32090	- 40096	- 480108	- 540	120 - 600	
Injection system VMH, anchor rod steel 5.8											
Permissible tensile load for hef,min - hef,max											
Cracked concrete	C20/25 perm		. N [kN]	5.0 - 8.	66.7 - 13.	89.6 - 20.011	.7 - 37.	114.0 - 58.	115.4 - 83.818	.4 - 109.5	21.6 -
Uncracked concrete	C20/25 permissible	N [kN]	8,610	,9 - 13,813	,7 - 20,	016,8 - 37,	120,0 - 58,	122,0 - 83,826	,3 -		
109,5 30,8 - 133,3											
133.3											
Cracked concrete	C20/25 permissible	V [kN]	6,3	9,7	14,	323,5 - 26,928	,0 - 42,	330,8 - 60,636	,8 - 78,		
943,1 - 96,0											
Uncracked concrete	C20/25 permissible	V [kN]	6,3	9,7	14,3	26,940	,0 - 42,	344,1 - 60,	652,6 - 78,	961,6 -	
Injection system VMH, anchor rod steel 8.8											
96,0											
Cracked concrete	C20/25 perm		. N [kN]	5.0 - 13.	46.7 - 21.	99.6 - 31.	911.7 - 59.514	.0 - 93.	315.4 - 120.6	18.4 - 152.7	21.6 -
188.5											
Uncracked concrete	C20/25 perm		. N [kN]	10.9 - 13.810	.9 - 21.913	.7 - 31.916	.8 - 59.	520.0 - 93.	322.0 - 134.3	26.3 - 175.2	30.8 - 213.8
Permissible shear load for hef,min - hef,max											
Cracked concrete	C20/25 permissible	V [kN]	8,6	13,	119,2 - 19,	423,5 - 36,	028,0 - 56,	030,8 - 80,636	,8 - 105,1	43,1 -	
Uncracked concrete	C20/25 permissible	V [kN]	8,6	13,1	19,	433,5 - 36,040	,0 - 56,	044,1 - 80,	652,6 - 105,1	61,6	
- 128,0											
Injection system VMH, anchor rod stainless steel A4-70, HCR-70											
Permissible tensile load for hef,min - hef,max											
Cracked concrete	C20/25 perm		. N [kN]	5.0 - 9.	96.7 - 15.	79.6 - 22.511	.7 - 42.	014.0 - 65.	315.4 - 94.	318.4 - 57.421	.6 -
Uncracked concrete	C20/25 permissible	N [kN]	9,910	,9 - 15,713	,7 - 22,516	,8 - 42,	020,0 - 65,	322,0 - 94,	326,3 - 57,		
430,8 - 70,2											
Permissible shear load for hef,min - hef,max											
Cracked concrete	C20/25 permissible	V [kN]	6,0	9,2	13,723	,5 - 25,	228,0 - 39,	430,8 - 56,8	34,5	42,0	
Uncracked concrete	C20/25 permissible	V [kN]	6,0	9,2	13,7	25,2	39,	444,1 - 56,8	34,5	42,0	
Center and edge distances											
Minimum component thickness for hef,min - hef,max	hmin	[mm]	100 - 190100	- 230100	- 270116	- 356134	- 444152	- 536168	- 600	190 - 670	
Minimum center distance	smin	[mm]	40	50	60	75	95	115	125	140	
Minimum edge distance	cmin	[mm]	35	40	45	50	60	65	75	80	
Assembly data											
Drill hole diameter	d0	[mm]	10	12	14	18	22	28	30	35	
Through-hole in the attachment part for pre-mountingf ≤		[mm]	9	12	14	18	22	26	30	33	
Through-hole in the attachment part for push-through mountingf ≤		[mm]	12	14	16	20	24	30	33	40	
Borehole depth range for hef,min - hef,max	h0	[mm]	60 - 16060	-	20070 - 24080	- 32090	- 40096	- 480108	- 540	120 - 600	
Anchoring torqueTinst ≤ [Nm]	10		2040	(FKL4.6: 35)		60	100	170	250	300	
Mortar requirement per 100 mm drilling depth		[ml]	6,53	8,16	9,82	13,61	17,89	32,25	30,69	48,67	

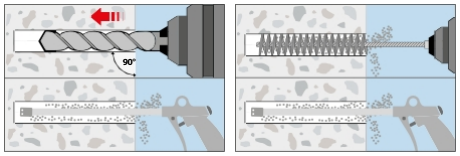
1)Max. Long-term temperature / max. short-term tempe-

Higher concrete strengths can lead to higher permissible loads. Manual cleaning or the use of a suction drill without subsequent cleaning can lead to lower loads. For further information, please refer to the European Technical Assessment ETA-17/0716.
The practical dimensioning program at www.recanorm.de/de/services/bemessungssoftware



Mounting threaded rod in concrete




90°

Extract from the conditions of use of the European Technical Assessment ETA-17/0716 for use in cracked and non-cracked concrete (Option 1)

Permissible loads according to EN 1992-4 for a service life of up to 50 years without the influence of center distances and edge distances in dry or damp conditions.
Concrete for compressed air cleaning in temperature range I -40°C to +24°C (briefly up to +40°C) and in temperature range II -40°C to +50°C (briefly up to +50°C).
at times up to +80°C). The influence of the permanent load with the factor $\Psi sus = 1.0$ and the total safety factor (γ_M and γ_F) were taken into account. For further information and temperature ranges see ETA.

Loads and characteristic valuesInjection system VMH IG M6 - IG M20				Temperature range I -40°C to +24°C/+40°C1) and temperature range II -40°C to +50°C/+80°C1)								
Internal threaded rod				**Internal thread M6 x 80**	**Internal thread M6 x 90**	**Internal thread M8 x 80**	**Internal thread M8 x 100**	**Internal thread M10 x 80**	**Internal thread M10 x 100**	**Internal thread M12 x 125**	**Internal thread M16 x 170**	**Internal thread M20 x 200**
Anchoring depth hef			[mm]	80	90	80	100	80	100	125	170	200
Injection system VMH, internal threaded rod VMU-IG steel 5.8												
Permissible tensile load for heavy												
Cracked permissible N [kN]	concreteC20/25			4,8	4,8	8,1	8,1	11,7	13,8	20,0	36,2	46,4
Uncracked permissible N [kN]	concreteC20/25			4,8	4,8	8,1	8,1	13,8	13,8	20,0	36,2	58,6
Permissible shear load for heavy												
Cracked permissible V [kN]	concreteC20/25			3,4	3,4	5,7	5,7	9,7	9,7	14,3	25,7	42,3
Uncracked permissible V [kN]	concreteC20/25			3,4	3,4	5,7	5,7	9,7	9,7	14,3	25,7	42,3
Injection system VMH, internal threaded rod VMU-IG stainless steel A4-70, HCR-70												
Permissible tensile load for heavy												
Cracked concrete	C20/25	permissible N	[kN]	5,3	5,3	9,9	9,9	11,7	15,7	22,5	36,3	31,0
Uncracked concrete	C20/25	permissible N	[kN]	5,3	5,3	9,9	9,9	15,7	15,7	22,5	42,0	31,0
Permissible shear load for heavy												
Cracked concrete	C20/25	permissible V	[kN]	3,2	3,2	6,0	6,0	9,2	9,2	13,7	25,2	18,6
Uncracked concrete	C20/25	permissible V	[kN]	3,2	3,2	6,0	6,0	9,2	9,2	13,7	25,2	18,6
Center and edge distances												
Minimum component thickness	hmin		[mm]	110	120	110	130	116	136	169	226	270
Minimum center distance	smin		[mm]	50	50	60	60	75	75	95	115	140
Minimum edge distance	cmin		[mm]	40	40	45	45	50	50	60	65	80
Assembly data												
Drill hole diameter	d0		[mm]	12	12	14	14	18	18	22	28	35
Through hole in the attachment part	df ≤		[mm]	7	7	9	9	12	12	14	18	22
Drill hole depth	h0		[mm]	80	90	80	100	80	100	125	170	200
Torque when anchoring	Tinst ≤		[Nm]	10	10	10	10	20	20	40	60	100
Mortar requirement per drill hole			[ml]	6,6	7,4	7,9	9,9	10,9	13,6	22,4	54,9	97,4

1)Max. Long-term temperature / max. short-term temperature.
Higher concrete strengths can lead to higher permissible loads. Manual cleaning or the use of a suction drill without subsequent cleaning can lead to lower loads. For further information, please refer to the European Technical Assessment ETA-17/0716.
The practical dimensioning program at www.recanorm.de/de/services/bemessungssoftware

Loads and characteristic values				Temperature range I -40°C to +24°C/+40°C1) and temperature range II -40°C to +50°C/+80°C1)									
Injection system VMH, reinforcing steel B500B				**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø24**	**Ø25**	**Ø28**	**Ø32**
Anchoring depth range hef,min - hef,max			[mm]	60 - 160	60 - 200	70 - 240	75 - 280	80 - 320	90 - 400	96 - 480	100 - 500	112 - 560	128 - 640
Permissible tensile load for hef,min - hef,max													
Cracked concrete	C20/25approved N		[kN]	3,9 - 10,5	4,9 - 16,5	7,5 - 25,9	10,2 - 38,1	11,7 - 49,8	14,0 - 77,8	15,4 - 112,0	16,4 - 130,9	19,4 - 164,2	23,7 - 214,5
Uncracked concrete	C20/25approved N		[kN]	10,1 - 13,8	10,9 - 21,6	13,7 - 31,2	15,2 - 42,4	16,8 - 55,4	20,0 - 86,6	22,0 - 124,5	23,4 - 135,2	27,8 - 169,6	33,9 - 221,6
Permissible shear load for hef,min - hef,max													
Cracked concrete	C20/25	permissible V	[kN]	6,5	9,9 - 10,1	14,5	19,8	23,5 - 25,9	28,0 - 40,4	30,8 - 58,1	32,8 - 63,1	38,9 - 79,2	47,5 - 103,4
Uncracked concrete	C20/25	permissible V	[kN]	6,5	10,1	14,5	19,8	25,9	40,0 - 40,4	44,1 - 58,1	46,9 - 63,1	55,5 - 79,2	67,8 - 103,4
Center and edge distances													
Minimum component thickness for hef,min - hef,max hmin			[mm]	100 - 190	100 - 230	100 - 270 /	111 - 316	120 - 360	140 - 450	160 - 544	164 - 564	182 - 630	208 - 720
Minimum center distance	smin		[mm]	40	50	60	70	75	95	120	120	130	150
Minimum edge distance	cmin		[mm]	35	40	45	50	50	60	70	70	75	85
Assembly data 1)Max. long-term temperature / max. short-term tempe-													
Drill hole diameter	d0		[mm]	10/122)	12/142)	14/162)	18	20	25	32	32	35	40
Borehole depth range for hef,min - hef,max	h0		[mm]	60 - 160	60 - 200	70 - 240	75 - 280	80 - 320	90 - 400	96 - 480	100 - 500	112 - 560	128 - 64
[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[3)] The second value is valid for the larger drilling diameter

Higher concrete strengths can lead to higher permissible loads. Manual cleaning or the use of a suction drill without subsequent cleaning can lead to lower loads. For further information, please refer to the European Technical Assessment ETA-17/0716.

The practical dimensioning program at www.recanorm.de/de/services/bemessungssoftware

Accessories for injection system VMH for subsequent reinforcement connection (special article)

Concrete steel Ø	Tie rod drill Ø		blow-out gun / Compressed air system	Cleaning brush RB	Injection adapter VM-IA1)	Mixer extension1)	Maximum permissible drilling depth for ejection gun: VM-P 345 Standard, VM-P 345 Profi, VM-P 380 Standard, VM-P 380 Profi, VM-P 345 battery, VM-P 380 battery, VM-P 825 rechargeable battery3)	Maximum permissible drilling depth for ejection gun: VM-P 345 Pneumatic Eco, VM-P 380 Pneumatic Eco, VM-P 380 Pneumatics	Maximum permissible drilling depth for ejection gun: VM-P825 Pneumatic3)
mm	mm	mm					mm	mm	mm
8		12	VM-ABP 200 DLS with RS, RS25	RB 12 M6 RB 12 M8		-VM-XE 10	700	800	800
10		14	VM-ABP 200 DLS with RS, RS25	RB 14 M6 RB 14 M8	VM-IA 14 1)	VM-XE 10	700	1000	1000
12	ZA-M12	16	VM-ABP 200 / 100RB DLS with RS, RS25RB	16 M6 16 M8	VM-IA 16 1)	VM-XE 10	700	1000	1200
14		18	VM-ABP 200 / 1 DLS with RS, RS	RB 18 M6 RB 18 M8	VM-IA 18 1)	VM-XE 102), VM-XLE 16	700	1000	1400
16	ZA-M16	20	VM-ABP 200 / 250 / 500 / 1000 DLS with RS, RS25	RB 20 M6 RB 20 M8	VM-IA 20 1)	VM-XE 102),	700	1000	1600
20	ZA-M20	25	VM-ABP 200 / 250/ 500 / 1000 DLS with RS, RS25	RB 25 M8 RB 26 M6	VM-IA 25 1)	VM-XE 102), VM-XLE 16	500	700	2000
22		28	VM-ABP 250 / 500 / 1000 DLS with RS, RS25		VM-IA 28 1)	VM-XE 102), VM-XLE 16	500	700	2000
24 / 25	ZA-M24	32	VM-ABP 250 / 500 / 1000 DLS with RS, RS25	RB 28 M6	VM-IA 32 1)	VM-XE 102), VM-XLE 16	500	500	2000
			VM-ABP 250 / 500 /1000 DLS with RS, RS35	RB 35 M6 RB 35 M8	VM-IA 35 1)	VM-XE 102),	500	500	2000
28		35	VM-ABP 250 / 500 /1000 DLS with RS, RS35		VM-IA 40 1)	VM-XE 102),	500	500	2000
32			40VM-ABP 250 / 500 / 1000	RB 40 M6		VM-XLE 16			

1) If the static mixer does not reach the bottom of the drill hole (see usable length of static mixer), a mixer extension must be used. From a drill hole Ø d_0 ≥ 14 mm, injection adapters and mixer extensions must be used for horizontal and overhead installation and for drill hole depths > 240 mm
2) Not in conjunction with the VM-P 825 pneumatic ejection gun
3) VMH 825 cartridge available on request

ETA-17/0715

Extract from the conditions of use of the European Technical Assessment ETA-17/0715 for post-installed reinforcement connection with injecton system VMH

Normal concrete Strength class	C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
Rated value of bond stress1) $f_{bd,PIR}$ [N/mm²] Hammer, suction and pneumatic drilling	1,6	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,3

1) The values for $f_{bd,PIR}$ are for good bonding conditions according to EN 1992-1-1:2004

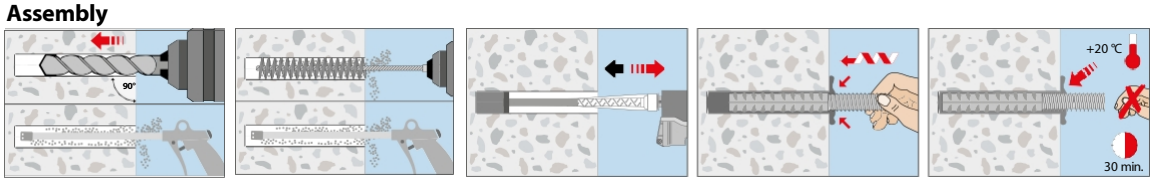
Installation data and mortar requirements Injection system VMH for reinforcement connection

Bar Ø	[mm]	8	10	12	14	16	20	22	24	25	28	32
Drill hole Ø	d_0 [mm]	12	14	16	18	20	25	28	32	32	35	40
Mortar requirement / 100 mm setting depth	[ml]	8,46	10,12	11,78	13,44	15,09	23,11	30,4	44,65	40,03	44,22	57,32

Installation data for injection system VMH with tie rod

Tie rod ZA / thread			ZA M12	ZA M16	ZA M20	ZA M24
Bar diameter		[mm]	12	16	20	25
Drill hole diameter	do	[mm]	16	20	25	32
Through hole in the attachment partf ≤		[mm]	14	18	22	26
Effective setting depth	lv	[mm]		according to static	Calculation	
Torque during anchoringTinst ≤		[Nm]	50	100	150	150
Width across flats	SW	[mm]	19	24	30	36
Mortar requirement / 100 mm setting depth		[ml]	11,78	15,09	23,11	40,03

Assembly



Accessories for processing RECA anchor technology, in particular the injection systems VMZ, VMU plus, VM-EA, VMH and VM-Multi plus

Static mixer VM-X

- With scaling (12 graduation marks)
- Suitable for all RECA injection mortars, except injection mortar VMH

Designation	Article no.	PU
Static mixer VM-X	0911 001 301	10

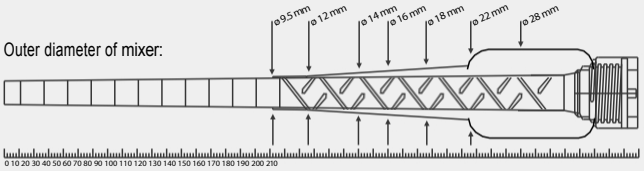
Static mixer VM-XH

- With scaling
- Suitable for RECA injection mortar VMH

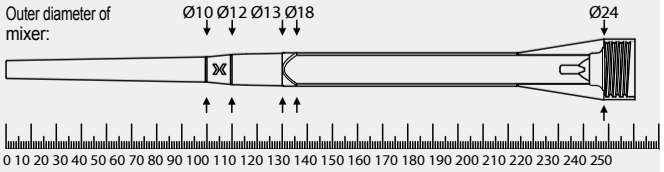
Designation	Article no.	PU
Static mixer VM-XH	0911 001 305	10

Boreholes must always be filled with mortar bubble-free from the bottom of the borehole. This is only possible if the mixer tip really reaches the bottom of the drill hole and only then can mortar be pressed out. If the mixer is not long enough for this due to the drilling depth or larger clamping thicknesses for through-hole installation, a mixer extension must be used.

Effective length static mixer VM-X



Effective length static mixer VM-XH



Backfill disk VS

Advantages

The backfill disk makes it possible to subsequently backfill the annular gap.

- Enables larger through holes in the add-on part
- Increased permissible shear loads under seismic action

Application

For subsequent filling of through-holes in conjunction with the BZ3 and BZ plus bolt anchors and the VMZ, VMH, VMU plus injection systems.

Note

When selecting dowels, take into account that the clamping thickness is reduced by up to 6 mm!

There are 10 mixer reducers per pack of 20, 5 per pack of 10 and 2 per pack of 4.

Galvanized steel

Stainless steel A4

Designation Galvanized steel	Article number	Designation Stainless steel A4	Article number	Suitable for thread	Inside Ø mm	Outer Ø mm	Slice thickness mm	Reduction of the clamping thickness t_{fix} for BZ3, BZ plus, BSZ mm	Reduction of the clamping thickness t_{fix} for VMZ, VMH, VMU plus, VME plus mm	Package contents Piece
VS M8, steel vz	0914 600 008	VS M8 A4	0914 600 908	M8	9	23	5	5	3,4	20
VS M10, steel vz	0914 600 010	VS M10 A4	0914 600 910	M10	12	26	5	5	3	20
VS M12, steel vz	0914 600 012	VS M12 A4	0914 600 912	M12	14	28	5	5	2,5	20
VS M16, steel vz	0914 600 016	VS M16 A4	0914 600 916	M16	17	34	5	5	2	10
VS M20, steel vz	0914 600 020	VS M20 A4	0914 600 920	M20	21	41	5	5	2	10
VS M24, steel vz	0914 600 024	VS M24 A4	0914 600 924	M24	25	48	6	6	2	4

Injection adapter VM-IA

- For bubble-free injection of the mortar into the drill hole
- Suitable for mixing tube extension VM-XE
- Color: Black

Designation	Article no.	For Drill hole Ø mm	Suitable for Threaded rods	Suitable for Concrete steel	PU
VM-IA 14	0911 001 014	14	M 12	Ø 10	20
VM-IA 16	0911 001 016	16	-	Ø 12	20
VM-IA 18	0911 001 018	18	M 16	Ø 14	20
VM-IA 20	0911 001 020	20	-	Ø 16	20
VM-IA 24	0911 001 024	24	M 20	Ø 20	20
VM-IA 25	0911 001 025	25	-	Ø 20	20
VM-IA 28	0911 001 028	28	M 24	Ø 22	20
VM-IA 32	0911 001 032	32	M 27	Ø 24,25	20
VM-IA 35	0911 001 035	35	M 30	Ø 28	20
VM-IA 40	0911 001 040	40	-	Ø 32	20

Mixing pipe extension VM-XE

- Extension tubes for greater drilling depths

Designation	Article no.	Length mm	Ø mm	Use in conjunction with	PU
VM-XE 10/200	0912 130 200	200	10	VM-X	25
VM-XE 10/500	0912 130 500	500	10	VM-X	10
VM-XE 10/1000	0912 131 000	1000	10	VM-X	10

Note: Anchoring up to 640 mm h_{ef} is possible using dowel technology.
This requires borehole depths of up to approx. 700 mm. Mixing pipe extensions are required for optimum borehole filling

Cleaning brushes RB M 6

- With connection thread M 6
- To extend for large drilling depths
- Separate SDS-plus adapter with M6 internal thread for SDS-plus mount
- Can be clamped directly into the drill with a ring gear chuck

Designation	Article no.	For drilling holes-Ø mm	Total length of the brush mm	Suitable for Threaded rods	Suitable for Concrete steel	PU
RB 10 M 6	0914 100 08	10	130	M 8	-	1
RB 12 M 6	0914 100 10	12	140	M 10	Ø 8	1
RB 14 M 6	0914 100 12	14	180	M 12	Ø 10	1
RB 16 M 6	0914 100 14	16	200	-	Ø 12	1
RB 18 M 6	0914 100 16	18	200	M 16	Ø 14	1
RB 20 M 6	0914 100 18	20	220	-	Ø 16	1
RB 24 M 6	0914 100 20	24	250	M 20	Ø 20	1
RB 26 M 6	0914 100 24	25,26	290	-	Ø 20	1
RB 28 M 6	0914 100 28	28	260	M 24	Ø 22	1
RB 32 M 6	0914 100 32	32	350	M 27	Ø 24,25	1
RB 35 M 6	0914 100 35	35	350	M 30	Ø 28	1
RB 40 M 6	0914 100 40	40	350	-	Ø 32	1
Brush extension with thread for RB M 6 SDS-						
RBL M 6	0914 100 002		150	Gear rim drill chuck		1
plus adapter for RB M 6 cleaning brushes						
RBL M 6 SDS	0914 100 001		110	SDS-plus drill chuck		1

Cleaning brush RB-H 18 with handle

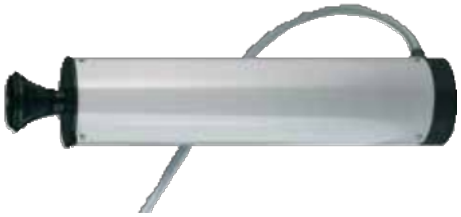
- Borehole cleaning in solid and perforated brickwork
- Cleaning brush with nylon trim and wooden cross handle
- Only one brush for all hole diameters in masonry

Designation	Article no.	For Drill hole Ø mm	Total length of the brush mm	PU
RB-H Nylon 18/250	0911 118	10-16	250	1
RB-H Nylon 18/400	0911 118 400	10-16	400	1

Blow-out pump VM-AP

- For drill holes from M 8

Designation	Article no.	Size mm	Volume liters	PU
VM-AP 06	0912 70	70 x 315	0,6	1
VM-AP 09	0914 110	70 x 415	0,9	1



Note: The products for cleaning drill holes for anchoring in concrete can of course also be used for cleaning drill holes in masonry.

Blowers

Designation	Article no.	PU
Diffuser Ø 70 mm / 143 ml	0912 7	1

Compressed air nozzle VM-ABP

- Borehole cleaning with compressed air for boreholes from 240 mm drilling depth or from 20 mm diameter
- For optimum cleaning, the cleaning nozzle must reach the bottom of the drill hole

Designation	Article no.	Nozzle Ø mm	Max. Drilling depth mm	For drill hole Ø mm	PU
VM-ABP 250	0914 120	16	240	18-40	1
VM-ABP 500	0914 120 500	16	480	18-40	1

Compressed air hose VM-ABP

- Borehole cleaning with compressed air for boreholes up to 1 meter drilling depth
- For optimum cleaning, the cleaning nozzle must reach the bottom of the drill hole

Designation	Article no.	Nozzle Ø mm	Max. Drilling depth mm	For drill hole Ø mm	PU
VM-ABP 1000	0914 121 000	14	1.000	16-40	1

Compressed air blow gun

- Borehole cleaning with compressed air for boreholes from 240 mm drilling depth or from 20 mm diameter
- For optimum cleaning, the cleaning nozzle must reach the bottom of the drill hole

Article no.	Connection	PU
1696 500	With threaded plug nipple with 1/4" external thread	1
1696 501	With threaded plug nipple with 1/4" external thread	1

Article no. 1696 500

Article no. 1696 501

Handymax squeeze gun for 330 ml cartridges

- With level indicator
- Low squeezing resistance due to special transmission
- Extra sturdy design

Designation	Article no.	PU
Squeeze gun Handymax, 330 ml	0891 022 912	1

Premium VM squeeze gun for 330 ml cartridges

- With level indicator

Designation	Article no.	PU
Premium VM squeeze gun, 330 ml	0911 001 297	1

Standard squeeze gun for 330 ml cartridges

Designation	Article no.	PU
Squeeze gun standard, 330 ml	0891 020 912	1

Economax squeeze gun for 420 ml cartridges

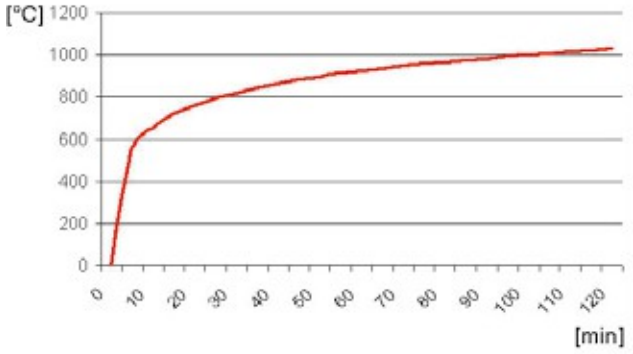
- Low squeezing resistance due to special transmission
- Suitable for coaxial cartridges 380 ml to 420 ml

Designation	Article no.	PU
Economax squeeze gun, 420 ml	0912 102 420	1

Tip! The following applies to all squeeze guns:
Regular cleaning and oiling extends the service life!

Fire fixings

Fire tested according to standard temperature curve taking into account ISO 834, DIN EN 1363-1: 1999-10, DIN EN 1363-1:2012, DIN 4102-2: 1977-09 in concrete with direct flame impingement without insulating or protective coatings and without the influence of center and edge distances. Detailed information can be found in the approvals, fire tests and expert reports. They are available at https://www.recanorm.de/de/loesungen/dokumente-zulassungen/duebeltechnik
are available for download or can be sent on request.



Heavy-duty fastening steel anchor

Fastening system	Documents	Size	Maximum tensile load [kN] in case of fire for fire resistance classes			
			R 30 (30 min)	R 60 (60 min)	R 90 (90 min)	R 120 (120 min)
Bolt anchor BZ3 Steel, galvanized 	ETA-19/0619	M8 $h_{ef,min}$	1,20	1,00	0,70	0,60
		M8 $h_{ef,std}$	1,20	1,00	0,70	0,60
		M8 $h_{ef,max}$	1,20	1,00	0,70	0,60
		M10 $h_{ef,min}$	1,74	1,74	1,30	1,00
		M10 $h_{ef,std}$	2,60	1,90	1,30	1,00
		M10 $h_{ef,max}$	2,60	1,90	1,30	1,00
		M12 $h_{ef,min}$	3,04	3,04	2,10	1,50
		M12 $h_{ef,std}$	4,60	3,30	2,10	1,50
		M12 $h_{ef,max}$	4,60	3,30	2,10	1,50
		M16 $h_{ef,min}$	5,86	5,60	3,50	2,50
		M16 $h_{ef,std}$	7,50	5,60	3,50	2,50
		M16 $h_{ef,max}$	7,50	5,60	3,50	2,50
Wedge anchor BZ3 A4 / HCR Stainless steel A4, stainless steel HCR 	ETA-19/0619	M8 $h_{ef,min}$	1,25	1,25	1,25	1,00
		M8 $h_{ef,std}$	2,34	2,34	1,80	1,20
		M8 $h_{ef,max}$	2,38	2,38	1,80	1,20
		M10 $h_{ef,min}$	1,74	1,74	1,74	1,39
		M10 $h_{ef,std}$	4,25	4,25	3,10	2,10
		M10 $h_{ef,max}$	4,25	4,25	3,10	2,10
		M12 $h_{ef,min}$	3,04	3,04	3,04	2,43
		M12 $h_{ef,std}$	5,50	5,50	4,90	3,40
		M12 $h_{ef,max}$	5,50	5,50	4,90	3,40
		M16 $h_{ef,min}$	5,86	5,86	5,86	4,69
		M16 $h_{ef,std}$	8,75	8,75	8,10	5,60
		M16 $h_{ef,max}$	8,75	8,75	8,10	5,60
Wedge anchor BZ3 dynamic Galvanized steel 	ETA-20/0117	M10	2,60	1,90	1,30	1,00
		M12	4,60	3,30	2,10	1,50
		M16	7,50	5,60	3,50	2,50
Wedge anchor BZ3 dynamic A4 Stainless steel A4 	ETA-20/0117	M10	4,25	4,25	3,10	2,10
		M12	5,50	5,50	4,90	3,40
		M16	8,75	8,75	8,10	5,60

Heavy-duty fastening steel anchor

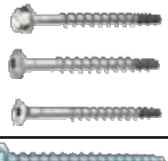
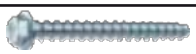
Fastening system	Documents	Size	Maximum tensile load [kN] in case of fire for fire resistance classes			
			F 30 (30 min)	F 60 (60 min)	F 90 (90 min)	F 120 (120 min)
Bolt anchor BZ plus Galvanized steel 	ETA-99/0010	M 8 $h_{ef,red}$/$h_{ef,std}$	1,25/1,25	1,10/1,10	0,80/0,80	0,60/0,70
		M 10 $h_{ef,red}$/$h_{ef,std}$	1,74/2,25	1,74/1,90	1,30/1,40	1,00/1,20
		M 12 $h_{ef,red}$/$h_{ef,std}$	3,04/4,00	3,00/3,00	1,90/2,40	1,30/2,20
		M 16 $h_{ef,red}$/$h_{ef,std}$	4,51/6,25	4,51/5,60	3,50/4,40	2,50/4,00
		M 20 $h_{ef,std}$	8,61	8,20	6,90	6,30
		M 24 $h_{ef,std}$	10,62	10,62	10,00	8,49
		M 27 $h_{ef,std}$	12,03	12,03	12,03	9,63
Bolt anchor BZ plus A4 Stainless steel A4, stainless steel 1.4529 	ETA-99/0010	M 8 $h_{ef,red}$/$h_{ef,std}$	1,25/1,25	1,25/1,25	1,25/1,25	1,00/1,00
		M 10 $h_{ef,red}$/$h_{ef,std}$	1,74/2,25	1,74/2,25	1,74/2,25	1,39/1,80
		M 12 $h_{ef,red}$/$h_{ef,std}$	3,04/4,00	3,04/4,00	3,04/4,00	2,43/3,20
		M 16 $h_{ef,red}$/$h_{ef,std}$	4,51/6,25	4,72/6,25	4,72/6,25	3,77/5,00
		M 20 $h_{ef,std}$	8,61	8,61	8,61	6,89
		M 24 $h_{ef,std}$	10,00	10,00	10,00	8,00
Bolt anchor B Galvanized steel, hot-dip galvanized steel 	Expert opinion 21716/2	M 6 $h_{ef,red}$/$h_{ef,std}$	0,60/0,60	0,50/0,50	0,30/0,30	0,30/0,30
		M 8 $h_{ef,red}$/$h_{ef,std}$	0,80/0,80	0,70/0,70	0,60/0,60	0,50/0,50
		M 10 $h_{ef,red}$/$h_{ef,std}$	1,80/1,80	1,50/1,50	1,00/1,00	0,80/0,80
		M 12 $h_{ef,red}$/$h_{ef,std}$	3,20/3,40	2,80/2,80	1,70/1,70	1,20/1,20
		M 16 $h_{ef,red}$/$h_{ef,std}$	4,60/6,30	4,60/5,20	3,20/3,20	2,30/2,30
		M 20 $h_{ef,red}$/$h_{ef,std}$	6,20/9,00	6,20/8,20	5,00/5,00	3,60/3,60
Bolt anchor B A4 Stainless steel A4, stainless steel 1.4529 	Expert opinion 21716/2	M 6 $h_{ef,red}$/$h_{ef,std}$	0,90/1,80	0,90/1,40	0,90/0,90	0,70/0,70
		M 8 $h_{ef,red}$/$h_{ef,std}$	1,30/2,30	1,30/2,30	1,30/2,10	1,00/1,00
		M 10 $h_{ef,red}$/$h_{ef,std}$	2,10/2,90	2,10/2,90	2,10/2,90	1,60/2,20
		M 12 $h_{ef,red}$/$h_{ef,std}$	3,20/6,10	3,20/6,10	3,20/4,80	2,50/3,90
		M 16 $h_{ef,red}$/$h_{ef,std}$	4,60/6,40	4,60/6,40	4,60/6,40	3,70/5,20
		M 20 $h_{ef,red}$/$h_{ef,std}$	6,20/9,00	6,20/9,00	6,20/9,00	5,00/7,20
Nail anchor N, N-K, N-M Galvanized steel, stainless steel A4, stainless steel HCR  With threaded rod strength class ≥ 5.8	ETA-11/0240	N h_{ef} = 25	0,60	0,60	0,50	0,40
		N-K h_{ef} = 25	0,60	0,60	0,60	0,50
		N-M h_{ef} = 25	0,60	0,60	0,60	0,50
		N h_{ef} = 30	0,90	0,70	0,50	0,40
		N-K h_{ef} = 30	0,90	0,80	0,60	0,50
		N-M h_{ef} = 30	0,80	0,70	0,60	0,60
		N A4 h_{ef} = 25	0,60	0,60	0,50	0,40
		N-K A4 h_{ef} = 25	0,60	0,60	0,60	0,50
		N-M A4 h_{ef} = 25	0,60	0,60	0,60	0,50
		N A4, N-K A4 h_{ef} =30	0,90	0,90	0,90	0,70
		N-M A4 h_{ef} =30	0,80	0,70	0,60	0,60
Ceiling nail Dowel Galvanized steel 	ETA-23/0246	Characteristic resistance - all load directions				
		6x40 / 6x70	0,74	0,61	0,49	0,42
		Characteristic bending resistance - steel failure with lever arm				
		6x40 / 6x70	0,39	0,33	0,26	0,23

Fastening system	Documents	Size	Maximum tensile load [kN] in case of fire for fire resistance classes			
			F 30 (30 min)	F 60 (60 min)	F 90 (90 min)	F 120 (120 min)
Drop-in anchor E / ES Galvanized steel / stainless steel A4  with screw ≥ Fkl. 5.6 or stainless steel A41) 1) Version with threaded rod or screw Fkl. 4.6/ Fkl. 4.8 see fire protection report.	Expert opinion 21725/1	M 6 x 30	0,90	0,70	0,40	0,30
		M 8 x 30	0,90	0,90	0,80	0,50
		M 8 x 40	1,80	1,30	0,80	0,50
		M 10 x 30	0,90	0,90	0,90	0,70
		M 10 x 40	1,80	1,80	1,20	0,80
		M 12 x 50	3,20	3,10	1,80	1,20
		M 12 x 80	4,30	3,10	1,80	1,20
		M 16 x 65	4,70	4,70	3,30	2,20
		M 16 x 80	6,40	5,70	3,30	2,20
		M 20 x 80	6,40	6,40	5,20	3,40
Drop-in anchor E / ES Use as multiple fastening of non-load-bearing systems according to ETAG 001, Part 6 Galvanized steel  with screw ≥ Fkl. 5.61) 1)Version with threaded rod or screw Fkl. 4.6/Fkl. 4.8 see ETA- 05/0116.	ETA-05/0116	M 6 x 25	0,40	0,35	0,30	0,25
		M 6 x 30	0,80	0,80	0,40	0,30
		M 8 x 25	0,60	0,60	0,60	0,50
		M 8 x 30	0,90	0,90	0,90	0,50
		M 8 x 40	1,50	1,50	0,90	0,50
		M 10 x 25	0,60	0,60	0,60	0,50
		M 10 x 30	0,90	0,90	0,90	0,70
		M 10 x 40	1,50	1,50	1,50	1,00
		M 12 x 25	0,60	0,60	0,60	0,50
		M 12 x 50	1,50	1,50	1,50	1,20
		M 16 x 65	4,00	4,00	3,70	2,40
Drop-in anchor E / ES A4 / HCR Use as multiple fastening of non-load-bearing systems according to ETAG 001, Part 6 Stainless steel A4, stainless steel 1.4529 	ETA-05/0116	M 6 x 30	0,80	0,80	0,40	0,30
		M 8 x 30	0,90	0,90	0,90	0,50
		M 8 x 40	1,50	1,50	0,90	0,50
		M 10 x 40	1,50	1,50	1,50	1,00
		M 12 x 50	1,50	1,50	1,50	1,20
		M 16 x 65	4,00	4,00	3,70	2,40
Hollow ceiling anchor EASY Galvanized steel, mirror thickness $d_u \geq 30$ mm  (Mirror thickness $d_u \geq 40$ mm see approval)	Z-21.1-1785	M 6	0,70	0,60	0,40	0,20
		M 8	0,90	0,90	0,70	0,40
		M 10	1,20	1,20	1,20	1,00
		M 12	1,20	1,20	1,20	1,20
Heavy-duty anchor SZ Galvanized steel 	ETA-02/0030	M 6	1,00	0,80	0,60	0,40
		M 8	1,90	1,50	1,00	0,80
		M 10	4,00	3,20	2,10	1,50
		M 12	6,25	4,60	3,00	2,00
		M 16	9,00	8,60	5,00	3,10
		M 16L	11,00	8,60	5,00	3,10
		M20	12,50	12,50	7,70	4,90
		M24	16,25	16,25	12,60	9,20

Heavy-duty chemical fastening

Fastening system	Documents	Size	Maximum tensile load [kN] in case of fire for fire resistance classes			
			F 30 (30 min)	F 60 (60 min)	F 90 (90 min)	F 120 (120 min)
Injection system VMZ Galvanized steel 	Expert opinion GS6.1/18-033-2	≥ 50 M 8	1,69	0,07	-	-
		≥ 60 M 10	3,38	0,83	-	-
		≥ 80 M 12	5,80	3,11	1,14	-
		≥ 125 M 16	7,62	5,81	4,01	3,11
		≥ 170 M 20	13,02	9,75	6,48	4,84
		≥ 170 M 24	18,76	14,05	9,34	6,97
Injection system VMZ A4 stainless steel / HCR stainless steel 	Expert opinion GS6.1/18-033-2	≥ 50 M 8	2,17 / 2,22	0,35 / 0,36	-	-
		≥ 60 M 10	4,46 / 4,56	1,31 / 1,35	0,22 / 0,23	-
		≥ 80 M 12	9,86	4,59 / 4,72	1,86 / 1,92	0,56 / 0,58
		≥ 125 M 16	16,67	11,79	6,92	4,48
		≥ 115 M 20	23,75	16,07	9,64	6,11
		≥ 170 M 24	34,23	24,06	13,89	8,79
Injection system VMU plus Galvanized steel ≥ Fkl. 5.8 / stainless steel A4 ≥ Fkl. 70 / stainless steel HCR ≥ Fkl. 70  Only uncracked concrete	Expert opinion EBB170019-3	M8 h_{ef} ≥ 80	1,60	1,10	0,60	0,30
		M10 h_{ef} ≥ 90	2,60	1,80	0,90	0,50
		M12 h_{ef} ≥ 110	3,40	2,60	1,80	1,40
		M16 h_{ef} ≥ 125	6,30	4,80	3,40	2,70
		M20 h_{ef} ≥ 175	9,80	7,50	5,30	4,20
		M24 h_{ef} ≥ 210	14,00	10,80	7,60	6,00
		M27 h_{ef} ≥ 250	18,30	14,10	9,90	7,90
		M30 h_{ef} ≥ 280	22,30	17,20	12,10	9,60
Injection system VMH Galvanized steel ≥ Fkl. 5.8 / stainless steel A4 ≥ Fkl. 70 / stainless steel HCR ≥ Fkl. 70  For smaller anchoring depths, see expert opinion	Expert opinion 22210	M8 h_{ef} ≥ 80	1,10	0,88	0,66	0,32
		M10 h_{ef} ≥ 90	1,74	1,39	1,04	0,61
		M12 h_{ef} ≥ 100	3,03	2,28	1,60	1,04
		M16 h_{ef} ≥ 110	5,65	4,24	2,98	1,40
		M20 h_{ef} ≥ 130	8,82	6,62	4,66	3,23
		M24 h_{ef} ≥ 140	12,71	9,53	6,71	4,05
		M27 h_{ef} ≥ 150	16,52	12,39	8,72	5,33
		M30 h_{ef} ≥ 160	20,20	15,15	10,66	7,85
Injection system VMH Anchor rods VMU-A stainless steel A4 ≥ Fkl. 70 / V-A stainless steel A4 ≥ Fkl. 70  For smaller anchoring depths, see expert opinion	Expert opinion 22210	M8 h_{ef} ≥ 90	2,45	1,94	1,46	0,71
		M10 h_{ef} ≥ 100	3,89	3,07	2,32	1,22
		M12 h_{ef} ≥ 115	8,43	6,15	3,79	2,50
		M16 h_{ef} ≥ 130	15,70	11,46	7,07	4,11
		M20 h_{ef} ≥ 150	24,50	17,89	11,03	7,60
		M24 h_{ef} ≥ 170	35,30	25,77	15,89	10,94
		M27 h_{ef} ≥ 180	45,90	33,51	20,66	14,23
		M30 h_{ef} ≥ 195	56,10	40,95	25,25	17,39
Bonded anchor VZ Galvanized steel ≥ Fkl. 5.8 	Expert opinion 22043	M 8	0,73	0,55	0,40	0,33
		M 10	2,67	2,09	1,45	0,87
		M 12	3,88	2,78	1,77	1,26
		M 16	7,22	5,18	3,30	2,36
		M 20	11,27	8,09	5,15	3,68
		M 24	16,24	11,65	7,41	5,30
Bonded anchor VZ Stainless steel A4 ≥ Fkl. 70 / Stainless steel HCR ≥ Fkl. 70 	Expert opinion 22043	M 8	2,45	1,79	0,95	0,52
		M 10	3,89	2,68	1,47	0,87
		M 12	8,43	5,22	3,05	2,00
		M 16	15,70	7,90	4,80	3,24
		M 20	24,50	17,89	11,03	7,60
		M 24	35,30	25,77	15,89	10,94

MULTI-MONTI® screw anchor, stainless steel A4 / galvanized steel

Fastening system	Documents	Size	Screw-in depth [mm]	Maximum tensile load [kN] in case of fire for fire resistance classes			
				F 30 (30 min)	F 60 (60 min)	F 90 (90 min)	F 120 (120 min)
MMS-plus A4 SS / P / F 	ETA-15/0784	Ø 7,5	35-40	0,5	0,5	0,5	0,4
		Ø 7,5	50-55 / 65-75	1,1	0,8	0,5	0,4
		Ø 10,0	60-70	1,4	1,4	1,0	0,8
		Ø 10,0	75-85	2,3	1,4	1,0	0,8
		Ø 12,0	90-100	3,0	2,1	1,5	1,2
		Ø 12,0	105-115	3,9	2,1	1,5	1,2
MMS-plus SS  **MMS-plus V** 	ETA-15/0784	Ø 6,0	35	0,3	0,3	0,3	0,2
		Ø 6,0	45	0,4	0,4	0,4	0,3
		Ø 7,5	35	0,5	0,5	0,5	0,4
		Ø 7,5	55	1,1	0,8	0,5	0,4
		Ø 10,0	50	1,4	1,4	1,0	0,8
		Ø 10,0	65	2,3	1,4	1,0	0,8
		Ø 12,0	75	3,0	2,1	1,5	1,2
		Ø 12,0	90	3,9	2,1	1,5	1,2
		Ø 16,0	100	5,0	4,5	3,3	2,6
		Ø 16,0	115	7,5	4,5	3,3	2,6
		Ø 20,0	140	11,0	7,7	5,6	4,5
MMS-plus F 	ETA-15/0784	Ø 6,0	35	0,3	0,3	0,3	0,2
		Ø 6,0	45	0,4	0,4	0,4	0,3
		Ø 7,5	35	0,5	0,5	0,5	0,4
		Ø 7,5	55	1,1	0,8	0,5	0,4
		Ø 10,0	50	1,4	1,4	1,0	0,8
		Ø 10,0	65	2,3	1,4	1,0	0,8
		Ø 12,0	75	3,0	2,1	1,5	1,2
		Ø 12,0	90	3,9	2,1	1,5	1,2
MMS-plus MS 	ETA-15/0784	Ø 7,5	35	0,5	0,5	0,5	0,4
		Ø 7,5	55	1,1	0,8	0,5	0,4
MMS-plus ST 	ETA-15/0784	Ø 6,0	35	0,3	0,3	0,3	0,2
		Ø 6,0	45	0,4	0,4	0,4	0,3
		Ø 7,5	35	0,5	0,5	0,5	0,4
		Ø 7,5	55	1,1	0,8	0,5	0,4
		Ø 10,0	50	1,4	1,4	1,0	0,8
		Ø 10,0	65	2,3	1,4	1,0	0,8
MMS-plus I 	ETA-15/0784	Ø 6,0	35	0,3	0,3	0,3	0,2
		Ø 6,0	45	0,4	0,4	0,4	0,3
		Ø 7,5	35	0,5	0,5	0,5	0,4
		Ø 7,5	55	1,1	0,8	0,5	0,4
		Ø 10,0	50	1,4	1,4	1,0	0,8
		Ø 10,0	65	2,3	1,4	1,0	0,8
MMS-plus P 	ETA-15/0784	Ø 6,0	35	0,3	0,3	0,3	0,2
		Ø 6,0	45	0,4	0,4	0,4	0,3
		Ø 7,5	35	0,5	0,5	0,5	0,4
		Ø 7,5	55	1,1	0,8	0,5	0,4
		Ø 10,0	50	1,4	1,4	1,0	0,8
		Ø 10,0	65	2,3	1,4	1,0	0,8

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