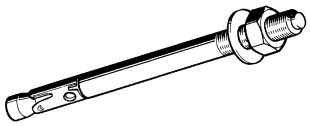
Products

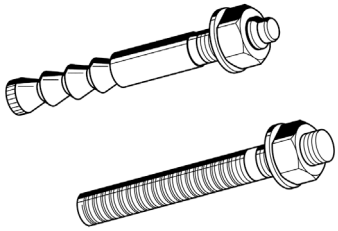
Bolt Anchor AN BZ PLUS



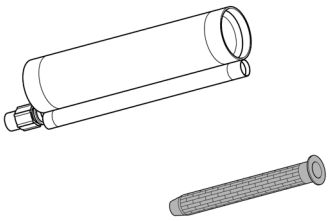
Drive Plug AN ES

Setting Tool for Drive Plug ANT

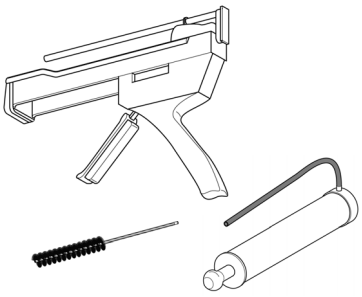
Resin Anchor Rod VMZ-A
Resin Anchor Rod VMU-A



Resin Injection Cartridge VMZ 345; VMU; VM-K / Perforated Sleeve SH

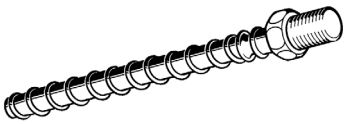


Assessories VMZ; VMU; VM-K

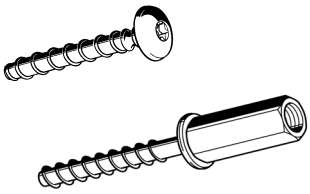


Dispenser; Steel brush; Blow-out Pump

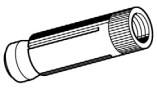
Screwbolt TSM-ST



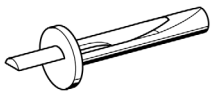
Screwbolt TSM-LP VZ 30
Screwbolt TSM-IM



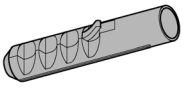
Hollow Core Anchor AN Easy



Nail Anchor PN 27

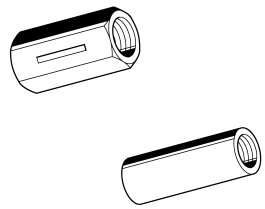


Nylon Plug AN



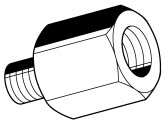
Products

Rod Coupling AD f/f



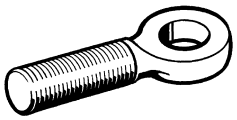
IG/IG; round

Reducer AD f/m

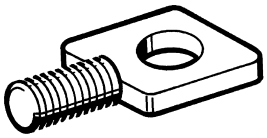


Reducer AD m/f

Eye Bolt SCR

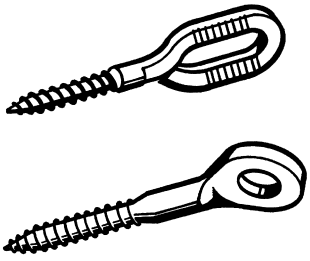


Flat Leaf Bolt SCR

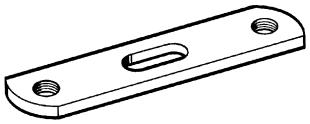


Link Eye SCB

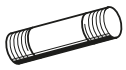
Eye Screw SCR
Eye Screw C RIN C



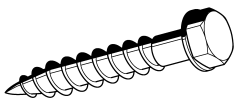
Twin Holder DHP M8



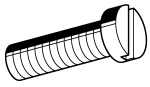
Threaded Spacer BOL M8



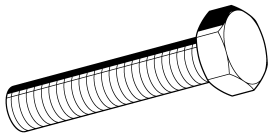
Hexagon Wood Screw SKH



Slotted Screw SCR

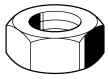


Hexagon Bolt SKT

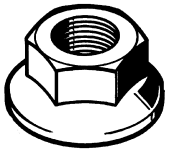


Products

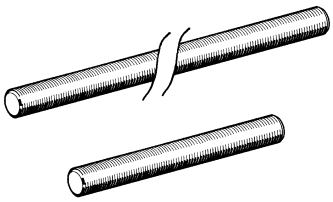
Hexagon Nut NT



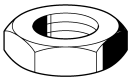
Flange Nut NT FLA



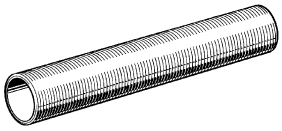
Threaded Rod GST
Threaded Stud GST



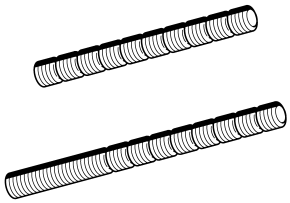
Locking Nut NT G



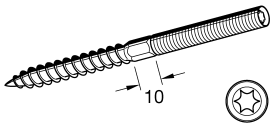
Threaded Tube GR



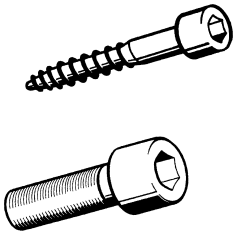
Grooved Rod GES PNS



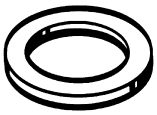
Bolt Screw BSCR with collar



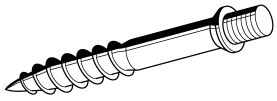
Hexagon Socket Screw SCR



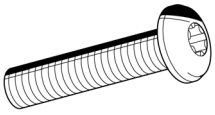
Washer US



Bolt Screw BSCR without collar



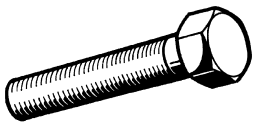
Flange Screw FLA HCP

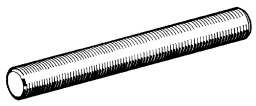


Bolt Screw Adapter ANT BIT

Load details for Bolts, Threaded Rods, Threaded Tube

Bolts and Threaded Rods

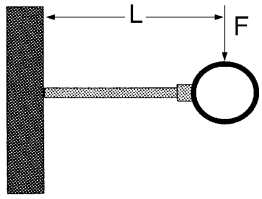




Thread	Permissible Load (tension) [kN]			Torque [Nm]	
	FK 4.8	FK 8.8	VA	FK 4.8	FK 8.8
M 8	8.0	15.6	4.6	12	25
M10	12.5	24.7	7.4	23	50
M12	18.1	35.9	10.8	40	85
M16	33.8	66.7	20.0	100	210

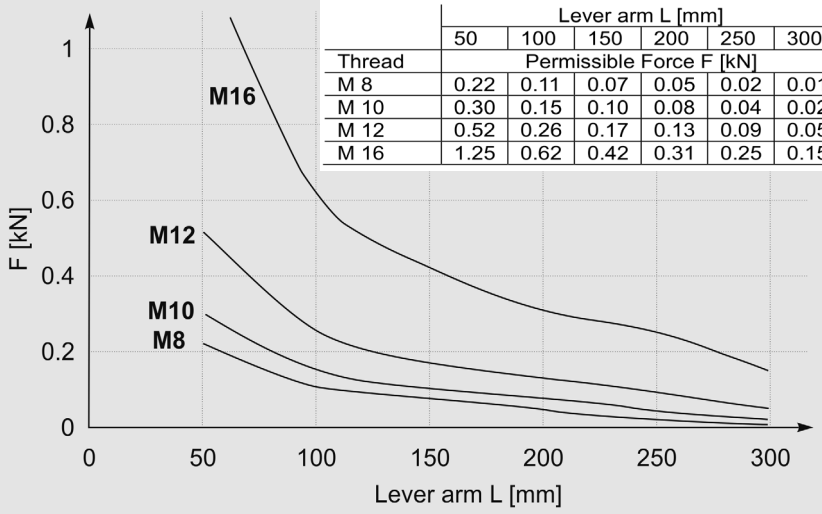
FK = Grade
μ_{ges} = 0.14

$\sigma_{adm} \leq 215$ N/mm² (FK 4.8)
$f_{adm} \leq 3$ mm

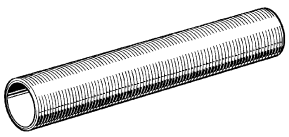


Permissible bending for threaded rod grade 4.8

Thread	Lever arm L [mm] 50	100	150	200	250	300
	Permissible Force F [kN]					
M 8	0.22	0.11	0.07	0.05	0.02	0.01
M 10	0.30	0.15	0.10	0.08	0.04	0.02
M 12	0.52	0.26	0.17	0.13	0.09	0.05
M 16	1.25	0.62	0.42	0.31	0.25	0.15



Threaded Tube

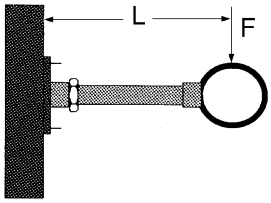


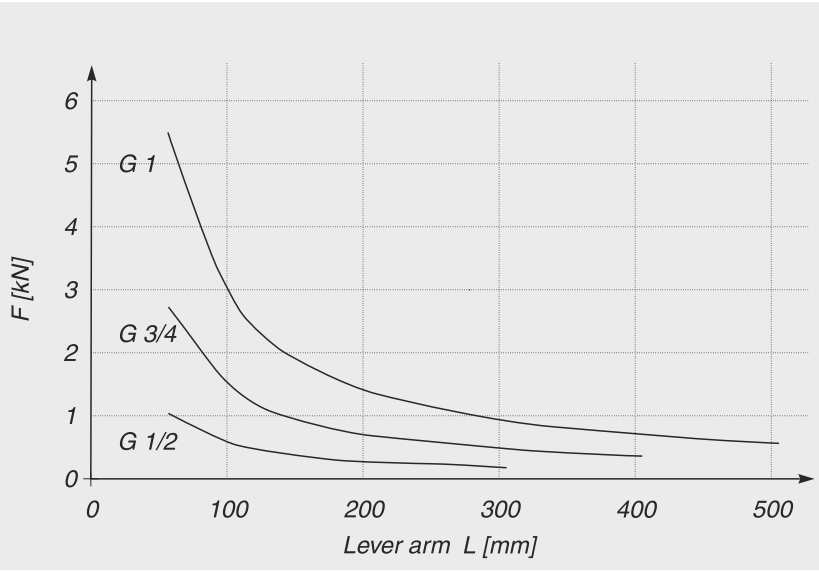
Thread	Permissible Load (tension) [kN]	Permissible Bending Moment [Nm]
G 1/2	18.0	53
G 3/4	28.3	138
G 1	41.4	277

Thread acc. to DIN ISO 228

$\sigma_{adm} \leq 160$ N/mm²
$f_{adm} \leq 3$ mm

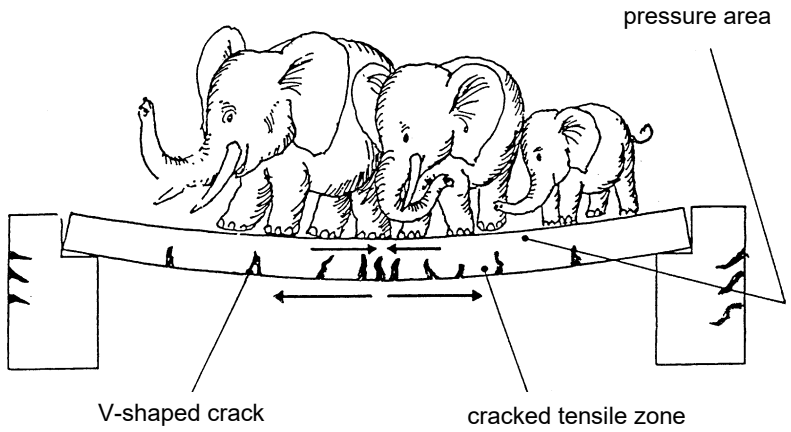
Anchor loads have to be calculated separately.





Basics for heavy duty fixings

Tensile zone (cracked concrete)



The crack width usually is approx. 0.3 … 0.5 mm.

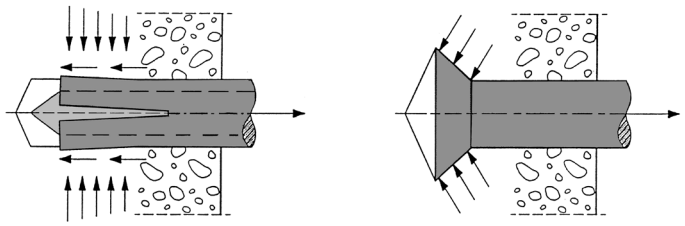
Tensile stress can cause cracks in all concrete parts of a building.

Areas particularly affected by tensile stress include the underside of slabs, and walls / columns under bending stresses.

Unless proven as a compression zone, all areas of concrete into which fixings and anchors are installed must be considered as cracked concrete.

Approvals
Anchorages must be dimensioned and calculated according to European Approvals **(ETA)**. The guidelines for these approvals are known as ETAGs and often statements on the characteristic load resistance of fixings to cracked concrete in the case of fire, can also be found here.

Function of Fixings



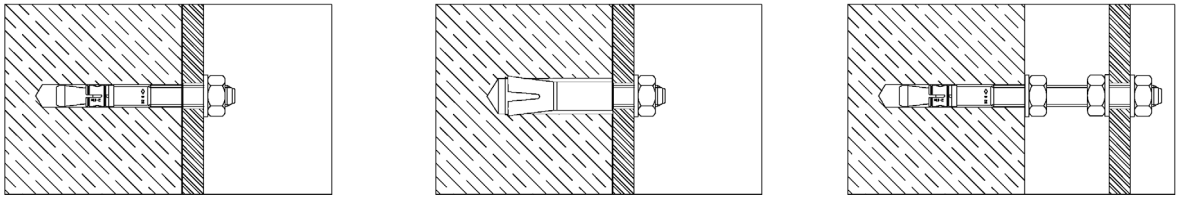
Friction by expansion

Form Locking

Anchors in cracked concrete have additional security through;

- automatic secondary expansion in case of crack expansion
- form locking by an undercut drill hole

Types of installation



Push-through installation
(Bolt Anchor)

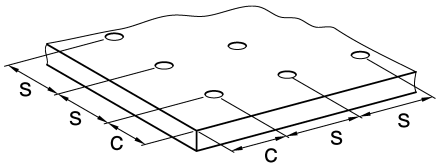
Pre-positioned installation
(internal thread anchor)

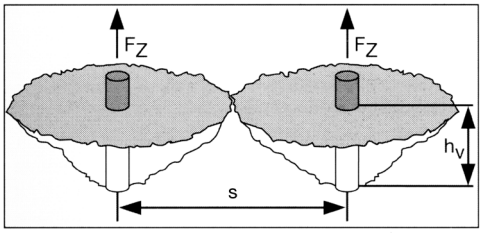
Stand-off installation
(Bolt Anchor)

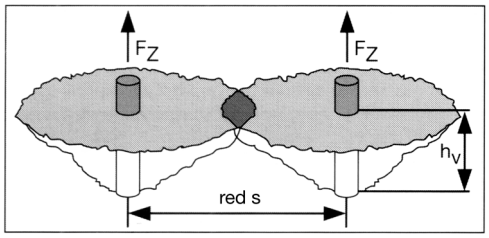
[Source: MKT]

Basics for heavy duty fixings

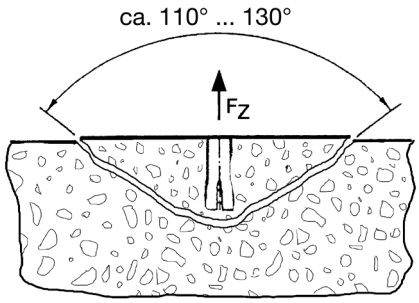
Axial spacing, edge distance, pull-out cone





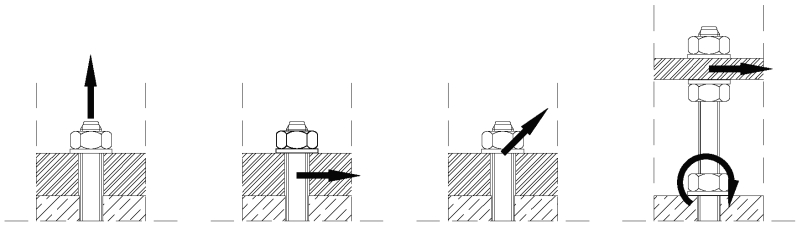


s = Axial spacing > red s = reduced axial spacing (in case of partial
c = Edge distance overlap of theoretical pull-out cones)
h = Component thickness
F_z = permissible loading (also N = normal force)



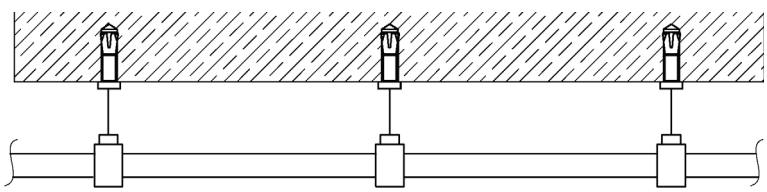
In the event of "concrete cone failure", a symmetrical cone of the concrete breaks away.
The anchor depth hv is therefore a determining factor in the load capacity.

Types of loading



tensile load | shear load | diagonal load | bending moment

Anchors for multiple use in non-structural applications



According to E**TAG** - part 6, a multiple fixing is existant when a pipeline has at least 3 fixings and the loading per point is max. 2 kN.
ETAG = Guide line for European Technical Approvals (ETA)

Basic rules for anchorages

① Load capacity:
Anchor type, base material strength and drill hole positions typically determine the load resistance of the anchorage.

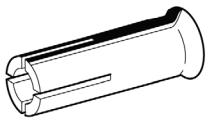
② Concrete tensile area:
The load values often refer to the anchor performance in a concrete base material of class C20/25 (formerly B25).

③ Corrosion protection:
Electro-galvanised anchors are typically only used only for dry indoor environments.
For damp environments and outdoors, anchors hot dip galvanised or made of stainless steel are typically specified.

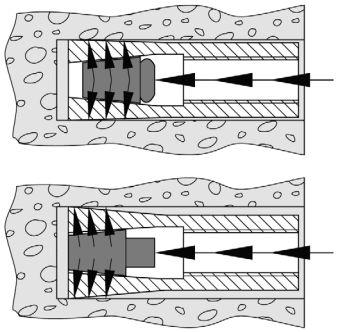
④ Fire protection:
According to TRGI, the anchors for gas pipes must be manufactured from non-combustible steel; equally for fire protection of fixings according to comments from MLAR.

Installation instructions Drive Plug AN and Bolt Anchor AN BZ PLUS

Drive Plug AN ES



Setting Tool for Drive Plug ANT for secure installation.



Independent of small diameter tolerances of the drillhole, the "intelligent" expanding cone simplifies installation by allways developing the right pressure.

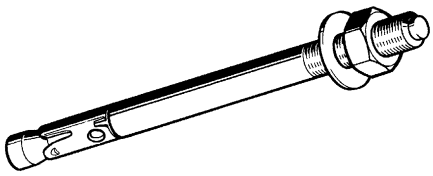
European Approvals (ETA) for multiple fixings used in non-structural systems in cracked concrete.

Load capacity is reduced in considering performance under exposure to fire.

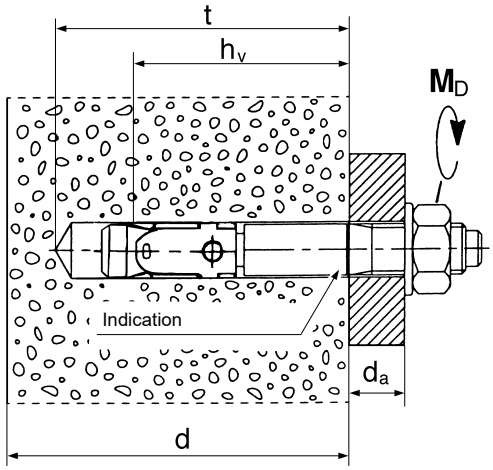
Advantages
- no special drill bit
- low impact energy when setting fixing
- suitable for pre-positioned installation.

Installation
1) Drill hole
2) Clean out the drilled hole
3) Set Drive Plug AN ES with Setting Tool ANT
4) Place installation item and connect to Drive Plug AN ES with correct length of threaded bolt or stud, and tightening torque.

Bolt Anchor AN BZ PLUS



Identical drill hole diameter to thread size



d = Thickness of components
d_a = Thickness of attachment parts
h_v = Anchor depth
M_D = specified tightening torque
t = Depth of drill hole

European Approvals (ETA) for multiple fixings used in non-structural systems in cracked concrete.

Load capacity is reduced in considering performance under exposure to fire.

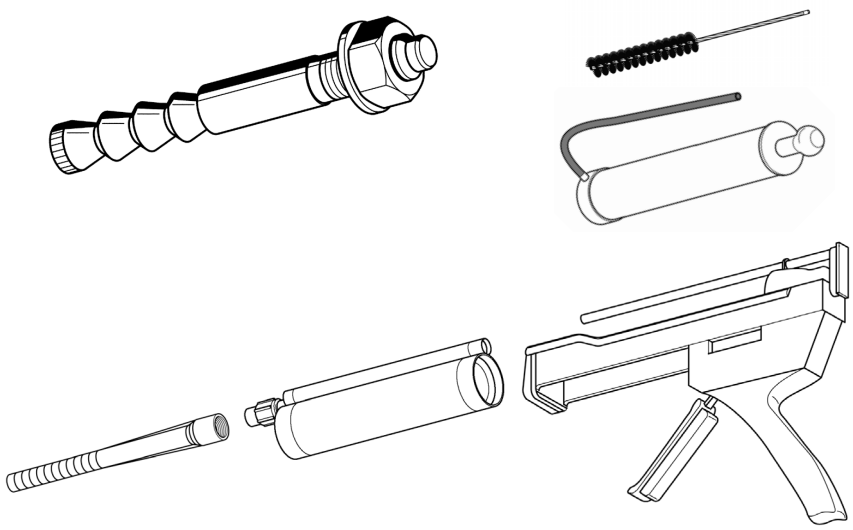
Advantages
- no special drill bit
- low impact energy when setting fixing
- suitable for pre-positioned installation.

Installation
1) Drill hole
2) Clean out the drilled hole
3) Set Drive Plug AN ES with Setting Tool ANT
4) Place installation item and connect to Drive Plug AN ES with correct length of threaded bolt or stud, and tightening torque.

2019-10

Installation of Resin Anchor System

Injection system VMZ



Resin and hardener are mixed together in the mixer nozzle during dispensing from the cartridge. From the bottom depth of the drill hole, inject the resin to fill a minimum of 2/3rds of the hole.

European Approvals (ETA) for multiple fixings used in non-structural systems in cracked concrete.

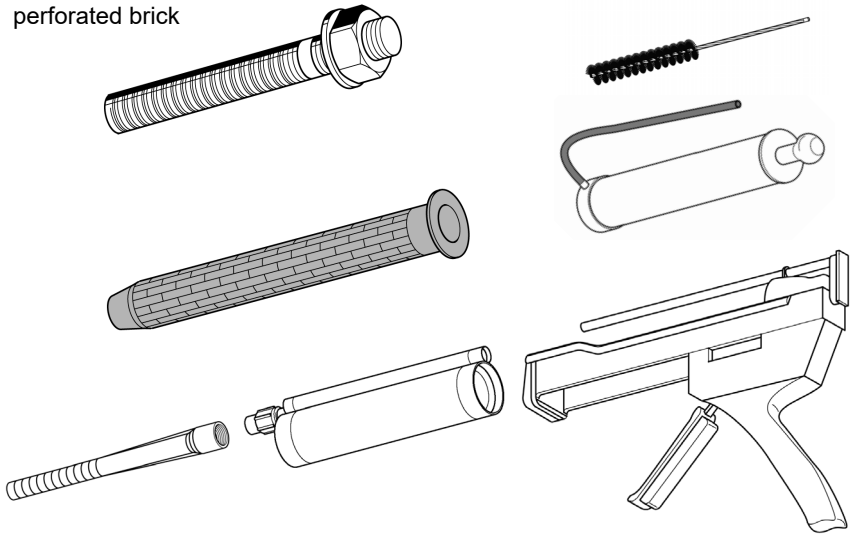
Load capacity is reduced in considering performance under exposure to fire.

Advantages
- no special drill bit
- unabated carrying capacity in wet drill holes
- processing from M12 on, even in water-filled drill hole
- processing temperature up to -5°C
- High load capacity with small edge distances and axial spacings

Installation
1) Drill hole
2) Brush out debris from the drilled hole
3) Blow out dust from the drilled hole
4) Fill the injection resin to the drilled hole
5) Screw in the anchor rod to the correct depth within the resin-filled hole
6) Allow resin to cure for the correct time (according to ambient installation temperature on site)
7) Affix connecting part and tighten down nut to specified torque.

Injection System VMU

Resin anchor stud VMU and perforated sleeve SH to be used in hollow or perforated brick



Suitable for brickwork (solid brick, sand-lime brick) and in combination with the Perforated Sleeve SH for:
- vertically perforated brick
- perforated sand-lime brick
- hollow brick made of gas concrete and concrete.

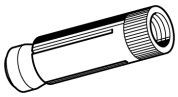
European Approval (ETA) for single fixation in uncracked concrete, general building inspection approval for anchorage in brickwork

Advantages
- no special drill bit
- Fixings possible to wet drill holes
- High load capacity with relatively small edge distances and axial spacings.

Installation
1) Drill hole
2) Brush out debris from the drilled hole
3) Blow out dust from the drilled hole
4) Install the perforated sleeve to the drilled hole (recommended for perforated brick)
5) Fill the injection resin to the perforated sleeve (100% fill)
6) Screw in the anchor rod to the correct depth within the resin-filled sleeve
7) Allow resin to cure for the correct time (according to ambient installation temperature on site)
8) Affix connecting part and tighten down nut to specified torque.

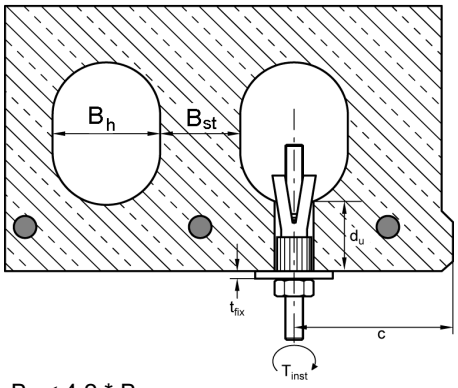
Installation Instructions Hollow Core Anchor Bolt

Hollow core anchor AN Easy



The anchor could be used, even if the bracing area is not inside the hollow chamber.

When tightening the screw, the conus is released from the anchor sleeve, roped in and tensed up



$B_h \leq 4.2 * B_{st}$

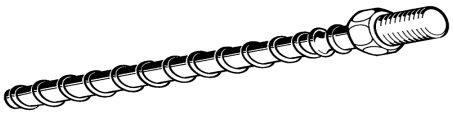
General building inspection approval of the DIBt for single fixation in prestressed concrete-hollow ceilings with stability ≥ C 45/55.

Considering reduced resilience suitable for exposure to fire.

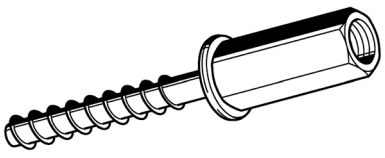
Advantages
- no special drill needed
- suitable for the assembly of standard bolts and threaded rods

Installation
1) Drill the bore hole
2) Drive in anchor flushy
3) After tightening to specified torque, directly resilient.

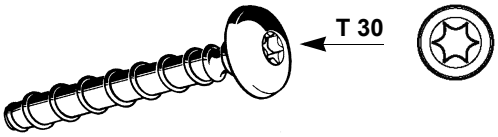
Screwbolt TSM-ST



Suitable for installation to concrete and masonry (sand-lime brick, solid brick, clinker and natural stone)



combined internal thread socket M8/M10



Screwbolt TSM-LP VZ 30
ideal for the installation of Channel 27 to concrete and masonry
Torx® -Connection T30 for a safe transfer of high torque during installation.
The screwbolt may be adjusted and is also removable.

European approval (ETA) for single fixation in cracked concrete.

Load capacity is reduced in considering performance under exposure to fire.

Advantages
- minimal drilling effort (small diameter and short embedment depths)
- small edge and axial spacings possible
- removable fixing

Installation
1) Drill the hole
2) Clean the drilled hole
3) Install with screw gun or impact driver.