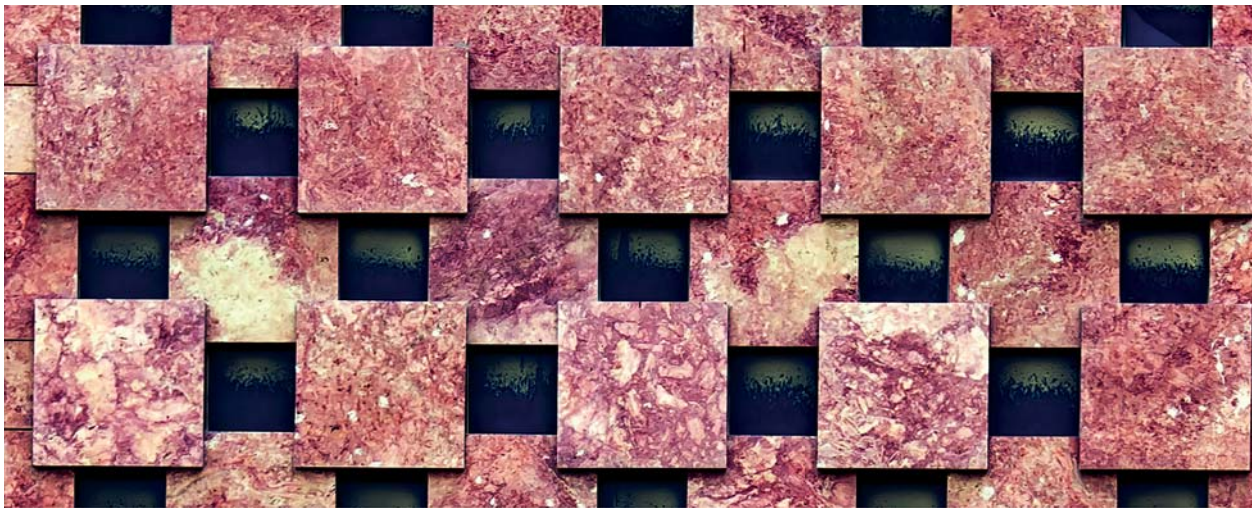
Your Fixing Systems Specialist

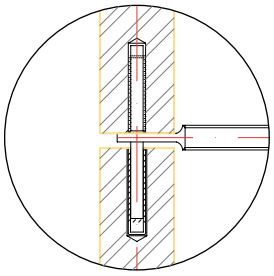
HAZ METAL

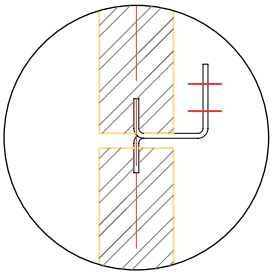
Stone Attachment Systems

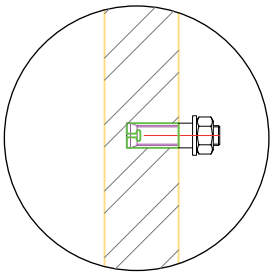
We offer a comprehensive selection of anchors and accessories designed to meet the highest demands in terms of quality, load capacities, and safety. Alongside this, we ensure maximum flexibility, ease of handling, and cost efficiency.

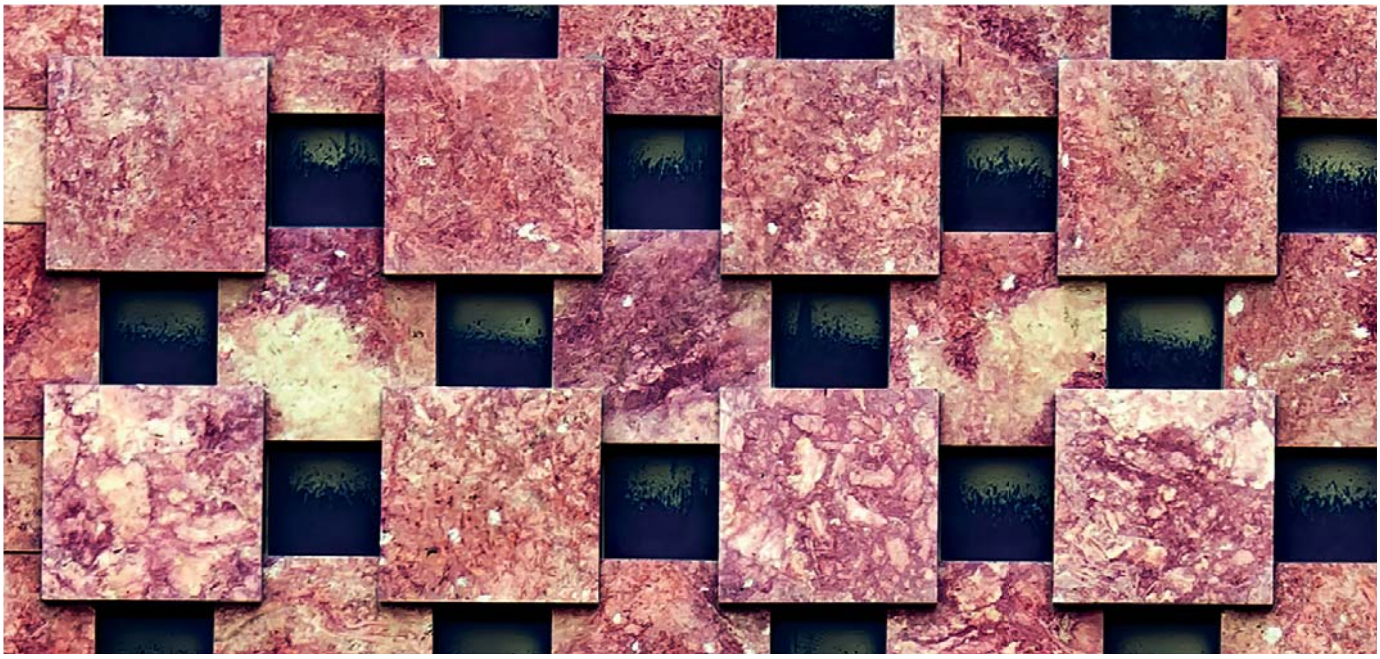
Product Brochure - HAZ-BR-SA-EN/12.24











Contents

HAZ
Group of Companies
Establishment
www.hazgrp.com

HAZ Metal Fixing Systems
is a member of HAZ Group of Companies

HAZ Metal is certified with integrated management systems by TUV SUD for ISO 9001:2008, ISO 14001:2004 & OHSAS 18001:2007

Undercut Bolts - Overview

The HB11 and T31 Undercut bolts are designed for attachments on the rear surfaces of stone panels. This method of attachnment becomes necessary when the use of conventioanl pin system is not suitable. The undercut stone attachment method has advantages which can result in various benefits in material cost and installation time. HAZ Metal provides service in the design and technical

HB11 Undercut bolt
for connections to natural stone

T31 Undercut bolt
for connections to natural stone

Indirect fixing of panels on to sub channel system using undercut anchors

Advantages:
* Free positioning of the undercut bolt anywhere on the rear side of the panel
* Higher pull out values can be achieved using undercut bolts
* Optimization of bending moments of the stone panels which result in thinner panels and larger panel dimensions.
* No appearance of fixing elements at joints.

In order to achieve easy and secure fixing of the undercut anchors, special drilling needs to be made on the rear surface of the panels. This must be done with great care as any incorrect drilled holes will prevent the firm attachment of the undercut bolts on to the panels. Drilling is done using special drill bits with wet machining system. Machines and drill bits can be supplied by HAZ.

Drilling for HB11 Undercut Bolts

Drilling is made with no core drill bits using wet system drilling machines. No tolerance drilled hole is essential for proper fixing.

Drilling for T31 Undercut Bolts

Drilling is made with a customized designed machine using electroplated special made bits to drill the hole required.

HAZ Undercut bolts are used in a various range of stone fixing applications. HAZ Metal designs their own fixing systems for use with under cut bolts. A variety of systems are available for direct and indirect installation of stone panels.

Structural analysis and in house testing is carried out in order to guarantee the highest quality and secure installation. external testing and certirfication is also carried out for project approvals.

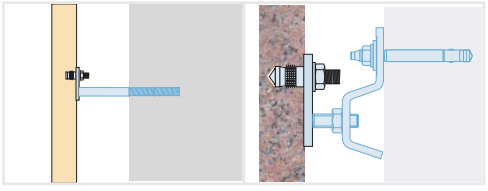
- Aluminium agraf brackets for connection insto aluminium sub channel systems

- Stainless steel brackets for connection on to steel sub channel systems

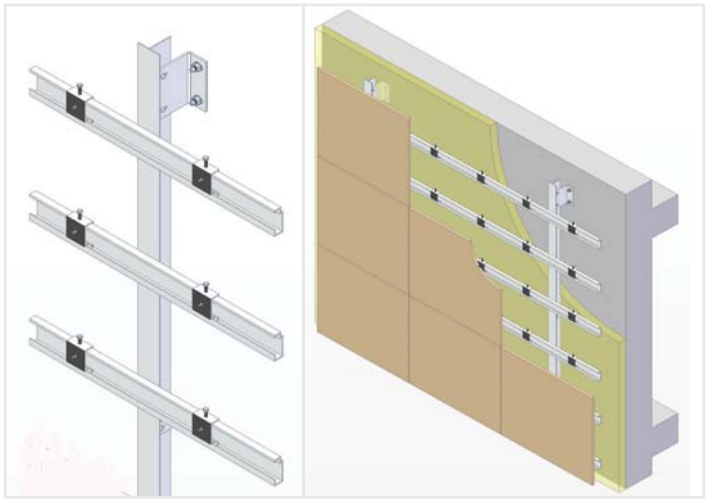
Application examples

Indirect Fixing on to Steel Sub Channel System

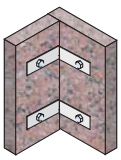
Fixing Direct On To Concrete Walls



Indirect Fixing On To Aluminium Sub Channel System



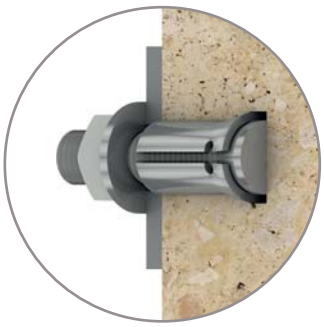
Assembly Of Panels

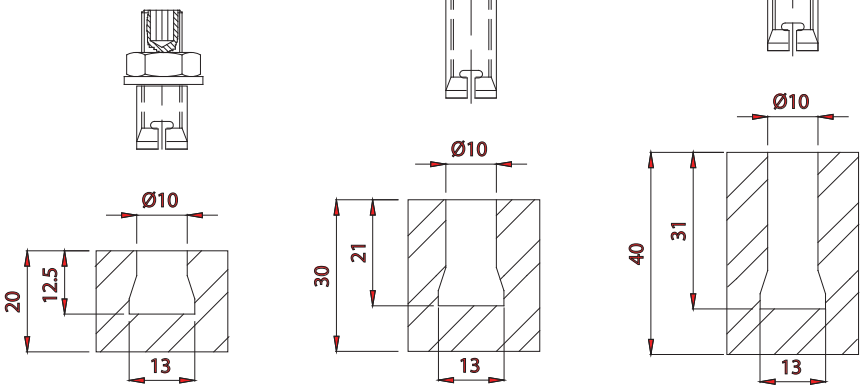


HB11 Undercut Bolt

- Suitable for natural stone connections on facades
- Applicable for minimum 20-50 mm thick stone
- Compatible drill bit and machine is provided

The HB11 HAZ Undercut bolt was developed to meet the special requirements in stone installation where attachments from the rear surface of stone panels are required without exerting stresses on the stone. The HB11 undercut bolt are fixed mechanically in to undercut holes that are drilled with special drilling machines and drill bits. Stone thicknesses from 20 mm to 50 mm are applicable.





Drilling rear surface of panels using special drilling machine with drilling wet system and non core drill bits.

Minimal tolerances in hole size to be achieved in order for proper and secure attachment.

Drilling Hole

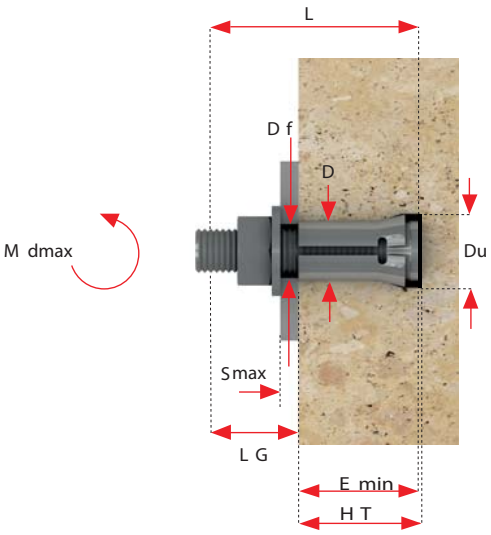
Checking Hole

Placing Bolt

Placing Pipe

Fastening

Final



Product Code	Technical Details									
	Bolt Size	Stone Thickness	Drill Hole Diameter	Drill Length	Min. Embedment	Max. Fixture Thickness	Fixture Hole Diameter	Max. Torque	Bolt Lenght	Thread Lenght
	(mm)	S t (mm)	D/Du (mm)	Ht (mm)	E min (mm)	S max (mm)	Df (mm)	Mdmax (Nm)	(mm)	(mm)
B 11-20	M6x27	20	8/11	12.50	11.50	5	9	5	24	14.5
B 11-30	M8x37	30	10/13	21.00	20.00	5	9	12	34	14.5
B 11-40	M8x47	40	10/13	31.00	30.00	5	9	12	39	14.5

Product Code

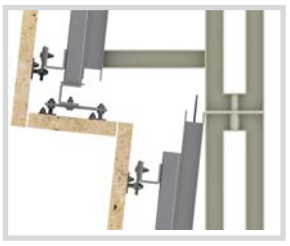
HB11 - 20

- Panel Thickness
- Type

Hard Granite Based Values

Allowable load (kN)				
Load Direction	a degree	M6(20mm tck.)	M8(30mm tck)	M8(40mm tck)
Pull Out	0	1.20	2.50	2.80
Shear	90	1.80	2.80	3.00

Application Examples:



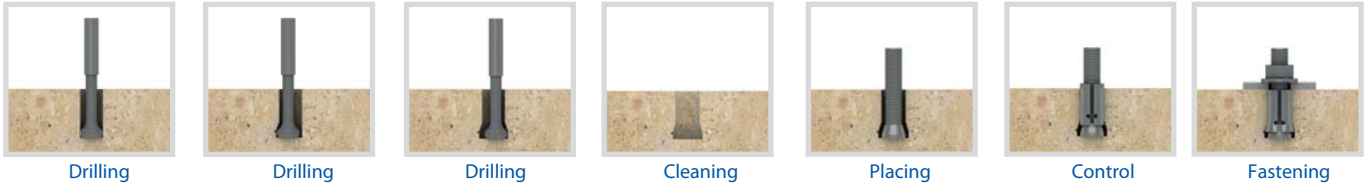
- Facade applications
- connections to curtain wall unitized panels
- corner stone fixing and reveal fixing

Marble Based Values

Allowable load (kN)				
Load Direction	a degree	M6(20mm tck.)	M8(30mm tck)	M8(40mm tck)
Pull Out	0	1.10	2.20	2.50
Shear	90	1.40	2.50	2.70

A safety factor of 3.5 is taken for mean ultimate failure loads.

Fixing Instructions

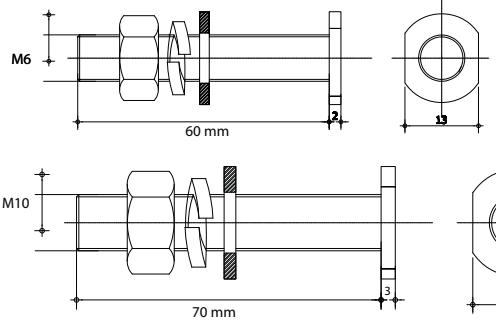


Drilling | Drilling | Drilling | Cleaning | Placing | Control | Fastening

T31 Undercut Bolt

- Suitable for natural stone connections on facades
- Applicable for minimum 30-80 mm thick stone
- Compatible drill bit and machine is provided

The T31 undercut bolt was developed to meet the special requirements in stone installation where the conventional pin method were not suitable. With the T31 bolts we can achieve attachments to the stone at the back surface. This provides freedom in design and creates an appearance where the joints will be clear of anchor tips. T31 undercut bolt is suitable for stone thicknesses between 20 and 50 mm.



Drilling Hole

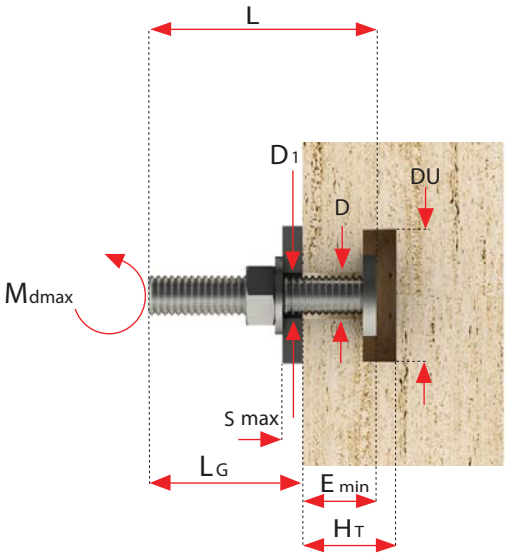
Inserting Bolt

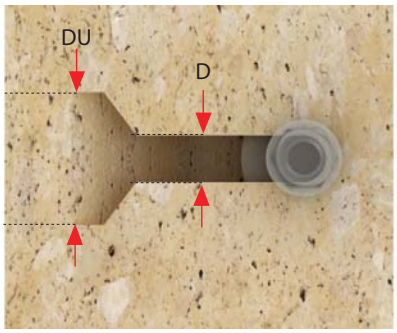
Positioning Bolt

Filling Hole

Fastening Fixture

Special drilling is made with suitable equipment to achieve the slot hole for fixing the T31 under cut bolt.





Product Code	Technical Details									
	Bolt Size	Stone Thickness	Drill Hole Diameter	Drill Length	Min Embed-ment	Max Fixture Thickness	Fixture Hole Diameter	Max. Torque	Bolt Length	Thread Length
	(mm)	St (mm)	DU (mm)	Ht (mm)	E min (mm)	S max (mm)	D1 (mm)	Mdmax (Nm)	(mm)	(mm)
HAZ T31-6/60	M6x60	30	7	21	20	8	7	7	60	40
HAZ T31-10/70	M10x70	40	11	31	30	8	11	25	70	40
HAZ T31-12/80	M12x80	50	13	41	40	8	13	60	80	40

Product Code

HAZ T31 - 6 / 60

- Length
- Diameter
- Type

Application:

For fastening fixtures to natural stone

Available in:

Stainless Steel AISI 304 & AISI 316

Travertine & Limestone values

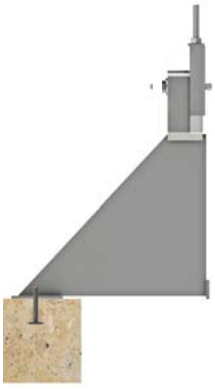
Allowable load values				
Load Direction	a degree	M6	M10	M12
Pull Out	0	1,40	2,20	3,00
Shear	90	3,00	3,40	3,80

A safety factor of 3.5 is taken for mean ultimate failure loads

Application Examples:

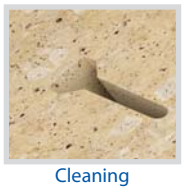
attachements made on to brackets for stone installation direct on to walls.

attachments made on to brackets fro stone lintels, cornishes or soffits.



Fixing Instructions

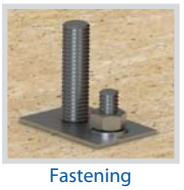

Drilling


Cleaning


Placing Bolt


Control

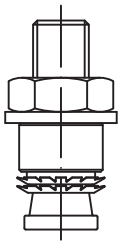

Filling void

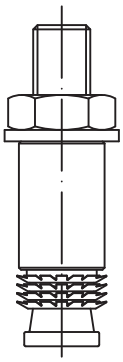

Fastening

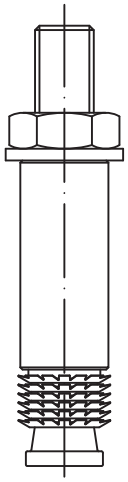
HB09 HAZ Super Bolt

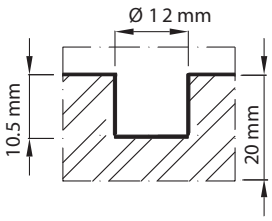
- Suitable for connections for internal works like vanity tops
- Applicable for minimum 20-40 mm thick stone
- Compatible drill bit and machine is provided

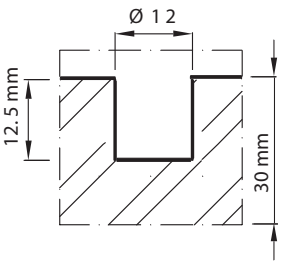
The HB09 HAZ Super bolt was developed to meet the special requirements in stone installation where attachments from the rear surface of stone panels were required. With the use of HB09 HAZ Super bolts and suitable drilling method, this is achieved. HB09 HAZ Super bolt is suitable for stone thicknesses between 20 and 50 mm.

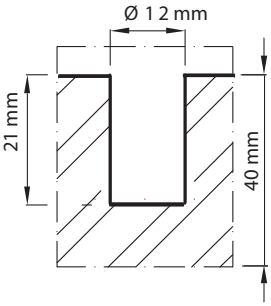












Drilling rear surface of panels using wet system machines and no core drill bits.

Zero tolerance in hole size to be achieved in order for proper and secure attachment.

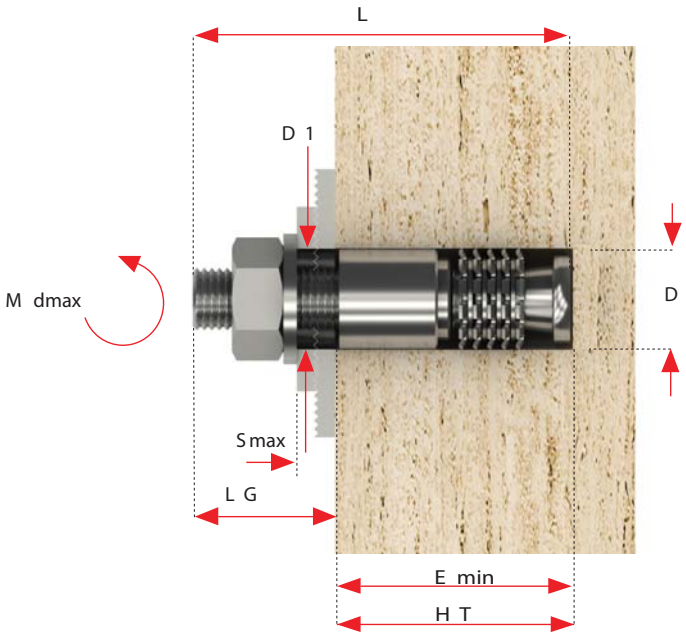
Drilling Hole

Checking Hole

Placing Bolt

Hammering Bolt

Fastening Fixture



Product Code	Technical Details									
	Bolt Size	Stone Thickness	Drill Hole Diameter	Drill Length	Min. Embedment	Max Fixture Thickness	Fixture Hole Diameter	Max. Torque	Bolt Lenght	Thread Lenght
	(mm)	St(mm)	D(mm)	Ht(mm)	E min(mm)	S max(mm)	D1 (mm)	Mdmax (mm)	(mm)	(mm)
HB 09-24/30	M8x30	20	12	10,5	10	5	9	13	30	18
HB 09-48/45	M8x45	30	12	12,5	12	5	9	13	45	23
HB 09-72/60	M8x60	40	12	22,5	22	5	9	13	60	28

Product Code

HB09 24/30

- Length
- Diameter
- Type

Application:

For faste ning fixtures to natural stone

Available in:

St ainle s s St ee l AIS I 30 4 & AIS I 31 6

Advantages of HB09 Haz Super Bolt

- No use of special and expensive drilling tools.
- No need of expensive drill bits.
- No stone breakage during fixation of bolt

Hard Granite Based Values

Working Load Resistance (KN)		
Load Direction	a degree	M8
Pull Out	0	1,40
Shear	90	3,00

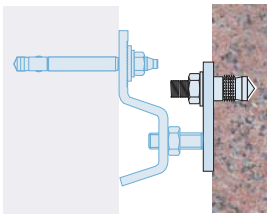
Marble Based Values

Working Load Resistance (KN)		
Load Direction	a degree	M8
Pull Out	0	1,00
Shear	90	2,10

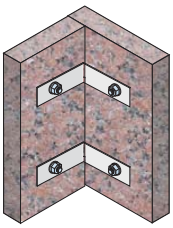
A safety factor of 2.5 is taken for mean ultimate failure loads.

Application Examples:

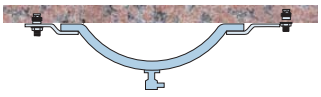
Facade Cladding

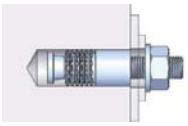


Corner Stone Fixing



Vanity Top Fixing





Fixing Instructions


Drilling


Cleaning


Placing Bolt


Hammering Bolt

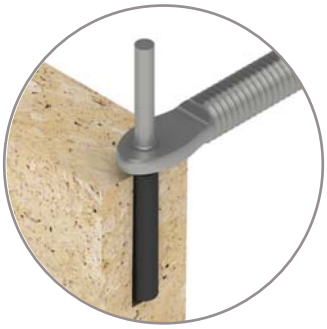

Control


Fastening

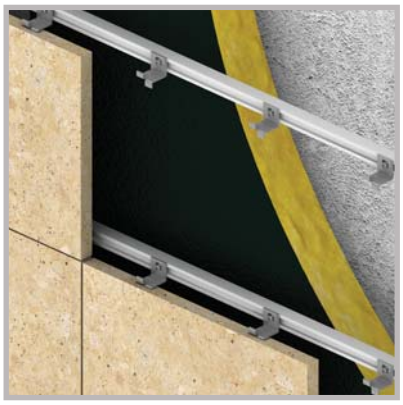
Stone Attachments - Pin & Kerf Systems

The pin & kerf attachment system is the conventional method for attachments made to stone. A pin hole or a kerf groove is opened at the edge of stone panels. Plastic sleeves are used along with suitable resin to securely attach the pin or kerf in place. The use of this system is applicable for stone thickness of 3 cm and above, depending on the strength of the stone. A breaking load test at pin or kerf areas may be necessary to determine the correct thickness of stone panels that may differ for different natural stone types.

HFP Pin Attachment To Stone



Kerf Attachment To Stone



Advantages:

- More freedom in facade design and anchor positioning
- No need for expansive drilling equipment
- Fine adjustment is possible
- Fast & easy installation

Special processing needs to be made on the edges of the of the panels where attachments are to be made. This process must be made using suitable drilling machines and drill bits. High precision is required with very tight tolerances. Failure to conduct proper processing to stones will result in breakage and will jeopardize the security of the stone panel installation.

Drilling for Pin holes

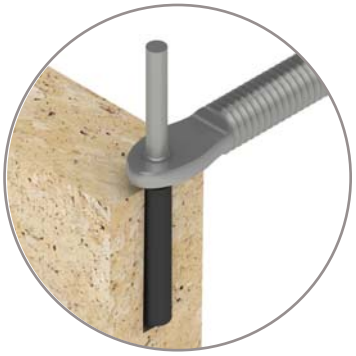
Drilling is made with no core drill bits using wet system drilling machines. No tolerance drilled hole is essential for proper fixing.

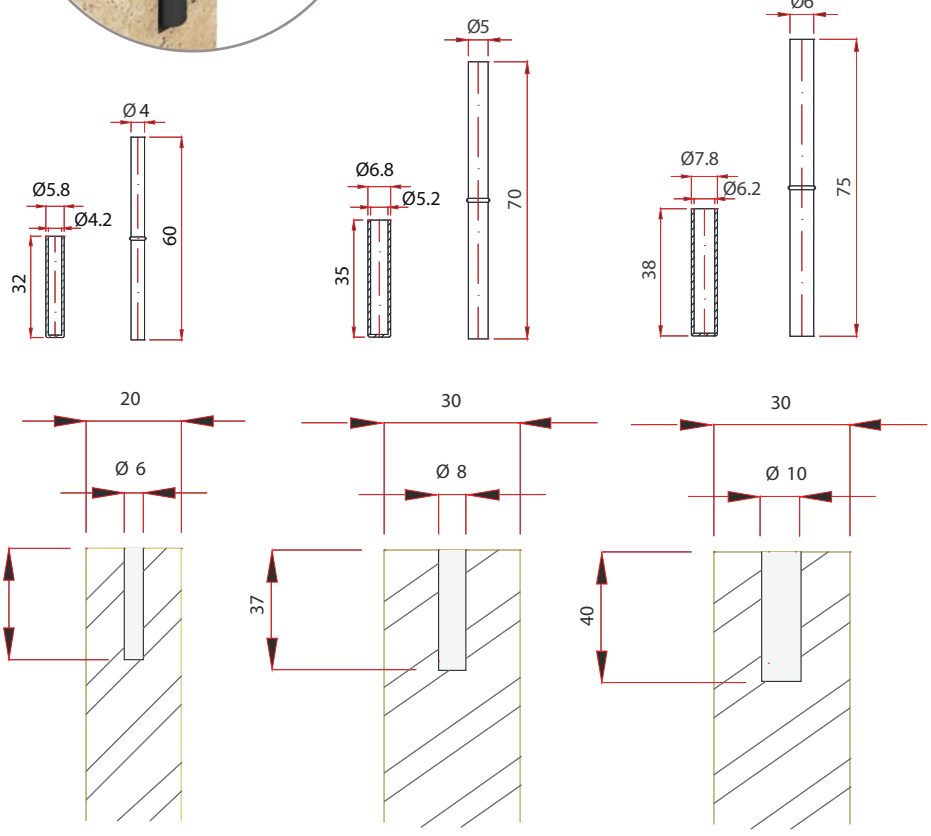
Opening Grooves

Drilling is made with a customized designed machine using electroplated special made bits to drill the hole required.

HFP Flanged Pin

- Attachement made in to holes dirlled at slab edges
- Suitable for minimum 20 mm slab thicknesses
- Plastic sleeve supplied for enabling vibration absorbtion and debonding to componsate on thermal expansion
- Available in sizes 4x60, 5x70 and 6x75 mm





* dimensions in mm

Drilling of the pin holes must be made with special machines that use no core drill bits with water in flow. The pin hole should be drilled according to the specification in order avoid damaging the stone.

Drilling Hole

Checking Hole

Placing Plastic Tube

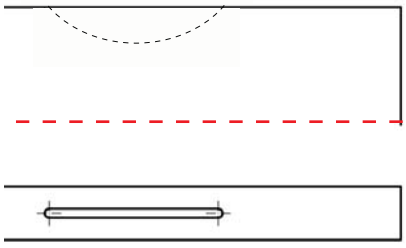
Positioning Adj Arm

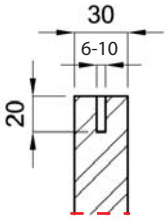
Placing Pin

HA3 Kerf Anchor

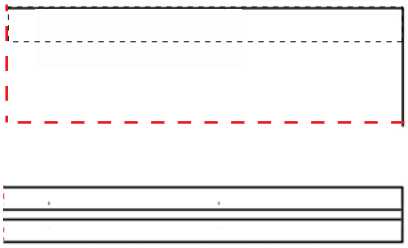
- Attachement made in to grooves opened at slab edges
- Suitable for minimum 30 mm slab thicknesses
- Plastic sleeves supplied for enabling vibration absorbtion and debonding to componsate on thermal expansion
- Available in 3-6 mm thicknesses

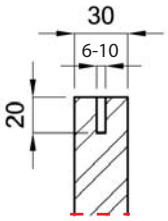
Single Groove





Continues Groove





* dimensions in mm

Grooves on the edge of the stone panels must be opened with suitable machines and diamond tools. Diamond discs using wet processing techniques are to be used in order achieve economic and cast results.

Using Spiral for Grooving

Opening Groove

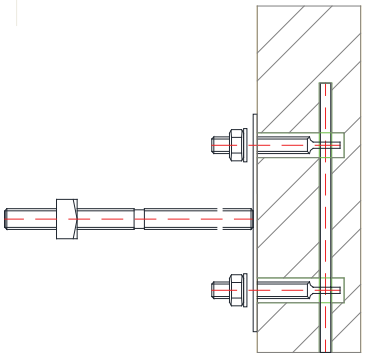
Checking Groove

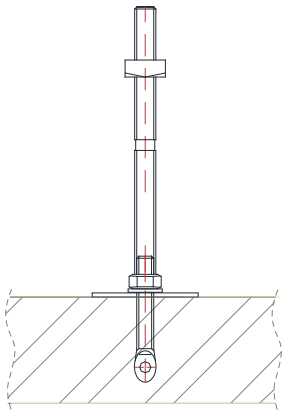
Positioning Kerfed Anchor

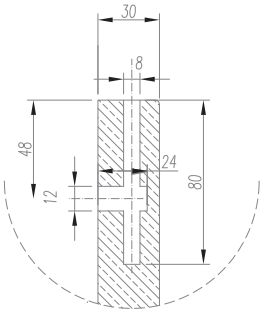
Placing Kerf In Groove

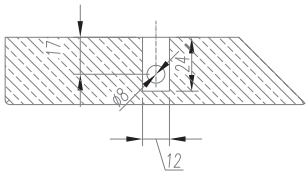
Drop-in Pin System

- Attachement made in to special holes using adjustable arms and pins
- Suitable for minimum 30 mm slab thicknesses
- Precision drilling required
- Available in M8 adjustale arm and diamter 6 mm pin



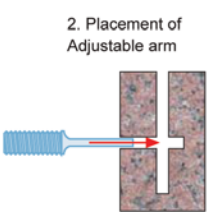


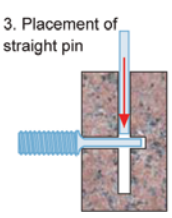


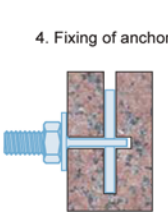


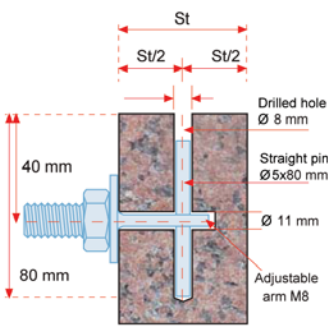
Special Drilling for Drop in pin connection

Special drilling is done to the slabs at the upper face and at the back. The drilling must be done precisely as shown on the illustration. The adjustable arm inserted from the back of the stone meets the pin which is inserted from the edge surface of the stone.









Drilling Solutions

HAZ-MC-11

Special Drilling Machine for HB-11 Undercut Bolt

- HAZ-MC-11 undercut drilling machine
- Suitable for HB11 type undercut bolt
- UC 12, vacuum basement
- Drilling unit 1400 W
- 230 V Electric power
- GFI switch undercut drilling head

HAZ-DB-11

Special No Core Drill Bit

- Sintered diamond segment with steel shank
- M10x1.5 adaptor for ways & secure fit
- Inner tube for water flow
- Available in diameter 12 mm

HAZ-MC-T31

Special Drilling Machine for T31 Undercut Bolt

- HAZ-MC-T31 undercut drilling machine
- Vacuum pad
- Pneumatic drilling
- GFI switch undercut drilling head

HAZ-DB-T31

Special Drill Bit

- Electro plated diamond bit with steel extension
- Inner tube for water flow
- Available in diameter 6,10 & 12 mm

HAZ-MC-PN

Drilling Machine for HFP pin system

- HAZ-MC-PN drilling machine for pins
- Suitable for HFP type pins
- Clamping device 10-50 mm
- Driving motor unit 1000 W
- Water sleeve
- 220 V Electric power
- GFI safety switch

HAZ-DB-PN

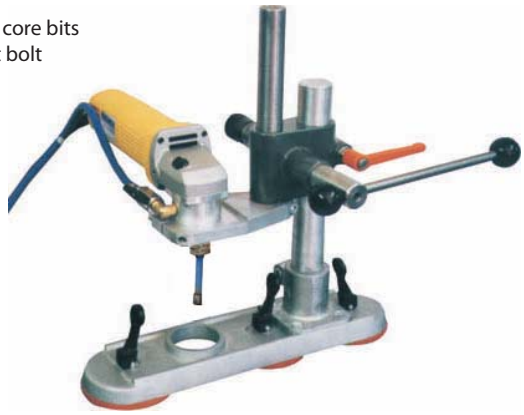
No Core Drill bit

- Sintered diamond segment with steel shank
- Inner tube for water flow
- Available in diameters 6, 8 and 10 mm

HAZ-MC-09

Special Drilling Machine for HB09 Undercut Bolt

- HAZ-MC-09 drilling machine for core bits
- Suitable for HB09 type undercut bolt
- Vacuum pad
- Driving motor unit 2200 W
- Leveller device up to 30 cm
- 220 V Electric power
- GFI safety switch



HAZ-DB-09

No Core Drill Bit

- Sintered diamond segment with steel shank
- Inner tube for water flow
- Available in diameter 12 mm

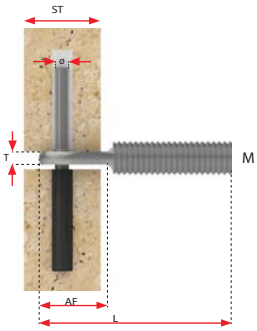
HAZ Metal Product range offers a wide range of products and solutions. HAZ Design department designs and propose to most suitable stone connection system for the project requirement. Bespoke system solutions for special applications can also be designed upon request.

This catalog includes the standardized products for the stone connection systems. Additional types and sizes of produccts are available to offer.

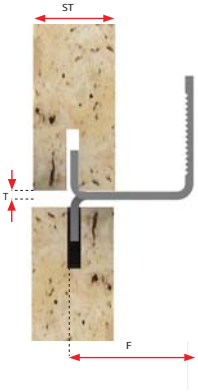
More details can be found about stone connection systems in our technical product catalogue which can be downloaded at www.hazmetal.com.

Stone Connections Technical catalogue is downloadable downloadable at www.hazmetal.com

HAA Adjustable arm & HFP Flanged pin

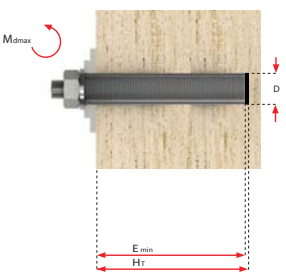


HA03 Kerfed L Anchor



HCA Corner Anchors

HTR Treaded Stud



HAZ-MC-P Pin hole drilling machine

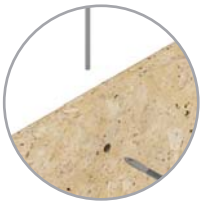
HAZ-DB-P Non Core Drill Bit

HAZ-MC-K Pin hole drilling machine

HAZ-DB-K Non Core Drill Bit

Drop in stone connection in to stone

Drilling of stone at exact locations



Placing of adjustable arm straight and pin

Fastening of fixture

Polyster Resin - Chemical adhesive Injection gun

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