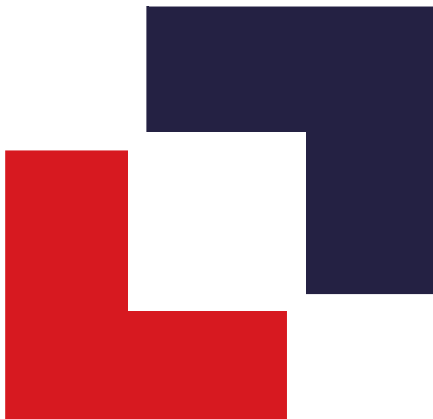


# HAZ METAL FIXING SYSTEMS

Your Fixing Systems Specialist



Stone Fixing Systems  
Technical Product Catalogue  
HAZ-SF-EN/04.20







Demir Bank Headquarters, Istanbul



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## Company Profile

### Introduction

HAZ Metal is located in Iskenderun, in the southern part of Turkey, based in the company owned property, with an area of 17.000 square meters. The company provides services in the design and production of stainless steel fixing systems for natural stone installation and a variety of products used in construction.

The company's objective is to assist and advise its clients in choosing in the most suitable fixing systems for their requirements and to provide them with quality production and supply with timely deliveries.

HAZ Metal has dedicated itself to supplying its clients with easy to use, secure and economical fixing systems. Along with this principle, HAZ Metal has organized a technical department to design and produce fixing systems in accordance with international standards.

HAZ Metal has 200 employees working both in Turkey and in foreign branches. Along with a sales office in Istanbul, Turkey, there are HAZ branches in the United Arab Emirates, Germany, the United Kingdom, Russia, Qatar, Egypt and Singapore. With this network, HAZ Metal reaches out closer to their clients, to provide better services to meet local requirements.

The innovative design and production techniques offer practical and economic solutions to solve every possible problem within the scope of natural stone installation. As a supplier of fixing systems to major projects around the world, HAZ Metal has proven its quality and reliability to its clients. The company enjoys serving the sector and works hard to constantly improve and develop its services.

### Mission Statement

To design and produce products that exactly meet the expectations of our clients and provide them with technical service in order to assist them with their requirements. Our objective is to propose the most secure, economical and easy to use fixing systems to satisfy our clients.

### Product Range

HAZ Metal started producing fixing systems in 1993. Today, the company has the technical know how and production capacity to produce all types of natural stone fixing systems used for ventilated stone facades. Production of a variety of fixing systems such as channels, cast-in channels, masonry support anchors and expansion bolts is also available.

- Sub channel systems
- Anchor channel systems
- Framing systems
- Brickwork support systems
- Concrete panel fixing systems
- Structural Building components
- Expansion bolts
- Various construction accessories

Standard and customized production is made to meet the special application requirements. Products are produced from stainless steel and galvanized steel raw materials. Stainless steel grade EN 1.4301 (AISI304) & EN 1.4401 (AISI 316) and galvanized mild steel



## Technical Service

HAZ Metal provides services in the design of fixing systems and preparation of structural calculations. This service is done in the company technical department using CAD software and SAP and RFEM engineering programs.

The company's technical staff consists of experienced engineers who are competent in the field. Our engineers provide services in design, anchor positioning, preparation of shop drawings and scheduling.

The technical department receives the necessary technical information of the project in order to design the most suitable, secure, easy to use and economical fixing systems in accordance with the project criteria. Custom design and production is also made after receiving detailed architectural drawings of the project.

HAZ Metal provides the necessary documentation and structural calculation reports for submittal in order to approve the designed fixing systems.

## Quality Standards

HAZ Metal implements internationally recognised standards in the design and production of fixing systems. Product design and production is strictly controlled within the specifications of these standards. All products are designed and produced by its personnel, applying the latest production methods with modern machinery. In order to guarantee outstanding quality to their clients, HAZ Metal has established a testing laboratory at the factory, to inspect materials during each stage of production.

## Production Capacity

With approximately 10.000 sqm of production halls, HAZ Metal is equipped with 120 work stations and has a monthly production capacity of more than 500 tons.

Throughout the years, production techniques and methods have been improved to achieve higher quality and productivity. HAZ Metal today implements modern technology in the production of fixing systems in order to meet the requirements of the industry.

The factory is equipped with a coil slitting machine, channel roll formers, press breaks, eccentric presses, automated end part formers, thread rolling machines, cold forge bolt makers and various production units. There is also an in house electro galvanizing unit where 12 micro thick zinc coating on mild steel is made. Hot dip galvanizing with over 50 micro thick zinc coating is made by prequalified sources outside the factory.

Emphasis has also been given to automation in which faster production and lower costs are achieved through higher efficiency. HAZ Metal is able to design and build apparatus and progressive dies in order speed up production.

The presence of a work shop with the capability of preparing and maintaining the required moulding and tooling, provides flexible production. The quick preparation, maintenance, alteration and adjustment of machines and tooling are made without interrupting the production process which leads to saving time and costs. This enables fast and flexible production to supply projects of any size.

## Stone Fixing Systems - Overview

Fixing systems need to accommodate all types of backing walls whether they are concrete walls, block work & masonry walls or steel structures.

The following points are taken into consideration when designing a fixing system for natural stone installation.

- Stone type and dimensions.
- Cavity structure: projection size and insulation.
- Application type: horizontal or vertical joint installation.
- Joint size.
- Structural wall backing.
- Height of facade.
- Relevant dynamic loads such as wind and seismic loads.
- Design criteria of the project.

HAZ Metal proposes and specially designs fixing systems according to individual projects requirements.

### Direct fixing to concrete walls with anchor bolts

Fixing to concrete with bolt anchors using expansion bolts. Insulation is cut at each anchoring point.



### Direct fixing to concrete or masonry walls with mortar

Fixing to concrete with mortar anchors using mortar. Insulation is drilled at each anchoring point.



### Indirect fixing to load bearing beams with channel system

Fixing to sub channel structure supported to load bearing beams. Insulation is cut at each anchoring point.

### HZ Z Anchor Fixing System



- Fixing to concrete with bolts.
- Projection sizes up to 150 mm.
- Recommended for loads up to 800 N.
- Installation at horizontal or vertical joints.
- Three dimensional adjustability.

### AXO Body Anchor Fixing



- Fixing to concrete with bolts.
- Projection sizes up to 260 mm.
- Recommended for loads up to 1300 N.
- Installation at horizontal or vertical joints.
- Optimum static performance.
- Three dimensional adjustability.

### HA L Anchor Fixing System



- Fixing to concrete with bolts.
- Can be used for 50 mm and larger stone thicknesses.
- Various types to enable adjustability.
- Installation at horizontal joints only.

### HSD Mortar Anchor Fixing System



- Fixing to masonry with mortar.
- Various types to fit a range of loads and projection sizes.
- Installation at horizontal or vertical joints.
- Three dimensional adjustability.

### HMP Sub Channel System



- Fixing to sub channel structure which is attached to load bearing beams.
- High load bearing capability to fit projection sizes up to 360 mm.
- Greater projection sizes are achieved with special design.
- Fully adjustable and allows fast installation.

## Stone Fixing Systems - Overview

HAZ Metal is known as a high quality and reliable service provider for the design and supply of fixing systems in the construction industry. Major projects have been successfully supplied with HAZ Metal fixing systems. The main advantage of HAZ Metal is the ability to custom design fixing systems and provide fast production to meet the time restraint requirements of projects. The design and supply is done in accordance with international standards and more importantly with our customers' expectations.

### Application examples for bolt anchors

Anchors are fixed on to load bearing walls with expansion bolts.



To fasten anchors on to isolated walls, the isolation must be cut first. After fastening, the cut out isolation piece must be inserted back, and the isolation parts must be sealed in order to reduce cold bridging.

### Application examples of profile systems

The channels are fastened to channel supports which are fixed with expansion bolts to floor beams. Natural stone panels are fixed with anchors which are fixed to channels with hex. bolt sets. This system allows installation to be independent from the wall. Low anchoring points allows faster installation and reduces cold bridging.



## Design Principles

### Technical Design & Engineering

HAZ Metal provides services in the design of fixing systems and the preparation of structural calculations. This service is done in the company technical department using CAD software and SAP and RFEM stress analysis programs.

Our technical department receives the necessary technical information of the project in order to propose the most suitable, secure, easy to use and economical fixing systems in accordance with the project criteria. Custom design is also made in accordance with the architectural drawings of the project.

HAZ Metal provides the necessary technical documentation for submittal to the project officials in order to receive approval for the fixing system elements. The following principles are used in the design and structural calculations for natural stone fixing systems.

Finite element stress analysis is implemented for complex structures where the structural integrity of the fixing systems needs to be maintained. This procedure is especially made for sub channel systems and unitised panel facade units.

HAZ Metal can offer the design and engineering services by referring to any internationally renown standards. The engineering department will relate to the specifications of the project and conduct its design and dimensioning according to the requested criteria.

Reference is made to the following standards:

#### British Standards

- |                                |  |
|--------------------------------|--|
| <a href="#">BS 8298</a>        | • Design and installation of natural stone cladding            |
| <a href="#">BS EN 10088-2</a>  | • Steel plates, sheets and strips stainless and heat resisting |
| <a href="#">BS 6105</a>        | • Corrosion resistant stainless steel fasteners                |
| <a href="#">BS 5950</a>        | • Structural use of steel work in building                     |
| <a href="#">BS 6399 Part 2</a> | • Code of practice for wind loads                              |
| <a href="#">BS 970 Part 3</a>  | • Mechanical properties for stainless steel                    |

#### German Standards

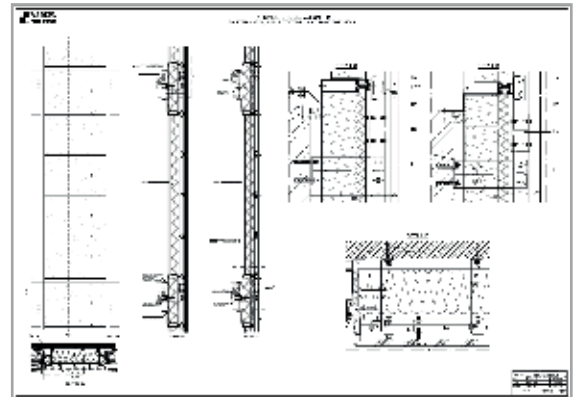
- |                            |   |
|----------------------------|---|
| <a href="#">DIN 18 516</a> | • Cladding for ventilated walls                             |
| <a href="#">DIN 18 800</a> | • Steel structures, design and dimensioning                 |
| <a href="#">DIN 18 801</a> | • Steel framed structures                                   |
| <a href="#">DIN 1045</a>   | • Concrete and reinforced concrete, design and dimensioning |
| <a href="#">DIN 1053</a>   | • Masonry, design and dimensioning                          |
| <a href="#">DIN 1055</a>   | • Wind loads design code                                    |
| <a href="#">DIN 4114</a>   | • Steel construction, stability cases                       |

#### American Standards

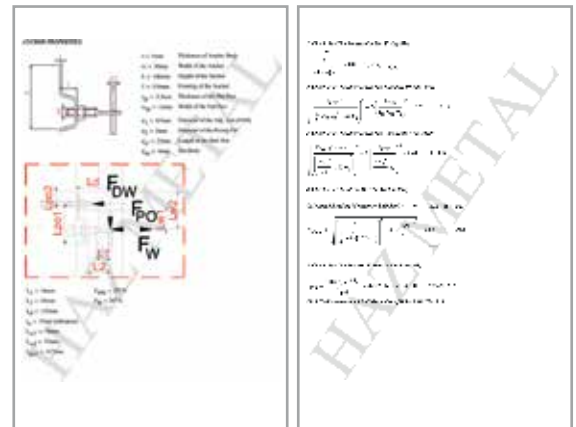
- |   |   |
|---|---|
| <a href="#">ASTM C1242 -12</a>  | • Standard guide for stone attachment systems                                 |
| <a href="#">ASTM A 276</a>  | • Specification for stainless steel bars and shapes                           |
| <a href="#">ASTM 666</a>  | • Specification for annealed or cold worked austenitic stainless steel sheets |
| <a href="#">ASCE</a>  | • Minimum design loads for buildings  |
| <a href="#">Uniform Building Code &amp; International Building Code</a> |   |

#### Euro codes

- |                         |   |
|-------------------------|---|
| <a href="#">EN 1990</a> | Basis of Structural Design. Structural Analysis and Design by Testing |
| <a href="#">EN 1090</a> | Execution of steel & aluminium structures                             |
| <a href="#">EN 1991</a> | General Actions - Wind  |
| <a href="#">EN 1998</a> | General Rules, seismic actions and rules for buildings                |



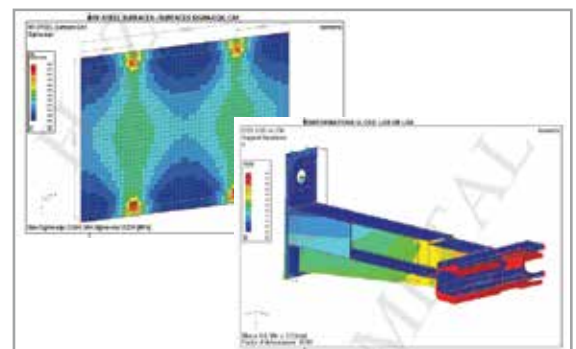
• Shop drawing with application details



• Structural analysis report



• Structural analysis report



• Finite element method stress analysis



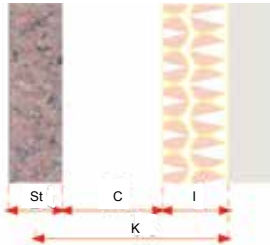
## Design Principles

### Design Factors

The following design factors are considered

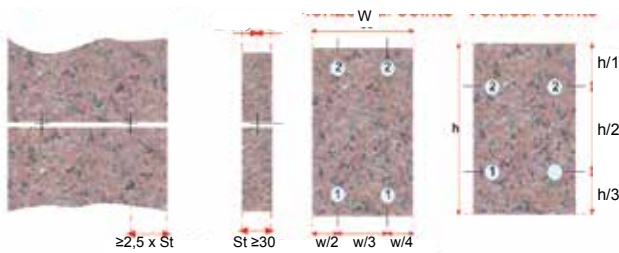
#### Wall Structure

- I : Thickness of insulation
- C : Cavity
- St : Thickness of stone
- K : Projection



#### Structure - Edge Spacing

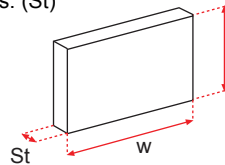
- Minimum distance from the corner of the slab to the pin centre should be 2.5 times the slab thickness.
- The minimum pin centre distance to the edge of slab at the surface should be 15mm.
- The most secure method is to arrange the distance of the drilled pin hole centre from the edge of the slab at 1/4 the size of the slab.



#### Natural Stone Material

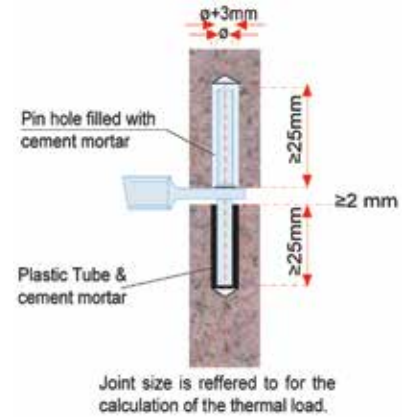
Dimensions of natural stone slabs : Design weight for natural stone slabs : (ds)

- Length: (w)
- Height: (h)
- Thickness: (St)
- Travertine: (24000 N/m<sup>3</sup>)
- Sandstone: (26000 N/m<sup>3</sup>)
- Marble & Limestone: (27000 N/m<sup>3</sup>)
- Granite: (28000 N/m<sup>3</sup>)



#### Anchor Pins

- Anchor pins are inserted into the drilled holes on the edge of the slab from four points.
- Drilled holes should be approx. 3 mm wider than the pin diameter and minimum 25 mm in length.
- Minimum 2 mm space should be left between the slab below and the bottom edge of the adjustable arm.
- A plastic tube is inserted on the slabs below to absorb wind loads.



### Applied Loads - (Actions)

The following applied loads are considered;

#### Dead loads:

Weight of natural stone slabs is determined  $F_{dw} = h \text{ (m)} \times w \text{ (m)} \times st \text{ (m)} \times ds \text{ (KN/m}^3\text{)}$   
 $F_{dw}$  is multiplied with 1.35 safety factor.

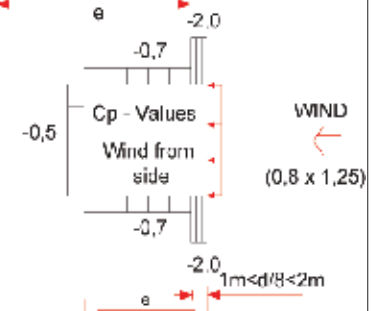
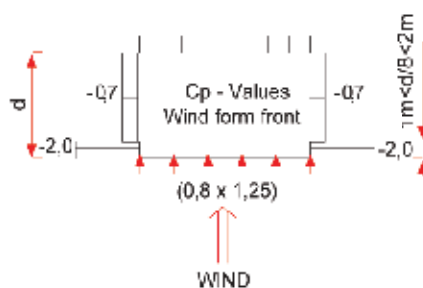
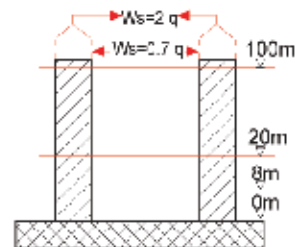
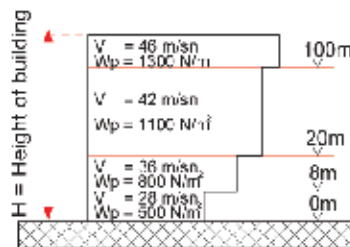
#### Wind loads:

The max. speed is;  $v_s$ .  
 The value of the dynamic pressure of the wind is  $q = k \times v_s^2$   
 The max. design pressure is;  $w_p = c_p \times Q$   
 The max. design suction is;  $w_s = c_s \times Q$   
 $w_s = 0.7 \times Q$  (normal)  
 $w_s = 2.0 \times Q$  (edge)  
 $w_p$  &  $w_s$  are multiplied with 1.50 safety factor

#### Thermal loading:

The following temperature is considered.

Range on the stone;  $T_{min} \text{ } ^\circ\text{C} < t \text{ } ^\circ\text{C} < T_{max} \text{ } ^\circ\text{C}$   
 The max. thermal loading in the stone is;  
 $\Delta t = T_{max} - T_{min}$  The max. thermal expansion for stone slab is;  $\Delta l = \mu \cdot \Delta t \cdot L$



## Design Principles

### Wall Backing

The anchoring ground can be concrete, brickwork, filled hollow block or steel structure. Different types of bolts are used for backing.

The type of wall backing is taken into consideration to propose suitable bolts for fixing the anchors.



Concrete wall



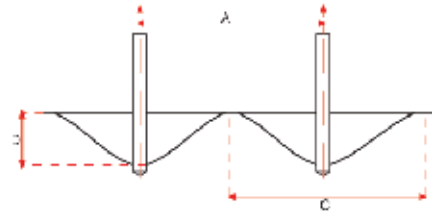
Masonry wall



Block work wall

### Group of Bolts

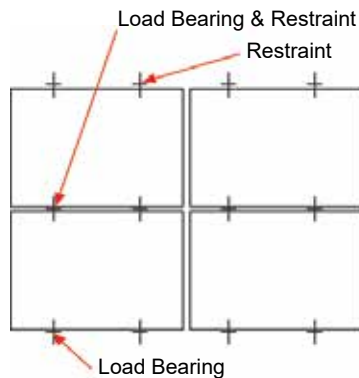
The distance between anchor bolts; A, which is necessary for a full cone of concrete to break away, is given by the crater diameter; C, depending on the type of anchor. This diameter is 1.5 to 2.5 times the depth of embedment, D.



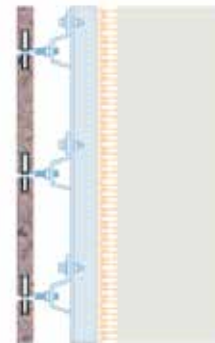
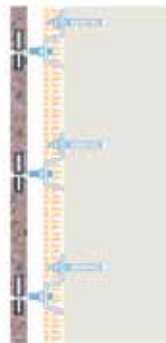
### Application Type

#### Horizontal Joints

The anchors carry half the weight of the natural stone slabs in horizontal installation. Anchors bear half the weight of the slab above and also act as restraint, holding the slabs below and restraining them against wind pressure and suction.



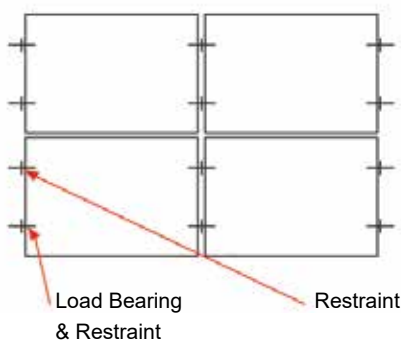
Direct fixing to concrete  
Min. Projection size 45 mm



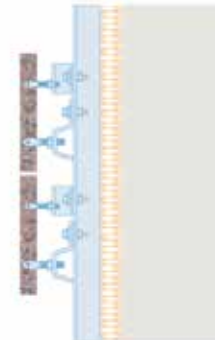
Indirect fixing to channels  
Min. Projection size 90 mm.

#### Vertical Joints

The load bearing anchors carry the full weight of the natural stone slab in vertical installation. Each anchor bears half the weight of the slab on the right and half the weight of the slab on the left. Restraint anchors hold the slabs below and restrain them against wind pressure and suction.



Direct fixing to concrete  
Min. Projection size 45 mm



Indirect fixing to channels  
Min. Projection size 90 mm.

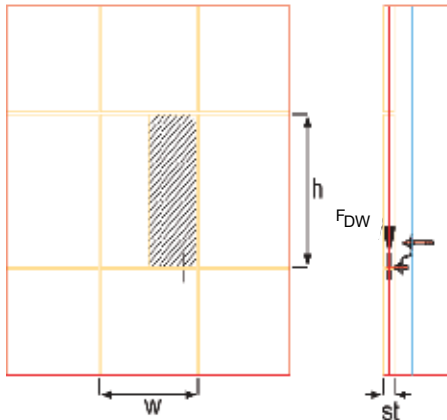
## Design Principles

### Load Principles

Vertical (Dead Load) and Horizontal (Wind Load) loads are determined according to the following diagram. The following principle is applied before designing a fixing system.

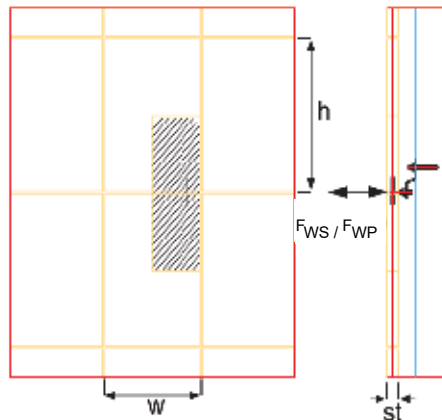
Support anchor in horizontal joint

Vertical load from dead load  
 $FDW = (st \times w \times h \times ds) / 2$  (for each anchor)



Restraint anchor in horizontal joint

$FWP = (w \times h \times qp) / 2$  ( for each anchor)  
 $FWS = (w \times h \times qs) / 2$  ( for each anchor)



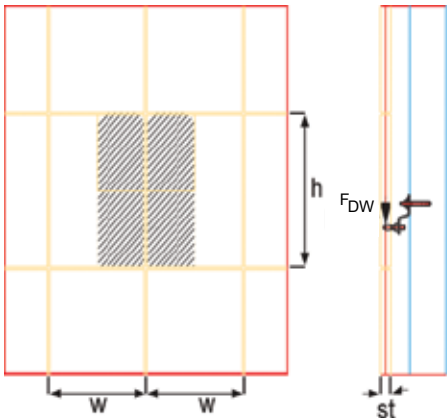
FDW = Dead load  
 FWP = Wind load at pressure case  
 FWS = Wind load at suction case

ds = Density of stone  
 qw = Design wind pressure  
 qs = Design wind suction

t = Thickness of stone  
 w = Width of stone  
 h = Height of stone

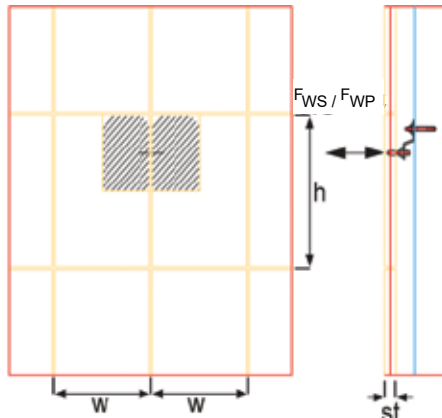
Support anchor in vertical joint

Vertical load from dead load  
 $FDW = (st \times w \times h \times ds) / 1$  (for each anchor)



Restraint anchor in vertical joint

$FWP = (w \times h \times qp) / 2$  ( for each anchor)  
 $FWS = (w \times h \times qs) / 2$  ( for each anchor)



### Material Grade

Anchors, adjustable arms and pins must be stainless steel grade AISI 304 - 1.4301 (A2) & AISI 316-1.4401 (A4).

Recommended material specifications for fixing systems are shown in the following table.

Product Type	Stainless Steel	Steel
	AISI = W.-Nr.	DIN = W. -Nr.
Anchors	304 = 1.4301 316 = 1.4401 316Ti = 1.4571	Not Advisable
Channels	304 = 1.4301 316 = 1.4401	Hot dip galv. St 37-2 = 1.0037 Hot dip galv. St 44-2 = 1.0044
Bolts	DIN 933 (A2/50-A2/70) A4/50-A4/70)	Electro galv. St 37 Strength class 4.6/8.8
Hexagon Nuts	DIN 934 & DIN 439 (A2/50-A2/70) A4/50-A4/70)	Electro galv. St 37 Strength class 8
Washers	DIN 125	ST DIN 125

## HZ Z Anchor Fixing Systems - Introduction

- Direct fixing into concrete walls with expansion bolts. Indirect fixing into sub channel system with hex bolts.
- Three dimensional adjustability - Quick and easy fixing.
- Installation at horizontal and vertical joints.
- Recommended projection sizes up to 150 mm & loads up to 800 N.

**HZ01**  
Z Anchor



**HZ02**  
Z Anchor



**HZ05 Z Anchor**  
With riveted nut



**HZ07**  
Soffit Anchor



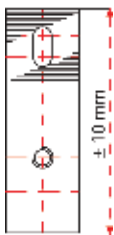
**HZ08 Z Anchor**  
For large projections



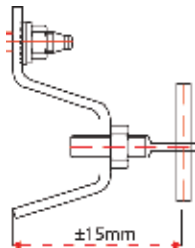
**HRS1**  
Restraint Anchor



### Three dimensional adjustability



1) Vertical adjustment is provided by the slotted hole. The anchor is fixed on to the bolt with the serrated washer at the desired level.

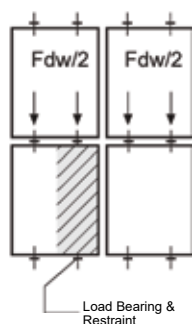


2) Adjustment of the projection size is provided by rotating the adjustable arm. The adjustable arm is locked with the hexagon nut.

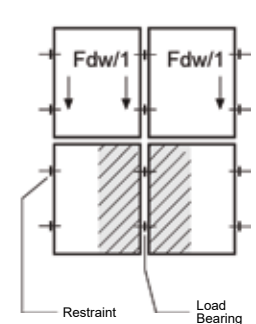


3) Adjustment of the anchor left and right is provided by sliding the body up to 15 degrees side ways.

### Installation at horizontal joints

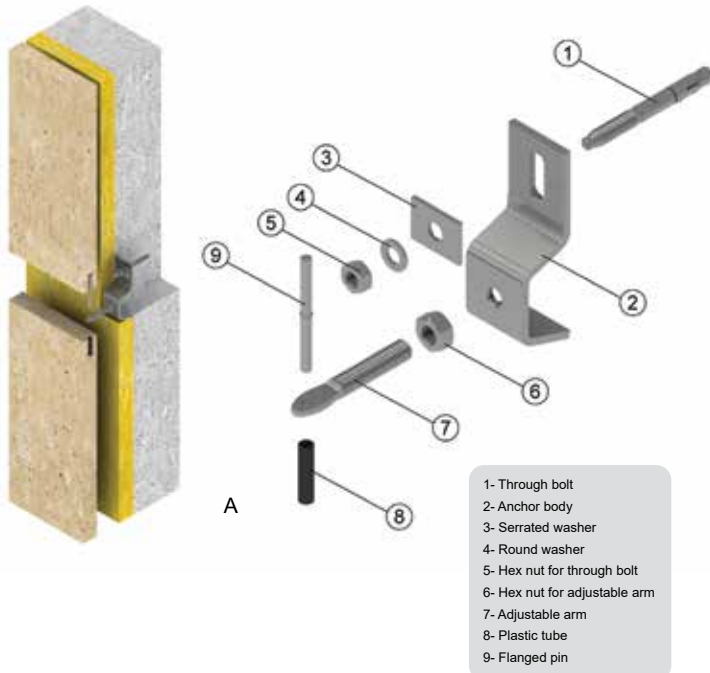


### Installation at vertical joints

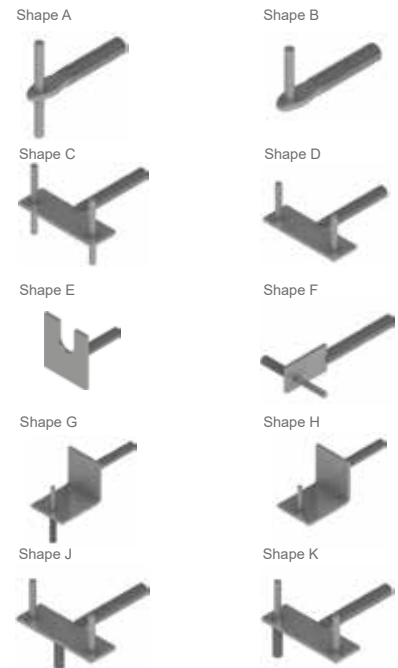


- Suitable for concrete walls. Anchors are fixed directly on to concrete walls with expansion bolts.
- Recommended projection size between 45 mm to 135 mm and loads up to 800 N.
- In horizontal joint installation, slabs are pinned on the bottom and upper sides. Anchors act as load bearing carrying half the weight of the slabs above. Anchors also act as restraints, holding the slabs below and restraining against wind suction and pressure.
- In vertical joint installation slabs are pinned on the left and right sides. Anchors on the bottom are load-bearing anchors carrying the whole weight of the slab. Half the weight of the slab on the left and half the weight of the slab on the right. Anchors on the top are restraint anchors holding the slabs and restraining against wind suction and pressure.
- Three - dimensional adjustability allows quick and easy installation.
- The design and structural calculations of these anchors are made in our technical department. Special design and manufacturing can be made for the requirements of each project.

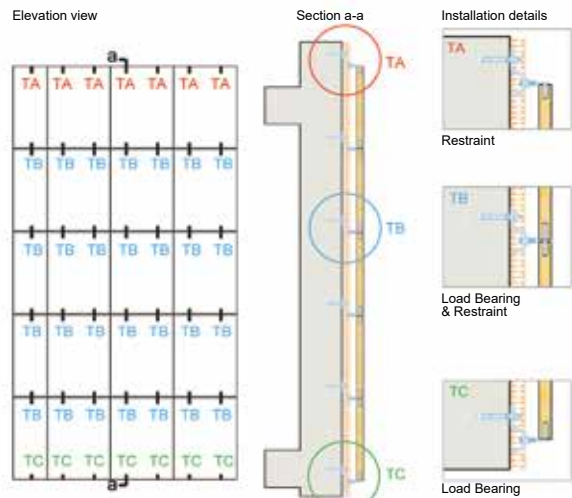
## HZ Z Anchor Fixing Systems - Installation Detail



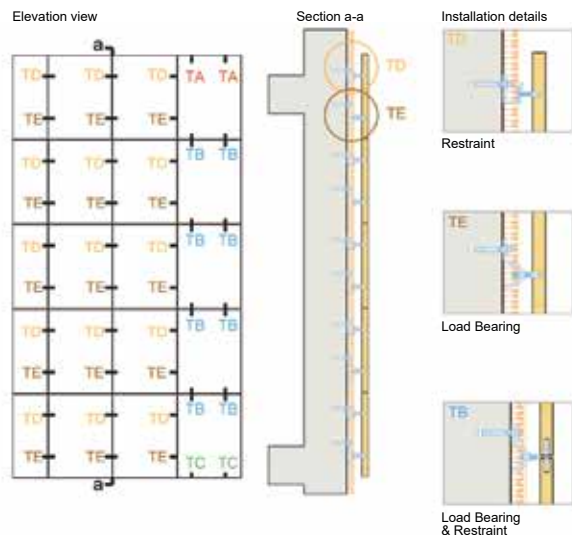
### Adjustable Arm Variations



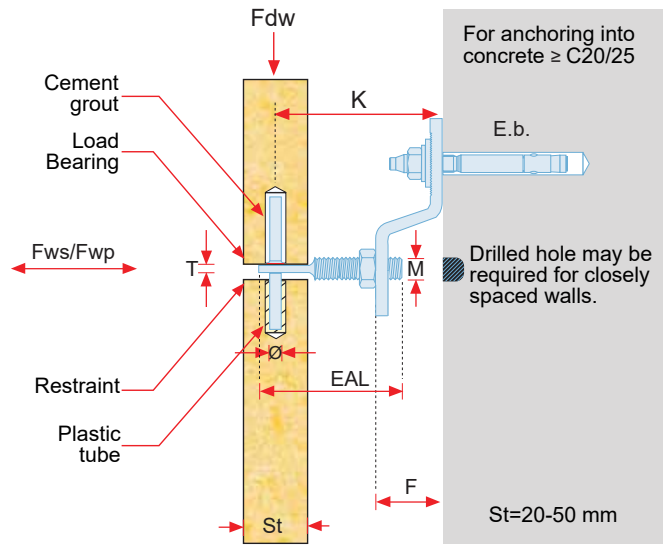
### Installation at horizontal joints



### Installation at vertical joints



**HZ01 Z Anchor - Product Details**



Product Code	Technical details											
	Projection	Min. Projection	Max. Projection	Dead Load	Forming Size	Wind-Pressure	Wind-Suction	Expansion Bolt Size	Pin Size	Adj. Arm Metric Size	Adj. Arm Flat Thickness	Adj. Arm Length
	K (mm)	K - (mm)	K + (mm)	Fdw (N)	F (mm)	Fwp (N)	Fws (N)	E.b. (mm)	Ø (mm)	M (mm)	T (mm)	EAL (mm)
HZ01-452	45	40	55	200	10	312	219	M8X80	5	M10	3.5	60
HZ01-552	55	45	70		20							60
HZ01-752	75	60	90		40							60
HZ01-952	95	80	110		60							60
HZ01-553	55	50	70	300	20	468	328	M8X80	5	M10	3.5	60
HZ01-753	75	60	90		40							60
HZ01-953	95	80	110		60							60
HZ01-1153	115	100	130		80							60
HZ01-554	55	50	65	400	10	624	437	M10X90	5	M12	4.5	70
HZ01-754	75	60	90		20							90
HZ01-954	95	80	110		40							90
HZ01-1154	115	100	130		60							90
HZ01-755	75	60	90	500	20	780	546	M10X90	5	M12	4.5	90
HZ01-955	95	80	110		40							90
HZ01-1155	115	100	130		60							90
HZ01-1355	135	120	150		80							90

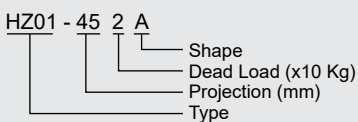
- Material: Stainless Steel 1.4301 (A2) & 1.4401 (A4).
- Table above is prepared according to Eurocode standards.
- Loads stated are working resistance loads.
- Other sizes are available for production upon request.
- Bolts are provided separately.
- Structural calculation reports are available upon order.

**HZ01 Z Anchor**

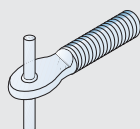
- Load bearing & restraint
- Three dimensional adjustability
- Fastened on to load bearing walls with expansion bolts and on to channels with set screws
- Projection sizes between 45 and 150 mm
- Suitable for horizontal & vertical joints

- Loads up to 500 N
- Stone thicknesses 20-50 mm

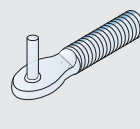
**Product Code Description**



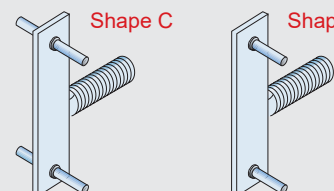
**Shape A**



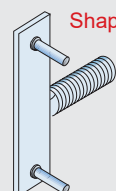
**Shape B**



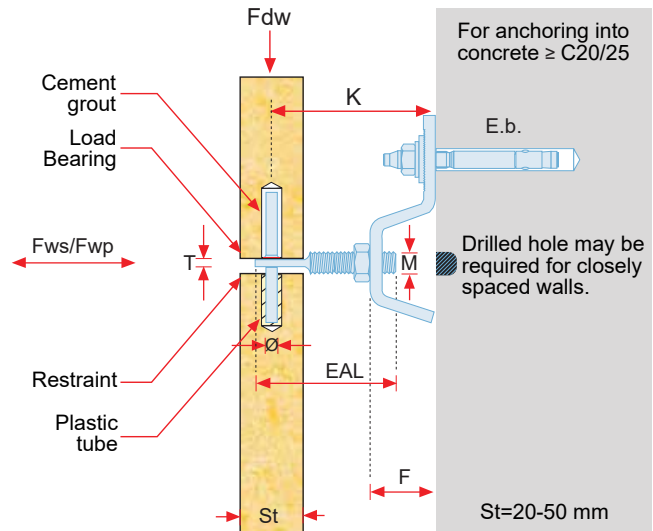
**Shape C**



**Shape D**



## HZ02 Z Anchor - Product Details



Product Code	Technical Details											
	Projection	Min. Projection	Max. Projection	Dead Load	Forming Size	Wind-Pressure	Wind-Suction	Expansion Bolt Size	Pin Size	Adj. Arm Metric Size	Adj. Arm Flat Thickness	Adj. Arm Length
	K (mm)	K - (mm)	K + (mm)	Fdw (N)	F (mm)	Fwp (N)	Fws (N)	E.b. (mm)	Ø (mm)	M (mm)	T (mm)	EAL (mm)
HZ02-452	45	40	55	200	10	312	219	M8X80	5	M10	3.5	60
HZ02-552	55	45	70		20							60
HZ02-752	75	60	90		40							60
HZ02-952	95	80	110		60							60
HZ02-553	55	45	70	300	20	468	328	M8X80	5	M10	3.5	60
HZ02-753	75	60	90		40							60
HZ02-953	95	80	110		60							60
HZ02-1153	115	100	130	400	80	624	437	M8X80	5	M12	4.5	60
HZ02-554	55	45	65		10							70
HZ02-754	75	60	90		20							90
HZ02-954	95	80	110		40							90
HZ02-1154	115	100	130	60	90							
HZ02-755	75	60	90	500	20	780	546	M8X80	5	M12	4.5	90
HZ02-955	95	80	110		40							90
HZ02-1155	115	100	130		60							90
HZ02-1355	135	120	150		80							90
HZ02-756	75	60	90	600	20	936	655	M10X90	6	M14	5.5	90
HZ02-956	95	80	110		40							90
HZ02-1156	115	100	130		60							90
HZ02-1356	135	120	150		80							90
HZ02-758	75	60	90	800	20	1235	865	M10X90	6	M14	5.5	90
HZ02-958	95	80	110		40							90
HZ02-1158	115	100	130		60							90
HZ02-1358	135	120	150		80							90

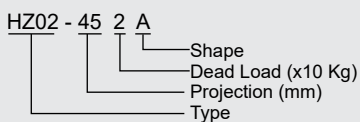
• Material : Stainless Steel 1.4301 (A2) & 1.4401 (A4). • Table above is prepared according to Eurocode standard. • Loads stated are working resistance loads. • Other sizes are available for production upon request. • Bolts are provided separately. • Structural calculation reports are available upon order.

### HZ02 Z Anchor

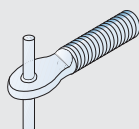
- Load bearing & restraint
- Three dimensional adjustability
- Fastened on to load bearing walls with expansion bolts and on to channels with set screws
- Projection sizes between 45 and 150 mm
- Suitable for horizontal & vertical joints

- Loads up to 800 N
- Stone thicknesses 20-50 mm

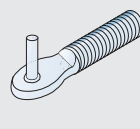
#### Product Code Description



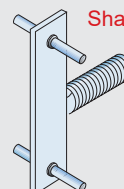
#### Shape A



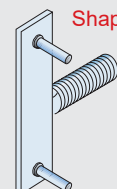
#### Shape B



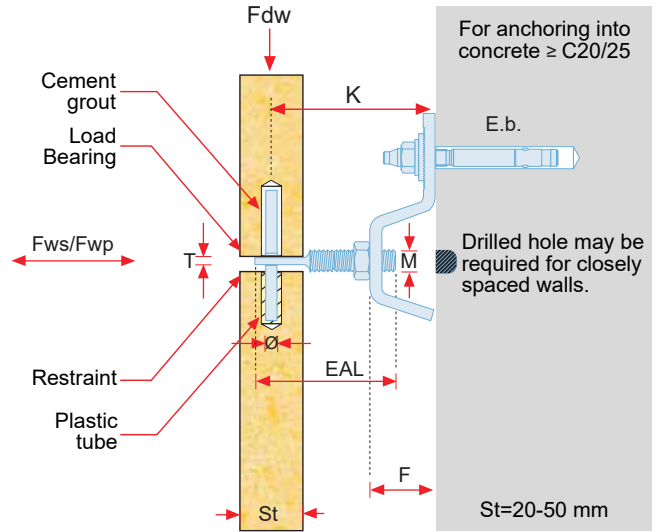
#### Shape C



#### Shape D



**HZ05 Z Anchor With Riveted Nut - Product Details**



Product Code	Technical Details											
	Projection	Min. Projection	Max. Projection	Dead Load	Forming Size	Wind-Pressure	Wind-Suction	Expansion Bolt Size	Pin Size	Adj. Arm Metric Size	Adj. Arm Flat Thickness	Adj. Arm Length
	K (mm)	K - (mm)	K + (mm)	Fdw (N)	F (mm)	Fwp (N)	Fws (N)	E.b. (mm)	Ø (mm)	M (mm)	T (mm)	EAL (mm)
HZ05-452	45	40	55	200	10	312	219	M8X80	5	M10	3.5	60
HZ05-552	55	45	70		20							60
HZ05-752	75	60	90		40							60
HZ05-952	95	80	110		60							60
HZ05-553	55	50	70	300	20	468	328	M8X80	5	M10	3.5	70
HZ05-753	75	60	90		40							70
HZ05-953	95	80	110		60							70
HZ05-1153	115	100	130		80							70
HZ05-554	55	50	65	400	10	624	437	M8X80	5	M12	4.5	70
HZ05-754	75	60	90		20							90
HZ05-954	95	80	110		40							90
HZ05-1154	115	100	130		60							90
HZ05-755	75	60	90	500	20	780	546	M8X80	5	M12	4.5	90
HZ05-955	95	80	110		40							90
HZ05-1155	115	100	130		60							90
HZ05-1355	135	120	150		80							90

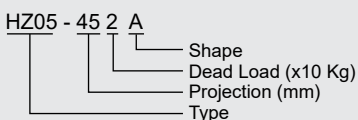
- Material : Stainless Steel 1.4301 (A2) & 1.4401 (A4).
- Table above is prepared according to Eurocode standard.
- Loads stated are working resistance loads.
- Other sizes are available for production upon request.
- Bolts are provided separately.
- Structural calculation reports are available upon order.

**HZ05 Z Anchor**

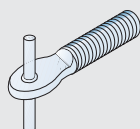
- Load bearing & restraint
- Three dimensional adjustability
- Fastened on to load bearing walls with expansion bolts and on to channels with set screws
- Projection sizes between 45 and 150 mm
- Suitable for horizontal & vertical joints

- Loads up to 500 N
- Stone thicknesses 20-50 mm

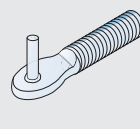
**Product Code Description**



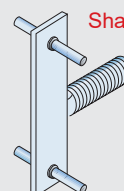
**Shape A**



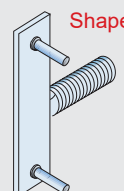
**Shape B**



**Shape C**

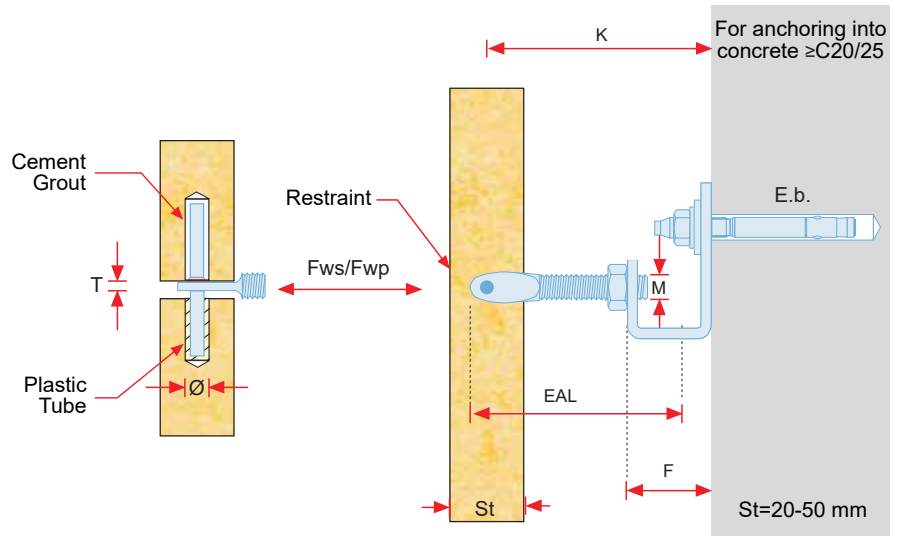


**Shape D**





## HRS1 Restraint Anchor - Product Details



Product Code	Technical Details										
	Projection	Min. Projection	Max. Projection	Forming Size	Wind-Pressure	Wind-Suction	Expansion Bolt Size	Pin Size	Adj. Arm Metric Size	Adj. Arm Flat Thickness	Adj. Arm Length
	K (mm)	K - (mm)	K + (mm)	F (mm)	Fwp (N)	Fws (N)	E.b. (mm)	Ø (mm)	M (mm)	T (mm)	EAL (mm)
HRS1-55 *	55	45	60	20	312	219	M8X80	5	M8	3	60
HRS1-75	75	60	90	40							60
HRS1-95	95	80	110	60							60
HRS1-115	115	100	130	60							80
HRS1-135	135	115	150	60							100

- Material : Stainless Steel 1.4301 (A2) & 1.4401 (A4).
- Table above is prepared according to Eurocode standard.
- Loads stated are working resistance loads.
- Other sizes are available for production upon request.
- Bolts are provided separately.
- Structural calculation reports are available upon order.
- Available in sizes to fit the projection range of all HZ anchors.

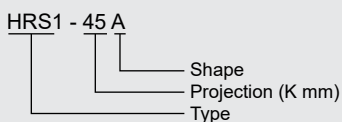
\* In case back adjustment shorter adj. arms should be used.

### HRS1 Restraint Anchor

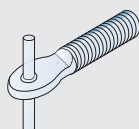
- Load bearing & restraint
- Three dimensional adjustability
- Fastened on to load bearing walls with expansion bolts and on to channels with set screws
- Projection sizes between 45 and 150 mm
- Suitable for horizontal & vertical joints

- Loads up to 312 N
- Stone thicknesses 20-50 mm

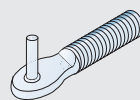
#### Product Code Description



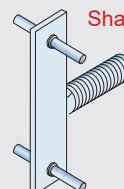
#### Shape A



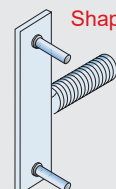
#### Shape B



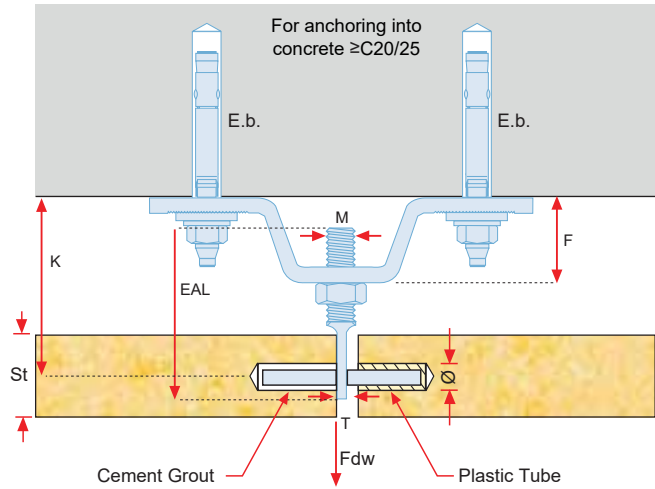
#### Shape C



#### Shape D



**HZ07 Z Anchor For Soffits - Product Details**



Product Code	Technical Details									
	Projection	Min. Projection	Max. Projection	Dead Load	Forming Size	Expansion Bolt Size	Pin Size	Adj. Arm Metric Size	Adj. Arm Flat Thickness	Adj. Arm Length
	K (mm)	K - (mm)	K + (mm)	Fdw (N)	F (mm)	E.b. (mm)	Ø (mm)	M (mm)	T (mm)	EAL (mm)
HZ07-452	45	40	55	200	10	M8X80	5	M10	3.5	60
HZ07-552	55	45	70		20					60
HZ07-752	75	60	90		40					60
HZ07-952	95	80	110		60					60
HZ07-553	55	50	70	300	20	M8X80	5	M10	3.5	60
HZ07-753	75	60	90		40					60
HZ07-953	95	80	110		60					60
HZ07-1153	115	100	130		80					60
HZ07-554	55	50	65	400	10	M8X80	5	M12	4.5	70
HZ07-754	75	60	90		20					80
HZ07-954	95	80	110		40					80
HZ07-1154	115	100	130		60					80

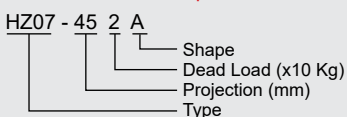
- Material : Stainless Steel 1.4301 (A2) & 1.4401 (A4).
- Table above is prepared according to Eurocode standard.
- Loads stated are working resistance loads.
- Other sizes are available for production upon request.
- Bolts are provided separately.
- Structural calculation reports are available upon order.

**HZ07 Z Anchor - Soffit Anchor**

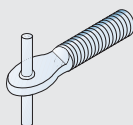
- Load bearing & restraint
- Three dimensional adjustability
- Fastened on to load bearing walls with expansion bolts and on to channels with set screws
- Projection sizes between 45 and 130 mm
- Suitable for horizontal & vertical joints

- Loads up to 400 N
- Stone thicknesses 20-50 mm

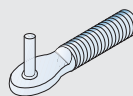
**Product Code Description**



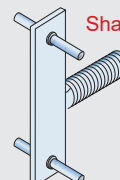
Shape A



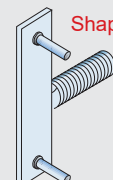
Shape B



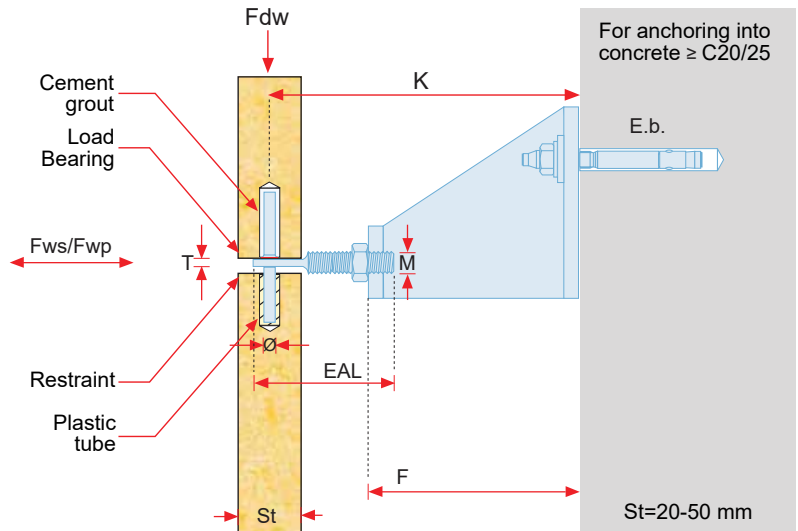
Shape C



Shape D



## HZ08 Z Anchor - Product Details



Product Code	Technical Details											
	Projection	Min. Projection	Max. Projection	Dead Load	Forming Size	Wind-Pressure	Wind-Suction	Expansion Bolt Size	Pin Size	Adj. Arm Metric Size	Adj. Arm Flat Thickness	Adj. Arm Length
	K (mm)	K - (mm)	K + (mm)	Fdw (N)	F (mm)	Fwp (N)	Fws (N)	E.b. (mm)	Ø (mm)	M (mm)	T (mm)	EAL (mm)
HZ08-1152	115	85	130	200	80	312	219	M8x80	5	M10	3.5	60
HZ08-1352	135	105	150		100							60
HZ08-1552	155	135	170		120							60
HZ08-1153	115	100	130	300	80	468	328	M8x80	5	M10	3.5	60
HZ08-1353	135	120	150		100							60
HZ08-1553	155	140	170		120							60
HZ08-1154	115	100	130	400	80	624	437	M8x80	5	M12	4.5	80
HZ08-1354	135	120	150		100							80
HZ08-1554	155	140	170		120							80

- Material : Stainless Steel 1.4301 (A2) & 1.4401 (A4).
- Table above is prepared according to Eurocode standard.
- Loads stated are working resistance loads.
- Other sizes are available for production upon request.
- Bolts are provided separately.
- Structural calculation reports are available upon order.

### HZ08 Z Anchor

- Load bearing & restraint
- Three dimensional adjustability
- Fastened on to load bearing walls with expansion bolts and on to channels with set screws
- Projection sizes between 115 and 170 mm
- Suitable for horizontal & vertical joints

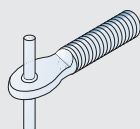
- Loads up to 400 N
- Stone thicknesses 20-50 mm

#### Product Code Description

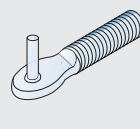
HZ08 - 115 2 A

- Shape
- Dead Load (x10 Kg)
- Projection (mm)
- Type

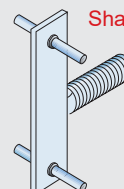
#### Shape A



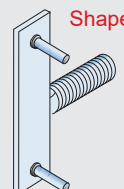
#### Shape B



#### Shape C



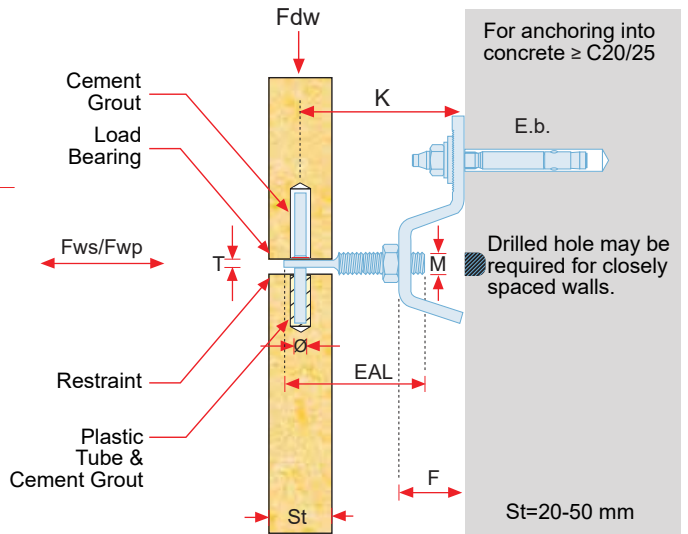
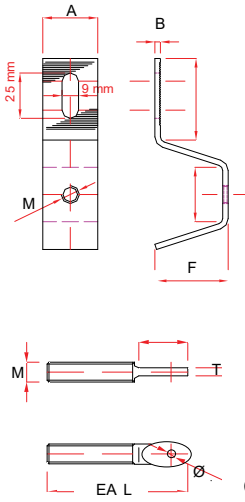
#### Shape D



**HZ02-S Z Anchor - Product Details**



LGA TEST REPORT  
No : BBW 121 51 21  
Date : 15.10.2006

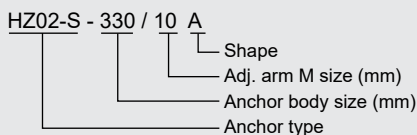


Product Code	Technical Details											
	Projec-tion	Min. Projec-tion	Max. Projec-tion	Dead Load	Offset	Wind-Pressure	Wind-Suction	Bolt Size	Pin Diameter	Adj. Arm Metric Size	Adj. Arm Flat Thickness	Adj. Arm Length
	K (mm)	K - (mm)	K + (mm)	Fdw (N)	F (mm)	Fwp (N)	Fws (N)	E.b. (mm)	Ø (mm)	M (mm)	T (mm)	EAL (mm)
HZ02-S-33010/10	40	40	50	500	10	312	219	M8x80	ø 5x70	M10	3.5	50
HZ02-S-33015/10	45	45	55	500	15							50
HZ02-S-33020/10	50	50	60	500	20							50
HZ02-S-33030/10	65	50	80	400	30							60
HZ02-S-33040/10	75	60	90	400	40							60
HZ02-S-33050/10	85	70	100	400	50							60
HZ02-S-33060/10	95	80	110	300	60					60		
HZ02-S-33080/10	125	110	140	300	80					70		
HZ02-S-330100/10	145	130	160	250	100					70		
HZ02-S-330120/10	165	150	180	250	120					70		
HZ02-S-43020/12	60	55	70	500	20					M12	4.5	70
HZ02-S-43040/12	90	75	105	500	40							80
HZ02-S-43060/12	110	95	125	400	60	80						
HZ02-S-43080/12	130	115	145	400	80	80						
HZ02-S-430100/12	150	135	165	300	100	80						
HZ02-S-430120/12	170	155	185	300	120	80						

- Material : Stainless Steel 1.4301 (A2) & 1.4401 (A4).
- Table above is prepared according to LGA test results.
- Loads stated are characteristic resistance loads.
- Bolts are provided separately.
- Max Wind pressure: 350 N
- Test results are available upon order.

HZ02-S type Z anchors with standard sizes. Different types available according to desired method of fixation.

**Product Code Description**



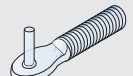
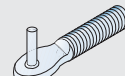
**HZ02-2S** Type without serration and with plain washer.

**HZ05-S** Type with riveted nut. Serrated with serrated washer.

**HZ05-2S** Type with riveted nut. Without serration and with plain washer.

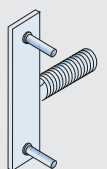
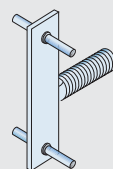
**Shape A**

**Shape B**



**Shape C**

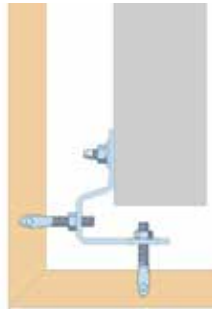
**Shape D**



## HZ Z Anchor - Special Applications Details

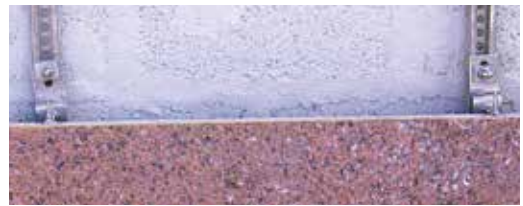
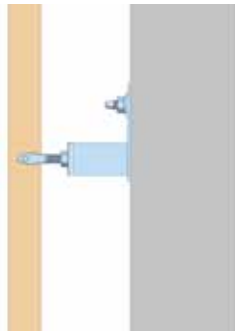
### HZ03 Special Z Anchor

Used for installing soffit and facade panels with a single anchor



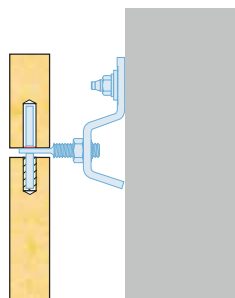
### HZ06 Special Z Anchor - for large projection sizes

With optimal static performance  
Can be used for projections over 150 mm



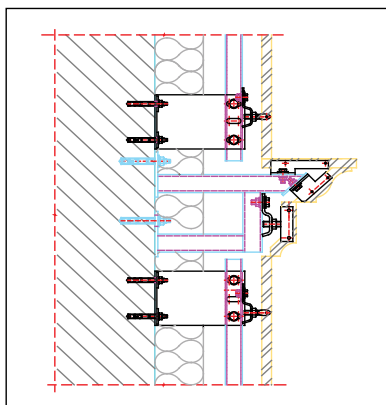
### HZ09 Z Anchor - with wedge washer

Can be used for loads that are over 800 N when stronger vertical stabilization is required

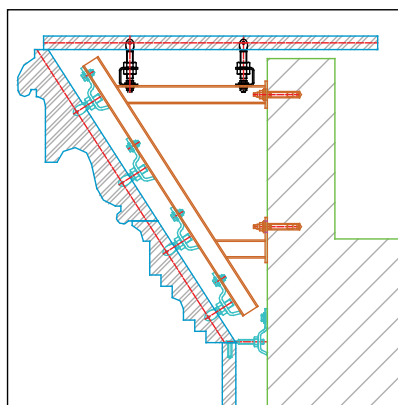


### Special Designs

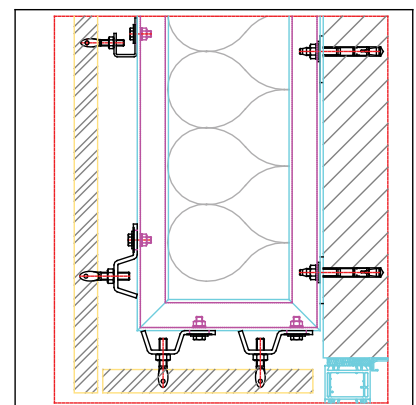
Z Anchors are fixed on sub frame to install cornice lining.



Z Anchors are fixed on to special steel structure for cornice parapet installation.



Z Anchors are fixed on to special steel structure for special area installation.



## AXO Body Anchor Fixing Systems - Introduction

- Direct fixing in to concrete walls with expansion bolts. Indirect fixing on to sub channel systems with hex bolts.
- Three dimensional adjustability - Quick and easy fixing.
- Installation at horizontal and vertical joints.
- Optimum static performance and low engineering for higher loads and larger projection sizes.
- Recommended projection sizes up to 260 mm and loads up to 1300 N.

**AXO1**  
Body Anchor



**AXO2**  
Body Anchor



**AXO3**  
Body Anchor



**AXO4**  
Body Anchor



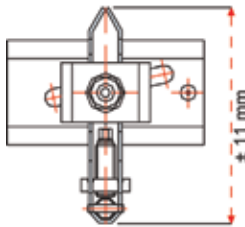
**HRS3**  
Restraint Anchor



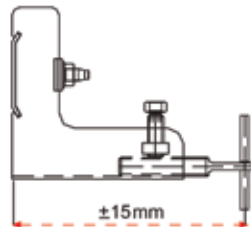
**HZTA**  
Telescope Anchor



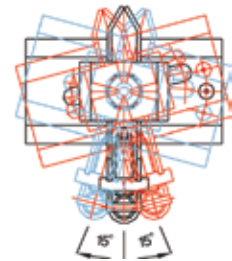
### Three dimensional adjustability



1) Vertical adjustment is provided through the body space. The anchor is fixed onto the bolt through the wedge washer and the lock washer at the desired level.

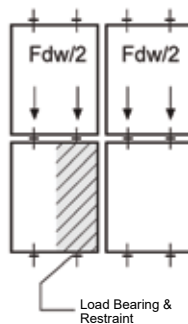


2) Adjusting the projection size by simply moving the adjustable arm without rotating. The adjustable arm is safely fixed to the anchor body with the lock nut and hex bolt.

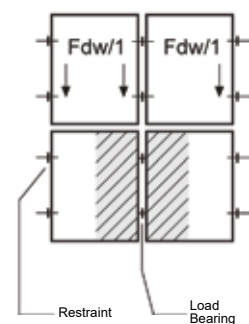
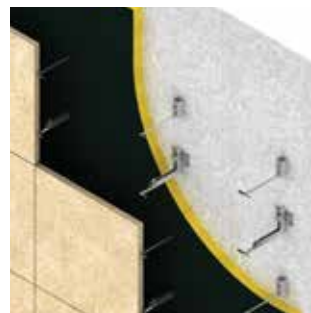


3) Adjusting the anchor left and right is provided by sliding the body up to 15 degrees left or right.

### Installation at horizontal joints

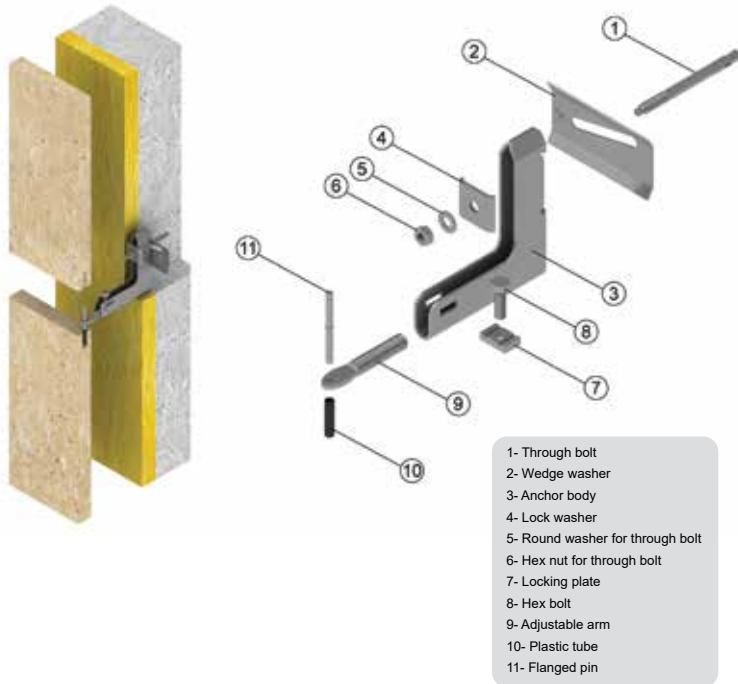


### Installation at vertical joints

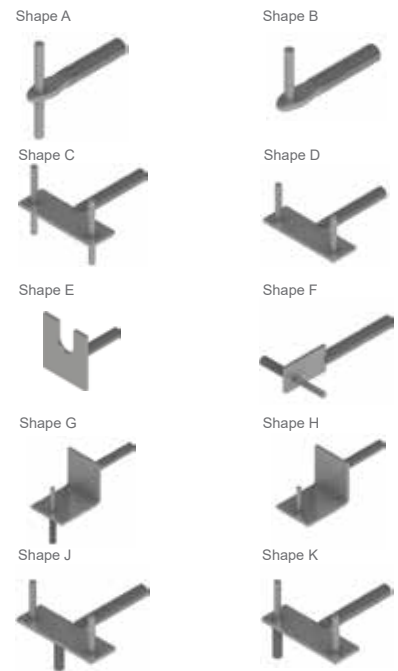


- Suitable for concrete walls. Anchors are fixed on to concrete walls with expansion bolts.
- Projection sizes between 60 and 260 mm and loads up to 1300 N.
- In horizontal installation, slabs are pinned on the bottom and upper sides. The anchors act as load bearing, carrying half the weight of the slabs above. Anchors also act as restraint holding the slabs below and restraining against wind suction and pressure.
- In vertical installation, slabs are pinned at the left and right sides. The anchors on the bottom are load-bearing anchors carrying the whole weight of the slab. Half the weight of the slab on the left and half the weight of the slab on the right. The anchors on the top are restraint anchors holding the slabs and restraining against wind suction and pressure.
- Three dimensional adjustability allows quick and easy installation.
- The design and structural calculations of these anchors are made in our technical department. Special design and manufacturing can be made for the requirements of the project.

## AXO Body Anchor Fixing Systems - Installation Details



### Adjustable Arm Variations



### Installation at horizontal joints



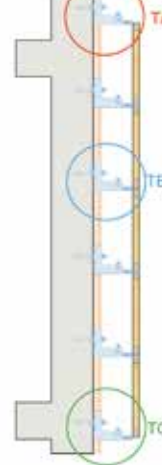
AXO4  
Body Anchor



Elevation view



Section a-a



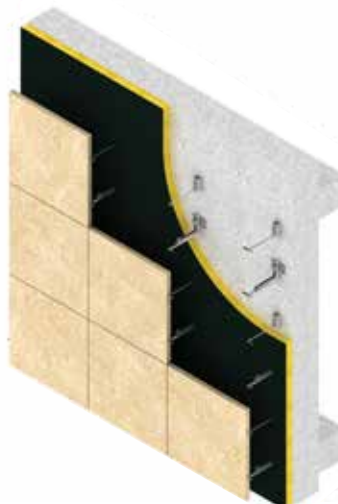
Installation details



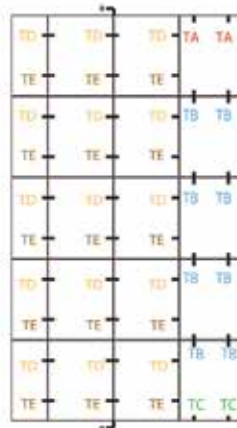
### Installation at vertical joints



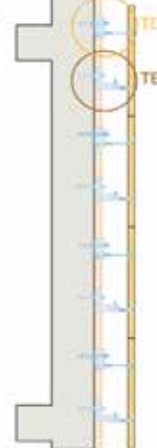
HRS3 Restraint Anchor



Elevation view



Section a-a



Installation details

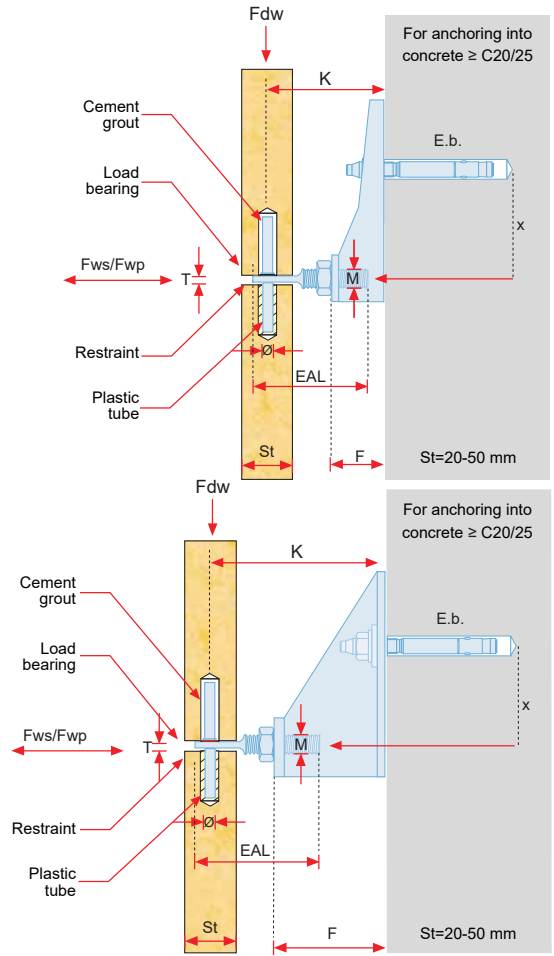
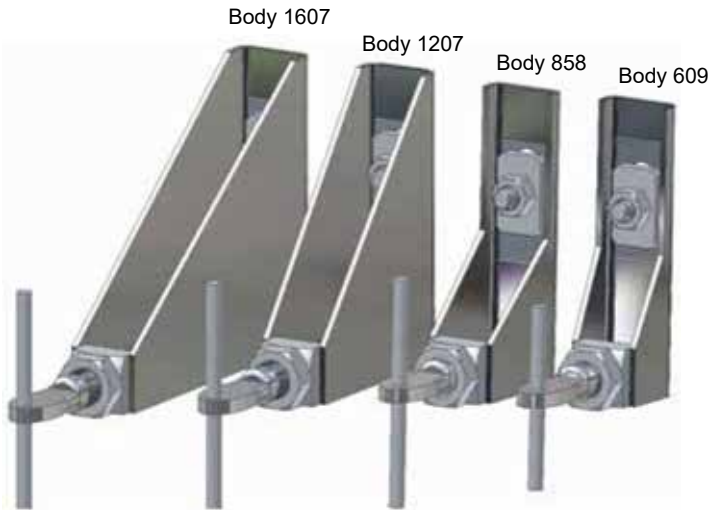


AXO4  
Body Anchor

**BA Body Anchor - Product Details**



LGA TEST REPORT  
No : BBW 0541135-01  
Date : 09.05.2005



Product Code	Technical Details													
	Projection	Min. Projection	Max. Projection	Dead Load	Forming Size	Wind-Pressure	Wind-Suction	Expansion Bolt Size	Pin Size	Adj. Arm Metric Size	Adj. Arm Flat Thickness	Adj. Arm Length	X Size	
	K (mm)	K - (mm)	K + (mm)	Fdw (N)	F (mm)	Fwp (N)	Fws (N)	E.b. (mm)	Ø (mm)	M (mm)	T (mm)	EAL (mm)	x (mm)	
BA-609 BODY 1	60	50	75	900	28	1100	770	M8X80	5	M12	4.5	70	50	
BA-858 BODY 2	85	70	100	800	46	700	700					70		
BA-1207 BODY 3	120	95	135	700	75	650	650					80		
BA-1607 BODY 4	160	145	175	700	115	600	600					80		

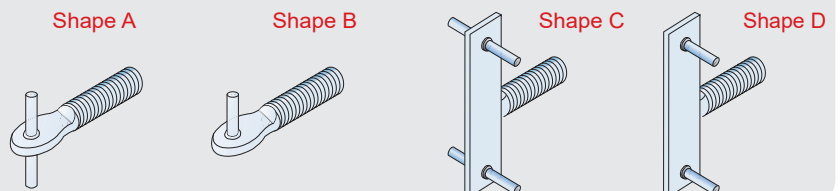
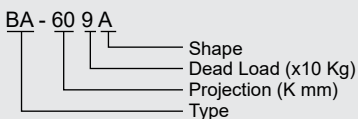
- Material : Stainless Steel 1.4301 (A2) & 1.4401 (A4).
- Table above is prepared according to LGA test results.
- Loads stated are characteristic resistance loads.
- Bolts are provided separately.
- Test results are available upon order.

**BA Body Anchor**

- Load bearing & restraint
- Three dimensional adjustability
- Fastened on to load bearing walls with expansion bolts and on to channels with set screws
- Projection sizes between 60 and 160 mm
- Suitable for horizontal & vertical joints

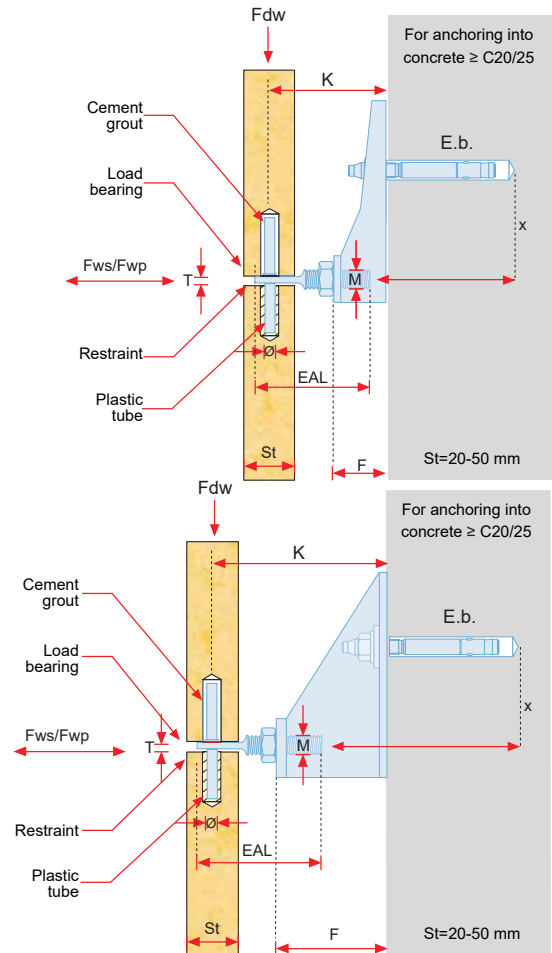
- Loads up to 900 N
- Stone thicknesses 20-50 mm

**Product Code Description**





## AXO1 & AXO2 Body Anchor - Product Details



Product Code	Technical Details												
	Projection	Min. Projection	Max. Projection	Dead Load	Forming Size	Wind-Pressure	Wind-Suction	Expansion Bolt Size	Pin Size	Adj. Arm Metric Size	Adj. Arm Flat Thickness	Adj. Arm Length	X Size
	K (mm)	K - (mm)	K + (mm)	Fdw (N)	F (mm)	Fwp (N)	Fws (N)	E.b. (mm)	Ø (mm)	M (mm)	T (mm)	EAL (mm)	x (mm)
AXO1-705	70	55	85	500	20	780	546	M8X80	5	M12	4.5	80	50
AXO1-1105	110	95	125		60								
AXO1-7013	70	55	85	1300	20	2028	1419	M10X90	6	M16	6	80	50
AXO1-11013	110	95	125		60								
AXO2-1505	150	135	165	500	100	780	546	M8X80	5	M12	4.5	80	50
AXO2-15013	150	135	165	1300	100	2028	1419	M10X90	6	M16	6	80	50

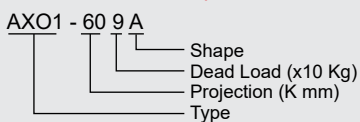
- Material : Stainless Steel 1.4301 (A2) & 1.4401 (A4).
- Table above is prepared according to Eurocode standard.
- Loads stated are working resistance loads.
- Other sizes are available for production upon request.
- Bolts are provided separately.
- Structural calculations are available upon order.

### AXO1 & AXO2 Body Anchor

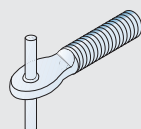
- Load bearing & restraint
- Three dimensional adjustability
- Fastened on to load bearing walls with expansion bolts and on to channels with set screws
- Projection sizes between 70 and 150 mm
- Suitable for horizontal & vertical joints

- Loads up to 1300 N
- Stone thicknesses 20-50 mm

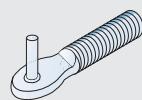
#### Product Code Description



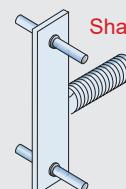
#### Shape A



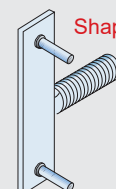
#### Shape B



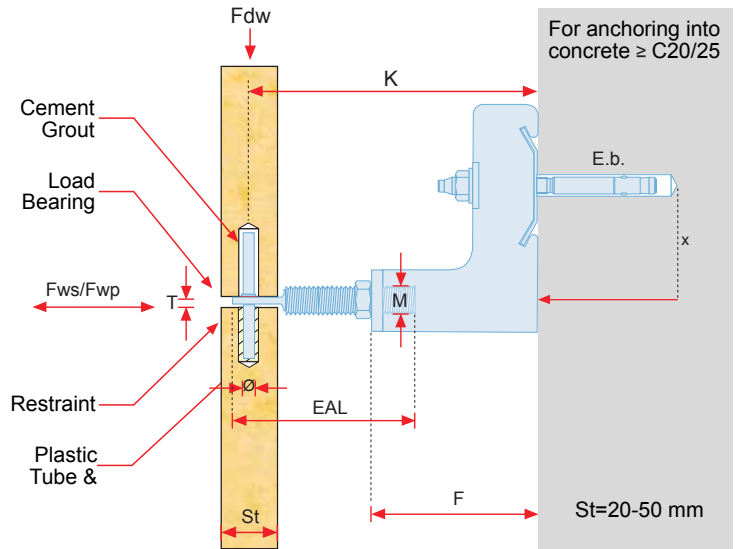
#### Shape C



#### Shape D



**AXO3 Body Anchor - Product Details**



Product Code	Technical Details													
	Projection	Min. Projection	Max. Projection	Dead Load	Forming Size	Wind-Pressure	Wind-Suction	Expansion Bolt Size	Pin Size	Adj. Arm Metric Size	Adj. Arm Flat Thickness	Adj. Arm Length	X Size	
	K (mm)	K - (mm)	K + (mm)	Fdw (N)	F (mm)	Fwp (N)	Fws (N)	E.b. (mm)	Ø (mm)	M (mm)	T (mm)	EAL (mm)	x (mm)	
AXO3-2005	200	180	220	500	155	780	546	M8X120	5	M12	4.5	80	75	
AXO3-2205	220	200	240		175									
AXO3-2405	240	220	260		195									
AXO3-2605	260	240	280		215									
AXO3-2009	200	180	220	900	155	1430	1000	M10X130	6	M14	5.5	80	75	
AXO3-2209	220	200	240		175									
AXO3-2409	240	220	260		195									
AXO3-2609	260	240	280		215									
AXO3-20013	200	180	220	1300	155	2028	1419	M12X145	6	M16	6	80	80	
AXO3-22013	220	200	240		175									
AXO3-24013	240	220	260		195									
AXO3-26013	260	240	280		215									

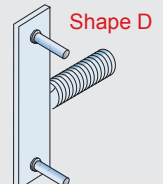
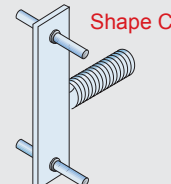
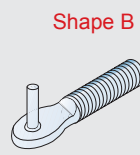
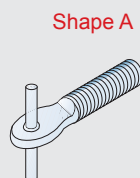
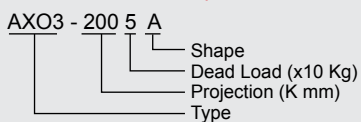
- Material : Stainless Steel 1.4301 (A2) & 1.4401 (A4).
- Table above is prepared according to Eurocode standard
- Loads stated are working resistance loads.
- Bolts are provided separately.
- Structural calculations are available upon order.

**AXO3 Body Anchor**

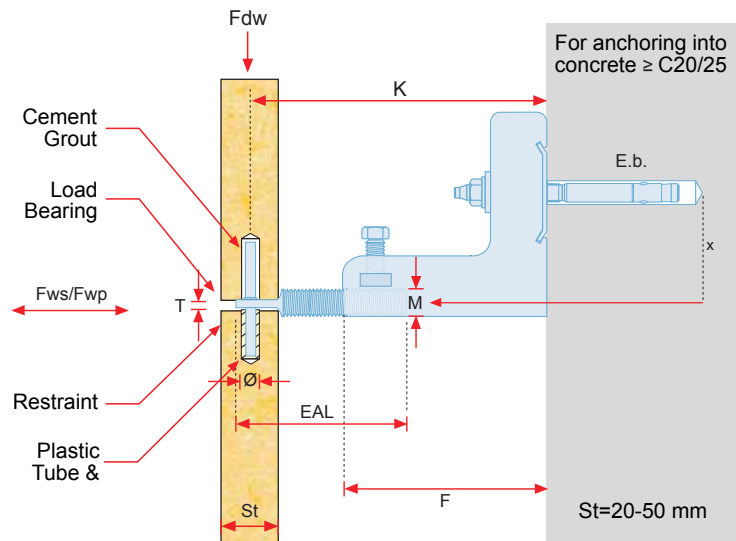
- Load bearing & restraint
- Three dimensional adjustability
- Fastened on to load bearing walls with expansion bolts and on to channels with set screws
- Projection sizes between 200 and 260 mm
- Suitable for horizontal & vertical joints

- Loads up to 1300 N
- Stone thicknesses 20-50 mm

**Product Code Description**



## AXO4 Body Anchor - Product Details



Product Code	Technical Details													
	Projection	Min. Projection	Max. Projection	Dead Load	Forming Size	Wind-Pressure	Wind-Suction	Expansion Bolt Size	Pin Size	Adj. Arm Metric Size	Adj. Arm Flat Thickness	Adj. Arm Length	X Size	
	K (mm)	K - (mm)	K + (mm)	Fdw (N)	F (mm)	Fwp (N)	Fws (N)	E.b. (mm)	Ø (mm)	M (mm)	T (mm)	EAL (mm)	x (mm)	
AXO4-1605	160	140	180	500	115	780	546	M8X120	5	M12	4.5	100	75	
AXO4-1805	180	160	200		135									
AXO4-2005	200	180	220		155									
AXO4-2205	220	200	240		175									
AXO4-2405	240	220	260		195									
AXO4-2605	260	240	280	215										
AXO4-1609	160	140	180	900	115	1430	1000	M10X130	6	M14	5.5	100	75	
AXO4-1809	180	160	200		135									
AXO4-2009	200	180	220		155									
AXO4-2209	220	200	240		175									
AXO4-2409	240	220	260		195									
AXO4-2609	260	240	280	215										
AXO4-16013	160	140	180	1300	115	2028	1419	M12X145	6	M16	6	100	80	
AXO4-18013	180	160	200		135									
AXO4-20013	200	180	220		155									
AXO4-22013	220	200	240		175									
AXO4-24013	240	220	260		195									
AXO4-26013	260	240	280	215										

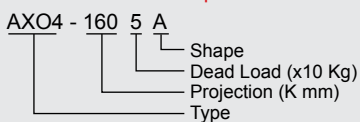
- Material: Stainless Steel 1.4301 (A2) & 1.4401 (A4).
- Table above is prepared according to Eurocode standard.
- Loads stated are working resistance loads.
- Other sizes are available for production upon request.
- Bolts are provided separately.
- Structural calculations are available upon order.

### AXO4 Body Anchor

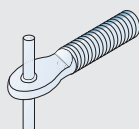
- Load bearing & restraint
- Three dimensional adjustability
- Fastened on to load bearing walls with expansion bolts and on to channels with set screws
- Projection sizes between 160 and 260 mm
- Suitable for horizontal & vertical joints

- Loads up to 1300 N
- Stone thicknesses 20-50 mm

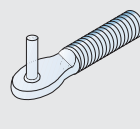
#### Product Code Description



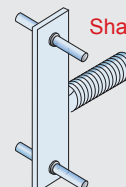
#### Shape A



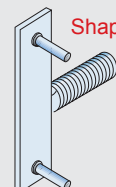
#### Shape B



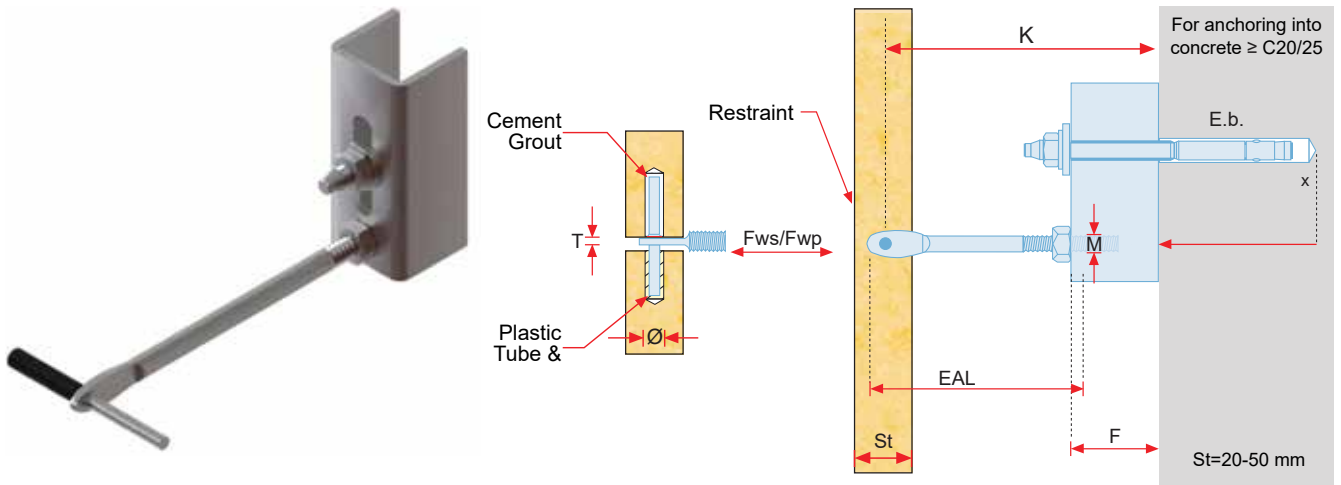
#### Shape C



#### Shape D



**HRS3 Restraint Anchor - Product Details**



• Available in sizes to fit the projection range of all AXO anchors.

Product Code	Technical Details											
	Projection	Min. Projection	Max. Projection	Forming Size	Wind-Pressure	Wind-Suction	Expansion Bolt Size	Pin Size	Adj. Arm Metric Size	Adj. Arm Flat Thickness	Adj. Arm Length	X Size
	K (mm)	K - (mm)	K + (mm)	F (mm)	Fwp (N)	Fws (N)	E.b. (mm)	Ø (mm)	M (mm)	T (mm)	EAL (mm)	x (mm)
HRS03-60	60	40	80	25	2028	1419	M8X80	5	M8	3	70	30
HRS03-80	80	60	100								90	
HRS03-100	100	80	120	32							100	
HRS03-120	120	100	140								120	
HRS03-140	140	120	160	140								
HRS03-160	160	140	180	40							160	
HRS03-180	180	160	200								170	
HRS03-200	200	180	220	50							190	
HRS03-220	220	200	240								210	
HRS03-240	240	220	260	220								
HRS03-260	260	240	280	240								

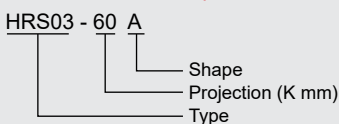
- Material: Stainless Steel 1.4301 (A2) & 1.4401 (A4)
- Table above is prepared according to Eurocode standard
- Loads stated are working resistance loads
- Other sizes are available for production upon request
- Bolts are provided separately
- Structural calculation reports are available upon order

**HRS3 Restraint Anchor**

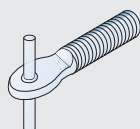
- Load bearing & restraint
- Three dimensional adjustability
- Fastened on to load bearing walls with expansion bolts and on to channels with set screws
- Projection sizes between 60 and 260 mm
- Suitable for horizontal & vertical joints

- Loads up to 2028 N
- Stone thicknesses 20-50 mm

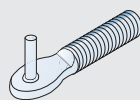
**Product Code Description**



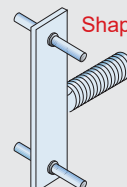
**Shape A**



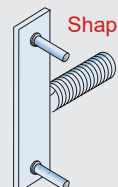
**Shape B**



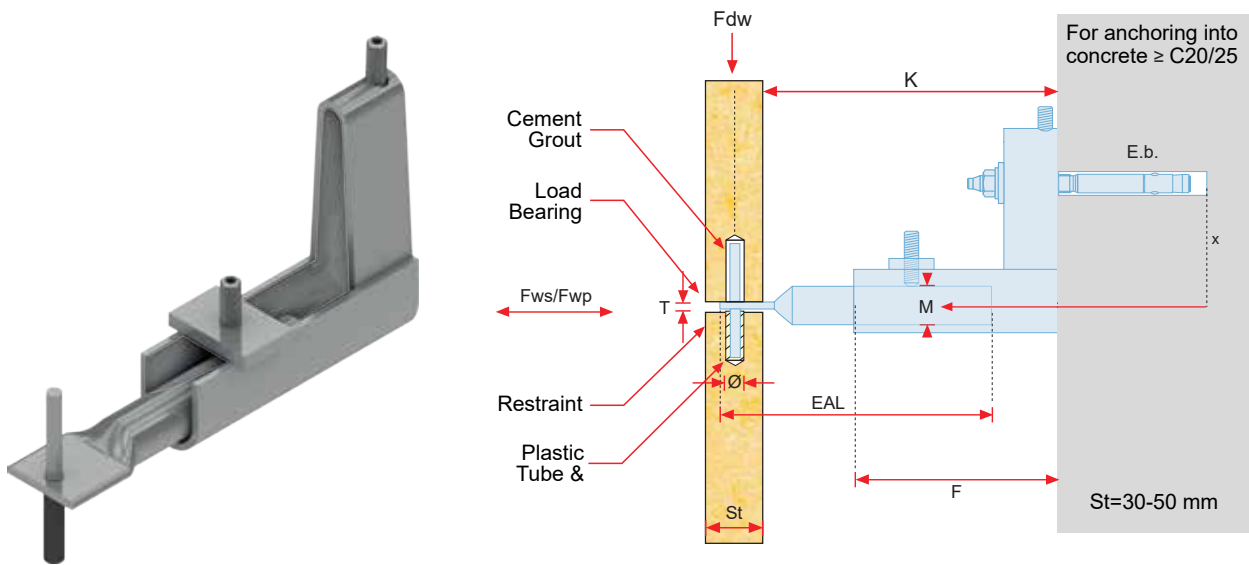
**Shape C**



**Shape D**



## HZTA Telescope Anchor - Product Details



Product Code	Technical Details													
	Projection	Min. Projection	Max. Projection	Dead Load	Forming Size	Wind-Pressure	Wind-Suction	Expansion Bolt Size	Pin Size	Adj. Arm Dia.	Adj. Arm Flat Thickness	Adj. Arm Length	X Size	
	K (mm)	K - (mm)	K + (mm)	Fdw (N)	F (mm)	Fwp (N)	Fws (N)	E.b. (mm)	Ø (mm)	M (mm)	T (mm)	EAL (mm)	x (mm)	
HZTA-15011	150	135	165	1100	90	1300	1300	M10	6	Ø21,3	4	132	75	
HZTA-18011	180	165	195		120									
HZTA-21011	210	195	225		150									
HZTA-24011	240	225	255		180									
HZTA-27011	270	255	285		210									
HZTA-30011	300	285	315	240										

- Material: Stainless Steel 1.4301 (A2) & 1.4401 (A4).
- Table above is prepared according to Eurocode standard.
- Loads stated are working resistance loads.
- Other sizes are available for production upon request.
- Bolts are provided separately.
- Structural calculations are available upon order.

### HZTA Telescope Anchor

- Load bearing & restraint
- Three dimensional adjustability
- Fastened on to load bearing walls with expansion bolts and on to channels with set screws
- Projection sizes between 150 and 300 mm
- Suitable for horizontal & vertical joints

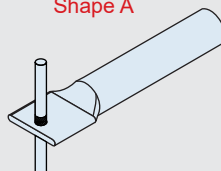
- Loads up to 1100 N
- Stone thicknesses 30-50 mm

### Product Code Description

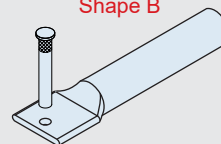
HZTA - 150 11

Dead Load  
Projection (K mm)  
Type

### Shape A



### Shape B



**AXO Body Anchor - Special Application Details**



Body anchor with welded plate with two pins. Used for stone installation with single anchor. This type used for installation of reveals with maximum width of 25 cm.



Body anchor with welded shims and HB09 execution. With this type of anchor, stone panels are supported from the rear surface using HB09 bolts instead of from the edges using pins.

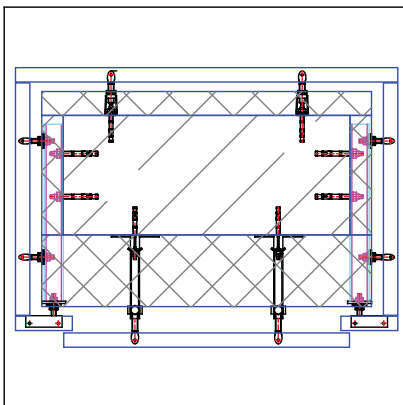


Body anchor with welded plate and riveted nut. A feature of HZ05 which is chosen for the fine adjustment of the projection by spinning or rotating the riveted nut while pins are set on the stone.

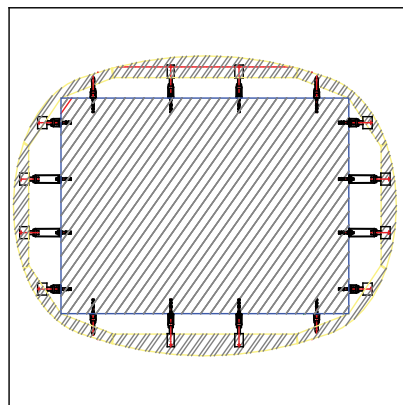


**Special Designs**

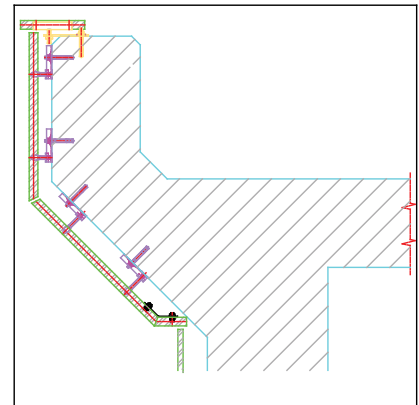
Body anchors are used for stone installation around columns.



Body anchors are used to form an oval column in natural stone.



Body anchors used for installation of parapet area.



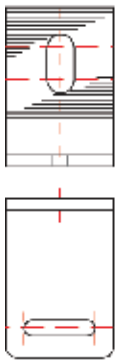
## HA L Anchor Fixing Systems - Introduction

- Direct fixing into concrete walls with expansion bolts. Indirect fixing onto sub channel system with hex bolts.
- Economical & easy fixing.
- Installation at horizontal joints.
- Adjustability provided through adjustable plates and slot pin holes.

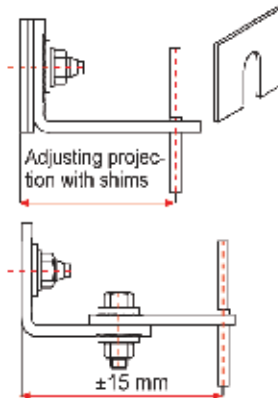
HA01 L Anchor

HA02 L Anchor  
Double PinHA03 L Anchor  
With KerfHA04 L Anchor  
With Adjustable PlateHA05 L Anchor With Adj. Plate  
& Welded Tie

### Adjustability

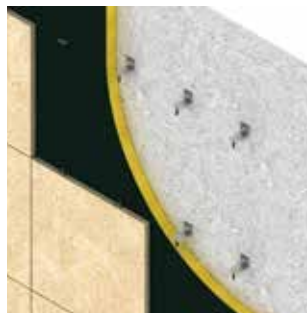
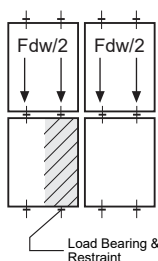


1. Vertical adjustment is made through the slot hole. The anchor is fixed on to the bolt with the serrated washer and nut.
2. A slot pin hole can be provided to enable lateral adjustment of the pin.



3. Greater projection sizes can be achieved by using shims. Shims are placed at the back of the anchor.
4. An adjustment plate is available in HA04 & HA05 type L anchors where adjustment of the projection size can be made.

### Installation at horizontal joints



### HA01 L Anchors

- Suitable for concrete walls. Recommended projection sizes up to 55 mm.
- Slabs are pinned at the bottom and upper sides.
- Adjustability for projection size can be done by inserting shims between the anchor and the wall.
- Anchors act as load bearing and restraint, carrying the slabs above and restraining the slabs below.

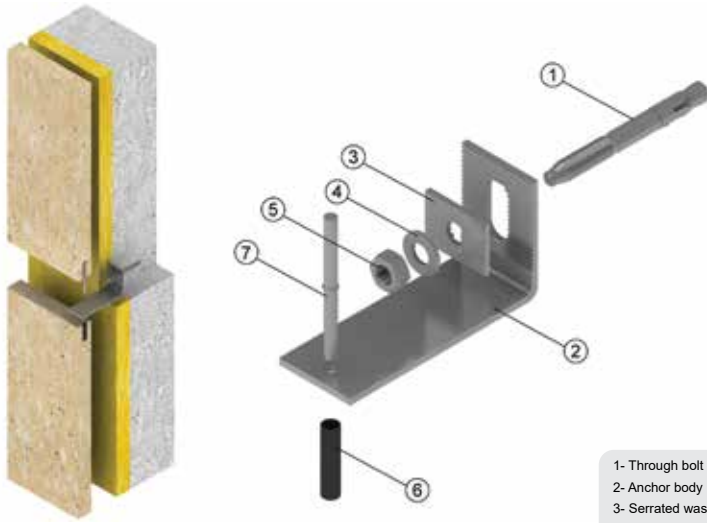
### HA03 L Anchors

- Suitable for concrete walls. Recommended projection sizes up to 55 mm.
- Slabs have slits and the kerf parts of the anchors are inserted in to the slit edges of the slabs.
- Adjustability for projection size can be done by inserting shims between the anchor and the wall.
- Anchors act as load bearing and restraint, carrying the slabs above and restraining the slabs below.

### HA04 L Anchors

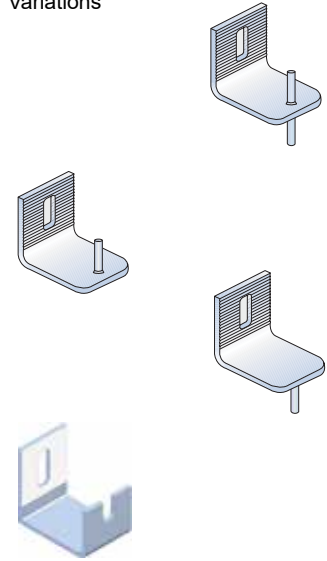
- Suitable for concrete walls. Recommended projection sizes up to 180 mm.
- Slabs are pinned from the bottom and upper sides.
- Adjustability of the projection size is enabled with the adjustable plate, which is fixed to the body with hex bolts.
- Anchors act as load bearing and restraint, carrying the slabs above and restraining the slabs below.

**HA L Anchor Fixing Systems - Installation Detail**



- 1- Through bolt
- 2- Anchor body
- 3- Serrated washer
- 4- Round washer for through bolt
- 5- Hex nut for through bolt
- 6- Plastic tube
- 7- Flanged pin

**Anchor Variations**



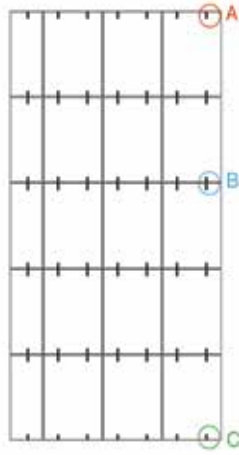
**Installation at horizontal joints**



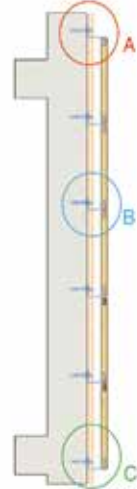
**HA01**  
L Anchor



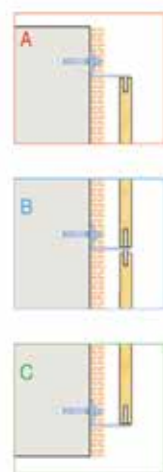
Elevation view



Section A-A



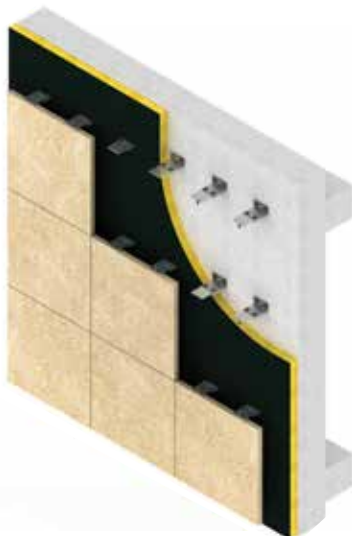
Installation details



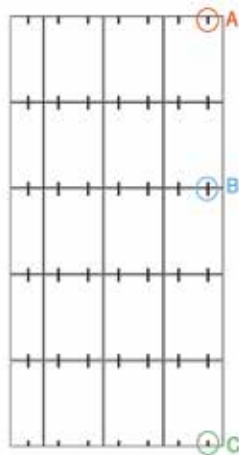
**Installation at vertical joints**



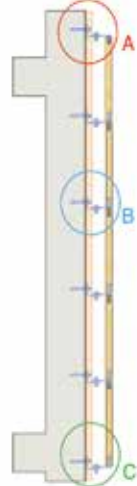
**HA04**  
L Anchor



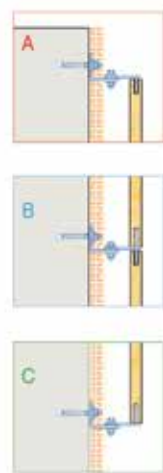
Elevation view



Section A-A

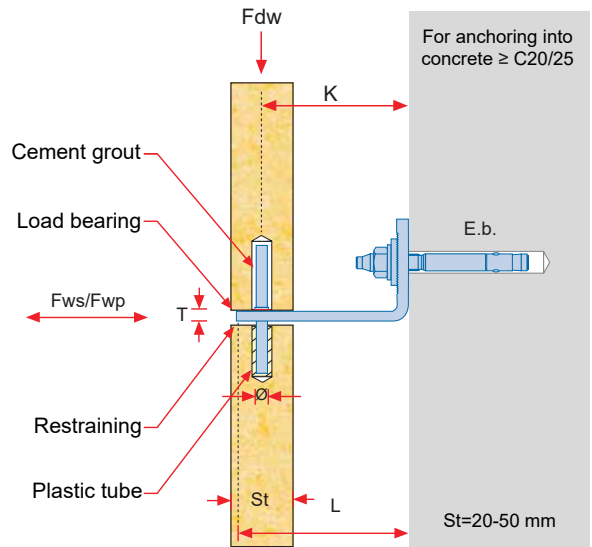


Installation details





## HA01 L Anchor - Product Details



Product Code	Technical Details								
	Projection	Dead Load	Wind Pressure	Wind Suction	Bolt Size	Pin Diameter	Anchor Length	Anchor Thickness	
	K (mm)	Fdw (N)	Fwp (N)	Fws (N)	E.b. (mm)	Ø (mm)	L (mm)	T (mm)	
HA01-301	30	100	156	110	M8X80	4	36	2	
HA01-351	35						41		
HA01-401	40						46		
HA01-451	45						51		
HA01-501	50						56		
HA01-551	55	61	2.5						
HA01-302	30	200		312	219	M8X80	4	38	3
HA01-352	35							43	
HA01-402	40							48	
HA01-452	45							53	
HA01-502	50		58						
HA01-552	55	63	4						
HA01-303	30	300		468	328	M8X80	5	38	3
HA01-353	35							43	
HA01-403	40							48	
HA01-453	45							53	
HA01-503	50		58						
HA01-553	55	63	4						
HA01-304	30	400		624	437	M8X80	5	38	3
HA01-354	35							43	
HA01-404	40							48	
HA01-454	45							53	
HA01-504	50		58						
HA01-554	55	63	4						

- Material: Stainless Steel 1.4301 (A2) & 1.4401 (A4).
- Table above is prepared according to Eurocode standard.
- Loads stated are working resistance loads.

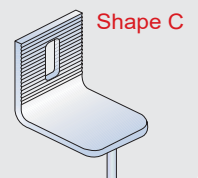
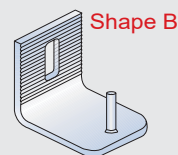
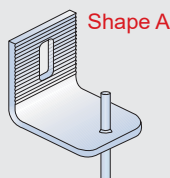
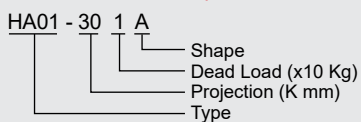
- Other sizes are available for production upon request.
- Bolts are provided separately.
- Structural calculation reports are available upon order.

### HA01 L Anchor

- Load bearing & restraint
- Limited adjustability
- Fastened on to load bearing walls with expansion bolts and on to channels with set screws
- Projection sizes between 30 and 35 mm
- Suitable for horizontal

- Loads up to 400 N
- Stone thicknesses above 20 mm

#### Product Code Description

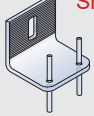


## HA02 & HA03 L Anchor - Product Details

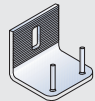
### HA02 L Anchor

- Load bearing & restraint.
- Projection sizes between 30 and 55 mm.
- Loads up to 400 N.
- Suitable for horizontal joints.
- Stone thicknesses above 20mm.
- Fastened on walls with expansion bolts.
- Stone installation is made with a single anchor on each side.

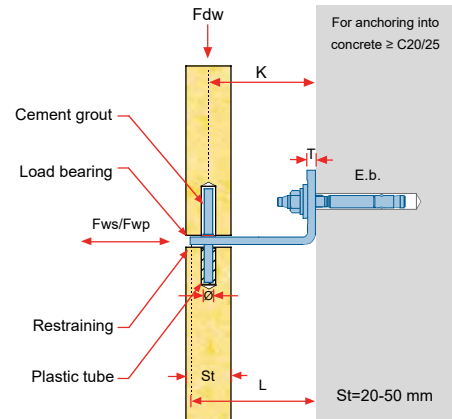
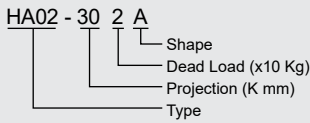
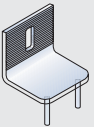
Shape A



Shape B



Shape C



Product Code	Technical Details							
	Projection	Dead Load	Wind Pressure	Wind Suction	Bolt Size	Pin Diameter	Anchor Length	Anchor Thickness
	K (mm)	Fdw (N)	Fwp (N)	Fws (N)	E.b. (mm)	Ø (mm)	L (mm)	T (mm)
HA02-302	30	200	312	219	M8X80	4	38	3
HA02-352	35						43	
HA02-402	40						48	
HA02-452	45						53	
HA02-502	50						58	
HA02-552	55						63	
HA02-304	30	400	624	437	M8X80	6	38	4
HA02-354	35						43	
HA02-404	40						48	
HA02-454	45						53	
HA02-504	50						58	
HA02-554	55						63	

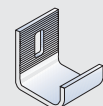
### HA03 L Anchor

- Load bearing & restraint.
- Projection sizes between 30 and 55 mm.
- Loads up to 400 N.
- Suitable for horizontal joints.
- Stone thicknesses above 20mm.
- Fastened on walls with expansion bolts.
- Installation is made with kerf system where there are slit edges in the slabs.

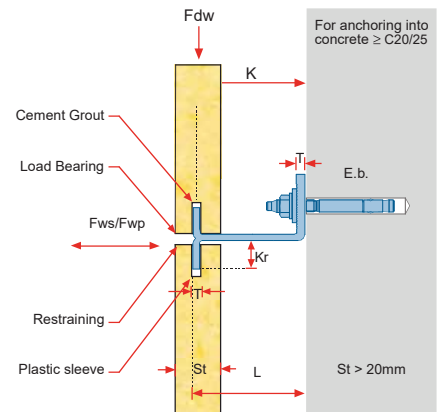
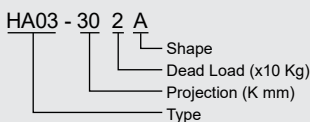
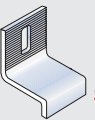
Shape A



Shape B



Shape C



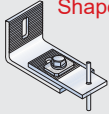
Product Code	Technical Details							
	Projection	Dead Load	Wind Pressure	Wind Suction	Bolt Size	Pin Diameter	Anchor Length	Anchor Thickness
	K (mm)	Fdw (N)	Fwp (N)	Fws (N)	E.b. (mm)	Ø (mm)	L (mm)	T (mm)
HA03-302	30	200	312	219	M8X80	12	32	3
HA03-352	35						37	
HA03-402	40						42	
HA03-452	45						47	
HA03-502	50						52	
HA03-552	55						57	
HA03-304	30	400	624	437	M8X80	15	32	4
HA03-354	35						37	
HA03-404	40						42	
HA03-454	45						47	
HA03-504	50						52	
HA03-554	55						57	

## HA04 & HA05 L Anchor - Product Details

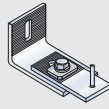
### HA04 L Anchor

- Load bearing & restraint.
- Projection sizes between 100 and 180 mm.
- Loads up to 800 N.
- Suitable for horizontal joints.
- Stone thicknesses above 20mm.
- Fastened on walls with expansion bolts.
- Adjustability of the projection size is provided with the adjustable plate.

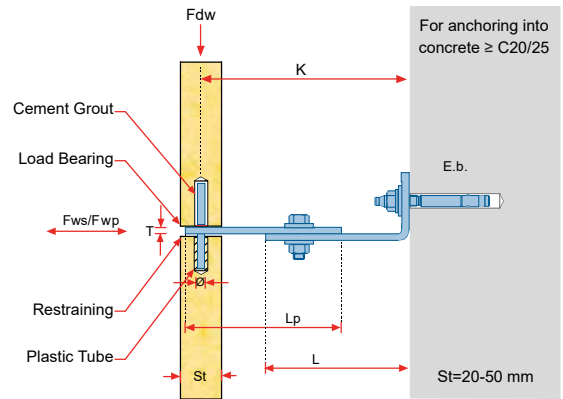
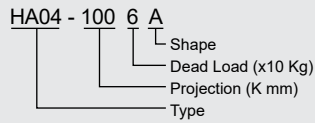
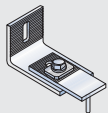
Shape A



Shape B



Shape C

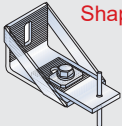


Product Code	Technical Details										
	Projection	Min. Projection	Max. Projection	Dead Load	Wind Pressure	Wind Suction	Bolt Size	Pin Diameter	Anchor Length	Adj. Plate Length	Adj. Plate Thickness
	K (mm)	K - (mm)	K + (mm)	Fdw (N)	Fwp (N)	Fws (N)	E.b. (mm)	Ø (mm)	L (mm)	Lp (mm)	T (mm)
HA04-1006	100	85	115	600	936	655	M12X120	6	70	80	6
HA04-1206	120	105	135						90		
HA04-1406	140	125	155						110		
HA04-1606	160	145	175						130		
HA04-1806	180	165	195						150		
HA04-1008	100	85	115	800	1235	865	M12X120	6	70	80	6
HA04-1208	120	105	135						90		
HA04-1408	140	125	155						110		
HA04-1608	160	145	175						130		
HA04-1808	180	165	195						150		

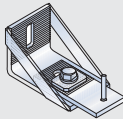
### HA05 L Anchor

- Load bearing & restraint.
- Projection sizes between 200 and 280 mm.
- Loads up to 800 N.
- Suitable for horizontal joints.
- Stone thicknesses above 20mm.
- Fastened on walls with expansion bolts.
- Adjustability of the projection size is provided with the adjustable plate.

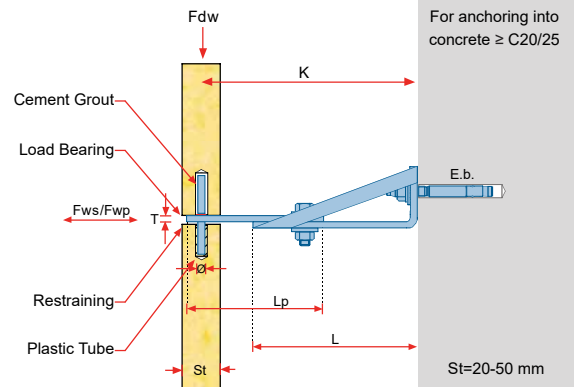
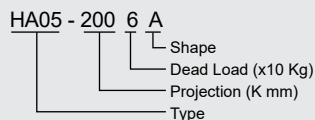
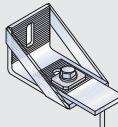
Shape A



Shape B



Shape C



Product Code	Technical Details										
	Projection	Min. Projection	Max. Projection	Dead Load	Wind Pressure	Wind Suction	Bolt Size	Pin Diameter	Anchor Length	Adj. Plate Length	Adj. Plate Thickness
	K (mm)	K - (mm)	K + (mm)	Fdw (N)	Fwp (N)	Fws (N)	E.b. (mm)	Ø (mm)	L (mm)	Lp (mm)	T (mm)
HA05-2006	200	185	215	600	936	655	M12X120	6	170	80	6
HA05-2206	220	205	235						190		
HA05-2406	240	225	255						210		
HA05-2606	260	245	275						230		
HA05-2806	280	265	295						250		
HA05-2008	200	185	215	800	1235	865	M12X120	6	170	80	6
HA05-2208	220	205	235						190		
HA05-2408	240	225	255						210		
HA05-2608	260	245	275						230		
HA05-2808	280	265	295						250		

**HA Anchors - Special Application Details**



L anchor with adjustable plate combined with a wedge washer instead of serrated washer. This is chosen in cases where vertical loads are too high for the serrated washer to sustain the no slip feature.



HA04-K L anchor with adjustable kerfed plates. This anchor is the same as HA04 L anchor with the difference of using kerf connection to stone instead of a pin connection.



L anchor is produced with three holes in order to accommodate a special requirement. Customized production is made in any case to fulfil the special requirement of the stone application.

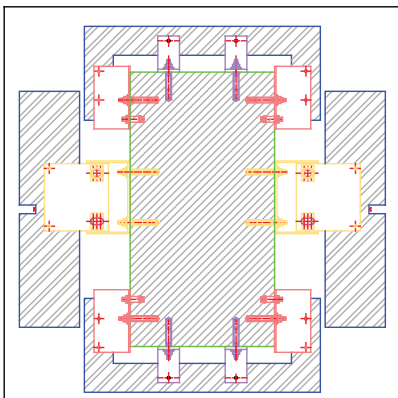


HAZ 21 restraint anchor, designed for the purpose of installing into insulated walls more quickly. Insulation is drilled instead of cut. HAZ 21 anchors are generally used as restraints and are used for corbel facade installations.

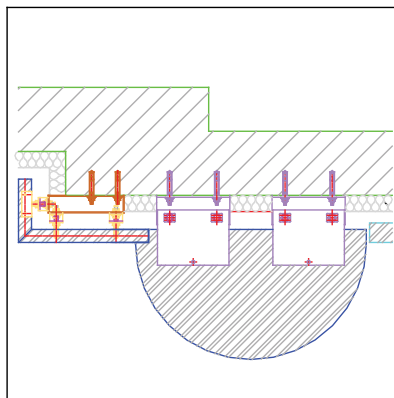


**Special Designs**

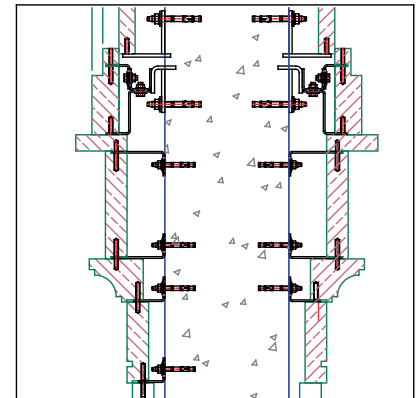
L anchors are used to install thick stone slabs around corners.



L anchors are used to support large semi circular stones to forming a massive column block.



L anchors used for stone installation around column with variations in stone and projection.



## HDM Mortar Anchor Fixing Systems - Introduction

- Direct fixing to concrete and masonry walls with mortar
- Economical & easy fixing
- Installation at vertical and horizontal joints
- Special design for installing heavy loads at large projection sizes

### Restraint Anchors

HN

HG



### Load Bearing Anchors

BUN

BUG

BTN

BTG

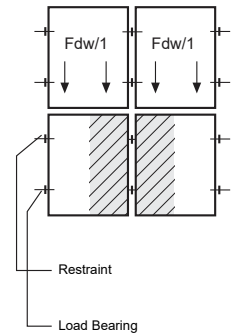
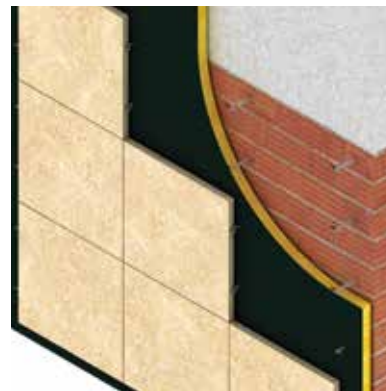
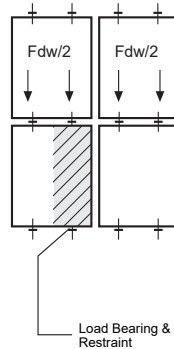
MTN

MTG

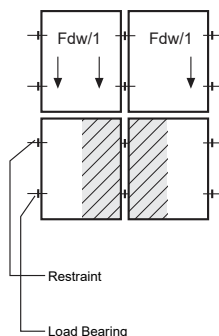


Installation at horizontal joints with BUG anchors

Installation at vertical joints with BTN & HG anchors



Installation at vertical joints with BUN & HG anchors



- Suitable for installing high load natural stone slabs at large projection sizes on to concrete and masonry walls.

- Holes 6mm larger than the anchor width are drilled in the walls.

- The holes are filled with mortar and anchors are set into mortar bed.

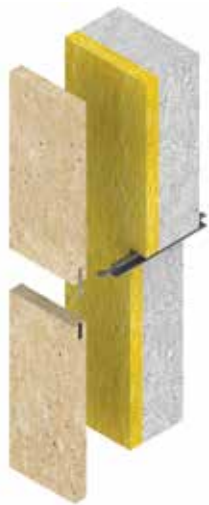
- In horizontal joint installation, slabs are pinned on the bottom and upper sides. Anchors act as load bearing carrying half the weight of the slabs above.

Anchors also act as restraint holding the slabs below and restraining against wind suction and pressure.

- In vertical joint installation, slabs are pinned at the left and right sides. Anchors on the bottom are load bearing anchors carrying the whole weight of the slab.

Half the weight of the slab on the left and half the weight of the slab on the right. Anchors on the top are restraint anchors holding the slabs and restraining against wind suction and pressure.

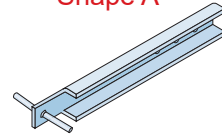
**HDM Mortar Anchor Fixing Systems - Installation Details**



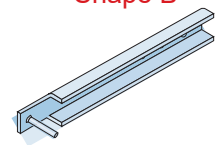
- 1- Anchor Body
- 2- Flanged pin
- 3- Plastic

Anchor Variations

Shape A



Shape B



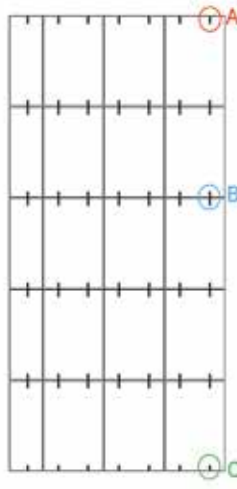
**Installation at horizontal joints**



**BUG**  
Mortar Anchor



Elevation view



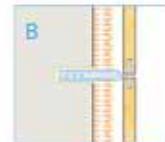
Section A-A



Installation details



Restraint



Load Bearing



Load Bearing

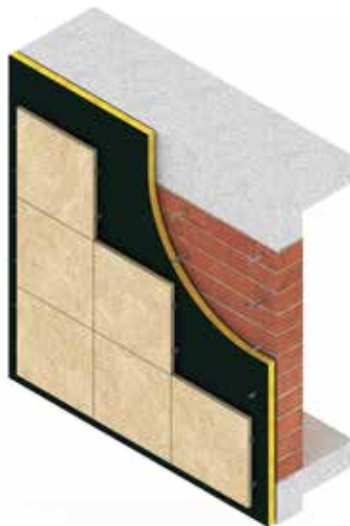
**Installation at vertical joints**



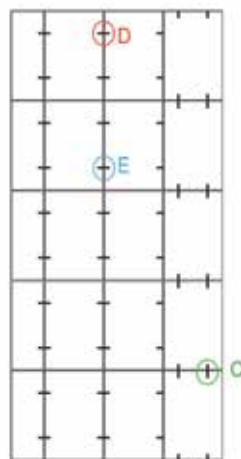
**HG**  
Restraint Anchor



**BUN**  
Mortar Anchor



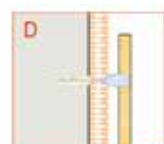
Elevation view



Section A-A



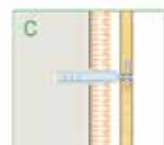
Installation details



Restraint



Load Bearing



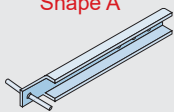
Load Bearing & Restraint

## BUN & BUG Mortar Anchor - Product Details

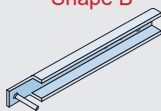
### BUN Mortar Anchor

- Load bearing & restraint.
- Projection sizes between 160 and 240 mm.
- Loads up to 1200 N
- Three dimensional adjust ability.
- Suitable for vertical joints.
- Stone thicknesses 20-50mm.
- Fastened into concrete  $\geq$ C20/25 and Masonry M12/II.

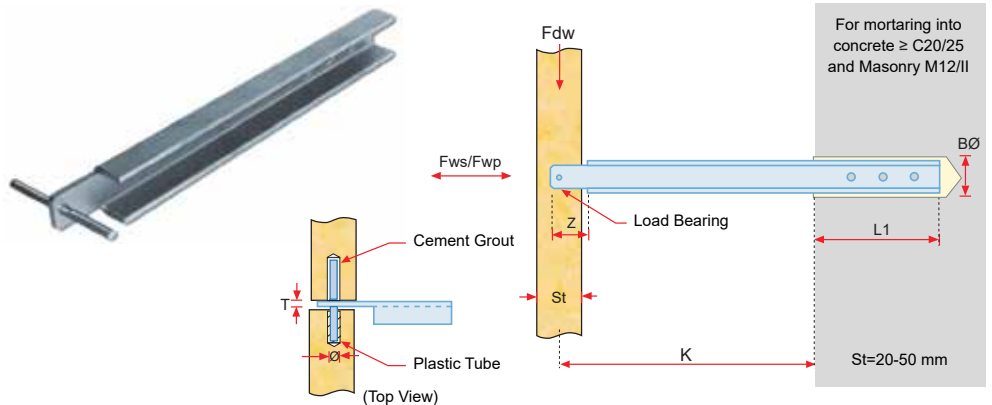
Shape A



Shape B



BUN - 6 22 A  
 Shape  
 Projection (x10mm)  
 Dead Load (x10 Kg)  
 Type

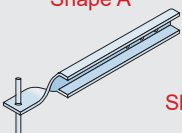


Product Code	Technical Details											
	Projection	Min. Projection	Max. Projection	Dead Load	Wind Pressure	Wind Suction	Z Size	Embedded Length	Pin Diameter	Bore Diameter	Anchor Thickness	
	K (mm)	K - (mm)	K + (mm)	Fdw (N)	Fwp (N)	Fws (N)	Z (mm)	L1 (mm)	Ø (mm)	BØ (mm)	T (mm)	
BUN-622	220	210	230	600	393	786	22	80	5	34	3	
BUN-624	240	230	250									
BUN-816	160	150	170	800	524	1048	22	80	5	32	4	
BUN-818	180	170	190									
BUN-820	200	190	210									
BUN-822	220	210	230									
BUN-824	240	230	250	1000	655	1310	22	80	6	36	4	
BUN-1016	160	150	170									
BUN-1018	180	170	190									
BUN-1020	200	190	210									
BUN-1022	220	210	230	1200	818	1636	22	80	6	36	4	
BUN-1024	240	230	250									
BUN-1216	160	150	170									
BUN-1218	180	170	190									
BUN-1220	200	190	210	220	210	230	22	80	6	36	4	
BUN-1222	220	210	230									
BUN-1224	240	230	250							38		

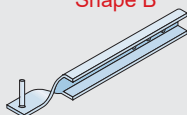
### BUG Mortar Anchor

- Load bearing & restraint.
- Projection sizes between 160 and 240 mm.
- Loads up to 600 N.
- Three dimensional adjustability.
- Suitable for horizontal joints.
- Stone thicknesses 20-50mm.
- Fastened into concrete  $\geq$ C20/25 and Masonry M12/II.

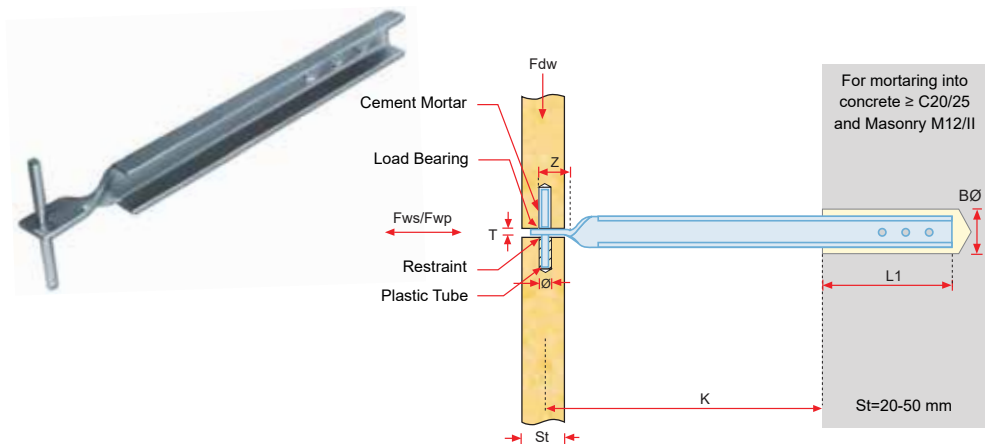
Shape A



Shape B



BUG - 6 22 A  
 Shape  
 Projection (x10mm)  
 Dead Load (x10 Kg)  
 Type



Product Code	Technical Details											
	Projection	Min. Projection	Max. Projection	Dead Load	Wind Pressure	Wind Suction	Z Size	Embedded Length	Pin Diameter	Bore Diameter	Anchor Thickness	
	K (mm)	K - (mm)	K + (mm)	Fdw (N)	Fwp (N)	Fws (N)	Z (mm)	L1 (mm)	Ø (mm)	BØ (mm)	T (mm)	
BUG-616	160	150	170	600	571	1142	17	80	5	32	4	
BUG-618	180	180	190									
BUG-620	200	200	210									
BUG-622	220	220	230									
BUG-624	240	240	250									

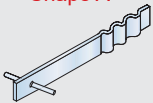
- Material: Stainless Steel 1.4301 (A2) & 1.4401 (A4).
- Table below is prepared according to Eurocode standard.
- Loads stated are working resistance loads.
- Other sizes are available for production upon request.
- Structural calculations are available upon order.

**BTN & BTG Mortar Anchor- Product Details**

**BTN Mortar Anchor**

- Load bearing & restraint.
- Projection sizes between 160 and 240 mm.
- Loads up to 600 N.
- Three dimensional adjustability.
- Suitable for vertical joints.
- Stone thicknesses 20-50 mm.
- Fastened into concrete  $\geq$ C20/25 and Masonry M12/II.

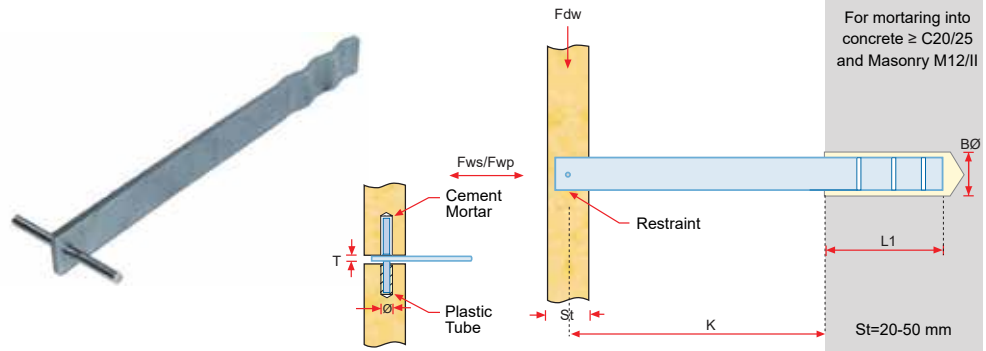
Shape A



Shape B



BTN - 4 16 A  
 Shape  
 Projection (x10mm)  
 Dead Load (x10 Kg)  
 Type

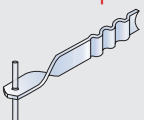


Product Code	Technical Details									
	Projection	Min. Projection	Max. Projection	Dead Load	Wind Pressure	Wind Suction	Embedded Length	Pin Diameter	Bore Diameter	Anchor Thickness
	K (mm)	K - (mm)	K + (mm)	Fdw (N)	Fwp (N)	Fws (N)	L1 (mm)	Ø (mm)	BØ (mm)	T (mm)
BTN-416	160	150	170	400	260	520	80	5	36	5
BTN-418	180	170	190						38	5
BTN-420	200	190	210						40	5
BTN-422	220	210	230						6	6
BTN-424	240	230	250						36	6
BTN-616	160	150	170	600	393	786	80	5	39	6
BTN-618	180	170	190						41	
BTN-620	200	190	210						42	

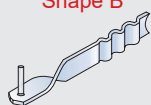
**BTG Mortar Anchor**

- Load bearing & restraint.
- Projection sizes between 160 and 240 mm.
- Loads up to 500 N.
- Three dimensional adjustability.
- Suitable for horizontal joints.
- Stone thicknesses 20-50 mm.
- Fastened into concrete  $\geq$ C20/25 and Masonry M12/II.

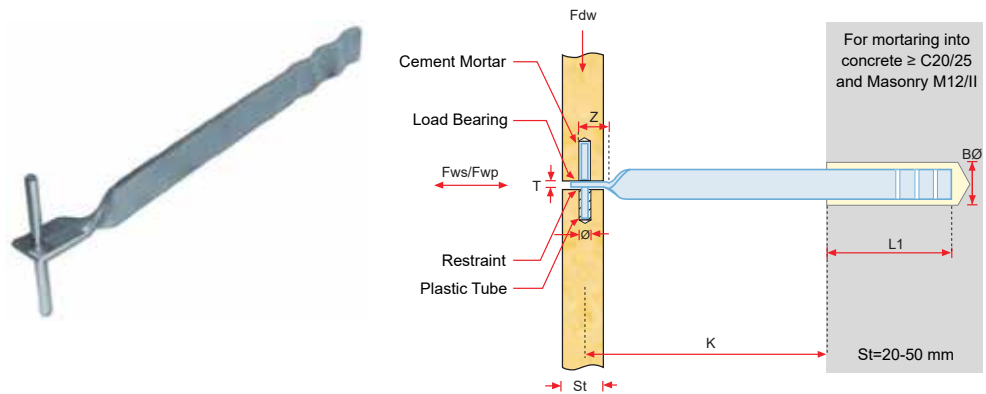
Shape A



Shape B



BTG - 3 16 A  
 Shape  
 Projection (x10mm)  
 Dead Load (x10 Kg)  
 Type



Product Code	Technical Details											
	Projection	Min. Projection	Max. Projection	Dead Load	Wind Pressure	Wind Suction	Z Size	Embedded Length	Pin Diameter	Bore Diameter	Anchor Thickness	
	K (mm)	K - (mm)	K + (mm)	Fdw (N)	Fwp (N)	Fws (N)	Z (mm)	L1 (mm)	Ø (mm)	BØ (mm)	T (mm)	
BTG-316	160	150	170	300	393	786	22	80	5	30	5	
BTG-318	180	170	190							32		
BTG-320	200	190	210							34		
BTG-322	220	210	230							6		6
BTG-324	240	230	250							36		6
BTG-516	160	150	170	500	655	1309	22	80	5	36	6	
BTG-518	180	170	190							38		
BTG-520	200	190	210							38		

- Material: Stainless Steel 1.4301 (A2) & 1.4401 (A4).
- Table below is prepared according to Eurocode standard.
- Loads stated are working resistance loads.
- Other sizes are available for production upon request.
- Structural calculations are available upon order.

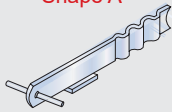


## MTN & MTG Mortar Anchor - Product Details

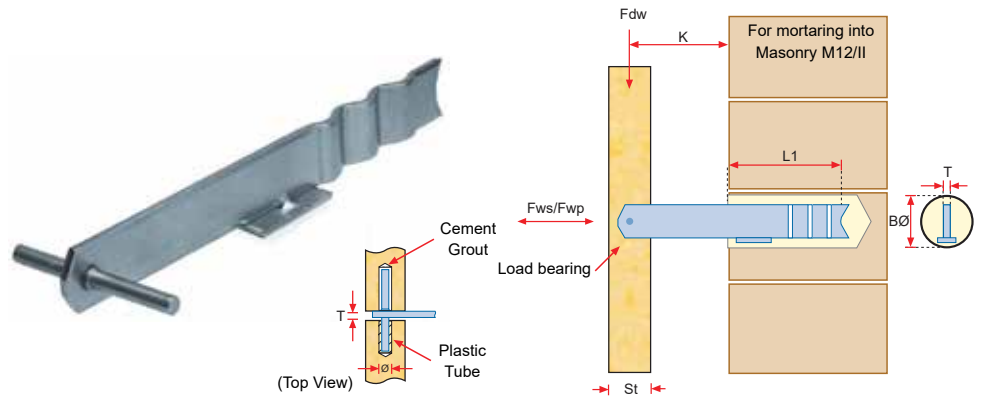
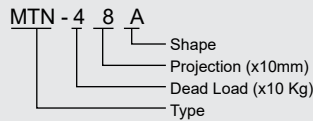
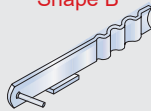
### MTN Mortar Anchor

- Load bearing & restraint
- Projection sizes between 80 and 180 mm.
- Loads up to 1000 N.
- Three dimensional adjustability.
- Suitable for vertical joints.
- Stone thicknesses 20-50 mm.
- Fastened into Masonry M12/II walls with mortar.

Shape A



Shape B



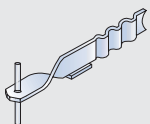
Product Code	Technical Details									
	Projection	Min. Projection	Max. Projection	Dead Load	Wind Pressure	Wind Suction	Embedded Length	Pin Diameter	Bore Diameter	Anchor Thickness
	K (mm)	K - (mm)	K + (mm)	Fdw (N)	Fwp (N)	Fws (N)	L1 (mm)	Ø (mm)	BØ (mm)	T (mm)
MTN-4 8	80	70	90	400	295	589	90	5	30	5
MTN-414	140	130	140						34	5
MTN-418	180	170	180						36	6
MTN-6 6	60	50	70	600	442	884	90	5	34	6
MTN-612	120	110	130						38	6
MTN-620	200	190	210						38	6
MTN-10 8	80	70	80	100	737	1473	90	5	40	6
MTN-1024	140	130	140						42	6
MTN-1018	180	170	190						42	6

- Material: Stainless Steel 1.4301 (A2) & 1.4401 (A4).
- Table below is prepared according to Eurocode standard.
- Loads stated are working resistance loads.
- Other sizes are available for production upon request.
- Structural calculations are available upon order.

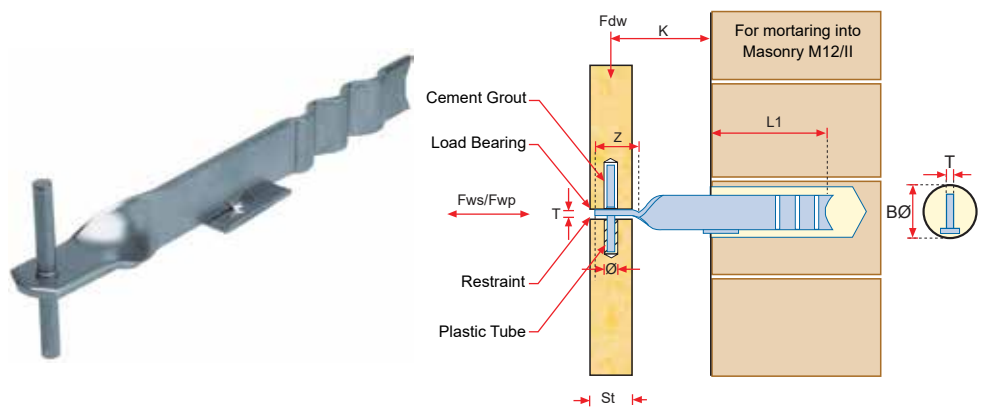
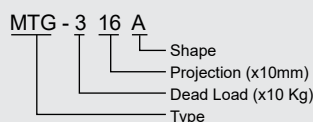
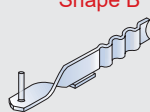
### MTG Mortar Anchor

- Load bearing & restraint.
- Projection sizes between 100 and 200 mm.
- Loads up to 800 N.
- Three dimensional adjustability.
- Suitable for horizontal joints.
- Stone thicknesses 20-50 mm.
- Fastened into Masonry M12/II walls with mortar.

Shape A



Shape B



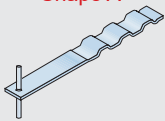
Product Code	Technical Details										
	Projection	Min. Projection	Max. Projection	Dead Load	Wind Pressure	Wind Suction	Z Size	Embedded Length	Pin Diameter	Bore Diameter	Anchor Thickness
	K (mm)	K - (mm)	K + (mm)	Fdw (N)	Fwp (N)	Fws (N)	Z (mm)	L1 (mm)	Ø (mm)	BØ (mm)	T (mm)
MTG-310	100	90	110	300	442	884	22	90	5	34	3
MTG-314	140	130	150							4	
MTG-316	160	150	170							5	
MTG-4 8	80	70	90	400	589	1179	22	90	5	34	4
MTG-412	120	110	130							36	4
MTG-420	200	190	210							40	6
MTG-6 6	60	50	70	600	884	1768	22	90	5	38	4
MTG-610	100	90	110							38	5
MTG-616	160	150	170							40	6
MTG-8 8	80	70	90	800	1179	2357	22	90	5	40	5
MTG-816	160	150	170							44	8
MTG-820	200	190	210							46	8

## HN & HG Mortar Anchor Restraint - Product Details

### HN Mortar Anchor & Restraint

- Restraint only.
- Projection sizes between 160 and 240 mm.
- Wind loads up to 1000 N.
- Three dimensional adjustability.
- Suitable for horizontal joints.
- Stone thicknesses 20-50 mm.
- Fastened into concrete  $\geq$ C20/25 Masonry M12/II walls with mortar.

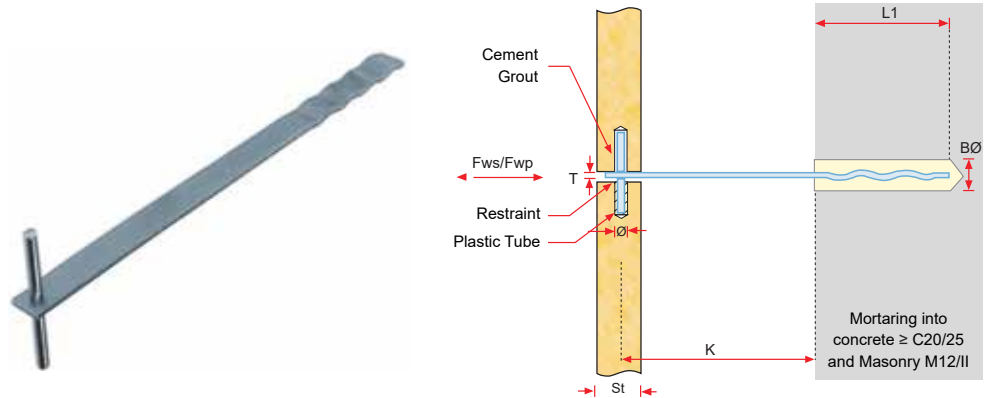
Shape A



Shape B



HN - 10 16 A  
 — Shape  
 — Projection (x10mm)  
 — Dead Load (x10 Kg)  
 — Type

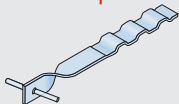


Product Code	Technical Details								
	Projection	Min. Projection	Max. Projection	Wind Pressure	Wind Suction	Embedded Length	Pin Diameter	Bore Diameter	Anchor Thickness
	K (mm)	K - (mm)	K + (mm)	Fwp (N)	Fws (N)	L1 (mm)	Ø (mm)	BØ (mm)	T (mm)
HN-1016	160	150	170	1000	500	80	5	21	3
HN-1018	180	170	190						
HN-1020	200	190	210						
HN-1022	220	210	230						
HN-1024	240	230	250						

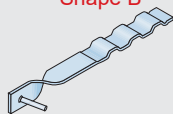
### HG Mortar Anchor

- Restraint only.
- Projection sizes between 100 and 240 mm.
- Wind loads up to 1000 N.
- Three dimensional adjustability.
- Suitable for vertical joints.
- Stone thicknesses 20-50 mm.
- Fastened into concrete  $\geq$ C20/25 Masonry M12/II walls with mortar.

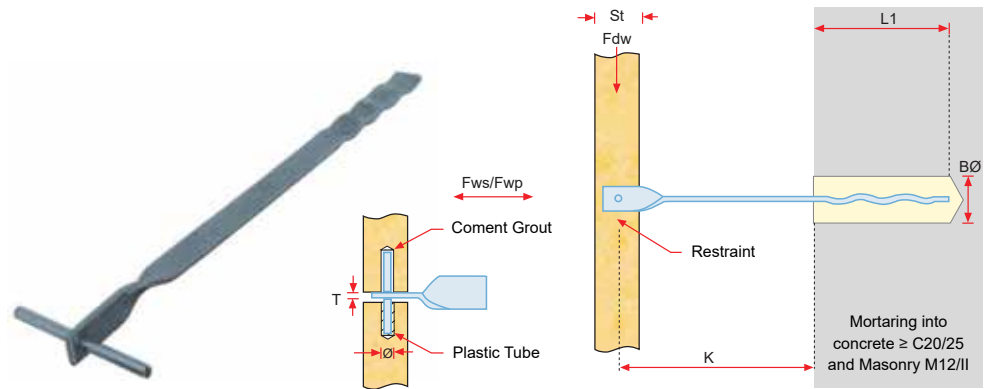
Shape A



Shape B



HG - 10 16 A  
 — Shape  
 — Projection (x10mm)  
 — Dead Load (x10 Kg)  
 — Type



Product Code	Technical Details								
	Projection	Min. Projection	Max. Projection	Wind Pressure	Wind Suction	Embedded Length	Pin Diameter	Bore Diameter	Anchor Thickness
	K (mm)	K - (mm)	K + (mm)	Fwp (N)	Fws (N)	L1 (mm)	Ø (mm)	BØ (mm)	T (mm)
HG-1016	160	150	170	1000	500	80	5	21	3
HG-1018	180	170	190						
HG-1020	200	190	210						
HG-1022	220	210	230						
HG-1024	240	230	250						

- Material: Stainless Steel 1.4301 (A2) & 1.4401 (A4).
- Table below is prepared according to Eurocode standard.
- Loads stated are working resistance loads.
- Other sizes are available for production upon request.
- Structural calculations are available upon request.

## HSD Mortar Anchor Fixing Systems - Introduction

- Direct fixing to concrete and masonry walls with mortar
- Economical & easy fixing
- Installation at vertical and horizontal joints

HSD01 Mortar Anchor

HSD02 Mortar Anchor  
W. Plate

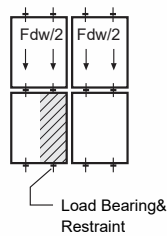
HSD03 Mortar Anchor  
Twisted Head

HSD04 Mortar Anchor  
W. Plate & Twisted

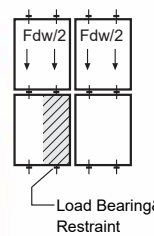
HRD01  
Mortar Anchor



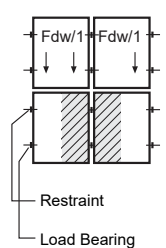
Installation at Horizontal joints  
with HRD01 Anchor



Installation at Horizontal joints  
with HSD04



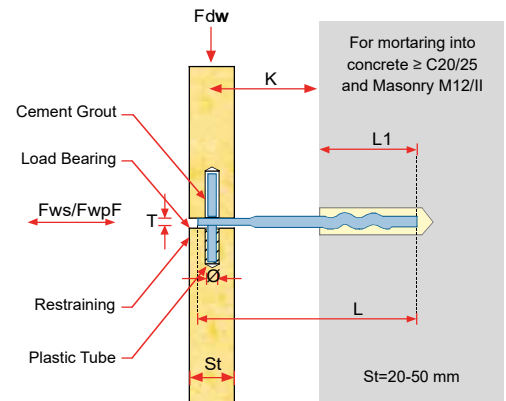
Installation at Vertical joints  
with HSD02&03



## HRD Mortar Anchor Fixing Systems - Product Details

### HRD01 Mortar Anchor

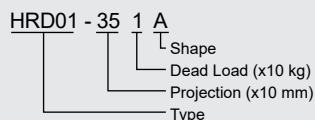
- Load bearing & restraint.
- Projection sizes between 35 and 75 mm.
- Loads up to 400 N
- Three dimensional adjustability. Suitable for horizontal joints.
- Stone thicknesses 20-50 mm.
- Fastened into concrete  $\geq$ C20/25 and Masonry M12/II.



Shape A



Shape B



Product Code	Technical Details										
	Projection	Min. Projection	Max. Projection	Dead Load	Wind Pressure	Wind Suction	Anchor Length	Dowel Embedded Length	Pin Diameter	Bore Diameter	Flat Thickness
	K (mm)	K - (mm)	K + (mm)	Fdw (N)	Fwp (N)	Fws (N)	L (mm)	L1 (mm)	Ø (mm)	BØ (mm)	T (mm)
HRD01-351	35	20	50	100	156	110	135	80	4	14	2.5
HRD01-451	45	30	60				145				
HRD01-551	55	40	70				155				
HRD01-651	65	50	80				165				
HRD01-751	75	60	90	200	312	219	175	80	4	14	3
HRD01-352	35	20	50				135				
HRD01-452	45	30	60				145				
HRD01-552	55	40	70				155				
HRD01-652	65	50	80	400	624	437	165	80	5	18	4
HRD01-752	75	60	90				175				
HRD01-354	35	20	50				135				
HRD01-454	45	30	60				145				
HRD01-554	55	40	70	400	624	437	155	80	5	18	4
HRD01-654	65	50	80				165				
HRD01-754	75	60	90				175				

- Material: Stainless Steel 1.4301 (A2) & 1.4401 (A4). • Table below is prepared according to Eurocode standard.
- Loads stated are working resistance loads. • Other sizes are available for production upon request.
- Structural calculations are available upon order.

## HSD Mortar Anchors - Product Details

### HSD01 Mortar Anchor



Product Code	Technical Details										
	Projection	Min. Projection	Max. Projection	Dead Load	Wind Pressure	Wind Suction	Anchor Length	Dowel Embedded Length	Pin Diameter	Bore Diameter	Flat Thickness
	K (mm)	K - (mm)	K + (mm)	Fdw (N)	Fwp (N)	Fws (N)	L (mm)	L1 (mm)	Ø (mm)	BØ (mm)	T (mm)
HSD01-352	35	20	50	200	312	219	135	90	4	21	2.5
HSD01-452	45	30	60				145			24	
HSD01-552	55	40	70				155			26	
HSD01-652	65	50	80				165				
HSD01-752	75	60	90				175				
HSD01-354	35	20	50	400	624	437	135	90	5	26	2.5
HSD01-454	45	30	60				145			28	
HSD01-554	55	40	70				155				
HSD01-654	65	50	80				165				
HSD01-754	75	60	90				175			30	
HSD01-356	35	20	50	600	936	655	135	90	6	26	4
HSD01-456	45	30	60				145			28	
HSD01-556	55	40	70				155				
HSD01-656	65	50	80				165				
HSD01-756	75	60	90				175			30	

### HSD02 Mortar Anchor



Product Code	Technical Details										
	Projection	Min. Projection	Max. Projection	Dead Load	Wind Pressure	Wind Suction	Anchor Length	Dowel Embedded Length	Pin Diameter	Bore Diameter	Flat Thickness
	K (mm)	K - (mm)	K + (mm)	Fdw (N)	Fwp (N)	Fws (N)	L (mm)	L1 (mm)	Ø (mm)	BØ (mm)	T (mm)
HSD02-352	35	20	50	200	312	219	135	90	4	24	2.5
HSD02-452	45	30	60				145			28	
HSD02-552	55	40	70				155				
HSD02-652	65	50	80				165				
HSD02-752	75	60	90				175			400	
HSD02-354	35	20	50	135							
HSD02-454	45	30	60	145	32						
HSD02-554	55	40	70	155							
HSD02-654	65	50	80	165							
HSD02-754	75	60	90	175	34						
HSD02-356	35	20	50	600	936	655	135	90	6	30	4
HSD02-456	45	30	60				145			32	
HSD02-556	55	40	70				155				
HSD02-656	65	50	80				165				
HSD02-756	75	60	90				175			34	

### HSD03 Mortar Anchor



Product Code	Technical Details										
	Projection	Min. Projection	Max. Projection	Dead Load	Wind Pressure	Wind Suction	Anchor Length	Dowel Embedded Length	Pin Diameter	Bore Diameter	Flat Thickness
	K (mm)	K - (mm)	K + (mm)	Fdw (N)	Fwp (N)	Fws (N)	L (mm)	L1 (mm)	Ø (mm)	BØ (mm)	T (mm)
HSD03-352	35	20	50	200	312	219	135	90	4	26	3
HSD03-452	45	30	60				145				
HSD03-552	55	40	70				155				
HSD03-652	65	50	80				165				
HSD03-752	75	60	90				175			400	
HSD03-354	35	20	50	135							
HSD03-454	45	30	60	145	26						
HSD03-554	55	40	70	155							
HSD03-654	65	50	80	165							
HSD03-754	75	60	90	175	600	936	655	90	6	34	4
HSD03-356	35	20	50	135							
HSD03-456	45	30	60	145							
HSD03-556	55	40	70	155							
HSD03-656	65	50	80	165							
HSD03-756	75	60	90	175							

### HSD04 Mortar Anchor



Product Code	Technical Details										
	Projection	Min. Projection	Max. Projection	Dead Load	Wind Pressure	Wind Suction	Anchor Length	Dowel Embedded Length	Pin Diameter	Bore Diameter	Flat Thickness
	K (mm)	K - (mm)	K + (mm)	Fdw (N)	Fwp (N)	Fws (N)	L (mm)	L1 (mm)	Ø (mm)	BØ (mm)	T (mm)
HSD04-352	35	20	50	200	312	219	135	90	4	30	3
HSD04-452	45	30	60				145				
HSD04-552	55	40	70				155				
HSD04-652	65	50	80				165				
HSD04-752	75	60	90				175			400	
HSD04-354	35	20	50	135							
HSD04-454	45	30	60	145	30						
HSD04-554	55	40	70	155							
HSD04-654	65	50	80	165							
HSD04-754	75	60	90	175	600	936	655	90	6	38	4
HSD04-356	35	20	50	135							
HSD04-456	45	30	60	145							
HSD04-556	55	40	70	155							
HSD04-656	65	50	80	165							
HSD04-756	75	60	90	175							

## HMP Sub Channel Fixing Systems - Introduction

- Indirect fixing on to non-load bearing walls or for large projection sizes
- Lower drilling points enable fast installation
- Installation at vertical and horizontal joints
- Special design is made for sub channel systems to suit various application requirements.

### Channels



### Sub channel systems



### Channel supports

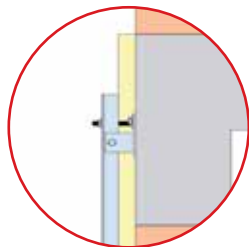
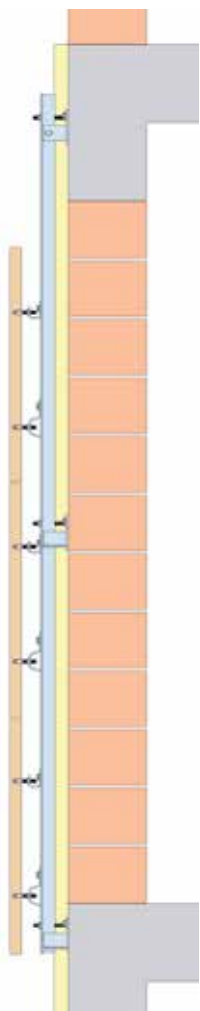


### Channel restraints

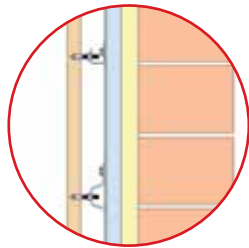


### HMPA-HC2 Channel System

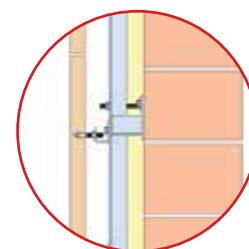
### HMPC-HC1 Channel System



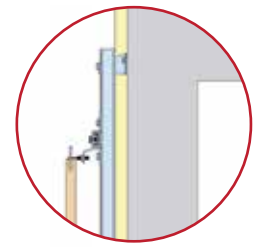
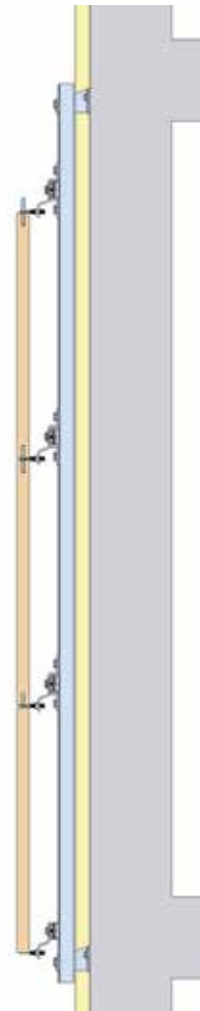
Channels supported on to load bearing concrete beams with **HCSP2** channel supports using anchor bolts



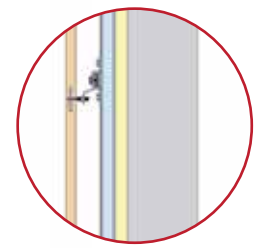
Stone installation is made with **HZ02 & HRS1** Anchors on to channels with hex bolts



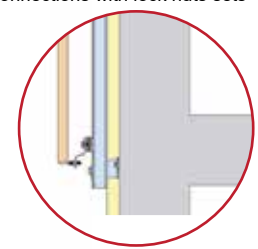
Channels are tied on to walls with **HCRS2** Channel restraints to eliminate deflection



Vertical channels supported on to load bearing beams with **HCSP1** channel supports using expansion bolts

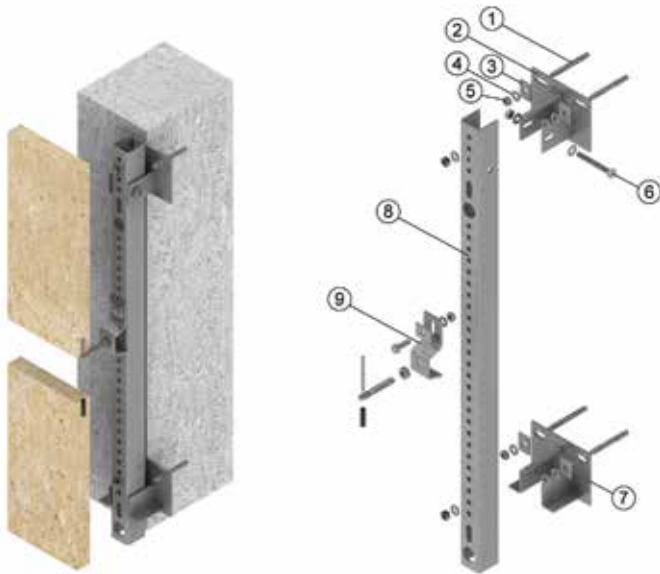


Horizontal C channels are fixed on to the vertical channels with **HCC** channel connections with lock nuts sets



Stone installation is made with **HZ01** Anchors on to channels with lock nuts hex bolts

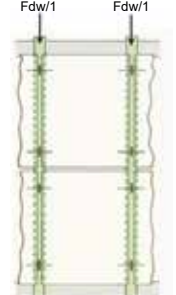
**HMP Sub Channel Systems - Installation Details**



- 1- Through Bolt
- 2- Channel Support
- 3- Plain Washer
- 4- Washer
- 5- Nut
- 6- Bolt Set
- 7- Channel Restraint
- 8- Channel
- 9- Anchor set

- Sub channel systems are fixed to load bearing beams for support.
- Channels are fixed on to beams with channel supports.
- Fixing of channels in the middle to the wall with channel restraints are made to reduce deflection.
- When installation is at vertical joints, the sub channel system bears the whole load of the slabs installed.
- When installation is at horizontal joints, the sub channel system bears half the load of the slabs installed.

Installation at vertical Joints

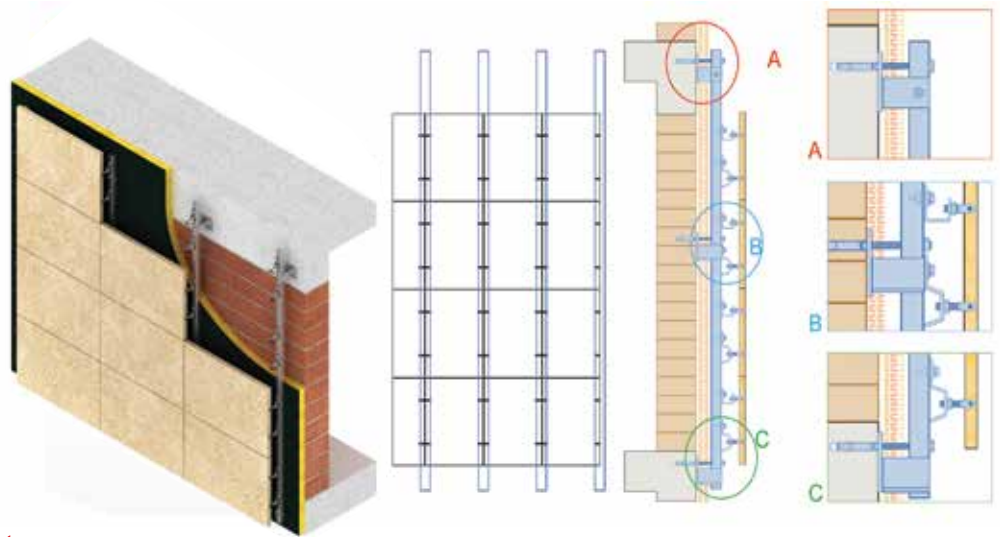


Installation at horizontal Joints







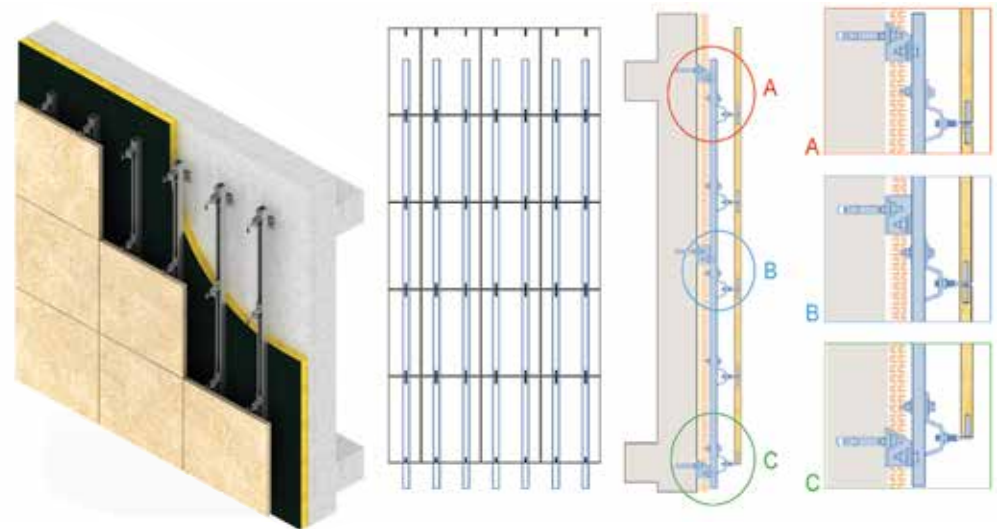
Installation at vertical Joints

-  HCSP2 Channel Support
-  HCRS2 Channel Restraint
-  HMPA U Channel
-  HZ02 Z Anchor

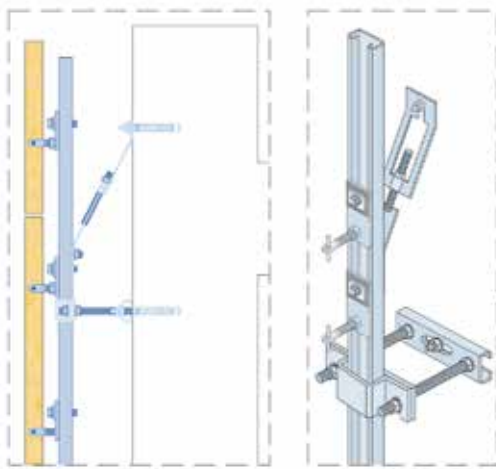


Installation at horizontal Joints

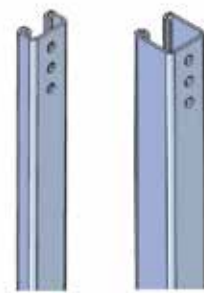
-  HCSP1 Channel Support
-  HCRS1 Channel Restraint
-  HMPB C Channel
-  HZ02 Z Anchor



## ATS Sub Channel Systems - Product Information



### ATS Channel System Elements



HMPS 41/22 & HMPS 41/41  
Toothed Channel



ATS-A  
Channel Support



ATS-B  
Channel Restraint

The ATS Channel system allows the quick and easy installation of natural stone facades through its adjustable capability and uncomplicated assembly features.

- The channel system is supported by the ATS-A channel support brackets.
- ATS-B channel restraint brackets, restrain the channel system against wind pressure and helps prevent the channel from buckling.
- The HMPS toothed channel enables the fixing of the anchors with hex bolts and lock nuts without the need for drilled holes and the use of nuts and washers.
- Toothed channel and lock nuts provide vertical load support after fixing.

### ATS Fixing System Elements



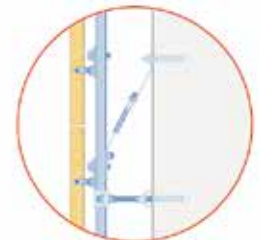
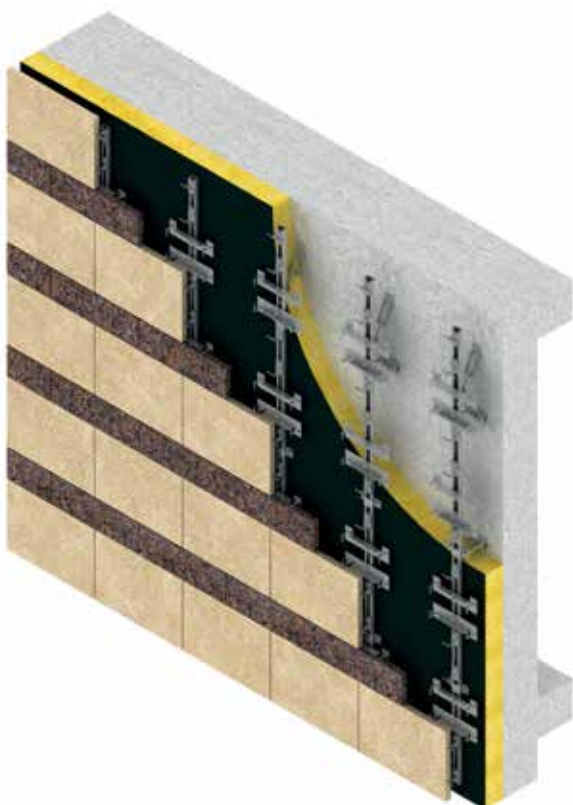
HZ-00  
Z Anchor



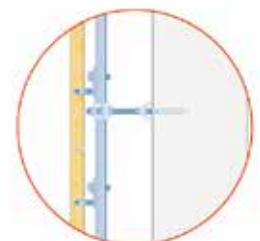
ATS-HA  
Special Anchor



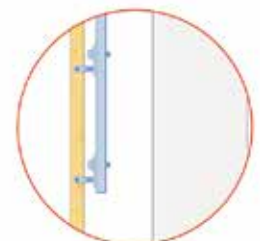
ATS-TS  
Special Anchor



ATS-A Channel Support



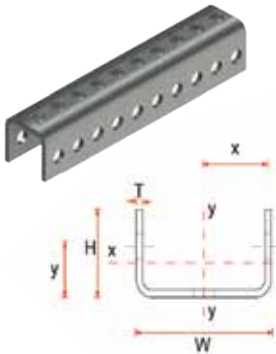
ATS-B Channel Restraint



ATS-HZ Z Anchor

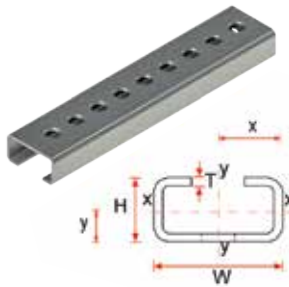
## HMP Channels - Product Details

### HMPA U Channel



Product Code	Technical Details								
	Dimensions			X-X Axis			Y-Y Axis		
	Thickness T (mm)	Width W (mm)	Height H (mm)	IXX (cm <sup>4</sup> )	ZX (cm <sup>3</sup> )	X (mm)	IYY (cm <sup>4</sup> )	ZY (cm <sup>3</sup> )	Y (mm)
HMPA-2.5-40/30	2.50	40.00	30.00	1.57	0.74	20.00	4.21	2.11	8.80
HMPA-2.5-40/40	2.50	40.00	40.00	3.91	1.50	20.00	5.97	2.99	13.84
HMPA-3-35/35	3.00	35.00	35.00	2.83	1.24	17.50	4.27	2.44	12.14
HMPA-3-40/30	3.00	40.00	30.00	1.79	0.85	20.00	4.86	2.43	8.83
HMPA-3-40/40	3.00	40.00	40.00	4.55	1.74	20.00	6.92	3.46	13.93
HMPA-3-50/50	3.00	50.00	50.00	9.68	2.97	25.00	15.04	6.01	17.42
HMPA-4-40/40	4.00	40.00	40.00	5.67	2.19	20.00	8.60	4.30	14.10
HMPA-4-50/50	4.00	50.00	50.00	12.33	3.81	25.00	18.97	7.60	17.65
HMPA-5-50/50	5.00	50.00	50.00	14.68	4.57	25.00	22.40	8.97	17.87

### HMPB C Channel



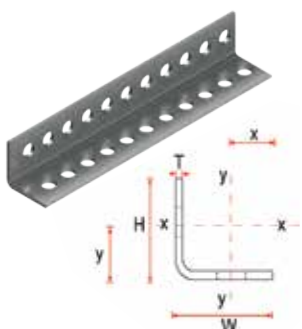
Product Code	Technical Details								
	Dimensions			X-X Axis			Y-Y Axis		
	Thickness T (mm)	Width W (mm)	Height H (mm)	IXX (cm <sup>4</sup> )	ZX (cm <sup>3</sup> )	X (mm)	IYY (cm <sup>4</sup> )	ZY (cm <sup>3</sup> )	Y (mm)
HMPB-2.5-28/15	2.50	28.00	15.00	0.33	0.43	14.00	1.43	1.02	7.38
HMPB-3-38/17	3.00	38.00	17.00	0.76	0.82	19.00	4.59	2.42	7.79
HMPB-2.5-41/21	2.50	41.00	21.00	1.32	1.19	20.50	5.71	2.79	9.85
HMPB-3-41/21	3.00	41.00	21.00	1.48	1.33	20.50	6.55	3.19	9.86

### HMPC C Channel



Product Code	Technical Details								
	Dimensions			X-X Axis			Y-Y Axis		
	Thickness T (mm)	Width W (mm)	Height H (mm)	IXX (cm <sup>4</sup> )	ZX (cm <sup>3</sup> )	X (mm)	IYY (cm <sup>4</sup> )	ZY (cm <sup>3</sup> )	Y (mm)
HMPC-2.5-41/22	2.50	41.00	22.00	1.25	0.99	20.50	5.60	2.72	8.16
HMPC-2.5-41/41	2.50	41.00	41.00	7.92	3.62	20.50	9.40	4.58	19.02
HMPC-3-41/22	3.00	41.00	22.00	1.69	1.43	20.50	6.94	3.40	9.16
HMPC-3-41/41	3.00	41.00	41.00	9.40	4.20	20.50	11.30	5.50	18.80

### HMPL L Channel



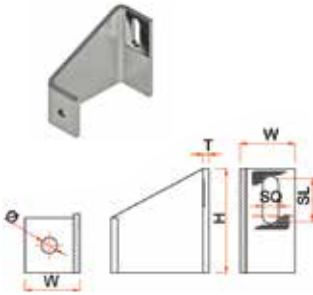
Product Code	Technical Details								
	Dimensions			X-X Axis			Y-Y Axis		
	Thickness T (mm)	Width W (mm)	Height H (mm)	IXX (cm <sup>4</sup> )	ZX (cm <sup>3</sup> )	X (mm)	IYY (cm <sup>4</sup> )	ZY (cm <sup>3</sup> )	Y (mm)
HMPL-2.5-30/30	2.50	30.00	30.00	0.93	0.44	21.22	0.93	0.44	8.78
HMPL-2.5-30/40	2.50	30.00	40.00	1.04	0.39	26.33	2.16	0.39	7.23
HMPL-3-30/30	3.00	30.00	30.00	1.09	0.52	20.79	1.09	0.52	9.21
HMPL-3-40/40	3.00	40.00	40.00	2.88	1.02	28.16	2.88	1.02	11.84
HMPL-3-50/50	3.00	50.00	50.00	6.04	1.69	35.72	6.04	1.69	14.28
HMPL-4-40/40	4.00	40.00	40.00	3.72	1.34	27.79	3.72	1.34	12.21
HMPL-50/50	4.00	50.00	50.00	7.85	2.22	35.40	7.85	2.22	14.60
HMPL-5-50/50	5.00	50.00	50.00	9.57	2.73	35.03	9.57	2.73	14.97

- Material: Stainless Steel 1.4301 (A2) & 1.4401 (A4) and Hot dip galvanized mild steel.
- Tables above is prepared according to values with Ø11 drilled holes.
- Channels can be provided up to 6 metres length.
- Load capacity for wind loads and dead loads needs to be verified with structural calculations.



## HCSP Channel Supports - Product Details

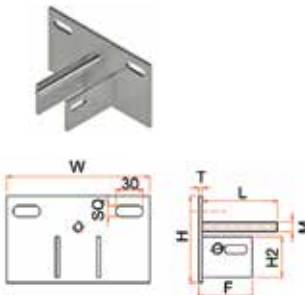
### HCSP1 Channel Support



Product Code	Technical Details						
	Thickness	Width	Height	Forming	Slot Hole Dia.	Slot Hole Length	Hole Dia.
	T (mm)	W (mm)	H (mm)	F (mm)	S Ø (mm)	SL (mm)	Ø (mm)
HCSP1-40	4	40	80	40	11	30	11
HCSP1-60	4	40	90	60	11	30	11
HCSP1-80	5	45	100	80	11	30	11
HCSP1-100	5	45	100	100	11	30	11
HCSP1-120	6	50	100	120	11	30	11
HCSP1-140	6	50	100	140	11	30	11
HCSP1-160	6	50	115	160	11	30	11
HCSP1-180	6	55	115	180	11	30	11
HCSP1-200	6	55	120	200	11	30	11

- Suitable for all type of channels
- Max dead load 2.5 kN
- Max wind load 1.2 kN

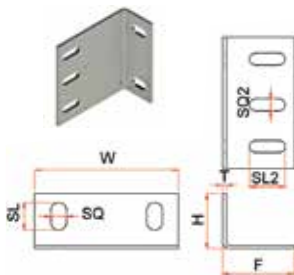
### HCSP2 Channel Support



Product Code	Technical Details							
	Thickness	Width	Height	Forming	Slot Hole Dia.	Slot Hole Length	Hole Dia.	Thr. Rod Metric Size
	T (mm)	W (mm)	H (mm)	F (mm)	S Ø (mm)	SL (mm)	Ø (mm)	MxL (mm)
HCSP2-100	4	160	85	100	11	30	11	M10x110
HCSP2-120	4	160	85	120	11	30	11	M10x130
HCSP2-140	5	160	95	140	11	30	11	M10x150
HCSP2-160	5	160	95	160	11	30	11	M10x170
HCSP2-180	5	180	95	180	11	30	11	M10x190
HCSP2-210	5	180	95	210	11	30	11	M10x220
HCSP2-240	5	180	95	240	11	30	11	M10x240
HCSP2-270	5	180	100	270	11	30	11	M10x280
HCSP2-300	5	180	100	300	11	30	11	M10x310

- Suitable only for HMPA type U channels
- Max dead load 3.5 kN
- Max wind load 2.0 kN

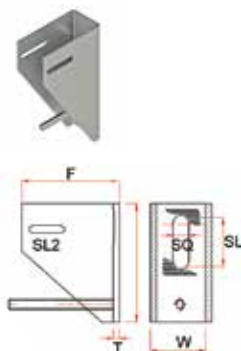
### HCSP3 Channel Support



Product Code	Technical Details							
	Thickness	Width	Height	Forming	Slot Hole Dia.	Slot Hole Length	Hole Dia.	Slot hole length
	T (mm)	W (mm)	H (mm)	F (mm)	S Ø (mm)	SL (mm)	Ø (mm)	SL2 (mm)
HCSP3-70	3	120	50	70	11	25	11	30
HCSP3-90	3	120	50	90	11	25	11	30
HCSP3-110	4	120	50	110	11	25	11	30
HCSP3-130	4	120	50	130	11	25	11	30
HCSP3-150	5	120	50	150	11	25	11	30
HCSP3-170	5	120	50	170	11	25	11	30
HCSP3-190	5	120	50	190	11	25	11	30
HCSP3-210	5	120	60	210	11	25	11	30
HCSP3-230	5	120	60	230	11	25	11	30

- Suitable only for HMPA type U channels & HMPL type L channels
- Max dead load 2.5 kN
- Max wind load 1.2 kN

### HCSP2 Channel Support



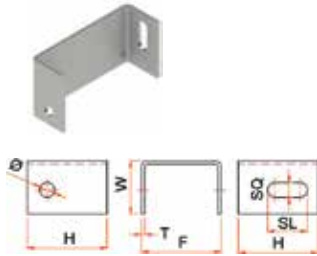
Product Code	Technical Details							
	Thickness	Width	Height	Forming	Slot Hole Dia.	Slot Hole Length	Hole Dia.	Thr. Rod Metric Size
	T (mm)	W (mm)	H (mm)	F (mm)	S Ø (mm)	SL (mm)	Ø (mm)	MxL (mm)
HCSP4-100	3	50	175	100	11	30	11	M10x110
HCSP4-120	3	50	175	120	11	30	11	M10x130
HCSP4-140	4	50	175	140	11	30	11	M10x150
HCSP4-160	4	50	195	160	11	30	11	M10x170
HCSP4-180	4	50	195	180	11	30	11	M10x190
HCSP4-210	5	50	195	210	11	30	11	M10x220
HCSP4-240	5	50	195	240	11	30	11	M10x240
HCSP4-270	5	50	215	270	11	30	11	M10x280
HCSP4-300	5	50	215	300	11	30	11	M10x310

- Suitable only for HMPA type U channels
- Max dead load 3.5 kN
- Max wind load 2.0 kN

• Material: Stainless Steel 1.4301 (A2) & 1.4401 (A4) and Hot dip galvanized ST37 mild steel.

## HCRS Channel Restraints - Product Details

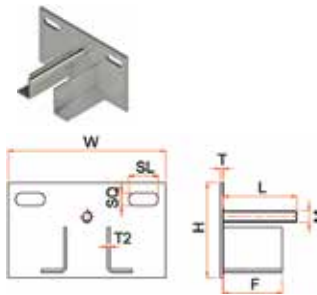
### HCRS1 Channel Restraint



Product Code	Technical Details						
	Thickness	Width	Height	Forming	Slot Hole Dia.	Slot Hole Length	Hole Dia.
	T (mm)	W (mm)	H (mm)	F (mm)	S Ø (mm)	SL (mm)	Ø (mm)
HCRS1-40	2	40	60	40	9	30	9
HCRS1-60	2	40	60	60	9	30	9
HCRS1-80	3	45	80	80	9	30	9
HCRS1-100	3	45	80	100	9	30	9
HCRS1-120	4	50	100	120	9	30	9
HCRS1-140	4	50	100	140	9	30	9
HCRS1-160	4	50	100	160	9	30	9
HCRS1-180	4	50	100	180	9	30	9
HCRS1-200	4	50	100	200	9	30	9

- Suitable for all type of channels
- Max wind load 1.2 kN

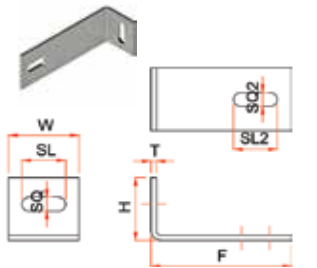
### HCRS2 Channel Restraint



Product Code	Technical Details							
	Thickness	Width	Height	Forming	Slot Hole Dia.	Slot Hole Length	Hole Dia.	Thr. Rod Metric Size
	T (mm)	W (mm)	H (mm)	F (mm)	S Ø (mm)	SL (mm)	Ø (mm)	MxL (mm)
HCRS2-100	4	160	85	100	11	30	11	M10x110
HCRS2-120	4	160	85	120	11	30	11	M10x130
HCRS2-140	5	160	95	140	11	30	11	M10x150
HCRS2-160	5	160	95	160	11	30	11	M10x170
HCRS2-180	5	180	95	180	11	30	11	M10x190
HCRS2-210	5	180	95	210	11	30	11	M10x220
HCRS2-240	5	180	95	240	11	30	11	M10x240
HCRS2-270	5	180	100	270	11	30	11	M10x280
HCRS2-300	5	180	100	300	11	30	11	M10x310

- Suitable only for HMPA type U channels
- Max wind load 2.0 kN

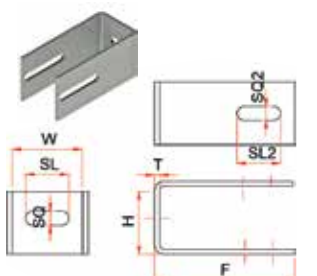
### HCRS3 Channel Restraint



Product Code	Technical Details							
	Thickness	Width	Height	Forming	Slot Hole Dia.	Slot Hole Length	Hole Dia.	Slot hole length
	T (mm)	W (mm)	H (mm)	F (mm)	S Ø (mm)	SL (mm)	Ø (mm)	SL2 (mm)
HCRS3-70	3	40	50	70	11	25	11	30
HCRS3-90	3	40	50	90	11	25	11	30
HCRS3-110	4	40	50	110	11	25	11	30
HCRS3-130	4	40	50	130	11	25	11	30
HCRS3-150	5	40	50	150	11	25	11	30
HCRS3-170	5	40	50	170	11	25	11	30
HCRS3-190	5	40	50	190	11	25	11	30
HCRS3-210	5	40	60	210	11	25	11	30
HCRS3-230	5	40	60	230	11	25	11	30

- Suitable only for HMPA type U channels & HMPL type L channels
- Max wind load 1.2 kN

### HCRS4 Channel Restraint



Product Code	Technical Details							
	Thickness	Width	Height	Forming	Slot Hole Dia.	Slot Hole Length	Hole Dia.	Thr. Rod Metric Size
	T (mm)	W (mm)	H (mm)	F (mm)	S Ø (mm)	SL (mm)	Ø (mm)	MxL (mm)
HCRS4-100	3	50	175	100	11	30	11	M10x110
HCRS4-120	3	50	175	120	11	30	11	M10x130
HCRS4-140	4	50	175	140	11	30	11	M10x150
HCRS4-160	4	50	195	160	11	30	11	M10x170
HCRS4-180	4	50	195	180	11	30	11	M10x190
HCRS4-210	5	50	195	210	11	30	11	M10x220
HCRS4-240	5	50	195	240	11	30	11	M10x240
HCRS4-270	5	50	215	270	11	30	11	M10x280
HCRS4-300	5	50	215	300	11	30	11	M10x310

- Suitable only for HMPA type U channels
- Max wind load 2.0 kN
- Material: Stainless Steel 1.4301 (A2) & 1.4401 (A4) and Hot dip galvanized ST37 mild steel.

## HMP Sub Channel Systems - Application Examples

### HMPA-HC2 sub channel fixing system :

- High load bearing and adjustable sub channel system.
- Fast and easy fixing of stone slabs.
- Minimum projection size is 90 mm and maximum is 350 mm.
- Ideal for heavy loads and large projection sizes.
- Anchors are fixed to channels with hex bolts and hex nuts.



**HCSP2** Channel Support    **HCRS2** Channel Restraint    **HMPA** U Channel    **HZ02** Z Anchor    **HRS1** Restraint Anchor

### HMPB-HC1 sub channel fixing system :

- Easy to assemble sub channel system.
- Easy to install with uncomplicated elements.
- Minimum projection size is 110 mm and maximum is 250 mm.
- Ideal for restoration of facades.
- Anchors are fixed to channels with hex bolts and hex nuts.



**HCSP1** Channel Support    **HCRS1** Channel Restraint    **HMPB** Channel    **HZ02** Z Anchor

### ATS sub channel fixing system :

- Adjustable and easy to use sub channel system.
- Fast and easy fixing of stone slabs.
- Minimum projection size is 160 mm and maximum projection size is 360 mm.
- Ideal for varying projection sizes and slab dimensions.
- Anchors are fixed to toothed channels with lock nuts and hex bolts.



**ATS-A** Channel Support    **ATS-B** Channel Restraint    **HMPS** Toothed Channel    **ATS-HA** Special Anchor    **HZ-00** Z Anchor

### HMPC-HC1H sub channel system :

- Adjustable sub channel system with horizontal channels.
- Quick adjustability at horizontal axis.
- Minimum projection size is 150 mm and maximum is 240 mm.
- Ideal for staggered patterned facades.
- Anchors are fixed to channels with lock nuts and hex bolts.



**HCSP1** Channel Support    **HCRS1** Channel Restraint    **HMPC** C Channel    **HMPC** C Channel    **HZ01** Z Anchor

### HMP Channel Systems - Special Application Details



Channel sub frame is designed to accommodate the natural stone angular installation.



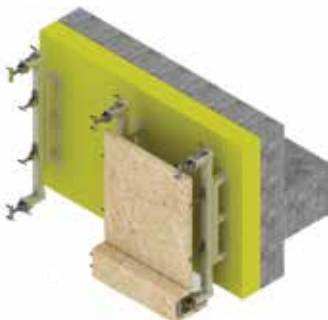
Channel system is supported on to concrete floor and ceiling forming a false wall for stone installation.



Customized panels with stone slabs supported on to channel sub frame.



Stone installation around structural steel column. Channels are used to form a sub frame for fixing with adjustable anchors.



Sub frame is formed to accommodate the facade movement. Channels provide the means of easy and fast installation.

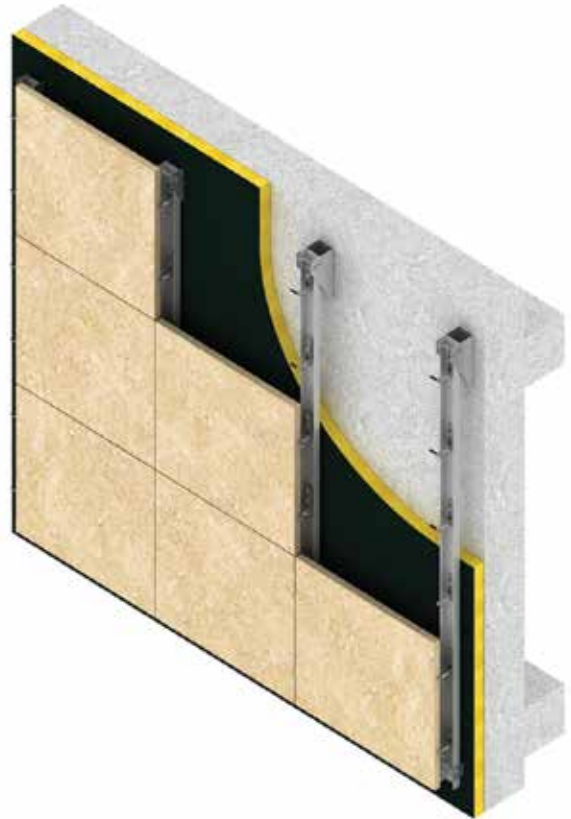
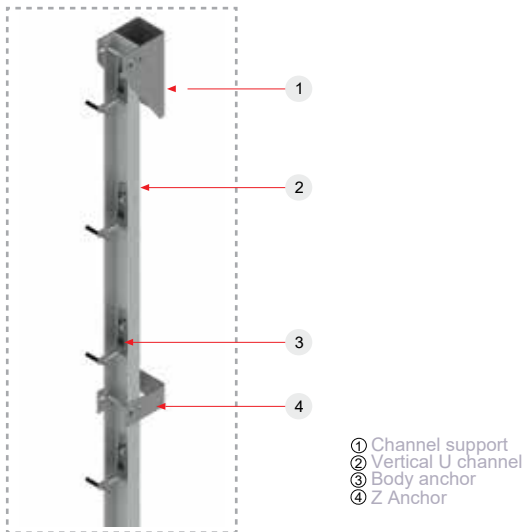


## Fixing Systems for Reconstructed Stone - Introduction

Fixing systems with aluminium channels are available for the installation of natural stone, ceramics and fibre cement panels. A variety of systems are available to accommodate the application requirements. Custom designs are also made for special requirements. Three dimensional adjustability is provided and fast installation is possible due to the light weight of aluminium and the ease of cutting and drilling on site.

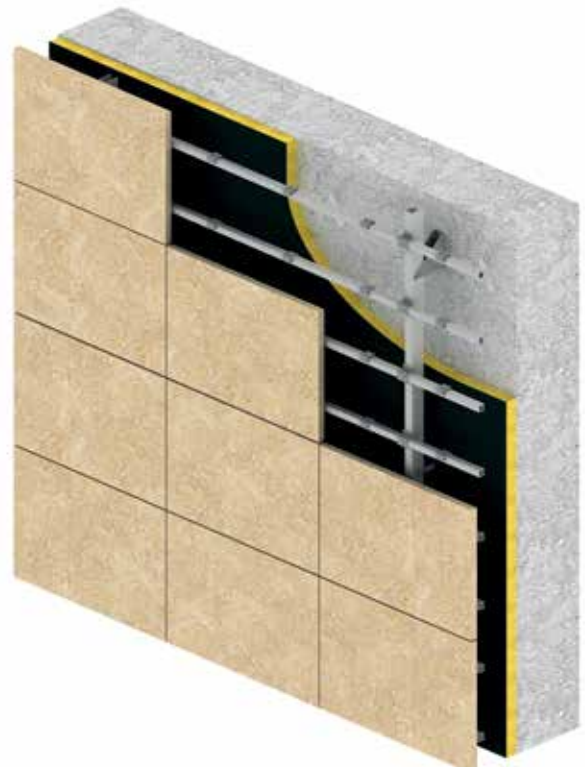
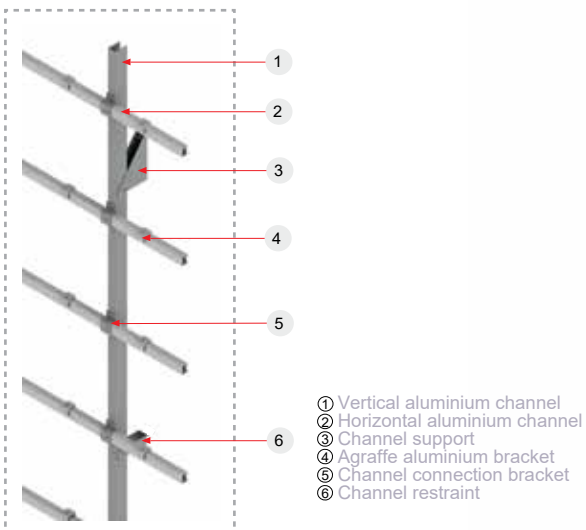
### HMP-ALU-U Aluminium Sub Channel System

Aluminium U Channel is supported and restrained with stainless steel brackets on to the walls. Stainless steel body 1 anchors are used for stone installation.



### HMP-ALU-AG Aluminium Sub Channel System

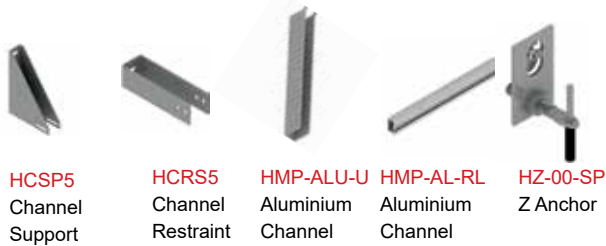
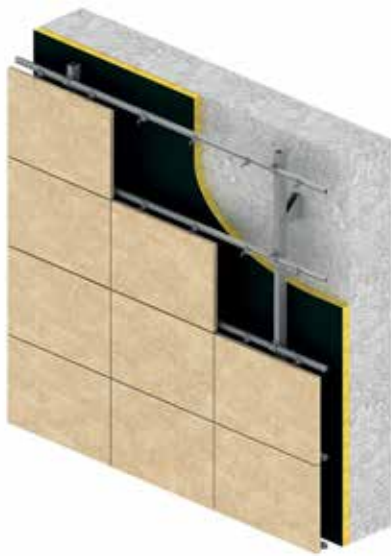
Aluminium sub channel system with vertical and horizontal channels that allow the fixing of panels from the rear surface using undercut bolts.



**HMP-ALU Aluminium Sub Channel Systems - Application Examples**

**HMP-ALU-SP/H**  
Aluminium Sub Channel System

- Adjustable sub channel system with horizontal channels
- Quick adjustability at horizontal axis
- Projection sizes up to 350 mm
- Ideal for staggered patterned facades
- Anchors are fixed to channels with lock nuts and hex bolts
- Suitable for installation at horizontal joints



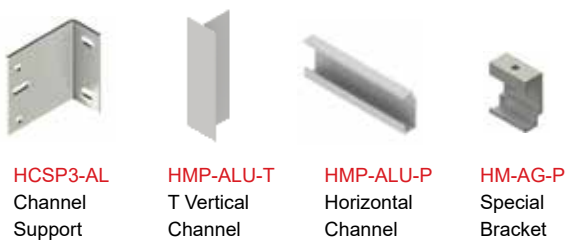
**HMP-ALU-SP**  
Aluminium Sub Channel System

- Easy to assemble sub channel system with special slotted aluminium channels
- Slots on the channels allow easy installation of special type Speed fix anchors.
- Quick and fast installation with self tapping screws.
- Projection sizes of up to 300 mm
- Ideal for restoration of facades



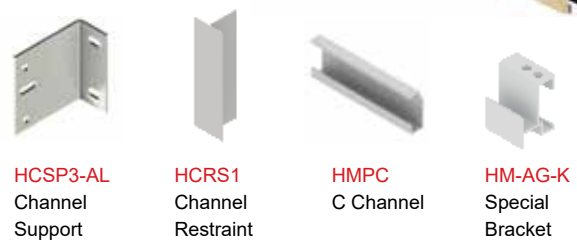
**HMP-ALU-P**  
Aluminium Sub Channel System

- Channel system formed with vertical and horizontal aluminium channel grid
- Used for thin panels such as ceramic, HPL, fibre cement and stone panels
- Projection sizes up to 250 mm
- Panels are installed with undercut bolts and special brackets that are set on the vertical channels using the hang on method



**HMP-ALU-AG/K** Aluminium Sub Channel System

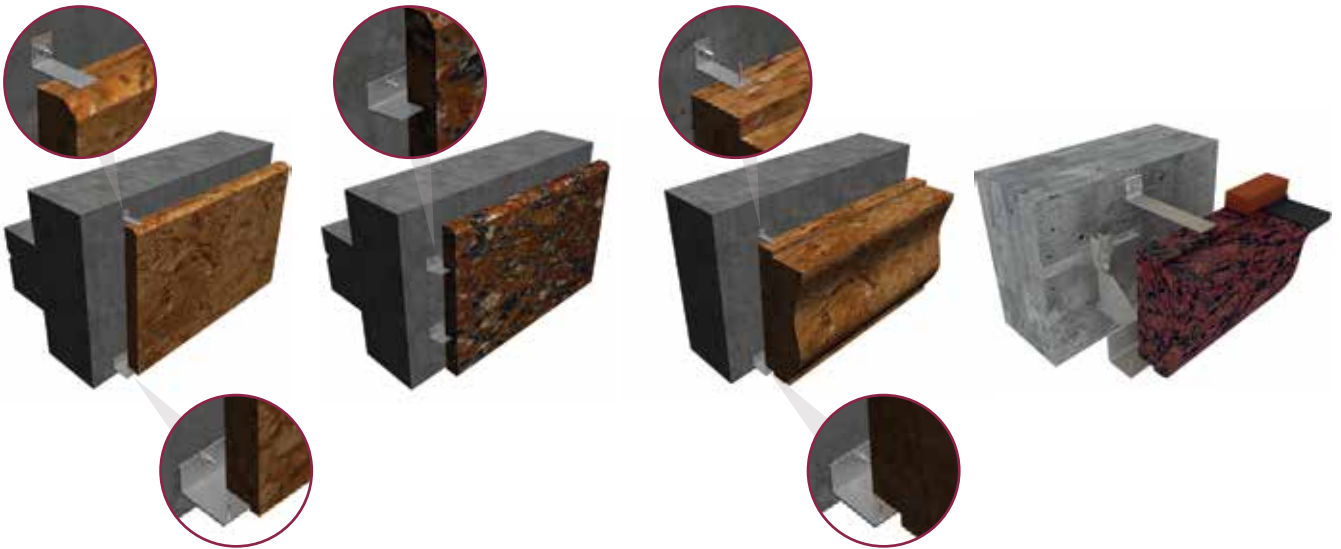
- Channel system formed with vertical and horizontal aluminium channel grid
- Used stone panels width mm 2 cm thickness that have slotted kerf openings on the edge
- Projection sizes up to 300 mm
- Panels are installed with kerf shaped aluminium brackets that are fixed on to the horizontal aluminium channels with hang on method



## Fixing Systems For Heavy Corbel Stones - Product Range

Fixing systems for the installation of high load natural stone or reconstructed stone are available in a variety of types and size ranges. The actual system proposal will be made according to the technical requirements of the project. The use of these fixing systems is for high load coping and cornice stones. Load bearing and restraint anchors are used to install the slabs on to different wall backings using a variety of attachment methods.

### Application Examples



### Heavy Load Bearing Anchors

HMS-UP



HMCS-SB/P



HMCS-DB



HAMF



### Restraint Anchors

HA-RST



HA-RST/K



HA-RST/K B



HAZ21



### Periscope Anchors

HPC1



HPC2



HPC3



HPC4

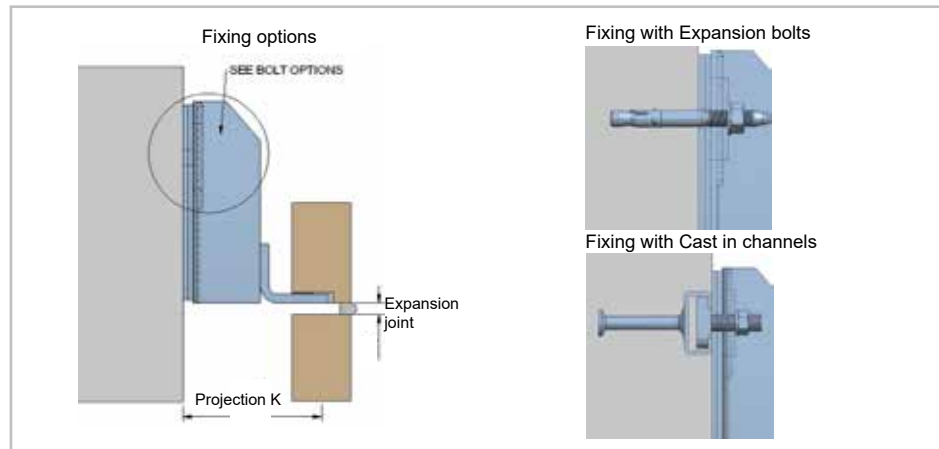


## Fixing Systems For Heavy Corbel Stones - Introduction

### Load Bearing Anchors

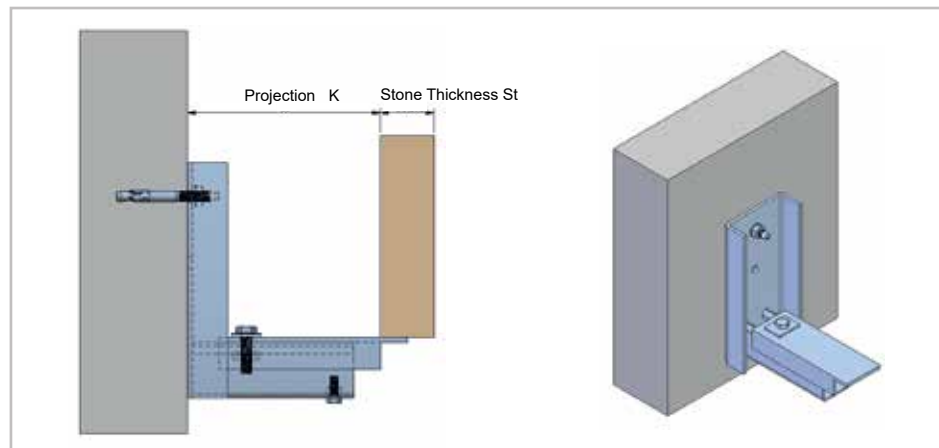
Heavy Duty brackets used for load bearing are fixed on to load bearing concrete walls. The two main methods that are usually used for attachments are either by anchor bolts or anchor channels.

Both anchor channels and anchors bolts specified according to the load requirements of the projects and must be structurally verified according to the loads concerned on the project.



Heavy Duty brackets have limited adjustability to take the irregularities of the walls. An accepted method is use of shims to adjust the projection sized by up to 5 mm.

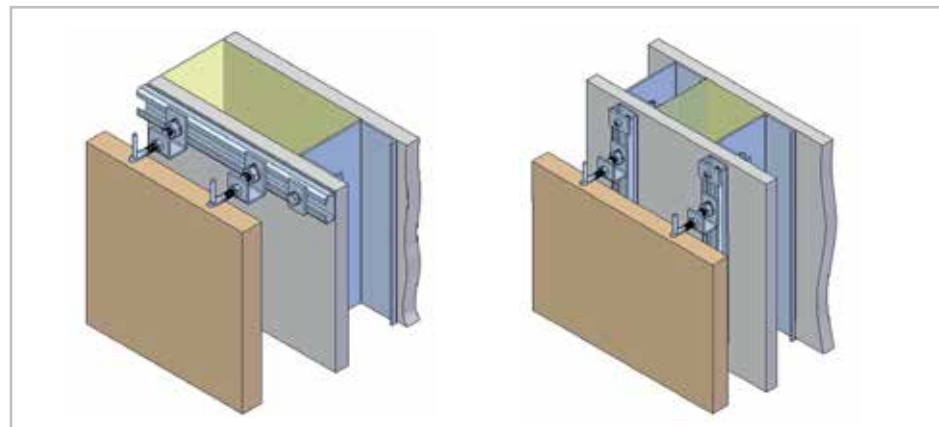
Greater adjustability can be achieved by special design as illustrated on the diagram on the right. An adjustable plate can be adapted to adjust in and out the distance of the projection size.



### Restraining Brackets

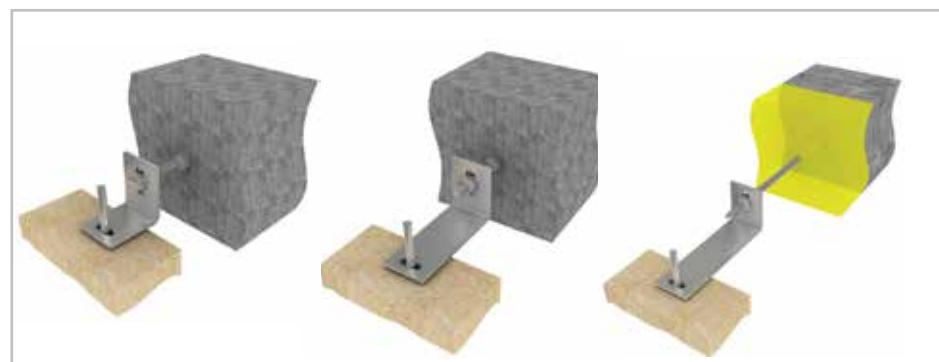
There are many systems to be used for restraining the stone slabs that are supported on a corbel system. Channel systems can be used as they are suitable to be fixed on commonly used steel sections.

Restraint anchors or wall ties can be easily fixed on to the channel at desired position which enables greater flexibility and easiness in installing the slabs.



Restraint brackets are used for restraining stone slabs directly on to wall backings. There are various types of brackets that can be used for quick and easy installation.

Depending on the cavity and the existence of insulation on the wall, different type of restraint brackets are preferred for installation.

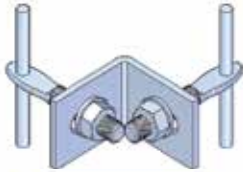




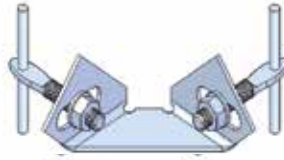
## HCA Corner Anchors - Product Details

- For fixing small slabs on to supported facade slabs.
- Used for reveal, column, soffit and sill slabs.
- Slabs can be assembled in the work shop for faster installation on site.
- Special drilling is required on the slabs, details of which are shown at the bottom of the page.

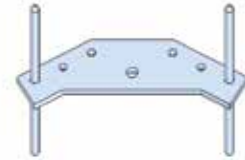
HCA01 Corner Anchor



HCA02 Corner Anchor



HCA03 Corner Anchor



### HCA01 Application

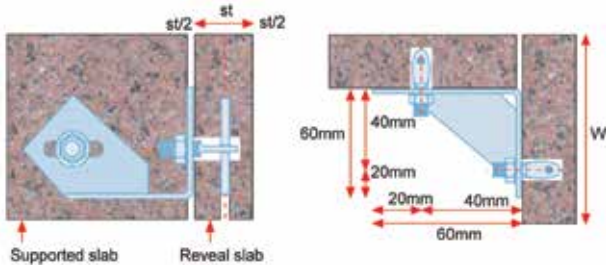
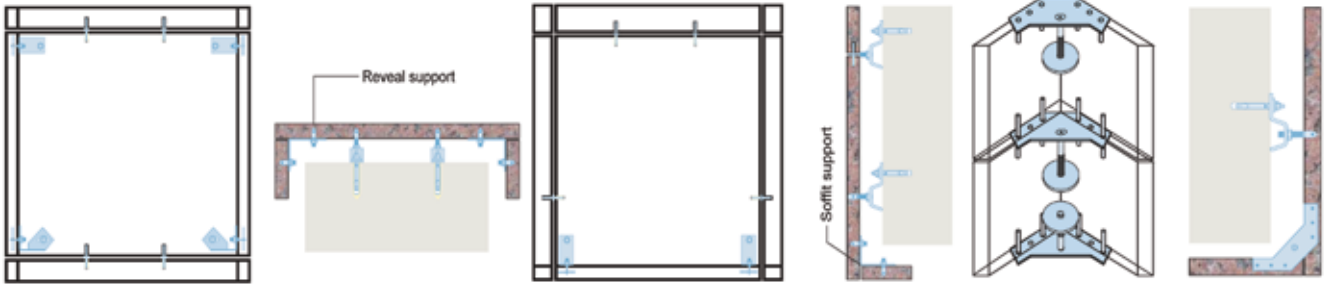
Reveal slabs can be connected to the supported slabs at columns. In this instance HCA01 corner anchors are used as load bearing and HCA02 are used as restraint.

### HCA02 Application

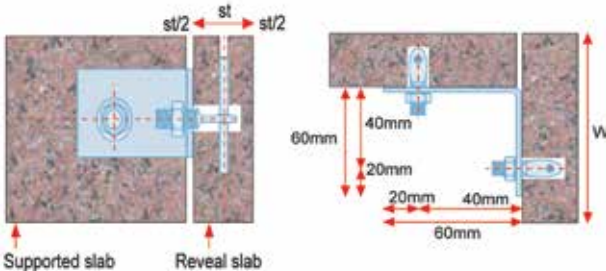
Soffit slabs can be connected to the supported slabs at parapets. In this instance only HCA02 corner anchors are used as restraint.

### HCA03 Application

This anchor is used to fasten two slabs together at corners. The disk is inserted at a split edge on the slab. A special bolt is fixed between the anchor and the disk which firmly connects the slabs together.



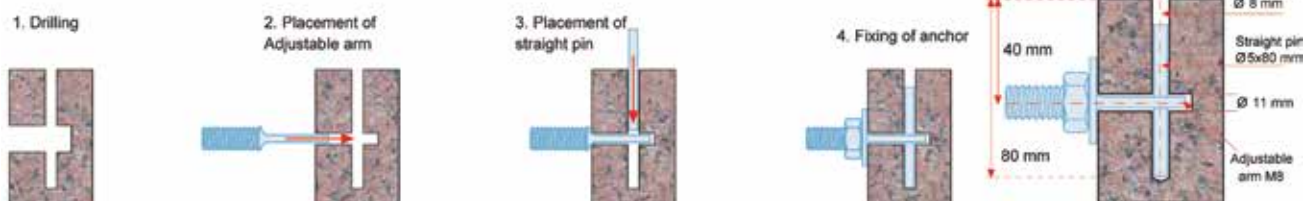
Product Code	Technical Details				
	Reveal Size	Vertical Load	Wind Load	Adjustable Arm	Straight Pin
	StxWxL cm	(N)	(N)	(mm)	(mm)
HCA02	3(4)x10x45	38(50)	40	M8x45	ø5x80
	3(4)x15x60	76(100)	50		
	3(4)x20x75	130(170)	60		



Product Code	Technical Details				
	Reveal Size	Vertical Load	Wind Load	Adjustable Arm	Straight Pin
	StxWxL cm	(N)	(N)	(mm)	(mm)
HCA01	3(4)x10x45	38(50)	40	M8x45	ø5x80
	3(4)x15x60	76(100)	50		
	3(4)x20x75	130(170)	60		

### Special Drilling for HCA01 & HCA02 Corner Anchors

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.

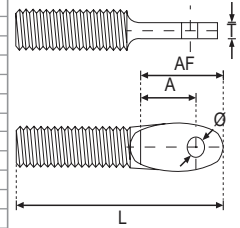


**HAZ Accessories - Product Details**

**HAA Adjustable Arm**



Product Code	Technical Detail						Stone Thickness St (mm)	Distance Between Edge & Hole A (mm)
	Metric Size	Length	Flat length Size	Flattening Thickness	Pin Diameter			
	M (mm)	L (mm)	AF (mm)	T (mm)	Ø (mm)			
HAA-8/50	8	50	A+6	3	4	20	12-13	
HAA-8/60	8	60	A+6	3	4	25	14-16	
HAA-8/70	8	70	A+6	3	4	30	16-17	
HAA-10/50	10	50	A+8	3.5	5	40	22-24	
HAA-10/60	10	60	A+8	3.5	5	50	26-29	
HAA-10/70	10	70	A+8	3.5	5			
HAA-10/80	10	80	A+8	3.5	5			
HAA-12/50	12	50	A+8	4.5	5			
HAA-12/60	12	60	A+8	4.5	5			
HAA-12/70	12	70	A+8	4.5	5			
HAA-12/80	12	80	A+8	4.5	5			
HAA-14/50	14	50	A+8	5.5	6			
HAA-14/60	14	60	A+8	5.5	6			
HAA-14/70	14	70	A+8	5.5	6			
HAA-14/80	14	80	A+8	5.5	6			
HAA-16/50	16	50	A+8	6	6			
HAA-16/60	16	60	A+8	6	6			
HAA-16/70	16	70	A+8	6	6			
HAA-16/80	16	80	A+8	6	6			



**Type B : With Welded Pin**



**Type C : With Welded Plate**



**Type D : With Welded Plate & Pins**



**Type E : With Welded Shim**



**HFP Flanged Pin**



Product Code	Technical Details		
	Diameter	Length	Flange Diameter
	Ø (mm)	L (mm)	FØ (mm)
HFP-4/50	4	50	5
HFP-5/60	5	60	6
HFP-5/70	5	70	6
HFP-6/70	6	70	7

**HSW Serrated Washer**



Product Code	Technical Details			
	Thick-ness	Height	Width	Length
	T (mm)	H (mm)	W (mm)	L (mm)
HSW-22307	2.5	22	30	Ø7
HSW-22309	2.5	22	30	Ø9
HSW-263411	3	26	34	Ø11
HSW-263413	3	26	34	Ø13

**HTP Traced Pin**



Product Code	Technical Details		
	Diameter	Length	Trace Height
	Ø (mm)	L (mm)	TH (mm)
HTP-5/70	5	70	5.2
HTP-6/75	6	75	6.2

**HPW Plain Washer**



Product Code	Technical Details			
	Thick-ness	Height	Width	Length
	T (mm)	H (mm)	W (mm)	L (mm)
HPW-22307	2.5	22	30	Ø7
HPW-22309	2.5	22	30	Ø9
HPW-263411	3	26	34	Ø11
HPW-263413	3	26	34	Ø13

**HSP Straight Pin**



Product Code	Technical Details	
	Diameter	Length
	Ø (mm)	L (mm)
HSP-4/60	4	60
HSP-5/60	5	60
HSP-5/70	5	70
HSP-6/70	6	70

**HMLN Lock Nut**



Product Code	Technical Details			
	Thick-ness	Height	Width	Metric Hole
	T (mm)	H (mm)	W (mm)	M (mm)
HMLN-6	6	20	34	M6
HMLN-8	8	20	34	M8
HMLN-10	9	20	34	M10
HMLN-12	10	20	34	M12

**HUP U Shaped Pin**



Product Code	Technical Details		
	Diameter	Height	Width
	Ø (mm)	L (mm)	W (mm)
HUP-4/50	4	20	50
HUP-5/50	5	25	50
HUP-6/50	6	30	50

**HSM Shim Plate**



Product Code	Technical Details			
	Thick-ness	Height	Width	Slot Hole
	T (mm)	H (mm)	W (mm)	Ø x SL
HSM-4030-7	2	40	30	7x20
HSM-4030-9	2	40	30	9x25
HSM-4050-11	3	40	50	11x25
HSM-4050-13	4	40	50	13x30

**HCP Capped Pin**



Product Code	Technical Details		
	Diameter	Cap Diameter	Length
	Ø (mm)	ØC (mm)	L (mm)
HCP-4/35	4	6	35
HCP-5/40	5	7	40
HCP-6/45	6	8	45

**HPT Plastic Tube**



Product Code	Technical Details		
	Inner Diameter	Outer Diameter	Length
	In. Ø (mm)	Ou. Ø (mm)	L (mm)
HPT-4	4.5	6	30
HPT-5	5.5	7	40
HPT-6	6.5	8	40

• Material : Stainless Steel 1.4301 (A2) & 1.4401 (A4). Material for Plastic Tube: Polyacetal.

## HB Anchor Bolts - Product Details

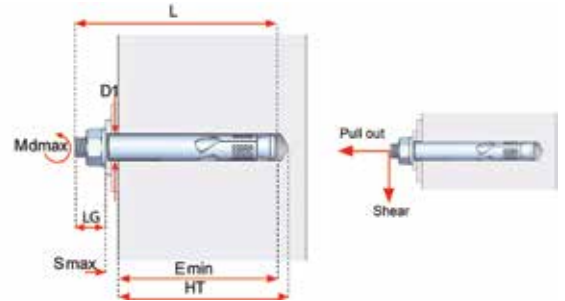
### HB01 Sleeve Bolt

#### Application

For fastening fixtures to concrete strength class C20/25 & solid concrete block walls.

#### Available in

Stainless Steel EN 1.4301 & 1.4401 (AISI 304 & AISI 316) and E.galvanized Mild Steel.



#### Product Code Example

HB01 - 6 / 80



Product Code	Technical Details									Working Resistance (kN)			
	Bolt Size	Sleeve Size	Drill Hole Dia.	Drill Length	Min. Embedment	Max. Fixture Thickness	Fixture Hole Dia.	Max Torque	Bolt Length	Concrete Blockwork Wall	C 20/25 Concrete Wall		
	(mm)	(mm)	D (mm)	HT (mm)	E min. (mm)	Smax (mm)	D1 (mm)	Mdmax(Nm)	L (mm)	Pullout	Shear	Pullout	Shear
HB01-6/80	M6X80	Ø8x60	8	55	45	10	9	7	80	2.50	0.84	4.29	5.43
HB01-8/80	M8X80	Ø10x60	10	55	45	10	11	15	80	2.89	1.04	6.85	9.89
HB01-10/80	M10X80	Ø12x60	12	55	45	10	13	30	80	3.00	1.24	7.72	15.60
HB01-12/100	M12X100	Ø16x78	16	75	65	10	17	45	100	3.20	1.40	8.00	16.10

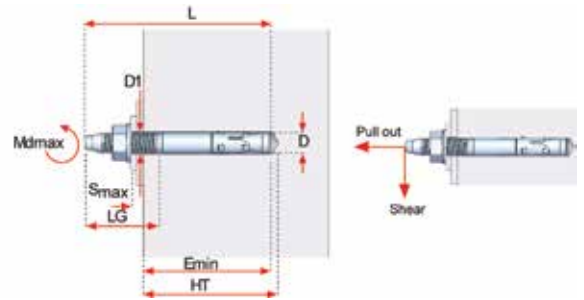
### HB03 Through Bolt

#### Application

For fastening fixtures to concrete strength class C20/25 & solid concrete block walls.

#### Available in

Stainless Steel EN 1.4301 & 1.4401 (AISI 304 & AISI 316) and E.galvanized mild steel.



#### Product Code Example

HB03 - 8 / 80



Product Code	Technical Details									Working Resistance (kN)	
	Bolt Size	Drill Hole Dia.	Drill Length	Min. Embedment	Max. Fixture Thickness	Fixture Hole Dia.	Max Torque	Bolt Length	Thread Length	C 20/25 Concrete Wall	
	(mm)	D (mm)	HT (mm)	E min. (mm)	Smax (mm)	D1 (mm)	Mdmax(Nm)	L (mm)	LG (mm)	Pullout	Shear
HB03-8/80	M8X80	8	65	47	23	9	13	80	30	4.11	6.50
HB03-8/100	M8X100	8	65	47	43	9	13	100	45		
HB03-8/120	M8X120	8	65	47	63	9	13	120	65		
HB03-10/90	M10X90	10	70	65	17	11	25	90	35	6.47	9.70
HB03-10/110	M10X110	10	70	65	37	11	25	110	45		
HB03-10/130	M10X130	10	70	65	57	11	25	130	65		
HB03-12/110	M12X110	12	95	80	15	13	40	110	35	9.64	12.40
HB03-12/135	M12X135	12	95	80	40	13	40	135	40		
HB03-12/145	M12X145	12	95	80	50	13	40	145	40		

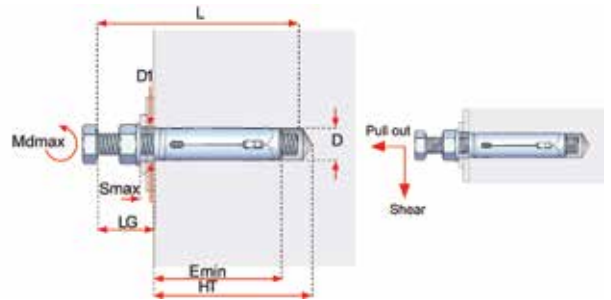
### HB05 Shell Bolt

#### Application

For fastening fixtures to concrete strength class C20/25 & solid concrete block walls.

#### Available in

Stainless steel EN 1.4301 & 1.4401 (AISI 304 & AISI 316)



#### Product Code Example

HB05 - 6 / 80



Product Code	Technical Details									Working Resistance (kN)			
	Bolt Size	Shell Size	Drill Hole Dia.	Drill Length	Min. Embedment	Max. Fixture Thickness	Fixture Hole Dia.	Max Torque	Bolt Length	Concrete Blockwork Wall	C 20/25 Concrete Wall		
	(mm)	(mm)	D (mm)	HT (mm)	E min. (mm)	Smax (mm)	D1 (mm)	Mdmax(Nm)	L (mm)	Pullout	Shear	Pullout	Shear
HB05-6/80	M6X80	Ø10X59	10	65	40	15	7	10	80	3.50	3.30	4.20	3.30
HB05-8/80	M8X80	Ø12X44	12	80	45	20	9	20	80	4.10	6.70	6.15	6.70
HB05-10/100	M10X100	Ø15X50	15	90	55	30	11	40	100	5.20	11.00	9.50	11.00
HB05-12/120	M12X120	Ø18X65	18	105	65	30	13	75	120	6.05	12.15	11.95	17.50

## HB Expansion Bolts - Product Details

### HB06 Drop in Bolt

#### Application

For fastening fixtures to concrete walls.

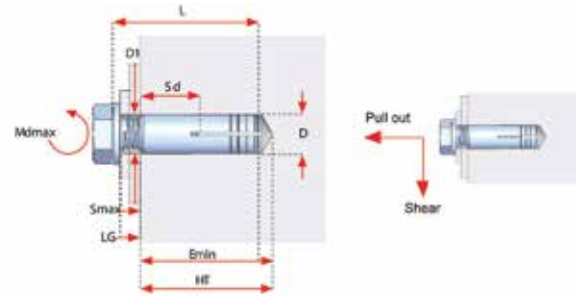
#### Available in

Stainless Steel EN 1.4301 & 1.4401 (AISI 304 & AISI 316) and E.galvanized mild steel.

#### Product Code Example

HB06 - 6

M. Size  
Type



Setting tool:



Product Code	Technical Details									Working Resistance (kN)	
	Bolt Size	Shell Size	Drill Hole Dia.	Drill Length	Min. Embedment	Max. Fixture Thickness	Fixture Hole Dia.	Max Torque	Screw in Depth Min/Max	C 20/25 Concrete Wall	
	(mm)	(mm)	D (mm)	HT (mm)	E min. (mm)	Smax (mm)	D1 (mm)	Mdmax(Nm)	Sd (mm)	Pullout	Shear
HB06-6	M6X20	Ø8x25	8	28	25	11	7	4	6/10	2.00	1.78
HB06-8	M8X25	Ø10x30	10	33	30	13	9	8	11/17	3.20	3.30
HB06-10	M10X30	Ø12x40	12	43	40	17	11	15	13/19	4.35	3.90
HB06-12	M12X35	Ø14x50	14	53	50	18	13	35	15/21	6.00	6.80

### HB07 Anchor Stud

#### Application

For fastening fixtures to concrete walls.

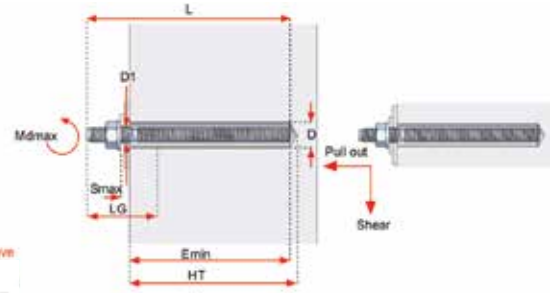
#### Available in

Stainless Steel EN 1.4301 & 1.4401 (AISI 304 & AISI 316) and E.galvanized Mild Steel.

#### Product Code Example

HB07- 8 / 110

Length  
Diameter  
Type



Product Code	Technical Details								Working Resistance (kN)	
	Bolt Size	Drill Hole Dia.	Drill Length	Min. Embedment	Max. Fixture Thickness	Fixture Hole Dia.	Max Torque	Bolt Length	C 20/25 Concrete Wall	
	(mm)	D (mm)	HT (mm)	E min. (mm)	Smax (mm)	D1 (mm)	Mdmax(Nm)	L (mm)	Pullout	Shear
HB07-8/110	M8X110	10	82	80	14	9	7	110	8.80	10.20
HB07-10/130	M10X130	12	92	90	21	11	15	130	12.30	15.60
HB07-12/160	M12X160	14	115	110	28	13	25	160	18.30	22.00

### HB11 Undercut bolt

#### Application

For Facade Applications

#### Available in

Stainless Steel EN 1.4301 & 1.4401 (AISI 304 & AISI 316)

#### Advantages

- Higher pull out values
- Lower bending moment on panel
- No appearance of fixing at joints

#### Product Code Example

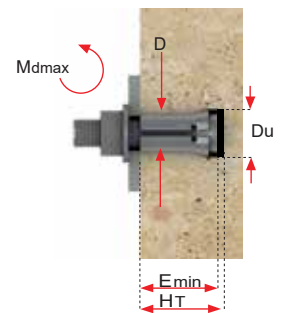
HB11 - 20

ST Thick.  
Type



HAZ-MC-11  
HB11 undercut drill machine

HAZ-DB-11  
HB11 drill bit



Product Code	Technical Details										Working Resistance (kN)			
	Bolt Size	Stone Thickness	Drill Hole Dia.	Drill Length	Min. Embedment	Max. Fixture Thickness	Fixture Hole Dia.	Max Torque	Bolt Length	Thread Length	Hard Granite		Soft Marble	
	(mm)	St (mm)	D/Du (mm)	HT (mm)	E min. (mm)	Smax (mm)	Df (mm)	Mdmax(Nm)	L (mm)	Thread Length (mm)	Pullout	Shear	Pullout	Shear
HB11-20	M6X27	20	8/11	12.50	11.50	5	9	5	24	14.5	1.20	1.20	1.00	1.00
HB11-30	M8X37	30	10/13	21.00	20.00	5	9	12	34	14.5	2.50	2.20	2.50	2.20
HB11-40	M8X47	40	10/13	31.00	30.00	5	9	12	39	14.5	2.80	2.50	2.80	2.50

A safety factor of 3 is taken for mean ultimate failure loads.

## References



**Project** : Conference Palace Hotel - Abu Dhabi  
**Contractor** : Turner Construction  
**Installation Area** : 160.000 m<sup>2</sup>



**Project** : Al Nahyan Masque - Abu Dhabi  
**Contractor** : Six Construct International  
**Installation Area** : 145.000 m<sup>2</sup>



**Project** : Museum of Islamic Arts - Doha  
**Contractor** : Baytur Construction  
**Installation Area** : 62.500 m<sup>2</sup>



**Project** : Bibliotheca Alexandria Library - Alexandria  
**Contractor** : Balfour Beatty and Arab Contractors JV  
**Installation Area** : 40.000 m<sup>2</sup>



**Project** : Texas Engineering University - Doha  
**Contractor** : Midmac Contracting  
**Installation Area** : 60.000 m<sup>2</sup>




**Project** : Sabanci University - Istanbul  
**Contractor** : Koray Construction  
**Installation Area** : 160.000 m<sup>2</sup>




**Project** : Is Bank Towers - Istanbul  
**Contractor** : Tepe Construction  
**Installation Area** : 45.000 m<sup>2</sup>

## References




 Project : Demir Bank  
Location : Istanbul



 Project : Yapi Kredi  
Location : Istanbul




 Project : Zorlu Holding  
Location : Istanbul




 Project : Istek Vakif  
Location : Istanbul




 Project : Tekfen Tower  
Location : Istanbul




 Project : Garanti Bank  
Location : Istanbul



 Project : Admo Apco  
Location : Abu Dhabi




 Project : Emirates Towers  
Location : Dubai




 Project : Fairmont Hotel  
Location : Dubai




 Project : Zadgo Gasco  
Location : Abu Dhabi




 Project : Trade Center  
Location : Abu Dhabi




 Project : American Embassy  
Location : Istanbul




 Project : American Embassy  
Location : Kingston




 Project : American Embassy  
Location : Astana




 Project : American Embassy  
Location : Yerevan




 Project : Usadba Center  
Location : Moscow




 Project : Tax Office  
Location : Moscow



 Project : Lazurnaya  
Location : Sochi




 Project : Gasprom  
Location : Moscow



 Project : Riverside Hotel  
Location : Moscow



 Project : Ritz Carlton Hotel  
Location : Moscow



 Project : Hilton Hotel  
Location : Jeddah




 Project : Kingdom Trade  
Location : Riyadh




 Project : Medinah  
Location : Jeddah



 Project : Four Seasons Hotel  
Location : Cairo



 Project : The Fund  
Location : Abu Dhabi



 Project : Mauritius Hotel  
Location : Mauritius





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