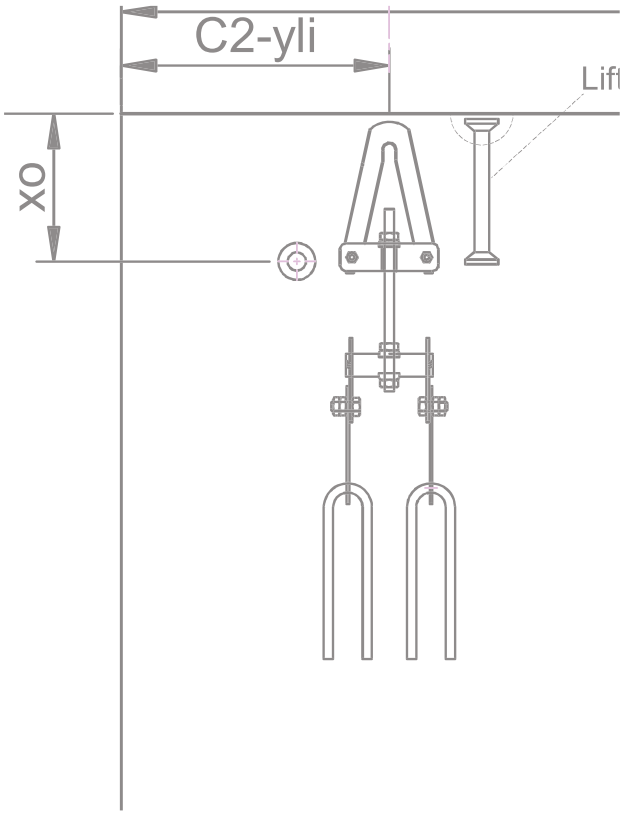
Your Fixing Systems Specialist

HAZ METAL

Concrete Panel Support Systems

HAZ fixing systems for architectural precast concrete cladding provide optimal solutions for mounting precast panels to structural substrates. Designed for precision and performance, these systems are ideal for façade applications requiring reliable, adjustable, and durable connections in modern architectural construction.

Product Brochure - HAZ-BR-PA-EN/01.25



HAZ METAL

HAZ
Group of Companies
Establishment
www.hazgrp.com

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

Contents

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

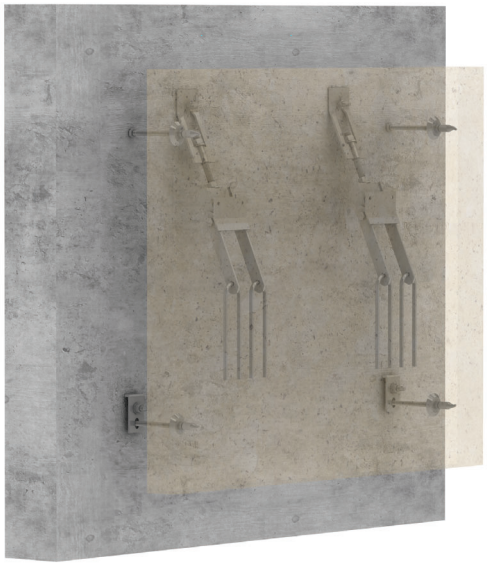
Concrete Panel Support Systems - Overview

PA2 precast panel support system is specially designed for the secure and fast installation of architectural prefabricated concrete panels on to load bearing structures. This system consists of support and restraining elements.

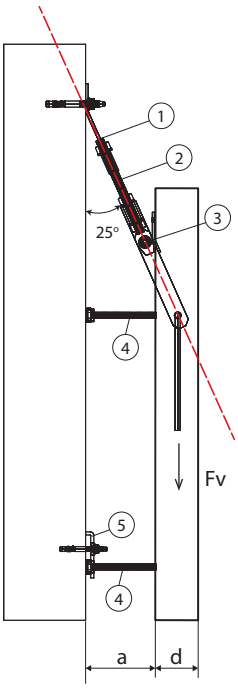
The PA2 panel anchor consist of upper section, center section and special fitting which is cast in to the concrete panel. Depending on the acting design resistence loads and the fixing type to the structure, there are different types of an upper section that is utilized. The standard upper section is fastened at the edge of the sub structure. Other types are available for connetion to top of slab.

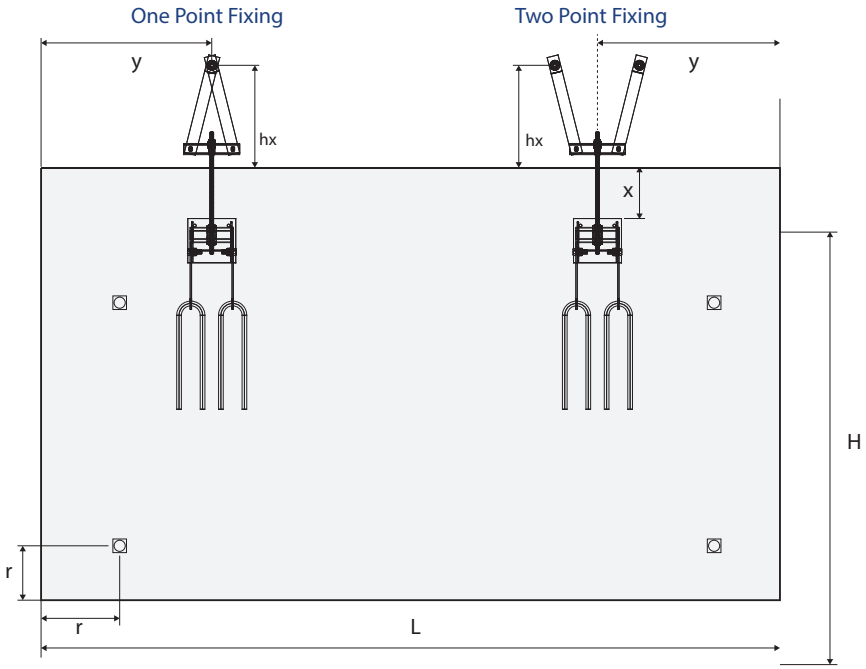
The standard PA2 anchor can support loads of up to 85.8 kN. However, custom design is made to achieve higher load capacities. The PA2 anchor fixing systems are tested and certified with an ETA report. Design caluculations are verified using a desgin software. To guarantee quality and safety periodic inspections are carried out by third party approval inspection bodies.

Facade panels are restrained by using BR spacing bolts which are compatible with the PA anchor system. The standard cavity sizes are 400 mm and are supplied with ISO plastic spacers.



PA2 Panel bracket





1. Upper Part
2. Tension Bar
3. Lower Part
4. Spacer Bolt
5. Bolt Restraint

lz = Length of tension bar
lz = a/tan 25° - 55 mm
hx = a/tan 25° - 30 mm

Values according to ETA-21/0146

Type Description	F_{Rk} (kN)	α (°)	γ_{Mc} (Faktor)	V_{Rd} (kN)	V (kN)
Typ A	19,4	25	1,5	11,7	8,7
Typ B	25,0	25	1,5	15,1	11,2
Typ C	35,6	25	1,5	21,5	15,9
Typ D	52,6	25	1,5	31,7	23,5
Typ E	85,8	25	1,5	51,8	38,4

Other load ranges on request

PA2 Upper part for panel bracket

One point triangle upper part

Two point triangle upper part

Daniela upper part

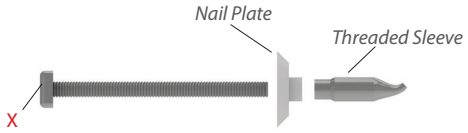
Stirrup upper part

PA2 Lower part / assembly part for panel bracket

Lower Part Into Concrete

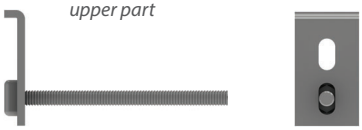
Joint

PA-DS Spacer bolts



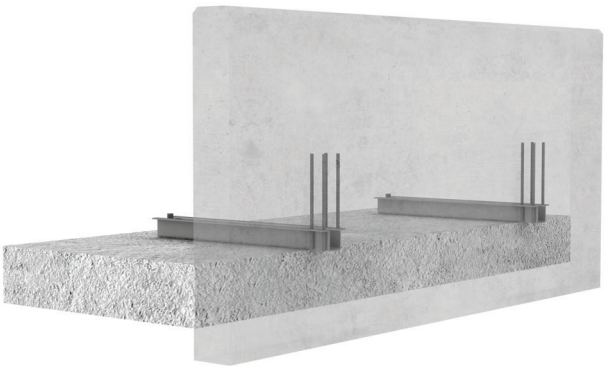
PA-BR Bolt Restraints

One point stirrup upper part



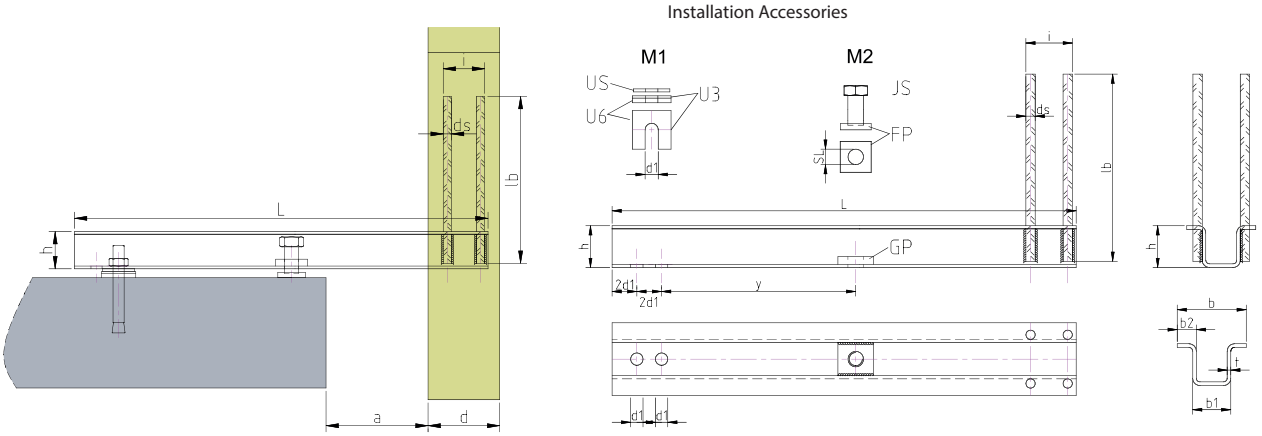
To complete the precast panel support system, HAZ offers the design and manufacture of BA parapet brackets. These brackets are used for the safe and easy support of parapet prefabricated components on to the supporting structure.

Prefabricated concrete parapet panels are attached to the load bearing subframe with BA parapet brackets, which are specially designed for the secure support of these heavy components. To achieve even load distribution, two parapet brackets are used to install each panel. These brackets are partially casted in to the compotent where there is reinforcement with rebars to achieve higher load capacity. The parapet brackets are attached to the supporting structure either with anchor channels or anchor bolts.



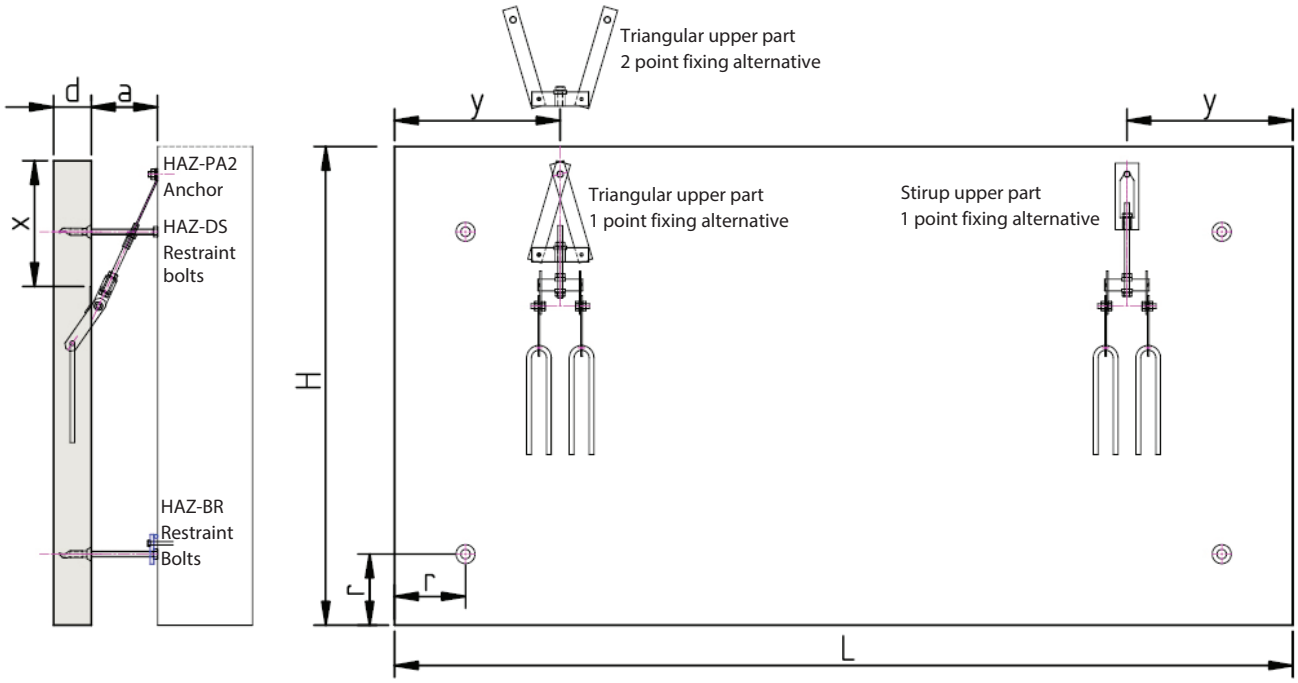
BA Parapet bracket

Installation Accessories



PA2 Anchor Design Principles

PA Anchorbracket - System

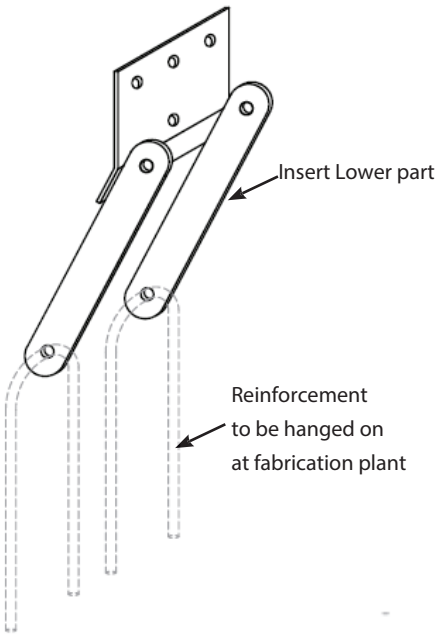


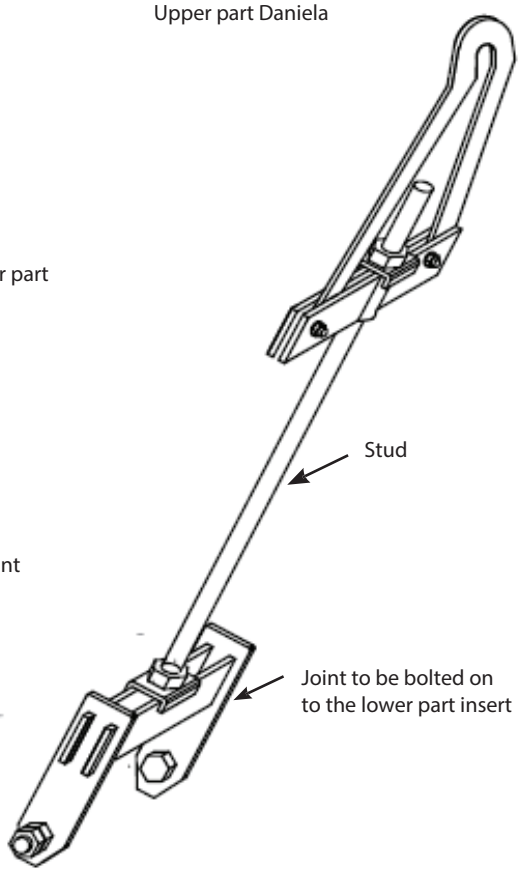
PA2 Lower part insert

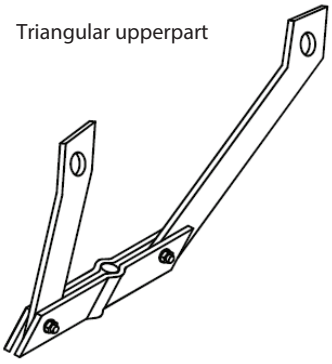
The Lower part insert is to be placed in the concrete panel during production at the prefabrication plant

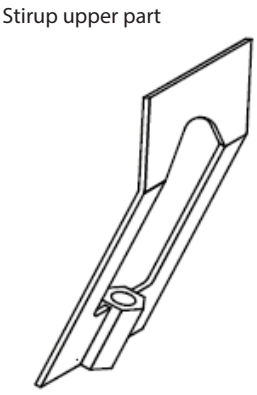
PA2-Fixing part: Upper part - stud - Joint

Three part Fixing Elements to be assembled at site during installation







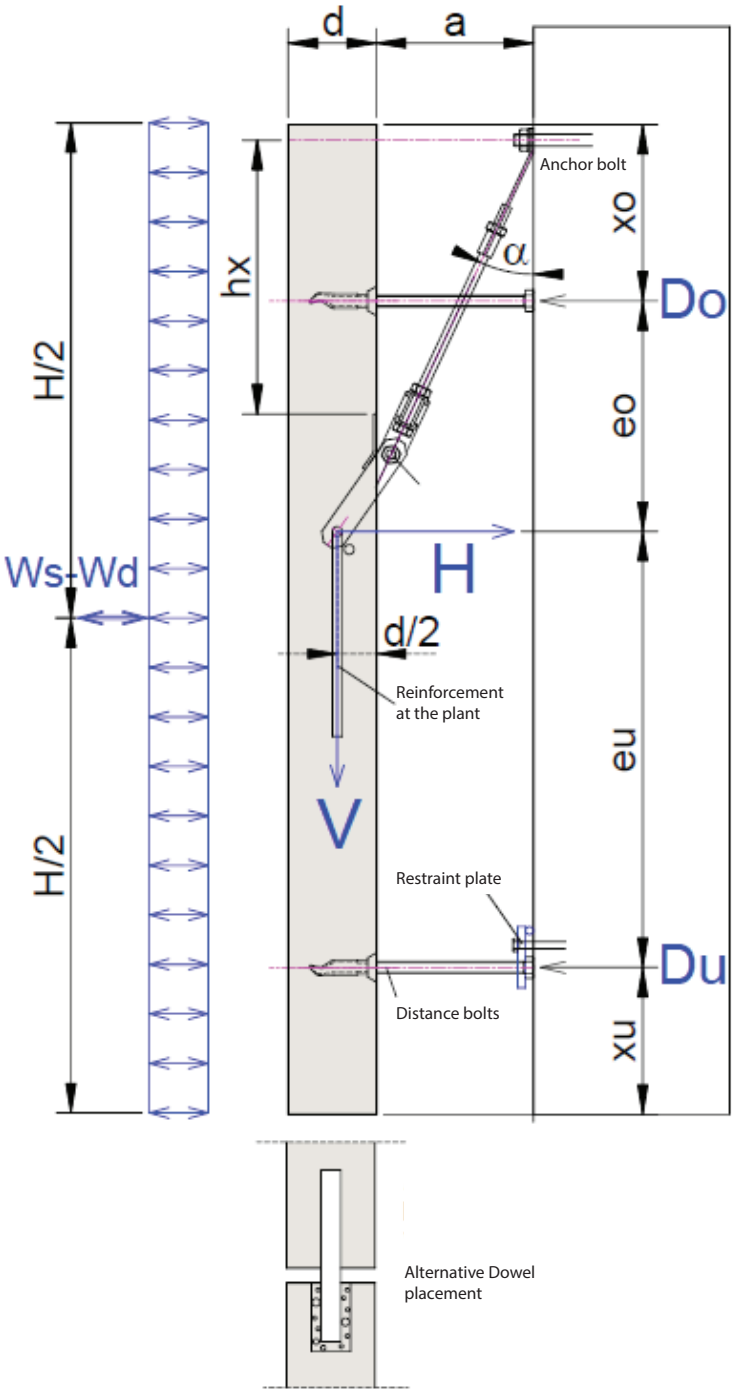


HAZ Panel Anchor PA2, System and Dimensioning

As a rule, two precast panel brackets are arranged as symmetrically as possible per concrete panel. For narrow slabs, one panel bracket usually suffices.

The pressure screws serve as spacers. If the façade slabs are arranged one above the other, the lower pressure screws are usually replaced by thorns (pincers).

When the wind suction forces are applied, the pressure screws must be held horizontally by suction cups.



Loading
H = Height of panel
L = Length of panel
d = Thickness of panel

Panel Bracket PA2:

$V_d = g_G * G + g_{G,} * Z$
$H_d = Vd * \tan a$
$R_{,d} = \text{root} \quad (V_d^2 + H_d^2)$

Pressure bolts for Hd:
$Do_{g,d} = Hd * eu / (eo + eu)$
$Du_{g,d} = Hd * eo / (eo + eu)$

Pressure bolts for Wind load:
$Wd_{,d}$ = wind pressure per bracket
$Ws_{,d}$ = windsuction per bracket

for symmetrical bracket positioning
$Wd_{,d} = g_G * Wd * L * H / 2$
$Ws_{,d} = g_G * Ws * L * H / 2$

max $Dow_{,d} = Wd_{,d} * (H/2-xu) / (eo+eu)$
max $Duw_{,d} = Wd_{,d} * (H/2-xo) / (eo+eu)$

min $Dow_{,d} = Ws_{,d} * (H/2-xu) / (eo+eu)$
min $Duw_{,d} = Ws_{,d} * (H/2-xo) / (eo+eu)$

Wind suction for Do
Case Do $_{g,d}$ - abs(min $Do_{w,d}$) < 1,0

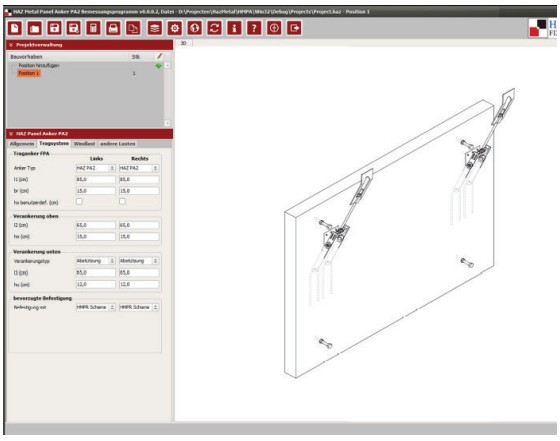
Wind suction for Du
Case Du $_{g,d}$ - abs(min $Du_{w,d}$) < 1,0

Effects:
V = Vertical load from dead load
z.B: V = L * H * d * g(concrete volume) * 1/2
for symmetrical bracket positioning
L = Length of panel
H = Height of panel
A load or an additional load
may have to be considered

Wd = Wind pressure per bracket
Ws = Wind suction per bracket

Partial safety factors:
g_G= 1,35 (Static load)
g_Q= 1,50 (Windload)

Please download or inquire design software from:
www.hazmetal.com

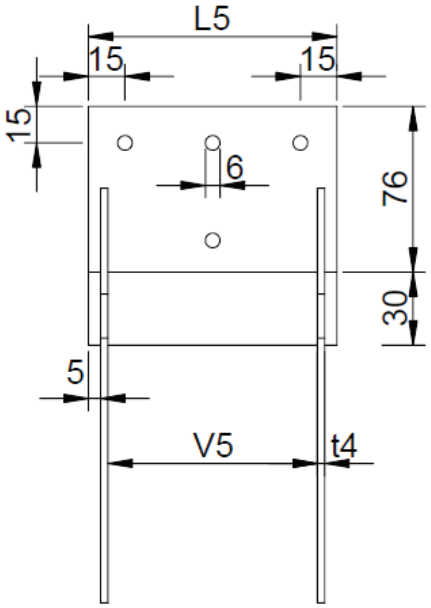


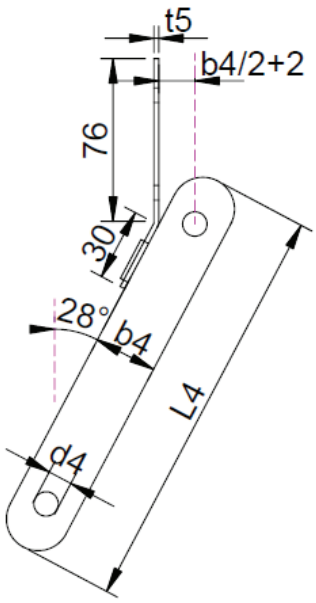
PA2 Panel Anchor Technical Details & Dimensioning

Load range, minimum edge distances, minimum plate thickness						
Load capacity (kN)	Fv,d (kN)	Threaded Rod	Min d (mm)	Min y (mm)	Min x (mm)	Min r (mm)
6,0	8,10	M8	80	100	20	80
9,0	12,15	M10	80	110	20	90
13,0	17,55	M12	90	120	20	100
18,0	24,30	M12	90	130	20	110
25,0	33,75	M16	100	140	20	120
35,0	47,25	M20	100	150	20	130
45,0	60,75	M24	120	180	20	150

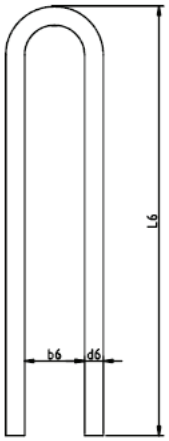
Other load capacities available upon request

Dimensions for mounting part and supplementary reinforcement





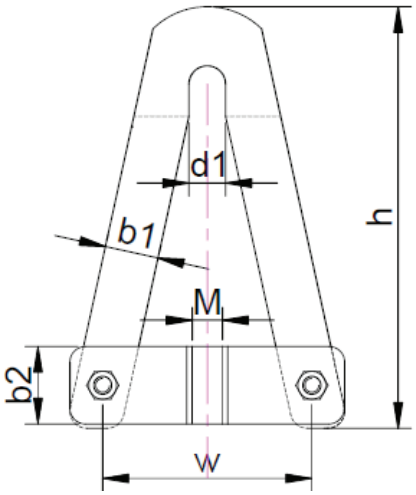
Steel reinforcing bar
strength grade B500B



The length of the supplementary reinforcement can be reduced by a factor of 0.7 if the push-on hanger is formed with an angle hook.

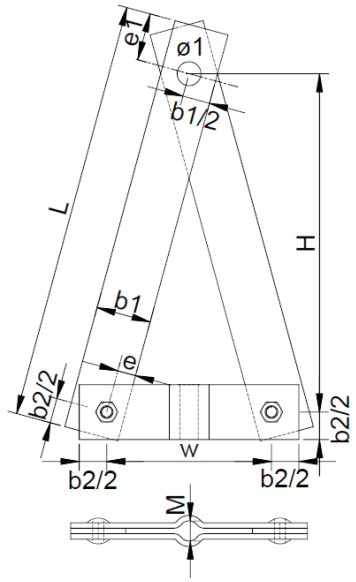
Load capacity (kN)	b4 (mm)	t4 (mm)	d4 (mm)	L4 (mm)	v4 (mm)	L5 (mm)	t5 (mm)	d6 (mm)	b6 (mm)	L6 (mm)
6,0	26	3	11	157	86,5	103	3	6	24	250
9,0	26	3	11	168	86,5	103	3	6	24	250
13,0	26	4	11	178	88,5	107	3	8	32	250
18,0	32	4	11	206	88,5	107	3	8	32	300
25,0	34	4	11	230	92,5	111	3	10	40	350
35,0	40	5	13	276	96,5	117	3	12	48	350
45,0	40	6	13	291	98,5	121	4	12	48	400

Daniela type Upper part Dimensions



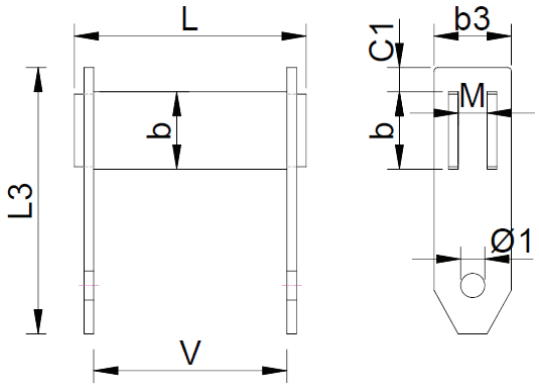
Load capacity	h	b1	b2	d1	w	M
(kN)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
6,0	163	21	31	16	82	10 (8)
9,0	163	21	31	16	82	10
13,0	163	21	31	16	82	10
18,0	190	25	40	17	93	12
25,0	206	28	42	21	100	16
35,0	228	36	55	24	118	20
45,0	228	36	55	24	118	20

Triangular type Upper part Dimensions



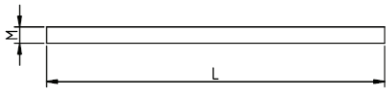
Load capacity	H	b1	Ø1	b2	e1	w	M
(kN)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
6,0	180	24	13	23	26	90	8
9,0	180	26	13	28	26	90	10
13,0	180	32	13	32	32	90	10
18,0	184	36	17	38	32	92	12
25,0	188	36	17	40	36	94	16
35,0	200	36	17	40	36	100	20
45,0	200	40	17	50	38	100	20

Joint type Upper part Dimensions



Load capacity	L	b	V	L3	b3	Ø1	C1	M
(kN)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
6,0	92	28	80	88	26	10,5	8	8
9,0	92	28	80	96	26	10,5	8	10
13,0	96	30	80	100	26	10,5	10	10
18,0	96	32	80	110	32	10,5	10	12
25,0	104	34	84	131	34	10,5	13	16
35,0	106	42	86	159	40	12,5	13	20
45,0	106	48	86	167	40	12,5	15	20

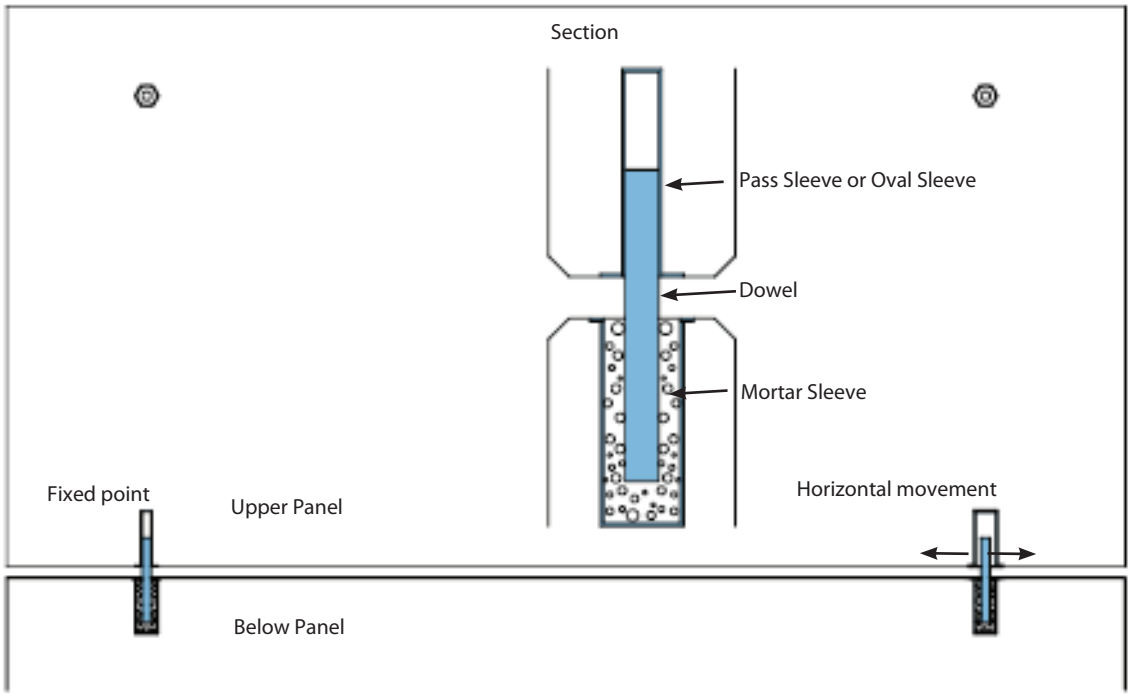
Threaded Rod Dimensions



Projection (mm)	100	150	200	250	300	350	400
L (mm)	120	235	350	465	580	690	800

Dowel Design & Technical Details

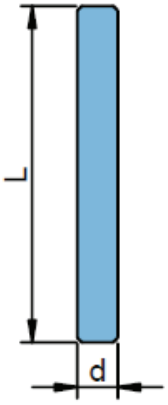
HAZ Panel bracket PA2, Arrangement of pins



Dowel

Dowel code	L (mm)	d (mm)	Load Range (kN)
Dowel 16x160	160	16	2,5
Dowel 20x160	160	20	5,0

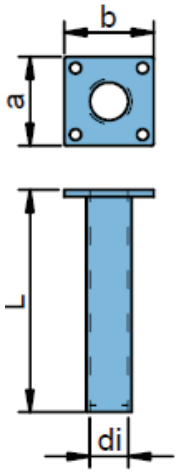
For thin plates, an edge reinforcement may be required. Please use the rated program HAZ-PA or contact us.



Pass Sleeve

Pass Sleeve Code	L (mm)	d (mm)
Pass-17	100	17
Pass-21	100	21

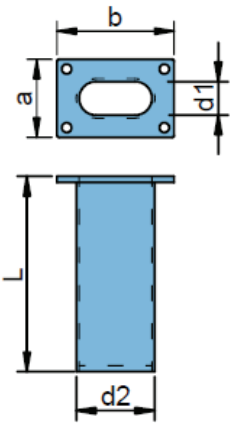
a x b = 40 x 60 mm



Oval Sleeve

Oval Sleeve Code	L (mm)	d1 (mm)	d2 (mm)
Ova-17	100	17	40
Ova-21	100	21	40

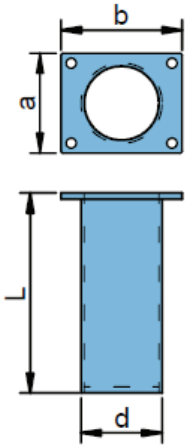
Ova-17: a x b = 40 x 60 mm
Ova-21: a x b = 44 x 60 mm



Mortar Sleeve

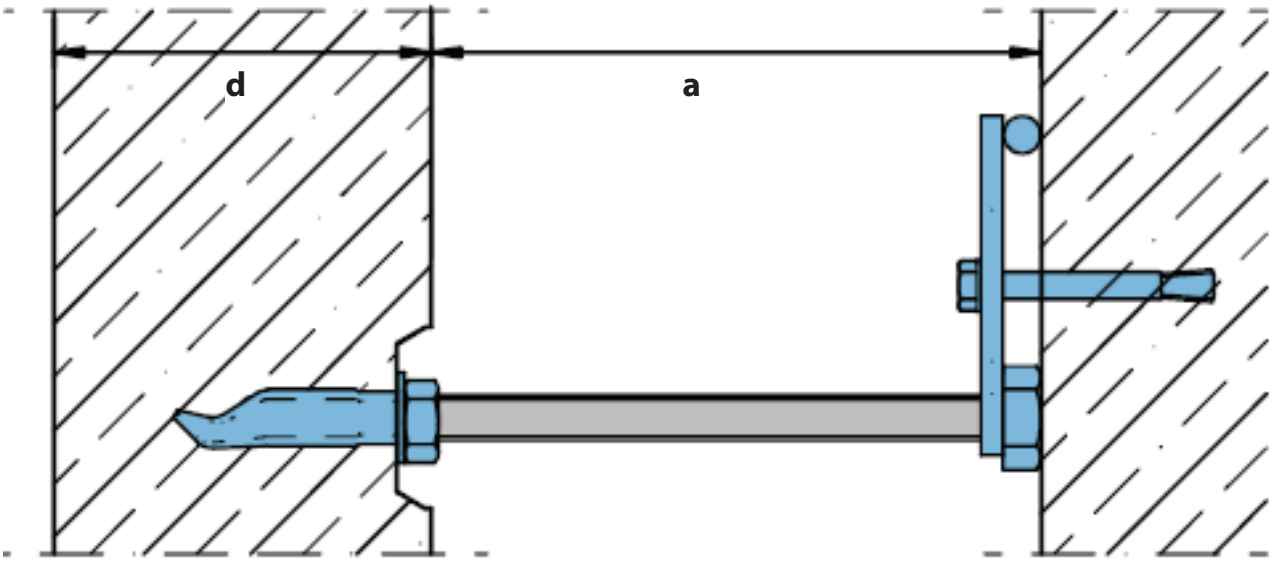
Mortar	L (mm)	d (mm)
Moh-40	100	40

a x b = 50 x 60 mm

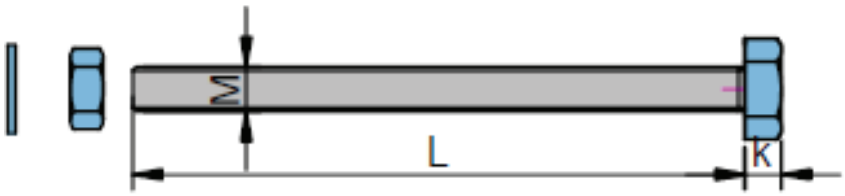


Restraint Brackets Technical Details

System for pressure screws with threaded sleeves and Restraint brackets



Pressure screws DS1 with nut and washer DIN 9021



Code DS1-M12	k mm
DS1-M12x1110	7
DS1-M12x130	7
DS1-M12x150	7
DS1-M12x170	7
DS1-M12x190	7
DS1-M12x230	7
DS1-M12x250	7

Code DS1-M16	k mm
DS-1M16x1115	10
DS1-M16x155	10
DS1-M16x195	10
DS1-M16x255	10
DS1-M16x315	10
DS1-M16x395	10
DS1-M16x435	10

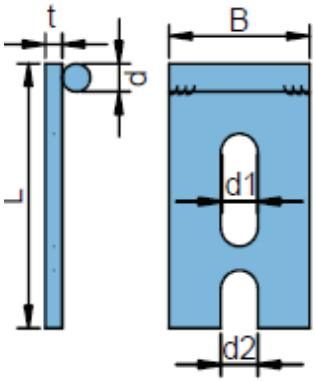
Code DS1-M20	k mm
DS1-M20x120	24
DS1M20x160	24
DS1-M20x200	24
DS1-M20x260	24
DS1-M20x300	24
DS1-M20x360	24
DS1-M20x440	24

Threaded Sleeve

Code	M mm
GH-M12x60	M12
GH-M12x80	M12
GH-M12x100	M12
GH-M16x70	M16
GH-M16x80	M16
GH-M16x100	M16
GH-M20x100	M20

Restraint Bracket PA2-BR

Restraint Code	L	B mm	t mm	d mm	d1 mm	d2 mm
BR-M12	134	50	6	7	11	13
BR-BA-M12	152	55	6	8	13	17
BR-BA-M12	180	75	6	10	13	21

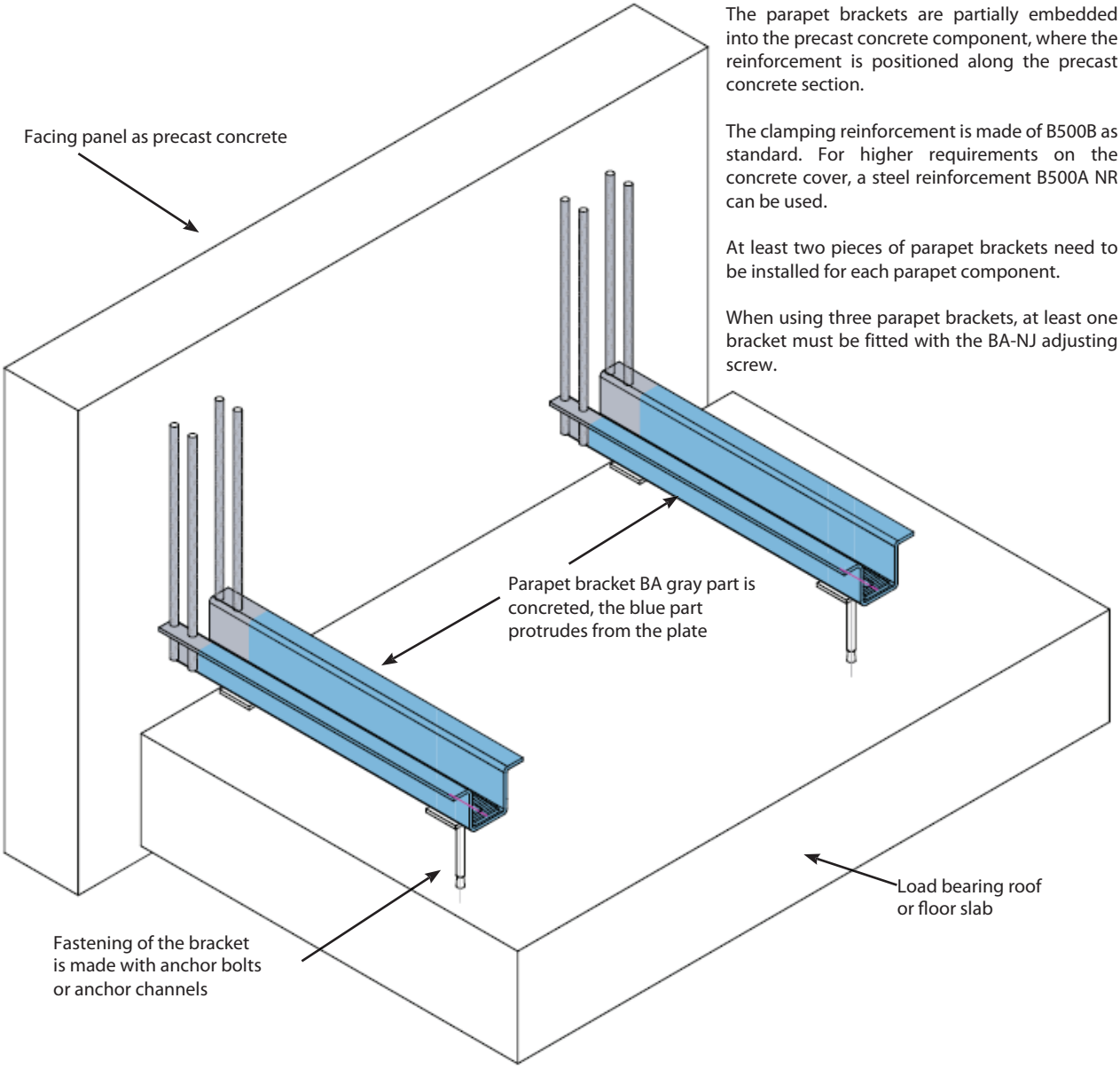


Nail cap

Code
NT-M12
NT-M16
NT-M20

Material: Plastic

HAZ Parapet Bracket Type BA - Design Principles



The parapet brackets are partially embedded into the precast concrete component, where the reinforcement is positioned along the precast concrete section.

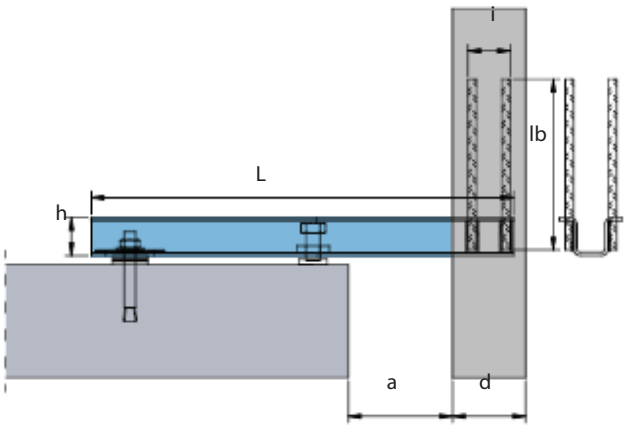
The clamping reinforcement is made of B500B as standard. For higher requirements on the concrete cover, a steel reinforcement B500A NR can be used.

At least two pieces of parapet brackets need to be installed for each parapet component.

When using three parapet brackets, at least one bracket must be fitted with the BA-NJ adjusting screw.

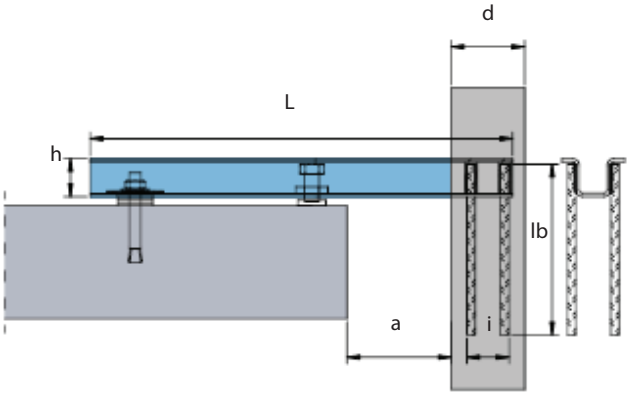
HAZ Parapet Bracket Type BA-NJ

NJ = Standard version with adjusting screw
NO = Standard version without adjustment



HAZ Parapet Bracket Type BA-AJ

AJ = Attic design with adjusting screw
AO = Attic execution without adjustment



HAZ BA Parapet Bracket Technical Details & Dimensioning

Dimensioning of the parapet brackets BA (see also HAZ calculation program PA)

$V_{z,d} = g_G*G+g_G*V$

$N_d = g_Q*H+g_Q*W$

$M_{y,d} = g_G*G*(d/2+a+50)$

$+ g_G*V*(d/2+a+50+a_1)$

$+ g_Q*H*h_1$

$+ g_Q*W*e_w$

$Z_d = M_{y,d} / y$

$y = z-a-50-60$

$z = L-te$

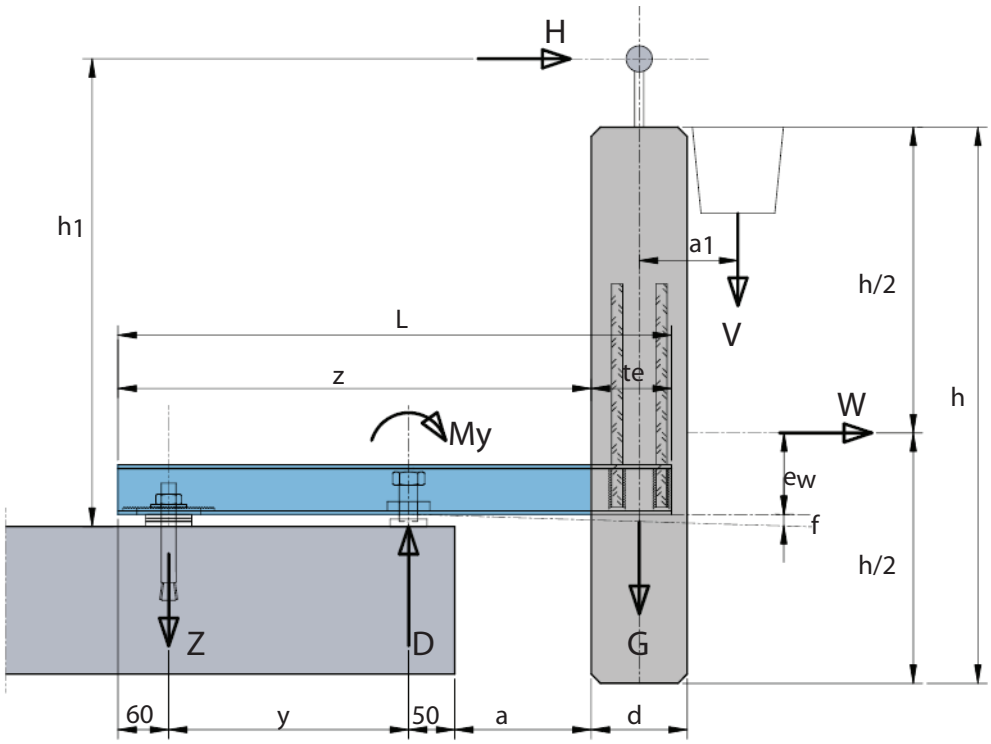
$D_d = Z_d + V_{z,d}$

$f = My*ab*(Li+a/2)/(3*E*Iy)$

$ab = d/2+a+50$ (mm)

$Li = z-60+d/2$

$E = 200.000$ (N/mm²)



Load actions, safety factors

Load actions:
G= Dead Load
V = Vertical loads (exp. tray,balustrade)
H = Horizontal loads (dynamic load +/-)
W = Windload
f = deflection

Partial safety factors:

g_G= 1,35 (Static load)
g_Q= 1,50 (dynamic load, wind)

Dimensioning:

Myd / My,Rd + Nd / NRd + Vd / VR < 1,0

To choose thet correct anchoring type please download the product calculation software from website www.hazmetal.com

Cross sections

Pos	Dim	BA1	BA2	BA3	BA4	BA5	BA6
A	cm²	4,45	5,00	7,35	9,43	11,96	14,36
Wy,pl	mm³	6,59	8,18	13,35	21,52	28,25	40,74
Iy	mm⁴	11,79	16,12	29,23	58,79	80,44	139,16

Material properties

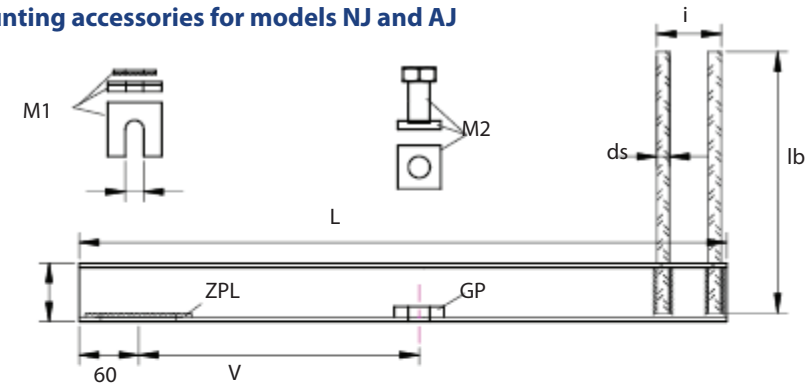
Pos	Dim	BA1	BA2	BA3	BA4	BA5	BA6
f_{yk}	N/mm²	400	400	400	400	400	400
f_{yk}/ (3^0,5)	N/mm²	230	230	230	230	230	230
gM	-	1,1	1,1	1,1	1,1	1,1	1,1

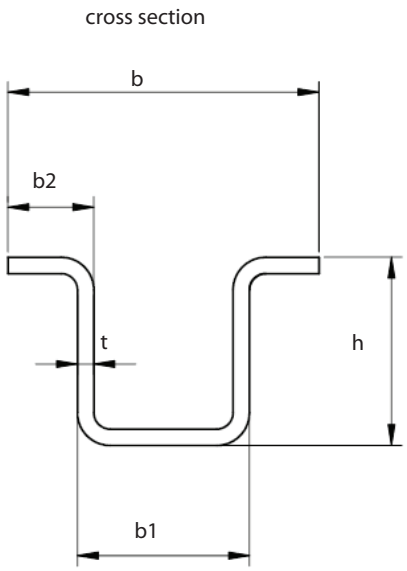
Load capacity

Pos	Dim	BA1	BA2	BA3	BA4	BA5	BA6
N_{Rd}	kN	161	181	267	342	434	522
$My,_{Rd}$	kNcm	220	273	445	717	950	1358
VRd	kN	40	45	63	83	104	131

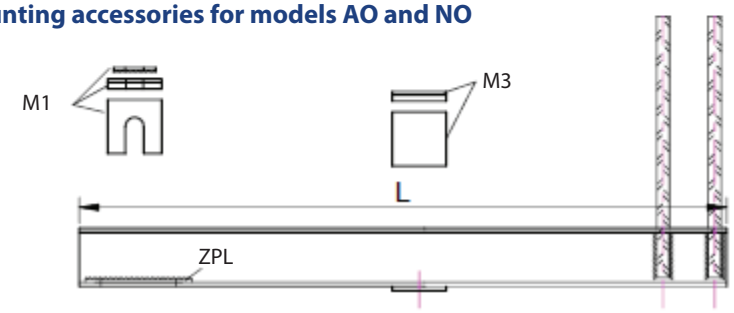
Installation accessories and profile cross section

Mounting accessories for models NJ and AJ





Mounting accessories for models AO and NO



Dimensioning for HAZ BA Parapet Bracket

Part	Pos	BA1	BA2	BA3	BA4	BA5	BA6	Designation
Profile	b	74	84	94	122	122	144	Overall width
	b1	40	45	51	65	66	77	Bottom width
	h	44	48	54	66	70	83	Height
	b2	20	22,5	25,5	32,5	33	38,5	Bending width
	t	3	3	4	4	5	5	Thickness
	L	Variable						Length
	d1	13	17	17	17	21	21	Slot hole size
ZPL	a/b/t	111/30/4	111/35/4	111/35/4	111/35/4	111/45/5	111/45/5	Toothed plate for slot
GP	a/b/t	40/33/12	40/38/12	60/42/12	60/56/12	60/55/15	60/66/15	Locking nut
	M	M16	M16	M20	M24	M27	M27	Metric size
Rebar	ds	10	10	12	14	14	16	Rebar B500B
	lb	350	400	440	500	520	600	Rebar B500B
	i	40	40	50	60	70	75	Spacing i
M1	ZP	30/30/4	35/35/4	35/35/4	35/35/4	45/45/4	45/45/4	Toothed channel with slot
	UL3	35/35/3	35/35/3	50/50/3	50/50/3	50/50/3	60/60/3	2x U-Plate with open slot
	UL5	35/35/5	35/35/5	50/50/5	50/50/3	50/50/3	60/60/5	U-Plate with open slot
M2	JS	M16x60	M16x60	M20x60	M24x60	M27x80	M27x80	Adjustable screw
	FP	40/40/6	40/40/6	40/40/6	40/40/6	60/60/10	60/60/10	Base plate
M3	U3	35/35/3	35/35/3	50/50/3	50/50/3	50/50/3	60/60/3	2 pcs shims
	U5	35/35/5	35/35/5	50/50/5	50/50/3	50/50/3	60/60/5	Shims

HWT Wall Ties Technical Details

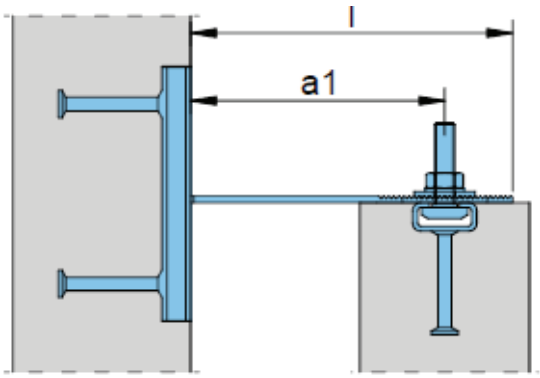
HAZ Wall Ties Type HWT

Type HWT
flat tie with hook end
and toothed serration
with serrated waster

Typ HWT-U
U formed tie with welded t head bolt
with not and washer. Tie has toothed
serrations with serrated waster

Type HWT-B
flat tie with hook end with welded t
head bolt. Toothed serrations with
corresponding serrated washer

System - Dimensioning
F = Tensile load capacity
F_{Rd} = Tensile Design load
LL = Slot hole size



HWT Wall Ties Standard Product Range - special design is made upon request

Product code HWT	a1 mm	L mm	LL mm
HWT - 28 - 50	50	90	11x55
HWT - 28 - 75	75	115	11x55
HWT - 28 - 100	100	140	11x55
HWT - 28 - 125	125	165	11x55
HWT - 28 - 150	150	190	11x55
HWT - 28 - 175	175	215	11x55
HWT - 28 - 200	200	240	11x55
HWT - 28: F = 3,5 kN, F_{Rd} = 4,9 kN			
HWT - 38 - 75	75	115	13x55
HWT - 38 - 100	100	140	13x55
HWT - 38 - 125	125	165	13x55
HWT - 38 - 150	150	190	13x55
HWT - 38 - 175	175	215	13x55
HWT - 38 - 200	200	240	13x55
HWT - 38: F = 3,5 kN, F_{Rd} = 4,9 kN			

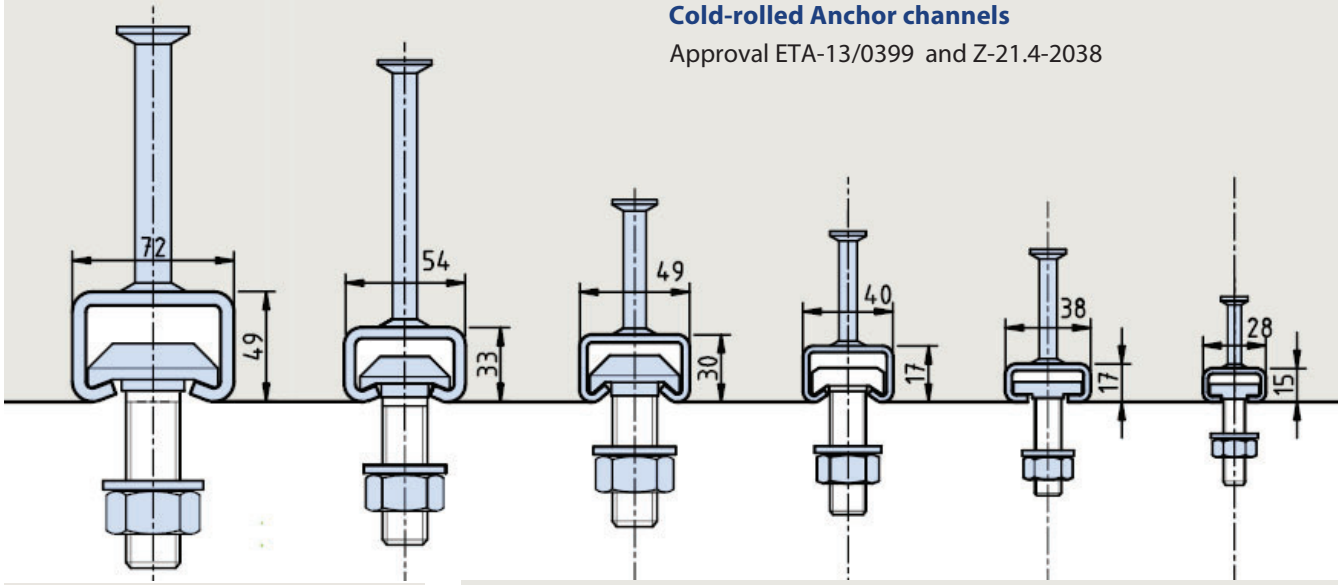
Product code HWT - B	a1 mm	L mm	LL mm
HWT - B- 28 - 75	75	115	11x55
HWT - B- 28 - 100	100	140	11x55
HWT - B- 28 - 125	125	165	11x55
HWT - B- 28 - 150	150	190	11x55
HWT - B- 28 - 175	175	215	11x55
HWT - B- 28 - 200	200	240	11x55
HWT - B- 28 - 225	225	265	11x55
HWT B - 28: F = 3,5 kN, F_{Rd} = 4,9 kN			
HWT - B- 38 - 100	100	140	13x55
HWT - B- 38 - 125	125	165	13x55
HWT - B- 38 - 150	150	190	13x55
HWT - B- 38 - 175	175	215	13x55
HWT - B- 38 - 200	200	240	13x55
HWT - B- 38 - 225	225	265	13x55
HWT - B- 38: F = 7,0 kN, F_{Rd} = 9,8 kN			

Product code HWT - U	a1 mm	L mm	LL mm
HWT - U- 38 - 125	125	165	13x60
HWT - U- 38 - 150	150	190	13x60
HWT - U- 38 - 175	175	215	13x60
HWT - U- 38 - 200	200	240	13x60
HWT - U- 38 - 225	225	265	13x60
HWT - U- 38 - 250	250	290	13x60
HWT - U- 38 - 275	275	315	13x60
HWT - U - 38: F = 7,0 kN, F_{Rd} = 9,8 kN			
HWT - U- 49 - 175	175	220	17x60
HWT - U- 49 - 200	200	245	17x60
HWT - U- 49 - 225	225	270	17x60
HWT - U- 49 - 250	250	295	17x60
HWT - U- 49 - 275	275	320	17x60
HWT - U- 49 - 300	300	345	17x60
HWT - U- 49: F = 12,0 kN, F_{Rd} = 16,2kN			

HMPR Anchor Channels Product Range

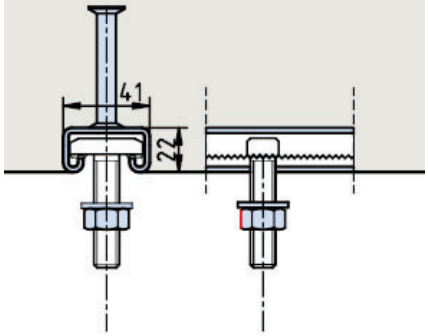
Cold-rolled Anchor channels

Approval ETA-13/0399 and Z-21.4-2038



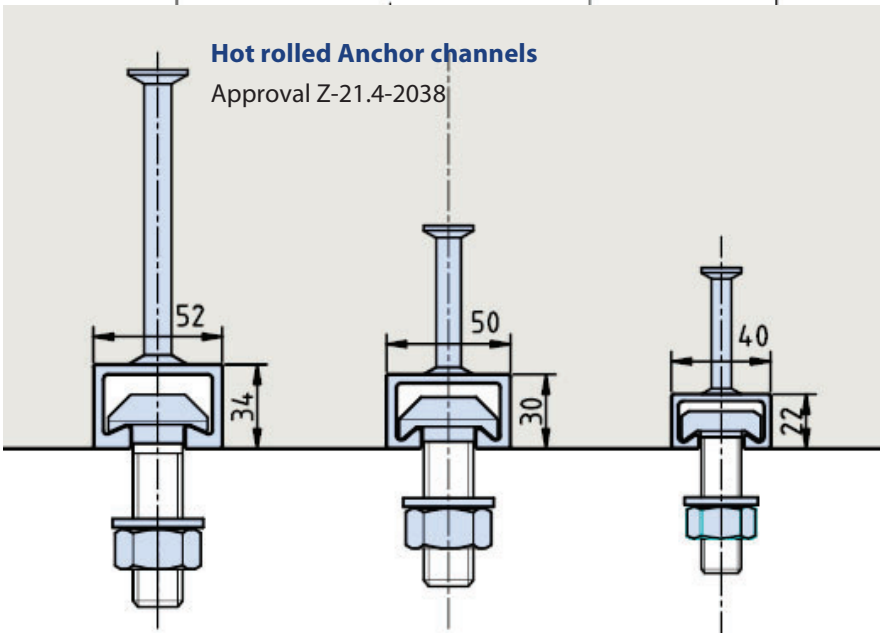
Toothed Anchor Channels

Approval Z-21.4-1921

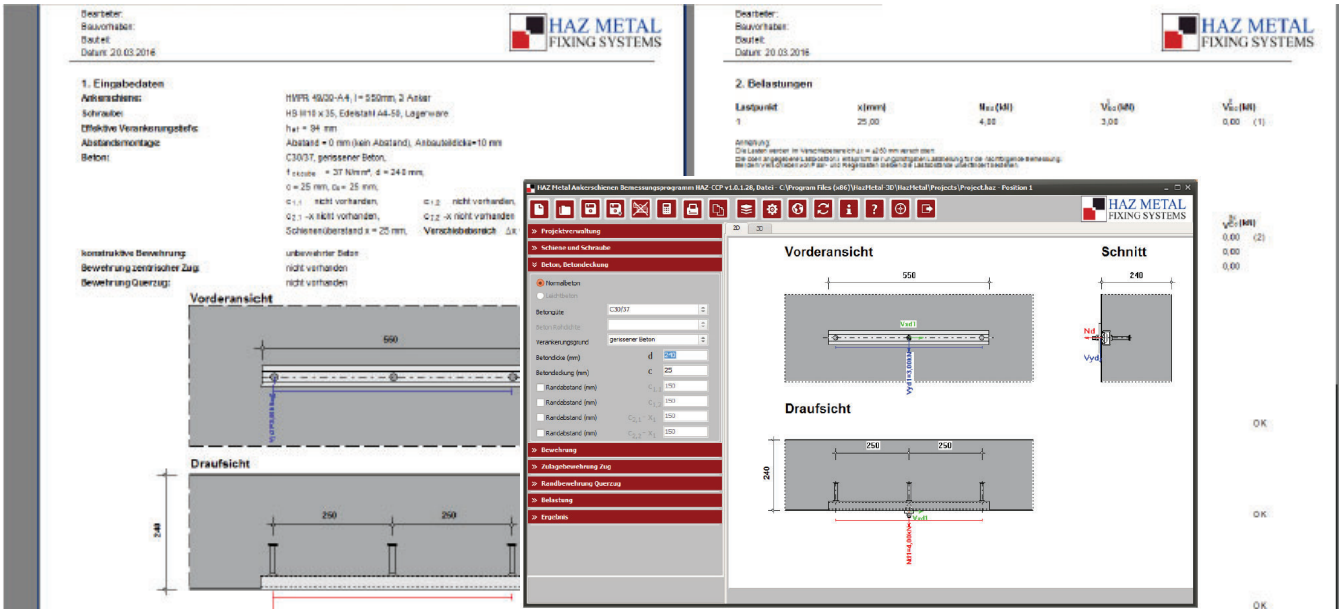


Hot rolled Anchor channels

Approval Z-21.4-2038



HAZ Product calculation program

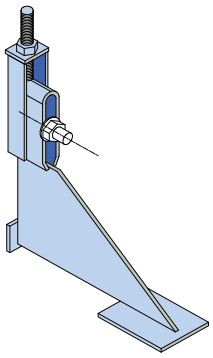


FIX Brackets Product Range

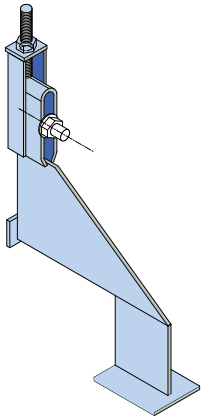
FIX Single Brackets

FIX brackets are available to accomodate wall projections of up to 350 mm with load capacities of 3,5 - 7,00 and 10,5 kN. All products are available in stainless steel 1.4301 & 1.4401. In special cases, use of duplex stainless is also available. Bespoke design production is made to fullfil special requirements .

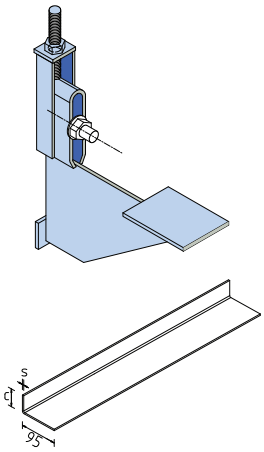
Type Fix-U



Type Fix-UV



Type Fix-UT



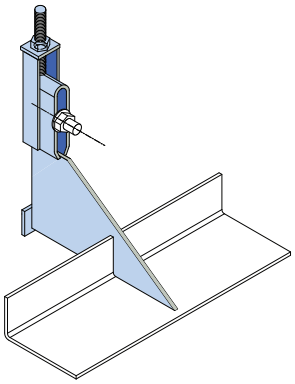
Angles

The brackets can be arranged at a spacing distance of 25 cm, at this distance each end parts of the bricks are placed on the bearing plate. For intermediate brackets where larger spacing distances are utilized, for example at 50 or 75 cm, intermediate angles are required which support the bricks during the wall mounting. The intermediate angles must also be supported before installation if a deflection of the intermediate angles is to be avoided. After the mortar has cured the intermediate angles are no longer stressed and the supports can be released.

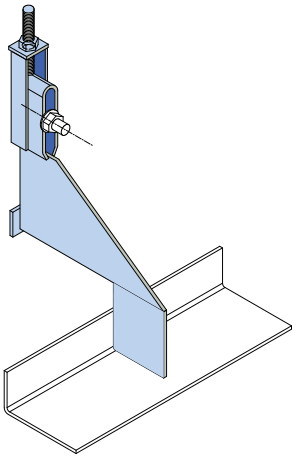
Bracket spacing (mm)	Angle - length L (mm)	c (mm)	s (mm)
500	480	30	2
750	730	30	3
1000	980	40	4

Single Brackets

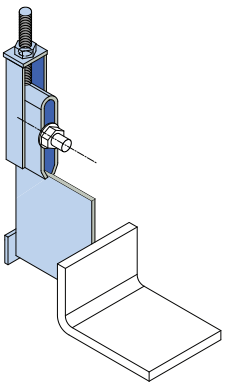
Type Fix-P



Type Fix-PV



Type Fix-W

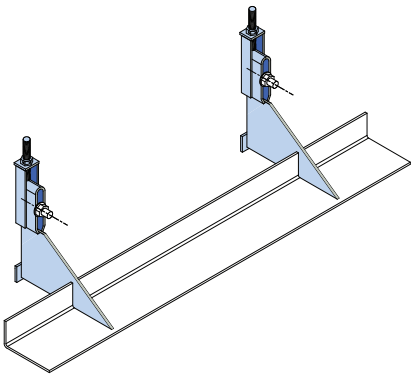


The single bracket type P with short angles as supports for the brick walls are preferably used in the edge area and corner area. The brick stands with its weight center point on the angle without tilting sideways.

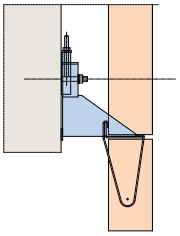
Type W are available for load capacity of 3,5 und 7,0 kN

Continuous Supports Angles

Type Fix-F



Angle brackets can also be designed as invisible brackets with the help of hook loops



Approvals & Inspection reports

CE
NB1109, SAC21

Haz Metal Deutschland GmbH
Leonhard-Karl-Straße 29
97877 Wertheim

15
1109-CPR-2043

EN 845-1
FIX-Konsolanker
FIX-U- / FIX-S-

Typen: Tragfähigkeiten:
3,5 3500 N
7,0 7000 N
10,5 10500 N

Durchbiegung:
< 2mm bei 1/3 der Tragfähigkeit
Dauerhaftigkeit:
Kurzzeichen für Material: 1.4571
Gefährliche Substanzen:
Leistungsmerkmal nicht bestimmt

CE
NB1109, SAC21

Haz Metal Deutschland GmbH
Leonhard-Karl-Straße 29
97877 Wertheim

13
1109-BPR-0096

ETA-13/0399

Haz Metal

Ankerschienen HMPR

Schrauben HS

CE
NB2306

Haz Metal Deutschland GmbH
Leonhard-Karl-Straße 29
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15
2306-CPR-1090-100462.
HWKR.2014.001

EN 1090-1: 2009+A1:2011

Haz Metal

Tragende Bauteile und Bausätze für Stahltragwerke bis EXC2 nach EN 1090-2

HMPR-Ankerschienen

Haz Metal Deutschland GmbH
Z-21.4-2038
Prüf-, Überwachungs- und Zertifizierstelle
IFBT
SAC21
NB1109

HMPR-Anker-Zahnschiene

Haz Metal Deutschland GmbH
Z-21.4-1962
Prüf-, Überwachungs- und Zertifizierstelle
IFBT
SAC21
NB1109

HAZ-TU

Haz Metal Deutschland GmbH
Z-21.4-1921
Prüf-, Überwachungs- und Zertifizierstelle
IFBT
SAC21
NB1109

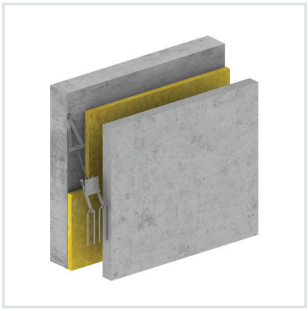
HAZ Metal Product range offers a wide range of products and fixing system solutions for facade claddings. HAZ Design department designs and propose to most suitable fixing system for the project requirement. Bespoke system solutions for special applications can also be designed upon request.

This catalog includes the standardized products for the precast panel support systems. Additional types and sizes of products are available to offer.

More detailed information can be sent upon request. For further information about our company and products, please visit www.hazmetal.com.

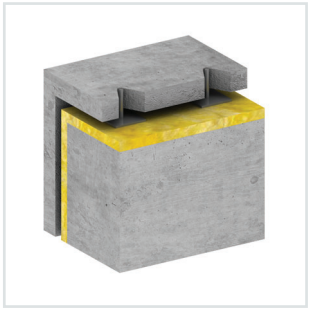
Panel Fixing Systems Brochure is downloadable at www.hazmetal.com

PA2
Panel Anchor



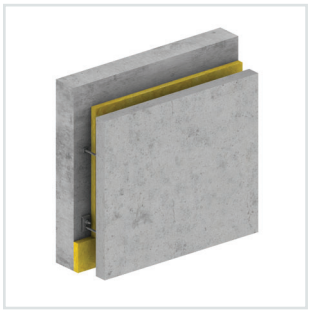
- Fully adjustable panel support system
- Load capacity from 6 to 45 kN
- Available in various types to accomodate fixing method to structure

DW
Top Fixing Dowels



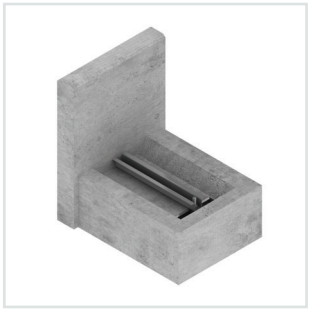
- Available for loads up to 35 kN
- Suitable for cavities of up to 80 mm
- Supplied with plastic sleeves

BR & DS
Restraint bolts



- Restraining bolts to accomodate the support anchors
- Up to 240 mm cavity sizes
- Supplied with ISO pressure plates

BA
Parapet Bracket



- Custom designed to suit large range of paraphet components
- Wall thicknesses of up to 200 mm
- Suplied with B500 grade rebar

Application pictures for FIX-PA panel brackets

WiFi St. Pölten, Austria

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Version: 01.25