

3 APPLICATION OVERVIEW

A. CURTAIN WALL

a. Fabrication

iii. Screwing and fixing frame panels

Framing components of the Curtain Wall unitized system must be assembled into unit frame. Commonly used tools are pneumatic or cordless drill drives.



Characteristics

SFC-22A



Product description	Compact cordless drill driver
Technology	Battery Li-Ion 22V
Number of gears	2
Necessary accessory	S-BS (S) standard bit set Battery charger C 4/36 Li-Ion 230V Battery pack B 22/2.6 Li-Ion

3 APPLICATION OVERVIEW

A. CURTAIN WALL

b. On site

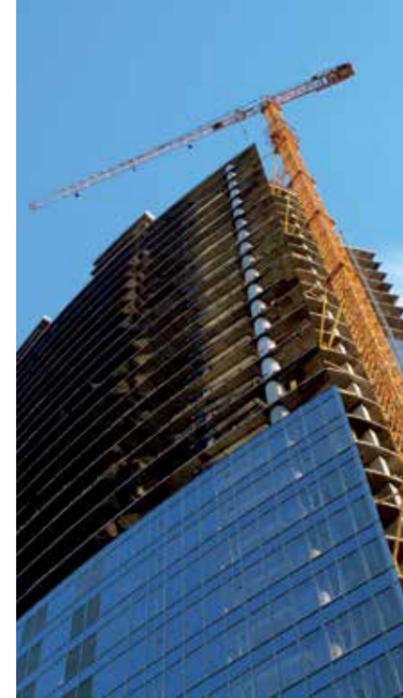
i. Fixing brackets for unitized systems

The shapes, styles and materials used in the construction of facades are becoming increasingly unconventional. Accordingly, the fastenings used to secure each section are frequently located in the heavily-reinforced edge zone of the supporting concrete structure. The demands placed on these fastenings in terms of their usability, loadbearing capacity and life expectancy are thus rising all the time.

Hilti offer a first-class product portfolio for the installation of curtain wall facades:

1. **Cast-in anchor channels** - the preferred solution for securing curtain wall facades
2. **Mechanical anchors** - optimized portfolio provides versatile, well-proven solutions for fastening all types of facades
3. **Chemical fast curing anchors** - safe and no hole cleaning solution with the HIT-Z anchor rod

All solutions are supported by state of the art Hilti PROFIS software - a complete family of compressive tools that help designers and specifiers get more done more efficiently.



1 Cast-in anchor channels

Since 2017 Hilti exclusively offers all three relevant production standards for Anchor Channel Profiles - TCRS (Temperature Controlled Roll Shaping), hot-rolled and cold-formed. Now you have the choice between three different Anchor Systems - depending on your applications.

All channels are ETA certified. Hilti also provides dedicated and tested solutions for e.g. corner, thin slab cases. Additionally, V-shape channels are approved for seismic, static and dynamic loads, as well as loads occurring in the event of fire.

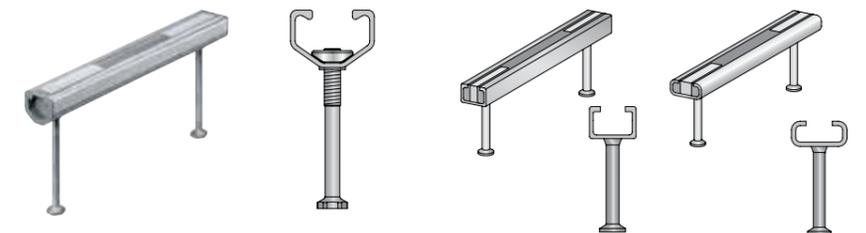


Characteristics

HAC

HAC-C

COMING 2018



Product description	Anchor channel V-shape	Anchor channel C-shape
Technology	Temperature Controlled Roll Shaping (TCRS)	Cold-formed Hot-rolled
Material	Hot-dip galvanized	Hot-dip galvanized Stainless steel A4
Necessary accessory	Torque controlled wrench for correct T-bolt fixation	
Other information	PROFIS Anchor Channel	

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i. Fixing brackets for unitized systems



2 Mechanical anchors

Complex curtain wall designs often present planners with a major challenge – especially when time is at a premium. Planning and execution of the work thus sometimes run almost parallel. Changes to plans at short notice can make it impossible to use anchor channels on all areas of the structure. For these situations, Hilti offers a range of stud anchors that provides versatile, well-proven solutions for fastening facades – which also includes the Hilti HUS3 undercut anchor.

Characteristics

HUS3



Product description	Ultimate performance screw anchor
Material	Carbon steel Carbon steel with multilayer coating
Base material	Cracked (concrete) Non-cracked (concrete)
Load conditions	Tensile zone Seismic ETA- C1 Fire resistance
Installation conditions	Hammer drilled holes
Other information	ETA CE conformity PROFIS Anchor design DIBt approval Reusability / Adjustability

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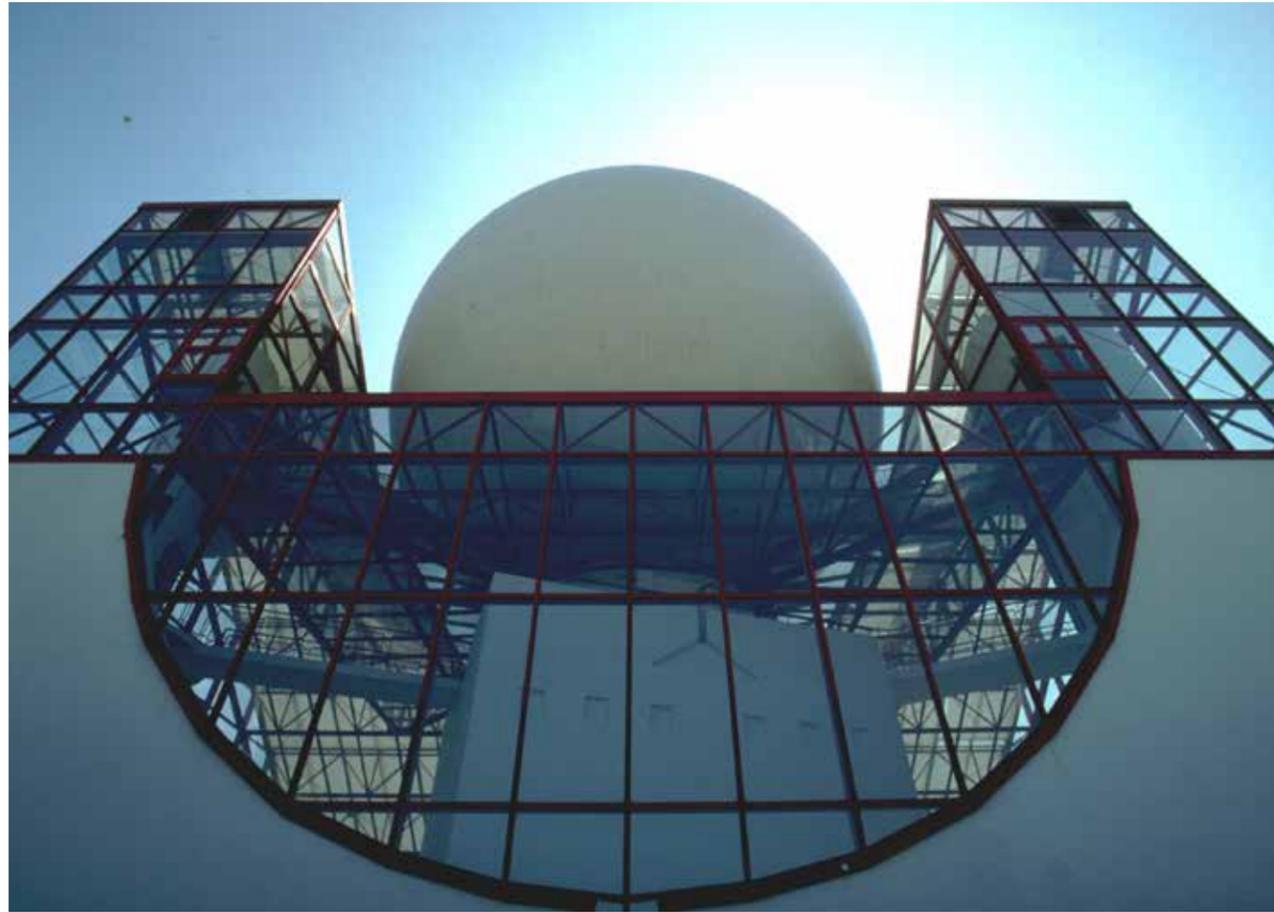


HUS3 SCREW ANCHOR - SETTING INSTRUCTIONS

Installation equipment

Anchor size	8	10	14
Type	HUS3	H, C	H, C, HF
Rotary hammer	TE 2 – TE 30	TE 2 – TE 30	TE 2 – TE 30
Drill bit for concrete, solid clay brick and solid sand-lime brick	CX 8	CX 10	CX 14
Drill bit for aerated concrete	CX 6	CX 8	-
Socket wrench insert	S-NSD 13 1/2	S-NSD 15 1/2	S-NSD 21 1/2
Torx	S-SY TX45	S-SY TX50	-
Tube for temporary application (only for H type)	HRG 8	HRG 10	HRG 14
Setting tool for concrete C12/15 to C50/60	SIW 22T-A		
Setting tool for solid brick and aerated concrete	SFH 22A		
Setting tool for hollow core slab	SIW 22 A		





Characteristics	HST3/2	HSA	HSV
Product description	Ultimate performance stud anchor	Standard stud anchor ETA approved	Standard stud anchor Material
Material	Carbon steel Stainless steel A4	Carbon steel Carbon steel hot deep galvanized Stainless steel A2 Stainless steel A4	Carbon steel
Base material	Cracked (concrete) Non-cracked (concrete)	Non-cracked (concrete)	Non-cracked (concrete)
Load conditions	Static/ quasi static Seismic ETA- C1/C2 Fire resistance	Fire resistance	
Installation conditions	Hammer drilled holes Diamond drilled holes Hollow drill bit holes	Hammer drilled holes Diamond drilled holes Hollow drill bit holes	Hammer drilled holes
Other information	Hammer ETA CE conformity PROFIS Anchor design FM approved	ETA CE conformity PROFIS Anchor design	

HST3 STUD ANCHOR - SETTING INSTRUCTIONS

Installation equipment

Anchor size	M8	M10	M12	M16	M20	M24
Rotary hammer		TE2(-A) – TE30(-A)			TE40 – TE70	
Diamond coring tool		DD-30W, DD-EC1				
Setting tool		Setting tool HS-SC				-
Hollow drill bit	-		TE-CD, TE-YD			
Other tools		hammer, torque wrench, blow out pump				

Setting instruction for M8

	HST3	HST3-R	HST3/-R BW	fix. 1	fix. 2
M8x75 -/10	✓	✓	✓	-	10
M8x95 -/30	✓	✓	-	-	30
M8x115 -/50	✓	✓	-	-	50

$h_{nom,2} = 54mm$
 $h_{min} \geq 80mm$

Setting instruction for M10

	HST3	HST3-R	HST3/ -R BW	h _{ax,1}	h _{ax,2}
M10x70 10/-	✓	✓	-	10	-
M10x80 20/-	✓	✓	-	20	-
M10x90 30/10	✓	✓	-	30	10
M10x100 40/20	✓	✓	✓	40	20
M10x110 50/30	✓	✓	-	50	30
M10x130 70/50	✓	✓	-	70	50
M10x160 100/80	✓	✓	-	100	80
M10x200 140/120	✓	-	-	140	120

Setting instruction for M16

	HST3	HST3-R	HST3/ -R BW	h _{ax,1}	h _{ax,2}
M16x115 15/-	✓	✓	-	15	-
M16x135 35/15	✓	✓	-	35	15
M16x145 45/25	✓	✓	✓	45	25
M16x170 70/50	✓	✓	-	70	50
M16x220 120/100	✓	✓	-	120	100
M16x260 160/140	✓	✓	-	160	140
M16x300 200/180	✓	✓	-	200	180
M16x360 260/240	✓	-	-	260	240
M16x420 320/300	✓	-	-	320	300
M16x470 370/350	✓	-	-	370	350

Setting instruction for M12

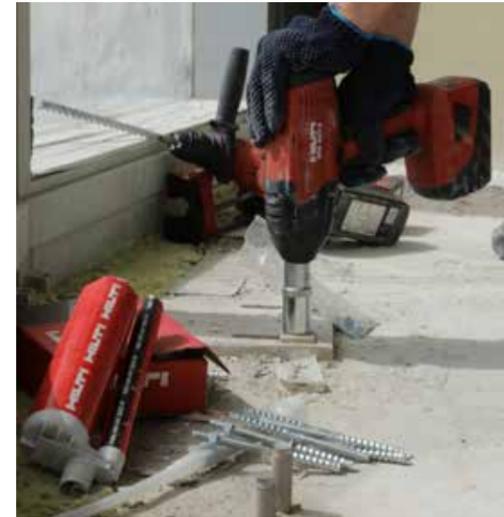
	HST3	HST3-R	HST3/ -R BW	h _{ax,1}	h _{ax,2}
M12x85 10/-	✓	✓	-	10	-
M12x95 20/-	✓	✓	-	20	-
M12x105 30/10	✓	✓	-	30	10
M12x115 40/20	✓	✓	✓	40	20
M12x125 50/30	✓	✓	-	50	30
M12x145 70/50	✓	✓	-	70	50
M12x165 90/70	✓	✓	-	90	70
M12x185 110/90	✓	✓	-	110	90
M12x215 140/120	✓	✓	-	140	120
M12x235 160/140	✓	-	-	160	140
M12x255 180/160	✓	-	-	180	160
M12x295 220/200	✓	-	-	220	200
M12x345 270/250	✓	-	-	270	250

HSA STUD ANCHOR - SETTING INSTRUCTIONS

Machine tightening of the anchor for standard installation torque

Type	HSA, HSA-BW, HSA-R2, HSA-R																	
	M6			M8			M10			M12			M16			M20		
Anchor Size	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Setting position	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Nominal anchorage depth h _{nom} [mm]	37	47	67	39	49	79	50	60	90	64	79	114	77	92	132	90	115	130
Standard installation torque T _{inst} [Nm]	-			15			25			50			80			-		
Setting tool	-			S-TB HSA M8			S-TB HSA M10			S-TB HSA M12			S-TB HSA M16			-		
Impact screw driver	-			Hilti SIW 14-A Hilti SIW 22-A									Hilti SIW 22T-A			-		
Speed	-			1			1			3			- ¹⁾			-		
Setting time t _{set} [sec.]	-			3			3			4			-			-		

¹⁾ The impact screw driver operates with a fixed speed.



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b. On site
i. Fixing brackets for unitized systems

3 Chemical fast curing anchors

Hilti provides an unique solution for façade brackets installation: HY 200 fast-curing adhesive with no cleaning required HIT-Z rod. This solution works in both cracked and non-cracked concrete.

The Hilti HIT-Z rod works as a torque-controlled bonded anchor. Because of their shape, rods are not affected by uncleaned holes.

Characteristics	HY 200	HIT-Z
		
Product description	Ultimate-performance hybrid mortar for heavy-duty anchoring	Ultimate performance anchor rod for injection
Material	Hybrid urethane methacrylate adhesive	Carbon steel Stainless steel A4 Multilayer coating
Base material	Cracked (concrete) Non-cracked (concrete)	
Load conditions	Tensile zone Fire resistance	
Installation conditions	Hammer drilled holes Diamond drilled holes	
Necessary accessories	HDE 500-A22 Cordless electric dispenser TE 7 Rotary hammer or TE 6-A36 cordless rotary hammer or TE 30-A36 cordless combi hammer TE-CX drill bits	

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ii. Fixing mullions brackets

Bracket fasteners are used to anchor substructures to load-bearing base material. The bracket fasteners must comply with national regulations or approval requirements and must meet the manufacturer's installation specifications. Where applicable, corrosion protection measures must be also implemented and the compatibility of materials considered.

The load-bearing capacity of the bracket fastener must also be verified by carrying out on-the-spot pull-out tests in accordance with equivalent test method.

Depending on the base material, the most common bracket fastening methods are:

1. **Anchor fastening** (mechanical or chemical) on brick, hollow block or concrete
2. **Screw fastening on steel**
3. **Direct fastening on concrete or steel**

1 Anchor fastening (mechanical or chemical) on brick, hollow block or concrete



Base material								Installation method		Special features		Corrosion protection			Approvals					
Uncracked concrete	Cracked concrete	Natural stone	Lightweight concrete	Solid brick	Airbrick	Hollowcore	Plasterboard	Through set installation	Pre-set installation	Small edge distance	Data available in PROFIS Anchor 2	Electroplated	Additional protection against corrosion	Stainless steel	Fire	Shock load	Sprinkler	European technical approval	Dynamic load	CE Marking
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Anchor applications / approvals

Anchor specification (chemical & mechanical)

	HIT-HY 200 HIT Z Rod HIT V Rod HIS N Sleeve Rebar	No borehole cleaning required (when used with HIT Z), suitable for dry and water saturated concrete, suitable for use in diamond drilled holes, fast cure	M8-M20 HIT Z, HIS N M8-M30 HIT V D8-D32 Rebar
	HIT-HY 170 HIT V Rod HAS Rod HAS E Rod HIT SC Sleeve	Specially designed for masonry including clay bricks, sand lime bricks, hollow bricks, concrete blocks and natural stone	M6-M12 HIT V, HAS, HAS E M8-M12 HIT IC, HIT SC
	HIT-HY 270 HIT V/C HAS Rod	Chemical adhesive anchor for applications on masonry and hollow block, available in Profis Design Software	M6-M16 HIT V/C, HAS, HAS E
	HVU HAS Rod HAS E Rod HIS N Sleeve	Very high loading capacity, large diameter applications, suitable for dry and water saturated concrete	M8-M39 HAS, HAS E M8-M20 HIS
	HST 3	Safety wedge for follow up expansion	M8-M24
	HSA	3 different embedment depths, approved for diamond drilled holes	M6-M20
	HSV	High quality stud anchor for non-specified applications.	M8-M16
	HUS3	Reusable anchor available with hexagon and countersink heads. Up to 30% more load in compaction to stud anchors.	8-14 mm
	HRD	Excellent setting behaviour, versatile with regards base material, finishes and head types; hex, countersunk, pan	8, 10, 14 mm
	HPS	Impact and temperature resistant	4-8 mm
	HUD-1	Economical universal plastic anchor for light duty applications on various base materials	5-14mm
	HUD-L	Economical universal plastic anchor for light duty applications on various base materials	5-14mm



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A. CURTAIN WALL
b. On site
ii. Fixing mullions brackets

2 Screw fastening on steel

Before the right screw for fastening brackets can be selected, the properties of the material, e.g. thickness of steel must be known.



Characteristics	Product description	Necessary accessories
Drilling thickness mm		
1.25 – 2.00 mm	S-MD 51 S	
2.00 – 6.00 mm	S-MD 53 S	Screwdriver Hilti ST 1800
4.60 – 12.00 mm	S-MD 55 S	



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A. CURTAIN WALL
b. On site
ii. Fixing mullions brackets

3 Direct fastening on concrete or steel

With the direct fastening technology, a powder-actuated fastening tool is used to drive a nail or threaded studs into concrete or steel.

Provides high fastening rate and easy to use solution for curtain wall fastening. Due to constant exposure to external environment stainless steel nails or threaded studs to be used.

When pre-drilling in concrete for threaded studs fastening, it helps to guide the nail and ensures extremely high loads. Additionally, the hole is drilled to a depth of only 23 mm and no reinforcing bars are hit during the drilling.

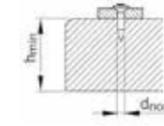
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Characteristics	DX 5
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Product description	Powder actuated fastening tool
Technology	Hybrid urethane methacrylate adhesive
Magazine holds	DX 5-F8: single nail
Base material	concrete, steel
Thickness of base material concrete:	Nails: hmin ≥ 80.00 mm Threaded studs: hmin ≥ 100.00 mm
Steel:	Nails: tl ≥ 6.00 mm Threaded studs: hmin ≥ 4.00 mm
Thickness of fastened material (steel plate/ GI sheet)	Nails: tl ≤ 3.00 mm Threaded studs: tl ≈ up to 13 mm
Nails	concrete & steel nails: X-CR 14, 16, 21, 29 P8
Threaded studs	concrete: X-CR M8 (requires pre-drilling) steel: X-CR M8 (no pre-drilling)
Necessary accessory	Cartridge 6.8/11, drill bit TE-C-5/23B or TE-C-5/23, TE 4-A22



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A. CURTAIN WALL

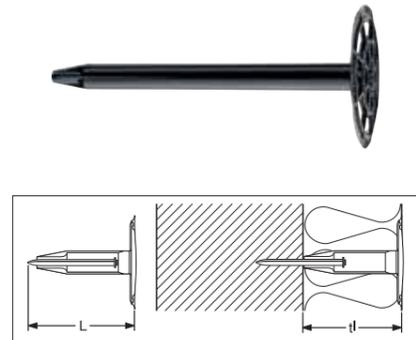
b. On site

iii. Fixing insulation in cladding area

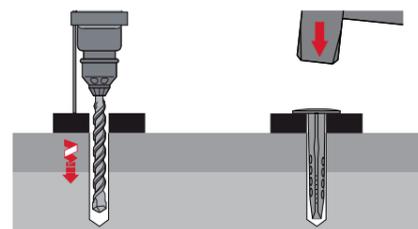
The insulation sheets must be fitted without gaps and reliably, permanently secured (depending on the type of substructure, anchors, adhesive, clamps or mechanical pressure may be used). The wind loads to be expected, also during construction, must be taken into account. Excessive compression of the insulating material at the fastening points should be avoided.

Hilti offers a range of insulation fasteners:

- Insulation fastener with direct fastening (X-IE, X-IE H)
- Insulation fastener (HIF)
- Insulation fastener with expansion pin (IZ)
- Fire-resistant metal insulation fastener (IDMR/IDMS)



Characteristics	X-IE
Base material	Concrete
Insulation thickness	60 – 200 mm
Load capacity	High (Refer Direct Fastening Technology Manual)
Washer diameter	90 mm
Insulation material	Mineral wool, EPS
Necessary accessories	DX 5-EI and cartridge 6.8/11



Characteristics	IDMR/IDMS
Base material	Concrete
Insulation thickness	60 – 240 mm
Load capacity	Medium
Washer diameter	90 mm
Insulation material	Mineral wool, EPS
Necessary accessories	Hammer

3 APPLICATION OVERVIEW

A. CURTAIN WALL

b. On site

iv. Sealing perimeter gap

The structure of a building changes dramatically during a fire. Components become deformed and facades bulge outwards. Conventional or static firestop solutions can compensate for these deformations only to a limited extent. Gaps and cracks open up between floor decks and walls or curtain wall facade sections, allowing flames, smoke and dangerous fumes to spread.

The perimeter barrier shall be intended to restrict the interior vertical passage of flame and hot gases from one floor to another at the location where the floor intersects the inside of an exterior curtain wall.

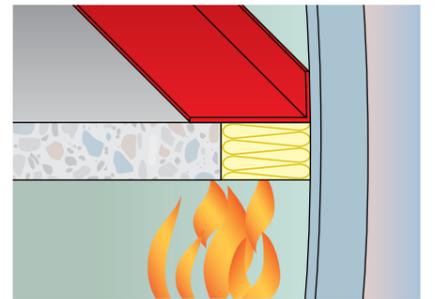
Only tested and listed firestop systems, which provide dynamic movement capabilities shall be used for slot gaps between edge of floor slabs and perimeter curtain walls.

The sealing membrane created by Hilti CFS-SP WB firestop joint spray is extremely elastic and capable of adapting to a gap, provides a reliable, fire-resistant membrane.

Characteristics	CFS-SP WB
Product flexibility	Meets 500 cycles requirements (as per ASTM E 1966 & UL 2079)
Movement capabilities	Up to 50%
Curing time	Approx. 24 hours @ 73°F (24°C), 50% humidity for 1/8" (3mm) depth
Insulation material	Mineral wool
Necessary accessory	Brush or spray machine
Tested in accordance with	ASTM E2307 BS EN 1364-4

Tested and listed firestop systems

- UL
- CW-D-1001, CW-D-1015, CW-D-1018, CW-D-2025, CW-D-2027, CW-D-2046, INTERTEK
- CEJ 127P, CEJ 216P, CEJ 244P, CEJ 245P, CEJ 246P, CEJ 259P, CEJ 260P, CEJ 261P, CEJ 262P, CEJ 263P, CEJ 264P, CEJ 265P, CEJ 307P, CEJ 308P, CEJ 309P, CEJ 310P, CEJ 314P, CEJ 315P, CEJ 316P, CEJ 400P, CEJ 421P, CEJ 425P, CEJ 526P, CEJ 529P, HI_BP 120-05, HI_BP 150-01 HI_BPF 120-11





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A. CURTAIN WALL

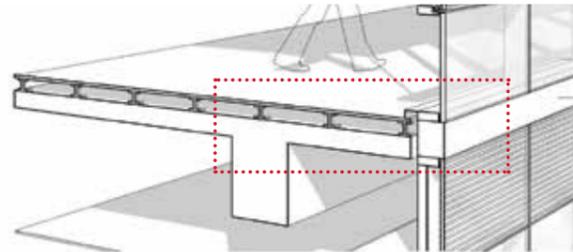
b. On site

v. Fixing GI sheet

A metal sheet layer covering perimeter gap (over the sealed perimeter gap). Depending on thickness and type of metal sheet, it may provide an additional aesthetical finishing and soundproofing requirements, besides providing a cover for the rockwool with firestop.

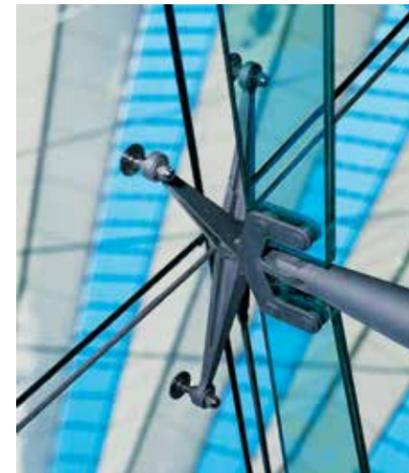
Hilti offers a range of solutions for fixing GI sheet

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Characteristics	BX 3	GX 120	DX 5 / MX 72
Product description	Battery actuated fastening tool	Gas actuated fastening tool	Powder actuated fastening tool Technology
Technology	Battery actuated	Gas actuated	Powder actuated
Magazine holds	20 nails	40 nails	DX 5-F8: single nail DX 5 MX 72: 10 nails
Base material	filled block, concrete, steel	concrete, concrete block, steel	concrete, steel
Thickness of base material concrete:	concrete: hmin = 60.00 mm dnom = 3.00 mm	concrete: hmin = 60.00 mm dnom = 3.00 mm	concrete: hmin ≥ 80.00 mm
steel:	steel: tll ≥ 4.00 mm	steel: tll ≥ 4.00 mm	steel: tll ≥ 6.00 mm
Thickness of fastened material (steel plate/ GI sheet)	tl ≤ 2.00 mm	tl ≤ 2.00 mm	tl ≤ 3.00 mm
Nails	concrete nails: X-C 20/24 B3 MX Universal nail: X-P 20 B3	concrete nails X-GN 20/27 steel nails: X-EGN 14MX, 18MX, 20MX, 24MX	Concrete nails: X-C 20, X-C 27 High strength concrete: X-P 22, X-P 27 Universal nails: X-U 16, X-U 19
Necessary accessory	Battery charger C 4/36 Li-Ion 230V Battery pack B 22/2.6 Li-Ion	Gas can GC 21	concrete: X-CR M8 (requires pre-drilling) steel: X-CR M8 (no pre-drilling)
Necessary accessory			Cartridge 6.8/11, drill bit TE-C-5/23B or TE-C-5/23, TE 4-A22

*More details on Direct Fastening Technology Manual



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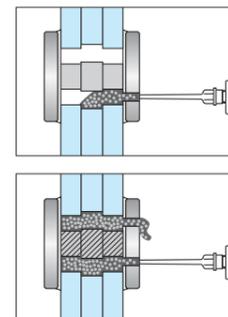
A. CURTAIN WALL

b. Onsite

vi. Point fixing Glass Wall

The incorporation of structural glass in a building presents many challenges due to the transfer of alternating compressive and shear forces between the glass and the steel structure. Allowance must also be made for stresses generated by temperature fluctuations and the heat of the sun. A versatile, reliable high-strength fastening solution capable of meeting these demanding requirements is thus called for.

Hilti HIT-HY 270 injectable adhesive mortar is particularly suitable. In contrast to mechanical fastening solutions, this injectable mortar offers maximum flexibility in use and its high compressive strength combined with excellent ductility allows loads to be taken up reliably without transferring stress peaks to the glass.



Characteristics	HIT-HY 270
Product description	Ultimate performance hybrid mortar for all glass
Necessary accessories	HDE 500-A22 Cordless electric dispenser

Ordering designation	Content per can/cartidge	Package contents	Sales pack quantity
HIT-HY 270 330/2	330 ml	1x Foil pack, 2x Mixer, 1x Mixer extension	1 pc
HIT-HY 270 330/1/P(20)	330 ml	1x Foil pack, 1x Mixer, 1x Mixer extension	20 pc
HIT-HY 270 500	500 ml	1x Foil pack, 2x Mixer, 1x Mixer extension	1 pc

Chemical and mechanical compatibility

- Compatibility with PVB film (polyvinyl butyral film) in laminated glass
- Compatibility with EPDM films (ethylene propylene diene monomer rubber) in the case of seals
- Compatibility with silicone caulking compounds
- Compatibility with stainless steel and aluminum surfaces