HALFEN SCAFFOLD ANCHORS

TECHNICAL PRODUCT INFORMATION

HALFEN SCAFFOLD ANCHORS

GA 17-E

FAÇADE

HALFEN

A CRH COMPANY

Scaffolding in ventilated façade construction or ETICS thermal insulation systems

Scaffolding used in the construction industry must be planned in accordance with DIN EN 12810 and DIN EN 12811. These standards include type specific requirements for initial scaffolding for building and also for façade installations and maintenance work. These regulations do not apply for safety scaffold; DIN 4420 is applied here.

To connect to the supporting structure of the buildings, scaffolding anchors are used which must be technically capable of securing the scaffolding reliably through the thickness of the façade. This is the only safe method to install the insulation and façade elements for the building from the scaffolding. As it is not possible to stabilize scaffolding to a ventilated brick render façade or an ETICS façade (*External Thermal Insulation Composite System*), the scaffold anchors must be able to absorb both compressive and tensile loads.

A scaffold of load category 4 is usually required for façade installation. Load categories of this class and upwards are required if the scaffold is used for temporary storage of larger loads or if cranes are used to place brick or stone stacks on the scaffold.

Load category 3 scaffold systems are generally used for façade maintenance.

HALFEN manufactures the scaffold anchors and also specifies the maximum working loads for each anchor both vertically and horizontally to the façade to ensure the required reliability in planning and application.
The maximum anchor loads for the scaffold result from the static calculation, the specifications in the general building authority approval for scaffolding or for standard application as specified in DIN 4420-3.


Pipe coupler scaffolding

HALFEN Scaffold anchors meet the requirements of EN 12810/ EN 12811 or DIN 4420 and can also be used as permanent scaffold anchors (optional) in accordance with DIN 4426.

In accordance with DIN 4426 specifications (not adopted by building authorities) if the load-bearing components of an external wall are designed with a façade system that cannot absorb anchor loads, permanent scaffolding anchors must be provided for anchoring of temporary workplaces for future maintenance and inspection of the façade. These façades include curtain wall systems, thermal insulation composite systems, ventilated masonry and similar.
Permanent scaffolding anchors are not required if façade maintenance units are available for maintenance and inspection, if an elevating work platform can be used or if the height of the building does not exceed eight metres.

It is the client's decision which system is used for future maintenance and façade inspection work; suitable fixings must be taken into account as early as in the planning phase of the façade.


Scaffold element connected to a strap

The HALFEN Scaffold anchors remain in the building after dismantling the scaffolding and are concealed so they do not interfere with the appearance of the façade. This ensures that required scaffolding can be erected at a later date without needing additional anchoring points.
The position, fixing method and load-bearing capacity of the scaffold anchors must be taken into account when planning the façade and included in the building's documentation.
The choice of anchors depends on the type of scaffolding selected, the anchor grid of the scaffolding and the distribution of the joints in the façade. Loads from the scaffolding are transferred to the HALFEN Scaffold anchors using reusable straps or ring bolts, which are connected directly to the HALFEN Scaffold anchors.

The two-part straps consist of a load strap and a safety strap. This ensures that the scaffold anchors do not spoil the visual aspect of the façade and when required, the scaffolding is safely connected to the anchors.

In brickwork render façades or in ETICS façades the scaffolding is connected to the scaffold anchor using a ring bolt.

HALFEN SCAFFOLD ANCHORS

Introduction

In principle, the scaffold anchor should be selected according to the type of façade. A distinction is made between the following types of façade:

- Brickwork façade
- Natural stone façade
- Concrete façade
- *External Thermal Insulation Composite Systems*

HALFEN GE-HB Scaffold anchors for natural stone façades

Scaffolding anchors are the current technological standard for scaffolding used with ventilated façades or in ETICS façades.
Scaffold anchors avoid damage to the façade and are an important and integral part of every façade project today. Increased demands on thermal insulation have resulted in thicker insulation material in façades and larger cavities for ventilated façades.

Anchoring scaffolding using only ring bolts is not recommend as lengths of 300 mm and more would be required. Ring bolts with long shaft lengths would deform and bend as a result of the high loads caused by the scaffolding. This bending would cause considerable damage to the façade. This could lead to failure of the anchorage or even to scaffold collapse.

Static verification is required when using ring bolts, which are longer than 70 mm; additional technical measures are also required to absorb loads (FII) parallel to the façade.

These measures must be statically verified and involve increased material and labour costs also for the subsequent scaffold installation.

To meet the ever-increasing demands on thermal insulation HALFEN HGA-Q and HGA-F Scaffold anchors can be installed with a HALFEN Thermal separation strip between the building and the anchor. The thermal separation strips reduce the heat loss caused by the scaffold anchors and improve the heat transmission efficiency of the building.

HALFEN HGA-Q Scaffold anchors with short ring bolt. The side struts absorb loads parallel to the façade.

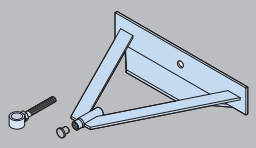
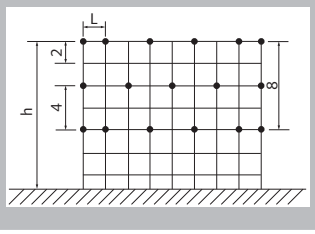
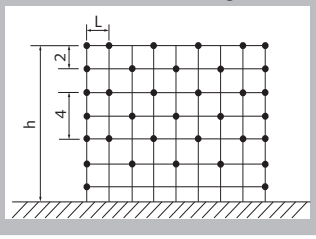
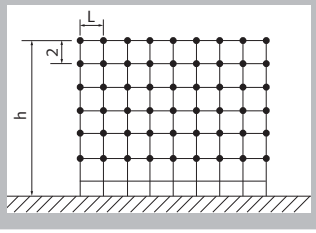
Standards, design guidelines and regulations for scaffold anchors	
DIN 4420-3: 2006-01	Service and work scaffolds - Part 3: Selected scaffolding types and their standard design
DIN 4426: 2017-01	Equipment for building maintenance - Safety requirements for workplaces and traffic access - Design and execution
DIN EN 1993-1-1:2012-12	Eurocode 3: Design and construction of steel structures - Part 1-1: General design rules and regulations for structural engineering
DIN EN 1993-1-4: 2015-10	Eurocode 3: Design and construction of steel structures - Part 1-4: General design rules - Additional regulations for the use of stainless steels
DIN EN 12811-1: 2003	Temporary structures for buildings - Part 1: Work scaffolding - Performance specifications, Design, construction and dimensioning
DIN 18451: 2016-09	VOB = German procurement and contract regulations for construction work - Part C: General Terms and Conditions of Contract for Construction Services (ATV) - scaffolding work
FRG 1: 2011	Technical regulations for scaffold structures
European Technical Assessment	For fixing paraphernalia: Dowels and HALFEN Cast-in channels
Building authority approvals	Approvals for components and fixings made of stainless steels
Building authority approvals	Provided by scaffolding suppliers

HALFEN Scaffold anchors: Load capacities and anchor spacings

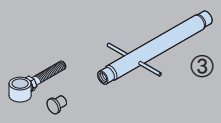
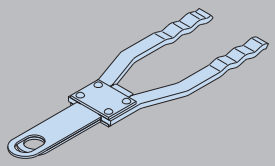
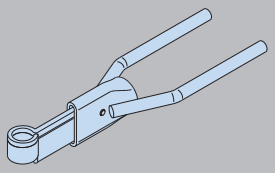
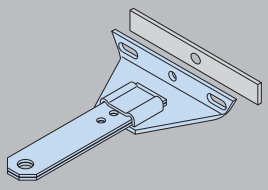
Note

The maximum horizontal anchoring spacing [m] is a typical example for use in steel tube coupling scaffolds (standard application) for façades with horizontal work platforms according to **DIN 4420-3,** and for use as permanent scaffolding anchors according to **DIN 4426**.

The specified characteristic resistance of the scaffold anchors and the horizontal and vertical spacing must be adapted to the installation grid of the scaffold, taking the static calculation and general building authority approval into account.

			Application is recommended for:	HGA-Q  → page 6
			Thermal insulation composite systems	■
			Brickwork façade	■
			Natural stone façade	
			Concrete façade	■
			Characteristic load capacity (γ_F = 1.0)	**$F_\perp$ = 3.9 kN (compression/tension) $F_\parallel$ = 1.3 kN**
DIN EN 12811-1 / DIN 4420-3	Non-covered scaffolding ① 	Load class 1 to 6	h ≤ 10 m	2.91 m
			h ≤ 20 m	2.54 m
			h ≤ 30 m	2.18 m
	Covered scaffolding ① 	Load class 1 to 6	h ≤ 10 m	1.05 m
			h ≤ 20 m	0.99 m
			h ≤ 30 m	0.95 m
	Covered scaffolding ② 	Load class 1 to 6	h ≤ 10 m	2.13 m
			h ≤ 20 m	2.02 m
			h ≤ 30 m	1.92 m
DIN 4426	Covered and non-covered scaffolding (vertical anchor spacing: 4.0 m) ①	Load class 1 to 6		1.75 m

① The loads may be reduced proportionately if the vertical anchor spacing distance is less than 4.0 m.
② The loads may be reduced proportionately if the vertical anchor spacing distance is less than 2.0 m.
③ With static verification of the horizontal load bearing capacity in the brickwork grout (shear force verification in brickwork).

HGA-ZN	GE-HB	GE-VB	HGA-F
			
→ page 7	→ page 8	→ page 9	→ page 10
■ ③			
	■	■	■
			■
$F_{\perp}$ = 5.6 kN (compression/tension)	**$F_{\perp}$ = 3.4 kN (compression/tension)** **$F_{\parallel}$ = 1.2 kN**	**$F_{\perp}$ = 2.7 kN (compression/tension)** **$F_{\parallel}$ = 0.9 kN**	**$F_{\perp}$ = 3.4 kN (compression/tension)** **$F_{\parallel}$ = 1.2 kN**
4.17 m	2.52 m	2.00 m	2.52 m
3.63 m	2.19 m	1.74 m	2.19 m
3.41 m	2.00 m	1.50 m	2.00 m
1.50 m	0.91 m	0.72 m	0.91 m
1.41 m	0.85 m	0.68 m	0.85 m
1.36 m	0.82 m	0.65 m	0.82 m
3.04 m	1.84 m	1.46 m	1.84 m
2.89 m	1.74 m	1.38 m	1.74 m
2.75 m	1.66 m	1.32 m	1.66 m
2.50 m	1.51 m	1.20 m	1.51 m

Load Application Horizontally Parallel and Perpendicular to the Main Support Structure

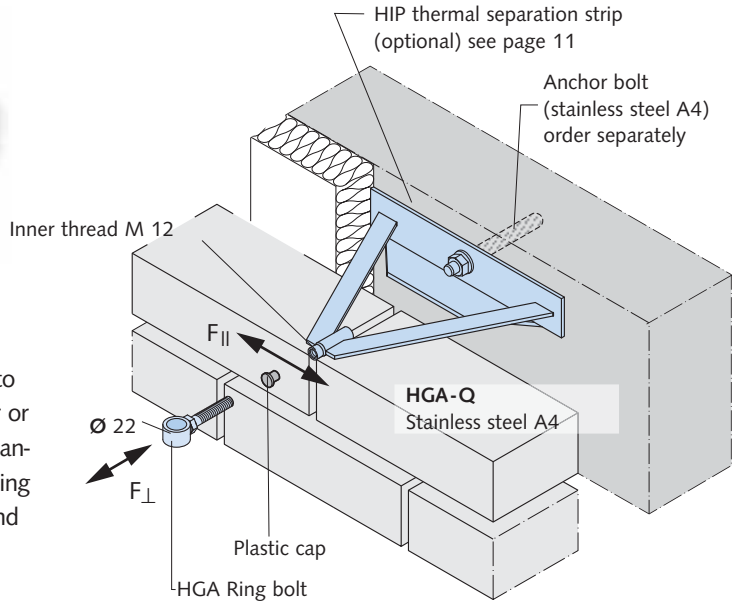
HGA- Q Scaffold anchor

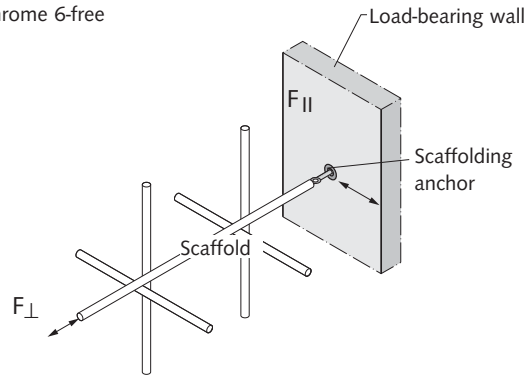
HGA-Q Scaffold anchor incl. plastic cap and ring bolt (the ring bolt requires separate static verification).

HALFEN HGA-Q Scaffold anchors are used to fix scaffolding to ETICS façades and in the horizontal joints in brickwork render or concrete façades. This anchorage is suitable for loads at right angles ($F_{\perp}$) and loads horizontally and parallel to the main building support structure ($F_{||}$) according to EN 12811 or DIN 4426 and the general building authority approval for scaffolding.

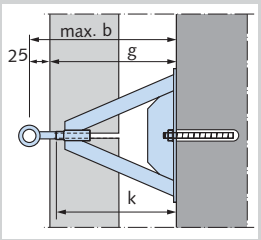
HALFEN HGA-Q Scaffold anchors reliably transfer loads into the load-bearing support structure of the building. An insulation strip is available as an option to thermally separate the scaffold anchors from the building. The scaffold anchor is supplied with a ring bolt and a plastic cap. The anchors are fixed with approved HALFEN Anchor bolts or to HALFEN Cast-in channels previously installed in the main support structure.

Note: Required anchor spacings according to DIN EN 12811-1 / DIN 4420-3 and DIN 4426 see table on page 4-5.





HGA-Q Scaffold anchor

Top view	Article name	Order no. 0159.010-	k ① [mm]	g [mm]
	**HGA-Q 160**	00101	160	165-180
	HGA-Q 185	00102	185	190-205
	HGA-Q 210	00103	210	215-230
	HGA-Q 235	00104	235	240-255
	HGA-Q 260	00105	260	265-280
	HGA-Q 285	00106	285	290-305
	HGA-Q 310	00107	310	315-330
	HGA-Q 335	00108	335	340-355
	HGA-Q 360	00109	360	365-380
HALFEN Wedge anchor for non-cracked concrete	HB-B 12-10-25/105-A4 (Order no.: 0432.060-00135)			
HALFEN Anchor stud for cracked and non-cracked concrete	HB-VMZ-A-80 - M12-25/125-A4 (Order no.: 0432.380-00010)			

① Further dimensions on request.
Individual ring bolts for use with previously installed HALFEN HGA-Q or HGA-ZN Scaffold anchors can be found in accessories, see page 11.

Load Application Perpendicular to the Main Building Support Structure

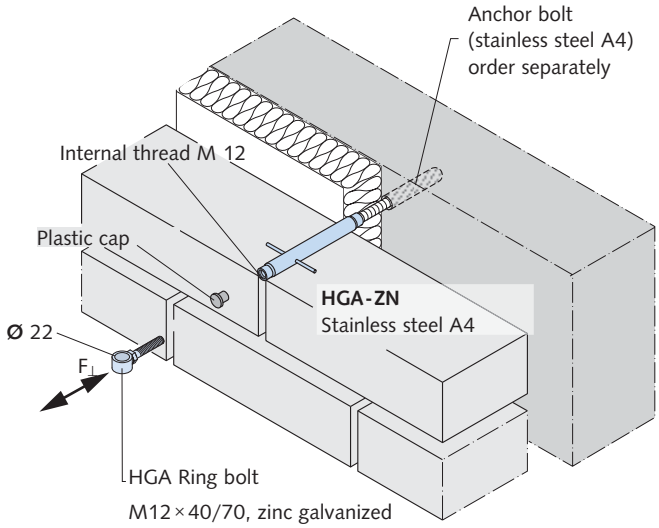
HGA-ZN Scaffold anchor

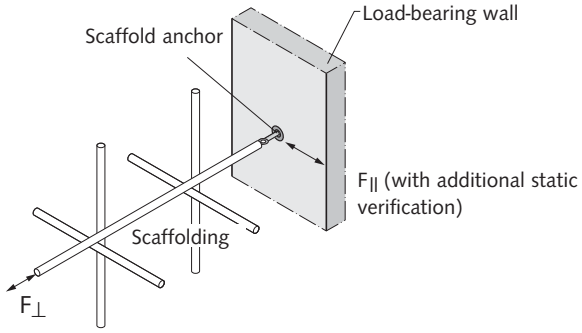
HGA-ZN Scaffold anchor incl. plastic cap and ring bolt

HALFEN HGA-ZN Scaffold anchors are used to fix scaffolding to brickwork render. This scaffold anchorage is only suitable for transferring loads at right angles ($F_{\perp}$) to the main support structure according to EN 12811 and DIN 4426 and the general building authority approval for scaffolding.

HALFEN HGA-ZN Scaffold anchors are supplied with a ring bolt and a plastic cap. The anchors are fixed to the support structure with approved HALFEN Anchor bolts.

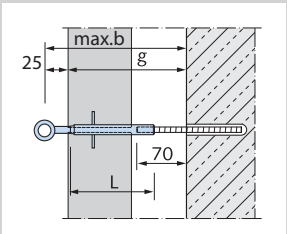
With additional static verification of horizontal load absorption into the brickwork grout (Shear verification in brickwork), this anchor is also suitable for loads horizontally and parallel to the support structure.





Note: Required anchor spacings according to DIN EN 12811-1 / DIN 4420-3 and DIN 4426 see table on page 4-5.

Scaffold anchor HGA-ZN

Top view	Article name	Order no. 0159.020-	L ① [mm]	g [mm]
	**HGA-ZN 115**	00001	115	145 - 165
	HGA-ZN 145	00002	145	165 - 195
	HGA-ZN 175	00003	175	195 - 225
	HGA-ZN 205	00004	205	225 - 255
	HGA-ZN 235	00005	235	255 - 285
	HGA-ZN 265	00006	265	285 - 305
	HGA-ZN 295	00007	295	315 - 335
	HGA-ZN 325	00008	325	345 - 365
	HGA-ZN 355	00009	355	375 - 395
HALFEN Anchor bolt for non-cracked concrete	HB-B 12-50-65/145-A4 (Order no.: 0432.060-00016)			
HALFEN Anchor bolt for cracked and non-cracked concrete	HB-VMZ-A 80 - M12-50/150-A4 (Order no.: 0432.380-00011)			

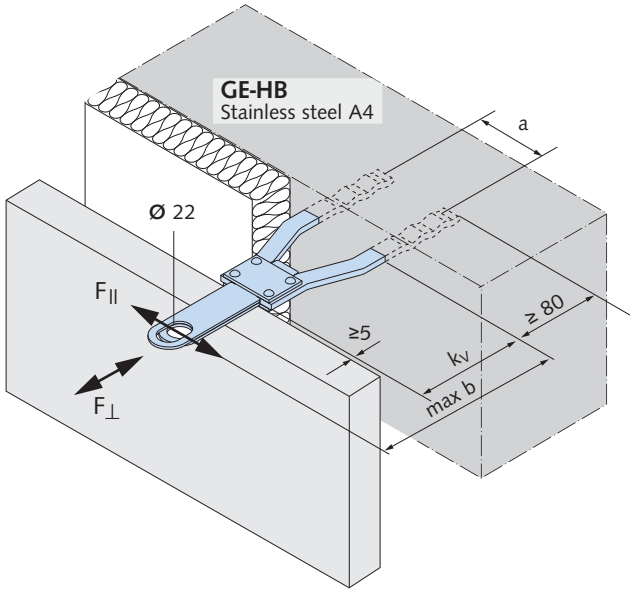
① Further dimensions on request.
Individual ring bolts for use with previously installed HALFEN HGA-Q or HGA-ZN Scaffold anchors can be found in accessories, see page 11.

GE-HB Scaffold anchor

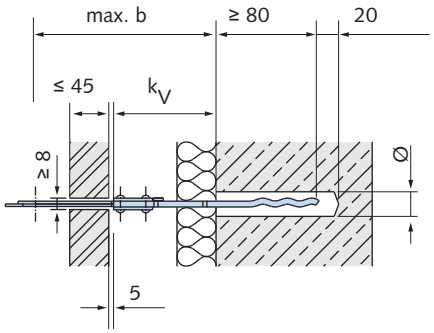
GE-HB Scaffolding anchor including plastic cap

HALFEN GE-HB Scaffold anchors are used to fix scaffolding in the horizontal joint of natural stone façades. The anchorage is suitable for loads at right angles ($F_{\perp}$) and loads horizontally and parallel to the main building support structure ($F_{||}$) according to DIN EN 12811 or DIN 4426 and the general building authority approval for scaffolding.

HALFEN GE-HB Scaffold straps are used to reliably transmit loads into the load-bearing inner structure of the building. The scaffold anchor is supplied with two reusable straps. The second strap locks into the first strap and provides a reliable anchor point for attaching scaffolding.
The GE-HB Anchor is fixed with cement based mortar in the support structure.



Vertical section



Note: Required anchor spacings according to DIN EN 12811-1 / DIN 4420-3 and DIN 4426 see table on page 4-5.

GE-HB Scaffold anchor including straps and plactic cap

Article name	Order no. 0765.010-	max. b [mm]	a [mm]	kv ① [mm]	Ø [mm]
GE-HB-135	00001	135	71	45-60	25
GE-HB-150	00002	150	70	60-75	25
GE-HB-165	00003	165	70	75-90	25
GE-HB-180	00004	180	80	90-105	30
GE-HB-195	00005	195	80	105-120	30
GE-HB-210	00006	210	80	120-135	30
GE-HB-225	00007	225	80	135-150	30
GE-HB-240	00008	240	105	150-165	30
GE-HB-255	00009	255	109	165-180	30
GE-HB-270	00010	270	109	180-195	30
GE-HB-285	00011	285	109	195-210	30
GE-HB-300	00012	300	120	210-225	30
GE-HB-315	00013	315	127	225-240	30
GE-HB-330	00014	330	129	240-255	35

① Further dimensions on request.

HALFEN GE-HB Straps

Both HALFEN GE-HB Straps are available separately for use with previously installed scaffold anchors.

Individual straps

Article name	Order no. 0570.030-
GE-HB-LA EL 01	00001
GE-HB-LA EL 02	00002

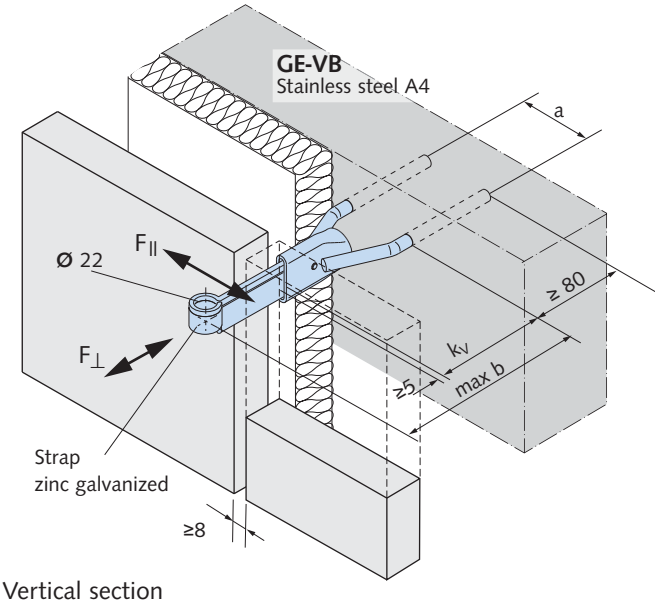
Note: Both GE-HB Straps are always required for application.

GE-VB Scaffold anchor

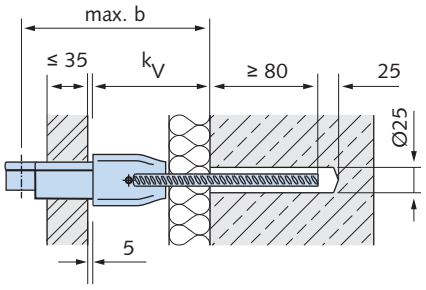
GE-VB Scaffold anchor incl. hook strap, ring bolt and PVC Cap

HALFEN GE-VB Scaffold anchors are used to fix scaffolding in the vertical joint between natural stone façade slabs. The anchorage is suitable for loads at right angles ($F_{\perp}$) and loads horizontally and parallel to the main building support structure ($F_{||}$) according to DIN EN 12811 or DIN 4426 and the general building authority approval for scaffolding.

HALFEN GE- VB Scaffold anchors are used to reliably transmit loads into the load-bearing inner structure of the building. The scaffold anchor is supplied with reusable hook straps, and a ring bolt to secure the strap. The GE-VB Anchor is grouted with cement based mortar in the support structure.



Vertical section



Note: Required anchor spacings according to DIN EN 12811-1 / DIN 4420-3 and DIN 4426 see table on page 4-5.

GE-VB Scaffold anchor including anchor, ring bolt and plactic cap

Article name	Order no. 0765.020-	max. b [mm]	a [mm]	kv ① [mm]
GE-VB-200	00001	200	80	115 - 135
GE-VB-220	00002	220	80	135 - 155
GE-VB-240	00003	240	90	155 - 175
GE-VB-260	00004	260	100	175 - 195
GE-VB-280	00005	280	110	195 - 215
GE-VB-300	00006	300	120	215 - 235
GE-VB-320	00007	320	120	235 - 255
GE-VB-340	00008	340	130	255 - 275
GE-VB-360	00009	360	130	275 - 295

① Further dimensions on request.

Additional straps

HALFEN also provides the hook strap and ring bolt separately for fitting to previously installed GE-VB Scaffold anchors.

EL 03

EL 04

Individual straps

Article name	Order no. 0570.040-
GE-VB-LA EL 03	00005
GE-VB-LA EL 04	00003

Dowel Application

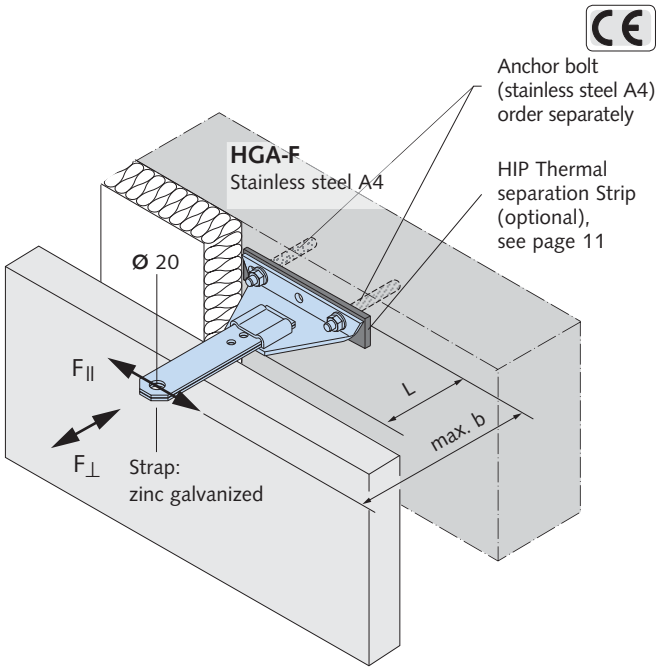
HGA-F Scaffold anchors

HGA-F Scaffold anchors

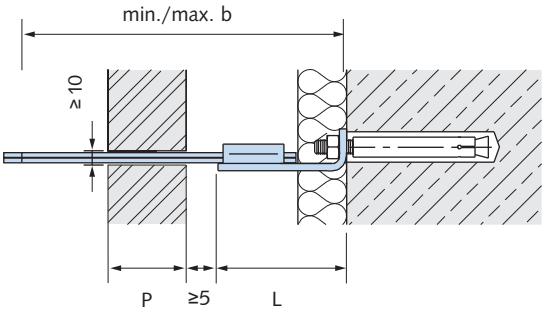
HALFEN HGA-F Scaffold anchors are used to fix scaffolding in the horizontal joint between natural stone or concrete façade slabs. The anchorage is suitable for loads at right angles ($F_{\perp}$) and loads horizontally and parallel to the main building support structure ($F_{\parallel}$) according to DIN EN 12811 or DIN 4426 and the General building authority approval for scaffolding.

HALFEN HGA-F Scaffold anchors are used to reliably transmit loads into the load-bearing inner structure of the building. As an option a thermal separation strip is available for use between the anchor and the building. The scaffold anchor is supplied with two reusable straps. The system, consisting of two strap slotted together, allows length adjustment.

The HGA-F Anchor is fixed with two approved HALFEN Anchor bolts or to HALFEN Cast-in channels previously installed in the main support structure.



Vertical section



Note: Required anchor spacings according to DIN EN 12811-1 / DIN 4420-3 and DIN 4426 see table on page 4-5.

HGA-F Scaffold anchors

Article name	Order no. 0233.010-	min. b [mm]	max. P [mm]	max. b [mm]	max. P [mm]	L ② [mm]
HGA-F-110	00001	233	110	277	150	109
HGA-F-140	00002	241	80	307	150	139
HALFEN Bolt anchor for non-cracked concrete ①	HB-B 12-10-25/105-A4 (Order no.: 0432.060-00135)					
HALFEN Injection anchor for cracked and non-cracked concrete ①	HB-VMZ-A-80 - M12-25/125-A4 (Order no.: 0432.380-00010)					

① Two anchor bolts are required for each anchor.
② Further dimensions on request.

HGA-F Straps

The HALFEN HGA-F Strap is available separately for use with previously installed scaffold anchors.

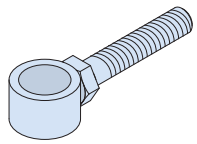
Individual straps

Article name	Order no. 0578.020-
HGA-F Strap	00001

Note: Two straps are required for each anchor.

Ring bolts and sealing caps

HGA-RS Scaffold anchor ring bolt

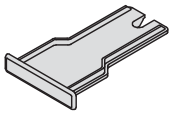


HGA-Q/ZN Scaffold anchor ring bolt		
	Order no. 0160.000-	Type
HGA-RS - M12×80 GV	00002	zinc galvanized Chrome 6-free

HGA-STO Scaffold anchor plastic cap

HGA-Q and HGA-ZN Plastic sealing cap		
	Order no. 0575.070-	Colour
HGA-STO-M12-GPN700	00001	light grey

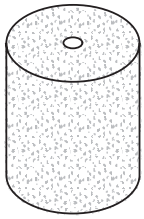
GE-KAP Scaffold anchor sealing cap



GE-HB and GE-VB PVC Plastic sealing cap		
	Order no. 0765.030-	Colour
GE-KAP-01	00001	black
GE-KAP-02	00002	transparent
GE-KAP-03	00003	light grey

Plug for thermal insulation composite system

Scaffold anchor plug



Manual application; the plug is compressed by hand and expands after installation.
Treated fine pore PUR soft foam with polyethylene core, for up to 17 mm hole diameter.

- suitable for plaster and paint finishes
- rain resistant according to DIN 18 055/EN 86
- UV resistant, fire resistance class B1
- length: 40 mm
- diameter: 30 mm
- items in package = 25

HGA-Q ETICS Scaffold anchor plug		
	Order no. 0159.040-	Colour
HGA-STO WDVS	00001	light grey

Thermal separation strip; only for HGA-Q/HGA-F

HALFEN HIP Thermal separation strip

The HIP plate is a 5 mm thick rigid foam strip (PVC) for thermal separation of the scaffolding anchors from the support structure.

- allowable compressive stress σm = 9 N/mm²
- thermal conductivity λ = 0.09 W/m × K
- resistance class B1

HIP Thermal separation strip		
	For anchor type	Order no. 0159.030-
HIP 1	HGA-F 110/140 HGA-Q 160/185/210	00001
HIP 2	HGA-Q 235/260/285	00002
HIP 3	HGA-Q 310/335/360	00003

Fixing the scaffold anchors using HALFEN HB-B Bolt anchors A4

HB-B Bolt anchor A4
see page 6, 7 and 10;
approved for non-cracked concrete

ETA-07/247

Fixing the scaffold anchors using the HALFEN HB-VMZ Injection system A4

HB-VMZ Bolt anchor A4
see page 6, 7 and 10;
approved for cracked
and non-cracked concrete

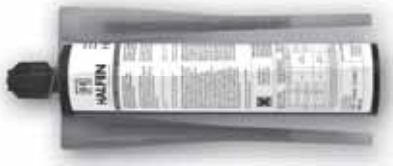
ETA-07/256

HB-VM-X Mixing nozzle
Order no. 0433.040-00039

Please refer to our **"HALFEN HB Anchor bolts systems"** technical catalogue for more detailed information

HB-VM-P 345 Dispenser, Order no. 0433.040-00077

HB-VMZ 280 Cartridge, Order no. 0433.040-00100



Fixing the scaffold anchors using HALFEN Cast-in channels

Using HALFEN Cast-in channels to fasten the scaffold anchors has the following advantages:

- adjustability
- flexible planning
- good installation reliability

ETA-09/0339

HALFEN HTA-CE Cast-in channel		With HALFEN HS T-bolt including hexagon nut					
		Article name	Thread		l [mm]		Torque [Nm]
HTA-CE 49/30	- A4	HS 50/30 -	M 12	×	30	- A4	25

HALFEN PSA Anchor point for personal fall protection equipment according to DIN EN 795

A single personal fall protection anchor point (PSA) consists of an approved, DEMU T-FIXX®, stainless steel fixing anchor, an identification cap and an approved attachment anchor. The suitability of the approved DEMU T-FIXX® fixing anchor as a personal fall protection anchor point for a maximum of two people was confirmed in a DGUV* test based on CEN/TS 16415.

Identification cap

* DGUV Deutsche Gesetzliche Unfallversicherung
German occupational safety insurance.

DEMU T-FIXX® M16, A4

Suitable attachment anchor, for example *RUD PSA INOX STAR M16*

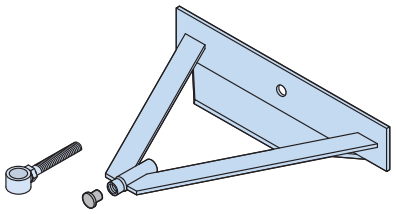
ETA-13/0222

Order number for the T-FIXX® with Identification clip; for use as attachment point for personal safety equipment (PSA): **0020.270-00508**

Tender text examples for HALFEN Scaffold anchors and accessories

1. Scaffold anchors, load assumptions according to scaffold statics, scaffold approval or DIN EN 12811-1 / DIN 4420-3 and DIN 4426

1.1 HALFEN HGA-Q Scaffold anchors



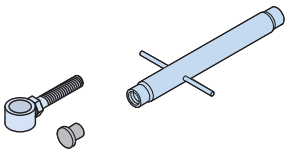
HALFEN HGA-Q Scaffold anchors,
for anchoring to cast-in HALFEN Channels (separate position) or approved HALFEN Anchor bolts (separate position), for scaffold loads acting at right angles and horizontally parallel to the building ($F_{\perp}$ = 3,94 kN / F_{II} = 1,31 kN) according to scaffold statics, scaffold approval, DIN EN 12811-1 / DIN 4420-3 and DIN 4426 in the horizontal joint of masonry, ETICS or concrete panel façades,

incl. plastic cap and galvanized, Chrome6 free ring bolts,
with CE marking,

Type HGA-Q-K
with
K = cantilever length [mm]..... (160 / 185 / 210 / 235 / 260 / 285 / 310 / 335 / 360),
body material: stainless steel (A4), corrosion resistance class CRC III
according to DIN EN 1993-1-4: 2015, table A.2, section 3;

or similar; deliver and install according to the manufacturer's instructions.

1.2 HALFEN HGA-ZN Scaffold anchors



HALFEN HGA-ZN Scaffold anchors,
for anchoring to cast-in HALFEN Channels (separate position) or approved HALFEN Anchor bolts (separate Position), for scaffold loads acting at right angles and horizontally parallel to the building ($F_{\perp}$=5,63 kN) according to scaffold statics, scaffold approval, DIN EN 12811-1 / DIN 4420-3 and DIN 4426 in the horizontal joint of masonry façades,

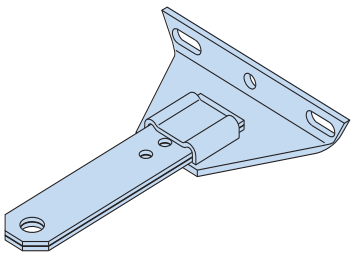
incl. plastic cap and galvanized, Chrome6 free ring bolts,
with CE marking,

Type HGA-ZN-L
with
L = Anchor length [mm] ..... (115 / 145 / 175 / 205 / 235 / 265 / 295 / 325 / 355),
body material: stainless steel (A4) corrosion resistance class CRC III
according to DIN EN 1993-1-4: 2015, table A.2, section 3;

or similar; deliver and install according to the manufacturer's instructions.

1.3 HALFEN HGA-F Scaffold anchor

HALFEN HGA-F Scaffold anchor,
for anchoring to cast-in HALFEN Channels (separate position) or approved HALFEN Anchor bolts (separate position), for scaffold loads acting at right angles and horizontally parallel to the building ($F_{\perp}$ = 3,38 kN / F_{II} = 1,12 kN) according to scaffold statics, scaffold approval, DIN EN 12811-1 / DIN 4420-3 and DIN 4426 in the horizontal joint of natural stone, artificial stone or concrete façade panels,



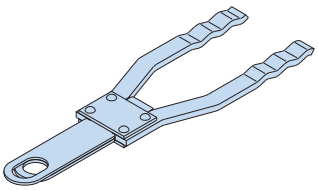
incl. 2 part strap,
with CE marking,

Type HGA-F-110
with
110 = max. cantilever length max b 233–277 mm,
body material: stainless steel (A4), corrosion resistance class CRC III according to DIN EN 1993-1-4: 2015, table A.2, section 3;
removable straps: zinc galvanized steel,

or similar; deliver and install according to the manufacturer's instructions.

1.4 HALFEN GE-HB Scaffold anchor

HALFEN GE-HB Scaffold anchor,
for grouting into concrete or masonry, for scaffold loads acting at right angles and horizontally parallel to the building according to scaffold statics, scaffold approval, DIN EN 12811-1 / DIN 4420-3 and DIN 4426 in the horizontal joint of natural stone or artificial stone façade panels,

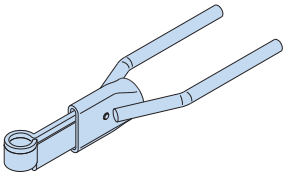


incl. 2 part strap,
with CE marking,

Type GE-HB-B
with
B = max. cantilever length [mm] max b .....
(135 / 150 / 165 / 180 / 195 / 210 / 225 / 240 / 255 / 270 / 285 / 300 / 315 / 330),
body material: stainless steel (A4), corrosion resistance class CRC III according to DIN EN 1993-1-4: 2015, table A.2, section 3;
removable straps: zinc galvanized steel,

or similar; deliver and install according to the manufacturer's instructions.

1.5 HALFEN GE-VB Scaffold anchors



HALFEN GE-VB Scaffold anchors,
for grouting into concrete or masonry, for scaffold loads acting at right angles and horizontally parallel to the building ($F_{\perp}$=2,7 kN / F_{II}=0,9 kN) according to scaffold statics, scaffold approval, DIN EN 12811-1 / DIN 4420-3 and DIN 4426 in the vertical joint of natural stone or artificial stone façade panels,

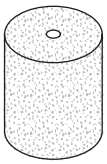
incl. 2 part strap,
with CE marking,

Type GE-VB-B
with
B = max. cantilever length [mm] max b .....
(200 / 220 / 240 / 260 / 280 / 300 / 320 / 340 / 360),
body material: stainless steel (A4), corrosion resistance class CRC III according to DIN EN 1993-1-4: 2015, table A.2, section 3;
removable straps: zinc galvanized steel,

or similar; deliver and install according to the manufacturer's instructions.

2. Scaffold anchors accessories

2.1 HALFEN Scaffold anchors plugs for use in ETICS, Type HGA-STO-WDVS



HALFEN HGA-STO-WDVS Scaffold anchors plugs,
for HALFEN HGA-Q and HGA-ZN Scaffold anchors, specially designed for use in composite thermal insulation systems (ETICS), made of treated PUR soft foam with polyethylene core, rain resistant, can be plastered and painted
DIN 18055/EN 86, UV-resistant, fire protection classification B1,

Type HGA-STO-WDVS

or similar; deliver and install according to the manufacturer's instructions.

2.2 HALFEN HIP Thermal insulation for Scaffold anchors

HALFEN HIP Thermal insulation strip for Scaffold anchors,
for HALFEN HGA-Q and HGA-F Scaffold anchors for thermal insulation from the building's main frame, in rigid foam PVC, allowable compressive stress δ m = 9 N/mm², thermal conductivity λ = 0.09 W / (m × K), fire protection classification B1,

Type HIP - X
with
X = Thermal insulation strip.....
1 for anchor types HGA-F 110 / 140 and HGA-Q 160 / 185 / 210;
2 for anchor types HGA-Q 235 / 260 / 285;
3 for anchor types HGA-Q 310 / 335 / 360,

or similar; deliver and install according to the manufacturer's instructions.

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