PRODUCT TECHNICAL DATASHEET

HSA
Expansion anchor

Steel-to-concrete
Update: Oct-25



HSA Expansion anchor

Everyday standard expansion anchor for uncracked concrete

Anchor version	Benefits



HSA
HSA-F
HSA-R
HSA-R2
(M6-M20)



HSA-BW
(M6-M20)

- Fast & convenient setting behaviour
- Reliable ETA approved torqueing using impact wrench with the innovative SIW and SI-AT system for automatic torqueing
- Small edge and spacing distances
- High loads
- Three embedment depths for maximal design flexibility
- M10, M12, M16 and M20 ETA approved for diamond cored holes using DD 30-W and matching diamond core bit
- Suitable for pre- and through fastening
- Long lengths available suitable for wood structures fastening applications





Base material	Load conditions



Concrete
(uncracked)

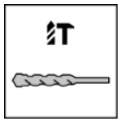


Static/
quasi-static

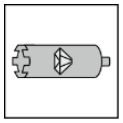


Fire
resistance

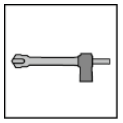
Drilling, cleaning, setting	Other information



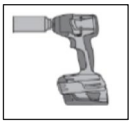
Hammer
drilled
holes



Diamond
drilled
holes



Hollow
drill-bit
drilling



Impact wrench
with adaptative
torque module



Hilti technical
data



PROFIS
Engineering
software



Steel to
concrete
handbook

Linked Approvals/Certificates and Instructions for use

Approvals/certificates

Approval no	Application / loading condition	Authority / Laboratory	Date of issue	Date of expiry
ETA-11/0374	Static and quasi-static	DIBt, Berlin	27-10-2023	-
MPABS-2402765	Fire test report	IBMB, Braunschweig	11-02-2025	11-02-2030
Hilti Technical data	Static and quasi-static (HSA-F M20)	Hilti Corp.	-	-

The instructions for use can be viewed using the link in the instructions for use table or the QR code/link in the Hilti webpage table.

Instructions for use(IFU)

Anchor version	M6	M8	M10	M12	M16	M20
HSA (R),(R2), (BW)	IFU-HSA M6	IFU-HSA M8	IFU-HSA M10	IFU-HSA M12	IFU-HSA M16	IFU-HSA M20
HSA-F	-				IFU-HSA M16	IFU-HSA M20

Link to Hilti Webpage

HSA	HSA-R	HSA-R2	HSA-BW	HSA- F

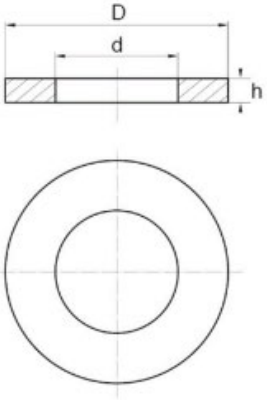
Fastener special dimensions

Mechanical properties and dimensions HSA

Mechanical properties of the HSA anchor can be taken from the ETA listed in the table Approvals / Certificates.

Big washer dimensions

Anchor size HSA-BW			M6	M8	M10	M12	M16	M20
Inner diameter	d	[mm]	6,4	8,4	10,5	13,0	17,0	21,0
Outer diameter	D	[mm]	18,0	24,0	30,0	37,0	50,0	60,0
Height	h	[mm]	1,8	2,0	2,5	3,0	3,0	4,0



Static and quasi-static loading based on ETA-11/0374 or Hilti technical data
Design according to EN 1992-4.

All data in this section applies to:

- Correct setting (see Instructions for use (IFU) section)
- For a single anchor
- No edge distance and spacing influence (see table with setting details)
- Characteristic spacing and edge distance for splitting failure apply only for uncracked concrete.
- Minimum base material thickness (see table with setting details)
- Embedment depth, as specified in the table of this section
- Anchor material, as specified in the tables of this section
- Concrete C20/25
- Hammer drilled holes
- Hilti Technical data for HSA-F M20
- Recommended loads: With overall partial safety factor for action γ = 1,4

For specific design cases refer to **PROFIS Engineering.**

Recommended application based on effective anchorage depth h_{ef}

Effective anchorage depth	Application Recommendation
25 mm ≤ h_{ef} < 40 mm	Fasteners in redundant non-structural applications uncracked concrete only
h_{ef} ≥ 40 mm	Single point fastenings in uncracked concrete as per EN 1992-4

Design resistance for uncracked concrete

Anchor size				M6			M8			M10		
Effective anchorage depth		h_{ef}	[mm]	30	40	60	30	40	70	40	50	80
Tension	HSA, HSA-BW	N_{Rd}	[kN]	4,0	5,0	6,0	5,4	8,3	10,7	8,3	11,6	16,7
	HSA-R2, HSA-R			4,0	5,0	6,0	5,4	8,3	10,7	8,3	11,6	16,7
	HSA-F			4,0	5,0	6,0	5,4	8,3	10,7	8,3	11,6	16,7
Shear	HSA, HSA-BW	V_{Rd}	[kN]	5,2	5,2	5,2	5,4	8,5	8,5	15,1	15,1	15,1
	HSA-R2, HSA-R			5,8	5,8	5,8	5,4	9,8	9,8	18,1	18,1	18,1
	HSA-F			5,2	5,2	5,2	5,4	8,5	8,5	15,1	15,1	15,1
Anchor size				**M12**			**M16**			**M20**		
Effective anchorage depth		h_{ef}	[mm]	50	65	100	65	80	120	75	100	115
Tension	HSA, HSA-BW	N_{Rd}	[kN]	11,6	17,2	23,3	17,2	23,5	33,3	21,3	32,8	40,4
	HSA-R2, HSA-R			11,6	17,2	23,3	17,2	23,5	33,3	21,3	32,8	40,4
	HSA-F			11,6	17,2	23,3	17,2	23,5	33,3	21,3	32,8	40,4
Shear	HSA, HSA-BW	V_{Rd}	[kN]	23,2	23,6	23,6	40,8	40,8	40,8	42,6	68,6	68,4
	HSA-R2, HSA-R			23,2	23,4	23,4	45,2	45,2	45,2	42,6	73,5	73,5
	HSA-F			23,2	23,6	23,6	40,8	40,8	40,8	42,6	68,6	68,6

Recommended loads for uncracked concrete

Anchor size				M6			M8			M10		
Effective anchorage depth		h_{ef}	[mm]	30	40	60	30	40	70	40	50	80
Tension	HSA, HSA-BW	N_{rec}	[kN]	-	3,6	4,3	-	5,9	7,6	5,9	8,3	11,9
	HSA-R2, HSA-R			-	3,6	4,3	-	5,9	7,6	5,9	8,3	11,9
	HSA-F			-	3,6	4,3	-	5,9	7,6	5,9	8,3	11,9
Shear	HSA, HSA-BW	V_{rec}	[kN]	-	3,7	3,7	-	6,1	6,1	10,8	10,8	10,8
	HSA-R2, HSA-R			-	4,1	4,1	-	7,0	7,0	12,9	12,9	12,9
	HSA-F			-	3,7	3,7	-	6,1	6,1	10,8	10,8	10,8
Anchor size				**M12**			**M16**			**M20**		
Effective anchorage depth		h_{ef}	[mm]	50	65	100	65	80	120	75	100	115
Tension	HSA, HSA-BW	N_{rec}	[kN]	8,3	12,3	16,7	12,3	16,8	23,8	15,2	23,4	28,9
	HSA-R2, HSA-R			8,3	12,3	16,7	12,3	16,8	23,8	15,2	23,4	28,9
	HSA-F			8,3	12,3	16,7	12,3	16,8	23,8	15,2	23,4	28,9
Shear	HSA, HSA-BW	V_{rec}	[kN]	16,6	16,9	16,9	29,1	29,1	29,1	30,4	49,0	48,9
	HSA-R2, HSA-R			16,6	16,7	16,7	32,3	32,3	32,3	30,4	52,5	52,5
	HSA-F			16,6	16,9	16,9	29,1	29,1	29,1	30,4	48,8	48,8

Fre loading data based on MPABS-2402765. Design according to EN1992-4.

All data in this section applies to:
- Correct setting (see Instructions for use (IFU))
- Characteristic spacing and edge distance for splitting failure apply only for uncracked concrete.
- Minimum base material thickness (see setting detail table)
- Embedment depth (see setting detail table)
- No edge distance and spacing influence (see setting detail tables with characteristic distances)
- For a single anchor
- Anchor and bolt material, as specified in the tables of this section
- Data is valid only for uncracked concrete C20/25
- Shown values representing only steel-related failure modes (steel break in Tension and/or Shear). Other failure modes (concrete cone failure, pullout failure, splitting failure; concrete pry-out, concrete breakout failure) shall be calculated separately
- Partial safety factor for resistance under fire exposure $\gamma_{M,fi}$ = 1,0 (in absence of other national regulations)

Design resistance [a)]

Anchor size				**M6**	**M8**	**M10**	**M12**	**M16**	**M20**
Effective anchorage depth [b)]		h_{ef}	[mm]	≥30	≥30	≥40	≥50	≥65	≥75
Fire exposure R30									
Tension / Shear	HSA, HSA-BW, HSA-R2, HSA-R	$N_{rd,s,fi}$	[kN]	0,20	0,37	0,87	1,69	3,14	4,90
Fire exposure R60									
Tension / Shear	HSA, HSA-BW, HSA-R2, HSA-R	$N_{rd,s,fi}$	[kN]	0,18	0,33	0,75	1,26	2,36	3,68
Fire exposure R90									
Tension / Shear	HSA, HSA-BW, HSA-R2, HSA-R	$N_{rd,s,fi}$	[kN]	0,14	0,26	0,58	1,10	2,04	3,19
Fire exposure R120									
Tension / Shear	HSA, HSA-BW, HSA-R2, HSA-R	$N_{rd,s,fi}$	[kN]	0,10	0,18	0,46	0,84	1,57	2,45

Note:
[a)] It is to be checked whether the admissible cold loads are relevant. Attachment parts are to be proven separately, if required. The boundary conditions according to MPABS-2402765 of 11-02-2025 shall be observed.
[b)] Anchorage depth is according to the setting details below

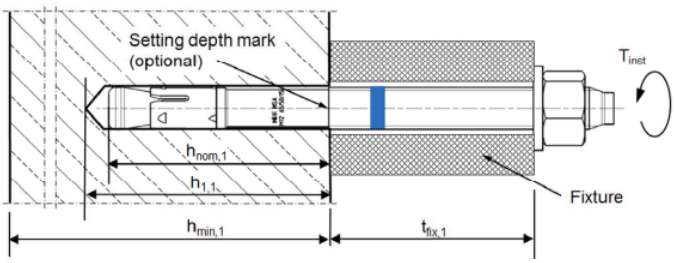
Setting information

Setting details

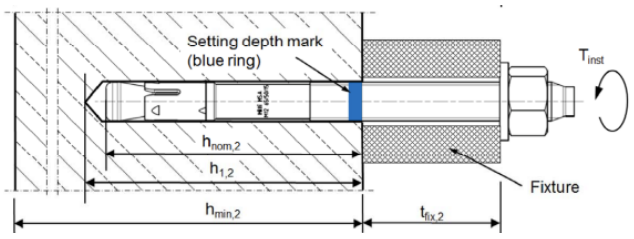
Anchor size			M6			M8			M10		
Nominal anchorage depth	h_{nom}	[mm]	① 37	② 47	③ 67	① 39	② 49	③ 79	① 50	② 60	③ 90
Effective anchorage depth	h_{ef}	[mm]	30	40	60	30	40	70	40	50	80
Minimum base material thickness	h_{min}	[mm]	100	100	120	100	100	120	100	120	160
Nominal diameter of drill bit	d_0	[mm]	6			8			10		
Depth of drill hole	h_{1min}	[mm]	42	52	72	44	54	84	55	65	95
Diameter of clearance hole in the fixture	$d_{f,max}$	[mm]	7			9			12		
Torque moment	T_{inst}	[Nm]	5			15			25		
Wrench size	SW	[mm]	10			13			17		
Characteristic distances											
Spacing for splitting failure	$s_{cr,sp}$	[mm]	100	120	130	130	180	200	190	210	290
Edge distance for splitting failure	$c_{cr,sp}$	[mm]	50	60	65	65	90	100	95	105	145
Spacing for concrete cone failure	$s_{cr,N}$	[mm]	90	120	180	90	120	210	120	150	240
Edge distance for concrete cone failure	$c_{cr,N}$	[mm]	45	60	90	45	60	105	60	75	120
Minimum distances											
Spacing	s_{min}	[mm]	35	35	35	35	35	35	50	50	50
Edge distance	c_{min}	[mm]	35	35	35	40	35	35	50	40	40

Setting details

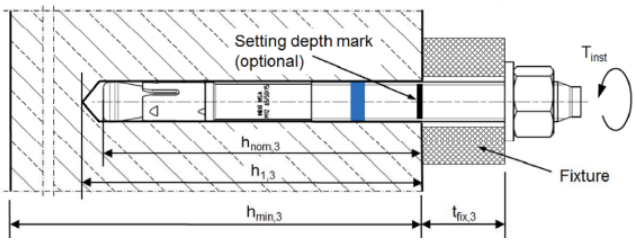
Anchor size			M12			M16			M20		
Nominal anchorage depth	h_{nom}	[mm]	① 64	② 79	③ 114	① 77	② 92	③ 132	① 90	② 115	③ 130
Effective anchorage depth	h_{ef}	[mm]	50	65	100	65	80	120	75	100	115
Minimum base material thickness	h_{min}	[mm]	100	140	180	140	160	180	160	220	220
Minimun spacing	s_{min}	[mm]	70	70	70	90	90	90	195	175	175
Minimum edge distance	c_{min}	[mm]	70	65	55	80	75	70	130	120	120
Nominal diameter of drill bit	d_0	[mm]	12			16			20		
Depth of drill hole	h_{1min}	[mm]	72	87	122	85	100	140	98	123	138
Diameter of clearance hole in the fixture	d_{fmax}	[mm]	14			18			22		
Torque moment	T_{inst}	[Nm]	50			80			200		
Wrench size	SW	[mm]	19			24			30		
Characteristic distances											
Spacing for splitting failure	$s_{cr,sp}$	[mm]	200	250	310	230	280	380	260	370	400
Edge distance for splitting failure	$c_{cr,sp}$	[mm]	100	125	155	115	140	190	130	185	200
Spacing for concrete cone failure	$s_{cr,N}$	[mm]	150	195	300	195	240	360	225	300	345
Edge distance for concrete cone failure	$c_{cr,N}$	[mm]	75	100	150	100	120	180	115	150	175



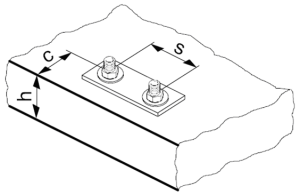
Setting position (1)



Setting position (2)



Setting position (3)



Drilling and Installation equipment

For detailed setting information on installation see instructions for use given with the product.

Rotary Hammers (Corded and Cordless)		TE 2 - TE 70
Diamond Coring Machines		DD 30 … DD 160
Other tools		Torque Impact wrench with AT module (use recommended socket)
		Torque wrinch (use recommended socket)
		Hammer drill bit TE-CX, TE-YX, TE-C, TE-Y
		Hollow drill bit TE-CD, TE-YD
		Diamond core bit SP-L, SP-HX, SP-H, P-U
		Setting Tool HS-SC
		Blow out pump