



PRODUCT TECHNICAL DATASHEET

# HSA



## Expansion anchor

Steel-to-concrete  
Update: Oct-25




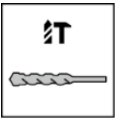
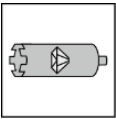
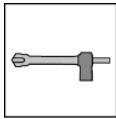
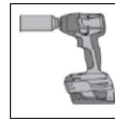





# HSA Expansion anchor

Everyday standard expansion anchor for uncracked concrete

Anchor version	Benefits
 <p>HSA HSA-F HSA-R HSA-R2 (M6-M20)</p>	<ul style="list-style-type: none"> <li>- Fast &amp; convenient setting behaviour</li> <li>- Reliable ETA approved torquing using impact wrench with the innovative SIW and SI-AT system for automatic torquing</li> <li>- Small edge and spacing distances</li> <li>- High loads</li> <li>- Three embedment depths for maximal design flexibility</li> </ul>
 <p>HSA-BW (M6-M20)</p>	<ul style="list-style-type: none"> <li>- M10, M12, M16 and M20 ETA approved for diamond cored holes using DD 30-W and matching diamond core bit</li> <li>- Suitable for pre- and through fastening</li> <li>- Long lengths available suitable for wood structures fastening applications</li> </ul>



Base material	Load conditions
 <p>Concrete (uncracked)</p>	  <p>Static/ quasi-static</p> <p>Fire resistance</p>
Drilling, cleaning, setting	Other information
    <p>Hammer drilled holes</p> <p>Diamond drilled holes</p> <p>Hollow drill-bit drilling</p> <p>Impact wrench with adaptative torque module</p>	   <p>Hilti technical data</p> <p><b>PROFIS Engineering software</b></p> <p><b>Steel to concrete handbook</b></p>



**Linked Approvals/Certificates and Instructions for use**

**Approvals/certificates**

Approval no	Application / loading condition	Authority / Laboratory	Date of issue	Date of expiry
<a href="#"><u>ETA-11/0374</u></a>	Static and quasi-static	DIBt, Berlin	27-10-2023	-
<a href="#"><u>MPABS-2402765</u></a>	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)	<a href="#"><u>IFU-HSA M6</u></a>	<a href="#"><u>IFU-HSA M8</u></a>	<a href="#"><u>IFU-HSA M10</u></a>	<a href="#"><u>IFU-HSA M12</u></a>	<a href="#"><u>IFU-HSA M16</u></a>	<a href="#"><u>IFU-HSA M20</u></a>
HSA-F	-				<a href="#"><u>IFU-HSA M16</u></a>	<a href="#"><u>IFU-HSA M20</u></a>

**Link to Hilti Webpage**

<a href="#"><u>HSA</u></a>	<a href="#"><u>HSA-R</u></a>	<a href="#"><u>HSA-R2</u></a>	<a href="#"><u>HSA-BW</u></a>	<a href="#"><u>HSA- F</u></a>
				

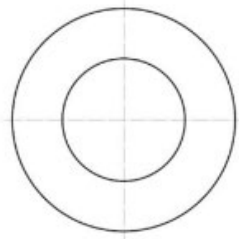
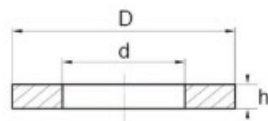
## Fastener special dimensions

### 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  $\gamma = 1,4$

For specific design cases refer to [PROFIS Engineering](#).

Recommended application based on effective anchorage depth  $h_{ef}$

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

**Design resistance**

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**

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 <sup>a)</sup>**

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

**Note:**

<sup>a)</sup> 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.

<sup>b)</sup> Anchorage depth is according to the setting details below

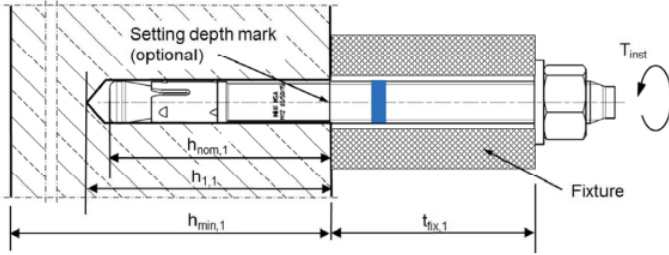
## Setting information

### Setting details

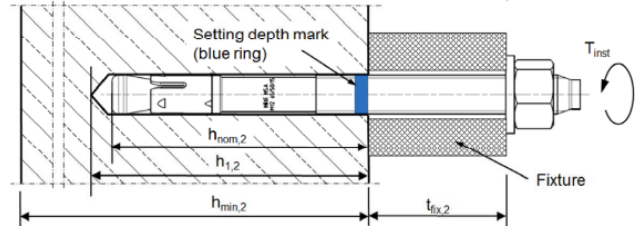
Anchor size			M6			M8			M10		
Nominal anchorage depth	$h_{nom}$		①	②	③	①	②	③	①	②	③
		[mm]	37	47	67	39	49	79	50	60	90
Effective anchorage depth	$h_{ef}$	[mm]	30	40	60	30	40	70	40	50	80
Minimum base material thickness	$h_{min}$	[mm]	100	100	120	100	100	120	100	120	160
Nominal diameter of drill bit	$d_0$	[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		
<b>Characteristic distances</b>											
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
<b>Minimum distances</b>											
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

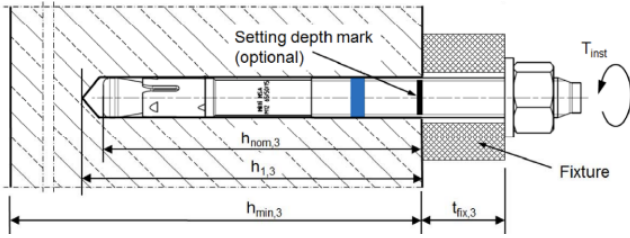
Anchor size			M12			M16			M20		
Nominal anchorage depth	$h_{nom}$		①	②	③	①	②	③	①	②	③
		[mm]	64	79	114	77	92	132	90	115	130
Effective anchorage depth	$h_{ef}$	[mm]	50	65	100	65	80	120	75	100	115
Minimum base material thickness	$h_{min}$	[mm]	100	140	180	140	160	180	160	220	220
Minimum spacing	$s_{min}$	[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	$d_{f,max}$	[mm]	14			18			22		
Torque moment	$T_{inst}$	[Nm]	50			80			200		
Wrench size	SW	[mm]	19			24			30		
<b>Characteristic distances</b>											
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



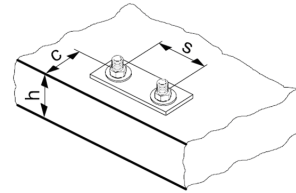
Setting position ①



Setting position ②



Setting position ③





**Drilling and Installation equipment**

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

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