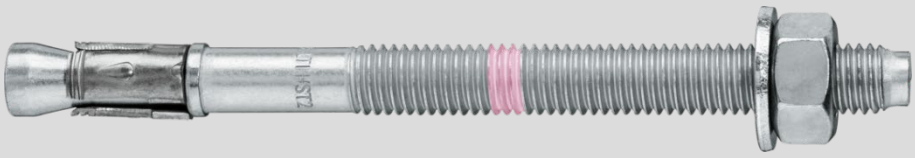
HST2 V3 Expansion anchor

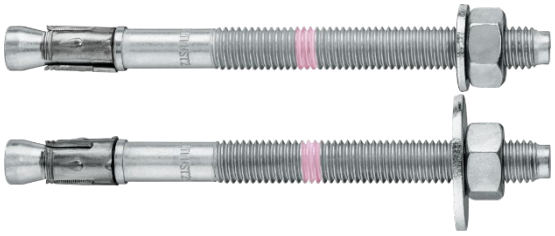
Product Technical Datasheet
Steel-to-concrete
Update:Dec 24



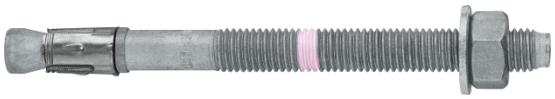
HST2 V3 Expansion anchor

High-performance expansion anchor

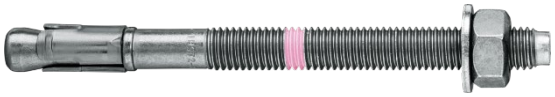
Anchor version	Benefits



HST2 V3
HST2 V3 BW
(M8-M16)



HST2-F V3
(M8-M16)

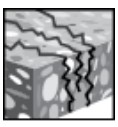


HST2-R V3
(M8-M16)

- Suitable for uncracked and cracked concrete C20/25 to C50/60
- Suitable for seismic design with ETA C1/C2 assessment
- Longer embedment depth option to get higher resistance, closer distance to the edge or smaller spacing
- Shallow embedment depths
- Full design flexibility with variable embedment depth and edge & spacing
- Faster and reliable installation thanks to approved non-cleaning and adaptive torqueing tool
- Product and length identification mark facilitates quality control and inspection
- HST2-F suitable for outdoor use with variable working life (e.g. C3 for 25 years)

Base material	Load conditions

Concrete (uncracked)



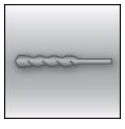
Concrete (cracked)

Static/ quasi-static

Seismic C1/C2

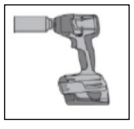
Fire resistance

Drilling, cleaning, setting	Other information

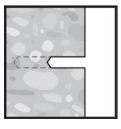


Hammer drilled holes (with no cleaning)

Diamond drilled holes



Impact wrench with adaptative torque module



Variable embedment depth

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
ETA-21/0480	HST2(-F,-R) V3 Static and quasi-static / Seismic / Fire	DIBt Berlin	31-10-2024
ETA-21/0510	HST2-F V3 Varible working life up to 50 years Static and quasi-static / Fire	DIBt Berlin	14-11-2024

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 size	M8	M10	M12	M16
HST2 V3	HST2 V3 M8	HST2 V3 M10	HST2 V3 M12	HST2 V3 M16
HST2-F V3	HST2-F V3 M8	HST2-F V3 M10	HST2-F V3 M12	HST2-F V3 M16
HST2-R V3	HST2-R V3 M8	HST2-R V3 M10	HST2-R V3 M12	HST2-R V3 M16
Filling set	Filling Set			

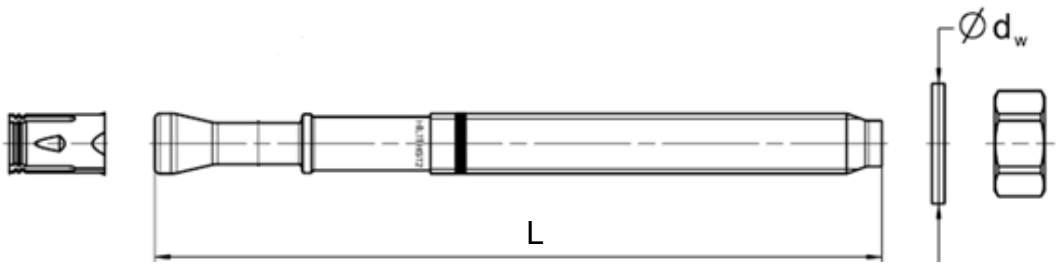
Link to Hilti Webpage

HST2 V3	HST2-F V3	HST2-R V3	HST2 V3 BW

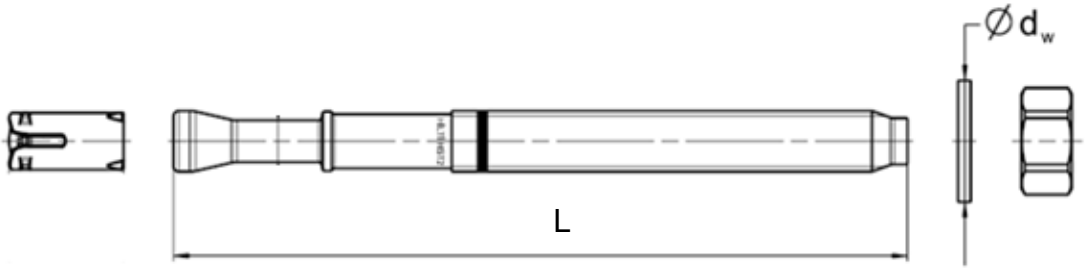
Fastener special dimensions

Anchor size			M8	M10	M12	M16
Maximum length of anchor (HST2 V3)	L	[mm]	230	230	245	245
Maximum length of anchor (HST2-F V3)	L	[mm]	230	230	245	245
Maximum length of anchor (HST2-R V3)	L	[mm]	260	280	295	350
Outer diameter of washer	$d_w \geq$	[mm]	16	20	24	30
Outer diameter of big washer version (BW)	$d_w \geq$	[mm]	24	30	37	50

HST2 (-F) V3

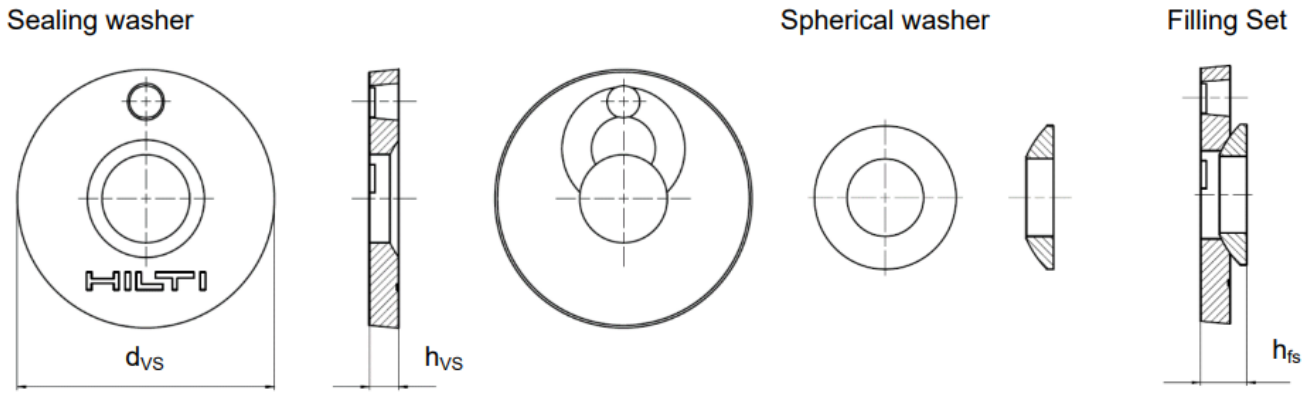


HST2-R V3



Hilti filling set with Injection mortar Hilti HIT-HY…

Anchor size			M8	M10	M12	M16
Diameter	d_{vs}	[mm]	38	42	44	52
Height filling washer	h_{vs}	[mm]	5	5	5	6
Height filling washer and spherical washer	h_{fs}	[mm]	8	9	10	11



Static and quasi-static loading based on ETA-21/0480 Design according to EN 1992-4

All data in this section applies to:

- Correct setting (See setting instruction)
- For a single anchor
- Concrete C20/25
- No edge distance and spacing influence (see table with characteristic distances)
- Characteristic spacing and edge distance for splitting failure apply only for uncracked concrete
- For cracked concrete only the characteristic spacing and edge distance for concrete cone failure are decisive
- Minimum base material thickness (see table)
- Embedment depth, as specified in the table of this section
- Anchor material, as specified in the tables of this section
- HST2-F V3 is suitable for variable working life design up to 50 years. For uncracked concrete refer to ETA-21/0510 for further details. For cracked concrete only Hilti Technical Data is available for Corrosivity category C3 working life 25 years
- Recommended loads: With overall partial safety factor for action γ = 1,4.

Note: Embedment depths h_{ef} <40 mm are applicable only for fastening of redundant non-structural systems as addressed in EN 1992-4, Clause 7.3 and CEN/TR 17079. For other types of fastenings please increase the embedment depth.

For specific design cases refer to PROFIS Engineering

Design resistance(Hammer drilled holes)

Anchor size				M8			M10			M12			M16		
Effective anchorage depth		h_{ef}	[mm]	30[1)]	45	70	40	60	80	50	70	100	65	85	120
Uncracked concrete															
Tension	HST2 V3 / HST2-F V3	N_{Rd}	[kN]	5,4	8,7	10,7	8,3	12,0	16,0	11,6	17,5	22,7	17,2	23,5	29,3
	HST2-R V3			5,4	8,7	10,7	8,3	12,2	16,7	11,6	18,1	23,3	17,2	24,4	30,7
Shear	HST2 V3 / HST2-F V3	V_{Rd}	[kN]	8,5	8,5	8,5	15,1	15,1	15,1	23,6	23,6	23,6	40,8	40,8	40,8
	HST2-R V3			12,6	12,6	12,6	20,2	20,2	20,2	29,4	29,4	29,4	48,5	50,9	50,9
Cracked concrete															
Tension	HST2 V3 / HST2-F V3	N_{Rd}	[kN]	3,3	4,7	4,7	5,8	7,3	7,3	8,1	9,3	9,3	12,0	16,7	16,7
	HST2-R V3			3,3	3,3	3,3	5,8	6,0	6,0	8,0	8,0	8,0	12,0	16,7	16,7
Shear	HST2 V3 / HST2-F V3	V_{Rd}	[kN]	8,5	8,5	8,5	14,8	15,1	15,1	20,9	23,6	23,6	33,9	40,8	40,8
	HST2-R V3			8,8	12,6	12,6	14,8	20,2	20,2	20,9	29,4	29,4	33,9	50,7	50,9

Recommended loads (Hammer drilled holes)

Anchor size				M8			M10			M12			M16		
Effective anchorage depth		h_{ef}	[mm]	30[1)]	45	70	40	60	80	50	70	100	65	85	120
Uncracked concrete															
Tension	HST2 V3 / HST2-F V3	N_{rec}	[kN]	[1)]	6,2	7,6	5,9	8,6	11,4	8,3	12,5	16,2	12,3	16,8	21,0
	HST2-R V3			[1)]	6,2	7,6	5,9	8,7	11,9	8,3	12,9	16,7	12,3	17,4	21,9
Shear	HST2 V3 / HST2-F V3	V_{rec}	[kN]	[1)]	6,1	6,1	10,8	10,8	10,8	16,9	16,9	16,9	29,1	29,1	29,1
	HST2-R V3			[1)]	9,0	9,0	14,5	14,5	14,5	21,0	21,0	21,0	34,6	36,3	36,3
Cracked concrete															
Tension	HST2 V3 / HST2-F V3	N_{rec}	[kN]	[1)]	3,3	3,3	4,1	5,2	5,2	5,8	6,7	6,7	8,6	11,9	11,9
	HST2-R V3			[1)]	2,4	2,4	4,1	4,3	4,3	5,7	5,7	5,7	8,6	11,9	11,9
Shear	HST2 V3 / HST2-F V3	V_{rec}	[kN]	[1)]	6,1	6,1	10,6	10,8	10,8	14,9	16,9	16,9	24,2	29,1	29,1
	HST2-R V3			[1)]	9,0	9,0	10,6	14,5	14,5	14,9	21,0	21,0	24,2	36,2	36,3

[1)] Please refer “Requirements for redundant fastening“ section.

Design resistance (Diamond cored holes)

Anchor size				M8			M10			M12			M16		
Effective anchorage depth		h_{ef}	[mm]	30[1)]	45	70	40	60	80	50	70	100	65	85	120
Uncracked concrete															
Tension	HST2 V3 HST2-F V3	N_{Rd}	[kN]	4,0	7,0	8,7	6,7	10,2	13,3	11,6	17,5	22,7	17,2	23,5	29,3
	HST2-R V3			4,0	6,9	8,0	6,7	9,8	13,3	9,3	14,1	18,7	13,3	19,3	24,0
Shear	HST2 V3 HST2-F V3	V_{Rd}	[kN]	8,5	8,5	8,5	15,1	15,1	15,1	23,6	23,6	23,6	40,8	40,8	40,8
	HST2-R V3			12,6	12,6	12,6	20,2	20,2	20,2	29,4	29,4	29,4	48,5	50,9	50,9
Cracked concrete															
Tension	HST2 V3 HST2-F V3	N_{Rd}	[kN]	3,3	4,7	4,7	4,7	6,0	6,0	6,7	8,0	8,0	9,3	13,3	13,3
	HST2-R V3			3,3	3,3	3,3	5,8	6,0	6,0	8,0	8,0	8,0	12,0	16,7	16,7
Shear	HST2 V3 HST2-F V3	V_{Rd}	[kN]	8,5	8,5	8,5	14,8	15,1	15,1	20,9	23,6	23,6	33,9	40,8	40,8
	HST2-R V3			8,8	12,6	12,6	14,8	20,2	20,2	20,9	29,4	29,4	33,9	50,7	50,9

Recommended loads (Diamond cored holes)

Anchor size				M8			M10			M12			M16		
Effective anchorage depth		h_{ef}	[mm]	30[1)]	45	70	40	60	80	50	70	100	65	85	120
Uncracked concrete															
Tension	HST2 V3 HST2-F V3	N_{rec}	[kN]	[1)]	5,0	6,2	4,8	7,3	9,5	8,3	12,5	16,2	12,3	16,8	21,0
	HST2-R V3			[1)]	4,9	5,7	4,8	7,0	9,5	6,7	10,1	13,3	9,5	13,8	17,1
Shear	HST2 V3 HST2-F V3	V_{rec}	[kN]	[1)]	6,1	6,1	10,8	10,8	10,8	16,9	16,9	16,9	29,1	29,1	29,1
	HST2-R V3			[1)]	9,0	9,0	14,5	14,5	14,5	21,0	21,0	21,0	34,6	36,3	36,3
Cracked concrete															
Tension	HST2 V3 HST2-F V3	N_{rec}	[kN]	[1)]	3,3	3,3	3,3	4,3	4,3	4,8	5,7	5,7	6,7	9,5	9,5
	HST2-R V3			[1)]	2,4	2,4	4,1	4,3	4,3	5,7	5,7	5,7	8,6	11,9	11,9
Shear	HST2 V3 HST2-F V3	V_{rec}	[kN]	[1)]	6,1	6,1	10,6	10,8	10,8	14,9	16,9	16,9	24,2	29,1	29,1
	HST2-R V3			[1)]	9,0	9,0	10,6	14,5	14,5	14,9	21,0	21,0	24,2	36,2	36,3

[1)] Please refer “Requirements for redundant fastening“ section

Requirements for redundant fastening

The definition of redundant fastening according to Member States is given in EN 1992-4 and CEN/TR 17079. In Absence of a definition by a Member State the following default values may be taken.

Minimum number of fixing points	Minimum number of anchors per fixing point	Maximum design load of action F_{Sd} per fixing point
3	1	2 kN
4	1	3 kN

The value for maximum design load of actions per fastening point F_{Sd} is valid in general that means all fastening points are considered in the design of the redundant structural system. F_{Sd} can be a tension, shear or inclined load.

Seismic loading based on ETA-21/0480. Design according to EN 1992-4

All data in this section applies to:
- Correct setting (See setting instruction)
- For a single anchor
- Concrete C20/25
- Hammer drilled holes
- No edge distance and spacing influence (see table with characteristic distances)
- Characteristic spacing and edge distance for splitting failure apply only for uncracked concrete.
- For cracked concrete only the characteristic spacing and edge distance for concrete cone failure are decisive
- Minimum base material thickness (see table)
- Embedment depth, as specified in the table of this section
- Anchor material, as specified in the tables of this section
- α_{gap} = 1,0 (using Hilti filling set) and α_{gap} = 0,5 (without using Hilti filling set) accordingly

For specific design cases refer to PROFIS Engineering.

Design resistance in case of seismic performance C2

Anchor size				M10	M12	M16
Effective anchorage depth		h_{ef}	[mm]	60	70	85
with and without Hilti filling set						
Tension	HST2 V3 HST2-F V3	$N_{Rd,C2}$	[kN]	3,7	9,3	12,0
	HST2-R V3			2,2	6,7	8,5
with filling set (α_{gap}=1,0)						
Shear	HST2 V3 HST2-F V3	$V_{Rd,C2}$	[kN]	5,9	8,9	20,0
	HST2-R V3			9,6	14,4	30,0
without filling set (α_{gap}=0,5)						
Shear	HST2 V3 HST2-F V3	$V_{Rd,C2}$	[kN]	3,0	4,4	10,0
	HST2-R V3			4,8	7,2	15,0

Design resistance in case of seismic performance C1

Anchor size				M10	M12	M16
Effective anchorage depth		h_{ef}	[mm]	60	70	85
with and without Hilti filling set						
Tension	HST2 V3 HST2-F V3	$N_{Rd,C1}$	[kN]	7,3	9,3	15,1
	HST2-R V3			5,3	7,1	12,0
with filling set (α_{gap}=1,0)						
Shear	HST2 V3 HST2-F V3	$V_{Rd,C1}$	[kN]	9,5	17,1	31,8
	HST2-R V3			10,9	18,5	30,0
without filling set (α_{gap}=0,5)						
Shear	HST2 V3 HST2-F V3	$V_{Rd,C1}$	[kN]	4,8	8,6	15,9
	HST2-R V3			5,4	9,2	15,0

Fire resistance based on ETA-21/0480 Design according to EN 1992-4

All data in this section applies to:
- Correct setting (See setting instruction)
- For a single anchor
- Concrete C20/25
- No edge distance and spacing influence (see table with characteristic distances)
- Characteristic spacing and edge distance for splitting failure apply only for uncracked concrete.
- For cracked concrete only the characteristic spacing and edge distance for concrete cone failure are decisive
- Minimum base material thickness (see table)
- Embedment depth, as specified in the table of this section
- Anchor material, as specified in the tables of this section
- Partial safety factor for resistance under fire exposure $\gamma_{M,fi} = 1{,}0$

Note: Embedment depths h_{ef} <40 mm are applicable only for fastening of redundant non-structural systems as addressed in EN 1992-4, Clause 7.3 and CEN/TR 17079. For other types of fastenings please increase the embedment depth.

For specific design cases refer to PROFIS Engineering.

Design resistance in case of fire (Hammer drilled holes)

Anchor size				**M8**			**M10**			**M12**			**M16**		
Effective anchorage depth		h_{ef}	[mm]	30[1)]	45	70	40	60	80	50	70	100	65	85	120
Fire Exposure R30															
Tension	HST2 V3 HST2-F V3	$N_{Rd,fi(30)}$	[kN]	0,4	1,2	1,2	0,9	2,6	2,6	1,7	3,5	3,5	3,1	6,3	6,3
	HST2-R V3			0,4	0,9	0,9	0,9	2,3	2,3	1,7	3,0	3,0	3,1	6,3	6,3
Shear	HST2 V3 HST2-F V3	$V_{Rd,fi(30)}$	[kN]	0,4	1,2	1,2	0,9	2,6	2,6	1,7	4,8	4,8	3,1	9,0	9,0
	HST2-R V3			0,4	0,9	0,9	0,9	2,5	2,5	1,7	5,0	5,0	3,1	9,0	9,0
Fire Exposure R60															
Tension	HST2 V3 HST2-F V3	$N_{Rd,fi(60)}$	[kN]	0,3	1,0	1,0	0,8	2,1	2,1	1,3	3,5	3,5	2,4	6,3	6,3
	HST2-R V3			0,3	0,7	0,7	0,8	1,5	1,5	1,3	3,0	3,0	2,4	6,0	6,0
Shear	HST2 V3 HST2-F V3	$V_{Rd,fi(60)}$	[kN]	0,3	1,0	1,0	0,8	2,1	2,1	1,3	3,8	3,8	2,4	7,0	7,0
	HST2-R V3			0,3	0,7	0,7	0,8	1,5	1,5	1,3	3,5	3,5	2,4	6,0	6,0
Fire Exposure R90															
Tension	HST2 V3 HST2-F V3	$N_{Rk,fi(90)}$	[kN]	0,3	0,8	0,8	0,6	1,5	1,5	1,1	2,7	2,7	2,0	5,0	5,0
	HST2-R V3			0,3	0,6	0,6	0,6	1,0	1,0	1,1	2,0	2,0	2,0	3,5	3,5
Shear	HST2 V3 HST2-F V3	$V_{Rk,fi(90)}$	[kN]	0,3	0,8	0,8	0,6	1,5	1,5	1,1	2,7	2,7	2,0	5,0	5,0
	HST2-R V3			0,3	0,6	0,6	0,6	1,0	1,0	1,1	2,0	2,0	2,0	3,5	3,5
Fire Exposure R120															
Tension	HST2 V3 HST2-F V3	$N_{Rd,fi(120)}$	[kN]	0,2	0,6	0,6	0,5	1,2	1,2	0,8	2,1	2,1	1,6	4,0	4,0
	HST2-R V3			0,2	0,5	0,5	0,5	0,7	0,7	0,8	1,0	1,0	1,6	2,0	2,0
Shear	HST2 V3 HST2-F V3	$V_{Rd,fi(120)}$	[kN]	0,2	0,6	0,6	0,5	1,2	1,2	0,8	2,1	2,1	1,5	4,0	4,0
	HST2-R V3			0,2	0,5	0,5	0,5	0,7	0,7	0,8	1,0	1,0	1,6	2,0	2,0

[1)] Please refer “Requirements for redundant fastening“ section

Design resistance in case of fire (Diamond cored holes)

Anchor size				M8			M10			M12			M16		
Effective anchorage depth		h_{ef}	[mm]	30[1)]	45	70	40	60	80	50	70	100	65	85	120
Fire Exposure R30															
Tension	HST2 V3 HST2-F V3	$N_{Rd,fi(30)}$	[kN]	0,4	1,2	1,2	0,9	2,3	2,3	1,7	3,0	3,0	3,1	5,0	5,0
	HST2-R V3			0,4	0,9	0,9	0,9	2,3	2,3	1,7	3,0	3,0	3,1	6,3	6,3
Shear	HST2 V3 HST2-F V3	$V_{Rd,fi(30)}$	[kN]	0,4	1,2	1,2	0,9	2,6	2,6	1,7	4,8	4,8	3,1	9,0	9,0
	HST2-R V3			0,4	0,9	0,9	0,9	2,5	2,5	1,7	5,0	5,0	3,1	9,0	9,0
Fire Exposure R60															
Tension	HST2 V3 HST2-F V3	$N_{Rd,fi(60)}$	[kN]	0,3	1,0	1,0	0,8	2,1	2,1	1,3	3,0	3,0	2,4	5,0	5,0
	HST2-R V3			0,3	0,7	0,7	0,8	1,5	1,5	1,3	3,0	3,0	2,4	6,0	6,0
Shear	HST2 V3 HST2-F V3	$V_{Rd,fi(60)}$	[kN]	0,3	1,0	1,0	0,8	2,1	2,1	1,3	3,8	3,8	2,4	7,0	7,0
	HST2-R V3			0,3	0,7	0,7	0,8	1,5	1,5	1,3	3,5	3,5	2,4	6,0	6,0
Fire Exposure R90															
Tension	HST2 V3 HST2-F V3	$N_{Rk,fi(90)}$	[kN]	0,3	0,8	0,8	0,6	1,5	1,5	1,1	2,7	2,7	2,0	5,0	5,0
	HST2-R V3			0,3	0,6	0,6	0,6	1,0	1,0	1,1	2,0	2,0	2,0	3,5	3,5
Shear	HST2 V3 HST2-F V3	$V_{Rk,fi(90)}$	[kN]	0,3	0,8	0,8	0,6	1,5	1,5	1,1	2,7	2,7	2,0	5,0	5,0
	HST2-R V3			0,3	0,6	0,6	0,6	1,0	1,0	1,1	2,0	2,0	2,0	3,5	3,5
Fire Exposure R120															
Tension	HST2 V3 HST2-F V3	$N_{Rd,fi(120)}$	[kN]	0,2	0,6	0,6	0,5	1,2	1,2	0,8	2,1	2,1	1,6	4,0	4,0
	HST2-R V3			0,2	0,5	0,5	0,5	0,7	0,7	0,8	1,0	1,0	1,6	2,0	2,0
Shear	HST2 V3 HST2-F V3	$V_{Rd,fi(120)}$	[kN]	0,2	0,6	0,6	0,5	1,2	1,2	0,8	2,1	2,1	1,6	4,0	4,0
	HST2-R V3			0,2	0,5	0,5	0,5	0,7	0,7	0,8	1,0	1,0	1,6	2,0	2,0

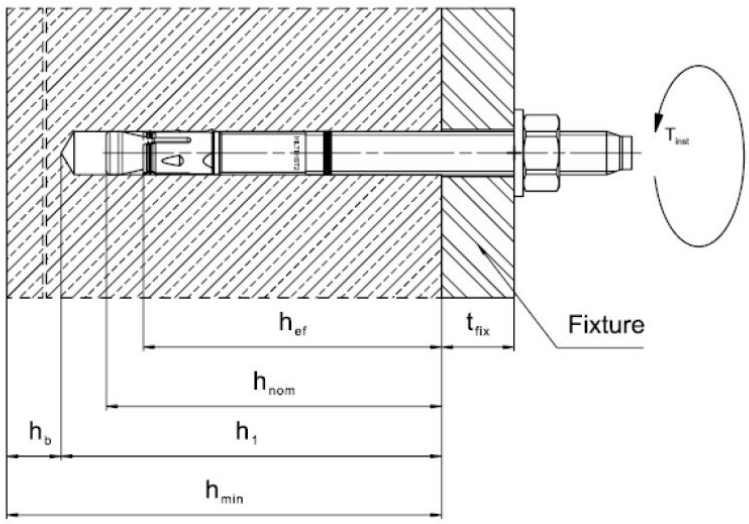
[1)] Please refer “Requirements for redundant fastening“ section

Setting information

Setting details HST2(-F) V3

Anchor size				M8			M10			M12			M16		
Nominal diameter of drill bit		d_o	[mm]	8			10			12			16		
Maximum diameter of clearance hole in the fixture		d_f	[mm]	9			12			14			18		
Torque moment (HST2 V3)		T_{inst}	[Nm]	15			25			40			80		
Torque moment (HST2-F V3)		T_{inst}	[Nm]	25			40			50			110		
Effective anchorage depth		h_{ef}	[mm]	30	45	70	40	60	80	50	70	100	65	85	120
Nominal embedment depth		h_{nom}	[mm]	40	55	80	50	70	90	63	83	113	78	98	133
				h_{ef} + 10			h_{ef} + 10			h_{ef} + 13			h_{ef} + 13		
Drill hole depth															
Hammer drill	not cleaned	h_{1min}	[mm]	60	75	100	70	90	110	83	103	133	98	118	153
				h_{nom} + 20											
	cleaned	h_{1min}	[mm]	45	60	85	55	75	95	71	91	121	86	106	141
				h_{nom} + 5						h_{nom} + 8					
Diamond coring		h_{1min}	[mm]	50	65	90	60	80	100	73	93	123	88	108	143
				h_{nom} + 10											
Concrete thickness belowbore hole		h_{bmin}	[mm]	21			27			32			34		
Minimum concrete thickness		h_{min}	[mm]	max(100; 1,5 h_{ef}; h_1+h_b)			max(120; 1,5 h_{ef}; h_1+h_b)			max(140; 1,5 h_{ef}; h_1+h_b)			max (160; 1,5 h_{ef}; h_1+h_b)		
Fixture thicknesses															
Thickness of Hilti filling set		h_{fs}	[mm]	8			9			10			11		
Effective fixture thickness with Hilti filling set		$t_{fix,ef}$	[mm]	t_{fix} - h_{fs}											
Characteristic distances HST2(-F) V3															
Spacing for splitting failure and concrete cone failure [a]		$s_{cr,sp}$	[mm]	152	191	210	194	291	386	181	284	340	210	337	409
		$s_{cr,N}$	[mm]	90	135	210	120	180	240	150	210	300	195	255	360
Edge distance for splitting failure and concrete cone failure [a]		$c_{cr,sp}$	[mm]	76	96	105	97	146	193	91	142	170	105	168	204
		$c_{cr,N}$	[mm]	45	68	105	60	90	120	75	105	150	98	128	180

[a] Values calculated under the hypothesis of uncracked concrete C20/25, cleaned, hammer drilled borehole.

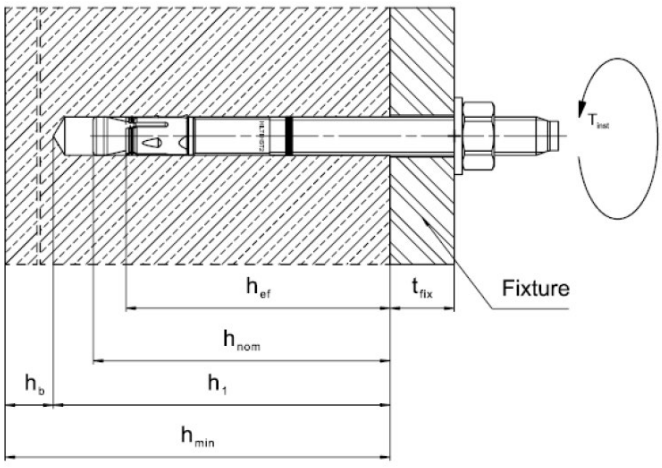


Setting information

Setting details HST2-R V3

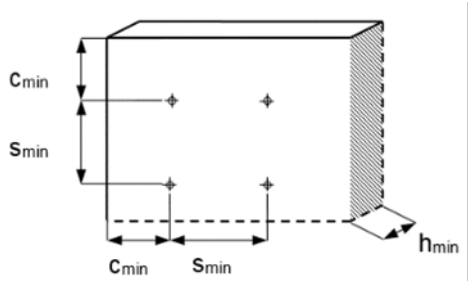
Anchor size				M8			M10			M12			M16		
Nominal diameter of drill bit		d_o	[mm]	8			10			12			16		
Maximum diameter of clearance hole in the fixture		d_f	[mm]	9			12			14			18		
Torque moment		T_{inst}	[Nm]	20			45			60			110		
Effective anchorage depth		h_{ef}	[mm]	30	45	70	40	60	80	50	70	100	65	85	120
Nominal embedment depth		h_{nom}	[mm]	38	53	78	49	69	89	60	80	110	78	98	133
				h_{ef} + 8			h_{ef} + 9			h_{ef} + 10			h_{ef} + 13		
Drill hole depth															
Hammer drill	not cleaned	h_{1min}	[mm]	58	73	98	69	89	109	80	100	130	98	118	153
				h_{nom} + 20											
	cleaned	h_{1min}	[mm]	43	58	83	54	74	94	68	88	118	86	106	141
				h_{nom} + 5						h_{nom} + 8					
Diamond coring		h_{1min}	[mm]	48	63	88	59	79	99	70	90	120	88	102	143
				h_{nom} + 10											
Minimum Concrete thickness belowbore hole		h_{bmin}	[mm]	21			27			32			34		
Minimum concrete thickness		h_{min}	[mm]	max(100; 1,5 h_{ef}; h_1+h_b)			max(120; 1,5 h_{ef}; h_1+h_b)			max(140; 1,5 h_{ef}; h_1+h_b)			max(160; 1,5 h_{ef}; h_1+h_b)		
Fixture thicknesses															
Thickness of Hilti filling set		h_{fs}	[mm]	8			9			10			11		
Effective fixture thickness with Hilti filling set		$t_{fix,ef}$	[mm]	t_{fix} - h_{fs}											
Characteristic distances HST2-R V3															
Spacing for splitting failure and concrete cone failure [a]		$s_{cr,sp}$	[mm]	142	248	299	161	241	319	204	292	343	327	432	475
		$s_{cr,N}$	[mm]	90	135	210	120	180	240	150	210	300	195	255	360
Edge distance for splitting failure and concrete cone failure [a]		$c_{cr,sp}$	[mm]	71	124	150	80	120	159	102	146	171	163	216	238
		$c_{cr,N}$	[mm]	45	68	105	60	90	120	75	105	150	98	128	180

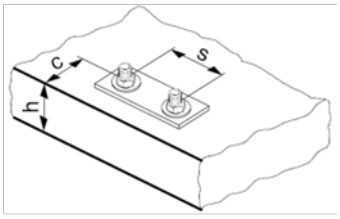
[a] Values calculated under the hypothesis of uncracked concrete C20/25, cleaned, hammer drilled borehole.



HST2 (-F) V3
Minimum spacing s_{min}, edge distance c_{min} and required splitting area $A_{sp,req}$

We recommend checking your designs in Hilti's PROFIS Engineering software to verify the edge & spacing values. ETA-21/0480 provides formulae for the calculation of flexible edge & spacing for each anchor layout configuration depending on base material thickness.
Minimum spacing and edge distance values on the tables below are recommendations for specific anchor layout and base material dimensions.





Anchor size HST2(-F) V3			M8					
Effective anchorage depth	h_{ef}	[mm]	30		45		70	
Drill hole cleaned			yes	no	yes	no	yes	no
Min. base material thickness	h_{min}	[mm]	100	100	100	100	110	125
Uncracked concrete								
Minimum spacing	s_{min}	[mm]	40	40	40	40	40	40
	for c_{min}	[mm]	55	55	55	55	50	45
Minimum edge distance	c_{min}	[mm]	45	45	45	45	45	45
	for s_{min}	[mm]	65	65	60	60	50	40
Cracked concrete								
Minimum spacing	s_{min}	[mm]	40	40	40	40	40	40
	for c_{min}	[mm]	50	50	45	45	45	45
Minimum edge distance	c_{min}	[mm]	45	45	45	45	45	45
	for s_{min}	[mm]	40	40	40	40	40	40

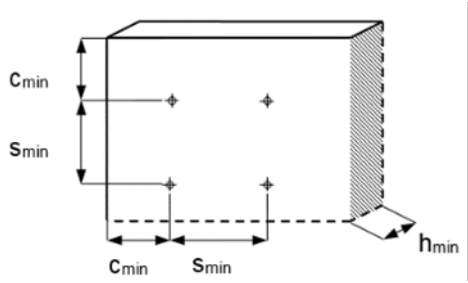
Anchor size HST2(-F) V3			M10					
Effective anchorage depth	h_{ef}	[mm]	40		60		80	
Drill hole cleaned			yes	no	yes	no	yes	no
Min. base material thickness	h_{min}	[mm]	120	120	120	120	125	140
Uncracked concrete								
Minimum spacing	s_{min}	[mm]	55	55	55	55	55	55
	for c_{min}	[mm]	75	75	75	75	70	60
Minimum edge distance	c_{min}	[mm]	55	55	55	55	55	55
	for s_{min}	[mm]	105	105	105	105	95	65
Cracked concrete								
Minimum spacing	s_{min}	[mm]	55	55	55	55	55	55
	for c_{min}	[mm]	55	55	55	55	55	55
Minimum edge distance	c_{min}	[mm]	55	55	55	55	55	55
	for s_{min}	[mm]	55	55	55	55	55	55

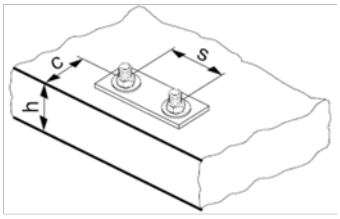
Anchor size HST2(-F) V3			M12					
Effective anchorage depth	h_{ef}	[mm]	50		70		100	
Drill hole cleaned			yes	no	yes	no	yes	no
Min. base material thickness	h_{min}	[mm]	140	140	140	140	155	165
Uncracked concrete								
Minimum spacing	s_{min}	[mm]	60	60	60	60	60	60
	for c_{min}	[mm]	75	75	75	75	65	65
Minimum edge distance	c_{min}	[mm]	55	55	55	55	55	55
	for s_{min}	[mm]	125	125	110	110	115	95
Cracked concrete								
Minimum spacing	s_{min}	[mm]	60	60	60	60	60	60
	for c_{min}	[mm]	60	60	55	55	60	55
Minimum edge distance	c_{min}	[mm]	55	55	55	55	55	55
	for s_{min}	[mm]	70	70	60	60	60	60

Anchor size HST2(-F) V3			M16					
Effective anchorage depth	h_{ef}	[mm]	65		85		120	
Drill hole cleaned			yes	no	yes	no	yes	no
Min. base material thickness	h_{min}	[mm]	160	160	160	160	180	190
Uncracked concrete								
Minimum spacing	s_{min}	[mm]	70	70	70	70	70	70
	for c_{min}	[mm]	85	85	85	85	75	75
Minimum edge distance	c_{min}	[mm]	70	70	70	70	70	70
	for s_{min}	[mm]	105	105	105	105	95	80
Cracked concrete								
Minimum spacing	s_{min}	[mm]	70	70	70	70	70	70
	for c_{min}	[mm]	70	70	70	70	70	70
Minimum edge distance	c_{min}	[mm]	70	70	70	70	70	70
	for s_{min}	[mm]	70	70	70	70	70	70

HST2-R V3
Minimum spacing s_{min}, edge distance c_{min} and required splitting area $A_{sp,req}$

We recommend checking your designs in Hilti's PROFIS Engineering software to verify the edge & spacing values. ETA-21/0480 provides formulae for the calculation of flexible edge & spacing for each anchor layout configuration depending on base material thickness.
Minimum spacing and edge distance values on the tables below are recommendations for specific anchor layout and base material dimensions.





Anchor size HST2-R V3			M8					
Effective anchorage depth	h_{ef}	[mm]	30		45		70	
Drill hole cleaned			yes	no	yes	no	yes	no
Min. base material thickness	h_{min}	[mm]	100	100	100	100	105	120
Uncracked concrete								
Minimum spacing	s_{min}	[mm]	40	40	40	40	40	40
	for c_{min}	[mm]	60	60	60	60	60	50
Minimum edge distance	c_{min}	[mm]	45	45	45	45	45	45
	for s_{min}	[mm]	90	90	85	85	80	50
Cracked concrete								
Minimum spacing	s_{min}	[mm]	40	40	40	40	40	40
	for c_{min}	[mm]	50	50	50	50	50	45
Minimum edge distance	c_{min}	[mm]	45	45	45	45	45	45
	for s_{min}	[mm]	50	50	45	45	45	40

Anchor size HST2-R V3			M10					
Effective anchorage depth	h_{ef}	[mm]	40		60		80	
Drill hole cleaned			yes	no	yes	no	yes	no
Min. base material thickness	h_{min}	[mm]	120	120	120	120	125	140
Uncracked concrete								
Minimum spacing	s_{min}	[mm]	55	55	55	55	55	55
	for c_{min}	[mm]	70	70	70	70	70	60
Minimum edge distance	c_{min}	[mm]	50	50	50	50	50	50
	for s_{min}	[mm]	130	130	115	115	115	90
Cracked concrete								
Minimum spacing	s_{min}	[mm]	55	55	55	55	55	55
	for c_{min}	[mm]	65	65	65	65	60	55
Minimum edge distance	c_{min}	[mm]	50	50	50	50	50	50
	for s_{min}	[mm]	100	100	90	90	90	65

Anchor size HST2-R V3			M12					
Effective anchorage depth	h_{ef}	[mm]	50		70		100	
Drill hole cleaned			yes	no	yes	no	yes	no
Min. base material thickness	h_{min}	[mm]	140	140	140	140	150	165
Uncracked concrete								
Minimum spacing	s_{min}	[mm]	60	60	60	60	60	60
	for c_{min}	[mm]	80	80	80	80	75	70
Minimum edge distance	c_{min}	[mm]	55	55	55	55	55	55
	for s_{min}	[mm]	155	155	135	135	155	120
Cracked concrete								
Minimum spacing	s_{min}	[mm]	60	60	60	60	60	60
	for c_{min}	[mm]	70	70	70	70	65	60
Minimum edge distance	c_{min}	[mm]	55	55	55	55	55	55
	for s_{min}	[mm]	110	110	95	95	110	85

Anchor size HST2-R V3			M16					
Effective anchorage depth	h_{ef}	[mm]	65		85		120	
Drill hole cleaned			yes	no	yes	no	yes	no
Min. base material thickness	h_{min}	[mm]	160	160	160	160	180	190
Uncracked concrete								
Minimum spacing	s_{min}	[mm]	70	70	70	70	70	70
	for c_{min}	[mm]	100	100	100	100	85	80
Minimum edge distance	c_{min}	[mm]	60	60	60	60	60	60
	for s_{min}	[mm]	200	200	185	185	210	185
Cracked concrete								
Minimum spacing	s_{min}	[mm]	70	70	70	70	70	70
	for c_{min}	[mm]	80	80	80	80	75	70
Minimum edge distance	c_{min}	[mm]	60	60	60	60	60	60
	for s_{min}	[mm]	135	135	125	125	145	125

Drilling and Installation equipment

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

Rotary Hammers (Corded and Cordless)		TE 2 - TE 70
Diamond Coring Machines		DD EC-1, DD 30-W, DD 150-U
Other tools		Torque Impact wrench with AT module - SIW 6AT-22 & SI-AT-22 - SIW 4AT-22 & SI-AT-22
		Hammer drill bit TE-CX, TE-YX, TE-C, TE-Y
		Diamond core bit TS, TL, SPX-T, SPX-L
		Setting Tool HS-SC
		Blow out pump