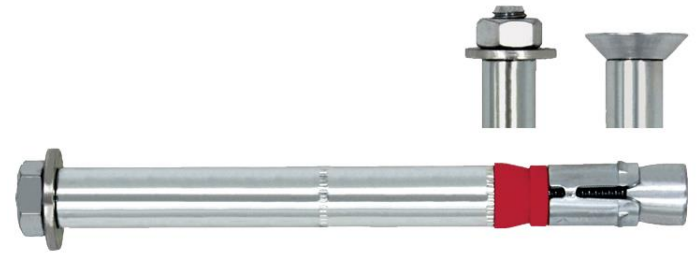


HD – MECHANICAL ANCHOR FOR HIGH LOADS



Usage:

- anchor designed for fastening elements of building structures, heavy devices, etc. under high loads
- fastening of dynamically loaded structural elements (vibrations, wind),
- basic anchor for fixing all types of steel constructions to concrete base in cracked and non-cracked concrete

Advantages:

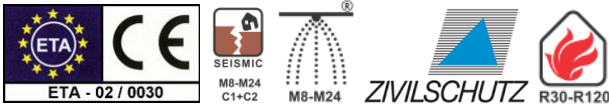
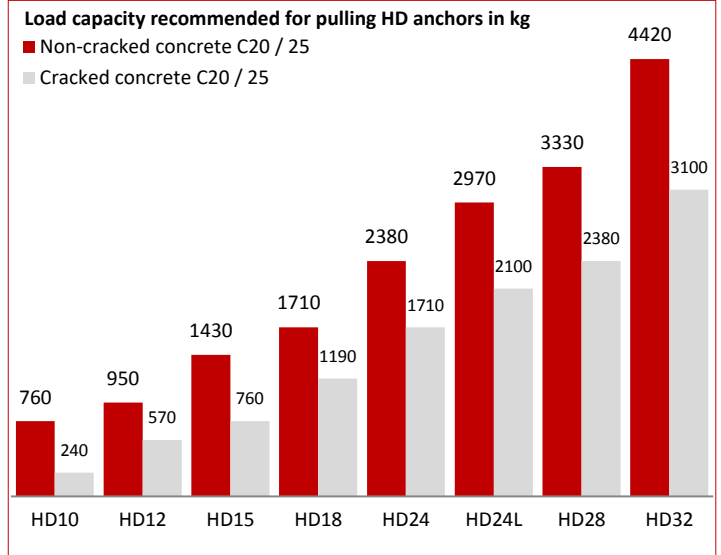
- high parameters ensuring safe fastening in cracked and non-cracked concrete
- The highest load-bearing and shear loads among mechanical anchors
- fastening in seismic zones of category C1 and C2 (M8-M24)
- simple assembly without special tools
- possibility of complete disassembly of the anchor - only the ring and the expansion cone remain in the hole
- fire resistance R30-R120 (M6-M24)

Anchor material:

The threaded rod or HD anchor screw are made of carbon steel in the mechanical properties class 8.8 according to EN ISO 898-1: 2013, the HD anchor spacer sleeve is made of EN 10305-2: 2016 steel, EN 10305-3: 2016, polyethylene plastic ring, EN 10139: 2016 steel expansion ring, EN 10083 steel expansion cone -2: 2006, washer made of steel EN 10139: 2016, nut made of steel grade 8 acc. EN ISO 898-2: 2012, conical flat washer made of steel EN 10083-2: 2006. All steel parts of HD anchor covered with a layer of galvanization not less than 5µm thick according to EN ISO 4042: 1999

Substrate material:

Cracked and non-cracked concrete class \geq C20 / 25 to C50 / 60.



HD anchor marking method			
Anchor mark	Anchor version	Hole size d_o [mm]	Attachment thickness t_{fix} [mm]
HD	LM - version with hexagon screw	10	10
HD	PM - version with nut	10	10
HD	F - version with countersunk head screw	12	10

Technical parameters of HDLM and HDPM anchors

Product Code - screw version	Product Code - version with nut	Thread size of rod or screw	Hole dia in the base material	Min. hole depth	Effective anchorage depth – min-max	Max. thickness of fixed element	Min. hole dia. in the element to be fixed	Anchor length - version with HDLM screw	Anchor length version with nut HDPM
		d [mm]	d_o [mm]	h_1 [mm]	$h_{ef,min} - h_{ef,max}$ [mm]	t_{fix} [mm]	d_f [mm]	L [mm]	L [mm]
HDLM10/0*	HDPM10/0*	M6	10	65	50	0	12	65	67
HDLM10/10	HDPM10/10			65-67	50-60	10		75	77
HDLM10/30	HDPM10/30			65-91	50-76	30		95	97
HDLM10/50	HDPM10/50			65-91	50-76	50		115	117
-	HDPM10/100*			65-91	50-76	100		-	167
HDLM12/0*	HDPM12/0*	M8	12	80	60	0	14	75	80
HDLM12/10	HDPM12/10			80-90	60-70	10		85	90
HDLM12/20*	HDPM12/20			80-100	60-80	20		95	-
HDLM12/30	HDPM12/30			80-110	60-90	30		105	110
HDLM12/50	HDPM12/50			80-120	60-100	50		125	130
-	HDPM12/100*			80-120	60-100	100		-	180
HDLM15/0*	HDPM15/0*	M10	15	95	71	0	17	91	96
HDLM15/15	HDPM15/15			95-110	71-86	15		106	111
HDLM15/25	HDPM15/25			95-120	71-96	25		116	121
HDLM15/45	HDPM15/45			95-134	71-110	45		136	141
HDLM15/95*	HDPM15/95*			95-134	71-110	95		186	191

* Anchors available only on request



Technical parameters of HDLM and HDPM anchors

Product Code - screw version	Product Code - version with nut	Thread size of rod or screw	Hole dia in the base material	Min. hole depth	Effective anchorage depth – min-max	Max. thickness of fixed element	Min. hole dia. in the element to be fixed	Anchor length - version with HDLM screw	Anchor length version with nut HDPM
		d [mm]	d _o [mm]	h ₁ [mm]	h _{ef,min} – h _{ef,max} [mm]	t _{fix} [mm]	d _f [mm]	L [mm]	L [mm]
HDLM18/0*	HDPM18/0*	M12	18	105	80	0	20	107	112
HDLM18/10	HDPM18/10			105-115	80-90	10		117	122
HDLM18/20	HDPM18/20			105-125	80-100	20		127	132
HDLM18/40	HDPM18/40			105-145	80-120	40		147	152
HDLM18/70*	HDPM18/70*			105-155	80-130	70		177	182
-	HDPM18/100*			105-155	80-130	100	-	212	
HDLM24/0*	HDPM24/0*	M16	24	130	100	0	26	130	137
HDLM24/20	HDPM24/20			130-144	100-114	20		150	157
HDLM24/50	HDPM24/50			130-144	100-114	50		180	187
HDLM24/100*	HDPM24/100*			130-144	100-114	100		-	237
HDLM24/0L*	HDPM24/0L*	M16	24	145	115	-	26	150	152
HDLM24/30L*	HDPM24/30L*			145-175	115-145	30		180	182
HDLM24/50L*	HDPM24/50L*			145-175	115-150	50		200	202
HDLM28/10*	HDPM28/10*	M20	28	160-170	125-135	10	31	172	181
HDLM28/30*	HDPM28/30*			160-190	125-155	30		192	201
HDLM28/60*	HDPM28/60*			160-220	125-185	60		222	231
HDLM28/100*	HDPM28/100*			160-220	125-185	100		262	271
HDLM32/10*	HDPM32/10*	M24	32	180-190	150-160	10	35	212	217
HDLM32/30*	HDPM32/30*			180-210	150-180	30		232	237
HDLM32/60*	HDPM32/60*			180-240	150-210	60		262	267

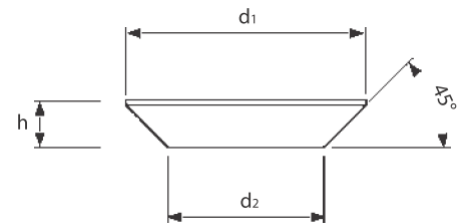
* Anchors available only on request



Technical parameters of HDF anchors

Product Code version with countersunk screw head	Screw size	Hole dia in the base material	Min. hole depth	Effective anchorage depth – min-max	Max. thickness of fixed element	Min. hole dia in the element to be attached	Anchor length HDF	Countersunk Flat Head Sizes		
								d [mm]	d _o [mm]	h ₁ [mm]
HDF10/10*	M6	10	65-67	50-52	10	12	70	16,5	9,5	3,9
HDF10/25*			65-91	50-76	25		85			
HDF10/40*			65-91	50-76	40		100			
HDF12/10*	M8	12	80	60	10	14	80	20,5	11,5	5,0
HDF12/25*			80-85	60-75	25		95			
HDF12/50*			80-120	60-100	50		120			
HDF15/10*	M10	15	95	71	10	17	100	24,5	14,5	5,7
HDF15/25*			95-106	71-82	25		110			
HDF15/35*			95-116	71-92	35		120			
HDF15/50*			95-131	71-107	50		135			
HDF18/20*	M12	18	105-107	80-82	20	20	115	29,5	17,5	6,7
HDF18/40*			105-107	80-102	40		135			

* Anchors available only on request



Recommended load capacities HDLM anchors in C 20/25 concrete

Technical Data:	HD10	HD12	HD15	HD18	HD24	HD24L	HD28	HD32
Thread size of anchor rod or bolt	M6	M8	M10	M12	M16	M16	M20	M24
Effective anchorage depth $h_{ef,min} - h_{ef,max}$ [mm]	50-76	60-100	71-110	80-130	100-114	115-150	125-185	150-210
Pull-out capacity N_{rec} [kN] – uncracked concrete C20/25	7,6	9,5	14,3	17,1	23,8	29,7	33,3	44,2
Pull-out capacity N_{rec} [kN] – C20 / 25 cracked concrete	2,4	5,7	7,6	11,9	17,1	21,0	23,8	31,0
Shear load capacity V_{rec} [kN] – uncracked concrete C20 / 25 HDLM and HDF anchors	10,3	17,1	27,4	34,3-41,7	48,1-58,5	59,3-72,0	67,2-85,7	88,4-114,3
Shear load capacity V_{rec} [kN] – uncracked concrete C20 / 25 HDPM anchor	9,1	14,3	20,6	34,4-36,0	48,1-52,0	52,0	67,2-85,7	88,4-114,3
Shear load capacity V_{rec} [kN] – C20/25 cracked concrete HDLM and HDF anchors	10,3	15,9-17,1	20,5-27,4	24,5-41,7	34,3-41,7	42,3-63,0	47,9-85,7	63,0-104,3
Shear load capacity V_{rec} [kN] – C20/25 cracked concrete HDPM anchor	9,1	14,3	20,5-20,6	24,5-36,0	34,3-41,7	42,3-52,0	47,9-69,7	63,0-104,3
Minimal concrete thickness h_{min} [mm]	100-126	120-160	140-179	160-210	200-214	230-265	250-310	300-360
Anchor spacing $S_{cr,N}$ [mm]	150-228	180-300	213-330	240-390	300-342	345-450	375-555	450-630
Distance from the edge $C_{cr,N}$ [mm]	75-114	90-150	106,5-165	120-195	150-171	172,5-225	187,5-277,5	225-315
Tightening torque HDLM and HDPM [Nm]	15	30	50	80	160	160	280	280
HDLM and HDPM key size [mm]	10	13	17	19	24	24	30	36
Tightening torque HDF [Nm]	10	25	55	70	-	-	-	-
Allen key size [mm]	4	5	6	8	-	-	-	-

The entire technical assessment ETA-02/0030 should be taken into account when designing

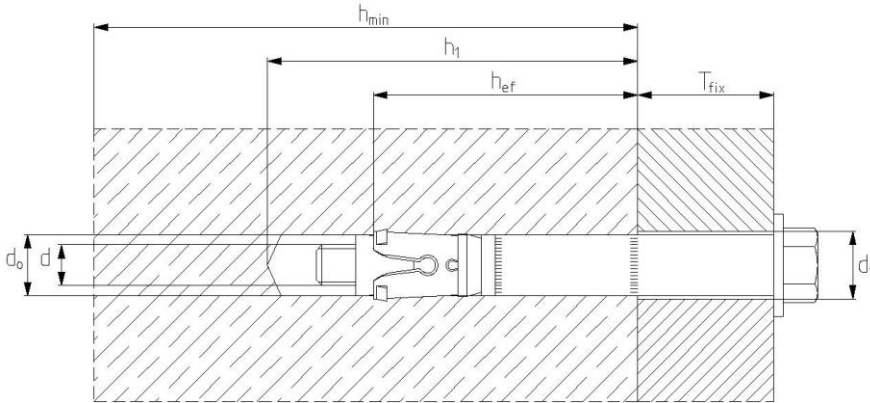


Fire resistance of HD anchors in cracked and non-cracked concrete, class C 20/25

Technical Data:	HD10	HD12	HD15	HD18	HD24	HD24L	HD28	HD32
Thread size of anchor rod or bolt	M6	M8	M10	M12	M16	M16	M20	M24
Effective anchorage depth $h_{ef,min} - h_{ef,max}$ [mm]	50-76	60-100	71-110	80-130	100-114	115-150	125-185	150-210
Fire resistance for class R30 FRk, f_i [kN]	1,0	1,9	4,0	6,3	9,0	11,1	12,58	16,53
Fire resistance for class R60 FRk, f_i [kN]	0,8	1,5	3,2	4,6	8,6	8,6	12,58	16,53
Fire resistance for class R90 FRk, f_i [kN]	0,6	1,0	2,1	3,0	5,0	5,0	7,7	12,6
Fire resistance for class R120 FRk, f_i [kN]	0,4	0,8	1,5	2,0	3,1	3,1	4,9	9,2

The entire technical assessment ETA-02/0030 should be taken into account when designing

HD anchor installation diagram



HD anchor mounting diagram

