

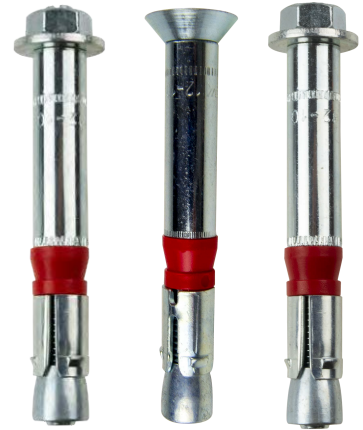
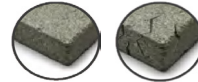
## HD – MECHANICAL ANCHOR FOR HIGH LOADS

### Features:

- Through fixing
- Approved for cracked and un-cracked concrete
- Embedment depth mark
- Bolt, nut and countersunk versions
- Fire tested

### Benefits:

- Quick and simple installation
- One anchor for concrete from C20/25 to C50/60
- Approved for seismic loads
- Loads for R30 to R120 fire rating



Concrete Ranges:	C20/C25 according to EN 206:2013+A1:2016
Certification:	European technical assessment 02/0030

### Product Range

Product Code			Thread Diameter	Anchor Length	Drill Hole Diameter	Drill Hole Depth	Max Fix Thick	Fixture Clearance Hole	Depth of Countersunk Hole	Minimum Fixture Thickness
			d	L	d <sub>0</sub>	h <sub>nom</sub>	t <sub>fix</sub>	d <sub>f</sub>	t <sub>sk</sub>	t <sub>fix,min</sub>
Bolt	Stud and Nut	Countersunk	mm	mm	mm	mm	mm	mm	mm	mm
HDLM10/10	HDPM10/10		6	75	10	65	10	12	-	-
HDLM10/30	HDPM10/30			95			30		-	
HDLM10/50	HDPM10/50			115			50		-	
		HDF12/10	8	80	12	80	10	14	4	8
HDLM12/10	HDPM12/10			87			10		-	
		HDF12/25		95			25		4	8
HDLM12/30	HDPM12/30			107			30		-	
HDLM12/50	HDPM12/50		127	50	-					
		HDF15/10	10	95	15	95	10	17	5	10
HDLM15/15	HDPM15/15			108			15		-	
		HDF15/25		110			25		5	10
HDLM15/25	HDPM15/25			118			25		-	
HDLM15/45	HDPM15/45		138	45	-					
HDLM18/10	HDPM18/10		12	117	18	105	10	20	-	-
		HDF18/20		115			20		6	14
HDLM18/20	HDPM18/20			127			20		-	
		HDF18/40		135			40		6	14
HDLM18/40	HDPM18/40		147	40	-					
HDLM24/20	HDPM24/20		16	152	24	130	20	26	-	-
HDLM24/50	HDPM24/50			182			50		-	
HDLM28/10	HDPM28/10		20	172	28	160	10	31	-	-
HDLM28/30	HDPM28/30			192			30		-	
HDLM28/60	HDPM28/60			122			60		-	

## Installation Data

Anchor Size				10/M6	12/M8	15/M10	18/M12	24/M16	28/M20	
Nominal Anchorage Depth		$h_{nom}$	[mm]	65	70	85	107	132	162	
Effectice Anchorage Depth		$h_{ef}$	[mm]	50	60	71	80	100	125	
Minimum Concrete Thickness		$h_{min}$	[mm]	100	120	140	160	200	250	
Design Spacing- Tension		Uncracked concrete	$S_{ucr,N}$	[mm]	120	130	355	400	500	630
Design Edge Distance - Tension			$C_{ucr,N}$	[mm]	110	130	180	200	250	320
Design Spacing - Tension		Cracked concrete	$S_{cr,N}$	[mm]	50	80	110	240	300	380
Design Edge Distance - Tension			$C_{cr,N}$	[mm]	50	60	70	120	150	190
Design Edge Distance - Shear	HDP	Uncracked concrete	$C_{ucr,V}$	[mm]	135	195	260	410	500	610
	HDL/HDF		$C_{ucr,V}$	[mm]	160	240	360	410	500	610
Design Edge Distance - Shear	HDP	Cracked concrete	$C_{cr,V}$	[mm]	200	290	380	410	500	610
	HDL/HDF		$C_{cr,V}$	[mm]	230	320	380	410	500	610
Installation Torque		HDL/HDP	$T_{inst}$	[Nm]	15	30	50	80	160	280
		HDF		10	25	55	70	-	-	

For reductions in Spacing and Edge Distance refer to DesignFix for calculations

## Load Data

### Characteristics Resistance

Anchor Diameter				10/M6	12/M8	15/M10	18/M12	24/M16	28/M20
Uncracked Concrete									
$N_{Rk}$	Tension		[kN]	16.0	20.0	30.0	36.0	50.0	70.0
$V_{Rk}$	Shear	HDP	[kN]	16.0	25.0	36.0	63.0	91.0	122.0
		HDL/HDF	[kN]	18.0	30.0	43.1	51.5	72.0	100.6
Cracked Concrete									
$N_{Rk}$	Tension		[kN]	5.0	12.0	16.0	25.0	36.0	50.0
$V_{Rk}$	Shear	HDP	[kN]	16.0	25.0	36.0	51.5	72.0	100.6
		HDL/HDF	[kN]	18.0	30.0	43.1	51.5	72.0	100.6

### Design Resistance

Anchor Diameter				10/M6	12/M8	15/M10	18/M12	24/M16	28/M20
Uncracked Concrete									
$N_{Rd}$	Tension		[kN]	10.6	13.3	20.0	24.0	33.6	47.0
$V_{Rd}$	Shear	HDP	[kN]	12.8	20.0	28.8	48.2	67.3	94.1
		HDL/HDF	[kN]	14.4	24.0	38.4	48.2	67.3	94.1
Cracked Concrete									
$N_{Rd}$	Tension		[kN]	3.3	8.0	10.6	17.1	24.0	33.5
$V_{Rd}$	Shear	HDP	[kN]	12.8	20.0	28.7	34.3	48.0	67.1
		HDL/HDF	[kN]	14.4	22.3	28.7	34.3	48.0	67.1

### Recommended Resistance

Anchor Diameter				10/M6	12/M8	15/M10	18/M12	24/M16	28/M20
Uncracked Concrete									
$N_{rec}$	Tension		[kN]	7.6	9.5	14.3	17.1	24.0	33.6
$V_{rec}$	Shear	HDP	[kN]	9.1	14.3	20.6	34.4	48.1	67.2
		HDL/HDF	[kN]	10.3	17.1	27.4	34.4	48.1	67.2
Cracked Concrete									
$N_{rec}$	Tension		[kN]	2.4	5.7	7.6	12.2	17.1	23.9
$V_{rec}$	Shear	HDP	[kN]	9.1	14.3	20.5	24.5	34.3	47.9
		HDL/HDF	[kN]	10.3	15.9	20.5	24.5	34.3	47.9

Includes Partial Safety Factor  $\gamma = 1.4$  in the absence of national regulations and type of loading Data is for Static and Quasi Static Loads for a single anchor

## Increasing Concrete Factors

Anchor Diameter				10/M6	12/M8	15/M10	18/M12	24/M16	28/M20
$\Psi_c$ C30/37	Increasing factor for $N_{Rk,p}$		[-]	1.22					
$\Psi_c$ C40/50			[-]	1.41					
$\Psi_c$ C50/60			[-]	1.58					

When using increasing factors care must be taken not to exceed steel limits

## Steel Limits

Anchor Diameter				10/M6	12/M8	15/M10	18/M12	24/M16	28/M20
$N_{Rk,s}$	Characteristic Tensile Resistance		[kN]	16.0	29.0	46.0	67.0	126	196
$Y_{MsN}$	Partial Safety Factor		[-]	1.5					
	Characteristic Shear Resistance	HDP	[kN]	16.0	25.0	36.0	63.0	91.0	122.0
$V_{Rk,s}$	Characteristic Shear Resistance	HDL/HDF	[kN]	18.0	30.0	48.0	73.0	126.0	150.0
	Characteristic Bending Moment	HDP	[Nm]	12.0	30.0	60.0	105.0	266.0	519.0
$M_{Rk,s}^0$	Characteristic Bending Moment	HDL/HDF	[Nm]	12.0	30.0	60.0	105.0	266.0	519.0
$Y_{MsV}$	Partial Safety Factor		[-]	1.25					

## Characteristic Tensile Resistance for Fire Loads

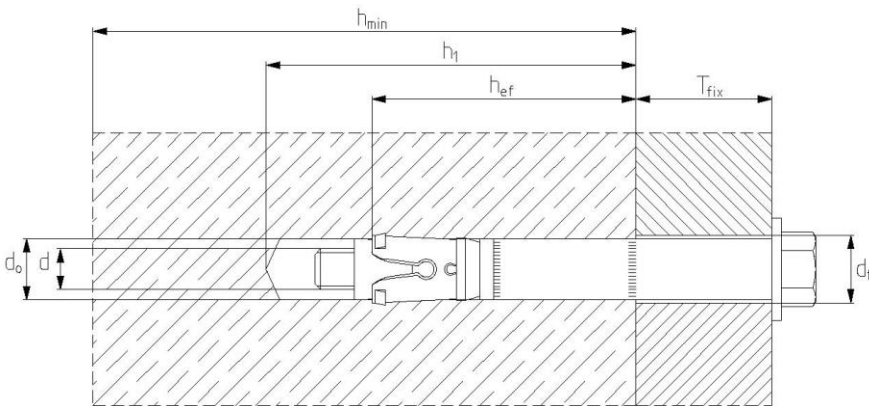
Anchor Diameter				10/M6	12/M8	15/M10	18/M12	24/M16	28/M20
$NRk_{s,f,30}$	Duration = 30 minutes		[kN]	1.00	1.90	4.00	6.25	9.00	12.50
$NRk_{s,f,60}$	Duration = 60 minutes		[kN]	0.80	1.50	3.20	4.60	8.60	12.50
$NRk_{s,f,90}$	Duration = 90 minutes		[kN]	0.60	1.00	2.10	3.00	5.00	7.70
$NRk_{s,f,120}$	Duration = 120 minutes		[kN]	0.40	0.80	1.50	2.00	3.10	4.90

For fire exposure cracked concrete is usually assumed in the absence of other national regulations the partial safety for resistance under fire exposure = 1.0

## Anchor Materials

Designation	Material, Zinc plated to $\geq 5\mu\text{m}$ acc. To EN ISO 4042:1999
Threaded stud	Steel, Strength class 8.8 EN ISO 898-1:2013
Washer	Steel, EN 10139:2016
Distance sleeve	Steel tube EN 10305-2:2016, EN 10305-3:2016
Ring	Polyethelene
Expansion sleeve	Steel, EN 10139:2016
Threaded cone	Steel, EN 10083-2:2006
Hexagon nut	Steel, strength class 8, EN ISO 898-2:20121
Hexagon headed screw	Steel, Strength class 8.8 EN ISO 898-1:2013
Countersunk screw	Steel, Strength class 8.8 EN ISO 898-1:2013
Countersunk washer	Steel, EN 10083-2:2006

## HD anchor installation diagram



## HD anchor mounting diagram

