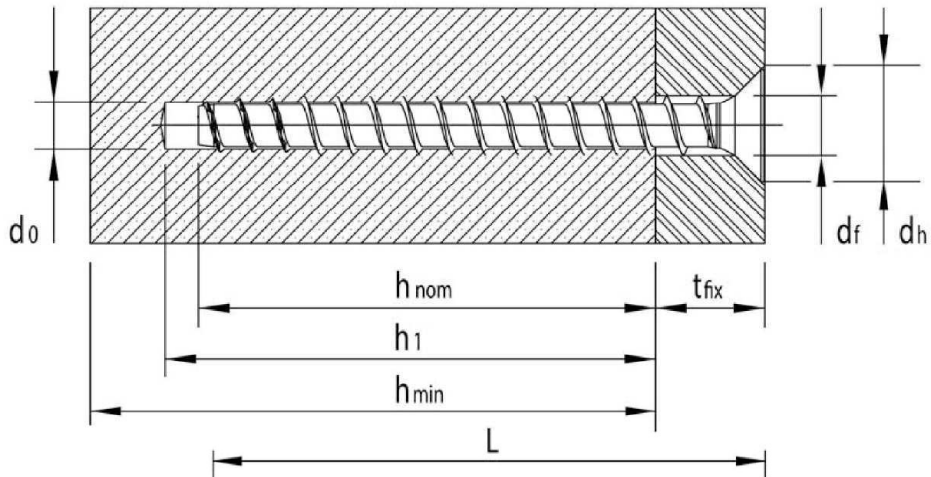


**Table B1: Installation parameters MMS-plus**

Size MMS-plus			6			7,5			10
			$h_{nom}$			$h_{nom}$			$h_{nom}$
Embedment depth in concrete		[mm]	25	35	45	25	35	55	50
Nominal drill diameter	$d_0$	[mm]	5			6			8
Cutting edge-Ø	$d_{cut} \leq$	[mm]	5,40			6,40			8,45
Borehole depth	$h_1 \geq$	[mm]	30	40	50	30	40	60	60
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	7			9			12,5
Diameter of countersunk head	$d_h$	[mm]	11,5			15,5			19,5
Min. thickness of the concrete member	$h_{min}$	[mm]	80						
cracked and uncracked concrete	min. spacing	$s_{min}$	30			30	35		35
	min. edge distance	$c_{min}$	30			30	30		35
Recommended installation tool		[Nm]	Impact screw driver, max. power output $T_{max}$ according to manufacturer information						
			60	75	100	60	120		250
Torque moment for threaded version (MMS-plus V)	$T_{inst}$	[Nm]	-			15			20



**MULTI-MONTI-plus**

Intended Use  
Installation parameters

**Annex B 2**

**Table C1: Characteristic values for static and quasi-static loading of MMS-plus**

Size MMS-plus			6			7,5			10
			$h_{nom}$			$h_{nom}$			$h_{nom}$
Embedment depth in concrete [mm]			25	35	45	25	35	55	50
<b>Steel failure for tension- and shear load</b>									
Characteristic resistance	$N_{RK,s}$	[kN]	10,8			17,6			32,1
Partial safety factor	$\gamma_{Ms}$	-	1,50						
Characteristic resistance	$V_{RK,s}$	[kN]	4,1			8,8			13,7
Partial safety factor	$\gamma_{Ms}$	-	1,25						
	$k_7$	-	0,8						
Characteristic resistance	$M^0_{RK,s}$	[Nm]	6,7			14,1			34,5
<b>Pull-out</b>									
Characteristic resistance in uncracked concrete C20/25	$N_{RK,p}$	[kN]	2,0	5,5	8,0	2,0	5,0	5,0	5,0
Characteristic resistance in cracked concrete C20/25	$N_{RK,p}$	[kN]	1,0	1,0	1,5	1,0	2,5	5,0	5,0
Increasing factor for concrete	C25/30	$\psi_c$	-	1,12					
	C30/37			1,22					
	C40/50			1,41					
	C50/60			1,58					
<b>Concrete cone failure and splitting failure</b>									
Effective anchorage depth	$h_{ef}$	[mm]	16	26	35	16	26	43	36
Factor for	cracked	$k_{cr,N}$	7,7						
	uncracked	$k_{urc,N}$	11,0						
Concrete cone	edge distance	$c_{cr,N}$	1,5 $h_{ef}$						
	spacing	$s_{cr,N}$	3 $h_{ef}$						
Splitting	edge distance	$c_{cr,sp}$	2,0 $h_{ef}$						
	spacing	$s_{cr,sp}$	4,0 $h_{ef}$						
Installation factor		-	1,4	1,0		1,4	1,0		
<b>Concrete pryout failure</b>									
k-Faktor	$k_g$	-	1,0						
<b>Concrete edge failure</b>									
Effective length of the anchor	$l_f = h_{ef}$	[mm]	16	26	35	16	26	43	36
Effective diameter of the anchor	$d_{nom}$	[mm]	5			6			8

**MULTI-MONTI-plus**

**Performance**  
Characteristic values for static and quasi static tension loads

**Annex C 1**

**Table C2: Characteristic values for static and quasi-static loading of MMS-plus in prestressed hollow core slabs C30/37 to C50/60**

Size MMS-plus			6			7,5			10	
			d <sub>b</sub>			d <sub>b</sub>			d <sub>b</sub>	
Thickness of slab web	[mm]		30	40	50	30	40	50	40	50
<b>All load directions</b>										
Characteristic resistance in concrete ≥ C30/37	F <sup>0</sup> <sub>Rk</sub>	[kN]	1,0	5,5	6,5	1,2	4,5	8,0	6,5	11,0
Characteristic resistance in concrete ≥ C45/55	F <sup>0</sup> <sub>Rk</sub>	[kN]	4,5	6,0	6,0	4,0	8,0	8,0	11,5	12,0
Partial safety factor	γ <sub>M</sub>	-	1,5							
Installation factor	γ <sub>inst</sub>	-	1,0							
Edge distance	c <sub>cr</sub> = c <sub>min</sub>	[mm]	100			100	120		140	
Spacing	s <sub>cr</sub> = s <sub>min</sub>	[mm]	200							

**Table C3: Characteristic values under fire exposure**

Size MMS-plus			6		7,5		10	
			h <sub>nom</sub>		h <sub>nom</sub>		h <sub>nom</sub>	
Embedment depth in concrete	[mm]		35	45	35	55	50	
<b>Characteristic resistance for tension and shear</b>								
Characteristic resistance	R30	F <sub>Rk,fi</sub>	[kN]	0,3	0,4	0,5	1,1	1,3
	R60	F <sub>Rk,fi</sub>	[kN]	0,3	0,4	0,5	0,8	1,3
	R90	F <sub>Rk,fi</sub>	[kN]	0,3	0,4	0,5	0,5	1,0
	R120	F <sub>Rk,fi</sub>	[kN]	0,2	0,3	0,4	0,4	0,8
	R30	M <sup>0</sup> <sub>Rk,s,fi</sub>	[Nm]	0,5		1,1		2,7
	R60	M <sup>0</sup> <sub>Rk,s,fi</sub>	[Nm]	0,3		0,6		1,5
	R90	M <sup>0</sup> <sub>Rk,s,fi</sub>	[Nm]	0,2		0,4		1,1
	R120	M <sup>0</sup> <sub>Rk,s,fi</sub>	[Nm]	0,2		0,3		0,9
R30 to R120	c <sub>cr,fi</sub>	[mm]	2 h <sub>ef</sub>					
R30 to R120	s <sub>cr,fi</sub>	[mm]	2 c <sub>cr,fi</sub>					

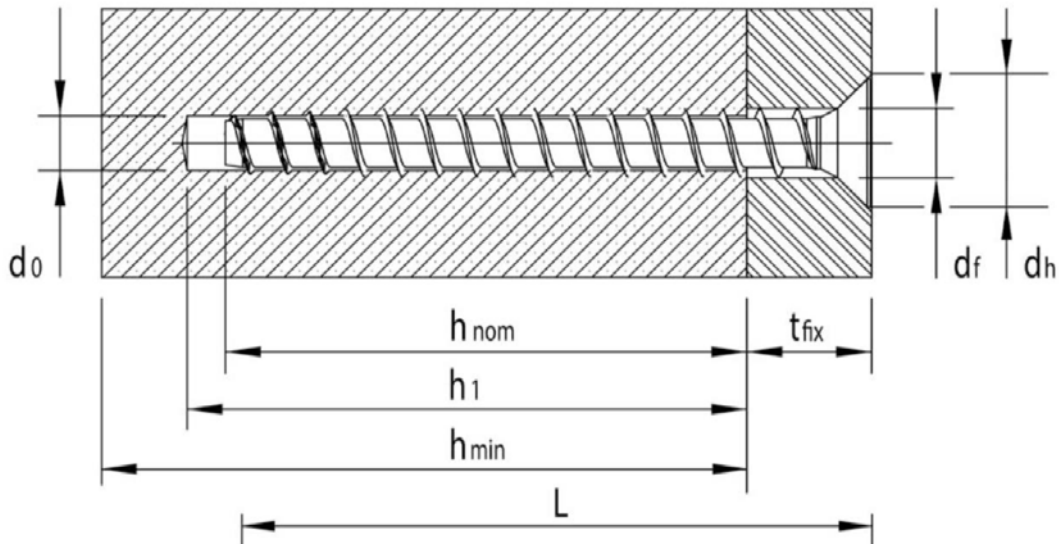
**MULTI-MONTI-plus**

Performance  
Characteristic values under fire exposure

**Annex C 2**

**Table B1: Installation parameters MMS-plus**

Size MMS-plus			6		7,5		10		12		16		20			
			$h_{nom}$		$h_{nom}$		$h_{nom}$		$h_{nom}$		$h_{nom}$		$h_{nom}$			
Embedment depth in concrete [mm]			35	45	35	55	50	65	75	90	100	115	140			
Norminal drill diameter	$d_0$	[mm]	5		6		8		10		14		18			
Drill bit cutting- $\emptyset$	$d_{cut} \leq$	[mm]	5,40		6,40		8,45		10,45		14,50		18,50			
Borehole depth	$h_1 \geq$	[mm]	40	50	40	65	60	75	85	100	115	130	160			
Diameter of clearhole in the fixure	$d_f \leq$	[mm]	7		9		12,5		14,5		19		23			
Diameter Countersunk	$d_h$	[mm]	11,5		15,5		19,5		24		-		-			
Min. thickness of the concrete member	$h_{min}$	[mm]	100		100		100	115	125	150	150		180			
cracked and uncracked concrete	min. spacing	$s_{min}$	30		35		35		40		60		80			
	min. edge distance	$c_{min}$	30		30		35		40		60		80			
Recommended installation tool		[Nm]	Impact screw driver, max. power output $T_{max}$ according manufacturer information													
			75	100	120		250		250		600		800			
Torque moment for threaded version (MMS-plus V)	$T_{inst}$	[Nm]	-		15		20		30		55	70	140			



**MULTI-MONTI-plus**

Intended Use  
Installation parameters

**Annex B 2**

**Table C1 Characteristic values for static and quasi-static loading MMS-plus**

Size MMS-plus			6		7,5		10		12		16		20		
			$h_{nom}$		$h_{nom}$		$h_{nom}$		$h_{nom}$		$h_{nom}$		$h_{nom}$		
Embedment depth in concrete [mm]			35 <sup>1)</sup>	45	35 <sup>1)</sup>	55	50	65	75	90	100	115	140		
<b>Steelfailure for Tension- and Shear resistance</b>															
Characteristic resistance		$N_{Rk,s}$	[kN]	10,8		17,6		32,1		49,9		111,1		190,2	
Partial safety factor		$\gamma_{Ms}$	-	1,50											
Characteristic resistance		$V_{Rk,s}$	[kN]	4,1		6,1		13,7		24,1		50,2		85,3	
Partial safety factor		$\gamma_{Ms}$	-	1,25											
		$k_7$ <sup>2)</sup>	-	0,8											
Characteristic resistance		$M^2_{Rk,s}$	[Nm]	6,7		14,1		34,5		66,8		207,6		464,3	
<b>Pullout</b>															
Characteristic resistance in uncracked concrete C20/25		$N_{Rk,p}$	[kN]	5,5	8	4	- <sup>2)</sup>	- <sup>2)</sup>	- <sup>2)</sup>	- <sup>2)</sup>	- <sup>2)</sup>	- <sup>2)</sup>	- <sup>2)</sup>	- <sup>2)</sup>	- <sup>2)</sup>
Characteristic resistance in cracked concrete C20/25		$N_{Rk,p}$	[kN]	1	1,5	2	4	6	9	12	16	20	30	44	
Increasing factor for concrete		C30/37		1,22											
		C40/50		1,41											
		C50/60		1,58											
<b>Concrete cone failure and splitting failure</b>															
Effective anchorage depth		$h_{ef}$	[mm]	26	35	26	43	36	50	57	70	77	90	114	
Factor for cracked		$k_{Cr,N}$	-	7,7											
Factor for uncracked		$k_{Ucr,N}$	-	11,0											
Concrete cone edge distance		$c_{Cr,N}$	[mm]	1,5 $h_{ef}$											
Concrete cone spacing		$s_{Cr,N}$	[mm]	3 $h_{ef}$											
Splitting edge distance		$c_{Cr,sp}$	[mm]	1,5 $h_{ef}$											
Splitting spacing		$s_{Cr,sp}$	[mm]	3 $h_{ef}$											
Installation safety factor		$\gamma_{inst}$	-	1,0											
<b>Concrete pryout failure</b>															
k-Factor		$k_B$	-	1,0						2,0					
<b>Concrete edge failure</b>															
Effective length of the anchor		$l_f = h_{ef}$	[mm]	26	35	26	43	36	50	57	70	77	90	114	
Effective diameter of the anchor		$d_{nom}$	[mm]	5		6		8		10		14		18	

<sup>1)</sup> Only for non-structural applications

<sup>2)</sup> Pullout is not decisive

**MULTI-MONTI-plus**

**Performance**  
Characteristic values for static and quasi static tensions load

**Annex C 1**

**Table C2.1 Characteristic values for seismic actions C1**

Size MMS-plus			10	12		16	20
Embedment depth in concrete [mm]			$h_{nom}$	$h_{nom}$	$h_{nom}$	$h_{nom}$	$h_{nom}$
Embedment depth in concrete [mm]			65	75	90	115	140
<b>Steelfailure for Tension- and Shear resistance</b>							
Characteristic resistance	$N_{Rk,s,eq}$	[kN]	24,1	37,4		100,0	142,7
	$V_{Rk,s,eq}$	[kN]	9,6	16,9		45,2	81,0
<b>Pullout</b>							
Characteristic resistance in cracked concrete	$N_{Rk,p,eq}$	[kN]	6,8	9,0	12,0	21,0	33,0
<b>Concrete cone failure</b>							
Effective anchorage depth	$h_{ef}$	[mm]	50	57	70	90	114
concrete edge distance	$c_{cr,N}$	[mm]	1,5 $h_{ef}$				
cone spacing	$s_{cr,N}$	[mm]	3 $h_{ef}$				
Installation safety factor	$\gamma_2$	-	1,0				
<b>Concrete pryout failure</b>							
k-Factor	k	-	1,0		2,0		
<b>Concrete edge failure</b>							
Effective length of the anchor under shear loading	$l_f = h_{ef}$	[mm]	50	57	70	90	114
Effective diameter-Ø	$d_{nom}$	[mm]	8	10		14	18

**Table C2.2 Characteristic values for seismic actions C2**

Size MMS-plus			16	20
Embedment depth in concrete [mm]			$h_{nom}$	$h_{nom}$
Embedment depth in concrete [mm]			115	140
<b>Steelfailure for Tension- and Shear resistance</b>				
Characteristic resistance	$N_{Rk,s,eq}$	[kN]	100,0	142,7
	$V_{Rk,s,eq}$	[kN]	27,6	57,2
<b>Pullout</b>				
Characteristic resistance in cracked concrete	$N_{Rk,p,eq}$	[kN]	14,0	18,1
<b>Concrete cone failure</b>				
Effective anchorage depth	$h_{ef}$	[mm]	90	114
concrete edge distance	$c_{cr,N}$	[mm]	1,5 $h_{ef}$	
cone spacing	$s_{cr,N}$	[mm]	3 $h_{ef}$	
Installation safety factor	$\gamma_2$	-	1,0	
<b>Concrete pryout failure</b>				
k-Factor	k	-	2,0	
<b>Concrete edge failure</b>				
Effective length of the anchor under shear loading	$l_f = h_{ef}$	[mm]	90	114
Effective diameter-Ø	$d_{nom}$	[mm]	14	18

**MULTI-MONTI-plus**

Performance  
Characteristic value for seismic actions C1 and C2

**Annex C 2**

**Table C3 Characteristic values under fire exposure**

Size MMS-plus				6		7,5		10		12		16		20	
				h <sub>nom</sub>		h <sub>nom</sub>		h <sub>nom</sub>		h <sub>nom</sub>		h <sub>nom</sub>		h <sub>nom</sub>	
Embedment depth in concrete [mm]				35	45	35	55	50	65	75	90	100	115	140	
<b>Characteristic resistance for tension and shear</b>															
Characteristic resistance	R30	F <sub>Rk,fi</sub>	[kN]	0,3	0,4	0,5	1,1	1,4	2,3	3,0	3,9	5,0	7,5	11,0	
	R60	F <sub>Rk,fi</sub>	[kN]	0,3	0,4	0,5	0,8	1,4	1,4	2,1	2,1	4,5	4,5	7,7	
	R90	F <sub>Rk,fi</sub>	[kN]	0,3	0,4	0,5	0,5	1,0	1,0	1,5	1,5	3,3	3,3	5,6	
	R120	F <sub>Rk,fi</sub>	[kN]	0,2	0,3	0,4	0,4	0,8	0,8	1,2	1,2	2,6	2,6	4,5	
	R30	M <sup>0</sup> <sub>Rk,s,fi</sub>	[Nm]	0,5		1,1		2,7		5,3		16,4		36,6	
	R60	M <sup>0</sup> <sub>Rk,s,fi</sub>	[Nm]	0,3		0,6		1,5		2,8		8,9		19,8	
	R90	M <sup>0</sup> <sub>Rk,s,fi</sub>	[Nm]	0,2		0,4		1,1		2,0		6,4		14,2	
	R120	M <sup>0</sup> <sub>Rk,s,fi</sub>	[Nm]	0,2		0,3		0,9		1,6		5,1		11,4	
<b>Edge distance</b>															
R30 bis R120				c <sub>cr,fi</sub>	[mm]	2 h <sub>ef</sub>									
<b>Spacing</b>															
R30 bis R120				s <sub>cr,fi</sub>	[mm]	2 c <sub>cr,fi</sub>									

**Table C4 Displacements under tension loads**

Size MMS-plus				6		7,5		10		12		16		20	
				h <sub>nom</sub>		h <sub>nom</sub>		h <sub>nom</sub>		h <sub>nom</sub>		h <sub>nom</sub>		h <sub>nom</sub>	
Embedment depth in concrete [mm]				35	45	35	55	50	65	75	90	100	115	140	
Tension load uncracked concrete	N	[kN]		1,9	3,0	1,9	5,3	5,7	7,9	10,7	12,8	16,2	20,1	29,3	
Displacement	δ <sub>N0</sub>	[mm]		0,11	0,11	0,06	0,12	0,06	0,07	0,05	0,19	0,09	0,09	0,09	
	δ <sub>N∞</sub>	[mm]		0,30	0,28	0,38	1,03	0,75	0,72	0,74	0,60	0,13	0,13	0,13	
Tension load cracked concrete	N	[kN]		0,5	0,7	0,9	2,0	2,9	4,3	5,7	6,4	20,0	30,0	20,95	
Displacement	δ <sub>N0</sub>	[mm]		0,01	0,02	0,03	0,04	0,03	0,09	0,05	0,02	0,09	0,09	0,09	
	δ <sub>N∞</sub>	[mm]		0,14	0,09	0,12	0,11	0,08	0,09	0,07	0,22	1,38	1,38	0,69	

**Table C5 Displacements under shear loads**

Size MMS-plus				6		7,5		10		12		16		20	
				h <sub>nom</sub>		h <sub>nom</sub>		h <sub>nom</sub>		h <sub>nom</sub>		h <sub>nom</sub>		h <sub>nom</sub>	
Embedment depth in concrete [mm]				35	45	35	55	50	65	75	90	100	115	140	
Shear load uncracked concrete	V	[kN]		2,0		4,0		8,0		12,0		22,6		42,8	
Displacement	δ <sub>V0</sub>	[mm]		0,14	0,13	0,09	0,11	0,18	0,13	0,18		2,9		3,4	
	δ <sub>V∞</sub>	[mm]		0,20	0,19	0,13	0,16	0,27	0,20	0,27		4,4		5,1	