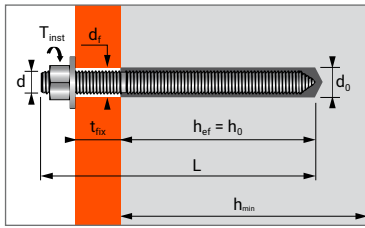




## Epoxyacrylate resin for use in non-cracked concrete



### TECHNICAL DATA

RANGE	Min. anchor depth	Max. thick. of part to be fixed	Min. thick. of base material	Thread diameter	Drilling depth	Drilling diameter	Clearance diameter	Total anchor length	Tighten torque	Code* SPIT stud	
	(mm) h <sub>ef</sub>	(mm) t <sub>fix</sub>	(mm) h <sub>min</sub>	(mm) d	(mm) h <sub>0</sub>	(mm) d <sub>0</sub>	(mm) d <sub>f</sub>	(mm) L	(Nm) T <sub>inst</sub>	zinc coated steel	stainless steel A4
M8X110	80	15	110	8	80	10	9	110	10	060215	060222
M10X130	90	20	120	10	90	12	12	130	20	060216	060223
M12X160	110	25	140	12	110	14	14	160	30	060217	060224
M16X190	125	35	160	16	125	18	18	190	60	060218	060225
M20X260	170	65	220	20	170	25	22	260	120	060219	060226
M24X300	210	63	265	24	210	28	26	300	200	060220	060227
MULTI-MAX PLUS cartridge 300 ml										060237	

\* These are SPIT Studs, for standard Studs (zinc coated or stainless steel versions) see catalogue.

### CHARACTERISTICS



### APPLICATION

- Fixing steel framed structures
- Fixing machinery (resistant to vibration)
- Fixing of storage silos, refinery pipework supports
- Fixing motorway signs
- Fixing safety barriers

### FIELD OF USE

Installation temperature: +5°C / +40°C

In-Service temperature range:

- Range 1: -40°C / +40°C
- Range 2: -40°C / +80°C

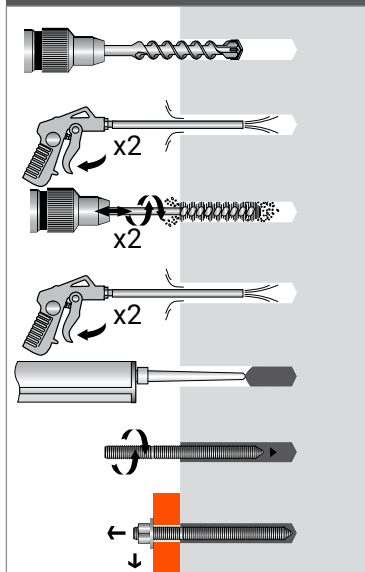
Installation conditions:

- Category 1: Dry or wet concrete

### ANCHOR MECHANICAL PROPERTIES

SIZE	M8	M10	M12	M16	M20	M24	
<b>SPIT Studs</b>							
f <sub>uk</sub> [N/mm <sup>2</sup> ]	Min. tensile strength	600	600	600	600	520	520
f <sub>yk</sub> [N/mm <sup>2</sup> ]	Yield strength	420	420	420	420	420	420
M <sup>0</sup> <sub>Rk,s</sub> [Nm]	Characteristic bending moment	22	45	79	200	301	520
<b>Studs Grade A4-70</b>							
f <sub>uk</sub> [N/mm <sup>2</sup> ]	Min. tensile strength	700	700	700	700	700	700
f <sub>yk</sub> [N/mm <sup>2</sup> ]	Yield strength	350	350	350	350	350	350
M <sup>0</sup> <sub>Rk,s</sub> [Nm]	Characteristic bending moment	26	52	92	233	454	786

### INSTALLATION



### SETTING TIME

TEMPERATURE	MAX. TIME FOR INSTALLATION	CURING TIME
5°C	18 min.	145 min.
6°C ▶ 10°C	10 min.	145 min.
11°C ▶ 20°C	6 min.	85 min.
21°C ▶ 30°C	4 min.	50 min.
31°C ▶ 40°C	4 min.	35 min.



# MULTI-MAX PLUS

## MINIMUM THICKNESS OF CONCRETE, CHARACTERISTIC & MINIMUM DISTANCES FOR SPACING, EDGE

SIZE			M8	M10	M12	M16	M20	M24
Anchorage depth	$h_{ef}$	[mm]	80	90	110	125	170	210
Minimum thickness of base material	$h_{min}$	[mm]	110	120	140	155	214	262
Characteristic edge and spacing distance for full anchor capacity	$C_{cr} \geq$	[mm]	120	135	165	187,5	255	315
	$S_{cr} \geq$	[mm]	240	270	330	375	510	630
Minimum distances for non-cracked concrete	$C_{min}$	[mm]	35	40	50	65	80	96
	$S \geq$	[mm]	35	40	50	65	80	96
	$S_{min}$	[mm]	35	40	50	65	80	96
	$C \geq$	[mm]	35	40	50	65	80	96

## CHARACTERISTIC RESISTANCES [kN]

Characteristic resistances are shown as informative, and have to be used by application of safety factors .

In tensile loads, the table below shows bond strength in N/mm<sup>2</sup>. All dimensions can be installed with embedment length between 7d to 20d.

The characteristic tensile load is determined with the formula:  $N_{Rk,p}^0 = \pi \cdot d \cdot h_{ef} \cdot \tau_{Rk}$

### TENSILE

#### NON-CRACKED CONCRETE - C20/25

SIZE	M8	M10	M12	M16	M20	M24
$h_{ef, min}$ [mm]	64	80	96	128	160	192
$h_{ef, max}$ [mm]	96	120	144	192	240	288
$\tau_{Rk, uncr}$ [N/mm <sup>2</sup> ]	10,0	8,0	9,0	9,5	8,5	8,5

### SHEAR

#### NON-CRACKED CONCRETE - C20/25 to C50/60

SIZE	M8	M10	M12	M16	M20	M24
$h_{ef, min}$ [mm]	64	80	96	128	160	192
$h_{ef, max}$ [mm]	96	120	144	192	240	288
<b>SPIT Studs</b>						
$V_{Rks}$ [kN]	<u>9,2</u>	<u>15,0</u>	<u>21,0</u>	<u>39,0</u>	<u>61,0</u>	<u>88,0</u>
<b>Studs Grade A4-70</b>						
$V_{Rks}$ [kN]	<u>13,0</u>	<u>20,0</u>	<u>30,0</u>	<u>55,0</u>	<u>86,0</u>	<u>124,0</u>

## RECOMMENDED LOADS OF ONE ANCHOR WITHOUT INFLUENCE OF SPACING & CONCRETE EDGE [kN]

Recommended values are determined from performances given in the ETA, and are guaranteed for spacing  $\geq S_{cr}$  and edge distance  $\geq C_{cr}$ .

### TENSILE

#### NON-CRACKED CONCRETE - C20/25

SIZE	M8	M10	M12	M16	M20	M24
$h_{ef}$ [mm]	80	90	110	125	170	210
<b>SPIT Studs</b>						
$N_{Rec}$ [kN]	8,0	9,0	14,8	23,7	36,0	53,4
<b>Studs Grade A4-70</b>						
$N_{Rec}$ [kN]	8,0	9,0	14,8	23,7	36,0	53,4

$N_{Rec} = \min [N_{Rd,p}; N_{Rd,c}; N_{Rd,s}] / \gamma_F; \gamma_F = 1,4$

### SHEAR

#### NON-CRACKED CONCRETE - C20/25 to C50/60

SIZE	M8	M10	M12	M16	M20	M24
$h_{ef}$ [mm]	80	90	110	125	170	210
<b>SPIT Studs</b>						
$V_{Rec}$ [kN]	<u>5,1</u>	<u>8,6</u>	<u>12,0</u>	<u>22,3</u>	<u>34,9</u>	<u>50,3</u>
<b>Studs Grade A4-70</b>						
$V_{Rec}$ [kN]	<u>6,0</u>	<u>9,2</u>	<u>13,7</u>	<u>25,2</u>	<u>39,4</u>	<u>56,8</u>

$V_{Rec} = V_{Rd,s} / \gamma_F; \gamma_F = 1,4$

Design resistances for static loads are determined from performances given in the ETA, and are guaranteed for spacing  $\geq S_{cr}$  and edge distance  $\geq C_{cr}$ .

For project with reduced spacing and edge distance, we recommend to use SPIT i-Expert software to design your project according to EN 1992-4.



## DESIGN RESISTANCE FOR STATIC LOADS IN NON CRACKED CONCRETE [kN]

### TENSILE

SIZE	M8	M10	M12	M16	M20	M24	
$h_{ef}$ [mm]	80	90	110	125	170	210	
<b>SPIT Studs</b>							
$N_{Rd, uncr}$ [kN]	C20/25	11,2	12,6	20,7	33,2	50,4	74,8
<b>Studs Grade A4-70</b>							
$N_{Rd, uncr}$ [kN]	C20/25	11,2	12,6	20,7	33,2	50,4	74,8

Distances  $S_{cr}$  and  $C_{cr}$  must be fulfilled  
 $N_{Rd, uncr} = \min [N_{Rk,p, uncr} / \gamma_{Mc}; N_{Rk,s} / \gamma_{Ms,N}]$   
 $\gamma_{Mc} = 1,8$ ; SPIT Studs :  $\gamma_{Ms,N} = 1,5$ ; Studs Grade A4-70 :  $\gamma_{Ms,N} = 1,87$

### SHEAR

SIZE	M8	M10	M12	M16	M20	M24	
$h_{ef}$ [mm]	80	90	110	125	170	210	
<b>SPIT Studs</b>							
$V_{Rd,s}$ [kN]	$\geq C20/25$	<u>7,2</u>	<u>12,0</u>	<u>16,8</u>	<u>31,2</u>	<u>48,8</u>	<u>70,4</u>
<b>Studs Grade A4-70</b>							
$V_{Rd,s}$ [kN]	$\geq C20/25$	<u>8,3</u>	<u>12,8</u>	<u>19,2</u>	<u>35,3</u>	<u>55,1</u>	<u>79,5</u>

$V_{Rd,s} = V_{Rk,s} / \gamma_{Ms,V}$   
 SPIT Studs :  $\gamma_{Ms,V} = 1,25$ ; Studs Grade A4-70 :  $\gamma_{Ms,V} = 1,56$

**Nota:** The values indicated *in italics and underlined* correspond to steel failure

