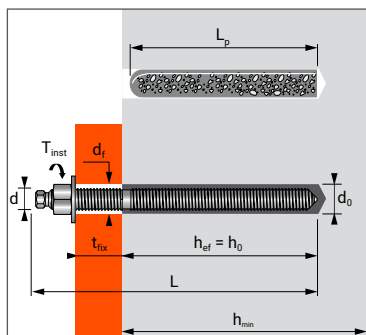




Bonded anchor in glass capsule - heavy loads,
for use in non-cracked concrete



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		Code capsule
	(mm) h_{ef}	(mm) t_{fix}	(mm) h_{min}	(mm) d	(mm) h_0	(mm) d_0	(mm) d_f	(mm) L	(Nm) T_{inst}	zinc coated steel	stainless steel A4	
M8X110	80	15	110	8	80	10	9	110	10	060215	060222	060204
M10X130	90	20	120	10	90	12	12	130	20	060216	060223	060205
M12X160	110	25	140	12	110	14	14	160	30	060217	060224	060206
M16X190	125	35	160	16	125	18	18	190	60	060218	060225	060207
M20X260	170	65	220	20	170	25	22	260	120	060219	060226	060208
M24X300	210	63	265	24	210	28	26	300	200	060220	060227	060209
M30X380	280	70	350	30	280	32	33	380	300	060221	-	060210

CHARACTERISTICS



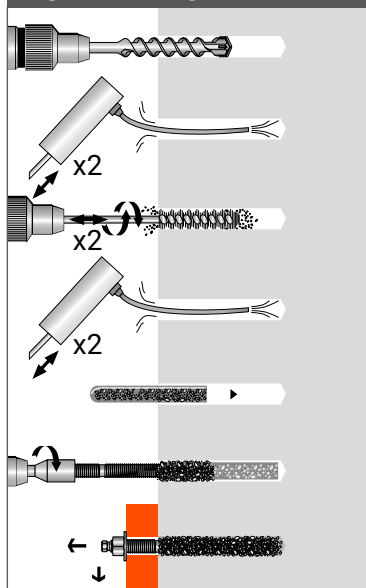
APPLICATION

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

ANCHOR MECHANICAL PROPERTIES

SIZE	M8	M10	M12	M16	M20	M24	M30
A_s [mm ²] Stressed cross-section	36,6	58,0	84,3	157,0	227,0	330,0	530,0
W_{el} [mm ²] Elastic section modulus	31,2	62,3	109,2	277,5	482,4	845,5	1721,0
SPIT studs							
f_{uk} [N/mm ²] Min. tensile strength	520	520	520	520	520	520	520
f_{yk} [N/mm ²] Yield strength	420	420	420	420	420	420	420
$M^0_{Rk,s}$ [Nm] Characteristic bending moment	19,5	39,0	68,0	173,0	301,0	528,0	1074,0
M [Nm] Recommended bending moment	8,0	15,9	27,8	70,7	122,9	215,4	438,3
Studs grade A4-70							
f_{uk} [N/mm ²] Min. tensile strength	700	700	700	700	700	700	-
f_{yk} [N/mm ²] Yield strength	350	350	350	350	350	350	-
$M^0_{Rk,s}$ [Nm] Characteristic bending moment	26,2	52,3	91,7	233,1	405,2	710,3	-
M [Nm] Recommended bending moment	10,7	21,4	37,4	95,1	165,4	289,9	-

INSTALLATION



CURING TIME

TEMPERATURE	CURING TIME	
	DRY CONCRETE	WET CONCRETE
$\leq 0^\circ\text{C}$	5 hours	10 hours
$0^\circ\text{C} \rightarrow 5^\circ\text{C}$	1 hour	2 hours
$5^\circ\text{C} \rightarrow 20^\circ\text{C}$	20 min.	40 min.
$\geq 30^\circ\text{C}$	10 min.	20 min.



MAXIMA+

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

SIZE			M8	M10	M12	M16	M20	M24	M30
Anchorage depth	h_{ef}	[mm]	80	90	110	125	170	210	280
Minimum thickness of base material	h_{min}	[mm]	110	120	140	160	220	265	350
Characteristic edge and spacing distance for full anchor capacity	$C_{cr} \geq$	[mm]	120	135	165	187,5	255	315	420
	$S_{cr} \geq$	[mm]	240	270	330	375	510	630	840
	C_{min}	[mm]	40	45	55	65	85	105	140
	$S \geq$	[mm]	40	45	55	65	85	105	140
	S_{min}	[mm]	40	45	55	65	85	105	140
Minimum distances for non-cracked concrete	$C \geq$	[mm]	40	45	55	65	85	105	140

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/mm². The characteristic tensile load is determined with the formular : $N_{Rk,p}^0 = \pi \cdot d \cdot h_{ef} \cdot \tau_{Rk}$

TENSILE

NON-CRACKED CONCRETE - C20/25

SIZE	M8	M10	M12	M16	M20	M24	M30
$h_{ef \min}$ [mm]	80	90	110	125	170	210	280
$\tau_{Rk,uncr}$ [N/mm ²]	12,0	12,0	12,0	12,0	11,0	11,0	10,0

SHEAR

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

SIZE	M8	M10	M12	M16	M20	M24	M30
h_{ef} [mm]	80	90	110	125	170	210	280
SPIT studs							
V_{Rks} [kN]	<u>9,0</u>	<u>15,0</u>	<u>21,0</u>	<u>39,0</u>	<u>61,0</u>	<u>88,0</u>	<u>140,0</u>
Studs grade A4-70							
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>	<u>140,0</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	M30
h_{ef} [mm]	80	90	110	125	170	210	280
SPIT studs							
N_{Rec} [kN]	<u>12,2</u>	<u>19,3</u>	<u>28,1</u>	45,8	72,7	99,8	128,0
Studs grade A4-70							
N_{Rec} [kN]	<u>9,9</u>	<u>15,7</u>	<u>22,5</u>	27,3	43,3	59,4	<u>70,2</u>

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

SHEAR

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

SIZE	M8	M10	M12	M16	M20	M24	M30
h_{ef} [mm]	80	90	110	125	170	210	280
SPIT studs							
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>	<u>80,0</u>
Studs grade A4-70							
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>	<u>64,1</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	M30
h_{ef} [mm]	80	90	110	125	170	210	280
SPIT studs							
$N_{Rd,uncr}$ [kN]	C20/25 <u>12,2</u>	<u>19,3</u>	<u>28,1</u>	45,8	72,7	99,8	128,0
	C40/50 <u>12,2</u>	<u>19,3</u>	<u>28,1</u>	<u>52,3</u>	<u>81,3</u>	<u>117,3</u>	181,1
Studs grade A4-70							
$N_{Rd,uncr}$ [kN]	C20/25 <u>13,9</u>	<u>21,9</u>	<u>31,6</u>	45,8	72,7	99,8	<u>98,3</u>
	C40/50 <u>13,9</u>	<u>21,9</u>	<u>31,6</u>	<u>58,8</u>	<u>92,0</u>	<u>132,1</u>	<u>98,3</u>

Distances S_{cr} and C_{cr} must be fulfilled
 $N_{Rd,uncr} = \min [N_{Rk,p,uncr} / \gamma_{Mc} ; N_{Rks} / \gamma_{Ms,N}]$
Studs M8-M24: $\gamma_{Mc} = 1,5$; Studs M30: $\gamma_{Mc} = 1,8$
SPIT Studs : $\gamma_{Ms,N} = 1,5$; Studs Grade A4-70 : $\gamma_{Ms,N} = 1,87$

SHEAR

SIZE	M8	M10	M12	M16	M20	M24	M30
h_{ef} [mm]	80	90	110	125	170	210	280
SPIT studs							
$V_{Rd,s}$ [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>	<u>112,0</u>
Studs grade A4-70							
$V_{Rd,s}$ [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>	<u>89,7</u>

$V_{Rd,s} = V_{Rks} / \gamma_{Ms,V}$
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

