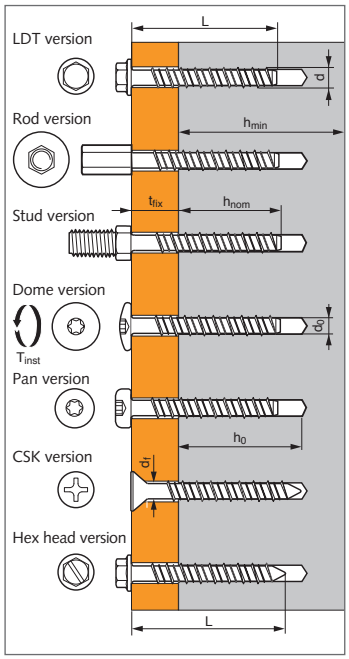




Concrete screw anchor

Technical data

	SPIT TAPCON	Anchor diameter (mm)	Drilling diameter (mm)	Total anchor length (mm)	Minimum embedment				Maximum embedment				Minimum Clearance diameter (mm)	Tightening torque (Nm)	Euro-code
					Minimum embedment depth (mm)	Maximum thickness of part to be fixed (mm)	Hole depth (mm)	Minimum thickness of base material (mm)	Maximum embedment depth (mm)	Maximum thickness part to be fixed (mm)	Hole depth (mm)	thickness of base material (mm)			
		d	d_o	L	$h_{nom,min}$	t_{fix}	h_o	h_{min}	$h_{nom,min}$	t_{fix}	h_o	h_{min}	d_f	T_{inst}	
TAPCON® LDT	7,5x35/3	7,5	6	35	33	2	43	60	50	-	60	100	9	15	016670
	7,5x45/12			45		12				-					016671
	7,5x60/27			60		27				10					016672
	7,5x80/47			80		47				30					016673
	7,5x100/67			100		67				50					016674
	10x50/5	10	8	50	45	5	55	100	65	-	70	115	12	35	016675
	10x60/15			60		15				-					016676
	10x80/35			80		35				15					016677
	10x100/55			100		55				35					016678
	12x60/5	12	10	60	55	5	65	110	75	-	85	125	14	45	016679
	12x80/25			80		25				5					016680
	12x100/45			100		45				15					016681
	12x120/65			120		65				45					016682
	12x140/85			140		85				65					016683
	12x160/105			160		105				85					016684
TAPCON® ROD	7,5x35/M8	7,5	6	35	33	-	43	60	-	-	-	-	-	15	016648
	7,5x55/M8			55					50	-	60	100			016650
	7,5x35/M10			35					-	-	-	-			016649
	7,5x55/M10			55					50	-	60	100			016651
TAPCON® STUD	7,5x35/M8	7,5	6	35	33	2	43	60	-	-	-	-	-	15	016652
	7,5x55/M10			55					50	10	60	100			016653
TAPCON® DOME	7,5x35/2	7,5	6	35	33	2	43	60	50	-	60	100	9	15	016718
	7,5x45/12			45		12				-					016717
	7,5x60/27			60		27				10					016716
TAPCON® PAN	5,5x30/5	5,5	4	30	25	5	35	60	-	-	-	-	-	15	016712
	5,5x40/15			40		15									016713
	6,5x30/15	6,5	5	30		5								10	016714
	6,5x40/15			40		15									016715
TAPCON® CSK	4F32	6	5	32	25	7	35	38	45	-	55	68	6	5	921513
	4F45			45		20				-					921514
	4F57			57		32				12					921515
	4F70			70		45				25					921516
	4F82			82		57				37					921517
	4F100			100		75				55					921518
	4F125			125		100				-					921519
TAPCON® HEX HEAD	4H32	6	5	32	25	7	35	38	45	-	55	68	7	10	921501
	4H45			45		20				-					921502
	4H57			57		32				12					921503
	4H70			70		45				25					921504
	4H82			82		57				37					921505
	4H100			100		75				55					921506

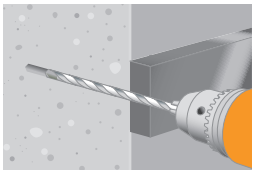
Applications

- Channel, cable tray
- Brackets
- E-Clips, cowhorn
- TRH clip, rod hanging
- Trunking
- Push-pull bars
- Formwork / shuttering

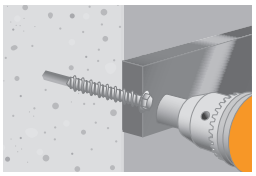
Material

- **Bolt:** Min. zinc coated steel 5 µm ; min. tensile strength: 1000 N/mm²

Installation



DRILL



DRIVE

Anchor mechanical properties

Anchor Ø		7,5	10	12
Threaded part				
As (mm²)	Stressed cross-section	23,3	43,6	70,1
$\mathbf{W_{el}}$ (mm³)	Elastic section modulus	15,9	40,6	82,9
$\mathbf{M^0_{Rk,s}}$ (Nm)	Characteristic bending moment	14,3	36,5	74,6
M (Nm)	Recommended bending moment	7,2	18,3	37,3



The loads specified on this page are derived from internal test results. For results derived from CC Methodology, please see overleaf. The data given in the pages "CC - Method" have to be applied.

Ultimate ($N_{Ru,m}$, $V_{Ru,m}$) / characteristic loads (N_{Rk}, V_{Rk}) in kN

Mean Ultimate loads are derived from test results in admissible service conditions, and characteristic loads are statistically determined.

TENSILE

Anchor Ø	4H*	5,5	6,5	7,5	10	12
Min. embedment depth						
h_{nom}	25	25	25	*33*	*45*	*55*
$N_{Ru,m}$	3,5	3,8	4,0	4,6	12,3	17,9
N_{Rk}	2,5	2,9	3,1	3,5	8,1	11,7
Max. embedment depth						
h_{nom}	44			*50*	*65*	*75*
$N_{Ru,m}$	7,5			8,6	24,8	28,8
N_{Rk}	5,4			6,5	16,4	20,4

SHEAR

Anchor Ø	4H*	5,5	6,5	7,5	10	12
h_{nom}	25	25	25	33	45	55
$V_{Ru,m}$	5,0	4,8	7,5	15,7	20,9	34,0
V_{Rk}	4,2	3,9	6,2	13,0	17,4	29,1
h_{nom}	44					
$V_{Ru,m}$	7,5					
V_{Rk}	6,3					

Design Loads (N_{Rd}, V_{Rd}) for one anchor without edge or spacing influence in kN

$$N_{Rd} = \frac{N_{Rk}^{*}}{\gamma_{Mc}}$$

*Derived from test results

$$V_{Rd} = \frac{V_{Rk}^{*}}{\gamma_{Ms}}$$

TENSILE

Anchor Ø	4H*	5,5	6,5	7,5	10	12
Min. embedment depth						
h_{nom}	25	25	25	33	45	55
N_{Rd}	1,2	1,4	1,5	1,9	4,5	6,5
Max. embedment depth						
h_{nom}	44			*50*	*65*	*75*
N_{Rd}	3,6			3,6	9,1	11,3

γ_{Mc} = 1,8 for ≥ Ø7,5

SHEAR

Anchor Ø	4H*	5,5	6,5	7,5	10	12
h_{nom}	25	25	25	33	45	55
V_{Rd}	2,8	2,6	4,1	8,7	11,6	19,4
h_{nom}	44					
V_{Rd}	4,0					

γ_{Ms} = 1,5

Recommended loads (N_{rec}, V_{rec}) for one anchor without edge or spacing influence in kN

$$N_{Rec} = \frac{N_{Rk}^{*}}{\gamma_{M}\gamma_{F}}$$

*Derived from test results

$$V_{Rec} = \frac{V_{Rk}^{*}}{\gamma_{M}.\gamma_{F}}$$

TENSILE

Anchor Ø	4H*	5,5	6,5	7,5	10	12
Min. embedment depth						
h_{nom}	25	25	25	33	45	55
N_{Rec}	0,9	1,0	1,1	1,4	3,2	4,6
Max. embedment depth						
h_{nom}	44			*50*	*65*	*75*
N_{Rec}	2,6			2,6	6,5	8,1

γ_F = 1,4 ; γ_{Mc} = 1,8 for ≥ Ø7,5

SHEAR

Anchor Ø	4H*	5,5	6,5	7,5	10	12
h_{nom}	25	25	25	33	45	55
V_{Rec}	2,0	1,9	3,0	6,2	8,3	13,8
h_{nom}	44					
V_{Rec}	3,0					

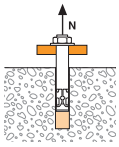
γ_{Ms} = 1,5; γ_F = 1,4

* When installing 4H Tapcon anchors in situations where spacing distances are below 100mm or edge distances are below 75mm, please contact the Spit Technical helpdesk for relevant the reduction factors, which must be applied to the stated recommended loads.



SPIT CC - Method

TENSILE in kN

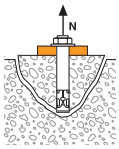


Pull-out resistance

$$N_{Rd,p} = N^{O}_{Rd,p} . f_b$$

$N^0_{Rd,p}$ Anchor Ø	Design pull-out resistance 5,5	6,5	7,5	10	12
Minimum embedment depth					
h_{nom}	25	25	33	45	55
$N^0_{Rd,p}$ (C20/25)	14	14	1,6	4,2	5,0
Maximum embedment depth					
h_{nom}	-	-	50	65	75
$N^0_{Rd,p}$ (C20/25)	-	-	3,3	6,7	8,9

γ_{Mc} = 1,8 for ≥ Ø7,5

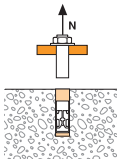


Concrete cone resistance

$$N_{Rd,c} = N^{O}_{Rd,c} . f_b . \Psi_s . \Psi_{c,N}$$

$N^0_{Rd,c}$ Anchor Ø	Design cone resistance 5,6	6,5	7,5	10	12
Minimum embedment depth					
h_{nom}	25	25	33	45	55
$N^0_{Rd,c}$ (C20/25)	3,0	3,0	4,6	8,5	11,4
Maximum embedment depth					
h_{nom}	-	-	50	65	75
$N^0_{Rd,c}$ (C20/25)	-	-	9,9	14,7	18,2

γ_{Mc} = 1,8 for ≥ Ø7,5

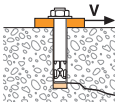


Steel resistance

$N_{Rd,s}$ Anchor Ø	Design steel tensile resistance 5,5	6,5	7,5	10	12
$N_{Rd,s}$	2,7	4,2	6,2	11,7	18,8

γ_{Ms} = 1,4

SHEAR in kN

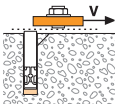


Concrete edge resistance

$$V_{Rd,c} = V^{O}_{Rd,c} . f_b . f_{\beta,V} . \Psi_{S-C,V}$$

$V^0_{Rd,c}$ Anchor Ø	Design concrete edge resistance at minimum edge distance (C_{min}) 5,5	6,5	7,5	10	12
Minimum embedment depth					
h_{nom}	25	25	33	45	55
C_{min}	30	30	40	50	50
S_{min}	30	30	40	50	50
$V^0_{Rd,c}$ (C20/25)	1,6	1,8	2,7	3,2	3,5
Maximum embedment depth					
h_{nom}	-	-	50	65	75
C_{min}	-	-	50	50	60
S_{min}	-	-	50	50	60
$V^0_{Rd,c}$ (C20/25)	-	-	3,0	3,4	4,9

γ_{Mc} = 1,5



Steel resistance

$V_{Rd,s}$ Anchor Ø	Design steel shear resistance 5,5	6,5	7,5	10	12
$V_{Rd,s}$	2,5	4,0	5,8	10,9	17,5

γ_{Ms} = 1,5

$$N_{Rd} = \min(N_{Rd,p} ; N_{Rd,c} ; N_{Rd,s})$$
$$\beta_N = N_{Sd} / N_{Rd} \leq 1$$

$$V_{Rd} = \min(V_{Rd,c} ; V_{Rd,cp} ; V_{Rd,s})$$
$$\beta_V = V_{Sd} / V_{Rd} \leq 1$$

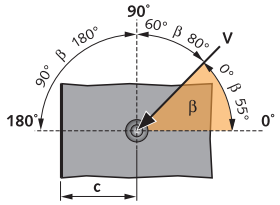
$$\beta_N + \beta_V \leq 1.2$$

f_B Influence of Concrete

Concrete class	f_B	Concrete class	f_B
C25/30	1,1	C40/50	1,41
C30/37	1,22	C45/55	1,48
C35/45	1,34	C50/60	1,55

$f_{\beta,V}$ Influence of Shear Loading Direction

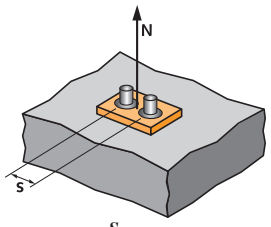
Angle β [°]	$f_{\beta,V}$
0 to 55	1
60	1.1
70	1.2
80	1.5
90 to 180	2





SPIT CC - Method

Ψ_s Influence of spacing for concrete cone resistance in tensile load



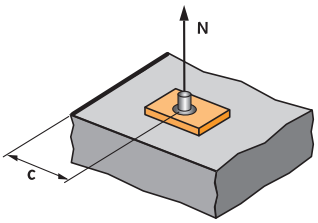
$$\Psi_S = 0{,}5 + \frac{s}{6.h_{ef}}$$

$S_{min} < S < S_{cr,N}$
$S_{cr,N} = 3.h_{ef}$
Ψ_s must be used for each spacing influenced the anchors group.

SPACING S	Factor Ψ_s Minimum embedment depth				
	5,5	6,5	7,5	10	12
30	0,75	0,75			
40	0,83	0,83	0,77		
50	0,92	0,92	0,83	0,74	0,71
60	1,00	1,00	0,90	0,79	0,75
70			0,97	0,83	0,79
80			1,00	0,88	0,83
90				0,93	0,88
100				0,98	0,92
110				1,00	0,96
120					1,00

SPACING S	Factor Ψ_s Minimum embedment depth		
	7,5	10	12
50	0,71	0,66	
60	0,75	0,69	0,67
70	0,79	0,72	0,70
80	0,83	0,75	0,73
90	0,88	0,78	0,76
100	0,92	0,81	0,79
120	1,00	0,88	0,84
140		0,94	0,90
150		0,97	0,93
160		1,00	0,96
170			1,00

$\Psi_{c,N}$ Influence of edge for concrete cone resistance in tensile load



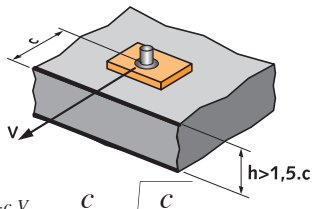
$$\Psi_{c,N} = 0{,}48 + 0{,}27.\frac{c}{h_{ef}}$$

$C_{min} < C < C_{cr,N}$
$C_{cr,N} = 1{,}5.h_{ef}$
$\Psi_{c,N}$ must be used for each distance influenced the anchors group.

EDGE C	Factor $\Psi_{c,N}$ Minimum embedment depth				
	5,5	6,5	7,5	10	12
30	1,00 m,m	n1,00			
40			1,00		
50				1,00	1,00

EDGE C	Factor $\Psi_{c,N}$ Maximum embedment depth		
	7,5	10	12
50	1,00	1,00	
60			1,00

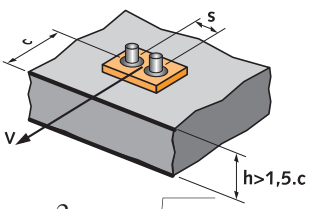
$\Psi_{s-c,V}$ Influence of spacing and edge distance for concrete edge resistance in shear load



$$\Psi_{s-c,V} = \frac{c}{c_{min}}.\sqrt{\frac{c}{c_{min}}}$$

For single anchor fastening

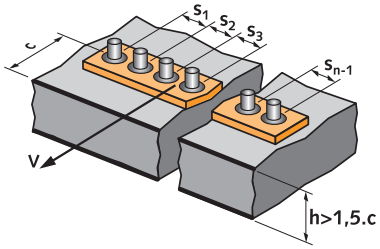
$\frac{C}{C_{min}}$	Factor $\Psi_{s-c,V}$ Non-cracked concrete											
	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2
$\Psi_{s-c,V}$	1,00	1,31	1,66	2,02	2,41	2,83	3,26	3,72	4,19	4,69	5,20	5,72



$$\Psi_{s-c,V} = \frac{3.c + s}{6.c_{min}}.\sqrt{\frac{c}{c_{min}}}$$

For 2 anchors

$\frac{S}{C_{min}}$ \ $\frac{C}{C_{min}}$	Factor $\Psi_{s-c,V}$ Non-cracked concrete											
	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2
1,0	0,67	0,84	1,03	1,22	1,43	1,65	1,88	2,12	2,36	2,62	2,89	3,16
1,5	0,75	0,93	1,12	1,33	1,54	1,77	2,00	2,25	2,50	2,76	3,03	3,31
2,0	0,83	1,02	1,22	1,43	1,65	1,89	2,12	2,38	2,63	2,90	3,18	3,46
2,5	0,92	1,11	1,32	1,54	1,77	2,00	2,25	2,50	2,77	3,04	3,32	3,61
3,0	1,00	1,20	1,42	1,64	1,88	2,12	2,37	2,63	2,90	3,18	3,46	3,76
3,5		1,30	1,52	1,75	1,99	2,24	2,50	2,76	3,04	3,32	3,61	3,91
4,0			1,62	1,86	2,10	2,36	2,62	2,89	3,17	3,46	3,75	4,05
4,5				1,96	2,21	2,47	2,74	3,02	3,31	3,60	3,90	4,20
5,0					2,33	2,59	2,87	3,15	3,44	3,74	4,04	4,35
5,5						2,71	2,99	3,28	3,71	4,02	4,33	4,65
6,0						2,83	3,11	3,41	3,71	4,02	4,33	4,65



For 3 anchors or more

$$\Psi_{s-c,V} = \frac{3.c + s_1 + s_2 + s_3 + \ldots + s_{n-1}}{3\,n\,c}.\sqrt{\frac{c}{c}}$$