

# LOADS - INJECTION MORTAR FIS V AND FIS VS

Mean ultimate loads, design resistant and recommended loads for single anchors of fischer Injection system FIS V and FIS VS used with threaded rods FIS A with large axial spacing and edge distance.

Anchor size			Non-cracked concrete																
			M 6		M 8		M 10		M 12		M 16		M 20		M 24		M30		
Effective anchorage depth = Drill hole depth	$h_{01} = h_{ef1}$ [mm]		50	65	80	95	125	160	190	240									
	$h_{02} = h_{ef2}$ [mm]		60	80	90	110	140	170	240	280									
	$h_{03} = h_{ef3}$ [mm]		75	95	110	120	170	210	285	340									
Drill hole diameter	$d_0$ [mm]		8	10	12	14	18	24	28	35									
<b>Mean ultimate loads <math>N_U</math> and <math>V_U</math> [kN]</b>																			
			gvz	A4	gvz	A4	gvz	A4	gvz	A4	gvz	A4	gvz	A4	gvz	A4			
Tensile	0°	$N_U$	[kN] $h_{ef1}$	10.5*	14.1*	19.0*	25.6*	30.2*	40.6*	43.8*	58.4	81.6*	93.2	127.4	127.4	176.9	176.9	248.1	248.1
			[kN] $h_{ef2}$	10.5*	14.1*	19.0*	25.6*	30.2*	40.6*	43.8*	59.0*	81.6*	104.4	127.4*	135.4	183.6*	223.5	289.5	289.5
			[kN] $h_{ef3}$	10.5*	14.1*	19.0*	25.6*	30.2*	40.6*	43.8*	59.0*	81.6*	109.9*	127.4*	167.2	183.6*	247.1*	291.7*	351.5
Shear	90°	$V_U$	[kN]	6.3*	8.4*	11.4*	15.4*	18.1*	24.4*	26.3*	35.4*	49.0*	65.9*	76.4*	102.9*	110.1*	148.3*	175.0*	235.6*
<b>Design resistant loads <math>N_{Rd}</math> and <math>V_{Rd}</math> [kN]</b>																			
			gvz	A4	gvz	A4	gvz	A4	gvz	A4	gvz	A4	gvz	A4	gvz	A4			
Tensile	0°	$N_{Rd}$	[kN] $h_{ef1}$	4.7	4.7	8.2	8.2	12.6	12.6	17.9	17.9	31.4	31.4	40.2	40.2	57.3	57.3	67.8	67.8
			[kN] $h_{ef2}$	5.7	5.7	10.1	10.1	14.1	14.1	20.7	20.7	35.2	35.2	42.7	42.7	72.4	72.4	79.2	79.2
			[kN] $h_{ef3}$	7.1	7.1	11.9	11.9	17.3	17.3	22.6	22.6	42.7	42.7	52.8	52.8	85.9	85.9	96.1	96.1
Shear	90°	$V_{Rd}$	[kN]	4.2	4.5	7.6	8.2	12.1	13.0	17.5	18.9	32.6	35.3	51.0	55.0	73.4	79.2	116.7	125.9
<b>Recommended loads <math>N_{rec}</math> and <math>V_{rec}</math> [kN]</b>																			
			gvz	A4	gvz	A4	gvz	A4	gvz	A4	gvz	A4	gvz	A4	gvz	A4			
Tensile	0°	$N_{rec}$	[kN] $h_{ef1}$	3.4	3.4	5.9	5.9	9.0	9.0	12.8	12.8	22.4	22.4	28.7	28.7	40.9	40.9	48.4	48.4
			[kN] $h_{ef2}$	4.1	4.1	7.2	7.2	10.1	10.1	14.8	14.8	25.1	25.1	30.5	30.5	51.7	51.7	56.6	56.6
			[kN] $h_{ef3}$	5.1	5.1	8.5	8.5	12.4	12.4	16.1	16.1	30.5	30.5	37.7	37.7	61.4	61.4	68.6	68.6
Shear	90°	$V_{rec}$	[kN]	3.0	3.2	5.4	5.9	8.6	9.3	12.5	13.5	23.3	25.2	36.4	39.3	52.4	56.6	83.4	89.9
<b>Recommended bending moment <math>M_{rec}</math> [Nm]</b>																			
			gvz	A4	gvz	A4	gvz	A4	gvz	A4	gvz	A4	gvz	A4	gvz	A4			
			$M_{rec}$ [Nm]	4.5	4.9	114	11.9	22.3	23.8	38.9	42.1	98.9	106.7	193.1	207.9	333.1	359.4	668.0	720.7
<b>Component dimensions, minimum axial spacings and edge distances</b>																			
Min. axial spacing <sup>1)</sup>	$s_{min}$ [mm]		40	40	45	55	65	85	105	140									
Min. edge distance <sup>1)</sup>	$c_{min}$ [mm]		40	40	45	55	65	85	105	140									
Min. structural component thickness	$h_{min1}$ [mm]		100	100	110	125	165	210	250	310									
	$h_{min2}$ [mm]		100	110	120	140	180	220	300	350									
	$h_{min3}$ [mm]		115	125	140	150	210	260	345	410									
Required torque	$T_{inst}$ [Nm]		5	10	20	40	60	120	150	300									

\* Steel failure decisive.

<sup>1)</sup> For minimum axial spacing and minimum edge distance the above described loads have to be reduced (see "fischer Technical Handbook" or design software "CC-Compufix")!

Values given above are valid under the following assumptions: - Sufficient mechanical cleaning of the drill hole using stainless steel brushes.

- Dry concrete, temperature range 50°C long term temperature and 80°C short term temperature.

All values apply for concrete C 20/25 without edge or spacing influence.

Design resistant loads: material safety factor  $\gamma_M$  is included. Material safety factor  $\gamma_M$  depends on the type of anchor.

Recommended loads: material safety factor  $\gamma_M$  and safety factor for load  $\gamma_L = 1.4$  are included.

**The condition of application differ from those given in the European Technical Approval (ETA). For further detailed information about the ETA please contact the fischer technical service department. RG M threaded rods can be used as an alternative. Please refer to page 47 for suitable threaded rods.**