Loads

Permissible loads of a single anchor[1] [2] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-17/0979 of 22.04.2024 has to be considered.

| Type | Material/ surface[3] | Effective anchorage depth h_{ef} [mm] | Minimum member thickness h_{min} [mm] | Maximum installation-torque $T_{inst,max}$ [Nm] | Cracked concrete Permissible tension (N_{perm}) and shear loads (V_{perm}); minimum spacing (s_{min}) and edge distances (c_{min}) with reduced loads | | | | Non-cracked concrete Permissible tension (N_{perm}) and shear loads (V_{perm}); minimum spacing (s_{min}) and edge distances (c_{min}) with reduced loads | | | |
					N_{perm}[4] [kN]	V_{perm}[4] [kN]	s_{min}[4] [mm]	c_{min}[4] [mm]	N_{perm}[4] [kN]	V_{perm}[4] [kN]	s_{min}[4] [mm]	c_{min}[4] [mm]
FIS A M 8	5.8	60	90	10	5.2	6.2	40	40	8.7	6.2	40	40
	5.8	80	110	10	6.9	6.2	40	40	8.7	6.2	40	40
	5.8	160	190	10	8.7	6.2	40	40	8.7	6.2	40	40
	R-70	60	90	10	5.2	5.9	40	40	9.8	5.9	40	40
	R-70	80	110	10	6.9	5.9	40	40	9.8	5.9	40	40
	R-70	160	190	10	9.8	5.9	80	40	9.8	5.9	40	40
FIS A M 10	5.8	60	90	20	7.6	9.9	45	45	10.9	9.9	45	45
	5.8	90	120	20	11.4	9.9	45	45	13.8	9.9	45	45
	5.8	200	230	20	13.8	9.9	45	45	13.8	9.9	45	45
	R-70	60	90	20	7.6	9.3	45	45	10.9	9.3	45	45
	R-70	90	120	20	11.4	9.3	45	45	15.5	9.3	45	45
	R-70	200	230	20	15.5	9.3	45	45	15.5	9.3	45	45
FIS A M 12	5.8	70	100	40	9.6	14.4	55	45	13.7	14.4	55	45
	5.8	110	140	40	18.8	14.4	55	45	20.0	14.4	55	45
	5.8	240	270	40	20.0	14.4	55	45	20.0	14.4	55	45
	R-70	70	100	40	9.6	13.5	55	45	13.7	13.5	55	45
	R-70	110	140	40	18.8	13.5	55	45	22.5	13.5	55	45
	R-70	240	270	40	22.5	13.5	55	45	22.5	13.5	55	45
FIS A M 16	5.8	80	120	60	11.7	23.5	65	50	16.8	26.9	65	50
	5.8	125	170	60	22.9	26.9	65	50	32.7	26.9	65	50
	5.8	320	360	60	37.4	26.9	65	50	37.4	26.9	65	50
	R-70	80	120	60	11.7	23.5	65	50	16.8	25.1	65	50
	R-70	125	170	60	22.9	25.1	65	50	32.7	25.1	65	50
	R-70	320	360	60	42.0	25.1	65	50	42.0	25.1	65	50
FIS A M 20	5.8	90	140	120	14.0	28.0	85	55	20.0	40.0	85	55
	5.8	170	220	120	36.3	42.0	85	55	51.9	42.0	85	55
	5.8	400	450	120	58.3	42.0	85	55	58.3	42.0	85	55
	R-70	90	140	120	14.0	28.0	85	55	20.0	39.2	85	55
	R-70	170	220	120	36.3	39.2	85	55	51.9	39.2	85	55
	R-70	400	450	120	65.5	39.2	85	55	65.5	39.2	85	55
FIS A M 24	5.8	96	160	150	15.4	30.8	105	60	22.0	44.1	105	60
	5.8	210	270	150	49.9	60.5	105	60	71.3	60.5	105	60
	5.8	480	540	150	84.0	60.5	105	60	84.0	60.5	105	60
	R-70	96	160	150	15.4	30.8	105	60	22.0	44.1	105	60
	R-70	210	270	150	49.9	56.5	105	60	71.3	56.5	105	60
	R-70	480	540	150	94.4	56.5	105	60	94.4	56.5	105	60
FIS A M 30	5.8	120	190	300	21.6	43.1	140	80	30.8	61.6	140	80
	5.8	280	350	300	76.8	96.2	140	80	109.8	96.2	140	80
	5.8	600	670	300	133.6	96.2	140	80	133.6	96.2	140	80
	R-70	120	190	300	21.6	43.1	140	80	30.8	61.6	140	80
	R-70	280	350	300	76.8	89.9	140	80	109.8	89.9	140	80
	R-70	600	670	300	150.0	89.9	140	80	150.0	89.9	140	80

[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of γ_L = 1.4 are considered. As a single anchor counts e.g. an anchor with a spacing s ≥ 3 x h_{ef} and an edge distance c ≥ 1.5 x h_{ef}. Accurate data see ETA.

[2] The specified loads are valid for anchorages in dry and damp concrete. For temperatures in the anchoring substrate up to 50 °C (resp. short term up to 72 °C). Higher loads are possible at lower temperatures. Drilling method and borehole cleaning according to ETA specifications. The factor Ψ_{sus} for sustained load was taken into account with 1.0.

[3] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).

[4] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.