The concrete all rounder

Steel structure

APPROVALS

ETA 12/0258
ETA 13/0651

Fire resistance classification R 120
Anchor types see test report

ICC ES ESR-3572
See ICC-ES Evaluation Report at www.ic-es.org
Inspection agency: IEA (AA-707)

SEISMIC

ADVANTAGES

- Thanks to its high bond strength, Superbond mortar FIS SB achieves a very high load level for safe use in cracked and non-cracked concrete.
- Beside the standard version the Superbond mortar is also available as fast curing FIS SB HIGH SPEED e.g. for installations at extreme minus temperatures (from –20 °C) and as FIS SB LOW SPEED with extended setting times.
- Variable anchorage depths from 4x to 20x anchor rod diameter allow for ideal adaptation to the load to be applied, and ensure an optimised installation time and use of materials.
- The Superbond mortar can even be used at extremely high temperatures of up to +150 °C. This opens up new application fields, where no chemical anchor could be used so far.
- The Superbond mortar FIS SB is approved for seismic applications, which ensures safety even under extreme conditions.
- The RSB capsule can be used in non-cleaned holes with just blowing air.

BUILDING MATERIALS

Approved for anchoring in:

- Concrete C20/25 to C50/60
- Cracked and non-cracked
- Seismic conditions
- Diamond drill holes

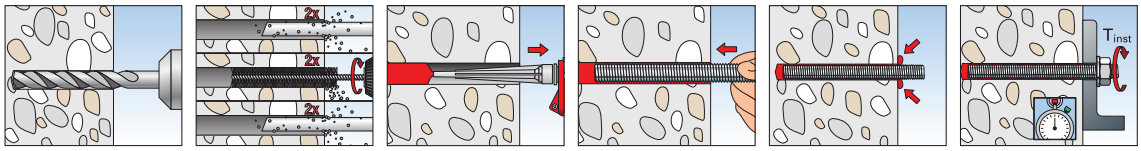
Approved for rebar connection in:

- Concrete C12/15 to C50/60

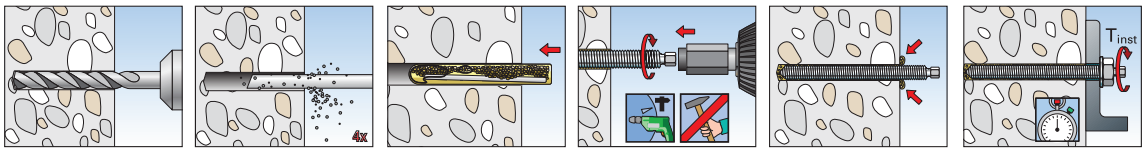
Also suitable for:

- Natural stone with dense structure

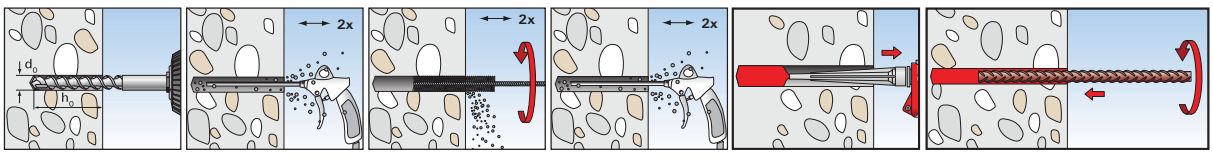
INSTALLATION WITH INJECTION MORTAR FIS SB IN HAMMER-DRILLED DRILL HOLE

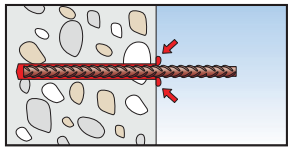


INSTALLATION WITH RESIN CAPSULE RSB IN HAMMER-DRILLED DRILL HOLE



INSTALLATION DETAILS - Rebar





CURING TIME

Temperature in the anchorage base	Maximum processing time t_{work} (minutes)			Maximum processing time t_{cure} (minutes)			
	FIS SB Low speed	FIS SB	FIS SB High speed	FIS SB Low speed	FIS SB	FIS SB High speed	RSB
>-5 to ±0	-	20	10	-	8 hours	2 hours	10 hours
>±0 to +5	30	13	5	17 hours	4 hours	1 hour	45
>+5 to +10	15	9	3	8 hours	120	45	30
>+10 to +20	12	5	2	4.5 hours	60	30	20
>+20 to +30	8	4	1	60	45	15	5
≥30°C	5	2	-	30	30	-	3

TECHNICAL DATA

Resin capsule**RSB**

Item	Art-No.	Drill-Ø do	Anchorage depth hef	Suitable for	Sales unit (units)
RSB 8	**518807**	10	80	RG M8	10
RSB 10 mini	**518820**	12	75 / 150 [1]	RG M10	10
RSB 10	**518821**	12 / 14 [2]	90	RG M10/RG M8 I	10
RSB 12 mini	**518822**	14	75 / 150 [1]	RG M12	10
RSB 12	**518823**	14 / 18 [2]	110 / 90 [2]	RG M12 / RG M10 I	10
RSB 16 mini	**518824**	18	95 / 190	RG M16	10
RSB 16	**518825**	18 / 20 [2]	125	RG M16 / RG M12 I	10
RSB 16 E	**518826**	18	160	RG M16 I	10
RSB 20	**518827**	24	170	RG M20	10
RSB 20 E/24	**518828**	24 / 28 / 32 [2]	210 / 200 [2]	RG M20 / RG M24 / RG M20 I	5
RSB 30	**518829**	35	280	RG M30	5

(1) with 2 capsules RSB mini per drill hole (2) if used with internal threaded rod anchor RG MI

FIS SB 390 S

FISMixer Red

Item	Art-No.	Language	Description	Content (scale units)	Sales unit (units)
FIS SB 390 S	**518831**	GB, E, P	1 cartridge 390 ml + 2 mixing nozzles	180	6
FIS Mixer Red	**096448**	-	10 mixing nozzles	-	10
Ultra Mixer Red	**520593**	-	10 mixing nozzles	-	10

LOADS

Loads for a single anchor in concrete C20/25 [1) 3) 4)]
For the design the complete approval ETA - 12/0258 has to be considered.

Item	Effective anchorage depth hef (mm)	Minimum member thickness hmin (mm)	Installation torque Tinst (Nm)	Min spacing Smin (mm)	Min edge distance Cmin (mm)	Cracked Concrete				Non-cracked Concrete			
						Design tensile load Nd (kN)	Design shear load Vd (kN)	Permissible tensile load Nrec (kN)	Permissible shear load Vrec (kN)	Design tensile load Nd (kN)	Design shear load Vd (kN)	Permissible tensile load Nrec (kN)	Permissible shear load Vrec (kN)
RG M 8 (8.8)	80	110	10	40	40	8.0	12.0	5.7	8.6	16.1	12.0	11.5	8.6
RG M 10 (8.8)	75	105	20	45	45	10.2	18.3	7.3	13.1	18.9	18.3	13.5	13.1
	90	120	20	45	45	12.3	18.3	8.8	13.1	22.7	18.3	16.2	13.1
	150	180	20	45	45	20.4	18.3	14.6	13.1	31.4	18.3	22.4	13.1
RG M 12 (8.8)	75	105	40	55	55	14.1	27.2	10.1	19.4	21.8	27.2	15.6	19.4
	110	140	40	55	55	20.7	27.2	14.8	19.4	33.2	27.2	23.7	19.4
	150	180	40	55	55	28.3	27.2	20.2	19.4	45.2	27.2	32.3	19.4
RG M 16 (8.8)	95	131	60	65	65	22.3	44.4	15.9	31.7	31.2	50.4	22.3	31.7
	125	161	60	65	65	31.4	50.4	22.4	36.0	47.0	50.4	33.6	36.0
	190	226	60	65	65	47.7	50.4	34.1	36.0	82.7	50.4	59.1	36.0
RG M 20 (8.8)	170	218	120	85	85	53.2	78.4	38.0	56.0	74.6	78.4	53.3	56.0
	210	258	120	85	85	65.9	78.4	47.1	56.0	102.5	78.4	73.2	56.0
RG M 24 (8.8)	210	266	150	105	105	73.1	112.8	52.2	80.6	102.5	112.8	73.2	80.6
RG M 30 (8.8)	280	350	300	140	140	112.4	180.0	80.3	128.6	157.8	180.0	112.7	128.6
RG M 8 (8.8)	80	110	10	40	40	8.0	8.4	5.7	6.0	13.9	8.4	9.9	6.0
RG M 10 (A4)	75	105	20	45	45	10.2	12.9	7.3	9.2	18.9	12.9	13.5	9.2
	90	120	20	45	45	12.3	12.9	8.8	9.2	22.0	12.9	15.7	9.2
	150	180	20	45	45	20.4	12.9	14.6	9.2	22.0	12.9	15.7	9.2
RG M 12 (A4)	75	105	40	55	55	14.1	19.2	10.1	13.7	21.8	19.2	15.6	13.7
	110	140	40	55	55	20.7	19.2	14.8	13.7	31.5	19.2	22.5	13.7
	150	180	40	55	55	28.3	19.2	20.2	13.7	31.5	19.2	22.5	13.7
RG M 16 (A4)	95	131	60	65	65	22.3	35.3	15.9	25.2	31.5	35.3	22.3	25.2
	125	161	60	65	65	31.4	35.3	22.4	25.2	47.0	35.3	33.6	25.2
	190	226	60	65	65	47.7	35.3	34.1	25.2	58.8	35.3	42.0	25.2
RG M 20 (A4)	170	218	120	85	85	53.2	55.2	38.0	39.4	74.6	55.2	53.3	39.4
	210	258	120	85	85	65.9	55.2	47.1	39.4	92.0	55.2	65.7	39.4
RG M 24 (A4)	210	266	150	105	105	73.1	79.5	52.2	56.8	102.5	79.5	73.2	56.8
RG M 30 (A4)	280	350	300	140	140	112.4	126.3	80.3	90.2	157.8	126.3	112.7	90.2

(1) The loads apply to fischer threaded rods with hammer drilling and careful drill hole cleaning according to the approval. The anchor may be installed in dry or wet concrete.
(2) (short term temperature / long term temperature)
(3) Material safety factor γ_M included as per approval
(4) Partial safety factor for action γ_L = 1.4 are considered for recommended load capacities.

Loads for a single anchor in concrete [1) 5) 8) 9)]
For the design the complete ETA - 12/0258 has to be considered
Design Resistance [1)]

Rod diameter	Dia 8				Dia 10				Dia 12				Dia 14	Dia 16				Dia 20				Dia 24			Dia 25
hef(mm)	80				100				120				140	160				200				240			250
Anchor type	5.8	8.8	A4-70	Rebar	5.8	8.8	A4-70	Rebar	5.8	8.8	A4-70	Rebar	Rebar	5.8	8.8	A4-70	Rebar	5.8	8.8	A4-70	Rebar	5.8	8.8	A4-70	Rebar
Drill diameter (mm)	10				12				14				18	18			20	24			25	28			30
Torque (Nm)	10			-	20			-	40			-	-	60			-	120			-	150			-
Non-cracked Concrete																									
Tension C20/25 N_{rd} (kN)	12.6	16.0	13.9	10.7	19.3	25.1	21.9	17.8	28.6	36.1	31.5	27.1	36.9	52.6	68.1	58.8	50.9	82.0	95.2	91.7	79.5	118.0	125.1	125.1	98.1
Tension C50/60 N_{rd} (kN)	12.6	17.6	13.9	11.7	19.3	27.6	21.9	19.5	28.6	39.8	31.5	29.6	40.6	52.6	76.6	58.8	56.0	82.0	119.7	91.7	87.5	118.0	159.2	132.0	129.5
Shear ≥ C25/25	7.2	12.0	8.3	10.1	12.0	18.4	12.8	15.8	16.0	27.2	19.2	22.8	31.1	31.2	50.2	35.2	40.6	48.8	78.4	55.0	63.5	71.2	112.8	79.2	99.3
Cracked Concrete																									
Tension C20/25 N_{rd} (kN)	8.0	8.0	8.0	6.0	13.6	13.6	13.6	11.5	22.6	22.6	22.6	16.5	22.5	40.2	40.2	40.2	34.8	62.8	62.8	62.8	50.2	89.2	89.2	89.2	78.5
Tension C50/60 N_{rd} (kN)	8.8	8.8	8.8	6.6	14.8	14.8	14.8	12.5	24.8	24.8	24.8	18.1	24.8	44.2	44.2	44.2	38.0	69.1	69.1	69.1	54.8	99.5	99.5	99.5	86.3
Shear ≥ C25/25	7.2	12.0	8.3	10.1	12.0	18.4	12.8	15.8	16.8	27.0	19.2	22.8	31.1	31.2	50.2	35.2	40.6	48.8	78.4	55.0	63.5	71.2	112.8	79.2	99.3

Rod diameter	Dia 27			Dia 28	Dia 30			Dia 32
hef(mm)	270			280	300			320
Anchor type	5.8	8.8	A4-70	Rebar	5.8	8.8	A4-70	Rebar
Drill diameter (mm)	30			35	35			40
Torque (Nm)	200			-	300			-
Non-cracked Concrete								
Tension C20/25 N_{rd} (kN)	149.0	149.0	149.0	139.5	174.9	174.9	174.9	160.8
Tension C50/60 N_{rd} (kN)	153.3	167.9	167.9	153.5	187.3	207.3	207.3	176.9
Shear ≥ C25/25	92.0	146.9	103.0	124.6	112.8	179.5	125.9	162.7
Cracked Concrete								
Tension C20/25 N_{rd} (kN)	106.4	106.4	106.4	98.5	124.7	124.7	124.7	128.5
Tension C50/60 N_{rd} (kN)	117.5	117.5	117.5	108.3	145.0	145.0	145.0	141.5
Shear ≥ C25/25	92.0	147.0	103.0	124.6	112.8	179.5	125.9	162.7

Loads for a single anchor in concrete [1) 2) 5) 8) 9)]
For the design the complete ETA - 12/0258
Recommended Resistance [2)]

Rod diameter	Dia 8				Dia 10				Dia 12				Dia 14	Dia 16				Dia 20				Dia 24			Dia 25
hef(mm)	80				100				120					160				200				240			250
Quality	5.8	8.8	A4-70	Rebar	5.8	8.8	A4-70	Rebar	5.8	8.8	A4-70	Rebar	Rebar	5.8	8.8	A4-70	Rebar	5.8	8.8	A4-70	Rebar	5.8	8.8	A4-70	Rebar
Drill diameter (mm)	12				14				14			16	18	18			20	24			25	28			30
Torque (Nm)	10			-	20			-	40			-	-	60			-	120			-	150			-
Non-cracked Concrete																									
Tension C20/25 N_{rd} (kN)	9.0	11.5	9.8	7.7	13.8	17.9	15.6	12.7	20.4	25.8	22.5	19.4	26.4	37.6	48.7	42.0	36.4	58.6	68.0	65.5	56.8	84.3	89.4	89.4	70.1
Tension C50/60 N_{rd} (kN)	9.0	12.6	9.9	8.3	13.8	19.7	15.6	13.9	20.4	28.4	22.5	21.1	29.0	37.6	54.7	42.0	40.0	58.6	85.5	65.5	62.5	84.3	113.7	94.3	92.5
Shear ≥ C25/25	5.1	8.6	5.9	7.2	8.6	13.1	9.1	11.3	12.0	19.4	13.7	16.3	22.3	22.3	35.9	25.2	29.0	34.9	56.0	39.3	45.4	50.9	80.6	56.6	70.9
Cracked Concrete																									
Tension C20/25 N_{rd} (kN)	5.7	5.7	5.7	4.3	9.7	9.7	9.7	8.2	16.1	16.1	16.1	11.8	16.1	28.7	28.7	28.7	24.9	44.9	44.9	44.9	35.9	63.7	63.7	63.7	56.1
Tension C50/60 N_{rd} (kN)	6.3	6.3	6.3	4.7	10.6	10.6	10.6	9.0	17.7	17.7	17.7	12.9	17.7	31.6	31.6	31.6	27.1	49.4	49.4	49.4	39.1	71.1	71.1	71.1	61.6
Shear ≥ C25/25	5.1	8.6	5.9	7.2	8.6	13.1	9.1	11.3	12.0	19.4	13.7	16.3	22.2	22.3	35.9	25.2	29.0	34.9	56.0	39.3	45.4	50.9	80.6	56.6	70.9

Rod diameter	Dia 27			Dia 28	Dia 30			Dia 32
hef(mm)	270			280	300			320
Quality	5.8	8.8	A4-70	Rebar	5.8	8.8	A4-70	Rebar
Drill diameter (mm)	30			35	35			40
Torque (Nm)	200			-	300			-
Non-cracked Concrete								
Tension C20/25 N_{rd} (kN)	106.4	106.4	106.4	99.6	124.9	124.9	124.9	114.9
Tension C50/60 N_{rd} (kN)	109.5	119.9	119.9	109.6	133.8	133.8	133.8	126.4
Shear ≥ C25/25	65.7	104.9	73.6	89.0	80.6	128.2	89.9	116.2
Cracked Concrete								
Tension C20/25 N_{rd} (kN)	76.0	76.0	76.0	70.4	89.1	89.1	89.1	91.8
Tension C50/60 N_{rd} (kN)	83.9	83.9	69.3	77.4	103.6	103.6	103.6	101.1
Shear ≥ C25/25	65.7	105.0	73.6	89.0	80.6	128.2	89.9	116.2

(1) The partial safety factors for material resistance as regulated in the approval.
(2) Partial safety factor for load γ_L= 1.4 are considered for recommended load capacities.
(3) Minimum possible axial spacings resp. edge distance while reducing the permissible load/ design load.
(4) For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.
(5) For higher concrete strength classes up to C50/60 higher permissible loads may be possible.
(6) The given loads are valid for fixations in dry and humid concrete for temperatures in the substrate up to +50°C (resp. short term up to 80°C) and best possible drillhole cleaning according approval.
(7) Rebar grade used for above calculation is FY= 460 n/mm²).
(8) The above loads use for embedment depth = 10 x dia.
(9) Embedment depth can be reduced or increased to get desired loads as per approval.