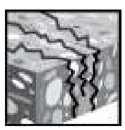
HIT-RE 100 injection mortar

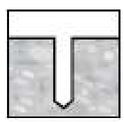
Rebar design (EN 1992-1) / Rebar elements / Concrete

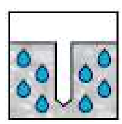
Injection mortar system		Benefits
	Hilti HIT-RE 100 330 ml foil pack (also available as 500 ml and 1400 ml foil pack)	- Suitable for concrete C 12/15 to C 50/60 - High loading capacity - Suitable for dry and water saturated concrete - For rebar diameters up to 40 mm - Non corrosive to rebar elements - Long working time at elevated temperatures - Suitable for embedment length till 3200 mm
	Rebar B500 B (ϕ8 - ϕ40)	

Base material

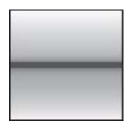

Concrete (non-cracked)


Concrete (cracked)


Dry concrete

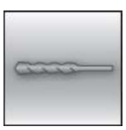

Wet concrete

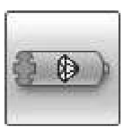
Load conditions


Static/ quasi-static


Fire resistance

Installation conditions


Hammer drilling


Diamond coring

Other information


European Technical Assessment


CE conformity

Approvals / certificates

Description	Authority / Laboratory	No, / date of issue
European technical assessment [a)]	DIBt, Berlin	ETA – 15/0883 / 2017-12-06
Fire report	MFPA, Liepzig	GS 3,2/15-431-4 / 2016-04-29

c) All data given in this section according to the approvals mentioned above ETA-15/0883 issue 2017-12-06,

Basic design data

Static EC2 design

Design bond strength in N/mm² according to ETA 15/0883 for good bond conditions

Rebar-size	Concrete class								
	C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
All allowed hammer drilling methods									
ϕ8 - ϕ32	1,6	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,3
ϕ34	1,6	2,0	2,3	2,6	2,9	3,3	3,6	3,9	4,2
ϕ36	1,5	1,9	2,2	2,6	2,9	3,3	3,6	3,8	4,1
ϕ40	1,5	1,8	2,1	2,5	2,8	3,1	3,4	3,7	4,0
Diamond coring wet									
ϕ8 - ϕ32	1,6	2,0	2,3	2,7					
ϕ34	1,6	2,0	2,3	2,6					
ϕ36	1,5	1,9	2,2	2,6					
ϕ40	1,5	1,8	2,1	2,5					

For poor bond conditions multiply the values by 0,7, Values valid for non-cracked and cracked concrete

Minimum anchorage length and minimum lap length

The minimum anchorage length $\ell_{b,min}$ and the minimum overlap length $\ell_{0,min}$ according to EN 1992-1-1 shall be multiplied by the relevant **Amplification factor** in the table below,

Amplification factor α_{lb} for the min, anchorage length and min, lap length according to EN 1992-1-1 for:

Rebar - size	Concrete class								
	C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
All allowed hammer drilling methods									
ϕ8 -ϕ40	1,0								
Diamond coring dry and wet									
ϕ8 -ϕ40	1,5								

Pre-calculated values[1] – anchorage length

Rebar yield strength f_{yk}=500 N/mm², concrete C25/30, good bond conditions

Rebar-size	Anchorage length l_{bd} [mm]	Design value N_{Rd} [KN]	Mortar volume[2] V_M [ml]	Anchorage length l_{bd} [mm]	Design value N_{Rd} [KN]	Mortar volume[2] V_M [ml]
	$\alpha_1=\alpha_2=\alpha_3=\alpha_4=\alpha_5=1{,}0$			$\alpha_1=\alpha_3=\alpha_4=1{,}0$ α_2 or $\alpha_5=0{,}7$		
ϕ8	100	6,8	8	100	9,7	8
	170	11,5	13	140	13,6	11
	250	17,0	19	180	17,4	14
	322,1	21,9	24	**225,4**	21,9	17
ϕ10	121	10,3	11	121	14,7	11
	220	18,7	20	170	20,6	15
	310	26,3	28	230	27,9	21
	402,6	34,1	36	**281,8**	34,1	25
ϕ12	145	14,8	15	145	21,1	15
	260	26,5	27	210	30,5	22
	370	37,7	39	270	39,3	29
	483,1	49,2	51	**338,2**	49,2	36
ϕ14	169	20,1	20	169	28,7	20
	300	35,6	36	240	40,7	29
	430	51,1	52	320	54,3	39
	563,6	66,9	68	**394,5**	66,9	48

Pre-calculated values[1] – anchorage length

Rebar yield strength f_{yk}=500 N/mm², concrete C25/30, good bond conditions

Rebar-size	Anchorage length l_{bd} [mm]	Design value N_{Rd} [KN]	Mortar volume[2] V_M [ml]	Anchorage length l_{bd} [mm]	Design value N_{Rd} [KN]	Mortar volume[2] V_M [ml]
	$\alpha_1=\alpha_2=\alpha_3=\alpha_4=\alpha_5=1,0$			$\alpha_1=\alpha_3=\alpha_4=1,0$	α_2 or $\alpha_5=0,7$	
ϕ16	193	26,2	26	193	37,4	26
	340	46,1	46	280	54,3	38
	490	66,5	67	370	71,7	50
	644	87,4	87	**450,9**	87,4	61
ϕ18	217	33,1	33	217	47,3	33
	380	58	57	310	67,6	47
	540	82,4	81	410	89,4	62
	724,6	110,6	109	**507,2**	110,6	76
ϕ20	242	41,1	51	242	58,6	51
	390	66,2	83	350	84,8	74
	550	93,3	117	460	111,5	98
	805,2	136,6	171	**563,6**	136,6	120
ϕ22	266	49,6	75	266	70,9	75
	410	76,5	116	380	101,3	107
	560	104,5	158	500	133,3	141
	885,7	165,3	250	**620**	165,3	175
ϕ24	290	59	122	290	84,3	122
	430	87,5	182	420	122,1	177
	560	114	236	550	160	232
	966,2	196,7	408	**676,3**	196,7	286
ϕ25	302	64	114	302	91,5	114
	430	91,2	162	430	130,3	162
	570	120,9	214	570	172,7	214
	1006,4	213,4	378	**704,5**	213,4	265
ϕ28	350	83,1	145	338	114,7	140
	595	141,3	247	480	162,9	200
	875	207,8	364	635	215,5	264
	1127,2	267,7	469	**789**	267,7	328
ϕ30	374	95,2	165	374	136	165
	635	161,6	281	528	191,9	233
	935	237,9	413	700	254,5	309
	1207,7	307,3	534	**845,4**	307,3	374
ϕ32	400	108,6	217	400	155,1	217
	680	184,6	369	580	224,9	315
	1000	271,4	543	800	310,2	434
	1288,2	349,7	699	**901,8**	349,7	490
ϕ36	450	132,3	387	440	184,8	379
	765	225	658	640	268,8	551
	1125	330,8	968	900	378,1	774
	1505,0	442,6	1295	**1053,5**	442,6	907
ϕ40	500	157,1	520	485	217,7	505
	850	267	884	700	314,2	728
	1000	314,2	1040	990	444,3	1030
	1739,1	546,4	1810	**1217,4**	546,4	1267

1) Values corresponding to the minimum anchorage length, The maximum permissible load is valid for "good bond conditions" as described in EN 1992-1-1, For all other conditions multiply by the value by 0,7,

2) The volume of mortar corresponds to the formula "$1,2*(d_0^2-d_s^2)*\pi*lb/4$" for hammer drilling

Pre-calculated values – overlap length

Rebar yield strength f_{yk}=500 N/mm², concrete c25/30, good bond conditions

Rebar-size	Overlap length l_0[mm]	Design value N_{Rd} [KN]	Mortar volume[2] V_M [ml]	Overlap length l_0 [mm]	Design value N_{Rd} [KN]	Mortar volume[2] V_M [ml]
	$\alpha_1=\alpha_2=\alpha_3=\alpha_4=\alpha_5=1,0$			$\alpha_1=\alpha_3=\alpha_4=1,0$ α_2 or $\alpha_5=0,7$		
ϕ8	200	13,6	15	200	19,4	15
	240	16,3	18	210	20,4	16
	280	19	21	220	21,3	17
	322,1	21,9	24	**225,4**	21,9	17
ϕ10	200	17	18	200	24,2	18
	270	22,9	24	230	27,9	21
	340	28,8	31	250	30,3	23
	402,6	34,1	36	**281,8**	34,1	25
ϕ12	200	20,4	21	200	29,1	21
	290	29,5	31	250	36,4	26
	390	39,7	41	290	42,2	31
	483,1	49,2	51	**338,2**	49,2	36
ϕ14	210	24,9	25	210	35,6	25
	330	39,2	40	270	45,8	33
	450	53,4	54	330	56	40
	563,6	66,9	68	**394,5**	66,9	48
ϕ16	240	32,6	33	240	46,5	33
	370	50,2	50	310	60,1	42
	510	69,2	69	380	73,7	52
	644	87,4	87	**450,9**	87,4	61
ϕ18	270	41,2	41	270	58,9	41
	410	62,6	62	350	76,3	53
	560	85,5	84	430	93,8	65
	724,6	110,6	109	**507,2**	110,6	76
ϕ20	300	50,9	64	300	72,7	64
	430	72,9	91	390	94,5	83
	570	96,7	121	480	116,3	102
	805,2	136,6	171	**563,6**	136,6	120
ϕ22	330	61,6	93	330	88	93
	450	84	127	430	114,6	122
	580	108,2	164	520	138,6	147
	885,7	165,3	250	**620**	165,3	175
ϕ24	360	73,3	152	360	104,7	152
	470	95,7	198	470	136,7	198
	590	120,1	249	570	165,8	241
	966,2	196,7	408	**676,3**	196,7	286
ϕ25	375	79,5	141	375	113,6	141
	430	91,2	162	480	145,4	181
	570	120,9	214	590	178,7	222
	1006,4	213,4	378	**704,5**	213,4	265
ϕ28	420	99,8	175	420	142,5	175
	595	141,3	247	530	179,8	220
	875	207,8	364	635	215,5	264
	1127,2	267,7	469	**789**	267,7	328

Pre-calculated values – overlap length

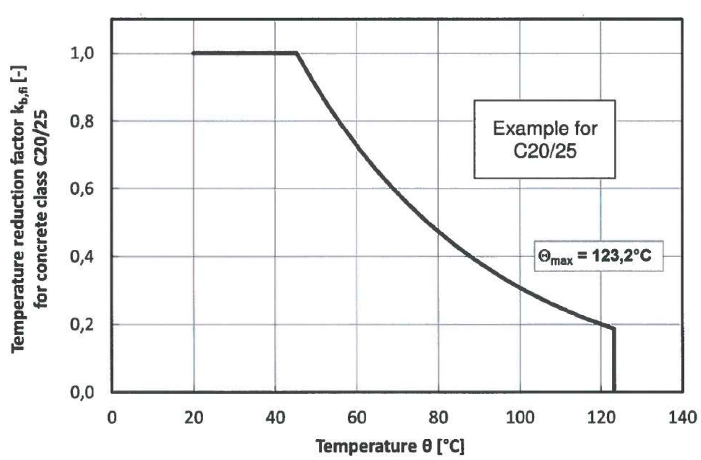
Rebar yield strength f_{yk}=500 N/mm², concrete c25/30, good bond conditions

Rebar-size	Overlap length l_0[mm]	Design value N_{Rd} [KN]	Mortar volume[2)] V_M [ml]	Overlap length l_0 [mm]	Design value N_{Rd} [KN]	Mortar volume[2)] V_M [ml]
	$\alpha_1=\alpha_2=\alpha_3=\alpha_4=\alpha_5=1,0$			$\alpha_1=\alpha_3=\alpha_4=1,0$ α_2 or $\alpha_5=0,7$		
ϕ30	450	114,5	199	450	163,6	199
	635	161,6	281	528	191,9	233
	935	237,9	413	700	254,5	309
	1207,7	307,3	534	**845,4**	307,3	374
ϕ32	480	130,3	261	480	186,1	261
	680	184,6	369	650	252	353
	1000	271,4	543	800	310,2	434
	1288,2	349,7	699	**901,8**	349,7	490
ϕ36	540	158,8	465	540	218,1	465
	765	225,0	658	720	290,0	620
	1125	330,8	968	900	363,5	774
	1505,0	442,6	1295	**1053,5**	442,6	907
ϕ40	600	188,5	624	600	269,3	624
	850	267,0	884	750	336,6	780
	1000	314,2	1040	990	444,3	1030
	1739,1	505,9	1676	**1217,4**	546,4	1267

1) Values corresponding to the minimum anchorage length, The maximum permissible load is valid for "good bond conditions" as described in EN 1992-1-1, For all other conditions multiply by the value by 0,7,

2) The volume of mortar corresponds to the formula "$1,2*(d_0^2-d_s^2)*\pi*lb/4$" for hammer drilling

Fire resistance



The design value of the bond strength $f_{bd,fi}$ under fire exposure has to be calculated by the following equation:

$$f_{bd,fi} = k_{b,fi}(\theta) \cdot f_{bd} \cdot \gamma_c / \gamma_{M,fi}$$

With: θ ≤ 123,2°C: $k_{b,fi}(\theta) = 26,424 \cdot e^{-0,0215 \cdot e} / f_{bd} \cdot 4,3 \leq 1,0$

θ > 123,2°C: $k_{b,fi}(\theta) = 0,0$

$f_{bd,fi}$ design value of the ultimate bond stress in case of fire in N/mm²

θ temperature in °C in the mortar layer

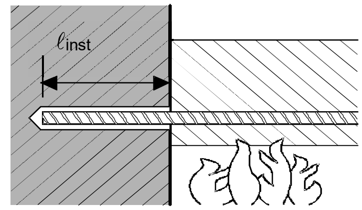
$k_{b,fi}(\theta)$ reduction factor under fire exposure

f_{bd} design values of the ultimate bond stress in N/mm2 in cold condition

γ_c partially safety factor according to EN 1992-1-1

$\gamma_{M,fi}$ partially safety factor according to EN 1992-1-2

a) Anchoring application



Anchoring application beam-wall connections with a concrete cover of 20 mm

Maximum force ($F_{s,T,max}$) in rebar in conjunction with HIT-RE 100 as a function of embedment depth (ℓ_{inst}) for the fire resistance classes F30 to F240 according to EC2,

Rebar-size	$F_{s,T,max}$ [kN]	ℓ_{inst} [mm]	Fire resistance of bar [kN]					
			R30	R60	R90	R120	R180	R240
ϕ8	16,8	100	3,4	1,0	0,2	-	-	-
		110	4,3	1,7	0,5			
		140	6,9	4,2	2,2	0,9		
		160	8,6	6,0	3,9	2,1	0,5	
		260	*16,8*	14,6	12,5	10,7	7,7	5,3
		290		*16,8*	15,1	13,3	10,3	7,9
		310			*16,8*	15,1	12,1	9,6
		330				*16,8*	13,8	11,4
		370					*16,8*	14,8
		400						*16,8*
ϕ10	26,2	110	5,3	2,1	0,6	-	-	-
		140	8,6	5,3	2,7	1,2		
		160	10,8	7,4	4,8	2,7	0,6	
		260	21,6	18,3	15,7	13,4	9,7	6,6
		290	24,8	21,5	18,9	16,7	12,9	9,9
		310	*26,2*	23,7	21,1	18,8	15,1	12,0
		340		*26,2*	24,3	22,1	18,3	15,3
		360			*26,2*	24,2	20,5	17,5
		380				*26,2*	22,7	19,6
		450					*26,2*	*26,2*
ϕ12	37,7	130	9,0	5,0	2,2	0,8	-	-
		140	10,3	6,3	3,2	1,4		
		160	12,9	8,9	5,8	3,2	0,8	
		260	25,9	21,9	18,8	16,1	11,6	7,9
		360	*37,7*	35,0	31,8	29,1	24,6	20,9
		390		*37,7*	35,7	33,0	28,5	24,8
		450			*37,7*	*37,7*	36,3	32,6
		500					*37,7*	*37,7*
ϕ14	51,3	160	15,1	10,4	6,8	3,7	0,9	-
		260	30,2	25,6	21,9	18,8	13,5	9,3
		360	45,4	40,8	37,1	33,9	28,7	24,4
		400	*51,3*	46,8	43,2	40,0	34,8	30,5
		450		*51,3*	50,8	47,6	42,4	38,1
		500			*51,3*	*51,3*	50,0	45,7
		550					*51,3*	*51,3*

Maximum force ($F_{s,T,max}$) in rebar in conjunction with HIT-RE 100 as a function of embedment depth (ℓ_{inst}) for the fire resistance classes F30 to F240 according to EC2,

Rebar-size	$F_{s,T,max}$ [kN]	ℓ_{inst} [mm]	Fire resistance of bar [kN]					
			R30	R60	R90	R120	R180	R240
ϕ16	67,0	180	20,7	15,4	11,2	7,6	2,7	0,9
		260	34,5	29,3	25,1	21,5	15,5	10,6
		360	51,9	46,6	42,4	38,8	32,8	27,9
		450	*67,0*	62,2	58,0	54,4	48,4	43,5
		500		*67,0*	66,7	63,1	57,1	52,2
		550			*67,0*	*67,0*	65,8	60,9
		600					*67,0*	*67,0*
ϕ18	84,8	200	27,2	21,2	16,5	12,4	5,9	2,6
		260	38,9	32,9	28,2	24,1	17,4	11,9
		360	58,4	52,4	47,7	43,6	36,9	31,4
		500	*84,8*	79,7	75,0	71,0	64,2	58,7
		550		*84,8*	*84,8*	80,7	74,0	68,5
		600				*84,8*	83,8	78,2
		650					*84,8*	*84,8*
ϕ20	104,7	220	34,5	27,9	22,7	18,2	10,7	5,5
		260	43,2	36,6	31,3	26,8	19,4	13,2
		360	64,9	58,3	53,0	48,5	41,0	34,9
		550	*104,7*	99,4	94,2	89,7	82,2	76,1
		600		*104,7*	104,7	100,5	93,1	86,9
		650			*104,7*	*104,7*	103,9	97,8
		700					*104,7*	*104,7*
ϕ22	126,7	240	42,7	35,5	29,7	24,7	16,5	9,9
		360	71,3	64,1	58,3	53,3	45,1	38,4
		500	104,7	97,5	91,7	86,7	78,5	71,8
		600	*126,7*	121,3	115,5	110,6	102,4	95,6
		650		*126,7*	*126,7*	122,5	114,3	107,5
		700				*126,7*	126,2	119,5
		750					*126,7*	*126,7*
ϕ24	150,8	270	54,4	46,5	40,2	34,8	25,8	18,5
		360	77,8	69,9	63,6	58,2	49,2	41,9
		650	*150,8*	145,3	139,1	133,6	124,7	117,3
		700		*150,8*	*150,8*	146,6	137,7	130,3
		750				*150,8*	150,7	143,3
		800					*150,8*	*150,8*
ϕ25	163,6	280	59,4	51,1	44,6	38,9	29,6	22,0
		360	81,1	72,8	66,3	60,6	51,3	43,6
		700	*163,6*	*163,6*	158,4	152,8	143,4	135,8
		750			*163,6*	*163,6*	157,0	149,3
		800					*163,6*	162,9
		850						*163,6*
ϕ26	177,0	290	64,6	56,0	49,2	43,3	33,6	25,6
		360	84,3	75,7	68,9	63,0	53,3	45,4
		700	*177,0*	171,5	164,7	158,9	149,2	141,2
		750		*177,0*	*177,0*	173,0	163,2	155,3
		800				*177,0*	*177,0*	169,4
		850						*177,0*
ϕ27	190,9	300	70,0	61,1	54,0	47,9	37,8	29,6
		500	128,5	119,6	112,5	106,4	96,4	88,1
		750	*190,9*	*190,9*	185,7	179,6	169,5	161,2
		800			*190,9*	*190,9*	184,2	175,9
		850					*190,9*	190,5
		900						*190,9*
ϕ28	205,3	300	75,6	66,4	59,0	52,7	42,3	33,7
		500	133,3	124,0	116,7	110,4	99,9	91,3
		750	*205,3*	199,9	192,6	186,3	175,8	167,2
		800		*205,3*	*205,3*	201,4	191,0	182,4
		850				*205,3*	*205,3*	197,6
		900						*205,3*

Maximum force ($F_{s,T,max}$) in rebar in conjunction with HIT-RE 100 as a function of embedment depth (ℓ_{inst}) for the fire resistance classes F30 to F240 according to EC2,

Rebar-size	$F_{s,T,max}$ [kN]	ℓ_{inst} [mm]	Fire resistance of bar [kN]					
			R30	R60	R90	R120	R180	R240
ϕ30	235,6	330	87,5	77,6	69,8	63,0	51,8	42,6
		500	142,8	132,9	125,0	118,3	107,1	97,9
		800	*235,6*	230,4	222,6	215,8	204,6	195,4
		850		*235,6*	*235,6*	232,1	220,9	211,7
		900				*235,6*	*235,6*	227,9
		950						*235,6*
ϕ32	268,1	350	100,3	89,7	81,4	74,1	62,2	
		500	152,3	141,8	133,4	126,2	114,2	104,4
		850	*268,1*	263,2	254,8	247,5	235,6	225,8
		900		*268,1*	*268,1*	264,9	252,9	243,1
		950				*268,1*	*268,1*	260,5
ϕ34	302,6	370	113,9	102,7	93,8	86,1	73,4	63,0
		500	161,8	150,6	141,7	134,0	121,3	110,9
		900	*302,6*	298,0	289,1	281,4	268,8	258,3
		950		*302,6*	*302,6*	299,9	287,2	276,8
ϕ36	339,3	400	132,3	120,5	111,0	102,9	89,5	78,4
		600	210,4	198,5	189,1	180,9	167,5	156,5
		800	288,4	276,5	267,1	259,0	245,5	234,5
		950	*339,3*	335,1	325,6	317,5	304,1	293,0
ϕ40	385,5	450	168,7	155,5	145,1	136,0	121,1	108,8
		600	233,8	220,6	210,1	201,0	186,1	173,9
		800	320,5	307,3	296,8	287,8	272,8	260,6
		950	385,5	372,3	361,8	352,8	337,9	325,6

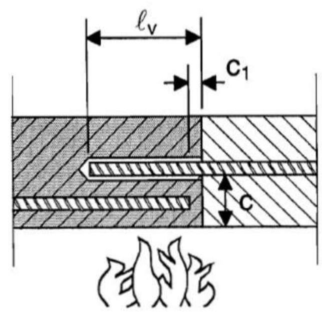
*For additional values please check GS 3,2/15-431-4 fire report,
Characteristic yield strength f_{yk} = 500 N/mm²
Steel failure

b) Overlap joint application

Max, bond stress, $f_{bd,FIRE}$, depending on actual clear concrete cover for classifying the fire resistance,

It must be verified that the actual force in the bar during a fire, $F_{s,T}$, can be taken up by the bar connection of the selected length, ℓ_{inst}, Note: Cold design for ULS is mandatory,

$F_{s,T} \leq (\ell_{inst} - c_f) \cdot \phi \cdot \pi \cdot f_{bd,FIRE}$ where: $(\ell_{inst} - c_f) \geq \ell_s$;



ℓ_s = lap length

ϕ = nominal diameter of bar

$\ell_{inst} - c_f$ = selected overlap joint length; this must be at least ℓ_s,

but may not be assumed to be more than 80 ϕ

$f_{bd,FIRE}$ = bond stress when exposed to fire

Critical temperature-dependent bond stress, $f_{bd,FIRE}$, concerning "overlap joint" for Hilti HIT-RE 100 injection adhesive in relation to fire resistance class and required minimum concrete coverage c,

Clear concrete cover c	Max, bond stress, τ_c [N/mm²]					
[mm]	R30	R60	R90	R120	R180	R240
50	0,9					
60	1,7					
70	2,7					
80	3,5	1,0				
90		1,6				
100		2,3	1,0			
110		3,0	1,4	0,7		

Critical temperature-dependent bond stress, $f_{bd,FIRE}$, concerning "overlap joint" for Hilti HIT-RE 100 injection adhesive in relation to fire resistance class and required minimum concrete coverage c,

<table>
<tr><th>Clear concrete cover c</th><th colspan="6">Max, bond stress, τ_c [N/mm²]</th></tr>
<tr><th>[mm]</th><th>R30</th><th>R60</th><th>R90</th><th>R120</th><th>R180</th><th>R240</th></tr>
<tr><td>120</td><td rowspan="15"></td><td rowspan="15">3,5</td><td>1,9</td><td>1,0</td><td rowspan="2"></td><td rowspan="5"></td></tr>
<tr><td>130</td><td>2,5</td><td>1,4</td></tr>
<tr><td>140</td><td>3,1</td><td>1,9</td><td>0,7</td></tr>
<tr><td>150</td><td rowspan="12">3,5</td><td>2,4</td><td>1,0</td></tr>
<tr><td>160</td><td>2,9</td><td>1,3</td></tr>
<tr><td>170</td><td>3,4</td><td>1,7</td><td>0,9</td></tr>
<tr><td>180</td><td rowspan="9">3,5</td><td>2,1</td><td>1,1</td></tr>
<tr><td>190</td><td>2,5</td><td>1,4</td></tr>
<tr><td>200</td><td>2,9</td><td>1,7</td></tr>
<tr><td>210</td><td>3,3</td><td>2,1</td></tr>
<tr><td>220</td><td rowspan="5">3,5</td><td>2,5</td></tr>
<tr><td>230</td><td>2,8</td></tr>
<tr><td>240</td><td>3,1</td></tr>
<tr><td>250</td><td rowspan="2">3,5</td></tr>
<tr><td>260</td></tr>
</table>

Materials

Material quality

Part	Material
Rebar EN 1992-1-1:2004+AC:2010	Bars and de-coiled rods class B or C with f_{yk} and k according to NDP or NCL of EN 1992-1-1/NA:2013 $f_{uk} = f_{tk} = k \cdot f_{yk}$

Fitness for use

Some creep tests have been conducted in accordance with ETAG guideline 001 part 5 and TR 023 in the following conditions: **in dry environment at 50 °C during 90 days,**
These tests show an excellent behaviour of the post-installed connection made with HIT-RE 100: low displacements with long term stability, failure load after exposure above reference load,

Resistance to chemical substances

Chemical	Resistance
Acetic acid 100%	o
Acetic acid 10%	+
Hydrochloric Acid 20%	+
Nitric Acid 40%	-
Phosphoric Acid 40%	+
Sulphuric acid 40%	+
Ethyl acetate 100%	o
Acetone 100%	-
Ammoniac 5%	o
Diesel 100%	+
Gasoline 100%	+
Ethanol 96%	o
Machine oils 100%	+

Chemical	Resistance
Methanol 100%	o
Peroxide of hydrogen 30%	o
Solution of phenol (sat,)	-
Sodium hydroxide pH=14	+
Solution of chlorine (sat,)	+
Solution of hydrocarbons (60 % vol Toluene, 30 % vol Xylene,10 % vol Methyl naphtalene)	+
Salted solution 10%	+
sodium chloride	
Suspension of concrete (sat,)	+
Chloroform 100%	+
Xylene 100%	+

+ resistant
o resistant in short term (max, 48h) contact

- not resistant

Electrical Conductivity

HIT-RE 100 in the hardened state **is not conductive electrically**, Its electric resistivity is $1{,}4 \cdot 10^{10}$ Ω·m (DIN IEC 93 – 12,93), It is adapted well to realize electrically insulating anchorings (ex: railway applications, subway),

Installation temperature range:
+5°C to +40°C

Service temperature range
Hilti HIT-RE 100 injection mortar may be applied in the temperature ranges given below, An elevated base material temperature may lead to a reduction of the design bond resistance,

Temperature range	Base material temperature	Maximum long term base material temperature	Maximum short term base material temperature
Temperature range I	-40 °C to +80 °C	+50 °C	+80 °C

Max short term base material temperature
Short-term elevated base material temperatures are those that occur over brief intervals, e,g, as a result of diurnal cycling,
Max long term base material temperature
Long-term elevated base material temperatures are roughly constant over significant periods of time,

Working time and curing time[a)]

Temperature IN the base material T_{BM}	Maximum working time t_{work}	Initial curing time $t_{cure,ini}$ [b)]	Minimum curing time t_{cure}
5 °C ≤ T_{BM} < 9 °C	2 hours	18 hours	72 hours
10 °C ≤ T_{BM} < 14 °C	1,5 hours	12 hours	48 hours
15 °C ≤ T_{BM} < 19 °C	30 min	8 hours	24 hours
20 °C ≤ T_{BM} < 24 °C	25 min	6 hours	12 hours
25 °C ≤ T_{BM} < 29 °C	20 min	5 hours	10 hours
30 °C ≤ T_{BM} ≤ 39 °C	12 min	4 hours	8 hours
40 °C	12 min	2 hours	4 hours

a) The curing time data are valid for dry base material only, In wet base material the curing times must be doubled,
b) After $t_{cure,ini}$ has elapsed preparation work may continue

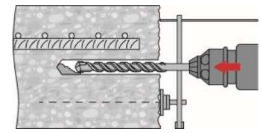
Setting information

Installation equipment

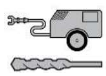
Rebar – size	ϕ8-ϕ16	ϕ18-ϕ40
Rotary hammer	TE2(-A) – TE30(-A)	TE40 – TE80
Other tools	Blow out pump (h_{ef} ≤ 10·d)	-
	Compressed air gun[a)] Set of cleaning brushes[b)], dispenser, piston plug	

a) Compressed air gun with extension hose for all drill holes deeper than 250 mm (for ϕ 8 to ϕ 12) or deeper than 20·ϕ (for ϕ > 12 mm)
b) Automatic brushing with round brush for all drill holes deeper than 250 mm (for ϕ 8 to ϕ 12) or deeper than 20·ϕ (for ϕ > 12 mm)

Minimum concrete cover c_{min} of the post-installed rebar

Drilling method	Rebar – size [mm]	Minimum concrete cover c_{min} [mm]		
		Without drilling aid	With drilling aid	
Hammer drilling **(HD)**	$\phi < 25$	$30 + 0,06 \cdot l_v \geq 2 \cdot \phi$	$30 + 0,02 \cdot l_v \geq 2 \cdot \phi$	
	$\phi \geq 25$	$40 + 0,06 \cdot l_v \geq 2 \cdot \phi$	$40 + 0,02 \cdot l_v \geq 2 \cdot \phi$	
Compressed air drilling **(CA)**	$\phi < 25$	$50 + 0,08 \cdot l_v$	$50 + 0,02 \cdot l_v$	
	$\phi \geq 25$	$60 + 0,08 \cdot l_v \geq 2 \cdot \phi$	$60 + 0,02 \cdot l_v \geq 2 \cdot \phi$	
Diamond coring dry **(PCC)** or wet **(DD)**	$\phi < 25$	Drill stand is used as drilling aid	$30 + 0,02 \cdot l_v \geq 2 \cdot \phi$	
	$\phi \geq 25$		$40 + 0,02 \cdot l_v \geq 2 \cdot \phi$	

Drilling and cleaning diameters

Rebar [mm]	Drill bit diameters d_0 [mm]			Diamond core d_0 [mm]		Installation size [mm]	
	Hammer drill (HD)	Compressed air drill (CA)	Hollow Drill Bit (HDB)	Wet (DD)	Dry (PCC)[b]	Brush HIT-RB	Air nozzle HIT-RB
							
ϕ8	12 (10[a])	-	-	12 (10[a])	-	12 (10[a])	12 (10[a])
ϕ10	14 (12[a])	-	-	14 (12[a])	-	14 (12[a])	14 (12[a])
ϕ12	16 (14[a])	-	-	16 (14[a])	-	16 (14[a])	16 (14[a])
	-	17	-	-	-	18	16
ϕ14	18	17	-	18	-	18	18
ϕ16	20	-	-	20	-	20	20
	-	20	-	-	-	22	20
ϕ18	22	22	-	22	-	22	22
ϕ20	25 (24[a])	-	-	25	-	25 (24[a])	25 (24[a])
	-	26	-	-	-	28	25
ϕ22	28	28	-	28	-	28	28
ϕ24	32	32		32	-	32	32
	-	-	35	-	35	-	
ϕ25	32 (30[a])	32 (30[a])	-	32 (30[a])	-	32 (30[a])	
	-	-	35	-	35	-	
ϕ26	35	35	35	35	35	35	
ϕ28	35	35	35	35	35	35	
ϕ30	-	35	35	35	35	35	
	37	-	-	-		37	
ϕ32	40	40	47	40	47	40	
ϕ34	-	42		42	47	42	
	45	-	47	-		45	
ϕ36	45	45		-	47	45	
	-	-	47	47		47	
ϕ40	-	-	52	52	52	52	
	55	57		-		55	

a) Both of a given values can be used,
b) No cleaning required,

Dispenser and corresponding maximum embedment depth $\ell_{v,max}$

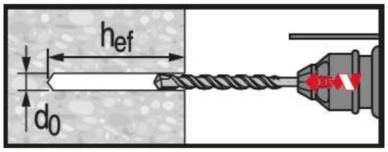
Rebar	Dispenser	
	HDM 330, HDM 500	HDE 500
	$\ell_{v,max}$ [mm]	
ϕ8 to ϕ10	1000	1000
ϕ12 to ϕ14		1200
ϕ16		1500
ϕ18 to ϕ20	700	1300
ϕ22 to ϕ25		1000
ϕ26 to ϕ28	500	700
ϕ30 to ϕ32	-	
ϕ34 to ϕ40		500

Setting instructions

***For detailed information on installation see instruction for use given with the package of the product,**

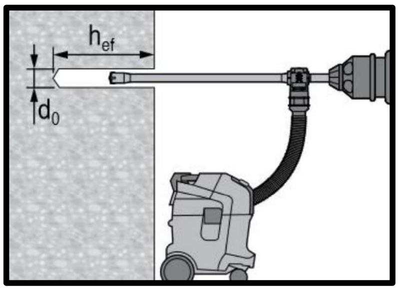
Safety regulations,

Review the Material Safety Data Sheet (MSDS) before use for proper and safe handling! Wear well-fitting protective goggles and protective gloves when working with Hilti HIT-RE 100,



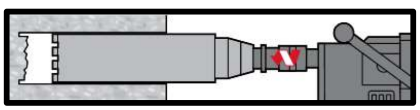
Hammer drilled hole

For dry and wet concrete,

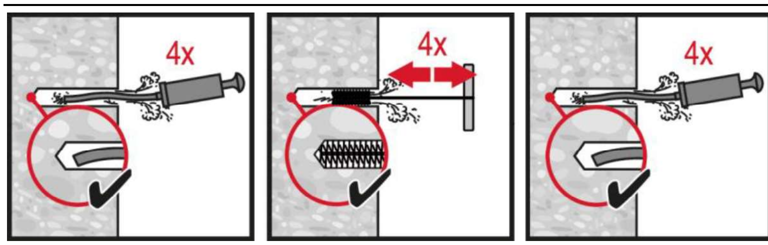


Hammer drilled hole with Hollow Drilled Bit (HDB)

No cleaning required,

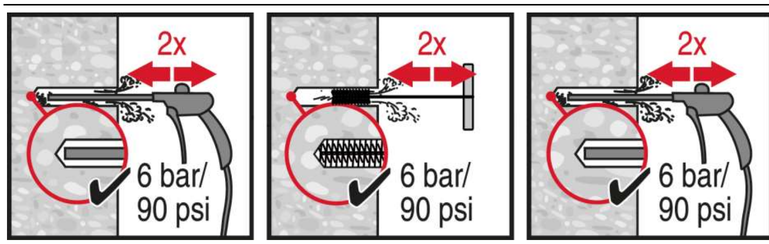


Diamond Drilling (DD)



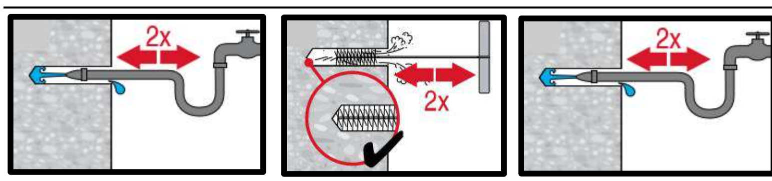
Hammer Drilling:

Manual cleaning (MC)
for drill diameters $d_0 \leq 20$ mm and drill hole depth $h_0 \leq 10 \cdot d$,



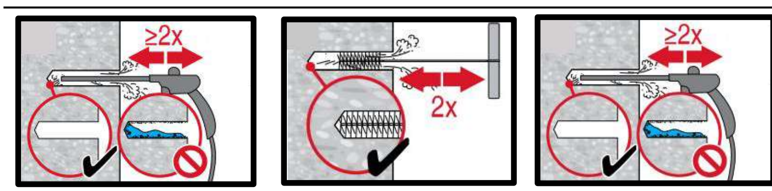
Hammer Drilling:

Compressed air cleaning (CAC)
for all drill hole diameters d_0 and drill hole depths $h_0 \leq 20 \cdot d$,



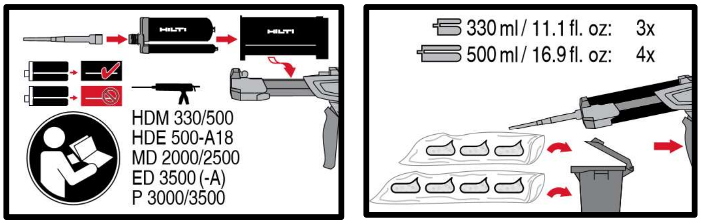
Wet diamond coring:

Compressed air cleaning (CAC)
for all drill hole diameters d_0 and drill hole depths h_0 ,

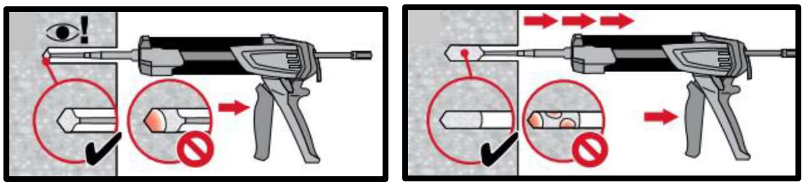


Dry diamond coring:

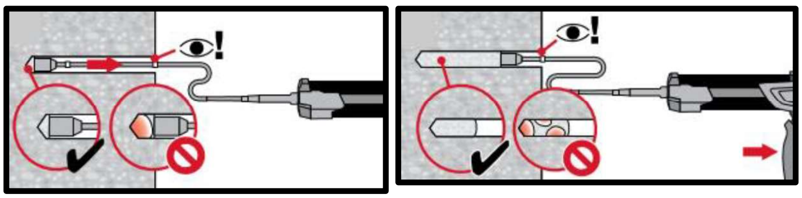
Compressed air cleaning (CAC)
for all drill hole diameters d_0 and drill hole depths h_0 ,



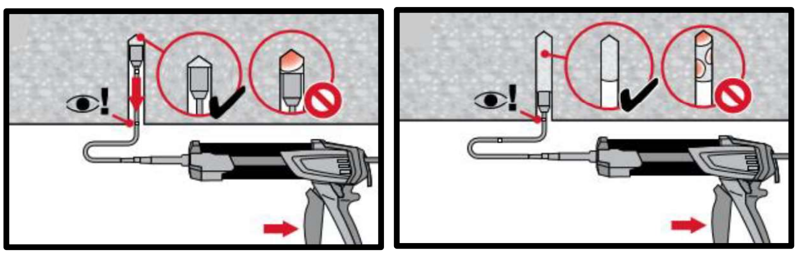
Injection system preparation,



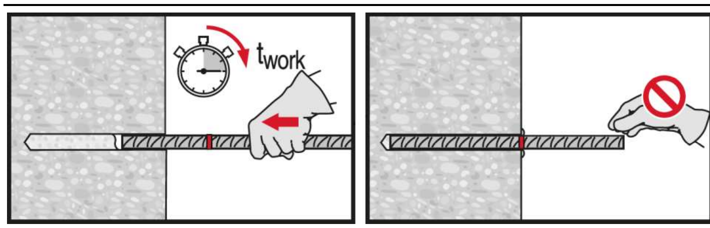
Injection method for drill hole depth h_{ef} ≤ 250 mm,



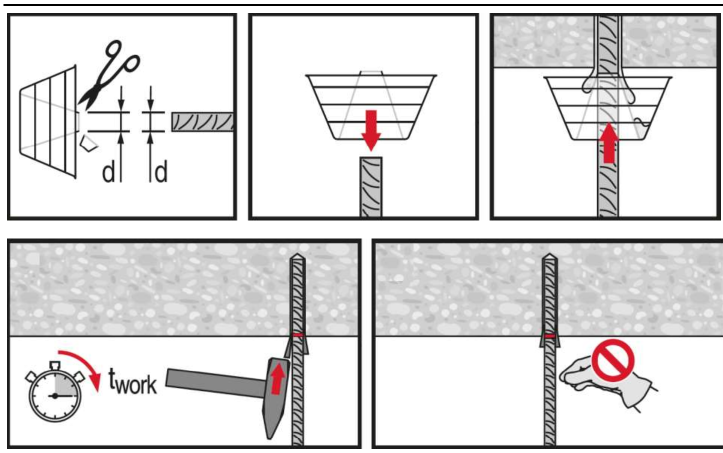
Injection method for drill hole depth h_{ef} > 250mm,



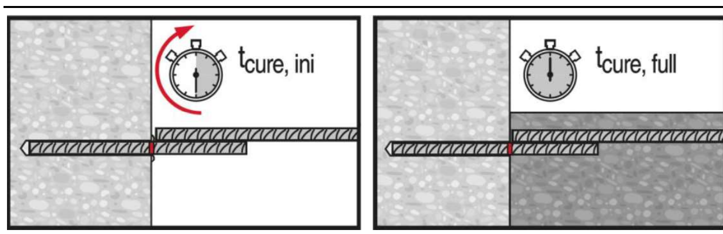
Injection method for overhead application,



Setting element, observe working time "t_{work}",



Setting element for overhead applications, observe working time "t_{work}",



Apply full load only after curing time "t_{cure}",