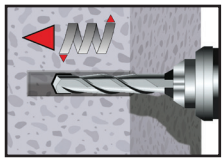
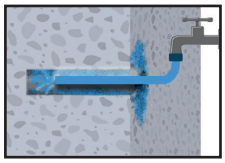
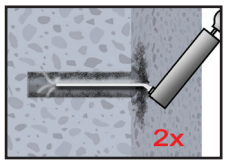
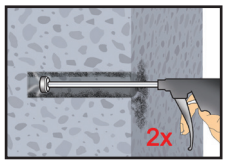
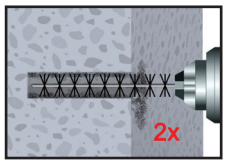
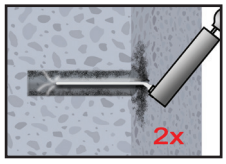
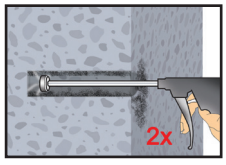
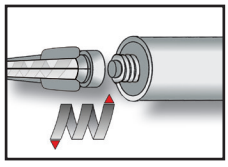
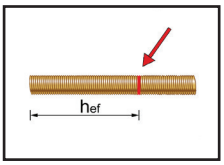
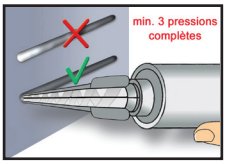
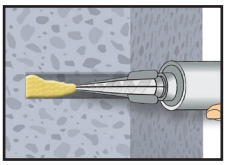
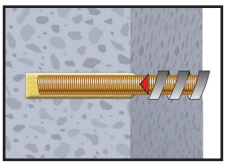
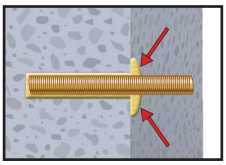
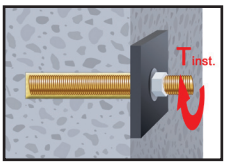
FAST ANCHORING & REPAIR ADHESIVE

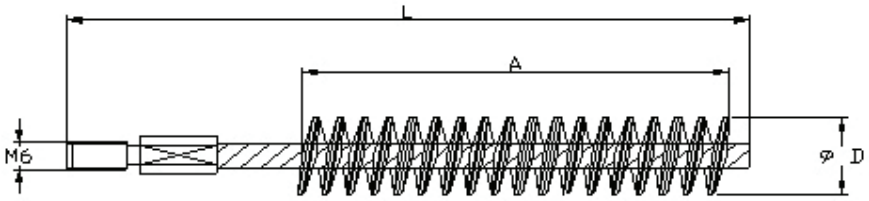
Technical Performance Specifications

Usage instructions - concrete

	**1.** Drill with hammer drill mode a hole into the base material to the size and embedment depth required by the selected anchor.
	**2a.** For diamond drilled holes rinse until clear water appears. Furthermore clean the hole with a mechanical wire brush. After that repeat the step before (rinse until clear water appears).
 or 	**2b.** Standing water must be removed before cleaning. Starting from the bottom resp. back of the bore hole, blow the hole clean with compressed air or a hand pump a minimum of two times. If the bore hole ground is not reached an extension shall be used. The hand-pump can be used for anchor sizes up to bore hole diameter 3/4 inch. For bore holes larger then 3/4 inch or deeper then 10ds, compressed air (min. 90 psi) must be used.
	**2c.** Check brush diameter and attach the brush to a drilling machine or a battery screwdriver. Brush the hole with an appropriate sized wire brush a minimum of two times. If the bore hole ground is not reached with the brush, a brush extension shall be used.
 or 	**2d.** Finally blow the hole clean again with compressed air or a hand pump a minimum of two times. If the bore hole ground is not reached an extension shall be used. The hand-pump can be used for anchor sizes up to bore hole diameter 3/4 inch. For bore holes larger then 3/4 inch or deeper then 10 inch, compressed air (min. 90 psi) must be used.
	**3.** Attach a supplied static-mixing nozzle to the cartridge and load the cartridge into the correct dispensing tool. After every working interruption longer than the recommended working time as well as for new cartridges, a new static-mixer shall be used.

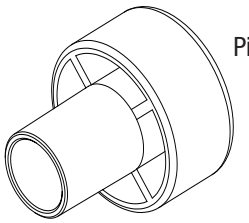
	**4.** Prior to inserting the anchor rod into the filled bore hole, the position of the embedment depth shall be marked on the anchor rods.
	**5.** Prior to dispensing into the anchor hole, squeeze out separately a minimum of three full strokes and discard non-uniformly mixed adhesive components until the mortar shows a consistent grey colour.
	**6.** Starting from the bottom resp. back of the cleaned anchor hole fill the hole up to approximately two-thirds with adhesive. Slowly withdraw of the static mixing nozzle as the holes filled avoids creating air pockets. For embedments larger than 7 inch an extension nozzle shall be used. For overhead and horizontal installation in bore holes bigger than 3/4 inch a piston plug and extension nozzle shall be used. Observe the gel-/ working times given.
	**7.** Push the threaded rod or reinforcing bar into the anchor hole while turning slightly to ensure positive distribution of the adhesive until the embedment depth is reached. The anchor should be free of dirt, grease, oil or other foreign material.
	**8.** Be sure that the anchor is fully seated at the bottom of the hole and that excess mortar is visible at the top of the hole. If these requirements are not maintained, the application has to be renewed. For overhead application the anchor rod should be fixed (e.g. wedges).
	**9.** Allow the adhesive to cure to the specified time prior to applying any load or torque. Do not move or load the anchor until it is fully cured.
	**10.** After full curing, the add-on part can be installed with the max. torque by using a calibrated torque wrench.

Cleaning of the drill hole - concrete



Brush:
Brush length: 3.15 in.
M6 thread for drilling machine connection

Blower



Piston plug

Threaded rod	Rebar	Bore hole-∅	Brush-∅	Min. brush-∅	Piston plug
(Inch)	(Inch)	(Inch)	d_b (Inch)	$d_{b,min}$ (Inch)	(Nr.)
3/8		7/16	0.528	0.458	-
	#3	1/2	0.591	0.520	-
1/2		9/16	0.654	0.582	#4
	#4	5/8	0.720	0.650	#4
5/8	#5	3/4	0.846	0.775	#5
3/4	#6	7/8	0.976	0.905	#6
7/8	#7	1	1.122	1.030	#7
1	#8	1-1/8	1.252	1.160	#8
1-1/4	#9	1-3/8	1.504	1.410	#9
	#10	1-1/2	1.630	1.535	#10

Setting parameter - concrete

Anchor size			3/8	1/2	5/8	3/4	7/8	1	1- 1/4
Effectness factor (cracked concrete)	$k_{c,cr}$	[-]	17						
Effectness factor (uncracked concrete)	$k_{c,uncr}$	[-]	24						
Min. edge distance	C_{min}	[inch]	1.88	2.50	3.13	3.75	4.38	5.00	6.25
Min. axial distance	S_{min}	[inch]	1.88	2.50	3.13	3.75	4.38	5.00	6.25
Embedment depth (hammer drilled)	$h_{ef,min}$	[inch]	2-3/8	2-1/4	3-1/8	3-1/2	3-1/2	4	5
	$h_{ef,max}$	[inch]	7-1/2	10	12-1/2	15	17-1/2	20	25
Min. part thickness	h_{min}	[inch]	h_{ef} + 1-1/4"			h_{ef} + $2d_0$			
Anchor diameter	d_a	[inch]	3/8	1/2	5/8	3/4	7/8	1	1-1/4
Drill diameter	d_0	[mm]	7/16	9/16	3/4	7/8	1	1 -1/8	1 -3/8
Installation torque	$T_{inst.}$	[ft-lb]	15	33	60	105	125	165	280

Anchor size			#3	#4	#5	#6	#7	#8	#9	#10
Effectness factor (cracked concrete)	$k_{c,cr}$	[-]	17							
Effectness factor (uncracked concrete)	$k_{c,uncr}$	[-]	24							
Min. edge distance	C_{min}	[inch]	1.88	2.50	3.13	3.75	4.38	5.00	5.63	6.25
Min. axial distance	S_{min}	[inch]	1.88	2.50	3.13	3.75	4.38	5.00	5.63	6.25
Embedment depth	$h_{ef,min}$	[inch]	2-3/8	2-1/4	3-1/8	3-1/2	3-1/2	4	4-1/2	5
	$h_{ef,max}$	[inch]	7-1/2	10	12-1/2	15	17-1/2	20	22-1/2	25
Min. part thickness	h_{min}	[inch]	h_{ef} + 1-1/4"		h_{ef} + $2d_0$					
Anchor diameter	d_a	[inch]	3/8	1/2	5/8	3/4	7/8	1	1-1/8	1-1/4
Drill diameter	d_0	[mm]	1/2	5/8	3/4	7/8	1	1 -1/8	1 -3/8	1-1/2
Installation torque	$T_{inst.}$	[ft-lb]	15	33	60	105	125	165	220	280

Performance data - concrete (Threaded rod)

TENSION LOADS - Design acc. to ACI 318-11 Appendix D, hammer drilled bore holes

Anchor size				3/8	1/2	5/8	3/4	7/8	1	1-1/4
Steel failure										
Nominal strength tension as governed by steel strength, ASTM A36		N_{sa}	[lb]	4,495	8,230	13,110	19,400	26,780	35,130	56,210
Nominal strength tension as governed by steel strength, ASTM A193 Grade B7		N_{sa}	[lb]	9,685	17,735	28,250	41,810	57,710	75,710	121,135
Reduction factor		ϕ		0.75						
Nominal strength tension as governed by steel strength, ASTM F593 CW Stainless		N_{sa}	[lb]	7,750	14,190	22,600	28,430	39,245	51,485	82,370
Reduction factor		ϕ		0.65						
Pullout and concrete cone failure										
Characteristic bond strength[3] in concrete 2500psi										
Temperature Range A: 75°F/104°F [1]	uncracked concrete	$\tau_{k,uncr}$	[psi]	1,435	1,449	1,411	1,294	1,186	1,077	1,025
	cracked concrete	$\tau_{k,cr}$		603	608	593	544	497	452	430
Temperature Range B: 95°F/122°F [1]	uncracked concrete	$\tau_{k,uncr}$		1,019	1,029	1,002	919	842	765	728
	cracked concrete	$\tau_{k,cr}$		428	432	421	386	353	321	305
Temperature Range C: 110°F/150°F [1]	uncracked concrete	$\tau_{k,uncr}$		604	591	560	519	478	432	412
	cracked concrete	$\tau_{k,cr}$		253	248	235	218	201	181	173
Strength reduction factor for permissible istallation condition	dry	ϕ_d		0.65						
	wet	ϕ_{ws}		0.55						
	water-filled	ϕ_{wf}		0.45						
Embedment depth		$h_{ef,min}$	[inch]	2-3/8	2-3/4	3-1/8	3-1/2	3-1/2	4	5
		$h_{ef,max}$	[inch]	7-1/2	10	12-1/2	15	17-1/2	20	25
Increasing factor				$(f'_c/2500)^{0.3}$						
Concrete breakout										
Effectness factor (cracked concrete)		$k_{c,cr}$	[-]	17						
Effectness factor (uncracked concrete)		$k_{c,uncr}$	[-]	24						
Reduction factor Condition B[2]		ϕ		0.65						

The data in this table are evaluated according AC308-11 and ACI 355.4.

1) Long term temperature/ Short term temperature. Long term concrete temperatures are roughly constant over significant periods of time. Short term elevated temperatures are those that occur over brief intervals, e.g. as a result of diurnal cycling.

2) Condition A requires supplemental reinforcement, while Condition B applies where supplemental reinforcement is not provided or where pullout or pryout governs, as set forth in ACI 318-11 D.4.3. The tabulated value of ϕ applies when the load combinations of Section 1605.2 of the IBC, or ACI 318-11 9.2 are used. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ must be determined in accordance with ACI 318-11 D.4.4.

3) Characteristic bond strengths are for sustained loads including dead and live loads. For load combinations consisting of short-term loads only such as wind or seismic, bond strengths may be increased by 45 percent for Temperature Range B and 115 percent for Temperature Range C.

Performance data - concrete (Threaded rod)

TENSION LOADS - Design acc. to ACI 318-11 Appendix D, diamond drilled bore holes

Anchor size				**3/8**	**1/2**	**5/8**	**3/4**	**7/8**	**1**	**1-1/4**
Steel failure										
Nominal tension strength as governed by steel strength, ASTM A36		N_{sa}	[lb]	4,495	8,230	13,110	19,400	26,780	35,130	56,210
Nominal tension strength as governed by steel strength, ASTM A193 Grade B7		N_{sa}	[lb]	9,685	17,735	28,250	41,810	57.,710	75,710	121,135
Reduction factor		ϕ		0.75						
Nominal tension strength as governed by steel strength, ASTM F593 CW Stainless		N_{sa}	[lb]	7,750	14,190	22,600	28,430	39,245	51,485	82,370
Reduction factor		ϕ		0.65						
Pullout and concrete cone failure										
Characteristic bond strength[3] in concrete 2500psi										
Temperature Range A: 75°F/104°F [1]	uncracked concrete	$\tau_{k,uncr}$		1,413	1,427	1,387	1,249	1,165	1,058	1,008
Temperature Range B: 95°F/122°F [1]	uncracked concrete	$\tau_{k,uncr}$	[psi]	1,003	1,013	985	887	827	751	716
Temperature Range C: 110°F/150°F [1]	uncracked concrete	$\tau_{k,uncr}$		594	582	551	501	470	425	405
Strength reduction factor for permissible istallation condition	dry	ϕ_d		0.65						
	wet	ϕ_{ws}		0.55						
	water-filled	ϕ_{wf}		0.45						
Embedment depth		$h_{ef,min}$	[inch]	2-3/8	2-3/4	3-1/8	3-1/2	3-1/2	4	5
		$h_{ef,max}$	[inch]	7-1/2	10	12-1/2	15	17-1/2	20	25
Increasing factor				$(f'_c/2500)^{0.3}$						
Concrete breakout										
Effectness factor (uncracked concrete)		$k_{c,uncr}$	[-]	24						
Reduction factor Condition B[2]		ϕ		0.65						

The data in this table are evaluated according AC308-11 and ACI 355.4.

1) Long term temperature/ Short term temperature. Long term concrete temperatures are roughly constant over significant periods of time. Short term elevated temperatures are those that occur over brief intervals, e.g. as a result of diurnal cycling.

2) Condition A requires supplemental reinforcement, while Condition B applies where supplemental reinforcement is not provided or where pullout or pryout governs, as set forth in ACI 318-11 D.4.3. The tabulated value of ϕ applies when the load combinations of Section 1605.2 of the IBC, or ACI 318-11 9.2 are used. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ must be determined in accordance with ACI 318-11 D.4.4.

3) Characteristic bond strengths are for sustained loads including dead and live loads. For load combinations consisting of short-term loads only such as wind or seismic, bond strengths may be increased by 45 percent for Temperature Range B and 115 percent for Temperature Range C.

Performance data - concrete (Threaded rod)

SHEAR LOADS - Design acc. to ACI 318-11 Appendix D, hammer and diamond drilled bore holes

Anchor size			3/8	1/2	5/8	3/8	7/8	1	1-1/4
Steel failure									
Nominal shear strength as governed by steel strength, ASTM A36	V_{sa}	[lb]	2,695	4,940	7,860	11,640	16,065	21,080	33,725
Nominal shar strength as governed by steel strength, ASTM A193 Grade B7	V_{sa}	[lb]	4,845	10,640	16,950	25,085	34,625	45,425	72,680
Reduction factor	ϕ		0.65						
Nominal shear strength as governed by steel strength, ASTM F593 CW Stainless	V_{sa}	[lb]	4,650	8,515	13,560	17,055	23,545	30,890	49,420
Reduction factor	ϕ		0.60						
Concrete edge failure									
Effective length of anchor in shear loading	l_e	[Inch]	min (h_{ef}; $8d_a$)						
Outside diameter of anchor	d_a	[Inch]	3/8	1/2	5/8	3/8	7/8	1	1-1/4
Reduction factor Condition B[1)]	ϕ		0.65						

The data in this table are evaluated according AC308-11 and ACI 355.4.

1) Condition A requires supplemental reinforcement, while Condition B applies where supplemental reinforcement is not provided or where pullout or pryout governs, as set forth in ACI 318-11 D.4.3. The tabulated value of ϕ applies when the load combinations of Section 1605.2 of the IBC, or ACI 318-11 9.2 are used. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ must be determined in accordance with ACI 318-11 D.4.4.

Performance data - concrete (Rebar)

TENSION LOADS - Design acc. to ACI 318-11 Appendix D, hammer drilled bore holes

Anchor size				#3	#4	#5	#6	#7	#8	#9	#10
Steel failure											
Nominal tension strength as governed by steel strength, ASTM A615 Grade 60		N_{sa}	[lb]	9,900	18,000	27,900	39,600	54,000	71,100	90,000	114,300
Reduction factor		ϕ		0.65							
Nominal tension strength as governed by steel strength, ASTM A706, Grade 60		N_{sa}	[lb]	8,800	16,000	24,800	35,200	48,000	63,200	80,000	101,600
Reduction factor		ϕ		0.75							
Pullout and concrete cone failure											
Characteristic bond strength[3] in concrete 2500psi											
Temperature Range A: 75°F/104°F [1]	uncracked concrete	$\tau_{k,uncr}$	[psi]	1,155	1,167	1,136	1,041	955	867	824	828
	cracked concrete	$\tau_{k,cr}$		484	489	476	437	401	364	347	344
Temperature Range B: 95°F/122°F [1]	uncracked concrete	$\tau_{k,uncr}$		866	875	852	781	716	650	618	621
	cracked concrete	$\tau_{k,cr}$		363	367	357	328	301	273	260	258
Temperature Range C: 110°F/150°F [1]	uncracked concrete	$\tau_{k,uncr}$		513	503	476	441	407	367	350	353
	cracked concrete	$\tau_{k,cr}$		215	211	200	185	171	154	147	143
Strength reduction factor for permissible istallation condition	dry	ϕ_d		0.65							
	wet	ϕ_{ws}		0.55							
	water-filled	ϕ_{wf}		0.45							
Embedment depth		$h_{ef,min}$	[inch]	2-3/8	2-3/4	3-1/8	3-1/2	3-1/2	4	4-1/2	5
		$h_{ef,max}$	[inch]	7-1/2	10	12-1/2	15	17-1/2	20	22-1/2	25
Concrete breakout											
Effectness factor (uncracked concrete)		$k_{c,uncr}$	[-]	24							
Reduction factor Condition B[2]		ϕ		0.65							

The data in this table are evaluated according AC308-11 and ACI 355.4.

1) Long term temperature/ Short term temperature. Long term concrete temperatures are roughly constant over significant periods of time. Short term elevated temperatures are those that occur over brief intervals, e.g. as a result of diurnal cycling.

2) Condition A requires supplemental reinforcement, while Condition B applies where supplemental reinforcement is not provided or where pullout or pryout governs, as set forth in ACI 318-11 D.4.3. The tabulated value of ϕ applies when the load combinations of Section 1605.2 of the IBC, or ACI 318-11 9.2 are used. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ must be determined in accordance with ACI 318-11 D.4.4.

3) Characteristic bond strengths are for sustained loads including dead and live loads. For load combinations consisting of short-term loads only such as wind or seismic, bond strengths may be increased by 45 percent for Temperature Range B and 115 percent for Temperature Range C.

Performance data - concrete (Rebar)

TENSION LOADS - Design acc. to ACI 318-11 Appendix D, diamond drilled bore holes

Anchor size				#3	#4	#5	#6	#7	#8	#9	#10
Steel failure											
Nominal tension strength as governed by steel strength, ASTM A615 Grade 60		N_{sa}	[lb]	9,900	18,000	27,900	39,600	54,000	71,100	90,000	114,300
Reduction factor		ϕ		0.65							
Nominal tension strength as governed by steel strength, ASTM A706, Grade 60		N_{sa}	[lb]	8,800	16,000	24,800	35,200	48,000	63,200	80,000	101,600
Reduction factor		ϕ		0.75							
Pullout and concrete cone failure											
Characteristic bond strength[3] in concrete 2500psi											
Temperature Range A: 75°F/104°F [1]	uncracked concrete	$\tau_{k,uncr}$	[psi]	1,137	1,148	1,117	1,005	937	851	811	815
Temperature Range A: 95°F/122°F [1]	uncracked concrete	$\tau_{k,uncr}$	[psi]	853	861	838	754	703	638	608	611
Temperature Range B: 110°F/150°F [1]	uncracked concrete	$\tau_{k,uncr}$	[psi]	505	495	468	426	399	361	345	344
Strength reduction factor for permissible istallation condition	dry	ϕ_d		0.65							
	wet	ϕ_{ws}		0.55							
	water-filled	ϕ_{wf}		0.45							
Embedment depth		$h_{ef,min}$	[inch]	2-3/8	2-3/4	3-1/8	3-1/2	3-1/2	4	4-1/2	5
		$h_{ef,max}$	[inch]	7-1/2	10	12-1/2	15	17-1/2	20	22-1/2	25
Concrete breakout											
Effectness factor (uncracked concrete)		$k_{c,uncr}$	[-]	24							
Reduction factor Condition B[2]		ϕ		0.65							

The data in this table are evaluated according AC308-11 and ACI 355.4.

1) Long term temperature/ Short term temperature. Long term concrete temperatures are roughly constant over significant periods of time. Short term elevated temperatures are those that occur over brief intervals, e.g. as a result of diurnal cycling.

2) Condition A requires supplemental reinforcement, while Condition B applies where supplemental reinforcement is not provided or where pullout or pryout governs, as set forth in ACI 318-11 D.4.3. The tabulated value of ϕ applies when the load combinations of Section 1605.2 of the IBC, or ACI 318-11 9.2 are used. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ must be determined in accordance with ACI 318-11 D.4.4.

3) Characteristic bond strengths are for sustained loads including dead and live loads. For load combinations consisting of short-term loads only such as wind or seismic, bond strengths may be increased by 45 percent for Temperature Range B and 115 percent for Temperature Range C.

Performance data - concrete (Rebar)

SHEAR LOADS - Design acc. to ACI 318-11 Appendix D, hammer and diamond drilled bore holes

Anchor size			#3	#4	#5	#6	#7	#8	#9	#10
Steel failure										
Nominal shear strength as governed by steel strength, ASTM A615 Grade 60	V_{sa}	[lb]	5,940	10,800	16,740	23,760	32,400	42,660	54,000	68,580
Reduction factor	ϕ		0.60							
Nominal shear strength as governed by steel strength, ASTM A706, Grade 60	V_{sa}	[lb]	5,280	9,600	14,880	21,120	28,800	37,920	48,000	60,960
Reduction factor	ϕ		0.65							
Concrete edge failure										
Effective length of anchor in shear loading	l_e	[Inch]	min (h_{ef} ; $8d_a$)							
Outside diameter of anchor	d_a	[Inch]	3/8	1/2	5/8	3/8	7/8	1	1-1/8	1-1/4
Reduction factor Condition B[1)]	ϕ		0.65							

The data in this table are evaluated according AC308-11 and ACI 355.4.

1) Condition A requires supplemental reinforcement, while Condition B applies where supplemental reinforcement is not provided or where pullout or pryout governs, as set forth in ACI 318-11 D.4.3. The tabulated value of ϕ applies when the load combinations of Section 1605.2 of the IBC, or ACI 318-11 9.2 are used. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ must be determined in accordance with ACI 318-11 D.4.4.

Allowable loads - concrete (Threaded rod) in hammer-drilled holes

The allowable loads are only valid for single anchor for a roughly design, if the following conditions are valid:
min edge distance $c_a \geqq c_{ac}$ min spacing $S \geqq 2 \times C_{Na}$
min thickness concrete $h \geqq 2 \times h_{ef}$ concrete compressive strength $f'c \geqq$ 2500 psi
If the conditions are not fulfilled the loads must be calculated acc. to ACI 318-11 Appendix D.
The safety factors are already included in the allowable loads. A dead load - live load relation of 50/50 is used.

Anchor size			3/8	1/2	5/8	3/4	7/8	1	1-1/4
Allowable tension load for all Steel strength									
Temperature Range A: 75°F/104°F	$N_{allowable,ucr}$	[lb]	2,408	4,409	6,229	9,204	12,108	15,716	20,326
	$N_{allowable,cr}$	[lb]	1,154	1,997	2,703	3,866	5,076	6,595	8,615
Temperature Range B: 95°F/122°F	$N_{allowable,ucr}$	[lb]	1,951	3,378	4,568	6,536	8,601	11,157	14,595
	$N_{allowable,cr}$	[lb]	819	1,419	1,918	2,744	3,608	4,680	6,117
Temperature Range C: 110°F/150°F	$N_{allowable,ucr}$	[lb]	1,156	1,941	2,554	3,692	4,882	6,308	8,269
	$N_{allowable,cr}$	[lb]	485	814	1,070	1,549	2,049	2,645	3,466
Allowable shear load for steel strength, ASTM A36									
Temperature Range A: 75°F/104°F	$V_{allowable,ucr}$	[lb]	1,251	2,294	3,649	5,404	7,459	9,787	15,658
	$V_{allowable,cr}$	[lb]	1,251	2,294	3,649	5,404	7,459	9,787	15,338
Temperature Range B: 95°F/122°F	$V_{allowable,ucr}$	[lb]	1,251	2,294	3,649	5,404	7,459	9,787	15,658
	$V_{allowable,cr}$	[lb]	1,251	2,294	3,649	5,404	7,459	9,787	13,175
Temperature Range C: 110°F/150°F	$V_{allowable,ucr}$	[lb]	1,251	2,294	3,649	5,404	7,459	9,787	13,694
	$V_{allowable,cr}$	[lb]	1,043	1,753	2,307	3,339	4,420	5,686	7,473
Embedment depth	h_{ef}	[Inch]	3-1/2	4-1/2	5	6-1/2	8	10	11
Edge distance	c_{ca}	[Inch]	6.48	8.36	9.19	11.55	13.72	16.51	17.80
Axial distance	C_{Na}	[Inch]	4.28	5.74	7.08	8.14	9.09	9.90	12.07

Allowable loads - concrete (Threaded rod) in hammer-drilled holes

The allowable loads are only valid for single anchor for a roughly design, if the following conditions are valid:
min edge distance $c_a \geqq c_{ac}$ min spacing $S \geqq 2 \times C_{Na}$
min thickness concrete $h \geqq 2 \times h_{ef}$ concrete compressive strength $f'c \geqq$ 2500 psi
If the conditions are not fulfilled the loads must be calculated acc. to ACI 318-11 Appendix D.
The safety factors are already included in the allowable loads. A dead load - live load relation of 50/50 is used.

Anchor size			**3/8**	**1/2**	**5/8**	**3/4**	**7/8**	**1**	**1-1/4**
Allowable shear load for steel strength, ASTM A193 Grade B7									
Temperature Range A: 75°F/104°F	$V_{allowable,ucr}$	[lb]	2,249	4,940	6,969	10,706	14,116	18,985	21,473
	$V_{allowable,cr}$	[lb]	2,249	3,842	4,978	7,647	10,083	13,561	15,338
Temperature Range B: 95°F/122°F	$V_{allowable,ucr}$	[lb]	2,249	4,691	6,077	9,336	12,311	16,554	18,721
	$V_{allowable,cr}$	[lb]	1,765	3,054	4,133	5,912	7,763	10,085	13,175
Temperature Range C: 110°F/150°F	$V_{allowable,ucr}$	[lb]	2,231	3,708	4,702	7,143	9,283	12,214	13,694
	$V_{allowable,cr}$	[lb]	1,043	1,753	2,307	3,339	4,420	5,686	7,473
Allowable shear load for steel strength, ASTM F593 CW Stainless									
Temperature Range A: 75°F/104°F	$V_{allowable,ucr}$	[lb]	1,993	3,649	5,811	7,309	10,091	13,239	21,180
	$V_{allowable,cr}$	[lb]	1,993	3,649	4,978	7,309	10,083	13,239	15,338
Temperature Range B: 95°F/122°F	$V_{allowable,ucr}$	[lb]	1,993	3,649	5,811	7,309	10,091	13,239	18,721
	$V_{allowable,cr}$	[lb]	1,765	3,054	4,133	5,912	7,763	10,085	13,175
Temperature Range C: 110°F/150°F	$V_{allowable,ucr}$	[lb]	1,993	3,649	4,702	7,143	9,283	12,214	13,694
	$V_{allowable,cr}$	[lb]	1,043	1,753	2,307	3,339	4,420	5,686	7,473
Embedment depth	h_{ef}	[Inch]	3-1/2	4-1/2	5	6-1/2	8	10	11
Edge distance	c_{ca}	[Inch]	6.48	8.36	9.19	11.55	13.72	16.51	17.80
Axial distance	C_{Na}	[Inch]	4.28	5.74	7.08	8.14	9.09	9.90	12.07

Allowable loads - concrete (Threaded rod) in diamond-drilled holes

The allowable loads are only valid for single anchor for a roughly design, if the following conditions are valid:
min edge distance $c_a \geqq c_{ac}$ min spacing $S \geqq 2 \times C_{Na}$
min thickness concrete $h \geqq 2 \times h_{ef}$ concrete compressive strength $f'c \geqq$ 2500 psi
If the conditions are not fulfilled the loads must be calculated acc. to ACI 318-11 Appendix D.
The safety factors are already included in the allowable loads. A dead load - live load relation of 50/50 is used.

Anchor size			**3/8**	**1/2**	**5/8**	**3/4**	**7/8**	**1**	**1-1/4**
Allowable tension load for all steel strength									
Temperature Range A: 75°F/104°F	$N_{allowable,ucr}$	[lb]	2,408	4,409	6,229	8,883	11,893	15,428	20,225
Temperature Range B: 95°F/122°F	$N_{allowable,ucr}$	[lb]	1,920	3,324	4,490	6,310	8,443	10,954	14,362
Temperature Range C: 110°F/150°F	$N_{allowable,ucr}$	[lb]	1,138	1,910	2,512	3,565	4,795	6,195	8,129
Allowable shear load for steel strength, ASTM A36									
Temperature Range A and B: 75°F/104°F and 95°F/122°F	$V_{allowable\ ,ucr}$	[lb]	1,251	2,294	3,649	5,404	7,459	9,787	15,658
Temperature Range C: 110°F/150°F	$V_{allowable\ ,ucr}$	[lb]	1,251	2,294	3,649	5,404	7,459	9,787	13,554
Allowable shear load for steel strength, ASTM A193 Grade B7									
Temperature Range A: 75°F/104°F	$V_{allowable\ ,ucr}$	[lb]	2,249	4,940	6,921	10,556	14,015	18,845	21,330
Temperature Range B: 95°F/122°F	$V_{allowable\ ,ucr}$	[lb]	2,249	4,661	6,035	9,206	12,220	16,432	18,600
Temperature Range C: 110°F/150°F	$V_{allowable\ ,ucr}$	[lb]	2,210	3,673	4,655	6,995	9,184	12,083	13,554
Allowable shear load for steel strength, ASTM F593 CW Stainless									
Temperature Range A and B: 75°F/104°F and 95°F/122°F	$V_{allowable\ ,ucr}$	[lb]	1,993	3,649	5,811	7,309	10,091	13,239	18,600
Temperature Range C: 110°F/150°F	$V_{allowable\ ,ucr}$	[lb]	1,993	3,649	4,655	6,995	9,184	12,083	13,554
Embedment depth	h_{ef}	[Inch]	3-1/2	4-1/2	5	6-1/2	8	10	11
Edge distance	c_{ca}	[Inch]	6.44	8.31	9.13	11.38	13.62	16.38	17.68
Axial distance	C_{Na}	[Inch]	4.25	5.69	7.02	7.99	9.00	9.81	11.97

Allowable loads - concrete (Rebar) in hammer-drilled holes

The allowable loads are only valid for single anchor for a roughly design, if the following conditions are valid:
min edge distance $c_a \geqq c_{ac}$ min spacing $S \geqq 2 \times C_{Na}$
min thickness concrete $h \geqq 2 \times h_{ef}$ concrete compressive strength $f'c \geqq$ 2500 psi
If the conditions are not fulfilled the loads must be calculated acc. to ACI 318-11 Appendix D.
The safety factors are already included in the allowable loads. A dead load - live load relation of 50/50 is used.

Anchor size			#3	#4	#5	#6	#7	#8	#9	#10
Allowable tension load for all steel strength										
Temperature Range A: 75°F/104°F	$N_{allowable,ucr}$	[lb]	2,211	3,829	5,178	7,405	9,747	12,641	14,197	16,606
	$N_{allowable,cr}$	[lb]	927	1,606	2,170	3,110	4,098	5,309	5,973	6,899
Temperature Range B: 95°F/122°F	$N_{allowable,ucr}$	[lb]	1,658	2,872	3,884	5,553	7,310	9,481	10,648	12,455
	$N_{allowable,cr}$	[lb]	695	1,204	1,627	2,332	3,073	3,982	4,480	5,174
Temperature Range C: 110°F/150°F	$N_{allowable,ucr}$	[lb]	982	1,651	2,170	3,136	4,156	5,353	6,030	7,080
	$N_{allowable,cr}$	[lb]	412	692	912	1,315	1,746	2,246	2,533	2,868
Allowable shear load for all steel strength										
Temperature Range A: 75°F/104°F	$V_{allowable,ucr}$	[lb]	2,546	4,629	6,389	9,814	12,943	17,401	18,348	19,713
	$V_{allowable,cr}$	[lb]	1,996	3,459	4,564	6,698	8,826	11,435	12,865	14,081
Temperature Range B: 95°F/122°F	$V_{allowable,ucr}$	[lb]	2,451	4,396	5,695	8,747	11,536	15,510	16,281	17,509
	$V_{allowable,cr}$	[lb]	1,497	2,594	3,505	5,023	6,619	8,577	9,649	11,145
Temperature Range C: 110°F/150°F	$V_{allowable,ucr}$	[lb]	2,023	3,365	4,263	6,477	8,428	11,069	11,575	12,476
	$V_{allowable,cr}$	[lb]	887	1,491	1,963	2,833	3,760	4,838	5,455	6,177
Embedment depth	h_{ef}	[Inch]	3-1/2	4-1/2	5	6-1/2	8	10	10-1/2	11
Edge distance	c_{ca}	[Inch]	5.94	7.67	8.43	10.58	12.58	15.13	15.57	16.34
Axial distance	C_{Na}	[Inch]	3.84	5.15	6.35	7.30	8.15	8.88	9.74	10.84

Allowable loads - concrete (Rebar) in diamond-drilled holes

The allowable loads are only valid for single anchor for a roughly design, if the following conditions are valid:
min edge distance $c_a \geqq c_{ac}$ min spacing $S \geqq 2 \times C_{Na}$
min thickness concrete $h \geqq 2 \times h_{ef}$ concrete compressive strength $f'c \geqq$ 2500 psi
If the conditions are not fulfilled the loads must be calculated acc. to ACI 318-11 Appendix D.
The safety factors are already included in the allowable loads. A dead load - live load relation of 50/50 is used.

Anchor size			**#3**	**#4**	**#5**	**#6**	**#7**	**#8**	**#9**	**#10**
Allowable tension load for all steel strength										
Temperature Range A: 75°F/104°F	$N_{allowable,ucr}$	[lb]	2,177	3,768	5,093	7,149	9,570	12,408	13,968	16,339
Temperature Range B: 95°F/122°F	$N_{allowable,ucr}$	[lb]	1,633	2,826	3,820	5,361	7,178	9,306	10,476	12,254
Temperature Range C: 110°F/150°F	$N_{allowable,ucr}$	[lb]	967	1,625	2,133	3,029	4,074	5,266	5,944	6,899
Allowable shear load for all steel strength										
Temperature Range A: 75°F/104°F	$V_{allowable}$	[lb]	2,451	4,457	6,347	9,677	12,848	17,272	18,229	19,585
Temperature Range B: 95°F/122°F	$V_{allowable}$	[lb]	2,451	4,367	5,657	8,625	11,452	15,395	16,123	17,339
Temperature Range C: 110°F/150°F	$V_{allowable}$	[lb]	2,004	3,333	4,220	6,343	8,328	10,960	11,476	12,284
Embedment depth	h_{ef}	[Inch]	3-1/2	4-1/2	5	6-1/2	8	10	10-1/2	11
Edge distance	c_{ca}	[Inch]	5.90	7.62	8.37	10.44	12.49	15.02	15.47	16.23
Axial distance	C_{Na}	[Inch]	3.81	5.11	6.30	7.17	8.08	8.79	9.66	10.76