Construction

Sika® AnchorFix-3001

High performance, 2 component adhesive anchor system use in cracked & uncracked concrete

Description	Sika AnchorFix-3001 adhesive anchor system has been specially formulated as a high performance, two component adhesive anchor system for threaded bars and reinforcing bars in both cracked and uncracked concrete.
Where to Use	■ Cracked & uncracked concrete ■ Hard natural stone ■ Solid rock ■ Solid masonry
Advantages	■ Fixing close to free edges ■ Versatile range of embedment depths ■ Anchoring without expansion forces
Packaging	20.2 fl. oz. (600 ml) or 50.7 fl. oz. (1500 ml) cartridges
Approvals	■ ESR to AC308 by ICC-ES (ESR-3608) ■ Certified to ANSI /NSF - 61 by IAPMO-R&T (file N-7858) ■ Sika AnchorFix-3001 has been tested according to ASTM C 881 Type I, IV, Class C, Grade 3

Typical Data

RESULTS MAY DIFFER BASED UPON STATISTICAL VARIATIONS DEPENDING UPON MIXING METHODS AND EQUIPMENT, TEMPERATURE, APPLICATION METHODS, TEST METHODS, ACTUAL SITE CONDITIONS AND CURING CONDITIONS.

Shelf Life	When stored correctly, the shelf life will be for 24 months from the date of manufacture.
Storage Conditions	Cartridges should be stored in their original packaging, the correct way up, in cool conditions (+50°F to +77°F) out of direct sunlight.

Working & Loading Times

Cartridge Temperature	T Work (minutes)	Base Material Temperature	T Load (hours)
+50°F to +59°F	20	+40°F to +49°F	24
		+50°F to +59°F	12
+59°F to +72°F	15	+59°F to +72°F	8
+72°F to +77°F	11	+72°F to +77°F	7
+77°F to +86°F	8	+77°F to +86°F	6
+86°F to +95°F	6	+86°F to +95°F	5
+95°F to +104°F	4	+95°F to +104°F	4
+104°F	3	+104°F	3

T Work is the typical time to gel at the highest temperature in the range
T Load is the typical time to reach full capacity

*The design professional on the job is ultimately responsible for the interpretation of the data provided above.

Construction

Physical Properties		
Property	Result	Method
Consistency	Pass	ASTM C 881
Gel Time	10 minutes**	ASTM C 881
Bond Strength (2 day cure)	2,500 psi	ASTM C 882
Bond Strength (14 day cure)	2,700 psi	ASTM C 882
Compressive Strength (7 day)	>13,000 psi	ASTM D 695
Compressive Modulus (7 days)	420,000 psi	ASTM D 695
Water Absorption	0.08%	ASTM D 570
Heat Deflection Temperature	122°F	ASTM D 468
Linear Coefficient of Shrinkage	0.0003 in/in	ASTM D 2566

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**Note: Per section 5.2 "The purchaser may specify a minimum gel time of 5 minutes for Types I and IV when automatic proportioning, mixing and dispensing equipment are used."

Installation Specification									
Property	Symbol	Unit							
Threaded Rod Diameter	d_a	in	3/8	1/2	5/8	3/4	7/8	1	1-1/4
Drill Bit Diameter	d_o	in	1/2	9/16	3/4	7/8	1	1-1/8	1-3/8
Cleaning Brush Size	d_b	-	S14H/F	S16H/F	S22H/F	S24H/F	S27H/F	S31H/F	S38H/F
Nozzle Type	-	-	Q	Q	Q /QH	QH	QH	QH	QH
Extension Tube Required?	-	-	Y1 > 3.5" h_{ef}	Y1 > 3.5" h_{ef}	Y2 > 10" h_{ef}	Y2 > 10" h_{ef}	Y2 > 10" h_{ef}	Y2 > 10" h_{ef}	Y2 > 10" h_{ef}
Resin Stopper Required?	-	-	NO	NO	RS18 > 10" h_{ef}	RS18 > 10" h_{ef}	RS22 > 10" h_{ef}	RS22 > 10" h_{ef}	RS30 > 10" h_{ef}
Rebar Size	d_a	in	#3	#4	#5	#6	#7	#8	#10
Drill Bit Diameter	d_o	in	9/16	5/8	3/4	7/8	1	1-1/8	1-3/8
Cleaning Brush Size	d_b	-	S16H/F	S18H/F	S22H/F	S27H/F	S31H/F	S35H/F	S43H/F
Nozzle Type	-	-	Q	Q	Q /QH	QH	QH	QH	QH
Extension Tube Required?	-	-	Y1 > 3.5" h_{ef}	Y1 > 3.5" h_{ef}	Y2 > 10" h_{ef}	Y2 > 10" h_{ef}	Y2 > 10" h_{ef}	Y2 > 10" h_{ef}	Y2 > 10" h_{ef}
Resin Stopper Required?	-	-	NO	NO	RS18 > 10" h_{ef}	RS18 > 10" h_{ef}	RS22 > 10" h_{ef}	RS22 > 10" h_{ef}	RS30 > 10" h_{ef}
Maximum Tightening Torque	T_{inst}	ft.lb	15	30	60	100	125	150	200

Y1 - requires 3/8" diameter extension tube fitted to Q nozzle
Y2 requires 9/16" diameter extension tube fitted to QH nozzle
RS22 - use 22mm diameter resin stopper
RS30 - use 30mm diameter resin stopper
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Allowable Steel Strength for Threaded Rods									
		Carbon Steel ASTM F 1554 Grade 36 (A307 Gr.C)		Carbon Steel ASTM A 193 B7		Stainless Steel ASTM F 593 CW		Stainless Steel ASTM F 593 SH	
Anchor Diameter (in)		Allowable Tension, N_{all}	Allowable Shear, V_{all}	Allowable Tension, N_{all}	Allowable Shear, V_{all}	Allowable Tension, N_{all}	Allowable Shear, V_{all}	Allowable Tension, N_{all}	Allowable Shear, V_{all}
3/8”	lb	2,110	1,080	4,550	2,345	3,360	1,870	4,190	2,160
	kN	9.4	4.8	20.2	10.4	16.1	8.3	18.6	9.6
1/2”	lb	3,750	1,930	8,100	4,170	6,470	3,330	7,450	3,840
	kN	16.7	8.6	36.0	18.5	28.8	14.8	33.1	17.1
5/8”	lb	5,870	3,030	12,655	6,520	10,130	5,220	11,640	6,000
	kN	26.1	13.5	56.3	29.0	45.1	23.2	51.8	26.7
3/4”	lb	8,460	4,360	18,220	9,390	12,400	6,390	15,300	7,880
	kN	37.6	19.4	81.0	41.8	55.2	28.4	68.1	35.1
7/8”	lb	11,500	5,930	24,800	12,780	16,860	8,680	20,830	10,730
	kN	51.2	26.4	110.3	56.8	75.0	38.6	92.7	47.7
1”	lb	15,020	7,740	32,400	16,690	22,020	11,340	27,210	14,020
	kN	66.8	34.4	144.1	74.2	97.9	50.4	121.0	62.4
1 - 1/4”	lb	23,480	12,100	50,640	26,070	34,420	17,730	38,470	19,820
	kN	104.4	53.8	225.1	116.0	153.1	78.9	171.1	88.2

Allowable Tension, N_{all} = 0.33 x f_u x nominal cross sectional area
Allowable Shear, V_{all} = 0.17 x f_u x nominal cross section area
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Allowable Steel Strength for Rebar			
		Carbon Steel ASTM A 615 Grade 60	
Rebar Size		Allowable Tension, N_{all}	Allowable Shear, V_{all}
#3	lb	3,280	1,690
	kN	14.6	7.5
#4	lb	5,831	3,004
	kN	25.9	13.4
#5	lb	9,111	4,693
	kN	40.5	20.9
#6	lb	13,121	6,759
	kN	58.4	30.1
#7	lb	17,859	9,200
	kN	79.4	40.9
#8	lb	23,326	12,016
	kN	103.8	53.4
#10	lb	37,623	19,381
	kN	167.4	86.2

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Allowable Steel Strength for Rebar			
		Carbon Steel CAN/CSA-G30.18 Gr.400	
Rebar Size		Allowable Tension, N_{all}	Allowable Shear, V_{all}
10M	lb	4,016	2,069
	kN	17.9	9.2
15M	lb	8,052	4,148
	kN	35.8	18.5
20M	lb	11,960	6,161
	kN	53.2	27.4
25M	lb	19,975	10,290
	kN	88.9	45.8
30M	lb	28,121	14,486
	kN	125.1	64.4
35M	lb	40,089	20,652
	kN	178.3	91.9

Tension = 0.33 x f_u x nominal cross sectional area
Shear = 0.17 x f_u x nominal cross section area
*The design professional on the job is ultimately responsible for the interpretation of the data provided above.

1. Above values for reinforcing steel assume the design method is the same as a post-installed adhesive anchor,under the principles of anchor design (failure modes will be concrete breakout, pryout, steel failure, or adhesive bond) and not under the principles of reinforcing steel design (failure modes are typically splitting failure, inadequatebar development etc..). CONSULT AN ENGINEERING DESIGN PROFESSIONAL PRIOR TO USE.

Construction

Anchor Diameter	Embedment Depth	Allowable Concrete Capacity /Bond					
		Tension (lb)			Shear (lb)		
		f^2_c=2,500psi	f^2_c=4,000psi	f^2_c=8,000psi	f^2_c=2,500psi	f^2_c=4,000psi	f^2_c=8,000psi
3/8" or #3	2-3/8"	1,939	2,032	2,178	2,585	2,710	2,904
	4-15/16"	4,031	4,225	4,528	5,375	5,633	6,038
	7-1/2"	6,123	6,418	6,878	8,164	8,557	9,171
1/2" or #4	2-3/4"	2,527	2,649	2,839	3,369	3,531	3,785
	6-3/8"	5,858	6,140	6,581	7,811	8,187	8,774
	10"	9,186	9,631	10,323	12,252	12,842	13,764
5/8" or #5	3-1/8"	3,889	4,076	4,368	5,185	5,434	5,824
	7-13/16"	9,722	10,189	10,921	12,962	13,586	14,561
	12-1/2"	15,555	16,303	17,473	20,739	21,737	23,298
3/4" or #6	3-3/4"	5,200	5,450	5,841	6,933	7,267	7,788
	9-3/8"	13,000	13,625	14,603	17,333	18,167	19,471
	15"	20,799	21,800	23,365	27,732	29,067	31,153
1" or #8	4"	8,407	8,811	9,444	11,209	11,749	12,592
	12"	25,221	26,434	28,332	33,628	35,246	37,776
	20"	42,035	44,057	47,219	56,046	58,743	62,959
1-1/4" or #10	5"	10,529	11,036	11,828	14,039	14,715	15,771
	15"	31,588	33,108	35,484	42,117	44,144	47,312
	25"	52,646	55,180	59,140	70,195	73,573	78,853

1. The above values represent mean ultimate values and allowable w orking loads. The allowable working loads have been reduced us ing a safety factor of 4.0 for tension and 3.0 for shear , however, in some cases, such as life safety, safety factors of 10.0 or higher may be necessary.
2. Allowable loads must be checked against steel capacity. The lowest value controls.
3. Tabulated data is applicable to single anchors in normal weight concrete unaffected by edge or spacing reduction factors. V alues are valid for anchors installed into dry concrete in holes drilled with a hammer drill and ANSI carbide drill bit.
4. Linear interpolation is allowed.

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In - Service Temperature	Reduction Factor*
40°F	1.0
68°F	1.0
110°F	0.9
130°F	0.7
150°F	0.5
168°F	0.4
176°F	0.3

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**For intermediate temperatures, linear interpolation is allowed. Values must not be extrapolated.

Coverage

Anchor size:		(in.)	5/16	3/8	1/2	5/8	3/4	1	1 1/4
Drill Hole Diameter:		(in.)	3/8	1/2	9/16	3/4	7/8	1 1/8	1 3/8
Embedment Depth:		(in.)	2 3/8	2 3/8	2 3/4	3 1/8	3 3/4	4	5
Estimated Number of Fixing *	Cartridge Volume	600 ml	176	99	67	33	20	11	6
		1500 ml	455	256	175	86	53	30	16

*Number of fixings assumes 30ml wastage in initial extrusion and holes filled to 3/4 full

Anchor size:		(in.)	5/16	3/8	1/2	5/8	3/4	1	1 1/4
Drill Hole Diameter:		(in.)	3/8	1/2	9/16	3/4	7/8	1 1/8	1 3/8
Embedment Depth:		(in.)	3 1/8	3 3/4	5	6 1/4	7 1/2	10	12 1/2
Estimated Number of Fixing *	Cartridge Volume	600 ml	134	62	37	16	10	4	2
		1500 ml	346	162	96	43	26	12	6

*Number of fixings assumes 30ml wastage in initial extrusion and holes filled to 3/4 full

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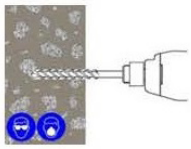
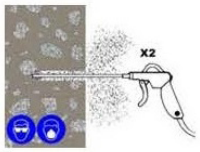
Application

Installation Method (Solid Substrates)
Always refer to MPII on ICC-ESR-3608

1. Using the SDS Hammer Drill in rotary hammer mode for drilling, with a carbide tipped drill bit conforming to ANSI B212.15-1994 of the appropriate size, drill the hole to the specified hole diameter and depth.

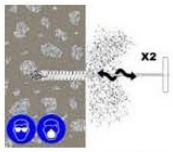


2. Select the correct Air Lance, insert to the bottom of the hole and depress the trigger for 2 seconds. The compressed air must be clean – free from water and oil – and at a minimum pressure of 90 psi (6 bar).



Perform the blowing operation twice.

3. Select the correct size Hole Cleaning Brush. Ensure that the brush is in good condition and the correct diameter. Insert the brush to the bottom of the hole, using a brush extension if needed to reach the bottom of the hole and withdraw with a twisting motion. *There should be positive interaction between the steel bristles of the brush and the sides of the drilled hole.*



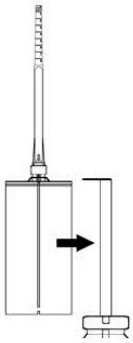
Perform the brushing operation twice.

4. Repeat 2 (blowing operation) twice.

5. Repeat 3 (brushing operation) twice.

6. Repeat 2 (blowing operation) twice.

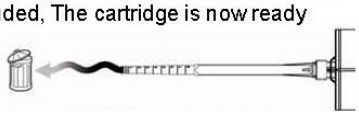
7. Select the appropriate static mixer nozzle, checking that the mixing elements are present and correct **(do not modify the mixer)**. Attach mixer nozzle to the cartridge. Check the Dispensing Tool is in good working order. Place the cartridge into the dispensing tool.



Note: The SAF-Q2 nozzle is in two sections. One section contains the mixing elements and the other section is an extension piece. Connect the extension piece to the mixing section by pushing the two sections firmly together until a positive engagement is felt.

Note: AnchorFix®-3001 may only be installed between the temperatures of 40°F and 104°F. The product must be conditioned to a minimum of 50°F. For gel and cure time data, refer to Table 14.

8. Extrude some resin to waste until an even-colored mixture is extruded, The cartridge is now ready for use.



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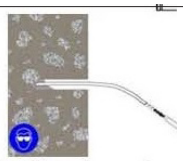
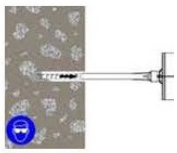
9. As specified in Figure 2, Table 11, and Table 12 , attach an extension tube with resin stopper (if required) to the end of the mixing nozzle with a push fit.
(The extension tubes may be pushed into the resin stoppers and are held in place with a coarse internal thread).



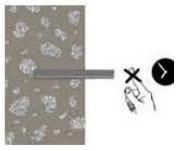
10. Insert the mixing nozzle to the bottom of the hole. Extrude the resin and slowly withdraw the nozzle from the hole. **Ensure no air voids are created** as the nozzle is withdrawn. Inject resin until the hole is approximately ¾ full and remove the nozzle from the hole.



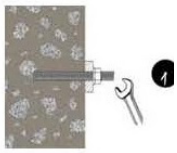
11. Select the steel anchor element ensuring it is free from oil or other contaminants, and mark with the required embedment depth. Insert the steel element into the hole using a back and forth twisting motion to ensure complete cover, until it reaches the bottom of the hole. Excess resin will be expelled from the hole evenly around the steel element and there shall be no gaps between the anchor element and the wall of the drilled hole.

12. Clean any excess resin from around the mouth of th hole.

13. Do not disturb the anchor until at least the minimum cure time has elapsed. Refer to the Table 14 Gel and Cure Times to determine the appropriate cure time.



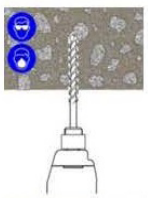
14. Position the fixture and tighten the anchor to the appropriate installation torque.



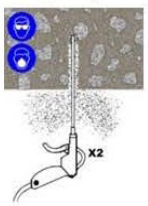
Do not over-torque the anchor as this could adversely affect its performance.

Overhead Substrate Installation Method
Always refer to MPII on ICC-ESR-3608

1. Using the SDS Hammer Drill in rotary hammer mode for drilling, with a carbide tipped drill bit conforming to ANSI B212.15-1994 of the appropriate size, drill the hole to the specified hole diameter and depth.

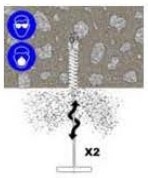


2. Select the correct Air Lance, insert to the bottom of the hole and depress the trigger for 2 seconds. The compressed air must be clean – free from water and oil – and at a minimum pressure of 90 psi (6 bar).



Perform the blowing operation twice.

3. Select the correct size Hole Cleaning Brush. Ensure that the brush is in good condition and the correct diameter. Insert the brush to the bottom of the hole, using a brush extension if needed to reach the bottom of the hole, and withdraw with a twisting motion. *There should be positive interaction between the steel bristles of the brush and the sides of the drilled hole.*



Perform the brushing operation twice.

4. Repeat 2 (blowing operation) twice.

5. Repeat 3 (brushing operation) twice.

6. Repeat 2 (blowing operation) twice.

7. Select the appropriate static mixer nozzle checking that the mixing elements are present and correct **(do not modify the mixer)**. Attach mixer nozzle to the cartridge. Check the Dispensing Tool is in good working order. Place the cartridge into the dispensing tool.

Note: The SAF-Q2 nozzle is in two sections. One section contains the mixing elements and the other section is an extension piece. Connect the extension piece to the mixing section by pushing the two sections firmly together until a positive engagement is felt.

Note: AnchorFix®-3001 may only be installed between the Temperatures of 40°F and 104°F. The product must be Conditioned to a minimum of 50°F. For gel and cure time data, refer to Table 14.

8. Extrude some resin to waste until an even-colored mixture is extruded, The cartridge is now ready for use.

9. As specified in Figure 2, Table 11, and Table 12, attach an extension tube with resin stopper (if required) to the end of the mixing nozzle with a push fit. (The extension tubes may be pushed into the resin stoppers and are held in place with a coarse internal thread).

10. Insert the mixing nozzle to the bottom of the hole. Extrude the resin and slowly withdraw the nozzle from the hole. **Ensure no air voids are created** as the nozzle is withdrawn. Inject resin until the hole is approximately ¾ full and remove the nozzle from the hole.

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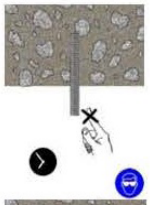
11. Select the steel anchor element ensuring it is free from oil or other contaminants, and mark with the required embedment depth. Insert the steel element into the hole using a back and forth twisting motion to ensure complete cover, until it reaches the bottom of the hole.
Excess resin will be expelled from the hole evenly around the steel element and there shall be no gaps between the anchor element and the wall of the drilled hole.

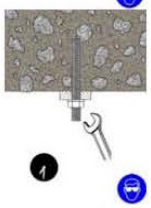
12. Clean any excess resin from around the mouth of the hole.

13. Do not disturb the anchor until at least the minimum cure time has elapsed. Refer to the Working and Load Timetable to determine the appropriate cure time.



14. Position the fixture and tighten the anchor to the appropriate installation torque.

Do not over-torque the anchor as this could adversely affect its performance.



Limitations

The design professional on the job is ultimately responsible for the interpretation of the data provided above.
Note: Sika AnchorFix-3001 has been qualified for resisting long-term leads through the ICC-ES AC308 creep test for which an anchor is loaded and monotored for movement over time. According to AC308, anchors that pass the creep test are determined to be suitable for resisting long- term tensile loads.

- Installation of anchors in horizontal or upwardly inclined orientations to resist sustained tension loads shall be performed by personnel certified by an application certification program in accordance with ACI 318 D.9.2.2 or D.9.2.3
- Please refer to section 5.0 for conditions of use in the ICC Evaluation Report #3608. This report is available on Sika and ICC's websites.
- For a complete list of tools and accessories, refer to ICC ESR #3608
- Minimum application temperature: 40°F (4°C)
- Maximum application temperature: 104°F (40°C)

Visit our website at www.sikausa.com **1-800-933-SIKA NATIONWIDE**

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