ADHESIVES TECHNOLOGY CORP.
Concrete Solutions for Concrete Applications

HS200

TECH DATA SHEET

1. Product Name

HS-200 Epoxy Anchoring Gel

2. Manufacturer

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3. Product Description

GENERAL DESCRIPTION

HS200 Epoxy Anchoring Gel is a two component (2:1 ratio), 100% solids, high modulus, structural epoxy gel. It is a solvent free, no odor, high strength, moisture insensitive, non-sag epoxy system. **HS200** has exceptional strength, maximum field reliability, along with a high heat deflection temperature of 152°F which provides engineers and contractors with a choice for specifying and setting adhesive anchors in elevated temperature environments.In addition, **HS200** has a working time 20 minutes at 75° F.), while providing an anchor that can be loaded in as little as 4 hours.

Quick Selection Guide	
Tension Load (1/2")	18,374 lbs. *
Working Time (75°)	20 minutes
Cure Time (75°)	4 hours
Temperature Range	35°F - 110°F

1/2" threaded rod at *9D in 2,000 psi concrete.

*9D is the embedment depth of the anchor (9 x 1/2"); in this example, a 1/2" threaded rod embedded 4-1/2" in 2,000 psi concrete.

BASIC USE

HS200 Epoxy Anchoring Gel is formulated for anchoring threaded rod, bolts, rebar and smooth dowels into concrete, grout filled block, and unreinforced masonry. **HS200** has been tested in accordance with ICC – AC58 and is acceptable for long term tensile loads, which includes overhead applications. It may also be used for short term tensile load anchors, which includes wind and seismic forces. Typical applications include:

- Seismic anchoring and bracing
- Grouting dowel bars and tie bars for full-depth concrete pavement repairs
- Pick proof sealant – windows, doors, locks, etc. (e.g. correctional facilities)
- Capping paste for crack-injection

COLOR

"A" Component (Resin): White
"B" Component (Hardener): Black
Mixed: Concrete Gray

SHELF LIFE: 28 Months

SIZE/PACKAGING

Cartridge Sizes: **HS200** is available in:

- 16 oz. cartridges; part number A16-HS200
- 33 oz. cartridges; part number A33-HS200

The resin and hardener are uniformly dispensed from a dual cartridge system and mixed simultaneously through a mixing nozzle, providing contractors with a self mix delivery system.
Bulk Sizes: **HS200** is also available in bulk sizes, which include:

- 1 gallon kit (102 fl. oz.); part number BUG-HS200
- 3 gallon kit; part number; B3G-HS200
- 15 gallon kit; part number; B15G-HS200
- 150 gallon kit; part number; B150G-HS200

4. Technical Data

APPLICABLE STANDARDS

American Society for Testing Materials (ASTM)
Meets ASTM C881, Type I, II, IV & V, Grade 3, Class A, B & C

Independent ASTM C881-99 Technical Data					
Properties	ASTM	35°	50°	75°F	110°F
Compressive Yield Strength - psi	D695	14,160	15,500	13,860	12,520
Compressive Modulus – psi	D695	233,800	289,200	218,200	232,250
Tensile Strength psi	D638	7,130	7,490	7,080	7,330
Elongation - %	D638	3.0	2.0	2.2	2.6
Bond Strength – psi 2 day	C882	3,730	3,930	3,880	3,660
Bond Strength – psi 14 day	C882	4.060	3,970	4,230	3,760
Consistency	C881	Non-Sag Gel			
Heat Deflection Temperature °F	D648	152 (7 day)			
Water Absorption - %	D570	0.25 (24 hr.)			
Linear Coefficient of Shrinkage %	D2566	0.0014			

Tension Loads for Threaded Rods - Safety Factor "Allowable" equals 25% of Ultimate Load, 32% for steel

Threaded Rod Diameter (in.)	Based on Bond Strength, 2000 psi Normal Weight Concrete				Allowable, Based on Steel Strength			
	Hole Diameter (in.)	Minimum Embedment Depth (in.)	Ultimate Tension Load (lbs.)	Allowable Tension Load (lbs.)	ASTM A36 (lbs.)	ASTM A307 GRADE C (lbs.)	ASTM A193 GRADE B7 (lbs.)	304/316 SS (lbs.)
3/8	7/16	1 11/16 3 3/8 4 1/2	3,037 8,214 9,277	759 2,054 2,319	2,115	2,185	4,555	3,645
1/2	9/16	2 1/4 4 1/2 6	5,696 18,374 22,224	1,424 4,594 5,556	3,775	3,885	8,100	6,480
5/8	3/4	2 13/16 5 5/8 7 1/2	9,680 26,581 34,819	2,420 6,645 8,705	5,870	6,075	12,655	10,125
3/4	7/8	3 3/8 6 3/4 9	12,388 38,414 44,725	3,097 9,604 11,181	8,455	8,750	18,225	12,390
7/8	1	3 15/16 7 7/8 10 1/2	16,107 52,393 66,130	4,027 13,098 16,533	11,510	11,905	24,805	16,865
1	1 1/8	4 1/2 9 12	21,606 60,837 72,540	5,402 15,209 18,135	15,030	15,550	32,400	22,030
1 1/4	1 3/8	5 5/8 11 1/4 15	31,142 82,281 106,186	7,786 20,570 26,547	23,490	24,295	50,620	34,425

Tension and Shear Loads for Rebar - Safety Factor "Allowable" equals 25% of Ultimate Load, 32% for steel

Rebar Size	Based on Bond Strength, 2000 psi Normal Weight Concrete						Allowable, Based on Steel Strength, Grade 60	
	Hole Diameter (in.)	Minimum Embedment Depth (in.)	Ultimate Tension Load (lbs.)	Allowable Tension Load (lbs.)	Ultimate Shear Load (lbs.)	Allowable Shear Load (lbs.)	Tension Load (lbs.)	Shear Load (lbs.)
#4	5/8	4 1/2	18,975	4,744	12,121	3,030	4,710	3,060
#5	3/4	5 5/8	31,555	7,889	20,597	5,149	7,365	4,740
#6	7/8	6 3/4	39,109	9,777	30,114	7,529	10,605	6,730
#7	1	7 7/8	47,523	11,881	34,302	8,575	14,430	9,180
#8	1 1/8	9	55,937	13,984	38,489	9,622	18,850	12,085

Shear Loads for Threaded Rods - Safety Factor "Allowable" equals 25% of Ultimate Load, 32% for steel

Threaded Rod Diameter (in.)	Based on Bond Strength, 2000 psi Normal Weight Concrete				Allowable, Based on Steel Strength			
	Hole Diameter (in.)	Minimum Embedment Depth (in.)	Ultimate Shear Load (lbs.)	Allowable Shear Load (lbs.)	ASTM A36 (lbs.)	ASTM A307 GRADE C (lbs.)	ASTM A193 GRADE B7 (lbs.)	304/316 SS (lbs.)
3/8	7/16	3 3/8	7,072	1,768	1,090	1,125	2,345	1,870
1/2	9/16	4 1/2	12,230	3,058	1,935	2,000	4,170	3,330
5/8	3/4	5 5/8	23,190	5,798	3,025	3,130	6,520	5,210
3/4	7/8	6 3/4	31,853	7,963	4,355	4,505	9,390	6,390
7/8	1	7 7/8	34,953	8,738	5,930	6,135	12,780	8,680
1	1 1/8	9	54,924	13,731	7,745	8,010	16,690	11,340
1 1/4	1 3/8	11 1/4	73,427	18,357	12,100	12,515	26,075	17,730

Manufactured In The U.S.A. by Adhesives Technology Corp.

APPROVALS

- Metro-Dade County, FL #06-0111.05
- Caltrans Approval
- Florida DOT 937HSHV Listed
- Many DOT Approvals, visit our web-site for a complete listing: www.atc.ws

HS200 has been tested in accordance with ICC - AC58 (Acceptance Criteria for Adhesive Anchors in concrete and masonry elements) and is recognized for the following uses:

- Static loads
- Seismic / wind loading for threaded rod and rebar
- Long term creep at elevated temperature
- Static loading at elevated temperature
- Damp holes
- Freeze thaw conditions
- Critical and minimum edge and spacing distances.

Tension - Edge Distance - 4.5D* Embedments

	Anchor Diameter						
	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/4"
Ultimate Load	3,037	5,969	9,680	12,3881	6,107	21,606	31,142
Edge Distance	Reduction Multiplier Table						
3/4"	0.57						
1"	0.63						
1 1/4"	0.69	0.59					
1 1/2"	0.75	0.64	0.57				
1 3/4"	0.82	0.69	0.61	0.57			
2"	0.88	0.74	0.65	0.60	0.57		
2 1/4"	0.94	0.79	0.69	0.63	0.60	0.57	
2 1/2"	1.00	0.83	0.73	0.67	0.62	0.59	
2 3/4"		0.88	0.77	0.70	0.65	0.62	
3"		0.93	0.80	0.73	0.68	0.64	0.58
3 1/4"		0.98	0.84	0.76	0.70	0.67	0.60
3 1/2"		1.00	0.88	0.79	0.73	0.69	0.62
3 3/4"			0.92	0.82	0.76	0.71	0.64
4"			0.96	0.86	0.79	0.74	0.66
4 1/4"			1.00	0.89	0.81	0.76	0.68
4 1/2"				0.92	0.84	0.79	0.69
4 3/4"				0.95	0.87	0.81	0.71
5"				0.98	0.89	0.83	0.73
5 1/4"				1.00	0.92	0.86	0.75
5 1/2"					0.95	0.88	0.77
5 3/4"					0.97	0.90	0.79
6"					1.00	0.93	0.81
6 1/4"						0.95	0.83
6 1/2"						0.98	0.85
6 3/4"						1.00	0.87
7"							0.89
7 1/2"							0.92
8"							0.96
8 1/2"							1.00

* D = Bolt/Rod Diameter

Tension - Edge Distance - 9D* Embedments

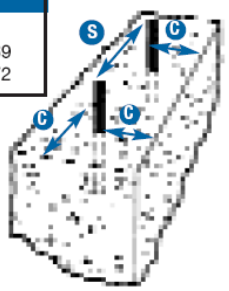
	Anchor Diameter						
	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/4"
Ultimate Load	8,214	18,374	26,581	38,414	52,393	60,837	82,281
Edge Distance	Reduction Multiplier Table						
1 3/4"	0.73						
2"	0.75						
2 1/2"	0.79	0.74					
3"	0.83	0.77	0.73				
3 1/2"	0.87	0.80	0.75	0.73			
4"	0.91	0.83	0.78	0.75	0.72		
4 1/2"	0.95	0.86	0.80	0.77	0.74	0.72	
5"	0.99	0.89	0.83	0.79	0.76	0.74	
5 1/2"	1.00	0.92	0.85	0.81	0.78	0.75	
6"		0.95	0.88	0.83	0.79	0.77	0.73
6 1/2"		0.98	0.90	0.85	0.81	0.78	0.74
7"		1.00	0.93	0.87	0.83	0.80	0.75
7 1/2"			0.95	0.89	0.85	0.81	0.77
8"			0.98	0.91	0.86	0.83	0.78
9"			1.00	0.95	0.90	0.86	0.80
10"				0.99	0.94	0.89	0.83
11"				1.00	0.97	0.92	0.85
12"					1.00	0.95	0.88
13"						0.98	0.90
14"						1.00	0.93
15"							0.95
16"							1.00

* D = Bolt/Rod Diameter

Reduction Factor for Reduced Spacing and Edge Distances for Threaded Rod

Embed-ment Depth	Edge Distance Factor, Tension Only			Edge Distance Factor, Shear Only			Spacing Factor, Tension Only		
	C_{CR}	C_{MIN}	f_{RN}	C_{CR}	C_{MIN}	f_{RV}	S_{CR}	S_{MIN}	f_A
4.5 x D	1.5 x h_{ef}	.5 x h_{ef}	0.57	1.5 x h_{ef}	-	-	2 x h_{ef}	-	-
9 x D	1.5 x h_{ef}	.5 x h_{ef}	0.72	1.5 x h_{ef}	.5 x h_{ef}	0.29	1.75 x h_{ef}	.5 x h_{ef}	0.69
12 x D	1.5 x h_{ef}	.5 x h_{ef}	0.75	1.5 x h_{ef}	.5 x h_{ef}	0.29	1.75 x h_{ef}	.5 x h_{ef}	0.72

h_{ef} = The anchor embedment depth
D = The diameter of the rod
C = The measure between the anchor center line and the free edge
C_{CR} = The least edge distance where no reduction would be applied
C_{MIN} = The least edge distance for which recognition is desired
S = The measure between anchors from center line to center line
S_{CR} = The least spacing between anchors where no reduction would be applied
S_{MIN} = The least spacing between anchors for which recognition is desired
f_{RN}, f_{RV} = Load reduction factors to be applied when: $C_{MIN} \leq C < C_{CR}$
f_A = Load reduction factors to be applied when: $S_{MIN} \leq S < S_{CR}$



C = Edge Distance

S = Spacing Distance

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Tension - Spacing Distance - 9D* Embedments

	Anchor Diameter						
	3/8"	1/2"	5/8"	3/4"	7/8"	1 "	1 1/4"
Ultimate Load	8,214	18,374	26,581	38,414	52,393	60,837	82,281
Spacing Distance	Reduction Multiplier Table						
1 3/4"	0.73						
2"	0.75						
2 1/2"	0.78	0.74					
3"	0.81	0.77	0.74				
3 1/2"	0.85	0.79	0.76	0.73			
4"	0.88	0.81	0.78	0.75	0.73		
4 1/2"	0.91	0.84	0.79	0.77	0.75	0.73	
5"	0.94	0.86	0.81	0.78	0.76	0.74	
5 1/2"	0.97	0.89	0.83	0.80	0.77	0.75	
6"	1.00	0.91	0.85	0.81	0.79	0.77	0.74
6 1/2"		0.93	0.87	0.83	0.80	0.78	0.75
7"		0.96	0.89	0.85	0.81	0.79	0.76
7 1/2"		0.98	0.91	0.86	0.83	0.80	0.77
8"		1.00	0.93	0.88	0.84	0.81	0.78
9"			0.97	0.91	0.87	0.84	0.79
10"			1.00	0.94	0.90	0.86	0.81
11"				0.97	0.92	0.89	0.83
12"				1.00	0.95	0.91	0.85
13"					0.98	0.93	0.87
14"					1.00	0.96	0.89
15"						0.98	0.91
16"						1.00	0.93
17"							0.95
18"							0.97
19"							0.99
20"							1.00

* D = Bolt/Rod Diameter

Tension - Edge Distance - 12D* Embedments

	Anchor Diameter						
	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/4"
Ultimate Load	9,277	22,224	34,819	44,725	66,130	72,540	106,186
Edge Distance	Reduction Multiplier Table						
1 3/4"	0.75						
2"	0.77						
2 1/2"	0.79	0.76					
3"	0.81	0.78	0.76				
3 1/2"	0.84	0.80	0.77	0.75			
4"	0.86	0.81	0.79	0.77	0.75		
4 1/2"	0.89	0.83	0.80	0.78	0.76	0.75	
5"	0.91	0.85	0.81	0.79	0.77	0.76	
5 1/2"	0.94	0.87	0.83	0.80	0.79	0.77	
6"	0.96	0.89	0.84	0.81	0.80	0.78	0.76
6 1/2"	0.99	0.91	0.86	0.83	0.81	0.79	0.76
7"	1.00	0.93	0.87	0.84	0.82	0.80	0.77
7 1/2"		0.94	0.89	0.85	0.83	0.81	0.78
8"		0.96	0.90	0.86	0.84	0.81	0.79
9"		1.00	0.93	0.89	0.86	0.83	0.80
10"			0.96	0.91	0.89	0.85	0.81
11"			0.99	0.94	0.91	0.87	0.83
12"			1.00	0.96	0.93	0.89	0.84
13"				0.99	0.95	0.91	0.86
14"				1.00	0.98	0.93	0.87
15"					1.00	0.94	0.89
16"						0.96	0.90
17"						0.98	0.92
18"						1.00	0.93
19"							0.95
20"							0.96
21'							0.98
22"							0.99
23"							1.00

* D = Bolt/Rod Diameter

Tension - Spacing Distance - 12D* Embedments

	Anchor Diameter						
	3/8"	1/2"	5/8"	3/4"	7/8"	1 "	1 1/4"
Ultimate Load	9,277	22,224	34,819	44,725	66,130	72,540	106,186
Spacing Distance	Reduction Multiplier Table						
1 3/4"	0.82						
2"	0.83						
2 1/2"	0.85	0.83					
3"	0.88	0.84	0.82				
3 1/2"	0.90	0.86	0.84	0.82			
4"	0.92	0.88	0.85	0.83	0.82		
4 1/2"	0.94	0.89	0.86	0.84	0.83	0.82	
5"	0.96	0.91	0.88	0.85	0.84	0.83	
5 1/2"	0.98	0.92	0.89	0.87	0.85	0.84	
6"	1.00	0.94	0.90	0.88	0.86	0.84	0.82
6 1/2"		0.96	0.91	0.89	0.87	0.85	0.83
7"		0.97	0.93	0.90	0.88	0.86	0.84
7 1/2"		0.99	0.94	0.91	0.89	0.87	0.84
8"		1.00	0.95	0.92	0.89	0.88	0.85
9"			0.98	0.94	0.91	0.89	0.86
10"			1.00	0.96	0.93	0.91	0.88
11"				0.98	0.95	0.92	0.89
12"				1.00	0.97	0.94	0.90
13"					0.99	0.96	0.91
14"					1.00	0.97	0.93
15"						0.99	0.94
16"						1.00	0.95
17"							0.97
18"							0.98
19"							0.99
20"							1.00

* D = Bolt/Rod Diameter

Shear - Edge Distance 9D* Embedments

	Anchor Diameter						
	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/4"
Ultimate Load	9,277	22,224	34,819	44,725	66,130	72,540	106,186
Edge Distance	Reduction Multiplier Table						
1 3/4"	0.30						
2"	0.36						
2 1/2"	0.46	0.33					
3"	0.57	0.41	0.31				
3 1/2"	0.67	0.49	0.38	0.30			
4"	0.78	0.57	0.44	0.36	0.30		
4 1/2"	0.88	0.65	0.50	0.41	0.34	0.29	
5"	0.99	0.72	0.57	0.46	0.39	0.33	
5 1/2"	1.00	0.80	0.63	0.51	0.43	0.37	
6"		0.88	0.69	0.57	0.48	0.41	0.31
6 1/2"		0.96	0.76	0.62	0.52	0.45	0.35
7"		1.00	0.82	0.67	0.57	0.49	0.38
7 1/2"			0.88	0.72	0.61	0.53	0.41
8"			0.94	0.78	0.66	0.57	0.44
9"			1.00	0.88	0.75	0.65	0.50
10"				0.99	0.84	0.72	0.57
11"				1.00	0.93	0.80	0.63
12"					1.00	0.88	0.69
13"						0.96	0.76
14"						1.00	0.82
15"							0.88
16"							0.94
17"							1.00

* D = Bolt/Rod Diameter

For multiple spacing and/or edge distances, the total reduction factor (F) is the product of all spacing reduction factors (f_s) and all edge reduction factor (f_E):

$F = x\ f_s1 \times f_s2 \ldots f_sn \times f_E1 \times f_E2 \ldots f_En$

16 & 33 oz Cartridge Systems

2:1 Ratio

HS200 Cure Schedule			
Temperature		Working Time	Cure Time
°C	°F		
1.7° C.	35° F.	35 min	48 hrs
4.4° C.	40° F.	33 min	24 hrs
10° C.	50° F.	30 min	24 hrs
18.3° C.	65° F.	15 min	8 hrs
23.8° C.	75° F.	10 min	4 hrs
30.0° C.	86° F.	8 min	4 hrs
35.0° C.	95° F.	5 min	3 hrs
46.1° C.	115° F.	2.5 min	3 hrs

ESTIMATING / USAGE GUIDES

Rod Dia	Hole Dia	HS200 Usage Estimate Guide – 16 oz. Cartridge System – Threaded Rod Embedment Depth (in.)															
(in.)	(in.)	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
3/8	7/16	158.5	105.7	79.3	63.4	52.8	45.3	39.6	35.2	31.7	28.8	26.4	24.4	22.7	21.2	19.8	18.7
1/2	9/16	119.9	79.9	59.9	48.0	40.0	34.3	29.8	26.7	24.0	21.8	20.0	18.5	17.1	16.0	15.0	14.1
5/8	3/4	67.4	45.0	33.7	27.0	22.5	19.3	16.9	15.0	13.5	12.3	11.3	10.4	9.7	9.0	8.5	8.0
3/4	7/8	49.5	33.0	24.8	19.8	16.5	14.2	12.4	10.8	9.9	9.0	8.3	7.6	7.1	6.6	6.2	5.9
7/8	1	42.2	28.1	21.1	16.9	14.1	12.1	10.6	9.3	8.5	7.7	7.0	6.5	6.0	5.6	5.3	5.0
1	1-1/8	40.0	26.8	20.0	16.0	13.3	11.4	10.0	9.0	8.0	7.3	6.7	6.2	5.7	5.4	5.0	4.7
1-1/8	1-1/4	32.4	21.6	16.2	13.0	10.8	9.3	8.1	7.3	6.5	5.9	5.4	5.0	4.6	4.3	4.1	3.8
1-1/4	1-3/8	26.8	17.9	13.4	10.7	8.9	7.7	6.7	6.1	5.4	4.9	4.5	4.1	3.8	3.6	3.4	3.2

Rod Dia	Hole Dia	HS200 Usage Estimate Guide – 16 oz. Cartridge System – Deformed Bar Embedment Depth (in.)															
(in.)	(in.)	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
#3	7/16	198.1	132.1	99.1	79.3	66.1	56.6	49.5	44.0	39.6	36.0	33.0	30.5	28.3	26.4	24.8	23.3
#4	5/8	129.4	86.3	64.7	51.8	43.2	37.0	32.4	28.8	25.9	23.6	21.6	19.9	18.5	17.3	16.2	15.2
#5	3/4	89.9	59.9	45.0	36.0	30.0	25.7	22.5	20.0	18.0	16.4	15.0	13.9	12.9	12.0	11.3	10.6
#6	7/8	70.8	47.2	35.4	28.3	23.6	20.2	17.7	15.7	14.2	12.9	11.8	10.9	10.1	9.5	8.9	8.3
#7	1	63.2	42.2	31.6	25.3	21.1	18.1	15.8	14.1	12.7	11.5	10.6	9.7	9.1	8.5	7.9	7.5
#8	1-1/8	50.0	33.3	25.0	20.0	16.7	14.3	12.5	11.1	10.0	9.1	8.3	7.7	7.2	6.7	6.3	5.9
#9	1-1/4	40.5	27.0	20.2	16.2	13.5	11.6	10.1	9.0	8.1	7.4	6.8	6.2	5.8	5.4	5.1	4.8
#10	1-1/2	28.1	18.7	14.1	11.3	9.4	8.0	7.0	6.3	5.6	5.1	4.7	4.3	4.0	3.8	3.5	3.3
#11	1-5/8	12.0	9.6	8.0	6.9	6.0	5.3	4.8	4.4	4.0	3.7	3.4	3.2	3.0	2.8	24.0	16.0

Rod Dia	Hole Dia	HS200 Usage Estimate Guide – 33 oz. Cartridge System – Threaded Rod Embedment Depth (in.)															
(in.)	(in.)	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
3/8	7/16	316.9	211.3	158.5	126.8	105.6	90.6	79.2	70.4	63.4	57.6	52.8	48.8	45.3	42.3	39.6	37.3
1/2	9/16	239.7	159.8	119.8	95.9	79.9	68.5	59.5	53.3	47.9	43.6	39.9	36.9	34.2	32.0	30.0	28.2
5/8	3/4	134.8	89.9	67.4	53.9	44.9	38.5	33.7	30.0	27.0	24.5	22.5	20.7	19.3	18.0	16.9	15.9
3/4	7/8	99.0	66.0	49.5	39.6	33.0	28.3	24.8	21.5	19.8	18.0	16.5	15.2	14.1	13.2	12.4	11.7
7/8	1	84.3	56.2	42.1	33.7	28.1	24.1	21.1	18.6	16.9	15.3	14.0	13.0	12.0	11.2	10.5	9.9
1	1-1/8	79.9	53.5	39.9	32.0	26.6	22.8	20.0	18.0	16.0	14.5	13.3	12.3	11.4	10.7	10.0	9.4
1-1/8	1-1/4	64.7	43.1	32.4	25.9	21.6	18.5	16.2	14.5	12.9	11.8	10.8	10.0	9.2	8.6	8.1	7.6
1-1/4	1-3/8	53.5	35.7	26.7	21.4	17.8	15.3	13.4	12.1	10.7	9.7	8.9	8.2	7.6	7.1	6.7	6.3

Rod Dia	Hole Dia	HS200 Usage Estimating Guide – 33 oz. Cartridge System – Deformed Bar Embedment Depth (in.)															
(in.)	(in.)	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
#3	7/16	396.2	264.1	198.1	158.5	132.1	113.2	99.0	88.0	79.2	72.0	66.0	60.9	56.6	52.8	49.5	46.6
#4	5/8	258.8	172.5	129.4	103.5	86.3	73.9	64.7	57.5	51.8	47.1	43.1	39.8	37.0	34.5	32.4	30.4
#5	3/4	179.7	119.8	89.9	71.9	59.9	51.4	44.9	39.9	35.9	32.7	30.0	27.7	25.7	24.0	22.5	21.1
#6	7/8	141.5	94.3	70.7	56.6	47.2	40.4	35.4	31.4	28.3	25.7	23.6	21.8	20.2	18.9	17.7	16.6
#7	1	126.4	84.3	63.2	50.6	42.1	36.1	31.6	28.1	25.3	23.0	21.1	19.4	18.1	16.9	15.8	14.9
#8	1-1/8	99.9	66.6	49.9	39.9	33.3	28.5	25.0	22.2	20.0	18.2	16.6	15.4	14.3	13.3	12.5	11.7
#9	1-1/4	80.9	53.9	40.4	32.4	27.0	23.1	20.2	18.0	16.2	14.7	13.5	12.4	11.6	10.8	10.1	9.5
#10	1-1/2	56.2	37.4	28.1	22.5	18.7	16.0	14.0	12.5	11.2	10.2	9.4	8.6	8.0	7.5	7.0	6.6
#11	1 5/8	47.9	31.9	23.9	19.1	16.0	13.7	12.0	10.6	9.6	8.7	8.0	7.4	6.8	6.4	6.0	5.6

Manufactured In The U.S.A. by Adhesives Technology Corp.

Sample Specification – Anchoring adhesive shall be a two component, 2:1 ratio, 100% solids epoxy system supplied in a two component side by side cartridge and dispensed through a static mixing nozzle supplied by the manufacturer. Epoxy must meet the requirements of ASTM C881 specification for Type I, II, IV and V, Grade 3, Class A, B, C. Epoxy must have a minimum heat deflection temperature of 152°F (67°C), per ASTM D648 and maintain a minimum of 94% of the tension load at 150°F. Adhesive shall have an average minimum ultimate tension load value of 22,224 lbs. when tested using 1/2" diameter threaded rod in a 9/16" diameter hole at a minimum embedment depth of 6" in 2000 psi normal weight concrete. Testing must be in accordance with ASTM E488. Shelf life must be a minimum of 28 months. Adhesive shall be **HS200** manufactured by Adhesives Technology Corp., Pompano Beach, Florida.

5. Installation

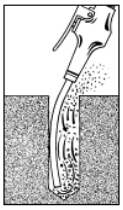
Job site preparation and work flow – to achieve the desired results, carefully follow these procedures!

Always be sure the holes are prepared in advance before starting a new cartridge. If at all possible, schedule dispensing to consume an entire cartridge at one time with no interruption of epoxy flow.

To achieve maximum flow and reduce fatigue, break off the nozzle to the largest diameter that will fit into the hole or screen. If the hole is 5/8" diameter or larger, snap off the smaller diameter section before using.

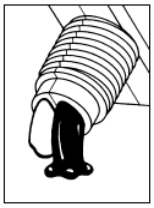
Most nozzles snap off to accommodate varying hole diameters and depths.

Dual Cartridge Anchoring & Doweling – Hole Preparation and Cartridge Set up

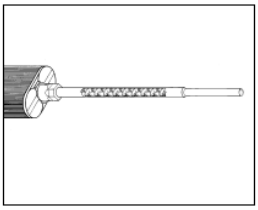


I. Drill hole to proper diameter and depth. Blow out dust from the bottom of the hole. Brush the hole with a nylon brush. Blow out dust again. The hole should be clean of dust and debris.

II. Insert cartridge into dispenser making sure it is properly positioned with shoulder of cartridge flush with top bracket of the dispenser.

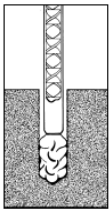


III. Remove plastic cap from the tip of the cartridge. Dispense a small amount of epoxy into a disposable container until you get an even flow of black and white material.

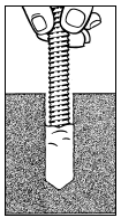


IV. Place nozzle onto cartridge and slide nut over nozzle and thread nut onto cartridge. No nut is necessary on mixers with built in nut. Make sure that the nozzle, nut and cartridge assembly is secure. Dispense enough epoxy into a disposable container until the color becomes a consistent gray with no streaks.

Anchoring Into Concrete



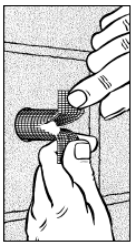
V. Dispense the material from the bottom of the hole. Fill approximately 1/2 – 5/8 of the hole depth while slowly withdrawing the nozzle. Fill completely full for holes totally submerged in water.



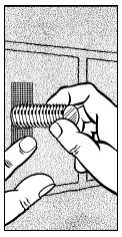
VI. Insert the threaded rod or rebar to the bottom of the hole while turning clockwise. The threaded rod or rebar should be free of dirt, grease, oil, or other foreign materials. Do not disturb or bolt-up until minimum bolt-up time has passed.

Anchoring Into Hollow Block or Unreinforced Masonry *(Repeat steps I through IV as shown above).*

V. Insert the mixing nozzle into the bottom of the screen and completely fill while withdrawing the nozzle. Fill the screen completely all the way to the end to insure that the epoxy completely fills the screen from top to bottom when threaded rod is inserted.



VI. Insert the epoxy-filled screen into the hole.



VII. Insert the threaded rod or dowel to the bottom of the screen while turning clockwise. The threaded rod or rebar should be free of dirt, grease, oil or other foreign material. Do not disturb or bolt-up until minimum bolt-up time has passed.

Manufactured In The U.S.A. by Adhesives Technology Corp.

BUILDING CODES
Installation of Adhesives Technology Products must comply with applicable local, state and national code requirements.

SITE CONDITIONS
Material shall be delivered in original unopened containers and stored in a dry environment at a temperature between 40° and 95°F.

PRECAUTIONS
- Wear safety glasses
- Avoid prolonged contact with skin.
- Keep out of reach of children
- Do not take internally
- If Ingested and conscious, give large quantities of water or milk. Do not induce vomiting. Call a physician
- Eye contact. Flush with water for at least 15 minutes. Call a physician

6. Availability and Cost
AVAILABILITY
Adhesives Technology Products are available through select distributors who can provide you with all of your construction needs. Please contact Adhesives Technology Corp. at (800) 892-1880 for a distributor near you.

COST
Cost information is available from your local distributor.

7. Warranty
All warranties of the product listed herein, in the corresponding ATC catalog, and in any other current literature, expressed or implied, including warranties of merchantability and fitness for a particular purpose are specifically and expressly excluded, with the following exception: At its sole discretion, ATC will repair or replace any product which it considers to be defective in material or workmanship, excepting normal wear and tear within sixty (60) days from the date of purchase from ATC. ATC shall not be liable for any injury, loss or damage, direct, indirect, incidental or consequential or arising out of use of, misuse of, negligence, accident or inability to use any ATC product.

8. Technical Services
For technical support contact Adhesives Technology Corp. at (800) 892-1880.

9. Maintenance
None required.

10. Filing System
Additional product information and specifications are available either on line at www.atc.ws or contact Adhesives Technology at (800) 892-1880 to get copies mailed to you.

PARTIAL LIST OF PROJECTS USING **HS200**

HS200 has been used on many high profile projects including:
Air Train Operating System at San Francisco Airport
Golden Gate Bridge (Seismic Retrofit)
Oakland Bay Bridge (Seismic Retrofit)
Ferry Building (San Francisco)

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