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Non-Metallic
Non-Shrink Grouting

MasterEmaco® ADH 610

Fast curing acrylic adhesive

PACKAGING

10.1 fl. oz / 300 ml cartridge
(12 per box)

COLOR

Part A (Resin) Beige
Part B (Hardener) Black, Mixed Ratio:
10:1 by volume

STORAGE

Store in unopened containers in a cool, clean, dry area. Keep from freezing.

SHELF LIFE

18 months when properly stored

VOC CONTENT

0 g/L less water and exempt solvents

DESCRIPTION

MasterEmaco ADH 610 is a two-component styrene free, acrylic resin used for anchoring and dowel applications in uncracked concrete using threaded rod and rebar. It may be used at temperatures between 15 to 95 °F (-9 to 35 °C).

PRODUCT HIGHLIGHTS

- 30-minute full cure at 77 °F (25 °C) in dry concrete
- Fast mortar repair for panels and other concrete surfaces
- High bond strengths
- Easily dispensable even at low temperatures
- Styrene free
- Non-sag

APPLICATIONS

- Adhering dowel bars and tie bars for full depth concrete repairs
- Short term tensile anchoring and shear loading conditions in accordance with allowable stress design (ASD)
- Wide service temperature range between -40° to 176 °F (-40 to 80 °C)
- Moisture insensitive, allowing installation and curing in damp and water-saturated environments
- Bonding agent for fresh concrete to hardened concrete and hardened concrete to hardened concrete

SUBSTRATES

- Concrete

HOW TO APPLY

SURFACE PREPARATION

CONCRETE

1. Substrate may be dry or damp, although dry surfaces produce optimum results.
 2. Remove grease, wax, oil contaminants, and curing compounds by scrubbing with an industrial-grade detergent or a degreasing compound. Follow with mechanical cleaning (ASTM D 4258).
 3. Remove weak, contaminated, or deteriorated concrete by shotblasting, gritblasting, scarifying, or other suitable mechanical means.
- ##### STEEL

1. Remove dirt, grease, and oil with a suitable industrial-grade cleaning-and-degreasing compound (SSPC-SP-1). Remove rust and mill scale by gritblasting. Blast steel to a white metal finish. Follow gritblasting with vacuuming or oil-free, dry-air blast (SSPC-SP-10 or NACE-2).

TECHNICAL DATA COMPLIANCE
MasterEmaco ADH 610 conforms to ASTM C 881-15 Type II* Grade 3 Class A & B (*with exception of linear shrinkage and gel time)

Test Data^{1, 2, 3}

PROPERTY	RESULTS	TEST METHOD
Gel Time @ 60 gram mass ⁴ (Minutes)		ASTM C 881
15 °F (-10 °C)	50	
50 °F (10 °C)	10	
95 °F (35 °C)	4	
Compressive Yield Strength, psi (MPa)		ASTM D 695
7 day @ 15 °F (-10 °C)	5,930 (40.9)	
7 day @ 50 °F (10 °C)	5,630 (38.8)	
7 day @ 95 °F (35 °C)	3,450 (23.8)	
Compressive Modulus, psi (MPa)		ASTM D 695
7 day @ 15 °F (-10 °C)	357,300 (2,464)	
7 day @ 50 °F (10 °C)	273,000 (1,882)	
7 day @ 95 °F (35 °C)	274,200 (1,891)	
Bond Strength – Hardened to Hardened Concrete, psi (MPa)		ASTM C 882
2 day @ 15 °F (-10 °C)	3,050 (21.0)	
2 day @ 50 °F (10 °C)	3,020 (20.8)	
2 day @ 95 °F (35 °C)	2,480 (17.1)	
Bond Strength – Hardened to Hardened Concrete, psi (MPa)		ASTM C 882
14 day @ 15 °F (-10 °C)	3,210 (22.1)	
14 day @ 50 °F (10 °C)	3,040 (21.0)	
14 day @ 95 °F (35 °C)	3,090 (21.3)	
Bond Strength – Fresh Concrete to Hardened Concrete, psi (MPa)		ASTM C 882
14 day @ 50 °F (10 °C)	2,120 (14.6)	
Heat Deflection Temperature		ASTM D 648
7 days	145 °F (62.8 °C)	
Water Absorption		ASTM D 570
24 hours	0.42%	
Linear Coefficient of Shrinkage		ASTM D 2566
48 hours	0.014%	

¹Results based on testing conducted on a representative lot(s) of product. Average results will vary according to the tolerances of the given property.

²Full cure time is listed above to obtain the given properties for each product characteristic.

³Results may vary due to environmental factors such as temperature, moisture and type of substrate.

⁴Gel time may be lower than the minimum requires for ASTM C 881.

Cure Schedule^{1, 2, 3}

BASE MATERIAL TEMPERATURE RANGE °F (°C)	WORKING TIME	FULL CURE TIME DRY CONCRETE	FULL CURE TIME DAMP CONCRETE
15 °F (-9 °C)	50 min	4 hr	8 hr
23 °F (-5 °C)	40 min	3 hr	6 hr
41 °F (5 °C)	20 min	90 min	3 hr
59 °F (15 °C)	9 min	60 min	2 hr
77 °F (25 °C)	5 min	30 min	60 min
95 °F (35 °C)	3 min	20 min	40 min

¹Working and full cure times are approximate, may be linearly interpolated between listed temperatures and are based on cartridge/nozzle system performance.

²Application Temperature: Substrate temperature should be between 15 – 95 °F (-9 – 35 °C).

³When ambient or base material temperature falls below 23 °F (-5 °C), condition the adhesive above 68 °F (20 °C) prior to use.

CARTRIDGE PREPARATION

1. Remove the protective cap from the adhesive cartridge and insert the cartridge into the recommended dispensing tool.
2. After the cartridge has been prepared, screw on supplied mixing nozzle to the cartridge. Do not modify mixing nozzle. Confirm that internal mixing element is in place prior to dispensing the adhesive.
3. Dispense 10 to 12 inches of material from the nozzle onto a disposable surface according to local regulations prior to initial injection into the drill hole. The product should be a uniform gray color with no streaks.
4. When changing cartridges never re-use nozzles. A new nozzle should be used with each new cartridges and steps 1–3 should be repeated accordingly.

NOTE: Tables are found in the Anchorage Guide

INSTALLATION & CURING (VERTICAL DOWN & HORIZONTAL)

1. **NOTE: The engineering drawings must be followed. For any applications not covered by this document, or if there are any installation questions, please contact Master Builders Solutions.** Insert the mixing nozzle to the bottom of the hole and fill from the bottom to the top approximately two-thirds full, being careful not to withdraw the nozzle too quickly as this may trap air in the adhesive. Use extension tubing as necessary to ensure that adhesive is injected at the bottom of the hole first. **NOTE:** When using a pneumatic dispensing tool, ensure that pressure is set at 90 psi (6.2 bar) maximum.
2. Prior to inserting the threaded rod or rebar into the hole, make sure it is clean and free of oil

and dirt and that the necessary embedment depth is marked on the anchor element. Insert the anchor element into the hole while turning 1–2 rotations prior to the anchor reaching the bottom of the hole. Excess adhesive should be visible on all sides of the fully installed anchor. For horizontal installations, wedges should be used to center and support the anchor while the adhesive is curing. **CAUTION:** Use extra care with deep embedment or high temperature installations to ensure that the working time has not elapsed prior to the anchor being fully installed.

3. Do not disturb, torque or apply any load to the installed anchor until the specified full cure time has passed. The amount of time needed to reach full cure is base material temperature and moisture dependent - refer to “Cure Schedule Table” for appropriate full cure time.

TABLE 12:

MasterEmaco ADH 610 ultimate and allowable TENSION & SHEAR loads for THREADED ROD in normal-weight concrete^{1,2}

Threaded Rod Diameter in.	Nominal Drill Bit Diameter in.	Embedment Depth in. (mm)	Tension Load Based on Bond Strength/Concrete Capacity			Allowable Loads Based on Steel Strength ³					
			f'c ≥ 4,000 psi (27.5 MPa)			Tension			Shear		
			Ultimate lbs. (kN)	Allowable lbs. (kN)	ASTM F1554 Grade 36 lbs. (kN)	ASTM A193 Grade B7 lbs. (kN)	ASTM F593 304/316 SS lbs. (kN)	ASTM F1554 Grade 36 lbs. (kN)	ASTM A193 Grade B7 lbs. (kN)	ASTM F593 304/316 SS lbs. (kN)	
3/8	7/16	3 3/8 (86)	7,127 (31.7)	1,782 (7.9)	2,114 (9.4)	4,556 (20.3)	3,645 (16.2)	1,089 (4.8)	2,347 (10.4)	1,878 (8.4)	
1/2	9/16	4 1/2 (114)	13,273 (59.0)	3,318 (14.8)	3,758 (16.7)	8,099 (36.0)	6,480 (28.8)	1,936 (8.6)	4,172 (18.6)	3,338 (14.8)	
5/8	3/4	5 5/8 (143)	16,800 (74.7)	4,200 (18.7)	5,872 (26.1)	12,655 (56.3)	10,124 (45.0)	3,025 (13.5)	6,519 (29.0)	5,216 (23.2)	
3/4	7/8	6 3/4 (171)	22,231 (98.9)	5,558 (24.7)	8,456 (37.6)	18,224 (81.1)	12,392 (55.1)	4,356 (19.4)	9,388 (41.8)	6,384 (28.4)	
7/8 ⁴	1	7 7/8 (200)	32,174 (143.1)	8,043 (35.8)	11,509 (51.2)	24,804 (110.3)	16,867 (75.0)	5,929 (26.4)	12,778 (56.8)	8,689 (38.7)	
1	1 1/8	9 (229)	41,474 (184.5)	10,369 (46.1)	15,033 (66.9)	32,398 (144.1)	22,030 (98.0)	7,744 (34.4)	16,690 (74.2)	11,349 (50.5)	

¹ Allowable bond strength/concrete capacity was calculated using a safety factor of 4.0.

² The lower value of either the allowable bond strength/concrete capacity or steel strength should be used as the allowable tension value for design.

³ Allowable steel strengths calculated in accordance with AISC Manual of Steel Construction: Tensile = 0.33*Fu*Anom., Shear = 0.17*Fu*Anom

⁴ Values for bond strength of 7/8" rebar were linearly interpolated from 3/4" & 1" data.

TABLE 13:
 MasterEmaco ADH 610 ultimate and allowable TENSION & SHEAR loads for REBAR in normal-weight concrete^{1,2}

Rebar Size	Nominal Drill Bit Diameter in.	Embedment Depth in. (mm)	Tension Load Based on Bond Strength/Concrete Capacity		Allowable Loads Based on Steel Strength ³			
			f'c ≥ 4,000 psi (27.5 MPa)		Tension		Shear	
			Ultimate lbs. (kN)	Allowable lbs. (kN)	ASTM A615 Grade 60 lbs. (kN)	ASTM A615 Grade 75 lbs. (kN)	ASTM A615 Grade 60 lbs. (kN)	ASTM A615 Grade 75 lbs. (kN)
#3	7/16	3 3/8 (86)	9,723 (43.3)	2,431 (10.8)	2640 (11.7)	3300 (14.7)	1683 (7.5)	1870 (8.3)
#4	9/16	4 1/2 (114)	14,830 (66.0)	3,708 (16.5)	4,800 (21.4)	6,000 (26.7)	3,060 (13.6)	3,400 (15.1)
#5	3/4	5 5/8 (143)	19,838 (88.2)	4,960 (22.1)	7,440 (33.1)	9,300 (41.4)	4,743 (21.1)	5,270 (23.4)
#6	7/8	6 3/4 (171)	28,762 (127.9)	7,191 (32.0)	10,560 (47.0)	13,200 (58.7)	6,732 (29.9)	7,480 (33.3)
#7 ⁴	1	7 7/8 (200)	33,598 (149.5)	8,400 (37.4)	14,400 (64.1)	18,000 (80.1)	9,180 (40.8)	10,200 (45.4)
#8	1 1/8	9 (229)	39,623 (176.3)	9,906 (44.1)	18,960 (84.3)	23,700 (105.4)	12,087 (53.8)	13,430 (59.7)

¹ Allowable bond strength/concrete capacity was calculated using a safety factor of 4.0.

² The lower value of either the adjusted allowable bond strength/concrete capacity or steel strength should be used as the allowable tension or shear value for design.

³ Allowable steel strengths calculated in accordance with AISC Manual of Steel Construction: Tensile = (Fy*Anom)/2.5, Shear = 0.17*Fu*Anom

⁴ Values for bond strength of #7 rebar were linearly interpolated from #6 & #8 data.

TABLE 14:
MasterEmaco ADH 14 reduction factors for EDGE DISTANCE in TENSION^{1,2}

Diameter	in.	3/8	1/2	5/8	3/4	7/8	1
Embedment Depth	in. (mm)	3 3/8 (86)	4 1/2 (114)	5 5/8 (143)	6 3/4 (171)	7 7/8 (200)	9 (229)
Critical Edge Distance	in. (mm)	4 1/2 (114)	5 7/8 (149)	7 3/8 (187)	8 7/8 (225)	10 1/4 (260)	11 3/4 (298)
Min. Edge Distance	in. (mm)	2 1/4 (57)	2 7/8 (73)	3 5/8 (92)	4 1/4 (108)	5 (127)	5 7/8 (149)
Edge Distance		Allowable Load Capacity Reduction Factor					
in.	(mm)						
2 1/4	(57.2)	0.63					
2 7/8	(73.0)	0.73	0.63				
3 5/8	(92.1)	0.86	0.72	0.63			
4	(101.6)	0.92	0.77	0.67			
4 1/4	(108.0)	0.96	0.80	0.69	0.63		
4 1/2	(114.3)	1.00	0.83	0.72	0.65		
5	(127.0)		0.89	0.77	0.69	0.63	
5 7/8	(149.2)		1.00	0.85	0.76	0.69	0.63
6 1/2	(165.1)			0.91	0.81	0.74	0.67
7 3/8	(187.3)			1.00	0.88	0.80	0.72
7 3/4	(196.9)				0.91	0.82	0.75
8 1/4	(209.6)				0.95	0.86	0.78
8 7/8	(225.4)				1.00	0.90	0.82
9 1/4	(235.0)					0.93	0.84
9 3/4	(247.7)					0.96	0.87
10 1/4	(260.4)					1.00	0.91
10 3/4	(273.1)						0.94
11 1/4	(285.8)						0.97
11 3/4	(298.5)						1.00

¹ Minimum slab thickness equals 1.5 x embedment depth.

² Linear interpolation may be used for intermediate edge distances.

TABLE 15:
 MasterEmaco ADH 610 reduction factors for EDGE DISTANCE in SHEAR^{1,2}

Diameter	in.	3/8	1/2	5/8	3/4	7/8	1
Embedment Depth	in. (mm)	3 3/8 (86)	4 1/2 (114)	5 5/8 (143)	6 3/4 (171)	7 7/8 (200)	9 (229)
Critical Edge Distance	in. (mm)	3 3/4 (95)	5 (127)	6 1/4 (159)	7 1/2 (191)	8 3/4 (222)	10 (254)
Min. Edge Distance	in. (mm)	2 (51)	2 1/2 (64)	3 1/4 (83)	3 3/4 (95)	4 3/8 (111)	5 (127)
Edge Distance		Allowable Load Capacity Reduction Factor					
in.	(mm)						
2	(50.8)	0.25					
2 1/2	(63.5)	0.46	0.25				
2 3/4	(69.9)	0.57	0.33				
3 1/4	(82.6)	0.79	0.48	0.25			
3 1/2	(88.9)	0.89	0.55	0.31			
3 3/4	(95.3)	1.00	0.63	0.38	0.25		
4	(101.6)		0.70	0.44	0.30		
4 3/8	(111.1)		0.81	0.53	0.38	0.25	
4 3/4	(120.7)		0.93	0.63	0.45	0.31	
5	(127.0)		1.00	0.69	0.50	0.36	0.25
5 1/2	(139.7)			0.81	0.60	0.44	0.33
6	(152.4)			0.94	0.70	0.53	0.40
6 1/4	(158.8)			1.00	0.75	0.57	0.44
7	(177.8)				0.90	0.70	0.55
7 1/2	(190.5)				1.00	0.79	0.63
8	(203.2)					0.87	0.70
8 3/4	(222.3)					1.00	0.81
9 1/4	(235.0)						0.89
10	(254.0)						1.00

¹ Minimum slab thickness equals 1.5 x embedment depth.

² Linear interpolation may be used for intermediate edge distances.

TABLE 16:
MasterEmaco ADH 610 reduction factors for SPACING in TENSION^{1,2}

Diameter	in.	3/8	1/2	5/8	3/4	7/8	1
Embedment Depth	in. (mm)	3 3/8 (86)	4 1/2 (114)	5 5/8 (143)	6 3/4 (171)	7 7/8 (200)	9 (229)
Critical Spacing Distance	in. (mm)	8 7/8 (225)	11 3/4 (298)	14 5/8 (371)	17 5/8 (448)	20 1/2 (521)	23 1/2 (597)
Min. Spacing Distance	in. (mm)	2 1/4 (57)	3 (76)	3 5/8 (92)	4 3/8 (111)	5 1/8 (130)	5 3/4 (146)
Spacing Distance		Allowable Load Capacity Reduction Factor					
in.	(mm)						
2 1/4	(57.2)	0.63					
3	(76.2)	0.67	0.63				
3 1/4	(82.6)	0.69	0.64				
3 5/8	(92.1)	0.71	0.66	0.63			
4	(101.6)	0.73	0.67	0.64			
4 3/8	(111.1)	0.75	0.69	0.66	0.63		
5 1/8	(130.2)	0.79	0.72	0.68	0.65	0.63	
5 3/4	(146.1)	0.83	0.75	0.70	0.67	0.65	0.63
6 3/4	(171.5)	0.88	0.79	0.74	0.70	0.67	0.65
7 3/4	(196.9)	0.94	0.83	0.77	0.72	0.69	0.67
8 7/8	(225.4)	1.00	0.88	0.81	0.76	0.72	0.70
10 1/4	(260.4)		0.94	0.85	0.79	0.75	0.72
11 3/4	(298.5)		1.00	0.90	0.84	0.79	0.76
13	(330.2)			0.95	0.87	0.82	0.78
14 5/8	(371.5)			1.00	0.92	0.86	0.82
16 1/4	(412.8)				0.96	0.90	0.85
17 5/8	(447.7)				1.00	0.93	0.88
19	(482.6)					0.96	0.91
20 1/2	(520.7)					1.00	0.94
22	(558.8)						0.97
23 1/2	(596.9)						1.00

¹ Minimum slab thickness equals 1.5 x embedment depth.

² Linear interpolation may be used for intermediate edge distances.

CLEAN UP

Clean uncured mixed material with xylene or mineral spirits. Cured material must be removed mechanically.

FOR BEST PERFORMANCE

- Do not thin with solvents
- Use entire contents of cartridge. Do not attempt to reuse unused portions.
- For anchoring applications, concrete should be a minimum of 21 days old prior to anchor installation.
- Not recommended for any application where there may be a sustained tensile load, including overhead applications.
- For professional use only: not for sale to or use by the general public.
- Contact your local representative for a pre-job conference to plan the installation.
- Make certain the most current versions of product data sheet and SDS are being used; visit www.master-builders-solutions.com to verify the most current versions.
- Proper application is the responsibility of the user. Field visits by Master Builders Solutions personnel are for the purpose of making technical recommendations only and not for supervising or providing quality control on the jobsite.

HEALTH, SAFETY AND ENVIRONMENTAL

Read, understand and follow all Safety Data Sheets and product label information for this product prior to use. The SDS can be obtained by visiting www.master-builders-solutions.com/en-us, e-mailing your request to mbsbscst@mbcc-group.com or calling +1 (800) 433-9517. Use only as directed.

IN CASE OF EMERGENCY: Call CHEMTEL +1 (800) 255-3924 or if outside the US or Canada, +1 (813) 248-0585.

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