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Non-Metallic
Non-Shrink Grouting

MasterEmaco[®] ADH 612

Hybrid, high-performance adhesive anchoring system

PACKAGING

19.8 oz cartridge/ 585 ml
(12 per box)

COLOR

Part A (Resin) Light Gray
Part B (Hardener) Black
Mixed Ratio: 3:1 by volume
Mixed Color – Gray

STORAGE

Store and transport in unopened
containers in a cool, clean, dry area.

SHELF LIFE

12 months when properly stored

VOC CONTENT

0 g/L less water and exempt solvents

DESCRIPTION

MasterEmaco[®] ADH 612 is a two-component, code compliant, high-performance adhesive anchoring system tested to ACI 355.4 and ICC-ES AC318. The silane-cementitious hybrid formulation is a 3:1 mix ratio by volume providing outstanding performance with a wide installation temperature range between 5 to 104 °F (-15 to 40 °C).

PRODUCT HIGHLIGHTS

- ICC-ES ESR-3770 evaluation report for cracked and uncracked concrete
- Florida Building Code (FBC) Compliant: 2014 and 2010
- Certified - Drinking Water System Components (NSF/ANSI 61) Joining and Sealing
- Service temperature range under short term loading conditions between 5 to 302 °F (-15 to 150 °C)
- Resists static, wind and earthquake loading in tension and shear (IBC Seismic Design Categories A – F)
- Full cure in 45 minutes @ 77 °F (25 °C)
- Resists sustained loads up to 194 °F (90 °C)
- Withstands freeze-thaw conditions
- Non-sag consistency for anchoring in any orientation

APPLICATIONS

- Structural steel anchoring columns, beams, trusses, racking, rails & barriers
- Retro-fitting and bracing reinforced concrete buildings subjected to earthquake displacement to resist deformation and wind resistant to resist elastic forces

- Threaded rod and reinforcing bar (rebar) into cracked or uncracked concrete
- Vertical down, horizontal, upwardly inclined and overhead installations
- Dry and water saturated concrete conditions

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 suitable industrial-grade cleaning-and-degreasing

TECHNICAL DATA COMPLIANCE

CODE COMPLIANT:

2015, 2012, 2009 and 2006 IBC/IRC
2014 and 2010 FBC - ICC ESR-3770
ASTM C881-15/AASHTO M235 Type I,
II, IV & V Grade 3 Class A, B & C
Drinking Water System Components
NSF/ANSI 61

Test Data^{1, 2, 3}

PROPERTY	RESULTS	TEST METHOD
Gel Time @ 60 gram mass ⁴ (Minutes)		ASTM C 881
5 °F (-15 °C)	78	
50 °F (18 °C)	12	
75 °F (24 °C)	5	
104 °F (40 °C)	2	
Compressive Yield Strength, psi (MPa)		ASTM D 695
7 day @ 5 °F (-15 °C)	10,730 (74.0)	
7 day @ 50 °F (18 °C)	10,230 (70.5)	
7 day @ 75 °F (24 °C)	10,020 (69.1)	
7 day @ 104 °F (40 °C)	9,260 (63.8)	
Compressive Modulus, psi (MPa)		ASTM D 695
7 day @ 5 °F (-15 °C)	443,100 (3,055)	
7 day @ 50 °F (18 °C)	365,300 (2,519)	
7 day @ 75 °F (24 °C)	474,200 (3,269)	
7 day @ 104 °F (40 °C)	346,200 (2,387)	
Tensile Strength ⁵ psi (MPa)		ASTM D 638
7 day @ 5 °F (-15 °C)	2,170 (15)	
7 day @ 50 °F (18 °C)	1,870 (13)	
7 day @ 75 °F (24 °C)	1,720 (12)	
7 day @ 104 °F (40 °C)	1,660 (11)	
Tensile Elongation ⁵ (%)		ASTM C 638
7 day @ 5 °F (-15 °C)	0.6	
7 day @ 50 °F (18 °C)	0.6	
7 day @ 75 °F (24 °C)	0.4	
7 day @ 104 °F (40 °C)	0.4	
Bond Strength – Hardened to Hardened Concrete, psi (MPa)		ASTM C 882
2 day @ 5 °F (-15 °C)	2,530 (17.4)	
2 day @ 50 °F (18 °C)	2,010 (13.9)	
2 day @ 75 °F (24 °C)	2,030 (14.0)	
2 day @ 104 °F (40 °C)	2,260 (15.6)	
Bond Strength – Hardened to Hardened Concrete, psi (MPa)		ASTM C 882
14 day @ 5 °F (-15 °C)	2,800 (19.3)	
14 day @ 50 °F (18 °C)	2,430 (16.8)	
14 day @ 75 °F (24 °C)	2,240 (15.4)	
14 day @ 104 °F (40 °C)	3,300 (22.98)	
Bond Strength – Fresh Concrete to Hardened Concrete, psi (MPa)		ASTM C 882
14 days	2,660 (18.3)	
Heat Deflection Temperature		ASTM D 648
7 days	156 °F (69 °C)	
Water Absorption (%)		ASTM D 570
14 days	0.90	
Linear Coefficient of Shrinkage		ASTM D 2566
48 hours	0.003	

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.

⁵Optional testing for Grade 3 systems

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).

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 3 full strokes 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.

INSTALLATION & CLEANING

1. Using a rotary hammer drill, a bit which conforms to ANSI B212.15 and is the appropriate size for the anchor diameter to be installed, drill the hole to the specified embedment depth. **CAUTION:** Always wear appropriate personal protection equipment (PPE) for eyes, ears & skin and avoid inhalation of dust during the drilling and cleaning process. Refer to the Safety Data Sheet (SDS) for details prior to proceeding.
2. **BLOW** – Using oil free compressed air with a minimum pressure of 90 psi (6 bar), insert the air wand to the bottom of the drilled hole and blow out the debris with an up/down motion for a minimum of 4 seconds/cycles (4X). For drilled holes < 7/8 in. diameter, a hand pump may be used instead of compressed air. **NOTE:** Remove any standing water from hole prior to beginning the cleaning process.
3. **BRUSH** - Select the correct wire brush size for the drilled hole diameter, making sure that the brush is long enough to reach the bottom of the drilled hole. Reaching the bottom of the hole, using a brush extension if required, brush in an up/down and twisting motion for 4 cycles (4X). **CAUTION:** The brush should be clean

and contact the walls of the hole. If it does not, the brush is either too worn or too small and should be replaced with a new brush of the correct diameter.

4. **BLOW** – Blow the hole out once more to remove brush debris using oil free compressed air with a minimum pressure of 90 psi (6 bar). Insert the air wand to the bottom of the drilled hole and blow out the debris with an up/down motion for a minimum of 4 seconds/cycles (4X). Visually inspect the hole to confirm it is clean. **NOTE:** If installation will be delayed for any reason, cover cleaned holes to prevent contamination.

INSTALLATION & CURING (VERTICAL DOWN, HORIZONTAL & OVERHEAD)

1. **NOTE: The engineering drawings must be followed. For any applications not covered by this document, or for any installation questions, please contact Master Builders Solutions.** Insert the mixing nozzle, using an extension tube if necessary, to the bottom of the hole and fill from the bottom to the top approximately 2/3 full, being careful not to withdraw the nozzle too quickly as this may trap air in the adhesive. **NOTE:** Building Code Requirements for Structural Concrete (ACI 318-11) requires the Installer to be certified where adhesive anchors are to be installed in horizontal or overhead installations.
2. Injection plugs must be used with the extension tube attached to the supplied nozzle for horizontal and overhead installations with anchor sizes 5/8 in. to 1 1/4 in. diameter and rebar sizes of #5 to #10. Select the proper injection plug for the drill hole diameter reference anchorage to concrete guidelines for information for appropriate plug selection.
3. Prior to inserting the threaded rod or rebar into the hole, make sure it is straight, 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 full depth of the hole. Excess adhesive should be visible on all sides of the fully installed anchor. **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.

4. For overhead installations, horizontal and inclined (between horizontal and overhead), wedges should be used to support the anchor while the adhesive is curing. Take appropriate steps to protect the exposed threads of the anchor element from uncured adhesive until after the full cure time has elapsed.
5. 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 dependent — refer to Curing Table for appropriate full cure time. Use caution not to exceed the maximum specified torque once the anchor has fully cured.

BASE MATERIAL TEMPERATURE RANGE °F (°C)	WORKING TIME	FULL CURE TIME
5 °F (-15 °C)	60 min	36 hr
14 °F (-10 °C)	30 min	24 hr
23 °F (-5 °C)	20 min	8 hr
32 °F (0 °C)	13 min	4 hr
41 °F (5 °C)	9 min	2 hr
50 °F (10 °C)	5 min	1 hr
68 °F (20 °C)	4 min	0.75 hr
86 °F (30 °C)	2 min	0.50 hr

¹For SI: °F = °C x 9/5 + 32 1. Working and full cure times are approximate, may be linearly interpolated between listed temperatures and are based on cartridge/nozzle system performance.

²For Temperatures below 41 °F, warm the adhesive to a minimum of 41 °F, otherwise install the adhesive at ambient temperature.

³Application Temperature: Substrate and ambient air temperature should be between 5 – 104 °F (-15 – 40 °C).

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
- For anchoring applications, concrete should be a minimum of 21 days old prior to anchor installation.
- 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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