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(Supersedes June 2012)

# FUTURA®-15

## Very Rapid-Hardening Horizontal Repair Mortar

### DESCRIPTION

FUTURA-15 is a one-component, cementitious, very rapid-hardening, structural repair mortar designed for horizontal applications. FUTURA-15 is composed of selected cements, graded sands, and chemical additives. This proprietary blend produces a very rapid-setting structural repair mortar, even in cold weather conditions, without the aid of chloride- or gypsum-based accelerators.

### USES

FUTURA-15 is ideal for structural patching of concrete pavements, bridges, parking decks, and airport runways and taxiways. FUTURA-15 is also designed for repair of industrial floors, expansion joint nosings, sidewalks, and general commercial applications, along with grouting keyways.

### FEATURES/BENEFITS

- Temperature usage range from 20° - 85° F (-7° - 29° C)/Can be used for a wide range of applications.
- May be top-coated with an epoxy in as little as four hours.
- Rapid strength gain/Repairs can be opened to traffic in as little as one hour.
- Shrinkage compensated/Minimizes cracking and de-bonding.
- Contains no chlorides/Will not promote reinforcing steel corrosion.
- Contains no added gypsum/Excellent resistance to freeze-thaw and wet environments.
- Low permeability/Protects reinforcing steel from future corrosion.
- Economical/Can be extended up to 50% by weight with aggregate.
- Self-compacting/Easy to apply/Saves labor.

### PACKAGING

50 Lb. (22.7 Kg) Bags

### COVERAGE

Bag yields 0.43 ft.<sup>3</sup> (12.16 L). Extended with 12.5 lb. (5.68 kg) of aggregate yields 0.51 ft.<sup>3</sup> (14.49 L). Extended with 25 lb. (11 kg) of aggregate yields 0.60 ft.<sup>3</sup> (17.06 L). Yields are based on 5.25 pints (2.48 L) of water per 50 lb. (22.7 kg) bag and will vary based on substrate profile, mix ratios, aggregate type, and waste. Field trials should be performed to determine yields based on aggregate type.

### SHELF LIFE

Store on pallets in a cool, dry location. Do not store product outdoors. Shelf life of properly stored products is one year from date of manufacture when stored in unopened, original packaging.

### SPECIFICATIONS/STANDARDS

Conforms to ASTM C 928-99a "Packaged, Dry, Rapid Hardening Cementitious Materials for Concrete Repair," Classification R1, R2 & R3, Very Rapid Hardening.

### TECHNICAL DATA

The following physical properties were determined using the maximum water to powder ratio of 5.25 pints (2.48 L) per 50 lb. (22.7 kg) of FUTURA-15 at 75° F (23.5° C)

Set Time per ASTM C 191	
Initial	14-18 Minutes
Final	20-25 Minutes
Working Time	7-9 Minutes
Flow Per ASTM C 928 <sup>1</sup>	103% after 5 Minutes
Compressive Strength Per ASTM C 109 <sup>1</sup>	
@ 1 hour	2,000 psi (14 MPa)
@ 2 hours	3,500 psi (24 MPa)
@ 3 hours	4,400 psi (30 MPa)
@ 1 day	6,000 psi (42 MPa)
@ 7 days	8,500 psi (59 MPa)
@ 28 days	9,500 psi (65 MPa)
Bond Strength Per ASTM C 882 <sup>1,2</sup>	
@ 1 day	2,370 psi (16 MPa)
@ 28 days	3,910 psi (27 MPa)
Modulus of Elasticity Per ASTM C 469 <sup>1</sup>	5.16 x 106 psi (35.5 GPa)
Length Change Per ASTM C 928 <sup>1</sup>	
Drying Shrinkage <sup>3</sup>	-0.11%
Wet Expansion	+0.08%
Scaling Resistance Per ASTM C 672 <sup>1</sup>	
@ 25 Cycles	
Visual Rating	0 Rating – No Scaling
Mass Loss	0.00 – No Mass Loss
Freeze-Thaw Resistance Per ASTM C 666 (Procedure A) <sup>1</sup> At 300 Cycles	100% RDM4
AASHTO T260, Chloride Analysis Weight % of sample	0.005

All technical data is typical information, but may vary due to testing methods, conditions and procedures.

<sup>1</sup>Independent reports are available upon request.

<sup>2</sup>Modified – No bonding agent used. Pre-dampening of properly prepared substrate.

<sup>3</sup>Cured after 3 hours at 73+/-3°F and 50+/-4% RH

<sup>4</sup>RDM-Relative Dynamic Modulus

### APPLICATION

**Surface Preparation** ... Prepare concrete substrate in accordance with International Concrete Repair Institute (ICRI) Technical Guideline #310.2-1997: Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays.

CONTINUED ON REVERSE SIDE ...

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Mechanically roughen or high pressure water-jet existing concrete substrate to a minimum concrete surface profile (CSP) of CSP-6 or higher, depending on substrate condition. Remove all unsound concrete and provide a profiled, porous surface. Substrate must be structurally sound, dust-free, and free of grease, oil, dirt, curing compounds, release agents, or any other surface or penetrated contaminants that will adversely affect bond. Sanding, grinding, wire-abrading, or similar are not approved surface preparation methods.

Substrate must be saturated surface dry (SSD) and free of standing water.

Saw cut perimeter of repair zone to a depth of 1/2" (12.5 mm) to avoid featheredging. Completely expose all reinforcing steel, ensuring a minimum clearance of 3/4" (19.1 mm) behind reinforcing steel. Abrade entire circumference of steel to a white metal finish. Perform reinforcing steel preparation in accordance with ICRI Technical Guidelines No. 310.1R-2008: Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion.

**Mixing ...** Mix only complete bags. Using a suitable sized mortar type mixer, add 4.75-5.25 pints (2.24-2.48 L) of clean water to the mixer per bag of FUTURA-15. If extension is required, add appropriate amount of aggregate to mixer prior to the addition of FUTURA-15. Mix for 3-5 minutes until homogenous and lump-free. Do not mix more product than can be mixed, placed, and finished in 15 minutes at 70° F (21° C). Do not over-mix

**Aggregate Extension ...** For repairs greater than 2" (51 mm) in depth, extend FUTURA-15 with 12.5 lbs. (5.68 kg) of aggregate. For repairs greater than 4" (102 mm) in depth, extend FUTURA-15 with 25 lbs. (11.36 kg) of aggregate. The aggregate must be a minimum of 3/8" (9 mm) size, saturated but surface dry condition, clean pea gravel. Always add the aggregate to the mixing water prior to the addition of FUTURA-15. For configurations requiring greater than 50% extension or larger areas, contact your local W. R. MEADOWS representative. Proper stress relief must be given for large patch areas.

**Placement ...** Apply FUTURA-15 by trowel or screed. Compact FUTURA-15 well against the prepared substrate prior to bulk placement. Ensure complete encapsulation of reinforcing steel. Finish surface by screeding FUTURA-15 to a level surface. For a rough finish, a broom or burlap bag is suitable. Do not re-temper or over-work.

Application Range: 20° - 85°F (-7° - 29°C)

Follow ACI 305-R89 "Standard on Hot Weather Concreting" or ACI 306-R88 "Standard on Cold Weather Concreting" when applicable. FUTURA-15 May be top-coated with an epoxy-based overlay after four hours. For most systems, wait a minimum of 24 hours prior to top-coating. Consult appropriate installation guide for the product to be overlaid.

**Curing ...** Cure FUTURA-15 immediately following application using a suitable water-based curing compound, such as 1100 or 2200-WHITE from W. R. MEADOWS, or in accordance with ACI 308. On large patches, cure repair zone as work proceeds. Wet curing for a minimum of one day, followed by a suitable curing compound, helps minimize shrinkage.

**LIMITATIONS/PRECAUTIONS**

FUTURA-15 is recommended for concrete repairs only. It is not intended to be used as a self-leveling underlayment or topping; FUTURA-15 is designed as a trowel down repair mortar. Protect from freezing for a minimum of 24 hours. Do not bridge moving cracks. Extend existing control and expansion joints through FUTURA-15. For large areas with no control, expansion or construction joints, refer to American Concrete Institute (ACI) guidelines. Do not exceed a length-to-width ratio of 2 to 1 for the repair area. Do not add any admixtures. Exceeding liquid requirements shall result in reduced physical properties. Realize that set time will decrease as the product, air, substrate, and mixing liquid temperature increases and will increase as the temperature decreases.

Repair areas should be saw cut and slightly undercut to a minimum depth of a 1/2" (12.5 mm). Do not featheredge. Protect from conditions that may cause early water loss: high winds, low humidity, high temperature, direct sunlight. Early water loss is exasperated in thin applications. Realize that the use of extender aggregate in most cases will reduce the physical properties. Cylinder testing per ASTM C 39 as compared to cube testing per ASTM C 109 will not correlate due to test sample geometries. Colder temperatures will delay strength gain. Do not use evaporation retardants, such as EVAPRE™, with this product. Failure to follow industry standard practices may result in decreased material performance.

**HEALTH AND SAFETY**

Avoid direct contact with this product, as it may cause skin and eye irritation. Utilize gloves and safety glasses to minimize direct contact. Avoid inhalation of dust. Inhalation may cause respiratory irritation and/or lung disease (silicosis). This product contains silicon dioxide, which is classified by the IARC and NTP as probably carcinogenic to humans (IARC Group 2A). The use of NIOSH-approved respiratory protection is recommended in dusty environments. Refer to Product Material Safety Data Sheet for complete health and safety information. Keep product out of reach of children.

For most recent data sheet, further sustainability information, and SDS, visit [www.wrmeadows.com](http://www.wrmeadows.com).



**LIMITED WARRANTY**

W. R. MEADOWS, INC. warrants at the time and place we make shipment, our material will be of good quality and will conform with our published specifications in force on the date of acceptance of the order. Read complete warranty. Copy furnished upon request.

**Disclaimer**

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