



## DATA SHEET NO. 8141-000

### FUTURA®-45 Rapid-Hardening Horizontal Repair Mortar

#### DESCRIPTION

FUTURA-45 is a one-component, cementitious, rapid-hardening structural repair mortar designed for horizontal applications. FUTURA-45 is composed of selected cements, graded sands, and chemical additives. This proprietary blend produces a rapid-setting structural repair mortar, even in cold weather conditions, without the aid of chloride- or gypsum-based accelerators.

#### USES

FUTURA-45 is ideal for structural patching of concrete pavements, bridges, parking decks, airport runways, and taxiways. FUTURA-45 is also designed for repair of industrial floors, expansion joint edges, sidewalks, and general commercial applications, along with grouting keyways.

#### FEATURES/BENEFITS

- Temperature usage range from 4.4° - 38° C (40° - 100° F)/Can be used for a wide range of applications.
- Rapid strength gain/Repairs can be opened to traffic in as little as three hours.
- May be top-coated at 24 hours with most standard coating systems.
- 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.
- Flowable/Easy to apply/Saves labour.

#### COVERAGE/YIELD

22.7 kg (50 lb.) bag yields 12.16 L (0.43 ft.<sup>3</sup>). Extended with 5.68 kg (12.5 lb.) of aggregate yields 14.49 L (0.51 ft.<sup>3</sup>). Extended with 11 kg (25 lb.) of aggregate yields 17.06 L (0.60 ft.<sup>3</sup>).

Yields listed above are based on 2.48 L (5.25 pints) of water per 22.7 kg (50 lb.) 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

One year from date of manufacture when stored indoors on pallets in a dry, cool area. Do not store product outside.

#### SPECIFICATIONS

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

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## TECHNICAL DATA

The following physical properties were determined using the maximum water to powder ratio of 2.36 L (5 pints) per 22.7 kg (50 lb.) bag of FUTURA-45 at 23.5° C.

Set Time per ASTM C191	
Initial	45 - 60 Minutes
Final	70 - 90 Minutes
Working Time	45 Minutes
Flow per ASTM C928	100% after 15 Minutes
Compressive Strength per ASTM C109	
@ 3 hours	24 MPa (3500 psi)
@ 1 day	35 MPa (5200 psi)
@ 28 days	58 MPa (8500 psi)
Bond Strength per ASTM C882 <sup>1</sup>	
@ 1 day	10 MPa (1500 psi)
@ 28 days	17 MPa (2500 psi)
Modulus of Elasticity Per ASTM C469	29 GPa (4.22 x 10 <sup>6</sup> psi)
Length Change per ASTM C928 <sup>2</sup>	
Drying Shrinkage	-0.12%
Wet Expansion	+0.10%
Scaling Resistance Per ASTM C672 @ 25 Cycles	
Visual Rating	0 Rating – No Scaling
Mass Loss	0.00 - No Mass Loss

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

<sup>1</sup>Modified – No bonding agent used. Pre-dampening of properly prepared substrate.

<sup>2</sup>Cured after three hours at 73+/-3° F and 50+/-4% RH.

## APPLICATION

**Surface Preparation ...** Perform surface preparation in accordance with ICRI Technical Guidelines #310.2-1997: Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays. Mechanically roughen or high pressure water jet the existing concrete substrate to a minimum concrete surface profile (CSP) of seven or higher, depending on substrate condition. Remove all unsound concrete and provide a profiled, porous surface. The 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, or wire-brushing are not approved surface preparation methods. Saw cut perimeter of repair zone to a depth of 19 mm (3/4"). Completely expose all reinforcing steel, ensuring a minimum clearance of 25.4 mm (1") behind reinforcing steel. Perform reinforcing steel preparation in accordance with

ICRI Technical Guidelines #03730. Pre-soak repair zone for a minimum four hours prior to application of FUTURA-45. Substrate must be saturated, surface dry (SSD) and free of standing water.

**Mixing ...** Mix only complete bags. Using a suitable sized mortar-type mixer, add 2.25 – 2.48 L (4.75 – 5.25 pints) of clean water to the mixer per 22.7 kg (50 lb.) bag of FUTURA-45. If extension is required, add appropriate amount of aggregate to mixer prior to the addition of FUTURA-45. Mix for 3 - 5 minutes until homogenous and lump-free. Do not mix more product than can be mixed, placed, and finished in 45 minutes at 21° C. Do not overmix.

**Aggregate Extension ...** For repairs greater than 38.25 mm (1.5") in depth, extend FUTURA-45 with 5.68 kg (12.5 lb.) of aggregate. For repairs greater than 102 mm (4") in depth, extend FUTURA-45 with 11.36 kg (25 lb.) of aggregate. The aggregate must be a minimum 9 mm (3/8") size, saturated but surface dry condition, clean pea gravel. Always add the aggregate to the mixing water prior to the addition of FUTURA-45. Proper stress relief must be given for large patch applications.

**Placement ...** Apply FUTURA-45 by trowel or screed. Compact FUTURA-45 well against the prepared substrate prior to bulk placement. Ensure complete encapsulation of reinforcing steel. Finish surface by screeding FUTURA-45 to a level surface. For a rough finish, a broom or burlap bag is suitable. Do not re-temper or overwork.

Application Range: 4.4 - 38° C

Follow ACI 305-R89 "Standard on Hot Weather Concreting" or ACI 306-R88 "Standard on Cold Weather Concreting" when applicable.

For epoxy-based coating systems, wait a minimum of six hours at 23.5° C prior to coating. Follow application instructions and recommendations of the coating manufacturer. For all other systems, contact the coating manufacturer.

**Curing ...** Cure in accordance with ACI 308. Cure immediately following removal of forms prior to a seven-day cure time using a curing compound such as 1100, 1215-WHITE, or 1220-WHITE from W. R. MEADOWS. Curing compounds may discolour and may require complete removal prior to topcoating, painting, sealing, waterproofing, or similar application.

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**WARRANTY:** W. R. Meadows of Canada warrants that, at the time and place we make shipment, our materials will be of good quality and will conform with our published specifications in force on the date of acceptance of the order. THE FOREGOING WARRANTY SHALL BE EXCLUSIVE AND IN LIEU OF ANY OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND ALL OTHER WARRANTIES OTHERWISE ARISING BY OPERATION OF LAW, COURSE OF DEALING, CUSTOM OF TRADE OR OTHERWISE. As the exclusive remedy for breach of this Warranty, we will replace defective materials, provided, however, that the buyer examine the materials when received and promptly notify us in writing of any defect before the materials are used or incorporated into a structure. Three (3) months after W. R. Meadows of Canada has shipped the materials, all our Warranty and other duties with respect to the quality of the materials delivered shall conclusively be presumed to have been satisfied, all liability therefore terminates and no action for breach of any such duties may thereafter be commenced. W. R. Meadows of Canada shall in no event be liable for consequential damages. Unless otherwise agreed to in writing, no warranty is made with respect to materials not manufactured by W. R. Meadows of Canada. We cannot warrant or in any way guarantee any particular method of use or application or the performance of materials under any particular condition. Neither this Warranty nor our liability may be extended or amended by our salesmen, distributors or representatives, or by our distributor's representatives, or by any sales information or drawings.

## PRECAUTIONS

FUTURA-45 is recommended for concrete repairs only. Not intended to be used as a self-leveling underlayment or topping; FUTURA-45 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-45. For large areas with no control, expansion, or construction joints, refer to 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 12.5 mm (1/2"). Do not feather edge. Protect from conditions that may cause early water loss: high winds, low humidity, high temperature, direct sunlight. Early water loss is amplified in thin applications. Realize that the use of extender aggregate will alter physical properties. Failure to follow industry standard practices may result in decreased material performance.



## HEALTH AND SAFETY

Contains Portland cement and crystalline silica (sand), which are suspected carcinogens. Skin and eye irritant. Dust may cause respiratory tract irritation. Follow OSHA safety regulations when handling. Avoid inhalation of dust. Avoid direct contact with product. Utilize chemical-resistant gloves and safety glasses to minimize direct contact. May cause serious delayed lung injury (silicosis). If contact occurs, wash affected areas with mild soap and water. For eye contact, flush with water for a minimum 15 minutes and contact a physician immediately. Keep product out of reach of children. For industrial use only. Not for consumption. Refer to Safety Data Sheet for complete health and safety information.

## MASTERFORMAT NUMBER AND TITLE

32 01 29.61 - Partial Depth Patching of Rigid Paving

## LEED INFORMATION

May help contribute to LEED credits:

- MRc9: Construction and Demolition Waste Management

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

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