



04 DIVISION
MORTAR

IWR MORTAR

INTEGRAL WATER REPELLENT



Superior Adhesion. Highly Durable.

SPEC MIX® Integral Water Repellent (IWR) Mortar is specially formulated to reduce water penetration and efflorescence of masonry mortar joints. By incorporating a proprietary, dry polymeric integral water repellent admixture during the SPEC MIX manufacturing process, the designer, specifier, owner and contractor are assured the mortar on their project will repel moisture, while maintaining optimal workability and flexural bond strength. When using ASTM C 1357 “Standard Test Methods for Evaluating Masonry Bond Strength” to compare the flexural bond strength of SPEC MIX IWR Mortar to the same reference mortar mixed with liquid admixture as typically added in the field, SPEC MIX IWR Mortar demonstrated a 46 percent increase in bond strength.

SPEC MIX IWR Mortar is a dry, preblended mortar mix that is produced using either Portland cement and hydrated lime, mortar cement or masonry cement with dried masonry sand and a proprietary water repellent admixture formulated for water repellency, superior bond, water retention and board life. Available in Types M, S and N, each meets ASTM C 270 and ASTM C 1714 requirements. SPEC MIX IWR Mortar is available in standard and custom colors.

In addition to custom mix designs that are available for specific applications or properties, IWR Mortars are available for all types of masonry construction, both above and below grade, and are compatible with most specified masonry units. Submittals are available upon request for certification to applicable ASTM, ACI, and CSA standards.

TYPICAL MATERIALS

PORTLAND, MASONRY OR MORTAR CEMENT
HYDRATED LIME
PROPRIETARY ADMIXTURES
SAND
PIGMENT



STANDARD (IW-01)
COLOR (IW-05)

AVAILABLE
IN COLOR



Reliable Performance. Proven Durability.

SPEC MIX Integral Water Repellent (IWR) Mortar is specially formulated to reduce water penetration and efflorescence of masonry mortar joints while meeting ASTM C 270 requirements. By incorporating a proprietary, dry integral water repellent admixture during the SPEC MIX masonry mortar manufacturing process, the designer, specifier, owner and contractor are assured that the mortar on their project will repel moisture while maintaining optimal workability and flexural bond strength.

Water penetration resistance of concrete masonry walls is dependent on wall design, design for differential movement, workmanship, wall maintenance, and the application of water repellents in both masonry units and mortar. Tests indicate that SPEC MIX IWR Mortar, when used with integral water repellent CMUs, creates a water-repellent assemblage when properly designed and constructed.

Based on independent testing, in accordance with ASTM E 514 "Standard Test Method

for Water Penetration and Leakage Through Masonry," SPEC MIX IWR Mortar and the masonry test wall showed no signs of water penetration (R.L. Nelson report, Oct. 2002). The water repellent in the mortar mix imparts hydrophobic properties to the mortar. This impedes water movement through the mortar joints, which also potentially reduces efflorescence.

When using ASTM C 1357 "Standard Test Methods for Evaluating Masonry Bond Strength" to compare the flexural bond strength of SPEC MIX IWR Mortar to the same reference mortar mixed with the leading liquid admixture as typically added in the field, the SPEC MIX IWR mortar demonstrated a 46 percent increase in bond strength (R.L. Nelson report, Oct. 2002). In addition, ASTM C 270 compressive strength values reported for IWR Mortar made with Portland cement and lime materials, as well as that made with masonry cement, achieved similar results as the SPEC MIX reference mortars.

Weighing and blending the dry water repellent admixture during the computer batching process guarantees the consistency and quality assurance of IWR Mortar. The same amount of IWR admixture, as well as the other mortar components, is included in each bag, every time. For the contractor, this eliminates the time associated with measuring and hand-adding materials on site that lower job site efficiency. More importantly, it eliminates the possibility of varying admix dosage rates that effect the integrity and aesthetic value of the masonry structure.

Using SPEC MIX IWR mortar can greatly reduce the potential for problems associated with water penetration of the building envelope. Preblending all dry mortar materials ensures uniformity of the mixture and increases productivity while improving the long-term performance of the wall system. SPEC MIX IWR is THE ultimate solution.

PROVEN COMPATIBILITY WITH TREATED MASONRY UNITS

FOR MASONRY WALLS TO ACHIEVE OPTIMAL WATER RESISTANCE, IT IS ESSENTIAL THAT INTEGRAL WATER REPELLENT ADMIXTURES BE INCORPORATED INTO CONCRETE UNITS AND MORTAR DURING THE MANUFACTURING PROCESS. TO TEST THE PERFORMANCE AND COMPATIBILITY OF SPEC MIX IWR MORTAR WITH MASONRY UNITS TREATED WITH WATER REPELLENT ADMIXTURES, STANDARD TEST METHOD ASTM E 514 WAS EMPLOYED. THIS STANDARD TEST IS THE MOST COMMONLY USED TEST AS IT MEASURES THE RELATIVE WATER PENETRATION RESISTANCE OF AN ENTIRE ASSEMBLAGE.

THE TEST SIMULATED THE EFFECTS OF WIND DRIVEN RAIN ON MASONRY ASSEMBLAGES BUILT WITH WATER REPELLENT UNITS AND SPEC MIX IWR MORTAR. DURING THE ACTUAL TEST, 40.8 GALLONS OF WATER PER HOUR FOR FOUR HOURS WERE APPLIED TO THE WALL PRESSURIZED AT 10 lb/ft², WHICH EQUALS 3.4 gal/ft²/hr. THIS WOULD EQUATE TO A WIND VELOCITY OF 62.5 MILES PER HOUR AND A RAINFALL RATE OF 5.5 INCHES PER HOUR.

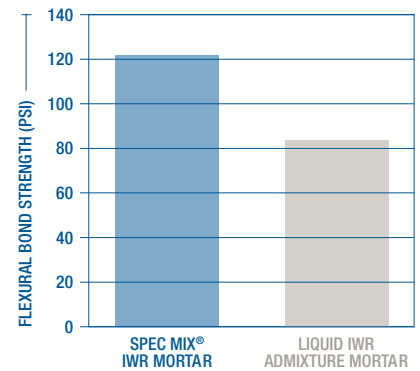
CONCLUSION: WHETHER DRY SPEC MIX IWR ADMIXTURE IS BLENDED WITH PORTLAND CEMENT AND LIME OR MASONRY CEMENT MORTARS, NO SIGNS OF DAMPNES OR WATER PENETRATION WERE VISIBLE AFTER THE FOUR-HOUR TEST PROCEDURE. SPEC MIX IWR MORTAR IS COMPATIBLE WITH WATER REPELLENT TREATED MASONRY UNITS WHILE ACHIEVING 46 PERCENT GREATER FLEXURAL BOND STRENGTH COMPARED TO THE SAME MORTAR MIXTURE INCORPORATING A LEADING LIQUID WATER REPELLENT ADMIXTURE.





FLEXURAL BOND STRENGTH COMPARISON

SPEC MIX IWR MORTAR SIGNIFICANTLY OUTPERFORMED LIQUID IWR ADMIXTURE MORTAR IN LABORATORY TESTS COMPARING FLEXURAL BOND STRENGTH. THE TEST MET ASTM C 1072 STANDARDS AND WAS CONDUCTED WITH AN AVERAGE OF 6 PRISMS CONSTRUCTED WITH UNITS TREATED WITH A WATER REPELLENT MIXTURE.



SPEC MIX IWR MORTAR TEST RESULTS: FLEXURAL BOND AND WATER PENETRATION STUDY

- SPEC MIX IWR MORTAR, UTILIZING A DRY POLYMERIC INTEGRAL WATER REPELLENT ADMIXTURE, WAS AS EFFECTIVE AND COMPARABLE TO MORTARS CONTAINING A NATIONALLY RECOGNIZED, PROPRIETARY LIQUID WATER REPELLENT ADMIXTURE.
- THE FLEXURAL BOND STRENGTH OF THE SPEC MIX IWR MORTAR SIGNIFICANTLY EXCEEDED THE BOND STRENGTH RESULTS OF A SIMILAR MORTAR MIXTURE CONTAINING A NATIONALLY RECOGNIZED PROPRIETARY LIQUID WATER REPELLENT ADMIXTURE.
- SPEC MIX IWR MORTAR AND A MORTAR CONTAINING A NATIONALLY RECOGNIZED PROPRIETARY LIQUID WATER REPELLENT ADMIXTURE BOTH PROVIDED GREATER RESISTANCES TO WATER PENETRATION THAN THE REFERENCE MORTAR WHEN TESTED IN ACCORDANCE WITH ASTM E 514.
- SPEC MIX IWR MORTAR MADE WITH A DRY INTEGRAL WATER REPELLENT ADMIXTURE, WHEN USED WITH WATER REPELLENT TREATED UNITS, CREATES A WATER REPELLENT MASONRY ASSEMBLAGE WHEN PROPERLY DESIGNED AND CONSTRUCTED.
- THE 7 AND 28 DAY COMPRESSIVE STRENGTHS OF THE SPEC MIX IWR MORTAR WERE SIMILAR TO THAT OF THE REFERENCE MORTAR.



OPPOSITE PAGE: SPEC MIX IWR MORTAR SHOWS NO WATER PENETRATION WHEN TESTED IN ACCORDANCE WITH ASTM E 514 STANDARD TEST METHOD FOR WATER PENETRATION AND LEAKAGE THROUGH MASONRY. THE TEST APPARATUS SIMULATES RAIN AT 60 MPH.

TOP LEFT: SPEC MIX IWR MORTAR EXCEEDS ASTM C 1357 BOND REQUIREMENTS.

ABOVE: FOR PROJECTS CONSTRUCTED WITH ARCHITECTURAL INTEGRAL WATER REPELLENT MASONRY UNITS, IWR MORTAR REDUCES THE PROBLEMS ASSOCIATED WITH WATER PENETRATION OF THE BUILDING ENVELOPE.



IWR MORTAR INTEGRAL WATER REPELLENT MORTAR

INSTALLATION/APPLICATION

Mortar type should correlate with the particular masonry unit to be used. The specifier should evaluate the interaction of the mortar type and masonry unit specified. That is, masonry units having a high initial rate of absorption will have greater compatibility with mortar that has a high-water retentivity. The material properties of mortar that influence the structural performance of masonry are compressive strength, bond strength and elasticity. The bond strength, workability and water retentivity of masonry mortar are generally more important than the compressive strength and these properties should be given primary consideration in the selection of mortar. Select mortar based on the design requirements and with consideration of code and specification provisions affected by the mortar.

A sample of the proposed product will be provided by the manufacturer for architectural approval and testing, if required. Preparation of a panel with all materials and systems employed in the final project is imperative. Retain the mock-up or field sample through the completion of the project.

Allow mortar to cure a minimum of 7 days but no more than 28 days before cleaning. Consult manufacturer of the masonry units and cleaning chemicals for further instructions to ensure proper washing procedures.

Clean masonry only with a national proprietary cleaning agent (following the manufacturer's instructions) or potable water. SPEC MIX products must be kept dry, covered and protected from weather and other damage.

SIZES AND EQUIPMENT

SPEC MIX IWR Mortar is available in 80 lb (36.2 kg) packages for easy hand loading or in 3,000 lb (1,360.7 kg) reusable bulk bags to be used with the various SPEC MIX silo systems. When using the silo system, once the bulk bags of mortar are delivered to the project site, the portable silo is loaded with a jobsite forklift and the product is dispensed into a mechanical batch mixer.

MIXING INSTRUCTIONS

WEAR IMPERVIOUS GLOVES, such as nitrile.

- Mixing is best accomplished by using a mechanical mixer to ensure optimal workability and performance.
- Use clean, potable water; add the amount of water consistent with optimum workability

EXAMPLE PERFORMANCE PROPERTIES - PORTLAND/LIME/SAND TYPE N MORTAR

| ASTM C 270 | Reference Type N Mortar | Type N Mortar with IWR Admixture |
|-----------------------------------|-------------------------|----------------------------------|
| Water Retention | 89% | 93% |
| Air | 6.3% | 6.1% |
| 7-Day Compressive Strength | 1,520 PSI (10.5 MPa) | 1,570 PSI (10.8 MPa) |
| 28-Day Compressive Strength | 1,730 PSI (11.9 MPa) | 1,800 PSI (12.4 MPa) |
| ASTM E 514 | | |
| Time of First Dampness | 60 min | None |
| Time of First Visible Water | None | None |
| Area of Dampness (% of test area) | 10% | None |
| Water Collected in 4 Hours | None | None |

EXAMPLE PERFORMANCE PROPERTIES - MASONRY CEMENT/SAND TYPE S MORTAR

| ASTM C 270 | Reference Type S Mortar | Type S Mortar with IWR Admixture |
|-----------------------------------|-------------------------|----------------------------------|
| Water Retention | 86% | 86% |
| Air | 15.8% | 15.3% |
| 7-Day Compressive Strength | 1,570 PSI (10.8 MPa) | 1,600 PSI (11.0 MPa) |
| 28-Day Compressive Strength | 1,950 PSI (13.4 MPa) | 2,040 PSI (14.1 MPa) |
| ASTM E 514 | | |
| Time of First Dampness | 38 min | None |
| Time of First Visible Water | None | None |
| Area of Dampness (% of test area) | 12% | None |
| Water Collected in 4 Hours | None | None |

which provides adequate water to satisfy the initial rate of absorption of the masonry units.

- Mixing times are four to five minutes and should be held consistent from batch to batch.
- Maintain the same mixing procedures to maintain consistency throughout the project.
- Tool mortar joints when the surface is thumb-print hard. Keep tooling times consistent.
- Hand mix mortar only with written approval by the specifier who should outline procedures.
- Use mortar within 2.5 hours after initial mixing.
- Retemper mortar only when mixing water is lost due to evaporation.
- Whenever possible, do not retemper colored SPEC MIX masonry mortars by adding additional water; retempering may affect color consistency.

LIMITATIONS

SPEC MIX IWR Mortar should be installed in accordance with the provisions of the local building code and applicable ASTM, ACI, and CSA standards. Good workmanship coupled with proper detailing and design assures durable, functional, watertight construction. Follow proper cold-weather and hot-weather masonry procedures at temperatures below 40 °F (4 °C) or above 100 °F (38 °C) respectively.

LIMITED WARRANTY

SPEC MIX, Inc. warrants this product to be of merchantable quality when used or applied in accordance with the instructions hereon. This product is not warranted as suitable for any purpose or use other than the general purpose for which it is intended. Liability under this warranty is LIMITED to the replacement of its product (as purchased) if found to be defective, or at the shipping company's option, to refund the purchase price. In the event of a claim under this warranty, notice must be given to SPEC MIX, Inc. in writing at: One Securities Centre, 3490 Piedmont Road, Suite 1300, Atlanta, GA 30305. THIS WARRANTY IS ISSUED AND ACCEPTED IN LIEU OF ALL OTHER EXPRESS WARRANTIES AND EXPRESSLY EXCLUDES LIABILITY FOR CONSEQUENTIAL DAMAGES.

TECHNICAL SUPPORT

- CONTACT YOUR LOCAL SPEC MIX® MANUFACTURER
- VISIT WWW.SPECMIX.COM
- CONTACT SPEC MIX®, INC.
PHONE: 888-SPEC MIX FAX: 651-454-5315