DRY-BLOCK® mortar admixture

Product Description

DRY-BLOCK® Mortar Admixture, part of the DRY-BLOCK® System, is formulated based on a patented technology. It is a liquid, integral water-repellent, bond-enhancing admixture for masonry mortar. Tests demonstrate that DRY-BLOCK® Mortar Admixture increases the flexural bond of both Portland cement/Lime and Masonry cement mortars to CMUs.

The wicking property, the amount of water absorbed, of masonry mortar is dramatically reduced when DRY-BLOCK® Mortar Admixture is added at its recommended dosage rate. DRY-BLOCK® Mortar Admixture is a requirement for all DRY-BLOCK® System projects and no substitutions shall be allowed.

Product Uses

The DRY-BLOCK® System has been successfully used on thousands of masonry structures to provide moisture control. It is the leading integral water repellent system on the market to address moisture penetration of CMU (concrete masonry units) and mortar.

The DRY-BLOCK® System consists of two separate admixtures. DRY-BLOCK® Admixture is mixed throughout the concrete during manufacture of the CMU and DRY-BLOCK® Mortar Admixture is added to the mortar. During the curing process, the admixtures within the CMU and mortar become an integral part of the cement matrix.

These admixtures become locked into the CMU and mortar providing long lasting resistance to water penetration. Due to their unique formulations, DRY-BLOCK® Admixture and DRY-BLOCK Mortar Admixture cannot be used interchangeably.

Product Advantages

As an integral admixture, DRY-BLOCK® Mortar Admixture provides bond enhancement and water penetration resistance throughout the depth of the mortar joint. DRY-BLOCK® Mortar Admixture's water-repellent properties will prevent the moisture from wicking through the mortar joint into the building's interior. Likewise, it will not be wicked back to the exterior carrying soluble salts that can cause efflorescence at the joints on the wall exterior.

- Provides water-repellent mortar
- Enhances bond between mortar & concrete masonry units
- Minimizes efflorescence at the mortar joint
- Improves workability
- Packaged for easy job site use

Application Information

DRY-BLOCK® Mortar Admixture contains workability agents to improve ease of placement with more efficient use of the mix water. DRY-BLOCK® Mortar Admixture may reduce the total amount of water required to achieve a given level of workability.

Addition Rates:

SHAKE WELL BEFORE USE. For optimum performance, DRY-BLOCK® Mortar Admixture should be added at 16 - 24 oz/3 ft3 (5.5 - 8.5 L/m3) of mortar. In no case should it be used at less than 16 oz/3 ft3 (5.5 L/m3) of mortar. To achieve this dosage range, the recommended addition is 1qt. (1 L) of DRY-BLOCK Mortar Admixture per bag of Portland cement in cement/lime mortars or 0.5 qt.(0.5 L) per bag of masonry or mortar cement. This will typically ensure that the dosage will be in the range of 16 - 24 oz/3 ft3 (5.5 - 8.5 L/m3) of mortar. For bulk mortar systems add 16 oz (0.5 L) for every 3 ft3 of mortar produced.

Mixing Procedure:

Agitate DRY-BLOCK® Mortar Admixture before using. DRY-BLOCK® Mortar Admixture should be added with the mix water prior to adding the cement and sand. It is important to reduce the initial water used in the mortar.

Recommended mixing sequence:

1. Add 2/3 of the water to the mixer
2. Add DRY-BLOCK® Mortar Admixture to the mixer
3. Add sand to the mixer
4. Add cement and lime to the mixer
5. Add additional water as necessary 6. Mix a minimum of 5 additional minutes after all materials have been added to the mixer

***Note:** Do not dilute DRY-BLOCK® Mortar Admixture with large volumes of water; for example, in a 55 gallon drum, and use as "mixing water." This will render the admixture ineffective.

Trial Batches:

Design Considerations

The water-repellency of mortar joints is a function of:

1. The ability of the mortar to resist water penetration
2. The geometry of the mortar joint.

The use of DRY-BLOCK Mortar Admixture and proper tooling increases the water tightness of the mortar joint and provides resistance to water penetration. A well-tooled concave joint profile has been shown to provide the greatest resistance to water penetration. The mortar should be tooled when thumbprint hard to a concave or Vee profile whenever DRY-BLOCK Mortar Admixture is used for exterior applications. Raked, Flush, Extruded, Struck, Beaded, Weathered or other joint profiles have poor water resistance and are not recommended for exterior applications.

The DRY-BLOCK System is only one part of a moisture protection system for concrete masonry walls. Other elements include:

- Proper drainage within the core or cavity area
- Properly installed flashing and weeps
- Properly spaced control joints
- Properly tooled mortar joints

Information on other design considerations for masonry wall systems, such as flashing, weeps, reinforcing and drainable in-core insulation can be obtained from GCP Applied Technologies, the NCMA (National Concrete Masonry Association) and the BIA (Brick Industry Association).

Cleaning:

All excess mortar containing DRY-BLOCK Mortar Admixture should be removed from the face of the CMU as soon as possible. This is important since standard methods for removing hardened mortar such as strong acids, sand blasting and high pressure cleaning are harmful to the masonry units and the mortar joints and are not recommended.

DRY-BLOCK® Mortar Admixture is compatible with other GCP mortar admixtures. Trial batches are recommended using job site materials and expected job site climatic conditions to determine compatibility of materials and the necessary adjustments to the mix design for actual addition rates, workability, color and physical properties. All admixtures must be added to the mix separately.

When pigments are used to provide a specific color tone, trial batches are strongly recommended to ensure the desired color is developed.

Health & Safety:

All precautions defined on the SDS (Safety data sheet) for DRY-BLOCK® Mortar Admixture must be followed.

Storage Information:

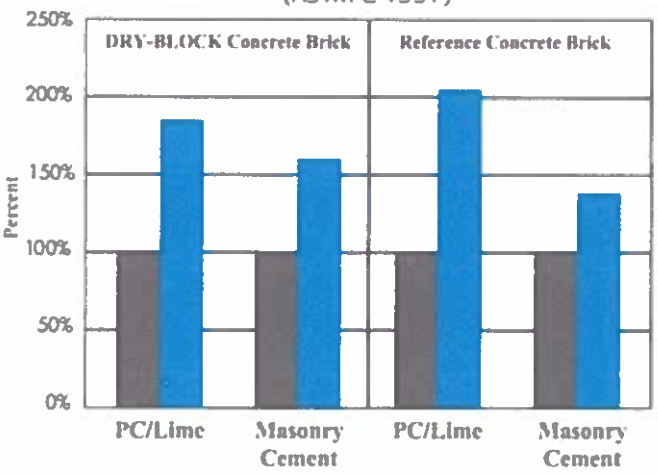
DRY-BLOCK® Mortar Admixture will freeze at 32 ° F (0 ° C). DRY-BLOCK® *Mortar Admixture must be protected from freezing. Once frozen, it is unusable.*

Precautions:

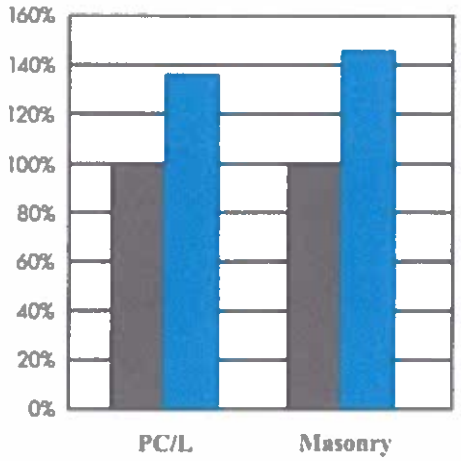
DRY-BLOCK Mortar Admixture is not a substitute for good masonry practices such as proper curing, tooling and covering the wall at the end of each work session. DRY-BLOCK Mortar Admixture will not prevent hairline cracking. Proper techniques for protection during construction as well as proper curing techniques can be found in literature published by the International Masonry Industry All-Weather Council, NCMA, and the BIA.

DRY-BLOCK Mortar Admixture provides water-repellent properties to cured mortar. If the mortar dries out before the desired properties are achieved, DRY-BLOCK Mortar Admixture's water-repellent properties will become active and subsequent hydration of the cement will be hindered.

Type S Mortar – Flexural Bond Strength to Reference Concrete Brick (ASTM C 1357)



Type S Mortar –Compressive Strength (ASTM C 109)



Legend:
Black: Reference mortar
Blue: DRY-BLOCK Motar Admixture mortar

PRODUCT INFORMATION

DRY-BLOCK® II

Mortar Admixture

Description

DRY-BLOCK® Mortar Admixture is formulated based on a patented technology. It is a liquid, integral water-repellent, bond-enhancing admixture for masonry mortar. Tests demonstrate that DRY-BLOCK Mortar Admixture increases the flexural bond of both Portland cement/Lime and Masonry cement mortars to CMUs. The wicking property, the amount of water absorbed, of masonry mortar is dramatically reduced when DRY-BLOCK Mortar Admixture is added at its recommended dosage rate. DRY-BLOCK Mortar Admixture is a requirement for all DRY-BLOCK System projects.

Product Uses

The DRY-BLOCK System has been successfully used for over 15 years to provide moisture control of concrete masonry walls. It is the only complete integral system on the market to address the moisture reduction of both CMU and mortar using complementary admixtures. The DRY-BLOCK System consists of two separate liquid, polymeric admixtures, DRY-BLOCK Block Admixture is mixed throughout the concrete during manufacture of the CMU and DRY-BLOCK Mortar Admixture is mixed into the mortar. As the concrete and mortar cure, the polymeric admixtures become an integral part of the cement matrix being locked into the CMU's and mortar for long lasting resistance to water penetration.

Product Advantages

As an integral admixture, DRY-BLOCK Mortar Admixture provides bond enhancement and water protection throughout the depth of the mortar joint. DRY-BLOCK Mortar Admixture's water-repellent properties will prevent the moisture from wicking through the mortar joint into the building's interior. Likewise, it will not be wicked back to the exterior carrying soluble salts that can cause efflorescence at the joints on the wall exterior.

Application Information

DRY-BLOCK Mortar Admixture contains workability agents to improve ease of placement and to more effectively use mix water. DRY-BLOCK Mortar Admixture may reduce the total amount of water required to achieve a given level of workability.

Addition Rates:
SHAKE WELL BEFORE USE.
For optimum performance, DRY-BLOCK Mortar Admixture should be added at 5.5 - 8.5L/m³ (16 - 24oz/3 ft³) of mortar. IN NO CASE, SHOULD IT BE USED AT LESS THAN 5.5L/m³ (16 oz/3 ft³) OF MORTAR. To achieve this dosage range, recommended addition is 1L (1qt.) of DRY-BLOCK Mortar Admixture per bag of Portland cement in cement/lime mortars or 0.5L (0.5 qt.) per bag of masonry or mortar cement. This will typically assure that the dosage will be in the range 5.5 - 8.5L/m³ (16 - 24oz/3 ft³) of mortar.

Mixing Procedure: *Agitate DRY-BLOCK Mortar Admixture before using. DRY-BLOCK Mortar Admixture should be added with the mix water prior to adding the cement and sand. It is important to reduce the initial water used in the mortar.*

The recommended sequence for mixing mortar containing DRY-BLOCK Mortar Admixture is:

1. Add 2/3 of the water to the mixer
2. Add the admixture to the mixer
3. Add sand to the mixer
4. Add cement and lime to the mixer
5. Add additional water as necessary
6. Mix a minimum of 5 additional minutes after all materials have been added to the mixer

Product Advantages

- Provides water-repellent mortar
- Enhances bond between mortar & concrete masonry units
- Minimizes efflorescence at the mortar joint
- Improves workability
- Packaged for easy jobsite use

Trial Batches: DRY-BLOCK Mortar Admixture is compatible with other Grace Mortar Admixtures. Trial batches are recommended as detailed in ASTM C 780, using job site materials and expected job site climatic conditions to determine compatibility of materials and the necessary adjustments to the mix design for actual addition rates, workability, color and physical properties. All admixtures must be added to the mix separately.

When pigments are used to provide a specific color tone, trial batches are strongly recommended to ensure the desired color is developed.

Packaging and Shipping Weights:
DRY-BLOCK Mortar Admixture weighs approximately 1 Kg/L (8.5 lbs./gal.)
DRY-BLOCK Mortar Admixture is supplied in cases of twelve .95L (32oz.) bottles. Each case weighs approximately 13.6 kg (30 lbs.). DRY-BLOCK Mortar Admixture is also available in 208 L (55 gal.) drums weighing 234 kg. (515 lbs.)

Heath & Safety: All precautions defined on the MSDS (Material Safety Data Sheet) for DRY-BLOCK Mortar Admixture must be followed.
Storage Information: DRY-BLOCK II Mortar Admixture is supplied as a free-flowing, off-white liquid with a mint scent. DRY-BLOCK Mortar Admixture will freeze at 0° C (32° F). *DRY-BLOCK Mortar Admixture must be protected from freezing. Once frozen, it is unusable.* DRY-BLOCK Mortar Admixture has a shelf life of 18 months from the date of manufacture. An expiration date is marked on each outer carton of bottles and drums.

Design Considerations

The water-repellency of mortar joints is a function of:

1. The ability of the mortar to resist water penetration and
2. The geometry of the mortar joint.

The use of DRY-BLOCK Mortar Admixture and proper tooling, increases the water tight properties of the joint and provides resistance to water penetration. A well-tooled concave joint profile has been shown to provide the greatest resistance to water penetration. Concave or Vee profile tooling is recommended whenever DRY-BLOCK Mortar Admixture is used for exterior applications. Raked, Flush, Extruded, Struck, Beaded, Weathered or other joint profiles have poor water resistance and are not recommended for exterior applications.

The DRY-BLOCK System is only one part of a moisture protection system for concrete masonry walls. Other elements include:

- Proper drainage within the core or cavity area.
- A properly installed flashing and weep system.

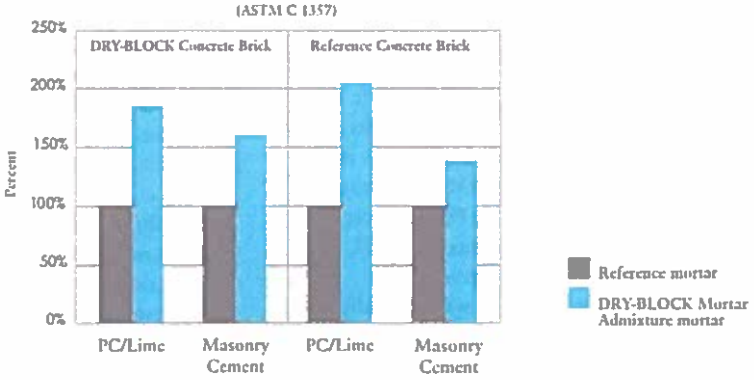
Information on other design considerations for masonry wall systems, such as flashing, weeps, reinforcing and drainable in-core insulation can be obtained from Grace Construction Products, the NCMA (National Concrete Masonry Association) and the BIA (Brick Industry Association).

Cleaning: All excess mortar containing DRY-BLOCK Mortar Admixture should be removed from the face of the masonry units as soon as possible. This is important, since standard methods for removing hardened mortar such as strong acids, sand blasting and high pressure cleaning are harmful to the masonry units and the mortar joints and are not recommended.
Precautions: DRY-BLOCK Mortar Admixture is not a substitute for good masonry practices such as proper curing, tooling and covering the wall at the end of each work session. DRY-BLOCK Mortar Admixture will not prevent cracking.

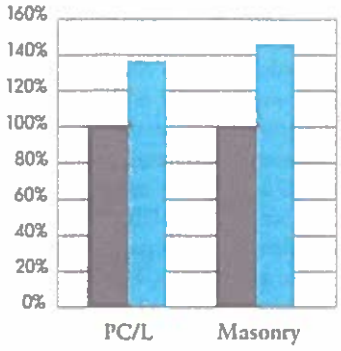
Proper techniques for protection during construction as well as proper curing techniques can be found in literature published by the All Weather Masonry Council, NCMA, BIA and the PCA (Portland Cement Association).

DRY-BLOCK Mortar Admixture provides water-repellent properties to cured mortar. If the mortar dries out before the desired properties are achieved, DRY-BLOCK Mortar Admixture's water-repellent properties will become active and subsequent hydration of the cement will be hindered.

Type S Mortar – Flexural Bond Strength to Reference Concrete Brick and DRY-BLOCK Concrete Brick
(ASTM C 1357)



Type S Mortar –Compressive Strength
(ASTM C 109)



SPECIFICATION

DRY-BLOCK® Block Admixture

Integral Water-Repellent

Short-form Specification
(For inclusion in Section 04200, Unit Masonry)

[Note to Specifier: The DRY-BLOCK® System is comprised of DRY-BLOCK Mortar Admixture which is added to the mortar mix on site by the mason contractor and DRY-BLOCK Block admixture, specified in this short-form specification, which is mixed throughout the low slump concrete during the manufacture of the Concrete Masonry Unit (CMU) by a Qualified DRY-BLOCK Producer. The admixtures provide effective water-repellency in typical masonry construction. To complement the DRY-BLOCK admixtures and to provide maximum protection to the masonry wall structure, field apply INFINISEAL™ DB Sealer, a water-based, clear, penetrating water-repellent sealer.

In addition to this short-form specification for the CMU admixture, the short-form specification for the GRACE integral water-repellent DRY-BLOCK Mortar Admixture must be incorporated into your project mortar specification, either in Section 04200, Unit Masonry, or in a separate Section 04100, Mortar. Both admixtures are required in your project specifications to achieve a water-repellent masonry wall. For maximum protection, include the short-form specification for INFINISEAL DB Sealer in Section 07190, Water Repellents.

Finally, it is important to understand that while the DRY-BLOCK System greatly enhances the water-resistant properties of the masonry, the DRY-BLOCK System should not be considered as a substitute for good design practices and quality construction procedures (workmanship). Proper flashing details and control joint specifications should also be included in your project specifications. Refer to information in National Concrete Masonry Association (NCMA) TEK 19-2A, 19-4A and 19-5A for flashing details, as well as NCMA TEK 10-1A and 10-2A for crack control and control joint recommendations. This short-form specification directly specifies the DRY-BLOCK System and is important to the water penetration performance of the wall. The DRY-BLOCK System components should be incorporated into your project specifications along with other important requirements, such as those specified in ACI 530.1, "Specification for Masonry Structures."]

[Note to Specifier: Incorporate the following information in Part 1 – General]

1. Summary: Section includes liquid polymeric admixture added to the concrete masonry units at the time of manufacture.

[Note to Specifier: If mortar is specified in Section 04100, include 2 below. If mortar is specified in Section 04200, delete 2 below.]

2. Product Installed But Not Furnished Under This Section: Install mortar containing compatible integral liquid polymeric water-repellent admixture furnished in Section 04100.
3. Performance Requirements:
   a. Water Permeance of Masonry: ASTM E 514, "Standard Test Method for Water Penetration and Leakage through Masonry."
   b. Flexural Bond Strength of Masonry: ASTM C 1357, "Standard Test Method for Evaluating Masonry Bond Strength."

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Construction Products

c. Compressive Strength of Masonry Prisms: ASTM C 1314, "Standard Test Method for Constructing and Testing Masonry Prisms Used to Determine Compliance with Specified Compressive Strength of Masonry."
d. Drying Shrinkage of CMU: ASTM C 426, "Standard Test Method for Drying Shrinkage of Concrete Masonry Units."

[Note to Specifier: If the masonry is to be grouted, include e below. If the masonry is not grouted, delete e below.]

e. Grout Shear Bond Strength: Test consistent with the Department of State Architect of California requirements in California State Chapter 2405(c)3.C. Test method is described in Concrete Masonry Association of California and Nevada document, "Recommended Grouting Procedure for Hollow Concrete Masonry Constructed Under CAC Title 24,"

4. Submittals:
   a. Spec-Data® Sheet on Grace Construction Products' DRY-BLOCK System of Integral Water-Repellent Admixtures for Block and Mortar.
   b. Technical Bulletin on Cleaning Masonry Containing DRY-BLOCK.
   c. Test Reports prepared by a qualified independent laboratory indicating compliance with the performance requirements for integral CMU water-repellent as tested using:
      (1) ASTM E 514, extended to 72 hours.
      (2) ASTM C 1357.
      (3) ASTM C 1314.
      (4) ASTM C 426.

[Note to Specifier: If the masonry is to be grouted, include (5) below. If the masonry is not grouted, delete (5) below.]

      (5) California State Chapter 2405(c)3.C test for Grout Shear Bond Strength.
   d. Current "Qualified Producer Certification" issued by manufacturer of integral CMU water-repellent admixture, indicating that CMU producer is qualified to produce CMU units containing manufacturer's admixture.
5. Quality Assurance: CMU producer shall be qualified by manufacturer of integral CMU water-repellent admixture.
6. Sample Panel: Construct a sample panel to determine the compatibility of materials and the effect of the materials and construction procedures on the final appearance of the wall. Use jobsite materials, including specified water-repellent CMU and mortar to construct sample panel. The CMU sample panels erected shall represent the range of texture and color permitted for the project. Prepare more than one sample batch of mortar, especially when coloring pigments are added to the mortar, to establish desired aesthetics and performance. Perform all construction procedures on sample panel, including cleaning and application of coatings and sealants. Retain sample panel during construction as standard for judging completed masonry work. Acceptance of sample panel does not constitute approval of deviations from materials contained in sample panel, unless such deviations are specifically approved by architect in writing.
7. Warranty:
   a. Integral CMU water-repellent admixture shall be warranted by admixture manufacturer to be free of defects and to meet manufacturer's published physical and chemical properties.
   b. CMU producer shall warrant that integral CMU water-repellent admixture has been provided at appropriate dosage rate in all CMU units shipped to project site for use in exterior wall construction.
   c. Installer shall warrant that only CMUs containing integral CMU water-repellent admixture have been placed in exterior CMU walls.

[Note to Specifier: Incorporate the following in Part 2 – Products]

A. Integral CMU Water-Repellent:
   1. Description: Integral liquid polymeric admixture mixed with concrete during production of CMUs.
   2. Water Permeance of Masonry: Capable of achieving a Class E Rating when evaluated using ASTM E 514 with the test extended to 72 hours, using the rating criteria specified in ASTM E 514-74.

[Note to Specifier: The following criteria for an increase in bond strength is important to achieve an adequate margin of safety in the structural design and to maximize the water-resistance of the masonry. In no case should the bond strength be allowed to show a decrease compared to the prepared control sample.]

   3. Flexural Bond Strength of Masonry: An increase of minimum 10% in masonry flexural bond strength shall occur as a result of adding integral water-repellent CMU and mortar admixtures when compared to a control (containing no admixtures) CMU and mortar tested according to ASTM C 1357.
   4. Compressive Strength of Masonry Prisms: Maximum 5% decrease in compressive strength of prisms shall occur as a result of adding integral water-repellent CMU and mortar admixtures when compared to a control (containing no admixtures) CMU and mortar when tested according to ASTM C 1314.
   5. Drying Shrinkage of CMU: Maximum 5% increase in drying shrinkage of the CMU shall occur as a result of adding integral water-repellent CMU admixture when compared to a control (containing no admixtures) CMU when tested according to ASTM C 426.

[Note to Specifier: If the masonry is to be grouted, include 6 below. If the masonry is not grouted, delete 6 below.]

   6. Grout Shear Bond Strength: Maximum 5% decrease in grout shear bond strength shall occur as a result of adding integral water-repellent admixture to the CMU compared to a control (containing no admixtures) CMU when tested according to California State Chapter 2405(c)3.C test for Grout Shear Bond Strength.

[Note to Specifier: Delete 7 if a performance specification is required.]

   7. Product: DRY-BLOCK Block Admixture, an integral liquid polymeric water-repellent CMU admixture manufactured by Grace Construction Products.

[Note to Specifier: Incorporate the following in Part 3 – Execution]

A. Integral Water-Repellent CMU:
   1. Installer shall use only mortar containing compatible integral liquid polymeric water-repellent mortar admixture at the manufacturer's recommended addition rate and mixed according to manufacturer's recommended instructions for construction of water-repellent CMU exterior walls.
   2. Cover top of unfinished masonry work to protect it from the weather and to prevent accumulation of water in the cores of the CMU.
   3. Cleaning:
      a. Remove "primary" efflorescence from masonry walls exposed in the finished work in accordance with the manufacturer's recommendations and the NCMA TEK Bulletin #8-3A.
      b. Remove dirt or stains from masonry walls exposed in the finished work in accordance with the manufacturer's recommendations and the NCMA TEK Bulletin #8-2A.

[Note to Specifier: Including the following in project specifications is important because standard methods for removing hardened mortar involve the use of methods or materials, such as strong acid, sandblasting, and high-pressure cleaning which are harmful to masonry units and are not recommended by Grace Construction Products.]

c. Promptly remove excess wet mortar containing integral water-repellent mortar admixture from the face of the masonry as work progresses. Do not use strong acids, sandblasting or high-pressure cleaning methods.
d. Comply with applicable environmental laws and restrictions.

[Note to Specifier: It is strongly recommended by Grace Construction Products that the following be included in Section 04100 or 04200 of your project specification. The pre-installation conference can establish your strong desire to enforce the requirements for water-repellency, proper flashing techniques, and the use of weeps. Coordinate with Section 01200.]

4. At least two weeks before starting above-grade masonry work, schedule a pre-installation conference at the jobsite in accordance with requirements of Section 01200 to discuss compliance with the requirements of the contract documents. Give two weeks advance notice to the participants, including the contractor, mason contractor, flashing installer, CMU producer, and/or the manufacturer of the integral water-repellent CMU admixture. Advise the architect of the scheduled meeting date.

[Note to Specifier – ASTM E 514 Modification Clarification: Note that this guide specification recommends modifying the current ASTM E 514 standard by extending the test period to 72 hours, and applying the Rating Scale found in ASTM E 514-74, an earlier version of the test method. Both versions subject test specimens to a 140 mm (5½ in.) per hour rainfall and a 100.6 km/hr (62.5 mph) wind.

Under the 1974 version of the test method:
- *the test period lasted for 72 hours; and*
- *the laboratory was instructed to rate the wall on an objective Rating Scale in one of five categories from "L" (indicating leakage), to "E" (for Excellent).*

Under the current version of the ASTM E 514:
- *the test period is only 4 hours; and*
- *the laboratory is instructed only to record their observations on the specimen.*

The current version of the standard is not as demanding as the previous version and does not provide the same level of performance required by the 1974 version. If you want the kind of performance the DRY-BLOCK System can achieve for your project, do not change the wording in this guide specification, which extends the test period to 72 hours and applies the rating criteria found in ASTM E 514-74 to the results.]

W. R. Grace & Co. - Conn., 7221 West Parkland Court, Milwaukee, WI 53223 Tel: (414) 354-4400 Fax: (414) 354-5088

DRY-BLOCK PRODUCER

CERTIFICATE OF QUALIFICATION

This is to certify that

Richvale York Block

Gormley, Ontario

HAS SUCCESSFULLY COMPLETED THE REQUIREMENTS AS SET FORTH BY GRACE CONSTRUCTION PRODUCTS AND IS HEREBY DESIGNATED AS A QUALIFIED DRY-BLOCK SYSTEM PRODUCER

Angel Abelleira

Angel Abelleira
PRODUCT MANAGER
GRACE CONSTRUCTION PRODUCTS

This Certification expires month ending June, 2016

GRACE