The Master Builders Solutions brand brings all of BASF’s expertise together to create chemical solutions for new construction, maintenance, repair and renovation of structures. Master Builders Solutions is built on the experience gained from more than a century in the construction industry.

The know-how and experience of a global community of BASF construction experts form the core of Master Builders Solutions. We combine the right elements from our portfolio to solve your specific construction challenges. We collaborate across areas of expertise and regions and draw on the experience gained from countless construction projects worldwide. We leverage global BASF technologies, as well as our in-depth knowledge of local building needs, to develop innovations that help make you more successful and drive sustainable construction.

The comprehensive portfolio under the Master Builders Solutions brand encompasses concrete admixtures, cement additives, chemical knowledge of local building needs, to develop innovations that help make you more successful and drive sustainable construction.

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Overview

The BASF Water-Repellent Admixture Certification Program, which helps standardize a measurable system for controlling water-repellency, is outlined in five steps:

Step 1: BASF uses computer generated models to help producers optimize mix designs, aggregate gradations, and develop proper admixture dosages.

Step 2: BASF works with the producer to develop trial mixes based on the results of Step 1. These trial mixes help determine optimum water-repellency properties.

Step 3: Block specimens are evaluated by BASF-laboratories for absorption, puddle retention, wicking resistance, and water permeation properties.

Step 4: Upon confirmation that the block specimens meet stringent water-repellency requirements, BASF will certify the mix design and admixture dosage and maintain test report documentation. This certification and documentation is a valuable tool for producers to acquire specified water-repellent projects.

Step 5: BASF will offer assistance for ongoing quality control support to CMU producers.

Step 1: Mix Design and Material Analysis

BASF first obtains all required background information including aggregate gradations and other physical characteristics, material samples (if needed), mix designs, and equipment information. The aggregate proportions are further optimized, if needed, using computer modeling techniques. Next, the ratio of aggregate to water-repellent admixture systems helps standardize a measurable system for controlling water-repellency.

BASF will offer assistance for ongoing quality control support to CMU producers.

The BASF Water-Repellent Admixture Certification Program, which is a revealing test, although it has no specific pass/fail criteria. It is a time and a calculated pressure which is translated into an estimated wind-driven rain force of nearly 100 mph (160 kph). While the hydrostatic pressure levels of the RILEM 6.4 or low-pressure permeability test procedures can estimate the sustained wind-driven rain conditions of ASTM E 514, there is no direct correlation between the measured results due to substantial variations in the methods themselves. MasterPel admixtures for concrete block and mortar achieved E-Rated (excellent) performance when tested in accordance with ASTM E 514, with a 72-hour test duration and 0% dampness on interior wall surface. National Concrete Masonry Association (NCMA), MasterPel Reports #97-227 & #03-365.

B. BASF Spray-Bar Water Permeation Test

This test simulates a steady rain over the face of a CMU. A representative sample is placed on a pan of water and a spray-bar apparatus is set atop the specimen (Figure 4). This spray bar is a 1/2 in. (12.5 mm) diameter tubing that is 12 in. (300 mm) in length with end caps and has 1/8 in. (3 mm) drilled holes. Water is sprayed on a block face at a rate of 100 gallons per hour (454 Lph). The block is inspected at 1, 2, 3, and 4 hours for any dampness penetrating the block face.

Figure 2: A low-pressure permeability and puddle retention test. See Chart 1 for equivalent wind-driven rain-resistance based on water height reading.

WICKING RESISTANCE

A block from each batch that successfully met the puddle retention criteria is randomly selected. The block, with core holes up, is placed in a shallow pan of water, and partially submerged 1/2 in. (2.5-5 cm) for 24 hours (Figure 3). The average height of capillary rise (distance between water surface and the dampened area on block) is measured to the nearest 1 mm (avg. 6-8 readings, except for split face surfaces). For normal weight CMUs, this is typically under 1 in. (2.5 cm). The test is critical in determining moisture transmitting potential of the concrete when treated with a water-repellent admixture.

WATER PERMEABILITY TESTING

A. BASF-Low-Pressure Permeation Test: (alternate method for RILEM 6.4)

Results of low-pressure permeability testing is a function of flow vs. time and a calculated pressure which is translated into an estimated wind-driven rain resistance equivalent (Figure 2 and Chart 1). This is a surprising test, although it has no specific pass/fail criteria. It is a practical tool for determining the optimal performance attainable for a given set of materials.

Figure 3: A wicking resistance test measures the moisture transmitted through a CMU.

Figure 4: A spray-bar water permeation test simulates a constant rainfall over a CMU surface and measures water penetration.

Step 4: Documentation/Certification

All test data is reviewed and documented at the BASF laboratories in Cleveland, Ohio. Once successful results are obtained, qualified admixture dosage(s), performance data, quality control recommendations, and certification(s) are then issued to the block producer per mix design. This information may be used for quality assurance purposes where required for specification submittals.

Step 5: Ongoing Quality Control

The Water-Repellent Admixture Certification Program is an important tool in a producer’s ongoing quality control processes to consistently produce high-performance water repellent CMUs. It is the producer’s responsibility to verify that certification criteria are controlled on each batch run. Therefore, after certification of a given mix and dosage, producers should conduct similar tests to those outlined in this program on an on-going basis to verify CMU certification compliance. Water permeability, puddle retention, and wicking resistance tests can usually be performed right at the plant. Testing is especially important whenever there are changes to the manufacturing process, materials, etc.