

WORLD OF MASONRY OFFICIAL SHOW ISSUE

The World of Masonry

# Masonry

## CONSTRUCTION

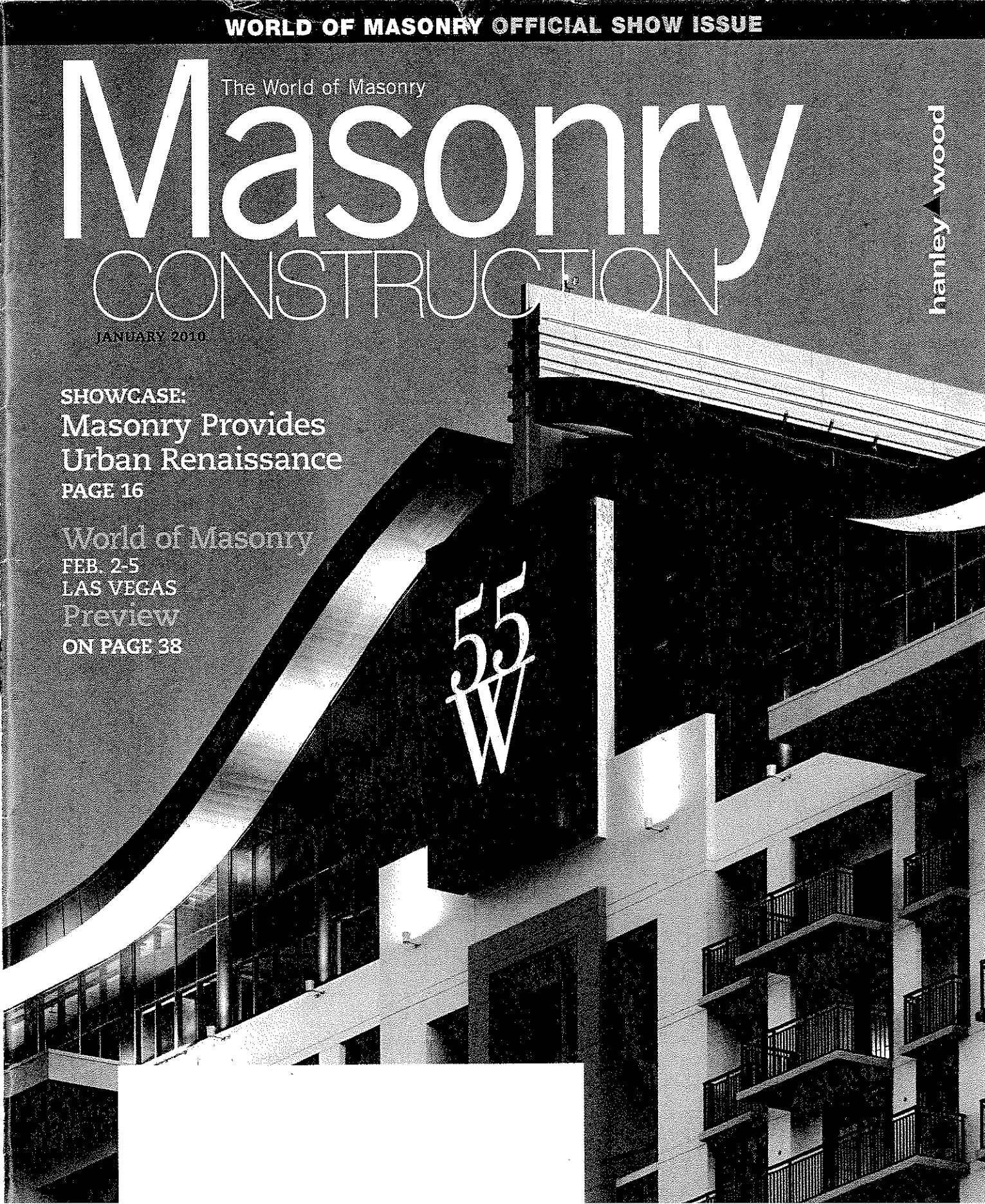
JANUARY 2010

hanley wood

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# Not Your Mother's MORTAR

Alternative mortars can provide speed or special properties.

**M**asons have successfully used mortar made from only sand, portland cement, and lime for more than a century. But as good as that simple mortar is, the properties can be improved by using various admixtures, including retarders and accelerators, to counteract the effects of cold and hot weather, and water repellents.

Mortar can be specified either based on prescribed proportions or by required performance properties. Masonry cements and mortar cements can only be specified based on the required performance since the precise materials are proprietary. In this sense, the masonry industry is leading the concrete business where performance-based mixes are less common than prescriptive ones.

This split-face block wall was built with no mortar joint, using an epoxy adhesive product.

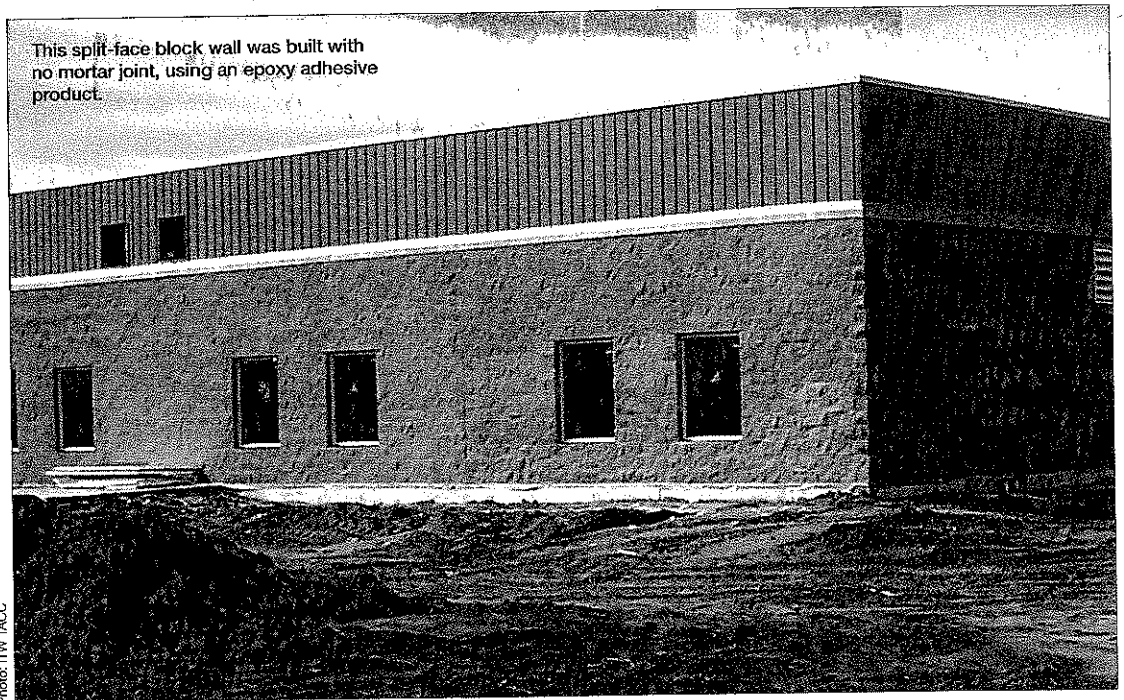


Photo: ITW TACC



Photo: Spec Mix



Photo: Perisus Products

Easy Spred is added to mortar in 7-pound bags to replace 50 pounds of lime.

Giving masons the freedom to select their mortar based on performance allows the use of a variety of sometimes unconventional ingredients. Contractors can select properties that speed up the work and increase the quality of masonry walls.

#### Lime substitute

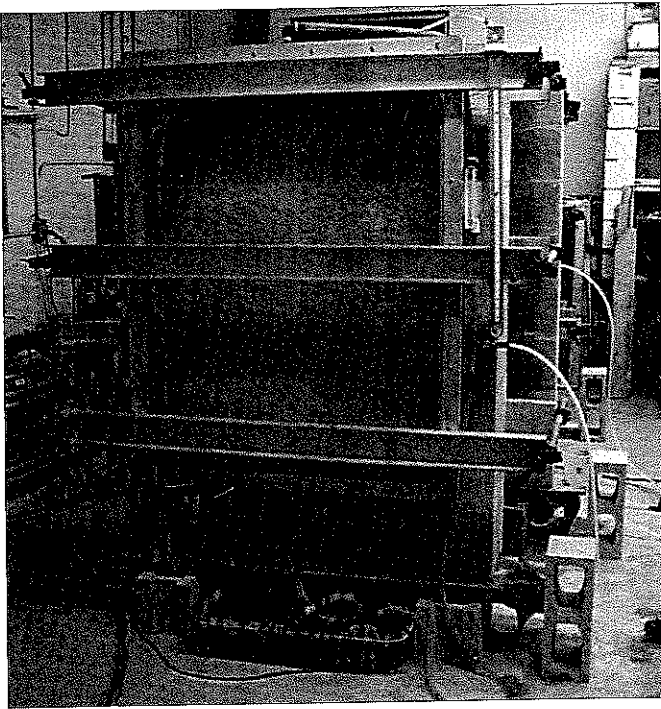
Mortar is not concrete—it needs a few additional properties to allow efficient construction of a quality masonry wall. The most important fresh mortar properties are workability and water retention; finished masonry needs better bond between the mortar and the units than could be achieved with a straight cement mortar.

That's why lime is added to the mortar. Mortar made with some proportion of lime (actually Type S calcined lime) has greater plasticity, bonds better with the units, and shrinks less than a straight cement mortar. The typical proportion of lime in a Type N mortar mix is 1/2 to 1 1/4 parts lime to one part cement, based on the proportion specification table of ASTM C 270, Mortar for Unit Masonry.

But if a mason chooses mortar based on performance requirements, there is flexibility in what can go into the mix. One change that some masons have found beneficial is to substitute a product called Easy Spred for some or all of the lime. This material is a finely

### Integral Water-Repellent Admixture Manufacturers

Manufacturer	Product name	Web site
ACM Chemistries	RainBloc	<a href="http://www.acmchem.com">www.acmchem.com</a>
BASF Admixtures	Rheopel	<a href="http://www.basf-admixtures.com">www.basf-admixtures.com</a>
Euclid Chemical	Blocktite	<a href="http://www.euclidchemical.com">www.euclidchemical.com</a>
Grace Construction Products	Dry-Block/Dry-Brick	<a href="http://www.graceconstruction.com">www.graceconstruction.com</a>
Hycrete	Infinishield	<a href="http://www.hycrete.com">www.hycrete.com</a>
Kryton	Krytol Mortar	<a href="http://www.kryton.com">www.kryton.com</a>
Larsen Products	Acrylic Ad-Mix 101	<a href="http://www.larsenproducts.com">www.larsenproducts.com</a>
Spec Mix	IWR	<a href="http://www.specmix.com">www.specmix.com</a>
Specco	W-33P	<a href="http://www.specco.com">www.specco.com</a>



This masonry wall assembly, with water-repellent blocks and integral water-repellent mortar, was tested under ASTM 514 and did not leak at all even under extreme conditions.

## Mortar—But Not

One new product takes mortar alternatives to the extreme by eliminating the mortar altogether. Mason Bond, from ITW TACC, Rockville, Md., introduced Mason Bond, an adhesive system for bonding CMUs, in early 2008. Usable at any temperature between 40° F and 120° F and relative humidity between 20% and 90%, Mason Bond is applied to head and bed joints in a  $\frac{3}{16}$ -inch diameter bead. The adhesive remains usable for about 15 minutes.

This adhesive is provided in 10.3-ounce tubes or 29-ounce tubes. ITW TACC also is working on a pump system that would use 5-gallon pails or 55-gallon drums and pump the adhesive into a wand that simultaneously will apply beads to both face shells.

Mason Bond greatly speeds masonry construction. On a recent foundation stem wall job, a crew of two installed 236 blocks in just three hours—about half the time needed for standard masonry assembly with mortar. Workers applied the adhesive bead  $\frac{3}{4}$ -inch back from the block faces—the material expands three times during curing. Excess material is scraped off the next day after it hardens.

One problem with this system is appearance. There is no mortar joint, a look that many people might prefer. “We know that this isn’t going to be used for every application,” says Tim Walsh, ITW TACC’s business manager. “Some object to the lack of joints since they are used to seeing them, but with split face blocks, some architects actually like the look. The largest project we’ve done to date was with split face.”

Another difficulty is the loss of modularity. To account for the mortar joint, standard blocks and bricks are manufactured  $\frac{3}{8}$  inch smaller in height and width. Since with Mason Bond the joint is very thin, this throws off modularity. “Some manufacturers have made true 8x8x16-inch blocks,” says Walsh. “But as we get more acceptance we will work with our distributors, who are typically block manufacturers, to make molds for true 8x8x16-inch blocks.”

ground clay that has a lubricating effect on the mortar.

In a mix that would require 50 pounds of lime, only seven pounds of Easy Spred is needed to achieve similar fresh and hardened properties. “Normally, Easy Spred is referenced under the ASTM C 270 property requirements,” says Charles Meadowcroft, president of Peninsula Products, which markets Easy Spred. “Or, if you blend cement and Easy Spred, you can qualify under ASTM C 1329 as a mortar cement and end up in the proportion table of C270.”

This product has been used across North America for more than 25 years. Masons report that it results in an easy-to-work-with mortar. Independent testing shows that the mortar has high strength and low shrinkage. Some masons have developed their own formulas using a combination of Easy Spred, lime, and portland cement to enhance workability and to reduce drying and shrinkage.

### Water-repellent admixtures

A masonry wall’s greatest weakness is its inability to prevent water penetration. Water-repellent admixtures added to the mortar, and also often to concrete blocks during manufacturing, can lead to more watertight masonry walls. These admixtures, often provided in liquid form but sometimes as a dry powder or blended with dry mortar

mix, are polymer emulsions that make the mortar much less permeable. Because water is unable to move easily through the mortar, this admixture also reduces or eliminates efflorescence. Water-repellent admixtures also increase the bond between the mortar and CMUs or brick, leading to even more water resistance.

Integral water repellents typically are added to the mortar during mixing. But Spec Mix, with its Spec Mix IWR, blends the water-repellent admixture into a dry portland cement-lime mortar mix that is available in 80-pound bags or 3000-pound bulk bags. In testing in conditions that simulated 62-mph winds and more than 5 inches of rain per hour, no water penetration was detected after four hours when using Spec Mix IWR and CMUs manufactured with water repellent. On projects where minimal water penetration and efflorescence are desired, integral water-repellent admixtures might be a good choice. **mc**

This article first appeared in CONCRETE & MASONRY CONSTRUCTION PRODUCTS magazine. William D. Palmer is a former editor in chief of MASONRY CONSTRUCTION.

# BUILD FASTER. BUILD STRONGER. BUILD FOR LESS.

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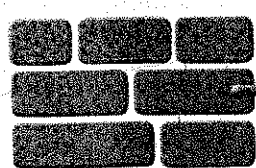
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MASON BOND has received significant review and verification:

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- Florida Building Commission – see Approval FL # 10101
- Department of Housing and Urban Development – see HUD Materials Release Bulletin #1331
- Alabama DOT – see PEB 1975
- Texas DOT – see 09-2501 Product Evaluation
- GREENGUARD for Children & Schools<sup>SM</sup>

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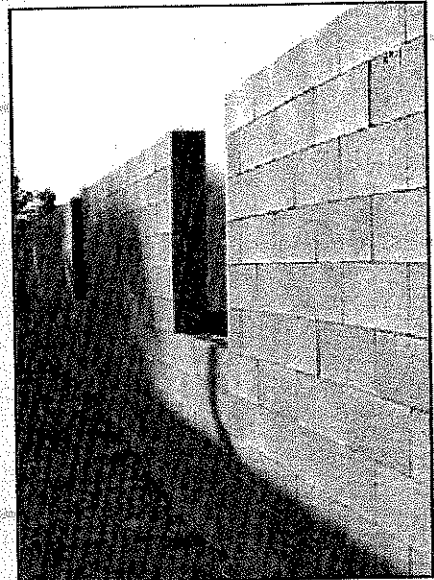
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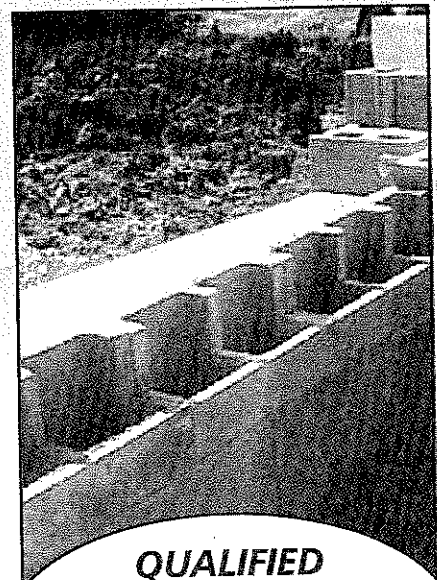
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\*International Building Code, Section 2103.8 and International Residential Code, Section R607.1



MASON BOND used in residential construction (above) and stem wall foundation (below).



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