

Cold Weather AND Hot Jobs

By David R. Miller,
Associate Editor

Photos Courtesy of
MasonPro, Inc.

Deadlines are nothing new to contractors. They never change, even when conditions do, so builders are always looking for ways to minimize the impact of adverse conditions. Cold weather has always been an issue on Michigan jobsites, but on time completion is far more likely today with new products that are gradually transforming construction into a year-round activity. Masonry is among the trades most impacted by winter conditions, but Masonpro, Inc. in Northville, offers an entire line of products that let masons work in almost any weather condition.

WHY TEMPERATURE IS SO IMPORTANT

Cold weather can impact any outdoor work, but masonry is particularly vulnerable to temperature variations.

"Water is very important in masonry," explained Don Hunson, sales manager for Masonpro. "The hydration process has to occur between the mortar, which is made with water, and the unit, which is the block or the brick. When hydration occurs, fines [finely crushed or powdered material] inside the mortar get accepted into the unit. That is what creates the bond. If the water is frozen, hydration can't occur and you don't get a proper bond."

The bond between mortar and masonry unit creates the wall's structural integrity. Since not having a proper bond can lead to collapse, contractors usually avoid unnecessary chances.

"I have been with Masonpro since '91," said Hunson. "At that time, we had some customers who said that it was too hard to be productive during the wintertime, so they

just shut down. They would do small jobs for customers when they had to, but they tried to avoid working in the winter until fairly recently. In the last few years, some new products have come out that help make masons more productive."

These new products fall into two general categories: those that heat materials or the ground prior to installation, and those that trap heat or speed up the bonding process during and after installation.

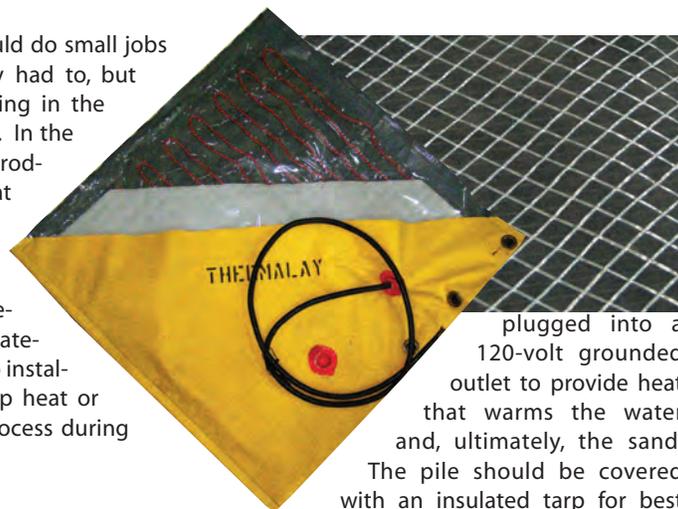
GENERATING HEAT

Mixing warm materials together obviously produces a warm product. Since mortar is usually 2/3 to 3/4 sand, masons have developed many ways to heat sand piles on jobsites.

"The traditional way to heat the sand was to dump it over a culvert pipe and then build a fire in the pipe," said Hunson.

This technique had obvious drawbacks. Someone had to come in early to start the fire and constant attention was needed to feed the fire and keep it going, which pulled workers away from the revenue generating business of placing masonry units. Fires also presented a safety hazard and produced bothersome smoke.

The Volcano Rod, manufactured by Heatron and distributed in Michigan by Masonpro, offer a better solution. Users simply position sand around a 55-gallon drum that is 3/4 full of water and immerse the Volcano Rod. A cord above the water can be



plugged into a 120-volt grounded outlet to provide heat that warms the water and, ultimately, the sand.

The pile should be covered with an insulated tarp for best results and the water will reach its maximum temperature in 6-12 hours, resulting in warm sand after an overnight run. Even though Volcano Rods cannot be used to warm the cement component of mortar, as moisture from the barrel would infiltrate the material, warm sand and water result in a serviceable cold weather mix. The Volcano Rod uses very little energy and has virtually no environmental impact.

Electric blankets, commonly used to thaw the ground for concrete work, can also be used to warm sand for masonry applications. Successful cold weather masonry projects start with warm materials, but products designed to prevent heat loss are often necessary, as well.

POST INSTALLATION

Masons have long understood the benefits of keeping worksites warm and they have employed many different types of physical barriers to trap heat over the years.

Canvas was the first material that was used, but it is seldom, if ever, used today. Its many shortcomings fueled the search for a better alternative.

Canvas is not the most flexible material, which makes it difficult to set up, and it also blocks light. Masons could place string lights inside the canvas, but this took time and also left them with no way of knowing what was going on outside. Staging areas needed to be manned when deliveries were expected, which reduced productivity by taking skilled masons out of commission.

In addition to the work area, masonry walls must also be covered for 24 to 48 hours after erection in cold weather to retain the heat that is generated as the mortar sets. Water can seep directly into the masonry cores if a non-watertight material, like canvas, is used. Newer materials proved to be an improvement over canvas, but there was a gradual evolution to the vastly superior materials that are available today.

"People started using woven plastic about 15-20 years ago," said Hunson. "It was fairly clear and it let sunlight in, but it wasn't strong enough. We were moving in the right direction, but we still had to find something better."

The clear reinforced poly sheets used today represent a significant improvement. These poly sheets are made from a reinforced network of filaments that are sandwiched between two clear plastic sheets. The resulting material transmits daylight while proving highly resistant to wind shredding. Fire rated sheets open up a variety of options for heaters that can be used inside the enclosure. In addition to materials designed to contain heat, admixtures that affect the freezing process are also evolving and improving.

Early additives used in the '60s, '70s and '80s contained chlorides that prevented water from freezing in the same way that road salt does. Unfortunately, these chemicals corroded metal parts inside the walls and also left deposits, commonly called efflorescence, on masonry units. Chlorides were so problematic then that they cannot be used today. Instead, a newer class of admixtures works as catalysts to accelerate the curing process, thereby leaving less time for water in the mortar to freeze.

Construction will probably always be a challenge in the wintertime, but new products are constantly being developed to lessen the impact of cold weather. Even on the coldest of days, there are products available to help masons meet hot deadlines. ❖

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