



## New Meat Cooler Floor, Coating Packed into 4 Days

**W**hen a food packing company needs a new floor in its cooler, timing can be critical, to the point of needing to coat green concrete. Such was Momence Packing Company's dilemma when it took on the replacement of a concrete floor that had failed due to heaving, or buckling, from thermal cycling, says Ed Petras, senior engineer for the plant. The floor is exposed to temperatures of 0 to 15 F (-18 to -9 C)

and nightly sanitation with water ranging from 150 to 160 F (66 to 71 C). In addition, the floor supports 1,000-pound racks of meat that are moved by forklift in and out of the cooler as part of the packing process. The Momence, IL-based packing company had tried different mixes of concrete, various epoxy floor coverings, and several patching materials, but each approach led to failure. "The coatings would last six months and then heave," says Petras.

The flooring project included the installation of a four-inch concrete base incorporating a heated glycol system to maintain the floor's temperature at 38 F (3 C). The specifications called for an epoxy flooring with antimicrobial properties, says Petras. To avoid disrupting the plant's operations, the project was scheduled over the four-day Thanksgiving holiday weekend in 2006. The contractor's work included removing the existing concrete, placing the grid for the heated glycol system, back-filling the new concrete, and applying the 100% solids epoxy.

The contractor first broke up and removed the cooler's buckled concrete floor. A system of tubes that connect to the plant's boiler system formed a grid on the dirt base. The heated tubes are designed to keep the floor from undergoing thermal shock as a result of cycling from operating temperatures below freezing to high temperatures during hot water sanitizing. Maintained at 38 F (3 C), the floor cannot freeze and, therefore, cannot go through thermal shock, says Bob Smith, owner of the contracting company.

The heated glycol system is equipped with sensors that will sound should the boiler system malfunction and subsequently affect the temperature of the concrete.

After laying the grid of tubing, the



After removing the damaged concrete floor, the contractor's crew placed the heated tube system (above) and installed a new, four-inch concrete floor over the tubing (inset).

Photos courtesy of Momence Packing Company

## Case History

contractor installed the four-inch concrete floor. The concrete (a standard concrete mix with no admixtures to accelerate cure) was given a wood float finish, which imparts a little texture, says Smith. The next day, the contractor applied the 100% solids epoxy by hand troweling. "Typically, concrete requires a 28-day cure before flooring systems can be applied," says Smith. In contrast, the 100% solids epoxy can be applied over green concrete in as little as one day after concrete installation, he says. To prepare the concrete for coating, the contractor simply removed the watery slurry on the surface with brooms.

Workers applied the first coat of 100% solids epoxy to a 1/8-inch (three-millimeter) thickness. After eight hours, another coat of epoxy, this time at 1/16 in. (1.5 mm), was applied by trowel. Aluminum oxide was then broadcast over the surface to impart anti-slip properties. The second coat of epoxy and the broadcast brought the system to 1/4 in. (6 mm), says Smith. After four hours, the contractor sanded the floor with a grinder equipped with diamond grit to reduce the texture imparted by the broadcast. Then, a thin topcoat of the 100% solids epoxy was troweled on and backrolled, says Smith. An antimicrobial was added to the 100% solids epoxy topcoat during mixing, he adds.

According to both Petras and Smith, the flooring system is performing well. "I was kind of skeptical at first," Petras says, but he notes that the flooring system has performed without cracking or spalling since it was put into service. Since this project, the packing company has installed another antimicrobial epoxy flooring system in a different area of the plant, he says.

Universal Floor and Wall Systems (Bartlett, IL) performed the surface preparation and application of the flooring. Corro-Shield International, Inc. (Rosemont, IL) manufactures the flooring materials.

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