HELP FOR CONCRETE FLOORS IN A WET ENVIRONMENT

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A NEW PROTECTIVE TOPPING, WITH A HIGH COMPRESSIVE STRENGTH, PROVES BENEFICIAL IN REPAIRING PAPER MILL FLOORS THAT CANNOT BE THOROUGHLY DRIED.

WET FLOORS IN PAPER MILLS HAVE ALWAYS BEEN A frustrating maintenance problem without a good solution. Water on floors not only makes them difficult to keep clean, but they can be dangerously slippery, and standing water leads to deterioration of the concrete surfaces that support papermaking activities.

Concrete is a splendid construction material, providing a solid, stable base for heavy machinery and the vehicles serving those machines. However, concrete is porous, and excess standing water eventually causes surface deterioration, especially where heavy weights continually roll across the floor. In time, the concrete becomes unsightly and unusable.

This situation was happening in some parts of the Bay West mill, which was built in 1923 to house the Frank Smith Paper Co. The mill has been expanded several times since then, but some of the older floors, especially in the basement under our two paper machines, were badly eroded and needed to be repaired. That floor was constantly wet with stock and pools of water due to inadequate drainage. In fact, some areas were eroded to the point that the surface was below the level of the U-drains, making the floor impossible to clean with hoses because the water would flow back to the low spots.

Other places where water on the floor was a problem were those areas between the wet ends of the paper machines and in the bleach/deink plant. The concrete floors in these areas get sprayed constantly with water from the process.

When the Bay West mill, a subsidiary of Mosinee Paper Co., was converted in 1990 to a 100% recycled paper producer of tissue and towels, a systematic effort was initiated to improve operating conditions and provide a safe working environment for employees. Still unanswered was the question of how to rehabilitate wet concrete floors without interrupting production in a mill that runs 24 h/day, 7 days/week.

Our two paper machines produce about 300 tons of tissue and paper towels per day. PM No. 1 produces 200 tons/day of toweling in three grades with different basis weights. PM No. 2 is a high-speed tissue machine that held the North American speed record. Rated at 7000 ft/min, this Sulzer Escher Wyss machine set a North American record of 6750 ft/min and has run as fast as 6900 ft/min, but not for the 24 hours required to beat the current world record of 6820 ft/min, according tro Production Manager Paul Back.

With continuous production moving at such a pace, it was not possible to dry the floors enough to apply most protective materials. Several were tried, with varying degrees of success. In most cases, the coatings lost adhesion, cracked, and peeled away.

We were seeking a material that could be applied in the presence of moisture, would cure rapidly, and could stand up to heavy loads. After reviewing product specifications from several manufacturers and checking with contractors and individuals from other mills, a resin-rich epoxy flooring product made by Rust-Oleum Concrete Protection Systems was identified as meeting our criteria.

We conducted a trial by installing Overkrete® slip-resistant test patches in key areas, including around the bases of ladders near both paper machines and on other frequently wet floor surfaces, to verify performance under severe conditions. During the trial, steel-wheeled carts carrying heavy machine rolls were frequently moved over the test patches, yet no surface damage was observed.

Based on two successful trials, a major project was initiated to repair 6000 ft^2 of badly eroded floor in the soggy basement beneath the paper machines. The contractor, Corrosion Prevention and Maintenance, Inc.,

1. A resin-rich flooring is poured onto a previously prepared section of floor between two floor drains and then smoothed with trowels. This area has been cleaned to remove loose concrete and to create a surface profile for better adhesion of the flooring. Although surrounded by wet floors and high humidity, the new floor topping adheres well to this still-damp section.

2. The floor topping is smoothed with a trowel to a depth of 250 mils (0.25 in.). With a compressive strength of about 12,000 psi when cured, this surface can withstand extremely heavy loads. It also resists wear, abrasion, and moisture.

Berea, OH, worked in sections, removing standing water, repairing cracks in the floor, and erecting plastic tents to divert moisture dripping from above. Using more than 300 ft^3 of epoxy grout, the contractor built up the floor and created a slope from the walls to the drains, which run the length of the basement between the paper machines. A resin-rich Overkrete industrial flooring was poured onto the floor and troweled to a thickness of 250 mils (0.25 in.). Aggregate was then broadcast over the still-wet material. After the flooring material cured, excess aggregate was swept away, leaving a uniform, nonporous, slip-resistant finish.

With a compressive strength of about 12,000 psi, this surface can withstand extremely heavy loads without cracking or breaking. It also exhibits good resistance to wear, abrasion, and moisture.

This project represents a sizable investment for Bay West and the parent company that will provide a financial return. We were able to make the needed repairs without having to stop production for an extended period, and maintenance in the area will be easier and less expensive. Other benefits include greater cleanliness and safety.

Based on the successful performance of the test areas installed several months ago under severe conditions, the new floor is expected to last indefinitely in the damp paper mill environment. TJ

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