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REPORT

Subject: Testing of **POWER COAT EPOXY** by ASTM E 1907 Standard Practices for Determining Moisture-Related Acceptability of Concrete Floors to Receive Moisture-Sensitive Finishes, Section 7.7 Quantitative Anhydrous Calcium Chloride Test

PURPOSE ASTM E 1907 includes Section 7.7 Quantitative Anhydrous Calcium Chloride Test which has been adopted by some floor tile applicators to determine if a floor is dry enough to allow satisfactory adhesion of floor tile systems. The ASTM procedure calls for placing containers of anhydrous calcium chloride on the surfaces in question, covering them with a water vapor impervious dome and measuring the weight gain of the calcium chloride after 72 hours. The purpose of the following tests is to demonstrate the effect of a surface coating system on the moisture emission (ME, lbs/1000 sq.ft.· 24hr) of a water saturated specimen. The specimens were mortar blocks immersed to a point about halfway up their sides in standing water during the test period.

Summary of tests One set of three mortar blocks were prepared as described in my report dated 11/18/00. - The specimens were placed in a tray of water about 3/4" deep and presoaked overnight. Half of the top surface of each block was coated as follows:

- 1) one coat of Power Coat C & S Primer, Clear, spray applied at 300 ft²/gal;
- 2) two coats of Power Coat Epoxy, Concrete Gray, brush applied at 300 ft²/gal each coat to provide coverage of 150 ft²/gal. The application rate for each coat was determined from the increase in weight of the mortar block and each coat was allowed to dry for 24 hours prior to application of the next coat.

Two shallow dishes containing calcium chloride were placed on the surface of each block, one on the coated surface, the other on the bare. Each dish was covered with a petri dish lid which was sealed to the surface with paraffin. The specimens were stored in the tray of water for three days at laboratory temperature, then the calcium chloride dishes were removed and reweighed. The increase in weight (in grams) is ΔM . The surface area under the petri dish lid (A) is $(45)^2\pi = 6362 \text{ mm}^2$ (0.068 sq.ft.). In accordance with E 1907, moisture emission (ME) is calculated as $52.9(\Delta M/tA)$, where t is test time in hours. The conversion factor 52.9 incorporates the constants necessary to give ME in lbs./1000sq.ft. in 24h. Moisture emission rates are tabulated below.

Results:

		<u>ME (lbs./1000sq.ft. in 24h)</u>
Specimen A	(coated)	0.9
	(bare)	13.5
		>93% Reduction
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Specimen B	(coated)	1.2
	(bare)	8.2
		>85% Reduction
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Specimen C	(coated)	1.1
	(bare)	8.8
		>87% Reduction

Discussion: Water emission from the coated surfaces is low, but definitely showing permeability. The adhesion of the coating to the damp block is excellent.