8-22-2015

Rapid Drying Concrete

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DOI: 10.5703/1288284315762

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Recommended Citation

ECT Team, Purdue, "Rapid Drying Concrete" (2015). *ECT Fact Sheets*. Paper 53.
<http://dx.doi.org/10.5703/1288284315762>

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RAPID DRYING CONCRETE

THE NEED

One of the essential problems that are faced during construction is the drying of concrete and the presence of moisture which affects floor coverings that need to be placed. Floor coverings are usually applied at least 6 months after concrete placement in order to give it enough time to dry since it dries at a rate of about 1 inch per month. Problems usually occur when flooring is installed prior to the drop in moisture levels, hence problems occur, such as (Prairie, 2014):

- *Failure of adhesives, leading to debonding of floor materials*
- *Discoloration of flooring*
- *Blisters in coatings*
- *Mold growth in flooring and surrounding materials*

Several techniques are available that aim at mitigating the problem of excess moisture such as topical techniques which seal concrete before flooring is applied. Although topical techniques may encapsulate moisture, they do not fully eradicate water migration which only adds to the project cost without eliminating the problem. Hence, a new type of concrete is needed. The rapid-drying characteristic in Aridus® concrete allows for the quick reduction of moisture vapor that travels through the concrete pores of the concrete.

THE TECHNOLOGY

It is a patented concrete mix design that provides a reduction in the drying time thus minimizing risks that could be borne of excess moisture vapor present in concrete slabs. It enables quicker and more effective installation of floor covering without the risk of moisture-related issues such as floor failure and mold. Aridus® uses a “proprietary self-desiccating technology that causes the moisture in the concrete to be consumed through more efficient hydration”. It also allows relative humidity targets for to be achieved in less than 45 days.

FIGURE 1 CONVENTIONAL VS. RAPID DRYING CONCRETE

FIGURE 2 INTERNAL RELATIVE HUMIDITY (RH)

THE BENEFITS

- Ability to reduce time and cost on concrete slabs since it allows faster floor covering installations
- It eliminates moisture-related flooring problems such as health hazards from mold-contaminated floors, corrections due to floor failing, testing and investigation and interruptions that occur due to replacing or removing failed flooring
- It increases the prospect that installations will progress as scheduled
- It eliminates the need for using curing compounds and other topical moisture mitigation treatments

STATUS

Aridus® has been used on some projects since its invention. It was used by Mortenson Construction on some slabs at Providence Medical Center in Everett, Washington where faster drying helped to maintain the project schedule. Another project it was used on was the Billy Earl Dade Middle School replacement

project in Dallas Texas where 5000 cubic yards of Aridus® covered 120,000 square feet of floor. Aridus® received a *Most Innovative Product Award* at the 2013 *World of Concrete* show.

FIGURE 3 MOISTURE VAPOR EMISSION RATE (MVER) TEST RESULTS AT 4 DAYS (IMAGE PROVIDED BY U.S. CONCRETE)

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REVIEWERS

Peer reviewed as an emerging construction technology

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PUBLISHER

Emerging Construction Technologies, Division of Construction Engineering and Management, Purdue University, West Lafayette, Indiana