VCCTL Newsletter

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VCCTL APPLICATION SPOTLIGHT

How Thirsty is Your Concrete?

Using the VCCTL to Support Mixture Proportioning for Internal Curing

This issue, we describe the usage of the VCCTL to support mixture proportioning for internal curing.

In recent years, the use of internal curing to provide extra curing water for low w/c ratio concretes has proceeded from the laboratory to field practice. To properly proportion such concrete mixtures, it is necessary to know how much extra internal curing water is required to satisfy the hydration requirements of the cement paste in the concrete (e.g., just how thirsty is the concrete being placed). While this can be calculated fairly easily (an example can be found at http://vcctl.cbt.nist.gov/lwagg.html), one of the key inputs for the calculation is the ultimate expected chemical shrinkage of the cement paste. Fortunately, this is one of the standard outputs from a hydration run in the VCCTL system. Specifically, one needs to know the chemical shrinkage of a given cement paste per unit of hydration of the cement. This is easily obtained by dividing the output chemical shrinkage values by the output degree of hydration values contained in the same ***.chs*** output files, and observing the long time trend in this quantity as it approaches a constant value.

Chemical shrinkage varies substantially with cement composition and curing temperature, two variables that are explicitly accounted for in the VCCTL cement hydration models!

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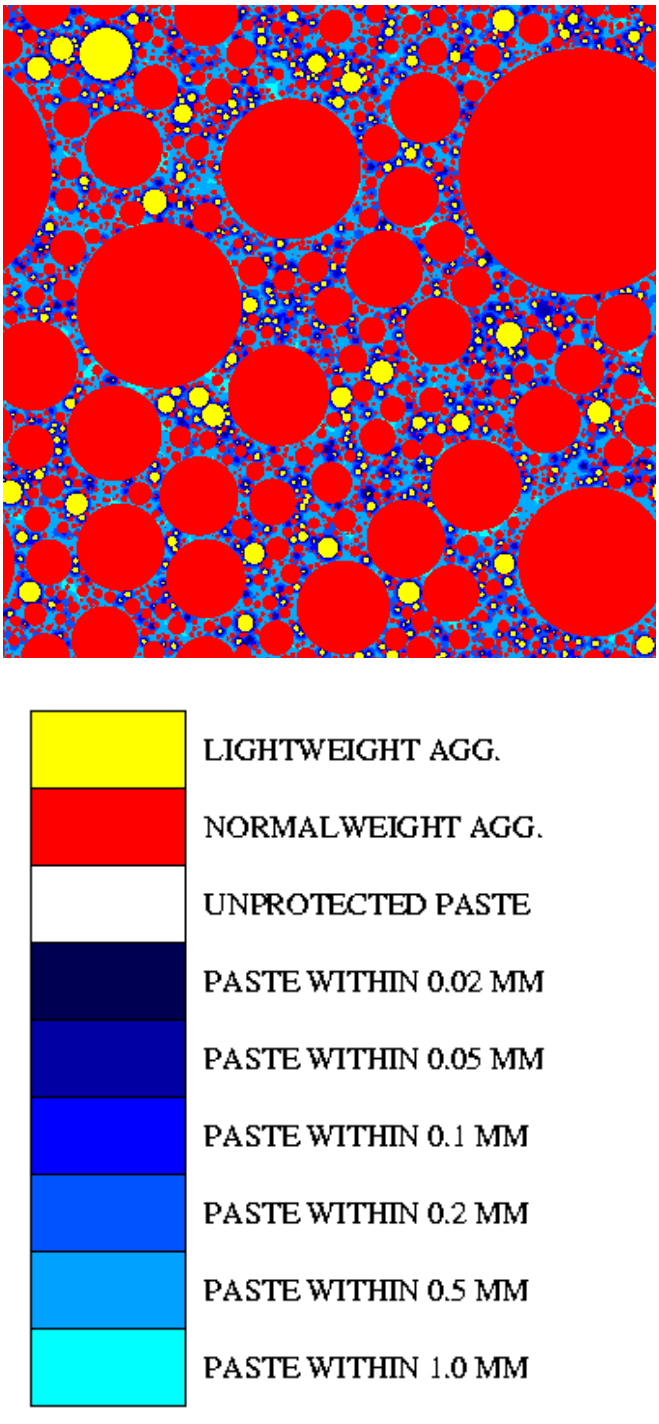
VCCTL WEB SITES

http://vcctl.cbt.nist.gov/
http://bfrl.nist.gov/862/vcctl/

VCCTL IMAGE GALLERY



Two-dimensional image (3cm x 3 cm) from a virtual concrete showing available water distribution (distance from surface of a water-containing lightweight aggregate (LWA)) for a mixture with 20% fine aggregate replacement by LWA.

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