

VCCTL Newsletter

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VCCTL APPLICATION SPOTLIGHT

This quarter, we spotlight the usage of the VCCTL system by Prof. Kenneth Hover and Kyle Douglas of Cornell University, Ithaca, NY. They have utilized the VCCTL to compute the chemical shrinkage potential of cement pastes at different w/c ratios to compare to their measured bulk shrinkage values. At early ages, the chemical shrinkage and bulk shrinkage are nearly identical, but once setting occurs, the bulk shrinkage is much less than the chemical shrinkage. Figure 1 shows the VCCTL-computed chemical shrinkage and the experimental bulk shrinkage for pastes at three different w/c ratios along with experimental data on the measured degree of hydration of cement pastes at different w/c ratios, obtained by J.H. Taplin in 1959.

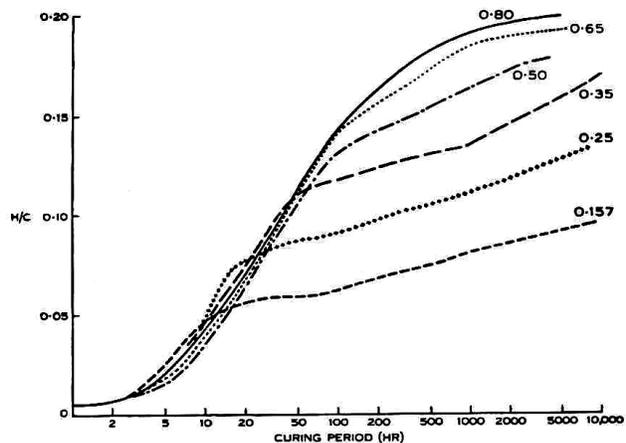
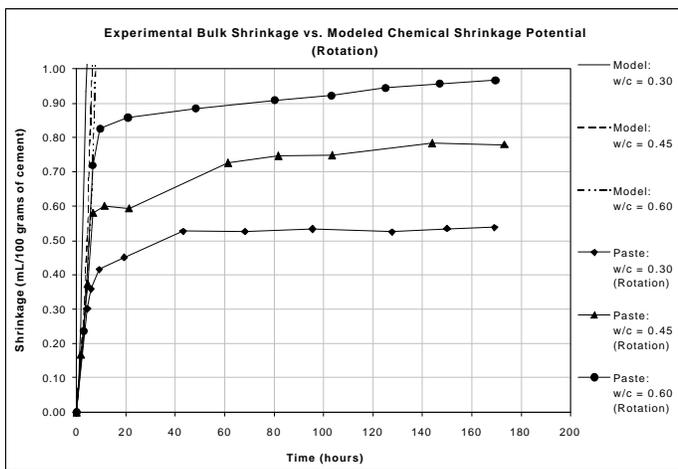


Fig. 2.—H/C v. log curing period for W/C of 0.157, 0.25, 0.35, 0.50, 0.65, and 0.80.

Figure 1. VCCTL-computed chemical shrinkage and experimental bulk shrinkage (upper) and Taplin's measured degree of hydration (lower) of portland cement pastes with various w/c ratios. (Taplin, J.H.. Austral. J. Appl. Sci.. 10. 329-345. 1959).

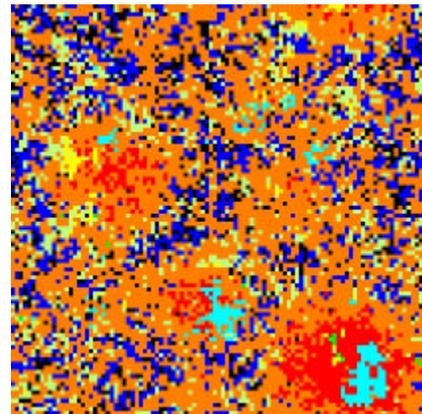
Consortium Industrial Members for 2002:

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- Degussa Construction Chemicals*
- Dyckerhoff Zement GmbH*
- Holcim Inc.*
- Int'l. Center for Aggregate Research*
- Portland Cement Association*
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- W.R. Grace & Co. – Conn.*

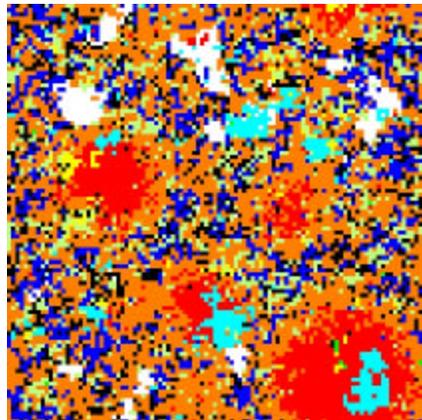
VCCTL Web Sites:

- <http://vcctl.cbt.nist.gov/>
- <http://bfrl.nist.gov/862/vcctl/>

VCCTL IMAGE GALLERY



saturated



sealed

Hydration of a w/c=0.4 cement paste under "saturated" and sealed curing conditions. White is empty porosity and other colors are unhydrated cement and hydration products.

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Editors: Dale Bentz and Jeff Bullard

dale.bentz@nist.gov

bullard@nist.gov