



Chapter News

The Super Air Meter (SAM)

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The Super Air Meter (SAM) is a testing device that measures both the air void spacing and air content of plastic (fresh) concrete in about 10 minutes. Air void spacing has been shown to be a better indicator of concrete freeze-thaw durability than total air content; however, until now, it has been challenging to measure in fresh concrete. By being able to measure the actual air-void spacing in the fresh concrete, the meter helps users better understand the freeze-thaw durability of their concrete before it is placed.

The device is a modified version of the typical pressure method (ASTM 231). The primary modification is that two sequential pressurizations are applied to the concrete. The deformation of the concrete is first investigated at 14.5, 30, and 45 psi, the pressure is then released, and the same pressure steps are used again to measure the deformation. The differences between the first and second pressure steps are used to calculate the SAM number, which is correlated with the average spacing between air voids in the concrete mixture. If the spacing between the voids is too high then this could mean the concrete is susceptible to

freeze-thaw deterioration. A SAM number of 0.20 has been shown to correctly determine over 90% of the time whether the spacing between the bubbles meets the recommendations of the ACI 201 Concrete Durability Committee.

This device has been investigated using more than 300 lab and field mixtures at Oklahoma State University and the FHWA Turner Fairbanks Laboratories. As part of an ongoing Pooled Fund Study, the SAM is being used by 10 different DOTs on field concrete. The results of the SAM are also being compared to performance in the ASTM C666 rapid freeze-thaw test. An AASHTO Provisional Standard for this test has been prepared and is being balloted in February. The meter is currently being used in 20 different states and one Canadian Province. The SAM has been specified in Oklahoma and Michigan. More details and purchasing information can be found at www.superairmeter.com.

