

Auto-Shrink

 for linear measurement of autogenous shrinkage of hardening cement-based materials

Increasing the resistance to penetration of water and harmful ions can be done by using mixes with low w/c ratio or application of e.g. silica fume. This is desirable in terms of durability, but such mixes are more prone to cracking due to chemical shrinkage of the cement.

The **Auto-Shrink** measure the unrestrained autogenous shrinkage of a specimen of cement paste or mortar cured under sealed conditions (ASTM C1698). The specimen is a corrugated plastic tube containing the paste / mortar. The system permits evaluation of the relative autogenous shrinkage potential of different cementitious systems. Excessive autogenous shrinkage may lead to microcracking in the paste increasing the permeability of concrete reducing concrete's resistance to penetration of water and deleterious substances such as chloride ions.

Procedure



Fill the corrugated tube and install end-plugs



Place the tubes on a grooved rack until setting



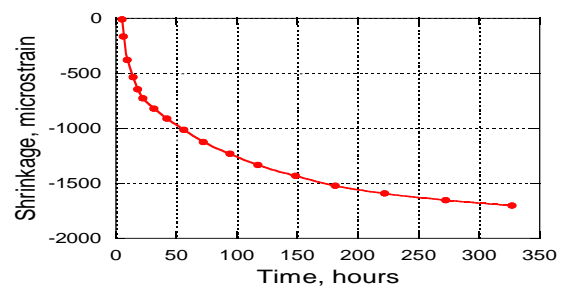
Position corrugated tube in the dilatometer



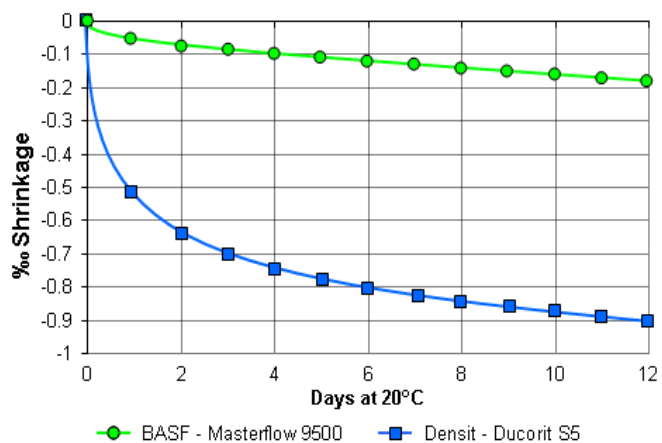
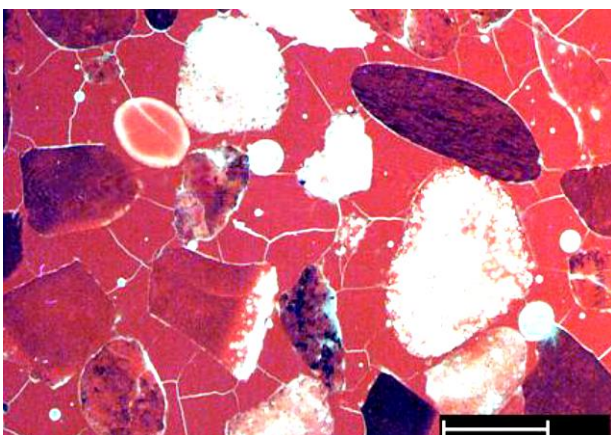
Measure length over time

Example 1

The adjacent graph is an example of very high autogenous strain measured over 2 weeks on a cement paste (w/c ratio of 0.25) with 10 % silica fume cured at 30 °C. The strain has been defined as 0 at the time of final setting of the paste (from Mejlhede Jensen and Freiesleben Hansen, 1995).



Example 2



Thin section showing excessive autogenous shrinkage microcracking, interconnected, for the mortar tested – the blue curve. The mortar related to the green curve showed no microcracking. Evaluation was made for mortars used in windmills monopile tower section construction.

GERMANN INSTRUMENTS A/S

Emdrupvej 102 - DK-2400 Copenhagen NV - Denmark
Phone: (+45) 39 67 71 17 , E-mail: germann-eu@germann.org
Internet: www.germanninstruments.com



Test Right – Sleep Tight