

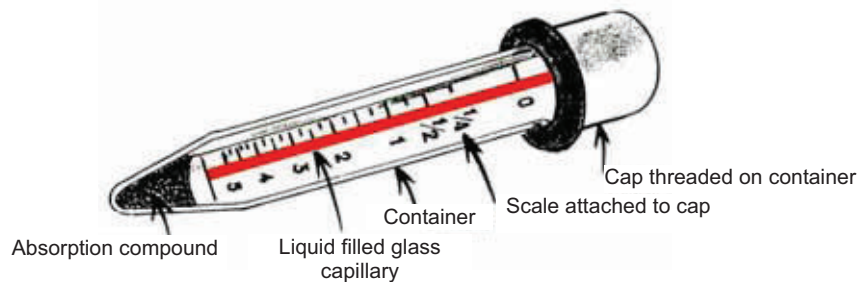
Purpose

The **COMA-Meter** (COncrete MAaturity-Meter) is used to measure the maturity of newly cast concrete at a depth of 80 mm from the surface for the following purposes:

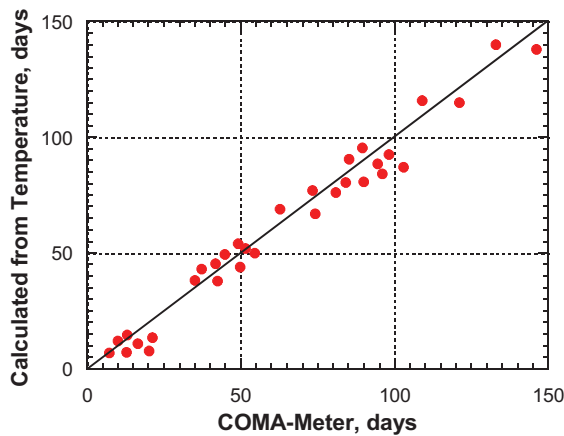
- Estimating the compressive strength at an early age using a pre-established strength-maturity relationship (see page 27 for illustration)
- Timing of pullout testing with **LOK-TEST** for early-age strength measurement
- Evaluating the effective in-place curing temperature

Principle

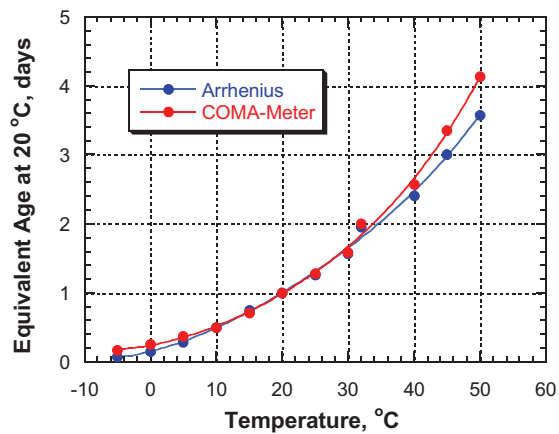
A glass capillary contains a liquid for which the rate of evaporation varies with temperature according to the Arrhenius equation, which is the same function that is used to determine maturity of concrete from the temperature history. The closed capillary is placed on a card with a calibrated scale indicating maturity in equivalent age at 20 °C. The card is attached to a cap threaded onto a transparent container. After the concrete is cast, the capillary tube is snapped at the zero mark on the scale, the cap is threaded in the container, and the container is pressed into the fresh concrete.



The temperature within the container will stabilize quickly with the temperature of the surrounding concrete. The liquid in the capillary tube evaporates at a rate determined by the temperature and time. The level of the liquid, readable on the scale, measures the maturity of the concrete stated in M_{20} units, which is the number of equivalent days of curing at 20 °C.



Comparison between **COMA-Meter** maturity and maturity calculated from temperature readings (Source: Möller, G. "Evaluation of COMA-test," Report 8335-1983, CBI, Stockholm, Sweden)



Maturity calculated by Arrhenius equation compared with **COMA-Meter** readings after one actual day at temperatures between -5 °C and 50 °C

COMA-Meter

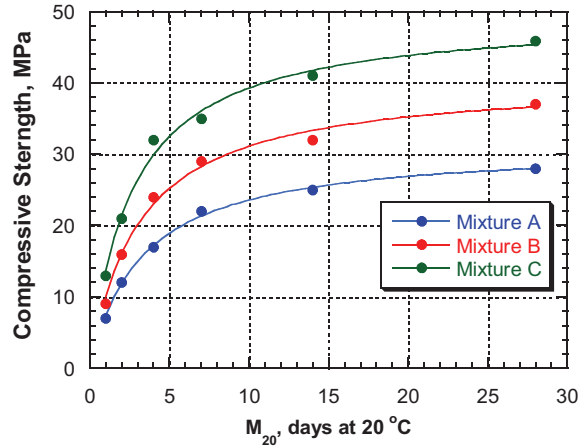
Resolution and Accuracy

The measuring ranges of the two types of **COMA-Meters** are 0 to 5 M_{20} days for the **COMA-5** and 0 to 14 M_{20} days for the **COMA-14**. The scale allows the maturity to be estimated to within $\pm 0.1 M_{20}$ days. The meter is accurate to within $\pm 5\%$ compared with maturity values calculated from temperature readings as shown on the previous page. The activation energy E for the **COMA-Meter** is 40 kJ/mol.

Applications



Maturity measured by the **COMA-Meter** before in-place strength testing with **LOK-TEST** for early form removal.



Examples of pre-established strength- maturity relationships, allowing in-place strength estimation by means of maturity.



COMA-Meter installed in concrete for strength indication before stripping of forms in cold weather conditions.



COMA-Meter installed in a newly cast airport runway slab for evaluation of the timing of cutting the joints.



COMA-5
Pack of five 0 to 5 M_{20} days **COMA-Meters**



COMA-14
Pack of five 0 to 14 M_{20} days **COMA-Meters**

GERMANN INSTRUMENTS A/S

Emdrupvej 102, DK-2400 Copenhagen, Denmark

Phone: +45 39 67 71 17, Fax +45 39 67 31 67

E-mail: germann-eu@germann.org Web site: www.germann.org



GERMANN INSTRUMENTS, Inc.

8845 Forest View Road, Evanston, Illinois 60203, USA

Phone: (847) 329-9999, Fax: (847) 329-8888

E-mail: germann@germann.org Web Site: www.germann.org



Test smart - Build right