

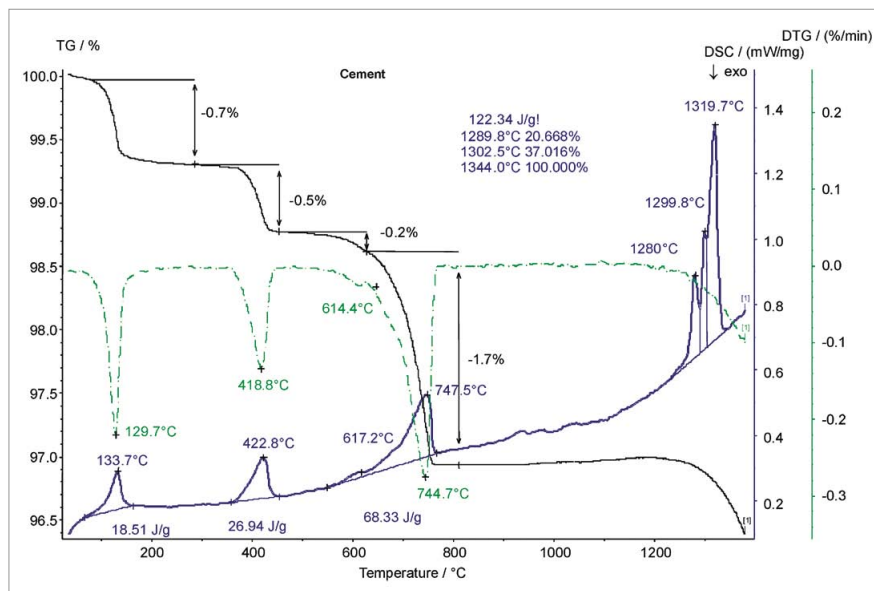
# APPLICATION SHEET

## INORGANICS – BUILDING MATERIALS

### PORTLAND CEMENT

In 2002 the world production of hydraulic cement was 1800 million metric tons. The top three producers were China with 704, India with 100, and the United States with 91 million metric tons. Portland cement is the most com-

mon type of cement and widely used for the construction of buildings, bridges etc. Cement is also one of the main components of concrete, which is a mixture of sand, stones and cement as binder.



#### Instrument

STA 449 C Jupiter®

#### Test Conditions

Temperature range	RT... 1350°C
Heating rate	10 K/min
Atmosphere	Argon at 50 ml/min
Sample mass	39.5 mg
Crucible	Pt/Rh with lids
Sensor	TG-DSC type S

#### Results

With the STA, the components (additives) of cement can be identified and quantified. The 1<sup>st</sup> TG step is due to the water loss of CaSO<sub>4</sub> di-hydrate and hemi-hydrate. At about 419°C (DTG peak), the water loss of Ca(OH)<sub>2</sub> shows its maximum. The decomposition of carbonates (calcite, dolomite) was found in the temperature range between 600°C and 750°C. The MgCO<sub>3</sub> amount of dolomite decomposes prior to CaCO<sub>3</sub>. At about 1200°C, CaSO<sub>4</sub> starts melting and decomposing.