

APPLICATION SHEET

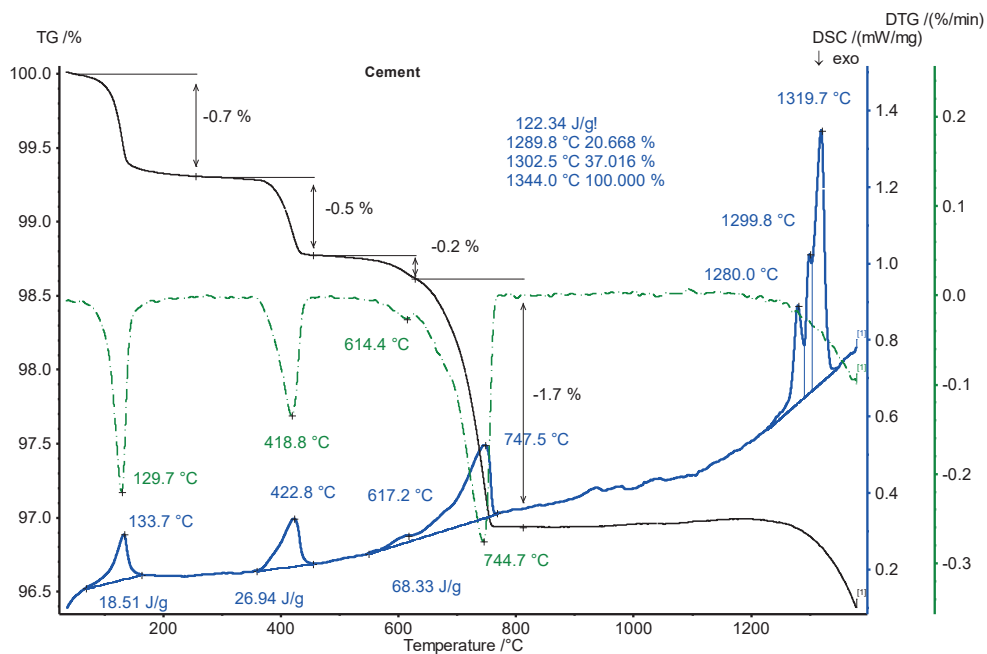
Inorganics · Building Materials
STA 449 **F1 Jupiter**[®]

Portland Cement

Introduction

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 common 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.



Test Conditions

Temperature range: RT ... 1350°C
Heating rate: 10 K/min
Atmosphere: Argon (50 ml/min)
Sample mass: 39.5 mg
Crucible: Pt/Rh with lids
Sensor: TGA-DSCtype S

Test Results

With the STA, the components (additives) of cement can be identified and quantified. The 1st TGA step is due to the water loss of CaSO₄ di-hydrate and hemi-hydrate. At about 419°C (DTG peak), the water loss of Ca(OH)₂ shows its maximum. The decomposition of carbonates (calcite, dolomite) was found in the temperature range between 600°C and 750°C. The MgCO₃ amount of dolomite decomposes prior to CaCO₃. At about 1200°C, CaSO₄ starts melting and decomposing.