

APPLICATION SHEET

Ceramics · Electronics
DIL 402 CD

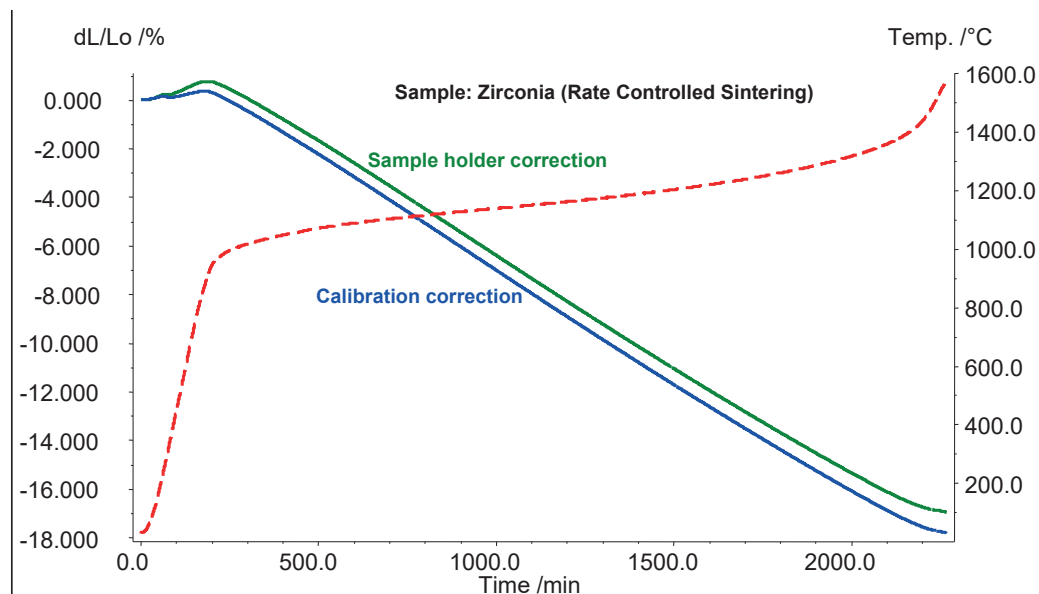


Zirconia – Correction for RCS Measurements

Introduction

The thermal expansion of zirconia was measured using the NETZSCH model pushrod dilatometer 402 CD. Using the double sample dilatometer, it is possible to measure the sample and standard parallelly. Hence, the sample and

standard go through exactly the same temperature program. This is an advantage especially for Rate Controlled Sintering where the course of the temperature raise is not completely predictable. Zirconia was measured with the DIL 402 CD+RCS software extension employing a constant shrinkage rate of 0.01%/min. (lass-reinforced plastic).



Test Conditions

Temperature range: RT ... 1600°C
Heating rates: 0 ... 10 K/min
Atmosphere: Air
Sample length: 10.13 mm
Sample holder: Alumina
Standard material: Alumina

Test Results

In the figure, it is shown that at the beginning with a temperature of 1000°C, the heating rate is reduced in order to keep the rate of shrinkage at a level which can be specified in the test program, in this case 0.01%/min. The green curve shows the thermal expansion in consideration of a sample holder correction for which literature values for the sample holder material were used. Much more accurate and less time-consuming is the correction with a standard which is parallelly measured ("calibration correction", blue curve).