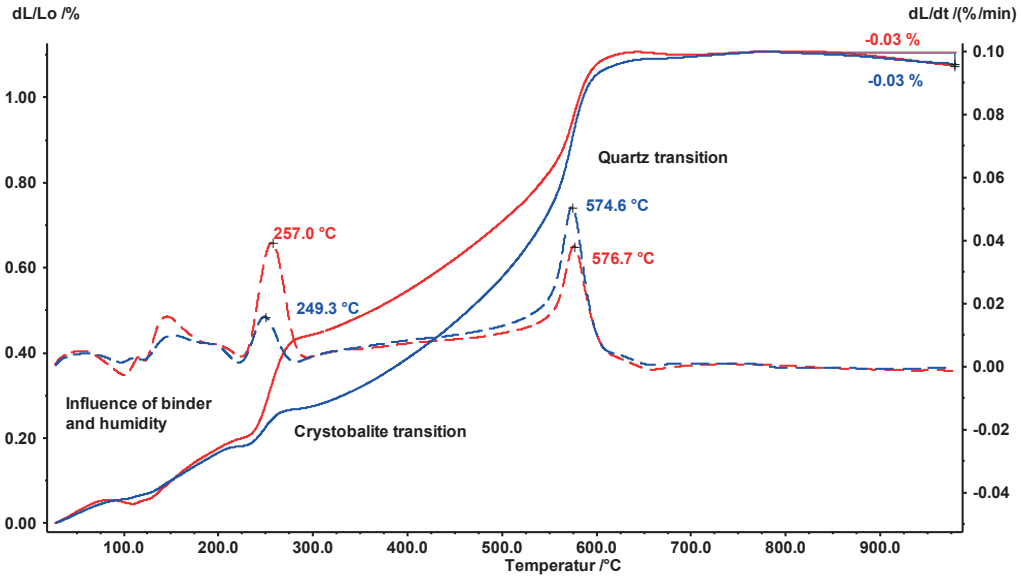
APPLICATION**SHEET**

Inorganics · Ceramics
DIL 402

Mold Materials for Casting of Dental Alloys

Introduction

Casting of precious metals for dental applications is a growing area in the medical field. More and more people prefer metal inserts in their teeth as they are more robust and biocompatible and yield a long lifetime. However, the costs for such precious metal alloys are high and the production process is critical. In case of expansion mismatches between the mold material (generally a mixture of different silica modifications) and the metal, the shape of the dental implant can no longer be accurately controlled. Thermal expansion measurements on the mold material are therefore crucial to achieve a good casting product.



Test Conditions

Temperature range:	RT ... 100°C
Heating rates:	5 K/min
Atmosphere:	air, static
Sample length:	approx. 25 mm
Calibration:	without alumina

Test Results

Presented in the figure are two thermal expansion measurements on different types of casting materials. The difference in the expansion behavior between 200 and 600°C can clearly be seen. The reason for the difference in the expansion behavior can be explained by the composition of the samples. Sample 1 (blue curve) has a lower crystobalite and higher quartz content. Sample 2 (red curve) has a higher crystobalite (higher expansion step between 200 and 300°C) and lower quartz content. The difference in the structural composition can simply be analyzed by means of a dilatometer test.

NGB · Application Sheet 091 · E · 0621 · Technical specifications are subject to change.

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