



Thermal shock resistance of ceramics in general

The heating and cooling curves generally recommended in ceramics for dense components should be adhered to as far as possible.

The heating rate from 20 °C to 1000 °C is 3,5 °C/minute.

From 1000 °C to the final temperature, 5 °C/minute is recommended.

For cooling, the reverse path is given.

It is generally known that the above values are only valid to a limited extent, because the geometry of the component, especially the wall thickness, has a great influence on the thermal shock resistance. For example, a dense aluminium oxide tube of Ø5 mm x Ø3 mm x 150 mm (wall thickness 1 mm) can be heated from 20 °C in approx. 3 minutes to 1500 °C in about 3 minutes.

The larger the parts become, the slower the heating up or cooling down must be. Porous, coarse-grained components allow a shorter heating rate. This should be tested by the customer depending on the application.

Isostatically pressed zirconium oxide crucibles should be backfilled with a MgO compound for inductive melting. Heating up to 1000 °C approx. 8 °C/min., after that it can be increased faster.