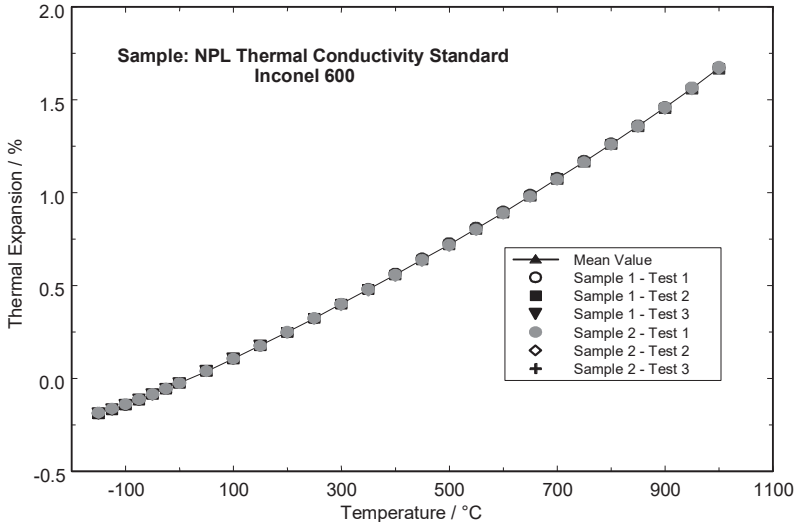
APPLICATION**SHEET**

Metals/Alloys Aerospace
DIL 402

Nickel-Based Superalloy (Inconel 600)

Introduction

Inconel alloys are a family of non-magnetic nickel-based superalloys. Inconel alloy 600 is 72% nickel, 16% chromium, and 8% iron. The high chromium content of Inconel 600 raises its oxidation resistance considerably above that of pure nickel, while its high nickel content provides good corrosion resistance under reducing conditions. Therefore, Inconel 600 offers high oxidation and corrosion resistance, even at very high temperatures, and retains a high mechanical strength under these conditions, as well. Thus, it is often used under extreme conditions, such as in aircraft engine parts, turbocharger turbine wheels, chemical processing and pressure vessels. Inconel 600 & 800 are also used in the pressure tubes of CANDU nuclear reactors. Furthermore, Inconel 600 is a certified reference material for the thermal conductivity.



Test Conditions

Temperature range:	-150°C ... 1000°C
Heating rates:	5 K/min
Atmopshere:	Helium at 100 ml/min
Sample length:	approx. 25 mm
Calibration:	Platinum/fused silica holder:

Test Results

Presented in the plot are the results of six different runs on an Inconel superalloy between room temperature and 1000°C. Additional measurements were carried out between -150 and 50°C employing the low-temperature furnace. The differences between the individual runs are in the range of ±0.5% which corresponds to the typical accuracy of the unit. At lower temperatures, a nearly linear increase in the thermal expansion results can be seen. Between 500 and 600°C, a slight slope change is visible. This effect can be explained by a structural change in the material (formation of $NiCr_3$ clusters) leading to a slightly different rate of expansion at higher temperatures.

NGB · Application Sheet 104 · E · 0621 · Technical specifications are subject to change.

NETZSCH-Gerätebau GmbH
Wittelsbacherstraße 42 · 95100 Selb · Germany
Phone: +49 9287/881-0 · Fax: +49 9287/881505
at@netzsch.com · www.netzsch.com