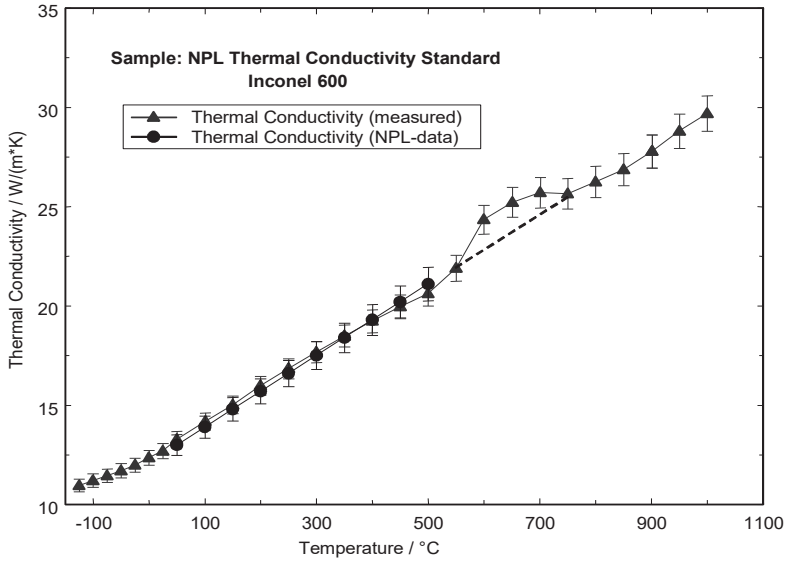
APPLICATION**SHEET**

Metals · Aerospace
LFA 467 *HyperFlash®*

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 also retains a high mechanical strength under these conditions. 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:	-125°C ... 1000°C
Sample holder:	12.7 mm
Sample thickness:	approx. 3 mm
Sample surface preparation:	Sandblasted
c_p from DS:	-

Test Results

Presented in the figure are the thermal conductivity values determined by means of LFA, DIL and DSC tests. Additionally shown are the certified values from NPL (Redgrove, 2003) between 50 and 500°C. Within the uncertainty of the standard material and the accuracy of the tests (error bars), both values agree quite well in the overlapping temperature range. The critical range for the thermal conductivity determination was the temperature range between 550 and 700°C. Here, the calculated thermal conductivity shows on overlapping effect. Due to the fact that the $NiCr_3$ cluster formation occurs in this temperature range, the results represent only the apparent thermal conductivity. Not considering a possible overlapping phase transition enthalpy in the specific heat, the true thermal conductivity might follow a nearly linear increase in this temperature range as indicated as a dashed line in the figure.

NGB · Application Sheet 102 · E · 0621 · Technical specifications are subject to change.

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