

APPLICATION SHEET

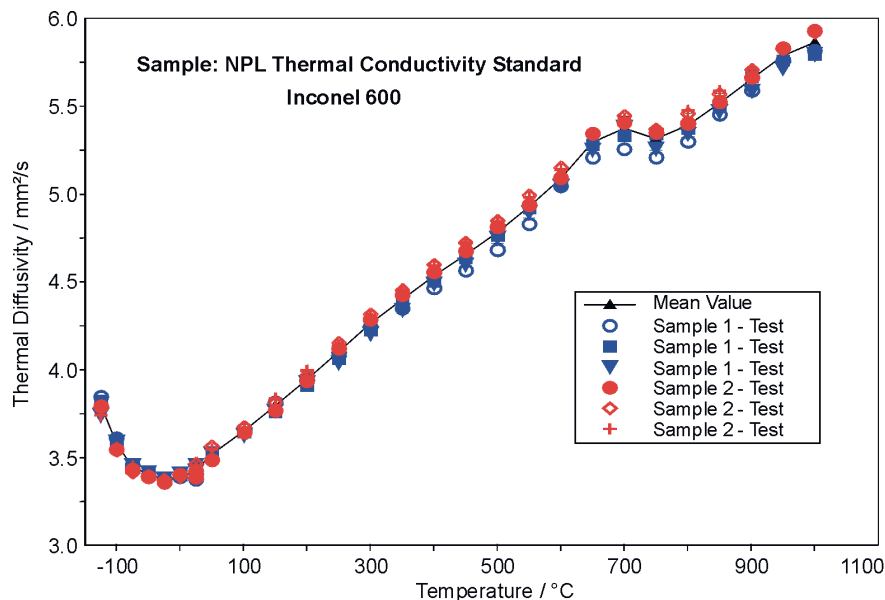
Metals/Alloys · Aerospace
LFA 467 HyperFlash®

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 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: -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 plot are the results of six different runs on Inconel superalloy between -125 and 1000°C. Two different furnace systems were employed for the tests (-125 ... 25 °C and 25 ... 1000°C). The differences between the individual runs are in the range of $\pm 2\%$ which corresponds to the typical accuracy of the unit. A minimum was obtained in the thermal diffusivity slightly below 0°C. This might be due to a change in magnetic properties. Between 500 and 700°C, a step overlaps the thermal diffusivity. This step is caused by the formation of $NiCr_3$ clusters. Outside the transition range, a nearly linear increase was obtained in the thermal diffusivity.