

APPLICATION SHEET

Metals – Aerospace

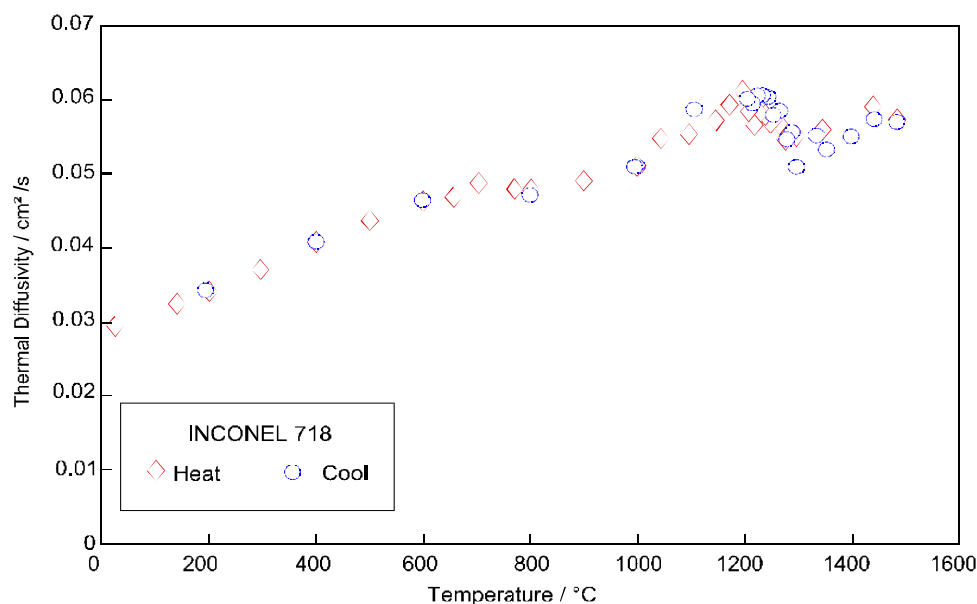
LFA 427

Inconel 718

Introduction

Inconel 718 is a nickel-based superalloy (nickel-chromium-iron) with high strength. It is a corrosion-resistant nickel chromium material used at -253°C to 700°C. The age-hardenable alloy can be readily fabricated, even into complex parts. Its welding characteristics, especially its resistance to postweld cracking, are outstanding. The ease and

economy with which INCONEL alloy 718 can be fabricated, combined with good tensile, fatigue, creep, and rupture strength, have resulted in its use in a wide range of applications. Examples of these are components for liquid-fueled rockets, rings, casings and various formed sheet metal parts for aircraft and land-based gas turbine engines, and cryogenic tankage. It is also used for fasteners and instrumentation parts.



Test Conditions

Temperature range: RT ... 1500°C
Heating rate: 20 K/min
Atmosphere: Ar at 60 ml/min
Sample holder: Liquid metal sample holder
Sensor: InSb

Test Results

The measurement was carried out during heating and cooling. No significant difference was obtained between the heating and cooling cycles. Between 600 and 900°C, a slight change in the slope can be seen which is caused by a solid-solid-phase transition (formation of nickel-chromium clusters). Above 1200°C, a drop is visible in the thermal diffusivity caused by melting of the material. In the liquid region (above 1300°C), the thermal diffusivity increases versus temperature. The result proves that the liquid metal container of the LFA 427 even works for critical metal melts.