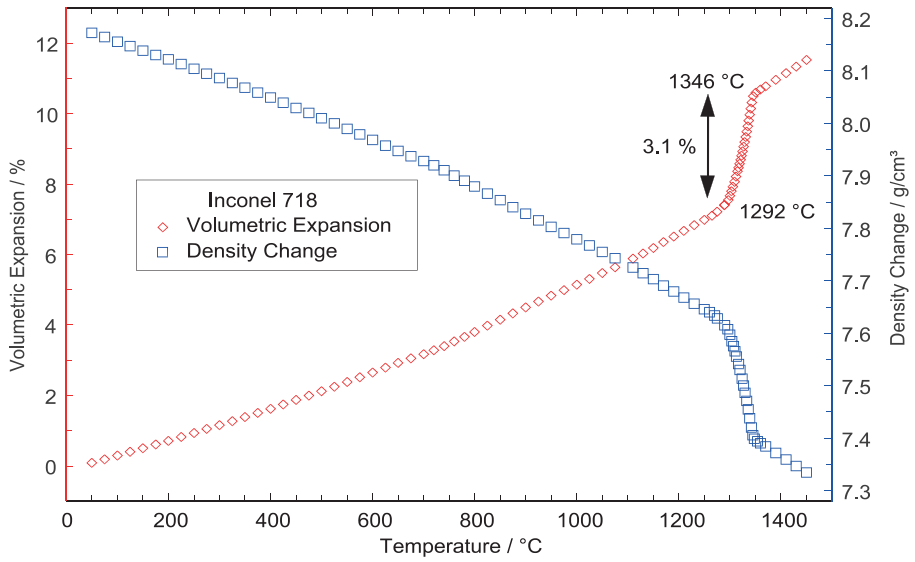
APPLICATION**SHEET**

Metals/Alloys · Aerospace
DIL 402

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-hard-enable 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 ... 1450°C
Heating rate:	5 K/min
Atmosphere:	Helium at 60 ml/min
Sample length:	12 mm
Container:	Sapphire
Sample holder:	Alumina

Test Results

The measurement was carried out during heating inside a sapphire liquid metal container for pushrod dilatometers. The results were evaluated using the NETZSCH density software to achieve the volumetric expansion and density change. It can be seen that the volume increases nearly linearly up to 700°C. There, a slight change in the slope was obtained. At 1292°C, a step is visible in volumetric expansion (melting). During the melting process, a volume change of 3.1% was measured. Such tests on liquid metals are unique for NETZSCH dilatometers and sample holders.

NGB · Application Sheet 105 · E · 0621 · Technical specifications are subject to change.

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