Technical Data Sheet

HI-TEMP® 935

NOMINAL COMPOSITION

Nickel	Remainder
Chromium	15.0% ± 1.5%
Boron	3.25% - 4.00%
Phosphorous	0.02% Max
Iron	1.5% Max
Carbon	0.06% Max
Sulfur	0.02% Max
Titanium	0.05% Max
Aluminum	0.05% Max
Zirconium	0.05% Max
Cobalt	0.10% Max
Selenium	0.005% Max
Other Elements (Total)	0.50% Max

PHYSICAL PROPERTIES

Color	Iron Gray
Melting Point (Solidus)	1930°F (1055°C)
Flow Point (Liquidus)	1930°F (1055°C)
Brazing Temperature Range	1930°F - 2200°F (1055°C - 1205°C)
Density (Lbs/in^3)	0.283
Electrical Conductivity (%IACS) [(1)]	N/A
Electrical Resistivity (Microhm-cm)	N/A

[(1)] IACS = International Annealed Copper Standard

PRODUCT USES

Hi-Temp 935 is a nickel-chromium brazing alloy used in high temperature strength and oxidation applications. Typically, this alloy is used for joining super alloys, corrosion and heat resistant steels, and alloys requiring good joint strength at high temperatures while maintaining good corrosion and oxidation resistant characteristics. Typical applications would include structural members in jet engines, turbines, thin walled heat exchangers, and automotive components.

BRAZING CHARACTERISTICS

Hi-Temp 935 is a eutectic composition and in melting it acts like a metallic element, i.e. it melts completely at a single temperature, thus it will quickly flow into long narrow joints. To achieve maximum flow, strength and joint ductility in furnace brazing through diffusion, it is recommended to maintain a brazing temperature closer to 2200°F (1204°C). However, if diffusion and erosion are a concern, brazing temperatures closer to 2140°F (1170°C) can be used. In atmosphere brazing, base metals containing more than 0.5% aluminum and/or titanium (i.e. Inconel X and A286) are often nickel-plated (0.0005 in. to 0.0015 in. thick depending upon brazing temperature and cycle), if difficulties in wetting and bonding are encountered. On thinner sections or less ductile base metals, brazing should be done at the low end of the brazing range with small clearances, fast heating/cooling cycles, and a minimum quantity of brazing alloy to minimize erosion.

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PROPERTIES OF BRAZED JOINTS

The properties of a brazed joint are dependent upon numerous factors including base metal properties, joint design, metallurgical interaction between the base metal and the filler metal. Joint ductility, strength and high temperature properties, and alloy re-melt temperature increase with increasing temperature and heating cycles, and decreasing joint clearances. Oxidation tests on Inconel for 500 hours in still air at 2200°F (1204°C) showed no deteriorations of fillet. Satisfactory corrosion resistance to liquid alkali metals (Na, K) and high temperature water were obtained in independent tests on Inconel and stainless steel.

AVAILABLE FORMS

Foil and powder.

Available mesh sizes for powder:

140C	140F	325
+100 Mesh: 0.5% Max	+100 Mesh: 0.5% Max	+200 Mesh: 0.5% Max
+140 Mesh: 10% Max	+140 Mesh: 10% Max	+325 Mesh: 10% Max
-325 Mesh: 20% Max	-325 Mesh: 55% Max	-325 Mesh: 90% Min

**Mesh sizes per AWS A5.8M/A5.8*

SPECIFICATIONS

Hi-Temp 935 alloy conforms to the following specifications:

- American Welding Society (AWS) A5.8/A5.8M BNi-9

APPLICABLE PRODUCT CODE(S)

The applicable Lucas-Milhaupt product code(s) for this technical data sheet: 77-935.

SAFETY INFORMATION

The operation and maintenance of brazing equipment or facility should conform to the provisions of American National Standard (ANSI) Z49.1, "Safety in Welding and Cutting". For more complete information refer to the Material Safety Data Sheet for Hi-Temp 935.

WARRANTY CLAUSE

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