LucasMilhaupt®
A Handy & Harman Company
Global Brazing Solutions®

Technical Data Sheet

HI-TEMP® 930

NOMINAL COMPOSITION

Nickel	Remainder
Boron	1.85% ± 0.35%
Silicon	3.5% ± 0.5%
Iron	1.5% Max
Phosphorous	0.02% 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)	1800°F (982°C)
Flow Point (Liquidus)	1950°F (1066°C)
Brazing Temperature Range	1950°F - 2150°F (1066°C - 1175°C)
Specific Gravity	7.74
Density (Lbs/in^3)	0.280
Electrical Conductivity (%IACS) [(1)]	N/A
Electrical Resistivity (Microhm-cm)	N/A

[(1)] IACS = International Annealed Copper Standard

PRODUCT USES

Hi-Temp 930 is a nickel -silicon-boron-iron brazing alloy powder with low joining temperature. It provides high temperature joint strength plus oxidation, corrosion, and abrasion resistance on thick sections of stainless steel, ductile nickel, and cobalt base alloys. Hi-Temp 930 exhibits lower base metal penetration compared to alloys like Hi-Temp 820 (AWS A5.8/A5.8M BNi-2) and Hi-Temp 910 (AWS A5.8/A5.8M BNi-3). Typical applications would include structural members in jet engines, turbines, chemical processing, and nuclear equipment (not exposed to radiation) requiring lower brazing/heat treatment temperatures.

BRAZING CHARACTERISTICS

Hi-Temp 930 will flow into long, narrow joints, in marginal atmospheres but will flow particularly well at the higher brazing temperature, in reducing atmospheres (-60°F dew point or lower) or inert atmospheres (-80°F dew point or lower). 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. Recommended joint clearance at brazing temperature for Hi-Temp 930 is 0.002 in. – 0.004 in. (0.05 mm – 0.10 mm).

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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. The hardness decreases, due to diffusion of the boron into the base metal and greater brazing-alloy/base-metal alloying. This alloy shows satisfactory oxidation resistance at temperatures as high as 1800°F (982°C).

AVAILABLE FORMS

Powder and paste.

Available mesh sizes for powder:

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

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

SPECIFICATIONS

Hi-Temp 930 alloy conforms to the following specifications:

- American Welding Society (AWS) A5.8/A5.8M BNi-4
- Society of Automotive Engineers (SAE) / AMS 4779
- ASME Boiler & Pressure Vessel Code, Sec II-C, SFA-5.8 BNi-4
- International Organization for Standardization (ISO) 17672 Ni 631
- British Standard (BS) EN 1044 Ni 104
- Deutsches Institut für Normung (DIN) 8513 Part 5 L-Ni4

APPLICABLE PRODUCT CODE(S)

The applicable Lucas-Milhaupt product code(s) for this technical data sheet: A00000479, Legacy Code: 77-931.

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 930.

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