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AMS 4778 (BNi-3)

TECHNICAL DATA

NOMINAL COMPOSITION

Nickel	Remaining
Boron	3.125% ± 0.375%
Silicon	4.5% ± 0.5%
Iron	0.5% Max
Phosphorus	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
Solidus	1800°F (982°C)
Liquidus	1900°F (1037°C)
Recommended Brazing Temperature	1950-2000°F (1065-1093°C)
Density (Lbs/in^3)	0.29
Specific Gravity	8.13
Electrical Conductivity (%IACS)	N/A
Electrical Resistivity (Microhm-cm)	N/A

USES

AMS 4778 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 based alloys. 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

AMS 4778 will flow into long, narrow joints, in marginal atmospheres but will flow particularly well at the higher brazing temperature, in reducing atmospheres (-60F dew point or lower) or inert atmospheres (-80F dew point or lower). In atmosphere brazing, base metals containing more than 0.5% aluminum and/or titanium 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 AMS 4778 is 0.000 in. – 0.002 in. (0.00 mm – 0.05 mm).

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 2000F (1093F).
SPECIFICATIONS	AMS 4778 conforms to: Unified Numbering System (UNS) N99630, American Welding Society (AWS) A5.8/A5.8M BNi-3 and Society of Automotive Engineers (SAE) AMS 4778
AVAILABLE FORMS	Powder and Paste

Individuals requiring further information and Engineering Specification Documents may wish to contact the Engineering Society for Advanced Mobility, Land Sea Air and Space, The Society of Automotive Engineers http://www.sae.org/ (SAE AMS) or The American Welding Society (AWS) http://aws.org/

NOTE: