

## Prince & Izant Company

12999 Plaza Drive  
Cleveland, Ohio 44130  
T: 216-362-7000  
F: 216-362-7456  
[princeizant.com](http://princeizant.com)



## APA 11 TECHNICAL DATA

<b>NOMINAL COMPOSITION</b>	<b>Gold</b>	82.0% ± 1.0
	<b>Nickel</b>	15.5% ± 0.5
	<b>Vanadium</b>	1.75% ± 0.25
	<b>Molybdenum</b>	0.75% ± 0.25
	<b>Cadmium</b>	0.001% max.
	<b>Zinc</b>	0.001% max.
	<b>Phosphorus</b>	0.002% max.
	<b>Lead</b>	0.002% max.
	<b>Carbon</b>	0.005% max.
	<b>Other volatile elements each*</b>	0.002% max.
	<b>Volatile elements total</b>	0.010% max.
	<b>Total non-volatile elements</b>	0.05% max.

\*Elements with a vapor pressure higher than  $10^{-7}$  torr at 932°F (such as Mg, Sb, K, Li, Tl, S, Cs, Rb, Se, Te, Sr, and Ca) are limited to 0.001% each for Grade 1 and 0.002% for Grade 2.

<b>PHYSICAL PROPERTIES</b>	<b>Solidus</b>	1724°F (940°C)
	<b>Liquidus</b>	1760°F (960°C)
	<b>Recommended Brazing Temperature</b>	1860-1910°F (1016-1043°C)
	<b>Density (Toz/in<sup>3</sup>)</b>	8.31
	<b>CTE (x10<sup>-6</sup>/°C) (RT-700°C)</b>	14
	<b>Thermal Conductivity (W/(m•K))</b>	49
	<b>Electrical Conductivity (x10<sup>6</sup>/(ohm•m))</b>	6.5
	<b>Electrical Resistivity (x10<sup>-9</sup> ohm•m)</b>	155
	<b>Yield Strength (MPa)</b>	483
	<b>Tensile Strength (MPa)</b>	616
	<b>Elongation (%)</b>	13
	<b>Knoop Hardness (KHN)</b>	2300
<b>Poisson's Ratio</b>	0.38	

**USES** Suitable for brazing ceramics to metals as well as other non-metallic components without the need for prior metallization of the contact surface. Typical applications include:

- Aerospace components
- Medical equipment components
- Vacuum tubes
- Wave guide and Klystron assemblies

**BRAZING  
CHARACTERISTICS**

Suitable for use in all vacuum brazing applications as well as under partial pressure of argon gas. Brazing of active alloys under protective nitrogen atmosphere is not recommended. It is important to maintain a high purity, oxygen-free environment; any oxidation of reactive elements will limit alloy wettability across the non-metallic surface. For controlled atmosphere brazing or vacuum brazing the recommended radial joint clearance for gold-base alloys ranges between 0-0.002 in (0-0.05 mm).

**PROPERTIES OF  
BRAZED JOINTS**

The properties of a brazed joint are dependent upon the base metal, joint design and brazing technique. This alloy in particular is ductile and will exhibit exceptional corrosion resistance due to the high gold content.

**SPECIFICATIONS**

APA 11 conforms to: Niore-ABA

**AVAILABLE FORMS**

Available in powder and paste.

**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."

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:**

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