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APA 7 / APA 8 / APA 9 TECHNICAL DATA

NOMINAL COMPOSITION

ABA	Ag	Cu	In	Ti	Total
APA 7	59.00%	27.25%	12.50%	1.25%	100.00%
APA 8	60.27%	23.03%	14.70%	2.00%	100.00%
APA 9	43.60%	29.10%	24.30%	3.00%	100.00%

Vacuum Grade Trace Elements

Cadmium	0.001% max.
Zinc	0.001% max.
Phosphorus	0.002% max.
Lead	0.002% max.
Carbon	0.005% max.
Other volatile elements each*	0.002% max.
Volatile elements total	0.010% max.
Total non-volatile elements (Grade 1)	0.01% max.
Total non-volatile elements (Grade 2)	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.

PHYSICAL PROPERTIES

ABA	Color	Solidus (°F)	Liquidus (°F)	Brazing Temperatures	Density
APA 7	Silver Grey	1121	1319	1400 - 1500	4.95 Toz./in ³
APA 8	Silver Grey	1120	1335	1400 - 1500	4.89 Toz./in ³
APA 9	Silver Grey	910	1134	1234 - 1284	4.62 Toz./in ³

Incusil-ABA

PHYSICAL PROPERTIES (Cont.)	CTE, RT-400°C (10⁻⁶/°C)	18.2
	Electrical Conductivity (x10⁶/ohm•m)	9.4
	Electrical Resistivity (10⁻⁹ ohm•m)	106
	Thermal Conductivity (W/m•K)	70
	Yield Strength, 0.2% offset (MPa)	338
	Tensile Strength (MPa)	455
	Young's Modulus (GPa)	76
	Elongation, 2" gage length (%)	21
Knoop Hardness (KHN)	100	

USES

Most commonly used to braze non-metallic cutting tools (PCD, CBN) to carbide, or for direct wetting to ceramic, graphite, glass & oxide surfaces.

BRAZING CHARACTERISTICS

Incusil-ABA alloys are used because of their ability to wet directly to PCD & CBN at reduced temperatures. Indium is used as a melting point depressant which decreases the liquidus of the filler metal. A braze range of 100-150 °F above the liquidus is beneficial for creating the reaction between the titanium and surface oxides. An increased soak time of 20 minutes also leads to a better reaction, and stronger braze joint. When wetting to a non-metallic surface, these ABA's will wet in-place, but not flow through a joint by capillary, therefore it is recommended that the paste is applied to all surfaces which require wetting, prior to brazing. ABA's should be brazed under vacuum or an inert gas such as argon or hydrogen. ABA's cannot be brazed in air or in nitrogen.

PROPERTIES OF BRAZED JOINTS

The properties of a brazed joint are dependent upon the base metal, joint design and brazing technique. For controlled atmosphere brazing or vacuum brazing the recommended radial joint clearance for silver base alloys fall within 0.0015 in. - 0.002 in. (0.038 mm - 0.051 mm.) range.

SPECIFICATIONS

APA 7 conforms to: Incusil-ABA
APA 9 conforms to: Incusil-25-ABA

AVAILABLE FORMS

Wire, strip, engineered preforms, specialty preforms per customer specification, 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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