Clad Inlays

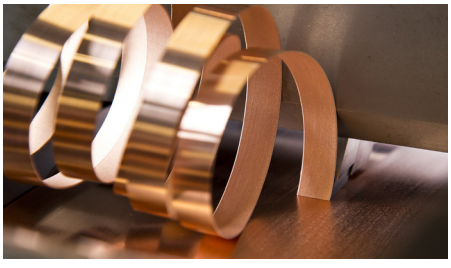
Engineered Materials Solutions
Wickeder Group

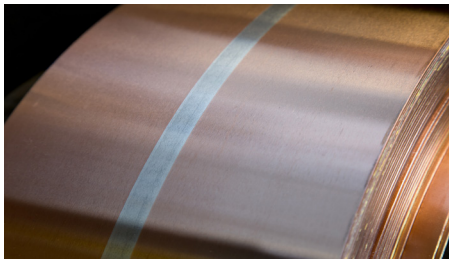
Inlay Aluminum / Copper Clad

Inlay Clad Metal is a preferred choice for demanding applications such as Automotive Hybrid Electronics, Power Conversion and Energy Storage. Various Engineered Material Solutions provide the strength, reliability, electrical conductivity, thermal heat dissipation and galvanic corrosion resistance. An example of a widely utilized material system is for Automotive Hybrid Power Module Lead-Frames.

The Aluminum Inlay Stripe - located selectively - enables proven high reliability interconneti-on(s) via Ultrasonic Wire-Bonding within the Hybrid Modules.

The Copper and Copper Alloy Base - provides excellent strength, electrical and thermal con-ductivity - supporting the intricacies of the Lead-Frame Geometries





Product Description - Key Attributes

EMS Material Designation	**Inlay Al / Cu**
Base Composition	C19400, C11000, C10200
Inlay Stripe Composition	A91145

Excellent Electrical Conductivity and Carrier Material Strength
Selective Aluminum Stripe for Ultrasonic Wire-Bonding
Proven High Reliability and Long - Term Stability in Automotive Enviroments

Chemical Composition

UNS	DIN	EN	Chemistry(%)
C19400	CuFe2P	CuFe2P	Cu 97.0 min, Fe 2.1-2.6, Ph 0.015-0.15, Zn 0.05-0.2, Pb 0.03 max
C11000	E-Cu58	Cu-ETP	Cu 99.90 (Cu value includes Ag)
C10200	OF-Cu	Cu-OF	Cu 99.95 (Cu value includes Ag, Oxygen Content 0.001 max)
A91145	NA	NA	Al 99.45 min, Cu 0.05, Mn 0.05, Mg 0.05, Zn 0.05, Ti 0.05, Si+Fe 0.32

Physical Properties	ENGLISH	METRIC
Clad Density	**0.319* lb / cu in**	**8.83* g / cm^3**

*Note: Assumes ~2% Aluminum Inlay content - 2 Inlays, (0.375“ wide) bonded into C102 Base at 4.0“ wide

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Mechanical Properties		ENGLISH	METRIC
Yeild Strength 0.2%offset	C19400	45 nom KSI	310 nom MPa
	C10200/C11000	37 nom KSI	255 nom MPa
Tensile Strength	C19400	53-63 KSI	365-435 MPa
	C10200/C11000	37-46 KSI	255-315 MPa
Elongation 2“ gage legnth	C19400	17 %	17 %
	C01200/C1100	20 %	20 %
%IACS	C19400	60 %	60 %
	C01200/C1100	101 %	101 %

*Note: Indicated Mechanical Properties are representative of 1/2 Hard Temper - alternate Tempers are available upon request

Other Properties	ENGLISH	METRIC
Al Inlay Thickness	**0.002 in minimum**	**0.05 mm minimum**

Availability

Overall Gauge	Typical 0.0236“ and 0.0315“, (0.60mm and 0.80mm)
Base Width	Widths up to 9.5“, (241.3mm) Maximum
Inlay Stripe Width	Typical 0.250“ to 0.500“, 6.35mm to 12.7mm)- up to 1.5“ possible
Number of Inlay Stripes	Typical 1-4 stripes - application specific- alternate configurations
Tolerances	Commercial Tolerances apply; consult EMS for other requirements
Ratio	Al Inlay Thickness typically ~10% of Overall Thickness
Surface	As-Rolled Typical RMS Value 3 - 5 µin, (0.76 - 1.27µm)
Temper	Typical 1/2 Hard Temper - other tempers available upon request
Form as Supplied	Individual Pancake Coil
Packaging	Individually Strapped - Stacked „eye-to-sky“ on Wooden Pallets
Cerification	Full Material Composition with Lot Identification Provided

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