Engineered Materials Solutions
Wickeder Group

Clad Inlays 

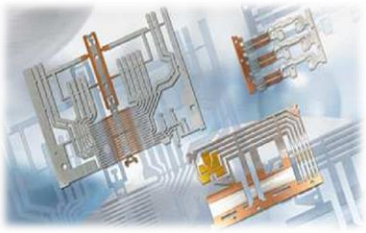
Data Sheet - Inlay Aluminum / Copper Clad

Product Overview

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 interconnection(s) via Ultrasonic Wire-Bonding within the Hybrid Modules.

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



Product Description - Key Attributes

EMS Material Designation	**Inlay Al / Cu**
Base Composition	**C19400, C11000, C10200 - application specific**
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 Environments

Chemical Composition

UNS	DIN	EN	Chemistry (%)
C19400	CuFe2P	CuFe2P	Cu 97.0 min, Fe 2.1-2.6, Ph 0.015-0.15, Zn 0.05-0.20, 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

Mechanical Properties 1/2 Hard Temper H02*)	**(Typical**	**ENGLISH**		**METRIC**	
Yield 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 length	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

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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) - others available upon request
Base Width	Widths up to 9.5", (241.3mm) maximum
Inlay Stripe Width	Typical 0.250" to 0.500", (6.35mm to 12.7mm) - application specific - up to 1.5", (38mm) possible
Number of Inlay Stripes	Typical 1-4 Stripes - application specific - alternate configurations possible
Tolerances	Commercial Tolerances apply; consult EMS for other requirements.
Ratio	Al Inlay Thickness typically ~10% of Overall Thickness - others available upon request
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

Contact

For additional information, please contact:

EMS North American Sales	***Mike Hardy***	***508-342-2304***
EMS Europe	***James Crag***	***+44 (0)7799 358 150***
EMS Asia	***CW Kong***	***+86-(514) 8891 6888***
EMS Corporate		***1-508-342-2100***

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