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LM-533 and **LM-535** are 1 mil polyimide label materials coated with pressure sensitive acrylic adhesive. **LM-533** has a *high opacity semi-gloss white topcoat*. **LM-535** has a *matte white topcoat*.

Both are specifically designed for thermal transfer printing. Bar code labels made from each material demonstrate excellent performance in lead free wave solder environments ranging from 260 degrees Celsius to 290 degrees Celsius.

Each polyimide label material is designed for barcode or alphanumeric identification of printed circuit boards, correlated electronic component. It is the ideal label to withstand mixed circuit board processes, on either the top or bottom side of the board. It has excellent resistance to harsh fluxes, cleaners, saponifiers and wave solder environments, and resists all commonly employed methods of cleaning.

When used with the proper ribbon, **LM-533** and **LM-535** polyimide labels pass **MIL-202F method 215J**. The printed polyimide label resists smearing, even when the board and labels are directly removed from a re-flow or wave solder environment.

Advantages of 1 mil polyimide labels:

- **Cost Savings:** The thinner construction of our 1-mil polyimide label material allows you to keep the high performance properties of Liberty's traditional materials, while reducing your label cost.
- **Greater Operational Ease of Use:** The lower profile of these new polyimide label materials allows for easier use in processes which demand thin materials, such as solder paste screen printing. The lower profile also makes it easier for uniform stacking and loading of boards.
- **Weight Reduction:** lighter 1 mil labels are ideal for small electronics applications in which reducing overall product weight is critical.

PHYSICAL CHARACTERISTICS

Adhesive thickness	ASTM D 1000	0.0008-.0010 in. (0.018-0.025 mm)
180 degree peel adhesion	ASTM D 1000	24 hour dwell 35 oz/in (39 N/100 mm)
		72 hour dwell 50 oz/in (55 N/100 mm)
Coated film thickness	ASTM D 1000	0.0015-.0018 in. (0.038-0.046 mm)
Flammability	ASTM D 1000	Average Burn Time < 2 seconds
Dielectric Strength	ASTM D 1000	> 8 kv
LM-533 / LM-535 Performance Properties		Typical Results
Short Term High Service Temperature		50 minutes at 600°F (315°C)
		No visible effect
2 hours at 338°F (170°C)		Label remains functional
		No visible effect at 170°C, 190°C, or 220°C
Long Term High Service Temperature		Label remains functional
		1000 hours at 212°F (100°C)
		No visible effect to label at 120°
		Label discolors slightly at 145°
		Label remains functional

Chemical Resistance, measured by PCS (Print Contrast Signal)		
Chemical	Test Condition	PCS
Control	260°C heat, 5 minutes	99%
Trichloroethane	74°C, 10 minutes	98%
Aquanox SSA 30 aqueous	40-50°C, 10 minutes	98%
RE-ENTRY ® KNI 2000 Terpene	40-50°C, 10 minutes	98%
BIOACT ® EC-7R Terpene	40-45°C, 10 minutes	98%
Alpha Metals Inc. 2110 Saponifier 6% aqu	65-70°C, 10 minutes	98%
Isopropanol 99%	82°C, 10 minutes	99%
Deionized Water	100°C, 10 minutes	99%

Product Performance and Suitability

All of the descriptive information and recommendations for the use of Liberty Marking Systems products are to be used only as a guide. The furnishing of such information and recommendations shall in no event constitute a warranty of any kind by Liberty Marking Systems. All purchasers of Liberty Marking Systems products shall independently determine the suitability of the material for the purpose for which it is purchased. No distributor, salesman, or representative of Liberty Marking Systems is authorized to give any warranty, guarantee, or to make any representation in addition or contrary to the above.

