Technical Data Sheet

Hysol® PC12-007M

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PRODUCT DESCRIPTION

Hysol® PC12-007M is a 100 percent solids, general purpose, epoxy printed circuit coating developed to meet military requirements. Its long successful history has proved it to be an outstanding coating with maximum electrical and ruggedization properties. The coating is suitable for continuous operation up to 125ºC (257ºF) and may be used on any substrate offering good adhesion. It is suggested that stress-sensitive components, such as diodes, be sleeved prior to coating.

PC12-007M meets the requirements of NASA specifications MSFC-SPEC-222 (Type I). It is widely used in commercial printed circuit applications and may be applied by spray, dip or brush procedures. A special solvent is available to control film build-up for thin coating.

SPECIFICATION OF MATERIAL

Color, maximum, Part B	Gardener 12
Color, Part A	Pale Yellow
Color, Part B	Dark Amber
Equivalent weight, Part A	180-200
Equivalent weight, Part B	144-160
Solids content, % weight, Part A	100
Solids content, % weight, Part B	100
Specific gravity @ 25ºC, Part A	1.15
Specific gravity @ 25ºC, Part B	1.0
Viscosity @ 25ºC, Brookfield RVF	
Spindle 5, Speed 2, cps, Part A	15,000-35,000
Shelf Life @ 25ºC, months from date of manufacture (unopened)	18

TYPICAL CURED PROPERTIES

Values are not intended for use in the preparation of specifications. All determinations are conducted in accordance with MIL-I-46058C and ASTM procedures. All measurements are taken at 25ºC, unless otherwise noted.

Appearance – No blistering, wrinkling, cracking or peeling of film. No discoloration of printed conductors or substrate after thermal shock, or after moisture resistance testing.

Flexibility – No cracking over 1/8" diameter mandrel.

Ruggedization – No cracking or crazing with vibration.

Film Thickness – Adjustable from 0.0015 to 0.006 inches.

Fungus Resistance – Non-nutrient per ASTM G21.

Fluorescent – when viewed under ultraviolet light (black light).

CURED ELECTRICAL PROPERTIES

Per Mil-I-46058C

Insulation resistance, ohms (1-3 mil film)	
Initial (25ºC-50% R.H.)	1×10^{14}
4th Cycle (65ºC-95% R.H.)	5×10^{9}
7th Cycle (65ºC-95% R.H.)	5×10^{9}
10th Cycle (65ºC-95% R.H.)	5×10^{9}
24 Hrs after 10th Cycle (25ºC-50% R.H.)	6×10^{12}

Dielectric withstand at 1,500 volts, 60 Hz – no flash over or breakdown before or after thermal shock and moisture exposure.

Leakage Rate: Less than 10 microamperes before and after thermal shock and moisture exposure.

Dielectric Constant @ 25ºC	
100 Hz	5.40
1 kHz	4.77
100 kHz	4.17
10 mHz	3.93
Dissipation Factor @ 25ºC	
100 Hz	0.110
1 kHz	0.071
100 kHz	0.046
10 mHz	0.042
Volume Resistivity @ 25ºC, ohm-cm	1.0×10^{14}
Dielectric Strength, 10 mil film, volts/mil	1,500

HANDLING

Mix ratio, parts by weight*, Part A/Part B	100/80
Viscosity @ 25ºC, Brookfield RVF	
Spindle 5, Speed 2, cps	7,500-20,000
Pot Life @ 25ºC, minutes	190

* Mix ratio of these materials is fixed by their chemistry. Any attempt to increase or decrease the cure rate by adding more or less hardener will result in degraded materials.

Warm components A and B to 30º - 40ºC (86º - 104ºF), stir, then mix thoroughly and deair with agitation (28 inches of mercury or better) for 5 to 10 minutes. Allow to stand for 30 minutes. Immerse the clean printed circuit board in PC12-007M at room temperature then withdraw at the rate of four inches per minute. The run-off during withdrawls is approximately 70% resulting in 2 to 5 mil film thickness.

Printed circuits or other objects to be coated should be cleaned in accordance with accepted industry practices. Isopropyl alcohol, P.C. freon or methyl ethyl ketone have been found satisfactory as cleaning agents.

Applications should be performed in a well-ventilated area. It is also recommended that Hysol bulletin entitled "Suggested Precautions for Handling HYSOL Liquid Products" be read.

NOT FOR PRODUCT SPECIFICATIONS
THE TECHNICAL DATA CONTAINED HEREIN ARE INTENDED AS REFERENCE ONLY.
PLEASE CONTACT LOCTITE CORPORATION QUALITY DEPARTMENT FOR ASSISTANCE AND RECOMMENDATIONS ON SPECIFICATIONS FOR THIS PRODUCT.

PC12-007M may be diluted with Hysol® AC0305 to reduce viscosity where a thin film build-up is desirable. The proper thinner addition may be determined by experimentation. Up to 50% addition will not degrade properties. Care must be taken to insure complete evaporation of thinner before cure takes place. This may be done, by allowing the coated boards to dry in clean, dry air for 30 to 45 minutes, before cure cycles. Other solvents such as methyl ethyl ketone, methoxy propyl acetate, xylene, and toluene, can be used alone or as a blend depending on how coating will be applied, and drying time desired. The evaporation rate of some recommended solvents starting with the fastest are as follows: methyl ethyl ketone – toluene – xylene – Hysol® AC0305 – methoxy propyl acetate.

Any of the above solvents can be used for clean-up of uncured coating.

CURE SCHEDULE
Boards must be air-dried for 30-45 minutes prior to curing.
Recommended cure – 2 hrs at 75ºC (167ºF)
Alternate cure – 4 hrs at 65ºC (149ºF)

Some variation in listed values may occur; customer should determine whether cure other than recommended cure above, will give satisfactory results.

GENERAL INFORMATION
For safe handling information on this product, consult the Material Safety Data Sheet, (MSDS).

STORAGE
Liquid Storage – Liquids should be stored at 23ºC or below, in closed containers. If stored below 23ºC, the material MUST be allowed to come to room temperature, in the sealed container, to avoid moisture contamination.

DATA RANGES
The data contained herein may be reported as a typical value and/or range values based on actual test data and are verified on a periodic basis.

Note
The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling and use thereof. In light of the foregoing, **Henkel Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel Loctite Corporation's products. Henkel Loctite Corporation specifically disclaims any liability for consequential or incidental damages of any kind, including lost profits.** The discussion herein of various processes or compositions is not to be interpreted as representation that they are free from domination of patents owned by others or as a license under any Henkel Loctite Corporation patents that may cover such processes or compositions. We recommend that each prospective user test his proposed application before repetitive use, using this data as a guide. This product may be covered by one or more United States or foreign patents or patent applications.

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