Hysol

STYCAST 1495 K
Thermally Conductive Epoxy Encapsulant

Key Feature:	Benefit:
• Good thermal conductivity	• Dissipation of heat from embedded components
• Low viscosity	• Effective flow in and around tight gaps in electronic assemblies
• Wide variety of catalysts available	• Versatility of resin system

Product Description:

STYCAST 1495 K is a low viscosity, thermally conductive, epoxy encapsulation resin. It features high filler loading yielding excellent thermal conductivity and good handling properties. STYCAST 1495 K can be cured with a wide variety of Catalysts yielding excellent mechanical and electrical properties.

Applications:

STYCAST 1495 K was designed for applications which require good thermal conductivity, and good flowability. It is an excellent choice for transformers, sensors and other electronic assemblies that require good heat dissipation and protection from environment.

Instructions For Use:

Thoroughly read the information concerning health and safety contained in this bulletin before using. Observe all precautionary statements that appear on the product label and/or contained in individual Material Safety Data Sheets (MSDS).

To ensure the long term performance of the potted or encapsulated electrical / electronic assembly, complete cleaning of components and substrates should be performed to remove contamination such as dust, moisture, salt, and oils which can cause electrical failure, poor adhesion or corrosion in an embedded part.

Some filler settling is common during shipping and storage. For this reason, it is recommended that the contents of the shipping container be thoroughly mixed prior to use. Power mixing is preferred to ensure a homogeneous product.

Accurately weigh resin and hardener into a clean container in the recommended ratio. Weighing apparatus having an accuracy in proportion to the amounts being weighed should be used.

Blend components by hand, using a kneading motion, for 2-3 minutes. Scrape the bottom and sides of the mixing container frequently to produce a uniform mixture. If possible, power mix for an additional 2-3 minutes. Avoid high mixing speeds which could entrap excessive amounts of air or cause overheating of the mixture resulting in reduced working life.

To ensure a void-free embedment, vacuum deairing or degassing should be performed to remove any entrapped air introduced during the mixing operation. Pump-down or pull vacuum on the mixture to achieve an ultimate vacuum or absolute pressure of 1- 5 torr or mm Hg. The foam will rise several times the liquid height and then subside. Continue vacuum deairing until most of the bubbling has ceased. This usually requires 3-10 minutes.

Pour mixture into cavity or mold. Gentle warming of the mold or assembly reduces the viscosity. This improves the flow of the material into the unit having intricate shapes or tightly packed coils or components. Further vacuum deairing in the mold may be required for critical applications.

Properties of Material As Supplied:

Property	Test Method	Unit	Value
Chemical Type			Epoxy
Appearance	Visual		Black liquid
Density	TP-13	g/cm^3	1.90
Brookfield Viscosity	TP-10 or TP-11 10 rpm # 6	Pa.s cP	45 45,000

Choice of Curing Agents			
Curing agent	Catalyst 9	Catalyst 11	Catalyst 23 LV
Description	General purpose with good chemical resistance and physical strength.	Long pot life, excellent chemical resistance, good physical and chemical properties at elevated temperatures.	Low color, low viscosity, long pot life. Excellent, thermal shock and impact resistance. Excellent low temperature properties and adhesion to glass.
Type of cure	Room	Heat	Room
Viscosity Pa.s cP	0.080 to 0.105 80 to 105	0.035 to 0.060 @ 65 °C 35 to 60 @ 65 °C	0.020 to 0.030 20 to 30

Properties of Material As Mixed:

Property	Test Method	Unit	Value		
			Catalyst 9	Catalyst 11	Catalyst 23 LV
Mix Ratio - Amount of Catalyst per 100 parts of STYCAST 1495 K		By Weight By Volume	4.5 8.5	5 9	9 17.5
Working Life (100 g @ 25°C)	ERF 13-70		45 minutes	>4 hours	60 minutes
Density	TP-13	g/cm^3	1.89	1.89	1.82
Brookfield Viscosity	TP-10 or TP-11	Pa.s cP	21 21,000	14 14,000	10 10,000

Cure Schedule:

Cure at any one of the recommended cure schedules. For optimum performance, follow the initial cure with a post cure of 2 - 4 hours at the highest expected use temperature. Cure schedules are 'the time at cure temperature to achieve full product cure'; the times do not include the time needed to ramp-up to cure temperature. Contact an Henkel Technical Service representative if an alternate cure schedule is desired.

Temperature	Cure Time		
°C	Catalyst 9	Catalyst 11	Catalyst 23 LV
25	16-24 hr		24 hr
45	4-6 hr		6-8 hr
65	1-2 hr		2-4 hr
80		8-16 hr	
100		2-4 hr	
120		30-60 min	

Properties of Material After Application:

Property	Test Method	Unit	Value		
			Catalyst 9	Catalyst 11	Catalyst 23 LV
Hardness	TP-311	Shore D	95	95	90
Flexural Strength	ASTM-D-790	mPa psi	88 12,800	87 12,700	97 14,000
Compressive Strength	TP-207	mPa psi	139 20,200	190 27,600	97 14,100
Tensile Strength	TP-239	mPa psi	46 6,700	59 8,500	49 7,100
Linear Shrinkage	TP-320	cm/cm	0.001	0.004	0.002
Water Absorption	24 hour boil	%	0.07	0.09	0.10
Coefficient of Thermal Expansion	TMA	10^{-6}/°C	42	33	37
Thermal Conductivity	TP-557W	W/m.K Btu-in/hr-ft^2-°F	 7.50	1.1 7.62	1.00 6.93
Temperature Range of Use		°C	-40 to +130	-55 to +155	-65 to +105
Dielectric Strength	TP-297	kV/mm V/mil	15.7 400	15.7 400	15.7 400
Dielectric Constant @ 1 mHz	TP-184	-	3.95	4.09	4.00
Dissipation Factor @ 1 mHz	TP-184	-	0.027	0.038	0.042
Volume Resistivity @ 25°C @ 130°C	TP-183	 Ohm-cm Ohm-cm	 5×10^{13} 5×10^{11}	 5×10^{13} 2.6×10^{11}	 5×10^{13} 1×10^{10}

TPs are internal test procedures typically derived from ASTM or other norms. Copies of these test procedures can be obtained upon request.

Storage and Handling:

The shelf life of STYCAST 1495 K is 12 months at 25°C. For best results, store in original, tightly covered containers. Storage in cool, clean and dry areas is recommended.

Health and Safety:

The STYCAST 1495 K, like most epoxy compounds, possesses the ability to cause skin and eye irritation upon contact. Certain individuals may also develop an allergic reaction after exposure (skin contact, inhalation of vapors, etc.) which may manifest itself in a number of ways including skin rashes and an itching sensation. Handling this product at elevated temperatures may also generate vapors irritating to the respiratory system.

Good industrial hygiene and safety practices should be followed when handling this product. Proper eye protection and appropriate chemical resistant clothing should be worn to minimize direct contact. Consult the Material Safety Data Sheet (MSDS) for detailed recommendations on the use of engineering controls and personal protective equipment.

This information is only a brief summary of the available safety and health data. Thoroughly review the MSDS for more complete information before using this product.

Attention Specification Writers:

The values contained herein are considered typical properties only and are not intended to be used as specification limits.

Medical Implantable Disclaimer

"In the event this product is intended by you for use in implantation in the human body, you are hereby advised that Henkel Corporation has not performed clinical testing of these materials for implantation in the human body nor has Henkel Corporation sought, nor received, approval from the FDA for the use of these material in implantation in the human body. It is YOUR responsibility, as a manufacturer of any such device, to ensure that all materials and processes relating to the manufacture of any medical device fully comply with all applicable federal, state and local laws, rules, regulations and requirements as well as any such laws, rules, regulations, directives or other orders of any foreign country where such product is sold. If you have not undertaken the necessary investigations to ensure compliance you are advised NOT TO USE this product in the manufacture of any device which is to be implanted in the human body. No representative of ours has any authority to change the foregoing provisions."

Note

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