

LOCTITE STYCAST ES 4322FC

October 2012

PRODUCT DESCRIPTION

LOCTITE STYCAST ES 4322FC provides the following product characteristics:

Technology	Epoxy
Appearance - Part A	Black
Appearance - Part B	Gray
Components	Two components - requires mixing
Mix Ratio, by weight - Part A: Part B	100 : 100
Product Benefits	• High purity • High flow • Non-conductive
Cure	Heat cure
Application	Encapsulation
Typical Applications	Encapsulation of bare chips mounted to plastic substrates and Potting of small hybrid circuit modules

LOCTITE STYCAST ES 4322FC liquid epoxy encapsulant is for protection of semiconductor devices. It is a high flow material which requires a cavity of flow control barrier to prevent excessive flow.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Part A Properties LOCTITE STYCAST EA 4322FC

Viscosity, Brookfield - RVF, 25 °C, mPa·s (cP):	
Spindle 7, speed 20 rpm	173,000
Filler Content, ASTM D2584, %	65
Specific Gravity, ASTM D1475	1.68
Shelf Life:	
@ 5°C, days	548
@ 25°C, days	365
Flash Point - See MSDS	

Part B Properties LOCTITE STYCAST EB 4322FC

Viscosity, Brookfield - RVF, 25 °C, mPa·s (cP):	
Spindle 7, speed 20 rpm	25,300
Filler Content, ASTM D2584, %	64
Specific Gravity, ASTM D1475	1.67
Shelf Life:	
@ 5°C, days	548
@ 25°C, days	365
Flash Point - See MSDS	

Mixed Properties LOCTITE STYCAST ES 4322FC

Mixed Viscosity @ 25 °C, mPa·s (cP):	
Spindle 7, speed 20 rpm	36,900
Pot Life @ 25°C, time to double in viscosity, hours	20

TYPICAL CURING PERFORMANCE

Gel Time

Gel @ 121°C, minutes	8.4
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Cure Schedule

2 hours @ 140°C

Curing below 140°C is not recommended.

Key material properties are affected by cure conditions, including: glass transition temperature, adhesion, modulus, moisture absorption, and chemical resistance. These properties generally improve with longer cure time due to increased cross link density. Cure time of 3 to 6 hours may be required for severe environmental conditions.

The above cure profile is a guideline recommendation. Cure conditions (time and temperature) may vary based on customers' experience and their application requirements, as well as customer curing equipment, oven loading and actual oven temperatures.

TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties

Appearance	Black
Coefficient of Thermal Expansion, TMA:	
Below Tg, ppm/°C	29
Above Tg, ppm/°C	89
Glass Transition Temperature (Tg) by TMA, °C	173
Shore Hardness, ASTM D2240, Shore D	91
Linear Shrinkage, ASTM D2566, %	0.2
Extractable Ionic Content, ppm:	
Chloride (Cl-)	13
Sodium (Na+)	1
Potassium (K+)	1

Electrical Properties

Volume Resistivity, ASTM D257ohm-cm	2.9×10 ¹⁴
Surface Resistivity, ASTM D257, ohms	4.8×10 ¹⁴
Dielectric Constant, (D)/ Dissipation Factor, (K), ASTM D150:	
@ 1KHz	2.17/0.007
@ 10KHz	3.54/0.006
@ 100KHz	3.51/0.007

GENERAL INFORMATION

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

DIRECTIONS FOR USE

1. LOCTITE STYCAST ES 4322FC may settle upon storage at room temperature.
2. Cold storage @ 5°C will minimize filler settling.
3. Each container must be thoroughly mixed before combining Part A and Part B. After warming to room temperature, approximately 5 to 10 minutes on a standard paint shaker will normally ensure complete dispersion of the filler.
4. Stir with a large spatula to check for lumps.
5. Part B may form a crust if exposed to moist air for an extended period of time. Keep in a well sealed container. For best results, do not use Part B which contains this crust caused by moisture contamination.
6. Thorough mechanical mixing of Part A and Part B together is required for best results. Hand mixing alone is not recommended.

Storage

Store product in the unopened container in a dry location. Storage information may be indicated on the product container labeling.

Optimal Storage : 2 to 8 °C

Material removed from containers may be contaminated during use. Do not return product to the original container. Henkel Corporation cannot assume responsibility for product which has been contaminated or stored under conditions other than those previously indicated. If additional information is required, please contact your local Technical Service Center or Customer Service Representative.

Not for product specifications

The technical data contained herein are intended as reference only. Please contact your local quality department for assistance and recommendations on specifications for this product.

Conversions

$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$
 $\text{kV/mm} \times 25.4 = \text{V/mil}$
 $\text{mm} / 25.4 = \text{inches}$
 $\text{N} \times 0.225 = \text{lb}$
 $\text{N/mm} \times 5.71 = \text{lb/in}$
 $\text{N/mm}^2 \times 145 = \text{psi}$
 $\text{MPa} \times 145 = \text{psi}$
 $\text{N}\cdot\text{m} \times 8.851 = \text{lb}\cdot\text{in}$
 $\text{N}\cdot\text{m} \times 0.738 = \text{lb}\cdot\text{ft}$
 $\text{N}\cdot\text{mm} \times 0.142 = \text{oz}\cdot\text{in}$
 $\text{mPa}\cdot\text{s} = \text{cP}$

Disclaimer

Note:

The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. The product can have a variety of different applications as well as differing application and working conditions in your environment that are beyond our control. Henkel is, therefore, not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product.

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