Technical Data Sheet

LOCTITE STYCAST 2850FT

March 2015

PRODUCT DESCRIPTION

LOCTITE STYCAST 2850FT provides the following product characteristics:

Technology	Epoxy
Appearance (Resin)	Black
Product Benefits	• Thermally conductive • Electrically insulative • Thermal shock resistant • Low CTE • Can be used with a variety of catalysts
Application	Thermally conductive epoxy encapsulant
Typical Assembly Applications	Encapsulating

LOCTITE STYCAST 2850FT is recommended for encapsulation of components that require heat dissipation and thermal shock properties.

LOCTITE STYCAST 2850FT is also available in the unpigmented version.

LOCTITE STYCAST 2850FT can be used with LOCTITE CAT 9, LOCTITE CAT 11, LOCTITE CAT 23LV or LOCTITE CAT 24LV

CATALYST DESCRIPTION

LOCTITE CAT 9 provides the following product characteristics:

Product Benefits	• General purpose • Good chemical resistance • Good physical strength
Cure	Room temperature cure
Mix Ratio, by weight - Material:Catalyst	100 : 3.5
Mix Ratio, by Volume - Material:Catalyst	100 : 8.5
Operating Temperature	-40 to 130ºC

LOCTITE CAT 11 provides the following product characteristics:

Product Benefits	• Long pot life • Excellent chemical resistance • Good physical and chemical properties at elevated temperatures
Cure	Heat cure
Mix Ratio, by weight - Material:Catalyst	100 : 4.5
Mix Ratio, by Volume - Material:Catalyst	100 : 9.5
Operating Temperature	-55 to 155ºC

LOCTITE CAT 23LV provides the following product characteristics:

Product Benefits	• Low color • Low viscosity • Long pot life • Excellent thermal shock and impact resistance • Excellent low temperature properties • Excellent adhesion to glass
Cure	Room temperature cure
Mix Ratio, by weight - Material:Catalyst	100 : 7.5
Mix Ratio, by Volume - Material:Catalyst	100 : 17.5
Operating Temperature	-65 to 105ºC

LOCTITE CAT 24LV provides the following product characteristics:

Product Benefits	• Low viscosity • Excellent adhesion • Thermal shock and impact resistant • Excellent low temperature properties • Fast cure
Cure	Room Temperature
Mix Ratio, by weight - Material:Catalyst	100 : 8
Mix Ratio, by Volume - Material:Catalyst	100 : 17.5
Operating Temperature	-65 to 105ºC

TYPICAL UNCURED PROPERTIES

LOCTITE STYCAST 2850FT

Brookfield Viscosity , mPa·s (cP):	
Spindle 7, Speed 10 rpm	250,000
Brookfield Viscosity - Small Sample Adapter, mPa·s (cP): (Equivalent Parameters)	
Spindle 14, speed 3 rpm	250,000
Density, g/cm³	2.4
Shelf Life @ 18 to 25°C (from date of manufacture), days	365
Flash Point - See SDS	

LOCTITE CAT 9

Viscosity @ 25 °C, mPa·s (cP)	92
Density , g/cm³	1.0
Flash Point - See SDS	

LOCTITE CAT 11

Viscosity @ 25 °C, mPa·s (cP)	48
Flash Point - See SDS	

LOCTITE CAT 23LV

Viscosity @ 25 °C, mPa·s (cP)	25
Flash Point - See SDS	

LOCTITE CAT 24LV

Viscosity @ 25 °C, mPa·s (cP)	35
Density , g/cm³	1.02
Flash Point - See SDS	

TYPICAL UNCURED PROPERTIES AS MIXED

LOCTITE STYCAST 2850FT with LOCTITE CAT 9

Viscosity @ 25 °C, mPa·s (cP)	58,000
Density, g/cm³	2.29
Work Life, 100 grams, @ 25ºC, minutes	45

LOCTITE STYCAST 2850FT with LOCTITE CAT 11

Viscosity @ 25 °C, mPa·s (cP)	64,000
Density, g/cm³	2.29
Work Life, 100 grams, @ 25ºC, hours	4

LOCTITE STYCAST 2850FT with LOCTITE CAT 23LV

Viscosity @ 25 °C, mPa·s (cP)	5,600
Density, , g/cm³	2.19
Work Life, 100 grams, @ 25ºC, hour	1

LOCTITE STYCAST 2850FT with LOCTITE CAT 24LV

Work Life, 100 grams, @ 25ºC, minutes	30

TYPICAL CURING PERFORMANCE

Cure Schedule

LOCTITE STYCAST 2850FT with LOCTITE CAT 9

16 to 24 hours @ 25°C
4 to 6 hours @ 45°C
1 to 2 hours @ 65°C

LOCTITE STYCAST 2850FT with LOCTITE CAT 11

8 to 16 hours @ 80°C
2 to 4 hours @ 100°C
30 to 60 minutes @ 120°C

LOCTITE STYCAST 2850FT with LOCTITE CAT 23LV

16 to 24 hours @ 25°C
4 to 6 hours @ 45°C
2 to 4 hours @ 65°C

LOCTITE STYCAST 2850FT with LOCTITE CAT 24LV

8 to 16 hours @ 25°C
4 to 6 hours @ 45°C
2 hours @ 65°C

For optimum performance, follow the initial cure with a post cure of 2 to 4 hours at maximum expected operating temperature.

The above cure profiles are guideline recommendations. 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

LOCTITE STYCAST 2850FT with LOCTITE CAT 9

Physical Properties

Hardness, Shore D	96
Linear Shrinkage, %	0.2
Water Absorption (24 hr immersion), %	0.03
Coefficient of Thermal Expansion :	
Alpha 1, ppm	35.0
Alpha 2, ppm	98.9
Glass Transition Temperature, °C	86
Thermal Conductivity, W/(m-K)	1.25

Electrical Properties

Dielectric Strength, kV/mm	14.4
Dielectric Constant / Dissipation Factor:	
@ 1mHz	5.01/0.028
Volume Resistivity @ 25 °C, ohm-cm	1×10^{15}

Outgassing Properties

Outgassing , per NASA Reference Publication 1124:	
Cured 24 hours @ 25ºC	
TML, %	0.25
CVCM, %	0.01

LOCTITE STYCAST 2850FT with LOCTITE CAT 11

Physical Properties

Hardness, Shore D	96
Linear Shrinkage, %	0.2
Water Absorption (24 hr immersion), %	0.05
Coefficient of Thermal Expansion :	
Alpha 1, ppm	31.2
Alpha 2, ppm	97.9
Glass Transition Temperature, °C	115
Thermal Conductivity, W/(m-K)	1.28

Electrical Properties

Dielectric Strength , kV/mm	15.0
Dielectric Constant/ Dissipation Factor:	
@ 1 MHz	5.36/0.043
Volume Resistivity @ 25 °C, ohm-cm	1×10^{15}

Outgassing Properties

Outgassing , per NASA Reference Publication 1124:	
Sample cured 4 hours @ 80ºC	
TML, %	0.29
CVCM, %	0.02

LOCTITE STYCAST 2850FT with LOCTITE CAT 23LV

Physical Properties

Hardness, Shore D	92
Linear Shrinkage, , %	0.3
Water Absorption (24 hr immersion), %	0.02
Coefficient of Thermal Expansion :	
Alpha 1, ppm	39.4
Alpha 2, ppm	111.5
Glass Transition Temperature, °C	68
Thermal Conductivity, W/(m-K)	1.1

Electrical Properties

Volume Resistivity @ 25 °C, ohm-cm	1×10^{15}
Dielectric Constant / Dissipation Factor:	
@ 1 mHz	5.36/0.051
Dielectric Strength , kV/mm	14.8

LOCTITE STYCAST 2850FT with LOCTITE CAT 24LV

Physical Properties

Hardness, Shore D	92
Linear Shrinkage, %	0.51
Water Absorption (24 hr immersion), %	0.14
Coefficient of Thermal Expansion :	
Alpha 1, ppm	47
Alpha 2, ppm	120
Glass Transition Temperature (Tg), °C	39
Thermal Conductivity, W/(m-K)	1.01

Electrical Properties

Volume Resistivity @ 25ºC, ohm-cm	2.0×10^{14}
Surface Resistivity, ohms	7.2×10^{15}
Dielectric Constant / Dissipation Factor:	
@ 1 MHz	6.0/0.037

TYPICAL CURED PERFORMANCE AS MIXED

LOCTITE STYCAST 2850FT with LOCTITE CAT 9

Miscellaneous

Flexural Strength	N/mm² (psi)	92 (13,300)
Compressive Strength	N/mm² (psi)	155 (22,500)

LOCTITE STYCAST 2850FT with LOCTITE CAT 11

Miscellaneous

Flexural Strength	N/mm² (psi)	117 (17,000)
Compressive Strength	N/mm² (psi)	193 (27,900)

LOCTITE STYCAST 2850FT with LOCTITE CAT 23LV

Miscellaneous

Flexural Strength	N/mm² (psi)	106 (15,300)
Compressive Strength	N/mm² (psi)	120 (17,400)

GENERAL INFORMATION

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

DIRECTIONS FOR USE

1. Certain resins and hardeners are prone to crystallization. If crystallization does occur, warm the contents of the shipping container to 50 to 60ºC until all crystals have dissolved. Shipping container must be loosely covered during the warming stage to prevent any pressure build-up.
2. Allow contents to cool to room temperature before continuing.
3. Complete cleaning of the substrates should be performed to remove contamination such as oxide layers, dust, moisture, salt and oils which can cause poor adhesion or corrosion in a bonded part.
4. Some separation of components 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.
5. Power mixing is preferred to ensure a homogeneous product.
6. 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.
7. Blend components by hand, using a kneading motion, for 2 to 3 minutes and scrape the bottom and sides of the mixing container frequently to produce a uniform mixture.
8. If possible, power mix for an additional 2 to 3 minutes. Avoid high mixing speeds. This can entrap excessive amounts of air. It can also cause overheating of the mixture, resulting in reduced working life.
9. To ensure a void-free embedment, vacuum deairing or degassing should be performed to remove any entrapped air introduced during the mixing operation.
10. Vacuum deair mixture at 1 to 5mm mercury. The foam will rise several times the liquid height and then subside.
11. Continue vacuum deairing until most of the bubbling has ceased. This usually takes 3 to 10 minutes.
12. To facilitate deairing in difficult to deair materials, add 1 to 3 drops of an air release agent, such as ANTIFOAM 88 into 100 gram of mixture.
13. Gentle warming will also help, but pot life will be shortened.
14. Pour mixture into cavity or mold.
15. 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.
16. Further vacuum deairing in the mold may be required for critical applications.

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

Optimal Storage : 18 to 25 °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
(°C x 1.8) + 32 = °F
kV/mm x 25.4 = V/mil
mm / 25.4 = inches
N x 0.225 = lb
N/mm x 5.71 = lb/in
psi x 145 = N/mm²
MPa = N/mm²
N·m x 8.851 = lb·in
N·m x 0.738 = lb·ft
N·mm x 0.142 = oz·in
mPa·s = 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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Reference 0.2