Technical Data Sheet

LOCTITE® STYCAST 2850FT

December 2024

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
Mix ratio, by weight - material: catalyst	100 : 3.5
Mix ratio, by volume - material: catalyst	100 : 8.5
Operating temperature, °C	-40 to 130

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, °C	-55 to 155

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, °C	-65 to 105

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, °C	-65 to 105

LOCTITE® CAT 27-1 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 : 7.0
Mix ratio, by volume - material: catalyst	100 : 16.5
Operating temperature - continuous, °C	-40 to 175
Operating temperature - intermittend, °C	-40 to 200

TYPICAL PROPERTIES OF UNCURED MATERIAL

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/cm^3	2.4
Shelf life @ 18 to 25°C, (from date of manufacture), days	365
Flash point - see SDS	

	Viscosity @ 25°C, mPa.s (cP)	Density, g/cm^3	Flash point - see SDS
LOCTITE® CAT 9	92	1.0	
LOCTITE® CAT 11	48	-	
LOCTITE® CAT 23LV	25	-	
LOCTITE® CAT 24LV	35	1.02	
LOCTITE® CAT 27-1	300	1.05	

TYPICAL UNCURED PROPERTIES AS MIXED

	Viscosity @ 25°C, mPa·s (cP)	Density, g/cm^3	Work life, 100 gram mass, @ 25ºC
LOCTITE® STYCAST 2850FT with LOCTITE® CAT 9	58,000	2.29	45 minutes
LOCTITE® STYCAST 2850FT with LOCTITE® CAT 11	64,000	2.29	4 hours
LOCTITE® STYCAST 2850FT with LOCTITE® CAT 23LV	5,600	2.19	1 hour
LOCTITE® STYCAST 2850FT with LOCTITE® CAT 24LV	-	-	30 minutes
LOCTITE® STYCAST 2850FT with LOCTITE® CAT 27-1	-	-	-

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
0.5 to 1 hours @ 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

LOCTITE® STYCAST 2850FT with LOCTITE® CAT 27-1
4 hours @ 120°C

For optimum performance, follow the initial cure with a post cure of 2 to 4 hours at the highest expected use 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, ppm	
Pre Tg	35.0
Post Tg	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 @ 1 MHz	5.01/0.028
Volume resistivity @ 25ºC, ohm-cm	1×10^{15}

Outgassing properties

Outgassing, per NASA Reference Publication 1124	
Cured 24 hours @ 25°C	
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, ppm	
Pre Tg	31.2
Post Tg	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 @ 25ºC, ohm-cm	1×10^{15}

Outgassing properties

Outgassing, per NASA Reference Publication 1124	
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, ppm	
Pre Tg	39.4
Post Tg	111.5
Glass transition temperature, °C	
Cured @ room temperature	40
Cured @ 65°C for 4 hours + room temperature for 24 hours	55
Thermal conductivity, W/(m-K)	1.1

Electrical properties

Dielectric strength, kV/mm	14.8
Dielectric constant / Dissipation factor @ 1 MHz	5.36/0.051
Volume resistivity @ 25ºC, ohm-cm	1×10^{15}

LOCTITE® STYCAST 2850FT with LOCTITE® CAT 24LV

Physical properties

Hardness, Shore D	92
Linear shrinkage, %	0.51
Water absorption, (24 hours immersion), %	0.14
Coefficient of thermal expansion, ppm	
Pre Tg	47
Post Tg	120
Glass transition temperature, °C	
Cured @ room temperature	40
Cured @ 65°C for 4 hours + room temperature for 24 hours	55
Thermal conductivity, W/(m-K)	1.01

Electrical properties

Volume resistivity @ 25ºC, ohm-cm	2.0×10^{14}
Surface resistivity, ohm.s	7.2×10^{15}
Dielectric constant / Dissipation factor @ 1 mHz	6.0/0.037

LOCTITE® STYCAST 2850FT with LOCTITE® CAT 27-1

Physical properties

Hardness, Shore D		94
Linear shrinkage, %		0.23
Water absorption,		
After 1 day @ RT		0.06
After 7 days @ RT		0.08
After 1 hour @ 100°C		0.12
Coefficient of thermal expansion, TMA, ppm		
Pre Tg		42
Post Tg		120
Glass transition temperature, °C		
Tan δ		132
Onset point		114
Thermal conductivity, W/(m-K)		1.066
Young's modulus, (E)		
@35ºC	N/mm^2 (psi)	6,413 (930,127)
@50ºC	N/mm^2 (psi)	6,266 (908,806)
@100ºC	N/mm^2 (psi)	4,898 (710,394)
@150ºC	N/mm^2 (psi)	85 (12,328)
Weight loss, %		
@200ºC		0.04
@250ºC		0.14
@300ºC		0.26
@700ºC		27.5

Electrical properties

Surface resistivity, ohms	7.4×10^{16}
Volume resistivity, ohm-cm	2.5×10^{15}
Dielectric constant / Dissipation factor	
@ 50 Hz	5.8/0.022
@ 1 KHz	5.6/0.016
@ 1 MHz	5.2/0.029

TYPICAL CURED PERFORMANCE AS MIXED

Miscellaneous

	Flexural strength, N/mm² (psi)	Compressive strength, N/mm² (psi)
LOCTITE® STYCAST 2850FT with LOCTITE® CAT 9	92 (13,300)	155 (22,500)
LOCTITE® STYCAST 2850FT with LOCTITE® CAT 11	117 (17,000)	193 (27,900)
LOCTITE® STYCAST 2850FT with LOCTITE® CAT 23LV	106 (15,300)	120 (17,400)

GENERAL INFORMATION

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

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 60 °C 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 inproportion to the amounts being weighed should be used.
7. Blend components by hand, using a kneading motion, for 2 to 3 minutes. 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 5 mm 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 an 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 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 Henkel representative.

Conversions

(°C x 1.8) + 32 = °F
kV/mm x 25.4 = V/mil
mm / 25.4 = inches
µm / 25.4 = mil
N x 0.225 = lb
N/mm x 5.71 = lb/in
N/mm² x 145 = psi
MPa x 145 = psi
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

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