chanhvinh.com

LOCTITE

Technical Data Sheet

LOCTITE STYCAST 2651

August 2019

PRODUCT DESCRIPTION

LOCTITE STYCAST 2651 provides the following product characteristics:

Technology	Epoxy
Appearance (Resin)	Black
Product Benefits	• General purpose • Can be used with a variety of catalysts
Application	Encapsulation

LOCTITE STYCAST 2651 is a dielectric grade epoxy encapsulant designed for general purpose applications and has excellent adhesion to a wide variety of substrates.

LOCTITE STYCAST 2651 can be used with a variety of catalysts. For more information on mixed properties when used with other available catalysts, please contact your local technical service representative for assistance and recommendations.

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 : 7
Mix Ratio, by Volume - Material:Catalyst	100 : 11.5

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 : 8.5
Mix Ratio, by Volume - Material:Catalyst	100 : 12.5

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 : 15
Mix Ratio, by Volume - Material:Catalyst	100 : 24

TYPICAL UNCURED PROPERTIES

LOCTITE STYCAST 2651

Viscosity, Brookfield , 25 °C, mPa·s (cP):	
Spindle 7, speed 5 rpm	225,000
Density, g/cm³	1.65
Shelf Life @ 25°C (from date of manufacture), days	274
Flash Point - See SDS	

LOCTITE CAT 9

Viscosity @ 25 °C, mPa·s (cP)	90
Flash Point - See SDS	

LOCTITE CAT 11

Viscosity @ 65 °C, mPa·s (cP)	45
Flash Point - See SDS	

LOCTITE CAT 23LV

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

TYPICAL UNCURED PROPERTIES AS MIXED

LOCTITE STYCAST 2651 with LOCTITE CAT 9

Brookfield Viscosity mPa·s (cP)	32,000
Density, g/cm³	1.56
Work Life, 100 grams, @ 25ºC, minutes	45

LOCTITE STYCAST 2651 with LOCTITE CAT 11

Brookfield Viscosity mPa·s (cP)	25,000
Density, ASTM-D-792, g/cm³	1.56
Work Life, 100 grams, @ 25ºC, hours	>4

LOCTITE STYCAST 2651 with LOCTITE CAT 23LV

Brookfield Viscosity mPa·s (cP)	3,200
Density, ASTM D792, g/cm³	1.5
Work Life, 100 grams, @ 25ºC, hour	1

TYPICAL CURING PERFORMANCE

Cure Schedule

LOCTITE STYCAST 2651 with LOCTITE CAT 9

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

LOCTITE STYCAST 2651 with LOCTITE CAT 11

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

Henkel

chanhvinh.com

LOCTITE STYCAST 2651 with LOCTITE CAT 23LV
24 hours @ 25°C
4 to 6 hours @ 45°C
2 to 4 hours @ 65°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 2651 with LOCTITE CAT 9:

Physical Properties :	
Hardness, Shore D	88
Water Absorption, 24-hr boil, %	0.25
Coefficient of Thermal Expansion, TMA, ppm/°C	43.3
Thermal Conductivity, ASTM D-2214, W/(m-K)	0.66
Operating temperature range, ºC	-40 to +130
Electrical Properties:	
Volume Resistivity @ 25°C, ohm-cm	5×10^{15}
Dielectric Strength, kV/mm	17.7
Dielectric Constant/Dissipation Factor @ 1 MHz	3.9/0.05
Outgassing Properties:	
Outgassing , per NASA Reference Publication 1124:	
Sample cured 8 hours @ 25ºC	
TML, %	0.37
CVCM, %	0.03

LOCTITE STYCAST 2651 with LOCTITE CAT 11:

Physical Properties :	
Hardness, Shore D	88
Water Absorption, 24-hr boil, %	0.1
Coefficient of Thermal Expansion, TMA, ppm/°C	40
Thermal Conductivity, , W/(m-K)	0.66
Operating temperature range, ºC	-55 to +155
Electrical Properties:	
Volume Resistivity @ 25°C, ohm-cm	5×10^{15}
Dielectric Strength , kV/mm	17.7
Dielectric Constant/ Dissipation Factor:	
@ 60 Hz	4.8/0.02
@ 1 KHz	4.6/0.01
@ 1 MHz	3.9/0.02
Outgassing Properties:	
Outgassing , ASTM E 595:	
Sample cured 3 hours @ 100ºC	
TML, %	0.63
CVCM, %	0.01

LOCTITE STYCAST 2651 with LOCTITE CAT 23LV:

Physical Properties :	
Hardness, Shore D	86
Water Absorption, 24-hr boil, %	0.3
Coefficient of Thermal Expansion, TMA, ppm/°C	54.7
Operating temperature range, ºC	-65 to +105
Electrical Properties:	
Volume Resistivity @ 25°C, ohm-cm	1.2×10^{14}
Dielectric Strength , kV/mm	17.7
Dielectric Constant / Loss @ 1 MHz	4.1/0.08

TYPICAL CURED PERFORMANCE AS MIXED

LOCTITE STYCAST 2651 with LOCTITE CAT 9

Miscellaneous

Flexural Strength	N/mm²	77
	(psi)	(11,100)
Compressive Strength	N/mm²	118
	(psi)	(17,100)
Tensile Strength	N/mm²	45
	(psi)	(6,500)

LOCTITE STYCAST 2651 with LOCTITE CAT 11

Miscellaneous

Flexural Strength	N/mm²	103
	(psi)	(15,000)
Compressive Strength	N/mm²	110
	(psi)	(16,000)
Tensile Strength	N/mm²	62
	(psi)	(9,000)

LOCTITE STYCAST 2651 with LOCTITE CAT 23LV

Miscellaneous

Flexural Strength	N/mm²	73
	(psi)	(10,600)
Compressive Strength	N/mm²	111
	(psi)	(16,100)
Tensile Strength	N/mm²	45
	(psi)	(6,500)

GENERAL INFORMATION

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

DIRECTIONS FOR USE

1. Complete cleaning of the 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.
2. 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.
3. 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.
4. 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.
5. 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.
6. To ensure a void-free embedment, vacuum deairing or degassing should be performed to remove any entrapped air introduced during the mixing operation.
7. Pump-down or pull vacuum on the mixture to achieve an ultimate vacuum or absolute pressure of 1 to 5 torr or mm Hg. The foam will rise several times in the liquid height and then subside.
8. Continue vacuum deairing until most of the bubbling has ceased. This usually takes 3 to 10 minutes.
9. To facilitate deairing in difficult to deair materials, add 1 to 3 drops of an air release agent, such as ANTIFOAM 88 into 100 grams of mixture.
10. Gentle warming will also help, but pot life will be shortened.
11. Pour mixture in mold or cavity. Cure as recommended..
12. Gentle warming of the mold or assembly reduces the viscosity.

chanhvinh.com

This improves the flow of the material into the unit having intricate shapes or tightly packed coils or components.

13. 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 : 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/F
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.
Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

In case products are delivered by Henkel Belgium NV, Henkel Electronic Materials NV, Henkel Nederland BV, Henkel Technologies France SAS and Henkel France SA please additionally note the following:
In case Henkel would be nevertheless held liable, on whatever legal ground, Henkel's liability will in no event exceed the amount of the concerned delivery.

In case products are delivered by Henkel Colombiana, S.A.S. the following disclaimer is applicable:
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. 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.
Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

In case products are delivered by Henkel Corporation, Resin Technology Group, Inc., or Henkel Canada Corporation, the following disclaimer is applicable:
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 Corporation's products. Henkel 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 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.

Trademark usage: [Except as otherwise noted] All trademarks in this document are trademarks and/or registered trademarks of Henkel and its affiliates in the U.S. and elsewhere.

Reference 3