Hysol

FP6101

July 2010

PRODUCT DESCRIPTION

FP6101 provides the following product characteristics:

Technology	Epoxy
Appearance	Black
Product Benefits	• Reworkable • High flow • High adhesion to flexible and rigid substrates • Low modulus • Low stress
Components	One-component
Cure	Heat cure
Application	CSP/BGA Underfill

FP6101 is an unfilled flexible epoxy designed as a removable CSP or BGA underfill. When fully cured, FP6101 forms a low modulus, low stress seal that dissipates impact stresses on solder joints and circuit boards.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Property	Value
Viscosity, Brookfield - Cone & Plate, 25 °C, mPa·s (cP):	
Spindle 52, speed 20 rpm	3,700
Specific Gravity	1.18
Pot Life @ 25 °C(time to double viscosity), weeks	2
Gel Time @ 121ºC, minutes	12
Shelf Life:	
@ -40ºC, months	9
@ -20ºC, months	6
@ -10ºC, months	4

Flash Point - See MSDS

TYPICAL CURING PERFORMANCE

Recommended Cure Schedule

5 to 10 minutes @ 150°C

Alternative Cure Schedule

5 minutes @ 165°C

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:

Property	Value
Coefficient of Thermal Expansion in/in/ºC:	
Below Tg (-30 to -10°C)	80
Above Tg (60 to 120°C)	210
Glass Transition Temperature (Tg), °C	15
Coefficient of Thermal Conductivity, ISO 8302, W/(m·K)	0.21
Young's modulus (E) MPa	15
Extractable Ionic Content, ppm:	
Chloride (Cl-)	<5
Potassium (K+)	<1
Sodium (Na+)	<5
Water Absorption, ISO 62, %:	
2 hours boil	<2
24 hours in RT immersion,%	<1
Shore Hardness, Shore D	46
Elongation ,%	102
Shrinkage, %	<2

Electrical Properties:

Property	Value
Dielectric Constant / Dissipation Factor, IEC 60250:	
@ 25 °C:	
1kHz	4.4 / 0.05
10 kHz	4.1 / 0.05
100 kHz	3.8 / 0.05
Volume Resistivity, IEC 60093, Ω·cm	1.4×10^{14}
Surface Resistivity, IEC 60093, Ω	6.3×10^{15}

TYPICAL PERFORMANCE OF CURED MATERIAL

Lap Shear Strength :		
	N/mm²	10
	(psi)	(1,450)

GENERAL INFORMATION

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

This product is not recommended for use in pure oxygen and/or oxygen rich systems and should not be selected as a sealant for chlorine or other strong oxidizing materials.

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.

THAWING:

1. Frozen packages must be completely thawed before use.
2. Warm at room temperature until no longer cool to the touch (normally 20 to 30 minutes).
3. DO NOT thaw in an oven.

Directions for use

1. Devices with wet encapsulant should not be exposed to humidity in the air and should be promptly post-cured according to suggested cure to achieve full properties.
2. If the material cannot be initially gelled to a hard finish within 1 hour after dispensing, storage in desiccator cabinet is suggested until full curing is possible.

Removal Procedure
1. Heat component to 220°C using direct and/or hot gasses.
2. Shear or lift component to remove.
3. Apply heat and flux to soften underfill and solder.
4. No additional redressing is necessary.
5. Continue rework process with application of new part.

Storage
Store product in the unopened container in a dry location. Storage information may be indicated on the product container labeling.
Optimal Storage: ≤-10 °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.

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
N/mm^2 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

Note
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 marks used above on this data sheet are trademarks and/or registered trademarks of Henkel and/or its affiliates in the U.S. and elsewhere.

Reference 0.0