Hysol

FP4655

September 2011

PRODUCT DESCRIPTION

FP4655 provides the following product characteristics:

Technology	Epoxy
Appearance	Black
Cure	Heat cure
Product Benefits	• High purity • Self-leveling • Low stress • Low viscosity
Application	Encapsulant
Typical Applications	Cavity fill or dam and fill

FP4655 is a high performance encapsulant which can be used alone as a cavity fill material, or in combination with FP4451 material as part of a dam and fill system. FP4655 is based on the same chemistry as the FP4451 and, therefore, is completely compatible with that product. Its low viscosity and fine particle filler size make it ideal for devices with fine pitch wire spacing. Dam and fill materials should be co-cured to obtain best results.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Viscosity, Brookfield - RVF, 25 °C, mPa·s (cP):	
Spindle 7, speed 10 rpm	140,000
Specific Gravity	1.88
Filler Loading, %	81
Pot life @ 25 °C, hours:	
(Time required to double viscosity)	11
Gel Time @ 121 °C, minutes	11
Shelf Life @ -40°C, months	9
Flash Point - See MSDS	

TYPICAL CURING PERFORMANCE

Recommended Cure Schedule

15 minutes @ 110°C plus 30 minutes @ 165°C

Alternative Cure Schedule

30 minutes @ 125°C plus 90 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:

Coefficient of Thermal Expansion ppm/°C:	
Below Tg (40 to 120°C)	12
Above Tg (190 to 220°C)	60
Glass Transition Temperature (Tg), °C	150
Extractable Ionic Content, ppm:	
Chloride (Cl-)	<15
Sodium (Na+)	<10
Potassium (K+)	<15

Electrical Properties:

Volume Resistivity, ohm/cm	$\geq 5\times10^{13}$

GENERAL INFORMATION

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

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 60 to 90 minutes).
3. DO NOT thaw in an oven.

Directions for use

1. A positive displacement pump is recommended for reproducible shot sizes.
2. A needle size gauge should be used.
3. For best results, dispense onto substrate warmed to 75°C.
4. Care should be taken to protect syringe material from excessive heat prior to dispense.
5. Once dispensed, material should be cured within 30 minutes to prevent moisture contamination.
6. The cured properties of moisture contaminated material will be poorer than those described.
7. **NOTE:** Elevated temperatures reduce working life.

Storage

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

Optimal Storage: -40 °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.

Henkel

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/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

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 and its affiliates ("Henkel") specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel products. Henkel 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 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
All trademarks in this document are trademarks and/or registered trademarks of Henkel in the US and elsewhere.

Reference 0.0