



# FH8301 Data Sheet

## Electronic Materials Flip Chip Underfill Material

### Material Description

FH8301 is a single component heat curable epoxy underfill encapsulant designed for flip chip applications such as System in Package and modules. It is designed for high adhesion and reliability. FH8301 is formulated to flow consistently without voids on die sizes up to than 12 x 12 mm.

This material can also improve the reliability of chip scale package (CSP) and ball grid array (BGA) packages assembly.

### Features & Benefits

- Low CTE
- High T<sub>g</sub>
- High Modulus
- High reliability design for flip chip on board applications

### Curing Profile

Recommended cure schedule is 120 minutes at 165°C

Curing speed will vary depending on oven temperatures profile efficiency, die size and substrate thickness.

Contact HB Fuller technical support for additional curing recommendations.

Typical Uncured Properties	
Property	Value
Color	Black
Specific Gravity	1.6
Viscosity (Brookfield CP52, 10 rpm @25°C, cps)	19,900
Capillary Flow Rate (sec) Flow time, @ 100°C flip chip 5mm, 0.2mm pitch, peripheral array bumps	50
Filler Content	55%
Maximum Particle Size (µm)	3
Average Particle Size (µm)	0.7
DSC Peak (°C)	189
DSC Onset (°C)	149
Working Pot Life (hours) at 23 °C	8

Physical Properties of Cured Material		
Property	Test Method	Value
Modulus at 25 °C (MPa)	DMA	14,570
Transition temperature (T <sub>g</sub> ), (°C)	TMA	105
Transition temperature (T <sub>g</sub> ), (°C)	DMA	122
Coefficient of thermal expansion, (m/m·°C)	ASTM E-831	α 1 = 35 α 2 = 122
Thermal Conductivity (W/mK)	HBF	0.33

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**Preparation for Material Usage**

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1. Do not open the package before completely thawing.
2. Thaw to room temperature (25°C) before using. Any moisture present on the container after thawing should be removed before opening the container.
3. Seal any remaining material and store immediately at -40°C.
4. Once removed from original packaging, allow thawing syringes to equilibrate in tip-down orientation. Handle only the tip or flange. Do not handle syringes from the body.
5. Do not thaw material more than one time.

Contact HB Fuller technical support for additional material handling recommendations.

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**Directions for Use**

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Selection of dispense equipment should be determined by application requirements - for advice on equipment selection and process optimization, users should contact HB Fuller technical support.

1. Ensure that air is not introduced to product during equipment set-up.
2. For best results, the substrate should be pre-heated to 80 to 100 °C. Ensure that the component and substrate have reached the prescribed temperature prior to dispensing the material. Measuring the substrate temperature adjacent to the component using a thermocouple is recommended.
3. The product can be dispensed using a pneumatic, auger or jet pump dispensing system.
4. Contact HB Fuller technical support for dispensing process recommendations.

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**Storage & Shelf Life**

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FH8301 is supplied in 10 cc/syringes  
It should be stored in a -40°C freezer.  
Shelf life is 6 months from date of manufacture.

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**Clean-Up**

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Equipment, brushes, and spillage can be cleaned promptly after use with a mixture of anhydrous isopropyl alcohol and acetone that should be discarded after each use.

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**Health & Safety Precautions**

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Please see the Material Safety Data Sheet (MSDS) for proper handling and disposal instructions.

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**Note**

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The values noted in this data sheet are typical properties only and are not intended to be used as material specifications.  
For assistance in writing a material specification please contact HB Fuller for future details.

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