Technical Data Sheet

LOCTITE ECCOBOND FP4450HF

May 2023

PRODUCT DESCRIPTION

LOCTITE ECCOBOND FP4450HF provides the following product characteristics:

Technology	Epoxy
Appearance	Black
Product Benefits	• High purity • Self-leveling • Excellent corrosion resistance • Excellent chemical resistance • Excellent moisture resistance • High temperature performance • High flow control
Filler Weight, %	73
Cure	Heat cure
Application	Encapsulation
Operating Temperature	-65 to 150 °C
Typical Package Application(s)	• IC memory cards • Chip carriers • Hybrid circuits • Chip-on-board • Multi-chip modules • BGA • Pin grid arrays

LOCTITE ECCOBOND FP4450HF encapsulant is designed for protection of bare semiconductor devices. Autoclave performance on live devices is greater than 1,000 hours with no failure, depending upon device and package type. The use of synthetic fused silica yields alpha particle emissions suitable for memory devices. A cavity or potting dam is required for flow control.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Viscosity, Brookfield - RVF, 25 °C, cps:	
Spindle 6, speed 20 rpm	32,000
Specific Gravity @ 25 °C	1.79
Particle Size, µm, maximum	25
Gel Time @ 121ºC, minutes	12
Pot Life 25 °C (time to double viscosity),days	4
Shelf Life @ -40°C (from date of manufacture), days	274

Flash Point - See SDS

TYPICAL CURING PERFORMANCE Recommended Cure Schedule

30 minutes @ 125°C plus
90 minutes @ 165°C

Alternative Cure Schedule

1 hour @ 110°C plus
3 hours @ 165°C

The above cure profile is a guideline recommendation. These cure conditions (time and temperature) may vary based on customers' experience and specific 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)	21
Above Tg (190 to 220°C)	72
Glass Transition Temperature (Tg) by TMA, °C	164
Alpha Particle Emissions, cts/cm² /hr	0.001
Thermal Conductivity @ 100°C, W/(m-K)	0.62
Extractable Ionic Content, :	
Chloride (Cl-)	2
Sodium (Na+)	1
Potassium (K+)	1

Electrical Properties:

Dielectric Constant / Dissipation Factor
Open ended coaxial probe:

@ 5 GHz	3.56/0.0029
@ 10 GHz	3.55/0.0062
@ 20 GHz	3.52/0.0069
@ 30 GHz	3.51/0.0058
@ 40 GHz	3.52/0.0058
@ 50 GHz	3.49/0.017

GENERAL INFORMATION

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

This product is not recommended for use in pure oxygen and/or oxygen rich systems and should not be used with 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.

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. Storage below minus (-)40 °C or greater than minus (-)40 °C can adversely affect product properties.

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 Henkel Representative.

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
N/mm² x 145 = psi
N/mm² = MPa
N·m x 8.851 = lb·in
N·m x 0.738 = lb·ft
N·mm x 0.142 = oz·in
mPa·s = cP

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