



FP5000™

February 2008

PRODUCT DESCRIPTION

FP5000™ provides the following product characteristics:

Technology	Epoxy
Chemical Type	Epoxy
Appearance (uncured)	Beige paste ^{LMS}
Components	One component - requires no mixing
Cure	Heat cure
Cure Benefit	Production - high speed curing
Application	NCP
Dispense Method	Syringe
Key Substrates	Flipchip to laminate
Reworkable	No

FP5000™ is a one part, high purity non-conductive paste (NCP) designed for thermal compression bonding process. When fully cured, the product provides excellent protection of integrated circuit electrical joints and provides resistance to thermal cycling. The product conforms with JEDEC Level 1, 260 °C requirement.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	1.6
Filler Content, %	53
Pot life @ 25 °C, days:	
(Time to increase 20 % of viscosity)	30
Flash Point - See MSDS	
Viscosity, Cone & Plate, mPa·s (cP):	
Temperature: 25 °C, Shear Rate: 20 s ⁻¹	80,000 to 150,000 ^{LMS}
Thixotropic ratio, Cone & Plate, mPa·s (cP):	
Constant shear rate (2s ⁻¹ / 20s ⁻¹)	1.5 to 3.0 ^{LMS}

TYPICAL CURING PERFORMANCE

Recommended Curing Conditions

4 seconds @ 240 °C

Note: Sufficient time must be added to allow the bond location to reach the desired temperature. Alternate cure profiles may be evaluated.

TYPICAL PROPERTIES OF CURED MATERIAL

Cured for 30 minutes @ 240 °C

Physical Properties:

Coefficient of Thermal Expansion ISO 11359-2, K ⁻¹ :	
Pre Tg (Alpha 1)	20×10 ⁻⁶ to 50×10 ⁻⁶ ^{LMS}
Post Tg (Alpha 2)	100×10 ⁻⁶
Coefficient of Thermal Conductivity, ASTM E 1530, W/(m·K)	0.43
Glass Transition Temperature, °C:	
(Tg) by TMA ISO 11359-2	≥150 ^{LMS}
Water Absorption, ISO 62, %:	
2 hours in water @ 100 °C	0.28
Extractable Ionic Content, MIL 883 E, µg/g:	
Sodium	≤5 ^{LMS}
Potassium	≤5 ^{LMS}
Chloride	≤40 ^{LMS}

Tensile Modulus , ISO 527-3

N/mm² 8,300
(psi) (1,200,000)

Electrical Properties:

Volume Resistivity, IEC 60093, Ω·cm	5.0×10 ¹⁶
Dielectric Constant / Dissipation Factor, IEC 60250:	
1 MHz	3.7 / 0.0138
100 MHz	3.5 / 0.0122
1,000 MHz	3.4 / 0.0095

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for 1 minute @ 240 °C

Die Shear Strength:

Polyimide passivated/FR-5 substrate:	
2 mm x 2 mm die	N/mm ² 104 (psi) (15,000)

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.

Storage

The product is light sensitive and accordingly, translucent containers should be kept in a dark place when not in use. Store product in the unopened container in a dry location. Storage information may also be indicated on the product container labelling.

Optimal Storage: below -20 °C. Storage greater than minus (-)20 °C can adversely affect product properties.

Material removed from containers may be contaminated during use. Do not return product to the original container. Henkel 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/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

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Reference 1.1