ACI Data Sheets

Flexible Conductive and Non-Conductive Adhesive
FE1331, FE1334, FE5236 & FE5237 Combination

ACI MATERIALS

FE1331

Stretchable Conductive Adhesive

Product Description

FE1331 is a silver filled, solvent free, one component conductive adhesive that remains stretchable following thermal cure. This conductive adhesive was designed for bonding to flexible substrates and accommodates interface stresses and strains during bending. FE1331 is both electrically and thermally conductive and can be used in a broad range of applications.

Product Benefits

FE1331 is compatible with flexible systems where interconnect robustness and reliability is challenging. It can be used with high volume automated dispensing processes, and can be cured rapidly with low shrinkage. The cured material displays outstanding thermal and electrical conductivity, with a unique combination of high flexibility, high shear strength, and high adhesion to a broad range of materials. The cured material provides stress relief for bonding dissimilar materials in flexible packaging, which enables high reliability performance metrics such as high resistance to shock and cyclic fatigue.

Typical Properties	
Physical State	Paste/Ink
Color	Silver
Viscosity[1]	
1 s^{-1}	40 Pa·s
10 s^{-1}	15 Pa·s
100 s^{-1}	10 Pa·s
Density	2.8 g/mL
Shelf Life at -40°C[2]	12 Months
Pot Life	9-12 hours
Weight loss on cure	< 1 %
Weight loss @ 300°C TGA	1%

[1] Anton Paar MCR302 at 25°C
[2] Storage at below or greater than can adversely affect product properties

Typical Processing Parameters	
Deposition	Syringe
Recommended Curing Conditions	
60 minutes	140°C
30 minutes	150°C
For performance reported, the material was processed at 140°C for 60 minutes.	

Typical Performance	
Volume Resistivity[3] 140°C for 60 min in box oven	<5.0 x 10^{-4} Ω*cm
Lap Shear Strength	>1,500 kPa
Tg	-10°C
Stretch	50%

[3] Measured 24 hours after suggested cure cycle.

FE1334

High Conductivity Stretchable Adhesive

Product Description

FE1334 is a stretchable adhesive with superior electrical conductivity. It is a silver filled, one component epoxy that can be deposited using stencil, syringe, or jet dispensing. The adhesive was designed for bonding components to compliant substrates and remains stretchable following thermal cure. This highly compliant material lowers the stress risers at the bonded interface and accommodates bending and flexing in a variety of applications

Product Benefits

FE1334 is compatible with flexible and stretchable systems where high electrical conductivity is required. This stretchable conductive adhesive accommodates bending and stretching along the bond line and improves interconnect robustness and reliability. FE1334 can be deposited via stencil, syringe, or jet dispensing and cures with low shrinkage. The combination of high electrical conductivity, high shear strength, and high adhesion to a broad range of materials makes it a good choice for bonding in many flexible and stretchable applications. It is also appropriate for bonding rigid components in packages with large thermally induced strains.

Typical Properties

Physical State	Paste/Ink
Color	Silver
Viscosity[1]	
1 s^{-1}	100 Pa·s
10 s^{-1}	27 Pa·s
100 s^{-1}	12 Pa·s
Density	3.2 g/mL
Shelf Life at -40°C[2]	12 Months
Pot Life	12-14 hours
Weight loss on cure	< 1 %
Weight loss @ 300°C TGA	< 3%

[1] Anton Paar MCR302 at 25°C
[2] Storage at below or greater than can adversely affect product properties

Typical Processing Parameters

Deposition	Stencil / Syringe / Jet
Recommended Curing Conditions	
60 minutes	140°C
30 minutes	150°C

For performance reported, the material was processed at 140°C for 60 minutes.

Typical Performance

Volume Resistivity[3] 140°C for 60 min in box oven	< 2.0 x 10^{-4} Ω*cm
Lap Shear Strength	> 1,500 kPa
Tg	-10°C
Stretch	Up to 40%

[3] Measured 24 hours after suggested cure cycle.

ACI MATERIALS

FE5236

Non-Conductive Stretchable Adhesive

Product Description

FE5236 is a stretchable non-conductive epoxy used to bond components in flexible and stretchable systems and to manage thermal expansion mismatches in rigid packaging solutions. The NCA can be used in concert with ACI's conductive adhesives, FE133X series, to create an effective surface mount attachment on flexible and stretchable substrates. It can be used with traditional deposition processes and cures with low shrinkage. FE5236 exhibits a unique combination of high compliance, high shear strength, and high adhesion to a broad range of materials.

Product Benefits

FE5236 is a filled non-conductive epoxy used to bond components in flexible and stretchable systems and to manage thermal expansion mismatches in rigid packaging solutions. It can be used with high volume dispensing processes, and cures with low shrinkage. The NCA exhibits a unique combination of high compliance, high shear strength, and high adhesion to a broad range of materials.

Typical Performance	
Lap Shear Strength	> 1,500 kPa
Tg	- 10 °C
Stretch	50%

Typical Properties	
Physical State	Paste
Color	Yellow-White
Viscosity[1]	
1 s^{-1}	37 Pa·s
10 s^{-1}	12 Pa·s
100 s^{-1}	8 Pa·s
Density	1.1 g/mL
Percent Solids	>97%
Shelf Life at -40°C[2]	12 Months
Pot Life:	14 – 16 hours
Weight Loss on Cure	<2%
Weight Loss at 300°C TGA	<3%

[1] Anton Paar MCR302 at 25 °C
[2] Storage at different temperatures can adversely affect properties

Typical Processing Parameters	
Deposition	Syringe \ Screen \ Stencil
Recommended Curing Conditions	
60 minutes	140 °C
30 minutes:	150 °C
For all physical properties reported, the materials was processed at 140 °C for 60 minutes.	

FE5237

Stretchable Glob Top Encapsulant

Product Description

FE5237 is an epoxy based glob top encapsulant that remains stretchable following thermal cure. The encapsulant can be used in combination with ACI's stretchable ECAs and NCAs for interconnect solutions. The material can also be used as a stand-alone to electrically insulate and protect components mounted to flexible and stretchable systems, or for rigid systems to manage stresses arising from large thermal expansion mismatches.

Product Benefits

FE5237 is a filled non-conductive epoxy used to encapsulate components in flexible and stretchable systems and to manage thermal expansion mismatches in rigid packaging solutions. It can be used with high volume dispensing processes and cures with low shrinkage. The encapsulant exhibits a unique combination of high compliance and high adhesion to a broad range of materials, including plastics, metals, glass and ceramics.

Typical Performance	
Lap Shear Strength	> 1,500 kPa
Tg	- 10 °C
Stretch	50%

Typical Properties	
Physical State	Paste
Color	Yellow-White
Viscosity[1]	
1 s^{-1}	37 Pa·s
10 s^{-1}	12 Pa·s
100 s^{-1}	8 Pa·s
Density	1.1 g/mL
Percent Solids	>97%
Shelf Life at -40°C[2]	12 Months
Pot Life	14 – 16 hours
Weight Loss on Cure	<2%
Weight Loss at 300°C TGA	<3%

[1] Anton Paar MCR302 at 25 °C
[2] Storage at different temperatures can adversely affect properties

Typical Processing Parameters	
Deposition	Syringe \ Screen \ Stencil
Recommended Curing Conditions	
60 minutes	140 °C
30 minutes:	150 °C

For all physical properties reported, the materials was processed at 140 °C for 60 minutes.

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Caution

Proper industrial safety precautions should be exercised in using these products. Use with adequate ventilation. Avoid prolonged contact with skin or inhalation of any vapors emitted during use or heating of these compositions. The use of safety eye goggles, gloves or hand protection creams is recommended. Wash hands or skin thoroughly with soap and water after using these products. Do not eat or smoke in areas where these materials are used. Refer to appropriate SDS information.

Disclaimer

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