United Adhesives

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ET 1653BN

High Thermal Conductive Epoxy Adhesive

Typical Properties			
Property	**Unit**	**Value**	**Test Method**
Color of Component		Off-White	Visual
Density	Gram /cc	1.4	ASTM D792
Viscosity at 25°C	cps	230,000	ASTM D2196
Property as Cured			
Color		Light Yellow	Visual
Young's modulus	GPa	6.5	DMA
Thermal conductivity	W/m-K	3.0	ASTM D5470
Heat Capacity at 25°C	J/g-K	1.0	ASTM D1269
Dielectric Strength	Volt/mil AC	> 500	ASTM D149
Volume Resistivity	Ohm-cm	> 10E+12	ASTM D257
Coefficient of Thermal Expansion	ppm/C	146 (@ > Tg) 53 (@ < Tg)	IPC-TM-650
Adhesion (Al/Al lap shear)	Psi	> 800	ASTM D1002
Tg	℃	120	DMA
Temperature Usage	℃	-80 to 180	TGA
Cure Profile			
Cure at 125°C	hr	1	DSC
Cure at 150°C	hr	0.5	DSC
Pot / Work Life at 25°C (after warmed up)	hr	8	Viscosity double

These figures are only intended as a guide and should not be used in preparing specifications.

Characteristics

ET 1653BN is an epoxy-based structural bonding adhesive with improved thermal conductivity for electronic applications. It is a one-part, thixotropic formulation that cures at elevated temperature to provide strong bonding to silicon, flip chip, BGA, ceramics, LTCC, aluminum, copper, stainless steel, etc. while notably dissipating heat. ET 1653BN uses boron nitride as filler to provide higher thermal conductivity than alumina filled materials. ET 1653BN is dispensable, and non-slumping at both ambient and elevated cure temperature.

Special Features and Benefits

- Very high thermal conductivity
- High thermal stability
- High structural bonding strength
- Low bleeding, low volatile
- Low ionic content

Typical Applications

- Aerospace electronics
- Automotive electronics
- Semiconductor and Telecommunications
- Structural bonding of die to LTCC, Al, Cu
- Bonding of power devices to heat sinks
- Resistance to thermal vibration

ET 1653BN has a shelf life of at least 3 months when stored at freezer (-40℃) in the originally sealed container. For flowable version, please select United Adhesives' product EP1642. For soft version, please select EP1610.

Processing Instruction

ET 1653BN is a pre-mixed adhesive as one part for easier applying. In order to keep longer usage life, please always store the original or left material in freezer (- 40℃). For some applications, it is recommended to warm the adhesive to about 50℃ to promote easier flow.

We recommend running preliminary tests to optimize conditions for the particular application. Comprehensive processing instructions can be obtained by contacting directly to United Adhesives, Inc.

Storage

ET 1653BN has a shelf life of at least 3 months when stored at freezer (-40℃) in the originally sealed container. The 'Best use before end' date of each batch appears on the product label. Storage beyond the date specified on the label does not necessarily mean that the product is no longer usable. In this case however, the properties required for the intended use must be checked for quality assurance reasons.

Safety information

General hygiene regulations should be observed. Comprehensive instructions are given in the corresponding Material Safety Data Sheets. They are available on request from United Adhesives, Inc.

The data presented in this leaflet are in accordance with the present state of our knowledge, but do not absolve the user from carefully checking all supplies immediately on receipt. We reserve the right to alter product constants within the scope of technical progress or new developments. The recommendations made in this leaflet should be checked by preliminary trials because of conditions during processing over which we have no control, especially where other companies' raw materials are also being used. The recommendations do not absolve the user from the obligation of investigating the possibility of infringement of third parties' rights and, if necessary, clarifying the position. Recommendations for use do not constitute a warranty, either express or implied, of the fitness or suitability of the products for a particular purpose. For technical, quality, or product safety questions, please contact directly to United Adhesives Inc.