GLUDITEC
Glue & Dispensing Technology

Technical Data Sheet

PE-F6004

Polyurethane Flame Retardant Encapsulation Foam

PE-F6004 is two-component flame retardant, low density polyurethane foam material designed for potting and encapsulation of battery cell in EV battery modules or other easily flamable applicatoions. PE-F6004 offers design engineer the ability to increase the power density of their modules while ensuring safety and protection from thermal propagation. The ultra lightweight nature of the PE-F6004 minimizes the weight impact to the modules. The semi-structural properties of the material also provide noise, vibration, and harshness benefits to the battery system by unitizing the battery module and absorbing external environment impacts.

FEATURE

- Prevents Thermal Propagation
- Ultra Lightweight
- Low Viscosity & Self Leveling
- Great Vibration and Impact Resistance
- Outstanding Insulation Properties
- No outgassing of Hydrogen gas during curing
- Meets UL94 V0 Certification
- Up to 5 Times Expansion Rate
- Cost Effective - Low Volume Usage
- Fast Processability

TYPICAL UNCURED PROPERTIES

Properties	PE-F6004A	PE-F6004A	Mixture
Color	Off-white	Clear Amber	
Specific gravity D792/D1475	1.17	1.25	
Viscosity *25°C, cps	500	160	
Mix ratio by weight	100	86	
Mix ratio by volume	100	81	
Working time *25°C, sec			120
Cream time *25°C, sec			180 - 240
Tack Free time *25°C, min			~ 60

TYPICAL CURED PROPERTIES

Operating Temperature Range, °C	-60 ~ 120
Hardness at 24/ 48 hours (Shore A)	20 ~ 30/ 35 ~ 45
Foam Density - Free Rise (g/cm^3)	0.16 ~ 0.19
Foam Density - Free Rise (pcf)	10 ~ 12
Thermal Conductivity (W/m-K)	0.05

ELECTRICAL PROPERTIES

Property	Test Method	Value
Dielectric Strength (kV/mm)	ASTM D149	3.0
Dielectric Constant at 1MHz	ASTM D-0150	1.40
Dissipation factor at 1MHz	ASTM D-0150	0.029
Volume resistivity (ohm-cm)	ASTM D-0257	5.1 * 10^{11}
Surface resistivity (ohm)	ASTM D-0257	7.7 * 10^{12}

HAND MIXING INSTRUCTIONS

1. Per the stated mix ratio, measure out (either by weight or volume) the appropriate portions of Part A and Part B as into a flat sided container.

2. The mixing container should be larger than the amount of total material being mixed to allow for vigorous mixing. For example, for 75 grams of total material we suggest a minimum size of 150 ml container for mixing. For larger amounts, adjust container size appropriately.

3. Generally it's recommended to add the higher density part into the flat sided mixing container first and then add the other part gently on top of the first part. This helps limit pre-reaction of the materials to just the interphase. Scrape the side and bottom of the individual parts container's to ensure nearly all the measured materials are added to the mixing container.

4. It is recommended to use automatical mixing system for better performance.

(+84) 969 469 089 info@gluditec.com www.gluditec.com

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GENERAL INSTRUCTIONS

PE-F6004 is a two-component material. Hand mixing may be difficult. It is recommended that an automated dispensing unit be used with dynamic mixer to mix material. Prior to use, stir the individual parts to ensure they are uniform and homogenerous. Mixing the PE-F6004 prior to use for 5 minutes is essential to achieve a consistent foam density and cell structure. Check the container bottom for sediment after mixing to ensure filler is mixed in. If an extended shutdown or break in production has occured (> 1 hour) re-mix part A side prior to use. Note: Pail or Drum size containers may require longer mixing times. Surface must be clean, dry, and free from grease, oil, wax and other surface contaminates.

HANDLING AND CLEAN-UP

For cleanup of PE-F6004, Methyl Ethyl Ketone, Acetone, Dibasic Ester, Ethyl Acetate, or Mineral Spirits are recommended. Confirm with equipment, Mineral oil can be used to flush uncured materials from lines. To clean uncured material from tabletops, tools or spatulas, additional cleaning solvent options are Isopropanol and Denatured Alcohol.

STORAGE AND SHELF LIFE

PE-F6004 should be stored in a cool, dry place above 15°C (60°F). Purge open containers with dry nitrogen. Shelf life is a minimum of one year in unopened containers when stored at 25°C.

TYPICAL PACKAGING

5 gal Pails

55 gal Drums

300 gal Totes

SAFETY AND DISPOSAL

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

Note:

The values noted in this data sheet are typical properties only and are not intended to be used as material specifications.

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