

Features & Benefits

- Expanding foam for battery cells
- Excellent thermally conductivity
- Low density for lightweighting
- Designed to meet the requirements of UL94
- Good resistance to thermal shocks
- Negligible hydrogen development during the foaming process

Description

PERMABOND[®] ET5442 is a two-component, thermally conductive, fire retardant, low density epoxy resin foam. It is developed for encapsulation of battery cell in EV battery modules. The highly conductive skin efficiently transfers heat to the cooling plate, providing a thermal bridge for heat conduction and dissipation. The cured product has been designed to meet the fire retardancy requirements of UL94 V1.

Physical Properties of Uncured Adhesive

	ET5442 A-side	ET5442 B-side
Chemical composition	Epoxy Resin	Modified Polyamide
Appearance	Blue	Light Blue
Viscosity @ 25°C	500,000 mPa.s (CP) Thixotropic	800,000 mPa.s (CP) Thixotropic
Specific gravity	2.1	1.9

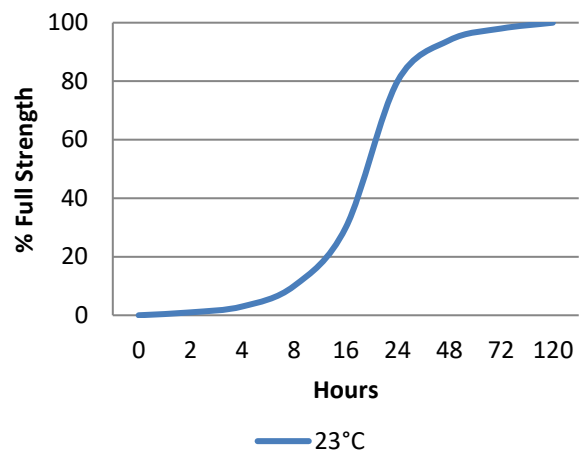
Typical Curing Properties

Mix ratio	2:1 by volume 100:50 by weight
Functional cure time (foam stability)	180 minutes
Free expansion	>200%
Full cure @ 23°C	5 days

Typical Performance of Cured Adhesive

Shear strength* (ISO4587)	Mild Steel: 0.8 N/mm ² (116 psi)
Foam density – free rise	0.89 g/cm ³
Thermal conductivity of the foam	0.3 W/(m.K)
Thermal conductivity of the skin	>1 W/(m.K)
Hardness (ISO868)	60 Shore D

Strength Development

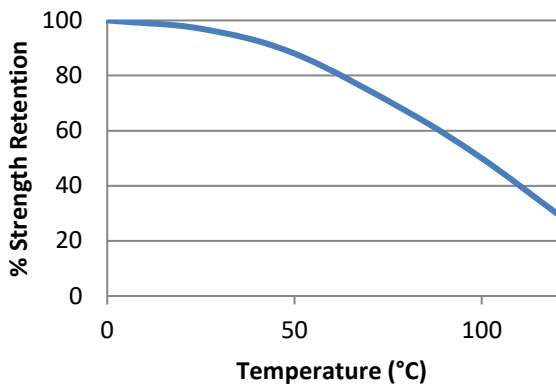


Graph shows typical strength development of bonded components. An increase of 8°C in temperature will halve the cure time. Lower temperatures will result in a slower cure time.

The information given and the recommendations made herein are based on our research and are believed to be accurate but no guarantee of their accuracy is made. In every case we urge and recommend that purchasers before using any product in full-scale production make their own tests to determine to their own satisfaction whether the product is of acceptable quality and is suitable for their particular purpose under their own operating conditions. THE PRODUCTS DISCLOSED HEREIN ARE SOLD WITHOUT ANY WARRANTY AS TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED.

No representative of ours has any authority to waive or change the foregoing provisions but, subject to such provisions, our engineers are available to assist purchasers in adapting our products to their needs and to the circumstances prevailing in their business. Nothing contained herein shall be construed to imply the non-existence of any relevant patents or to constitute a permission, inducement or recommendation to practice any invention covered by any patent, without authority from the owner of this patent. We also expect purchasers to use our products in accordance with the guiding principles of the Chemical Manufacturers Association's Responsible Care® program.

Hot Strength



"Hot strength" shear strength. Fully cured specimens conditioned to pull temperature for 30 minutes before testing at temperature.

ET5442 can withstand higher temperatures for brief periods providing the foam is not unduly stressed.

Additional Information

This product is not recommended for use in contact with strong oxidizing materials.

Information regarding the safe handling of this material may be obtained from the safety data sheet.

Users are reminded that all materials, whether innocuous or not, should be handled in accordance with the principles of good industrial hygiene.

This Technical Datasheet (TDS) offers guideline information and does not constitute a specification.

Surface Preparation

Surfaces should be clean, dry and grease-free before applying the product. Use a suitable solvent (such as acetone or isopropanol) for the degreasing of surfaces.

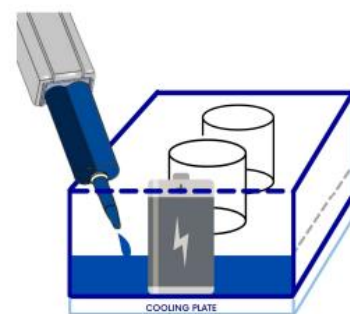
Storage & Handling

Storage Temperature	5 to 25°C (41 to 77°F)
---------------------	------------------------

NB. Suitable only for battery pack made with cylindrical batteries.

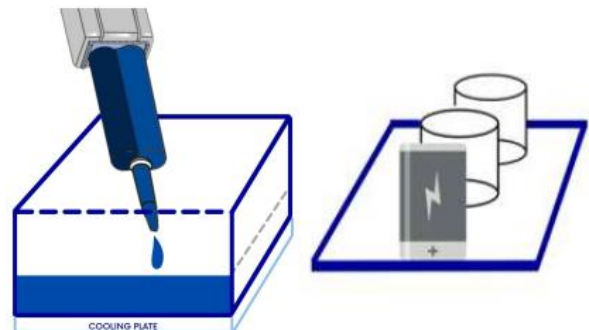
Directions for Use

1. Dual cartridges:
 - a) Insert the cartridge into the application gun and guide the plunger into the cartridge.
 - b) Remove the cartridge cap and dispense material until both sides are flowing.
 - c) Attach the static mixer to the end of the cartridge and begin dispensing the material.
2. There are two options [see diagrams below]: 1) dispense the product into the battery pack or 2) dispense the product in the case and then introduce the pre-assembled battery pack.
3. Full cure will be obtained after 5 days at 23°C (74°F).



1

Dispense product into the battery pack



2

Dispense product in the case and after introduce the battery pack pre-applied on the cover

www.permabond.com

• UK: 0800 975 9800

• General Enquiries: +44 (0)1962 711661

• US: 732-868-1372

• Asia: + 86 21 5773 4913

info.europe@permabond.com

info.americas@permabond.com

info.asia@permabond.com

The information given and the recommendations made herein are based on our research and are believed to be accurate but no guarantee of their accuracy is made. In every case we urge and recommend that purchasers before using any product in full-scale production make their own tests to determine to their own satisfaction whether the product is of acceptable quality and is suitable for their particular purpose under their own operating conditions. THE PRODUCTS DISCLOSED HEREIN ARE SOLD WITHOUT ANY WARRANTY AS TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED.

No representative of ours has any authority to waive or change the foregoing provisions but, subject to such provisions, our engineers are available to assist purchasers in adapting our products to their needs and to the circumstances prevailing in their business. Nothing contained herein shall be construed to imply the non-existence of any relevant patents or to constitute a permission, inducement or recommendation to practice any invention covered by any patent, without authority from the owner of this patent. We also expect purchasers to use our products in accordance with the guiding principles of the Chemical Manufacturers Association's Responsible Care® program.