PERMABOND® ES560

Single-part, heat-cure Epoxy

Technical Datasheet

Features & Benefits

- Excellent adhesive strength
- Excellent resistance to vibration
- Easy to use – no mixing required
- Low viscosity

Description

PERMABOND® ES560 is a single-part epoxy adhesive which flows when heated. It is unfilled and self-levelling, making it particularly suitable for electronics potting and encapsulation applications, as well as underfilling and reworking microchips. It withstands thermal cycling and has excellent shock resistance.

Physical Properties of Uncured Adhesive

Chemical composition	Epoxy Resin
Appearance	Uncured – white / opaque Cured – translucent
Viscosity @ 25°C	1,000-3,000 mPa.s (cp)
Specific gravity	1.2

Typical Curing Properties

Flow at high temperature	Free flow
Maximum gap fill	0.1 mm ***0.004 in***
Cure speed (oven)*	**Potting:** 100°C ***(210°F):*** 30 minutes plus 120°C ***(250°F):*** 30 minutes. **Bonding:** 100° C ***(210°F):*** 60 minutes or 120°C ***(250°F):*** 40 minutes
Cure speed (induction)	<3 minutes

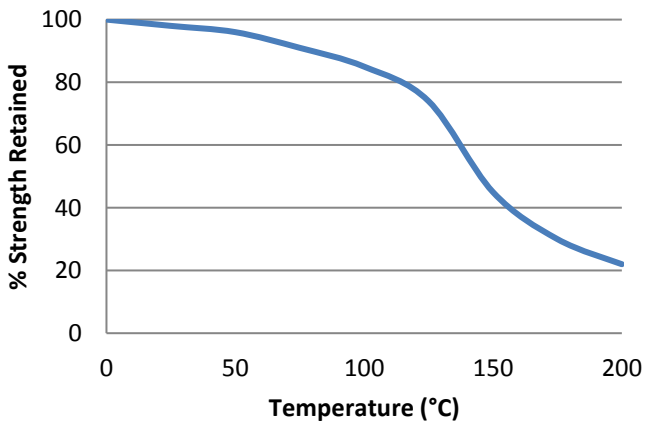
**Actual cure times will depend on the time it takes for the adhesive to reach this temperature - for example, large assemblies or a crowded oven will require longer to reach full cure. Alternative, quicker methods of curing include induction, hotplates, infrared lamps and hot-air guns.*

Typical Performance of Cured Adhesive

Shear strength* (ISO4587)	Steel 14 - 20 N/mm² ***(2000-2900 psi)***
Peel strength (aluminium) (ISO4578)	40 N/25mm
Glass transition (Tg)	110°C
Hardness (ISO868)	80 Shore D
Coefficient of thermal expansion (+40-+100°C)	45 x 10^{-6} mm/mm/°C
Thermal conductivity	0.1 W/(m.K)
Dielectric strength	22 kV/mm
Dielectric constant	4.5

**Strength results will vary depending on the level of surface preparation and gap.*

Hot strength



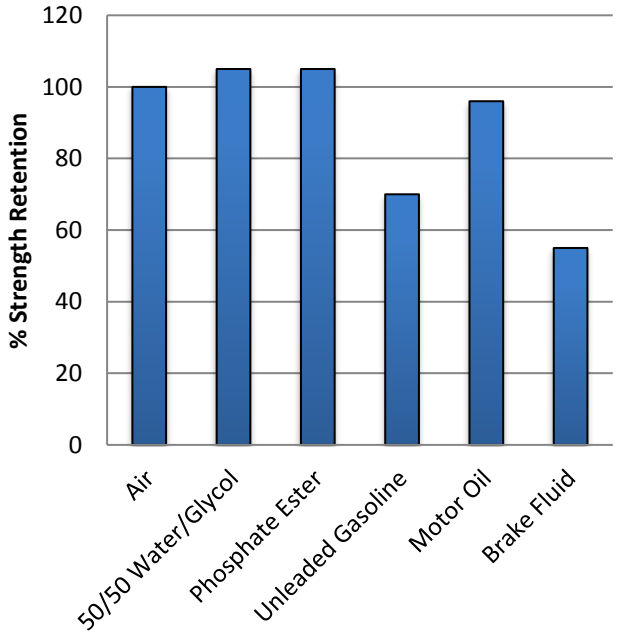
"Hot strength" shear strength tests performed on mild steel. Fully cured then conditioned to pull temperature for 30 minutes before testing.

ES560 can withstand higher temperatures for brief periods (such as for paint baking and wave soldering processes) providing the joint is not unduly stressed. The minimum temperature the cured adhesive can be exposed to is -40°C (-40°F) depending on the materials being bonded.

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.

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Chemical Resistance



Specimens were immersed for 30 days at 85ºC and tested at room temperature.

Surface Preparation

Surfaces should be clean, dry and grease-free before applying the adhesive. Use a suitable solvent (such as acetone or isopropanol) for the degreasing of surfaces. Some metals such as aluminium, copper and its alloys will benefit from light abrasion with emery cloth (or similar), to remove the oxide layer.

Directions for Use

1) The adhesive should be dispensed from the bottle via the nozzle supplied (this can be cut to give the appropriate sized bead to cover the bond area).
2) Apply the adhesive to one surface and avoid entrapping air.
3) Assemble parts applying sufficient pressure to ensure the adhesive spreads to cover the entire bond area.
4) Use a jig / clamp to prevent parts moving during cure.
5) It is advisable not to disturb the joint until the adhesive is fully cured.
6) Cure with heat – see page one for cure schedule.

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 (SDS).
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.

Video Links

Surface preparation:
https://youtu.be/8CMOMP7hXjU

Single-part epoxy directions for use:
https://youtu.be/_KupaieuuZw

Storage & Handling

Storage Temperature	2 to 7°C *(35 to 45°F)*

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

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