PERMABOND® ES5516

Single-part, heat-cure Epoxy

Provisional Technical Datasheet

Features & Benefits

- Parts can be tacked in place with UV light
- UV fluorescence for in-line QC
- Excellent resistance to vibration
- High shear strength
- Structural bonding for high temperature applications
- Good resistance to chemicals

Description

PERMABOND® ES5516 is a unique, lightly thixotropic, toughened, heat-cured adhesive. Before curing, it can be tacked or sealed in place with UV light. ES5516 is ideally suited for bonding magnets in synchronous motors, or fixing any small-sized close fitting parts where there is no ability to mechanically clamp. ES5516 exhibits good chemical resistance as well as excellent heat resistance on metals and composites and maintains a high structural strength at 180°C, making it suitable for Class H electric motor bonding applications.

Physical Properties of Uncured Adhesive

Chemical composition	Epoxy Resin
Appearance	Ivory – yellow once cured
Viscosity @ 25°C	4,500 mPa.s *(cP)* Thixotropic
Specific gravity	1.17

Typical Curing Properties

Flow at high temperature	Free flowing at 150°C
Maximum gap fill	0.5 mm *0.02 in*
Fixture time with UV-LED lamp (400nm, 150mW/cm²)	30 seconds
Cure speed (oven)*	150°C *(300°F):* 60 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.*

Typical Performance of Cured Adhesive

Shear strength* (ISO4587)	Mild Steel 23 N/mm² *(3336 psi)* Aluminium 22 N/mm² *(3190 psi)* Stainless Steel 29 N/mm² *(4206 psi)* Hot Dip Galv 15 N/mm² *(2175 psi)* Tin 7 N/mm² *(1015 psi)* Zintec 20 N/mm² *(2900 psi)* PBT 6 N/mm² **SF *(2175 psi)*
Impact strength (ASTM D950)	25-35 KJ/m²
Hardness (ISO868)	>75 Shore D
Thermal conductivity	0.66 W/(m.K)

**Strength results will vary depending on the level of surface preparation and gap.*
***SF denotes substrate failure*

Hot Strength Data

Mild Steel @150°C	18 N/mm² *(2610 psi)*
Mild Steel @180°C	8 N/mm² *(1160 psi)*
Mild Steel @200°C	5 N/mm² *(725 psi)*
Aluminium @150°C	15 N/mm² *(2175 psi)*
Aluminium @200°C	8 N/mm² *(1160 psi)*
Stainless Steel @200°C	10 N/mm² *(1450 psi)*

"Hot strength" shear strength tests were fully cured then conditioned to pull temperature for 30 minutes before testing.

ES5516 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.

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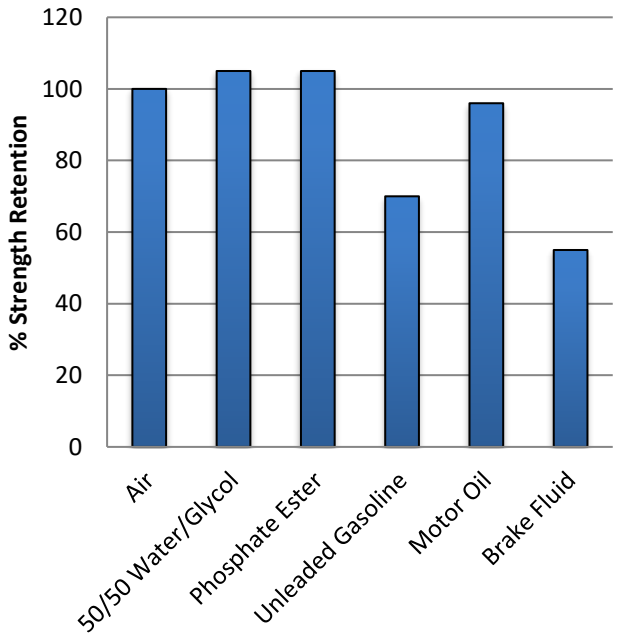
Chemical Resistance



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 cartridge 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 material safety data sheet (MSDS).
Users are reminded that all materials, whether innocuous or not, should be handled in accordance with the principles of good industrial hygiene.

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)*

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