

### Features & Benefits

- 💧 Very good thermal conductivity
- 💧 Excellent resistance to vibration
- 💧 Easy to use – no mixing required
- 💧 High shear and peel strength
- 💧 High temperature resistance
- 💧 Good resistance to chemicals
- 💧 Electrically insulating

### Description

**PERMABOND® ES578** is a single-part heat cured epoxy adhesive with excellent adhesion to metal surfaces, ceramics as well as composite materials. ES578 provides excellent thermal conductivity and bond strength. ES578 was designed for applications requiring heat dissipation such as bonding aluminum heat sinks to ceramic headers. **The cured adhesive has been designed to meet the fire retardancy requirements of UL94 V-0.**

### Physical Properties of Uncured Adhesive

Chemical composition	Epoxy Resin
Appearance	Black
Viscosity @ 25°C	600,000 to 800,000 mPa.s (cP)
Specific gravity	1.6

### Typical Curing Properties

Flow at high temperature	Flowing
Maximum gap fill	5 mm <b>0.2 in</b>
Cure speed (oven) *	130° C ( <b>266°F</b> ): 75 minutes 150° C ( <b>300°F</b> ): 60 minutes 170° C ( <b>338°F</b> ): 25 minutes
Cure speed (induction)	<3 minutes

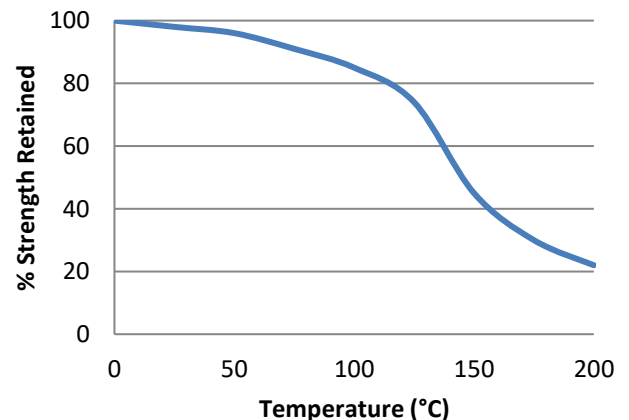
\*Actual cure times will depend on the time it takes for the adhesive to reach this temperature - for example, large assemblies or a crowded oven will require longer to reach full cure. Alternative, quicker methods of curing include induction, hotplates, infrared lamps and hot-air guns.

### Typical Performance of Cured Adhesive

Shear strength* (ISO4587)	Steel 27 – 41 N/mm <sup>2</sup> ( <b>4000 – 6000 psi</b> ) Aluminium 17 – 31 N/mm <sup>2</sup> ( <b>2500 – 4500 psi</b> ) Zinc 14 – 27 N/mm <sup>2</sup> ( <b>2000 – 4000 psi</b> )
Hardness (ISO868)	80-85 Shore D
Coefficient of thermal expansion	45 x 10 <sup>-6</sup> mm/mm/°C (below Tg)
Thermal conductivity	1.0 W/(m.K)
Dielectric strength	40-45 kV/mm
Glass transition temperature (Tg – DSC)	105°C ( <b>220°F</b> )

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

### Hot Strength



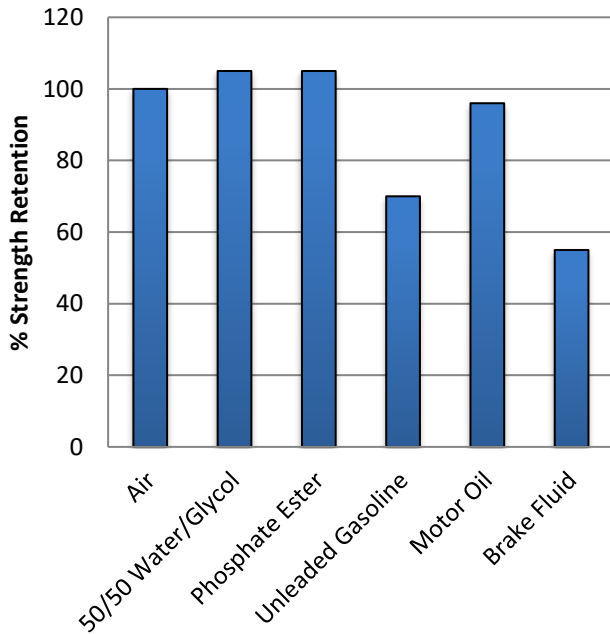
“Hot strength” shear strength tests performed on mild steel. Fully cured then conditioned to pull temperature for 30 minutes before testing.

ES578 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.**

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.

## Chemical Resistance



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

## 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.**

## Storage & Handling

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

## 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.

## Video Links

Surface preparation:

<https://youtu.be/8CMOMP7hXjU>



Single-part epoxy directions for use:

[https://youtu.be/\\_KupaieuuZw](https://youtu.be/_KupaieuuZw)



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.

PermaBond ES578

Global TDS Revision 10

12 August 2019

Page 2/2

**FOR PROFESSIONAL OR INDUSTRIAL USE ONLY. KEEP OUT OF REACH OF CHILDREN**