# PERMABOND® ES579

*Single-part, heat-cure Epoxy*

Technical Datasheet

## Features & Benefits

- Very high shear, impact and peel strength
- Excellent resistance to vibration
- Easy to use – no mixing required
- High shear and peel strength
- High temperature resistance
- Good resistance to chemicals

## Description

**PERMABOND® ES579** is a single-part heat cured epoxy adhesive with excellent adhesion to metal surfaces, ceramics as well as composite materials. ES579 provides excellent thermal conductivity and bond strength, it is electrically non-conductive.

## Physical Properties of Uncured Adhesive

| | |
|---|---|
| Chemical composition | Epoxy Resin |
| Appearance | Ivory |
| Viscosity @ 25°C | 60,000 to 90,000 mPa.s *(cP)* |
| Specific gravity | 1.7 |

## Typical Curing Properties

| | |
|---|---|
| Flow at high temperature | Some flow |
| Maximum gap fill | 2 mm *0.08 in* |
| Cure speed (oven) * | 100° C *(210°F):* 240 minutes<br>120°C *(250°F):* 60 minutes<br>150°C *(300°F):* 45 minutes<br>180°C *(356°F):* 20 minutes |
| Cure speed (induction) | <3 minutes |

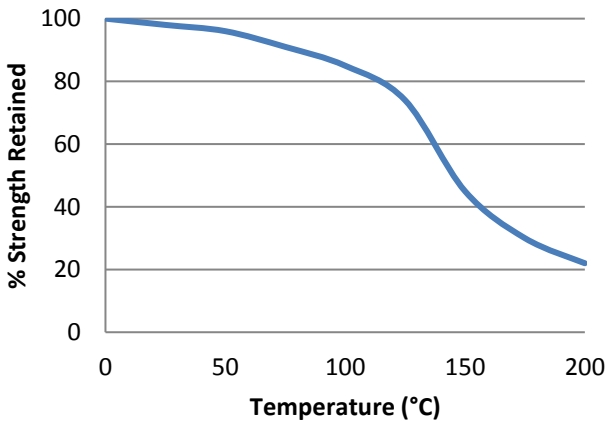
**Actual cure times will depend on the time it takes for the adhesive to reach this temperature - for example, large assemblies or a crowded oven will require longer to reach full cure. Alternative, quicker methods of curing include induction, hotplates, infrared lamps and hot-air guns.*

## Typical Performance of Cured Adhesive

| | |
|---|---|
| Shear strength* (ISO4587) | Steel 27 – 41 N/mm² *(4000 – 6000 psi)*<br>Aluminium 17 - 31 N/mm² *(2500 – 4500 psi)*<br>Zinc 14 - 27 N/mm² *(2000 – 4000 psi)* |
| Peel strength (ISO4578) | 70 N/25mm *(15 PIW)* |
| Hardness (ISO868) | 80-85 Shore D |
| Coefficient of thermal expansion | 45 x $10^{-6}$ mm/mm/°C (below Tg) |
| Thermal conductivity | 1.3 W/(m.K) |
| Dielectric strength | 17.7 kV/mm |
| Dielectric constant 1mHz | 5.4 |
| Glass transition temperature (Tg – DSC) | 105°C *(220°F)* |

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

## Hot Strength



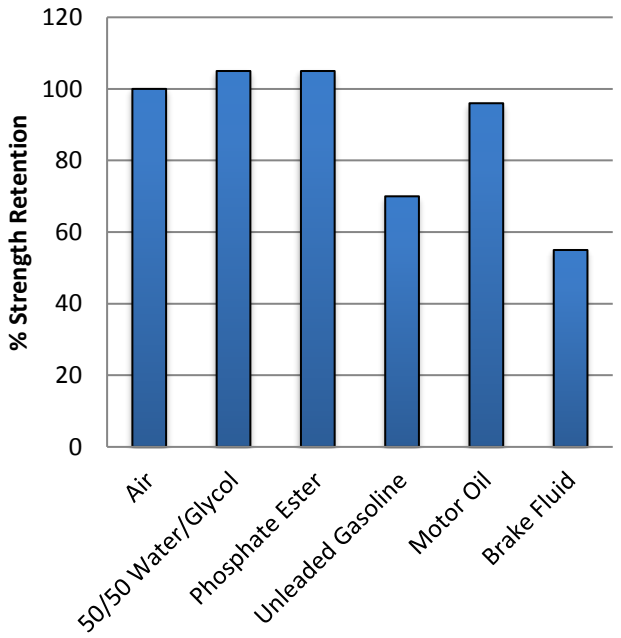

*"Hot strength" shear strength tests performed on mild steel. Fully cured then conditioned to pull temperature for 30 minutes before testing.*

ES579 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.*

## 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


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