

### Features & Benefits

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

### Description

PERMABOND® ES550 is a single-part epoxy paste which is slump-resistant (does not flow) during cure. The adhesive is toughened for maximum impact resistance, along with excellent peel and shear strength. ES550 is ideal for bonding a wide range of materials including metals, ferrites, ceramics and composites.

### Physical Properties of Uncured Adhesive

Chemical composition	Epoxy Resin
Appearance	Silver-grey
Viscosity @ 25°C	1,000,000 to 2,000,000 mPa.s (cP) (Helipath, 2rpm)
Specific gravity	1.5

### Typical Curing Properties

Flow at high temperature	No flow
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> ): 40 minutes
Cure speed (induction)	<3 minutes

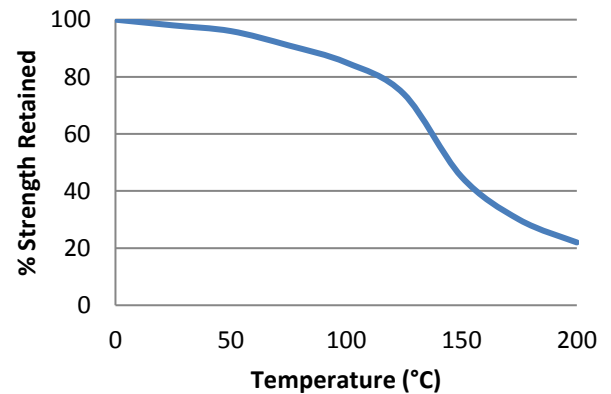
\*Actual cure times will depend on the time it takes for the adhesive to reach this temperature - for example, large assemblies or a crowded oven will require longer to reach full cure. Alternative, quicker methods of curing include induction, hotplates, infrared lamps and hot-air guns.

### Typical Performance of Cured Adhesive

Shear strength* (ISO4587)	Steel 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> )
Shear strength steel to ferrite	>14 N/mm <sup>2</sup> ( <b>&gt;2000 psi</b> ) Substrate failure
Impact Strength (ASTM D-950)	25-35 KJ/m <sup>2</sup>
Hardness (ISO868)	80-85 Shore D
E-modulus	3.5 GPa
Elongation at break (DIN 53504)	<3%
Coefficient of thermal expansion	45 x 10 <sup>-6</sup> mm/mm/°C (below Tg) 160 x 10 <sup>-6</sup> mm/mm/°C (above Tg)
Thermal conductivity	0.55 W/(m.K)
Glass transition temperature (Tg – DSC)	120°C ( <b>250°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. ES550 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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