

# Single-Part Epoxies

Permabond single-part epoxy adhesives are suitable for bonding a wide variety of materials. They are available with a range of different viscosities and with and without metal filler. Permabond epoxies have been developed to offer a high standard of performance for demanding applications.

## Substrates

Permabond single-part epoxy adhesives will bond most engineering materials. They form excellent structural bonds to a wide variety of materials including metals, composites, wood and even some plastics.

## Durability

These adhesives offer excellent performance at high temperatures and harsh environmental conditions, having superb resistance to strong chemicals.

## Applications

Single-part epoxies are ideal for use in heavy wear-and-tear applications such as bonding tungsten carbide tools & machinery. They are ideal for replacing welding and brazing and can significantly reduce assembly production costs. For this reason their use is widespread in the heat exchanger market for sealing heat exchanger tubes and end-plates.

## Material selection

By replacing welding or brazing, the designer can have greater freedom of choice of manufacturing materials and can bond dissimilar substrates together. This can help reduce component cost and weight and improve performance.

## Process

Adhesive is available in cartridge form or in bulk to dispense via automated dispensing equipment. The adhesives cure rapidly when heated so it is necessary to use an oven to cure the adhesive (or other method such as an induction coil, infra-red or a hot air gun).

## Joint Design

Joint design possibilities are greatly improved by the high shear and peel strength of joints bonded with these adhesives because of the increased stress distribution that they offer.

## Benefits

- High peel strength increases design versatility
- No requirement for weighing or mixing material
- Durability increases material choices
- Rapid cure increases production rates
- Solvent free improves workplace safety
- Low odour improves workplace environment



**Permabond**<sup>®</sup>  
Engineering Adhesives

## Permabond Single-Part Epoxy Adhesives Comparison Chart

This table represents a selection of the complete range of Permabond single-part epoxy adhesives. For more detailed technical information and product Material Safety Data Sheets, visit [www.permabond.com](http://www.permabond.com). To discuss your specific application requirements, please call the Permabond Helpline and our technical advisors will recommend the best adhesive for you or discuss the development of a new grade or product modification to meet your technical requirements.

Grade	Description	Colour	Viscosity mPa. s=cP	Max. Gap Fill (mm) in	Cure time at 150°C in mins	Shear Strength, steel (MPa) psi	Shore D	Service Temperature (°C) °F	Availability
<b>ES550</b>	Toughened, non-sagging at curing temperature, high temperature resistance	Silver-grey	1,000,000 to 2,000,000	(3.0) 0.12	20	(27-41) 4000-6000	80	(-40 to +180) -40 to +355	Worldwide
<b>ES558</b>	Toughened, free flowing at curing temperature, high temperature resistance	Grey	100,000 to 300,000	(0.5) 0.02	45	(27-41) 4000-6000	80	(-40 to +180) -40 to +355	Worldwide
<b>ES562</b>	Free flowing at curing temperature, high temperature resistance	White	15,000 to 25,000	(0.25) 0.01	30	(20-35) 3000-5000	80	(-40 to +180) -40 to +355	Worldwide
<b>ES569</b>	High strength bonding, non-sagging at curing temperature, high temperature resistance	Black	250,000 to 500,000	(5.0) 0.20	45	(27-41) 4000-6000	80	(-40 to +180) -40 to +355	Worldwide
<b>ES578</b>	Excellent thermal conductivity, high temperature resistance, bonding metals and ceramic for heat dissipation applications	Black	600,000 to 800,000	(5.0) 0.20	20	(27-41) 4000-6000	84	(-40 to +180) -40 to +355	Worldwide

Cure-speed varies depending on cure temperature (refer to technical datasheet for recommended cure times). These 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.

For further information please contact Permabond for individual technical and safety data sheets.

### Permabond Worldwide

Wherever your manufacturing or R&D site may be located, Permabond representatives can be called upon to assist you. We have an extensive network of professional distributors worldwide.



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