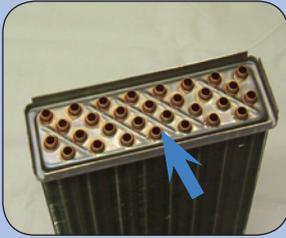


Adhesives for Heat Exchangers

Application: Vehicle heat exchanger

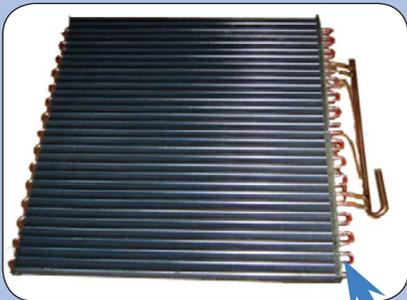


Permabond dual cure anaerobic UV adhesives for sealing vehicle heat exchanger tubes

- Excellent durability
- Low viscosity for wicking
- No need to heat cure
- Rapid curing - ideal for high-speed production lines
- Easy in-line QC inspection as sealant fluoresces under UV black light

Adhesive used: Permabond A1062

Application: Air conditioning heat exchanger sealing



Permabond heat cure epoxy adhesive is used for sealing copper tubes into aluminium for air conditioning heat exchangers

- No need to weld or braze
- Easy to seal between dissimilar metals
- Low viscosity ES558 is ideal for where gaps are very small or where adhesive flow is required
- High viscosity ES550 is ideal for sealing around tubes and creating "fillets" (a meniscus) around the tubes giving enhanced durability.

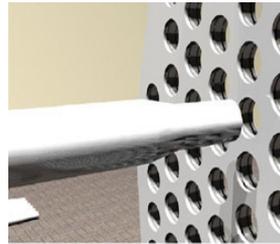
Adhesives used: Permabond ES550 and ES558

Adhesives are a popular solution for sealing heat exchanger tubes to endplates, offering easier, cost effective processing compared to welding or brazing and a superior, leak-free finish.

Using adhesives also opens up the possibility of introducing new lightweight materials into heat exchanger production, for example Nylon endplates can't be welded to aluminium tubes so adhesives are the logical solution.



Permabond adhesives offer excellent resistance to oil, water, coolants and even highly-searching refrigerant gases making them suitable for a variety of industry heat exchangers e.g. automotive, aircon and refrigeration as well as large heat exchangers such as those found on ships. Permabond adhesives can also be used to repair damaged or leaking heat exchangers without having to send parts for welding.



Application: Potting tubes in endcaps.

Depending on the fit of the tubes into the holes and how densely packed the tubes are, Permabond can offer suitable adhesives to match application viscosity requirements.



Benefits over welding or brazing

- Less skill involved - no need for a trained welder
- Reduced workplace hazards - no oxy-acetylene needed
- No pin prick weld holes; improved sealing
- More choice in terms of using dissimilar materials, plastics and metals
- Adhesives available with metallic colour to give a good aesthetic appearance
- Reduced costs

Product selector

Features	Typical Applications	Cure method	Viscosity (mPa.s) cP	Gap fill (mm) in	Handling time	Max. shear strength steel (MPa) psi	Temperature range (°C) °F
Permabond A1024 Low viscosity wicking anaerobic sealant	Heat exchangers - for wicking and sealing around tubes. Ideal for repairing pin prick weld holes	Anaerobic - lack of oxygen, presence of metal	30	(0.05) 0.001	<20 minutes	(7) 1000	(-55 to +150) -65 to +300
Permabond A1062 Dual cure anaerobic sealant. Secondary UV cure allows the curing of the excess meniscus around the top of the tube, providing improved durability and a visible seal.	Heat exchangers - for wicking and sealing around tubes and creating fillets around tubes	Anaerobic - lack of oxygen, presence of metal	30	(0.05) 0.001	<20 minutes	(7) 1000	(-55 to +120) -65 to +300
Permabond ES558 Flows like solder when heated	Heat exchangers - for wicking and sealing around tubes	No mix, heat cure (oven) or induction	200,000	(0.25) 0.01	45 mins (full strength at 150°C / 300°F oven cure)	(41) 6000	(-40 to +180) -40 to +350
Permabond ES550 Toughened epoxy, excellent chemical and temperature resistance	Heat exchangers - for creating fillets around the tubes / endplates. Bonding heat exchanger fins	No mix, heat cure (oven) or induction	Paste	(3.0) 0.12	20 mins (full strength at 150°C / 300°F oven cure)	(41) 6000	(-40 to +180) -40 to +350
Permabond ET530* Clear, low viscosity, long pot life (usable life once mixed)	Potting around tubes into endcaps	2-part epoxy resin and hardener	900 mPa.s	(0.4) 0.016	7 seconds with 4mW/cm lamp	Polycarbonate substrate failure	(-55 to +120) -65 to +250

*Special products available by request, minimum order quantities may apply.

If you can't see the exact product you are looking for, or need more in depth technical information, Permabond's technical team would be more than happy to help. Permabond offers free custom development of sealants to suit your precise heat exchanger project requirements. Please contact us to discuss.

Contact Permabond

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Permabond's sales engineers are available to assess your production line and find the best possible turnkey adhesive solution that will result in production efficiencies.

The experienced team of Permabond chemists is on hand to help you with custom formulations and fulfilling your technical data requests.



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 trained distributors worldwide.



Permabond
Engineering Adhesives

The information given and the recommendations made herein are based on our experience and are believed to be accurate. No guarantee as to, or responsibility for, their accuracy can be given or accepted, however, and no statement herein is to be treated as a representation or warranty. In every case we urge and recommend that purchasers, before using any product, make their own tests to determine, to their own satisfaction, its suitability for their particular purposes under their own operating conditions.