Permabond®
Engineering Adhesives

ISO 9001:2008 Certified
"Our Science ... Your Success"

# Adhesives for Electric Motors & Coils

Permabond adhesives and sealants are used to bond magnets, seal end plates, retain bearings, pot and reinforce wires and for a variety of other applications. Permabond is a trusted brand on motors throughout diverse industries, from very large wind turbine motors to very small electronics motors.

Permabond's range includes toughened, impact resistant, high temperature products as well as acrylic acid-free high strength structural adhesives.

Typical applications where Permabond adhesives can be used include:

- Bonding magnets to housings
- Bonding magnets to rotors or stators
- Coaxial bonding of bearings and shaft assemblies
- Potting and encapsulation of electronic components
- Ferrite bonding for torroids, inductors and transformers
- Reinforcement of rotor tangs
- Bonding ferrite halves together for transformers
- Coating and encapsulating coils / wires
- Bonding and sealing motor housings
- Threadlocking, gasketing and retaining
- Sealing transformer laminates
- Bonding mounting brackets
- Bonding paper sleeves prior to winding
- Wire tacking


*Ideal for bonding:*

- ABS
- Acetal
- Acrylic
- Aluminium
- Carbon Fibre
- Copper
- Ferrite
- FRP/GRP/Gelcoat
- LCD
- Magnet
- Neodymium
- Nylon
- PBT
- PCB
- Phenolic
- Paper
- PVC
- Silicon
- Steel
- Tungsten
- Zinc

*+Many more materials*

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# Permabond Adhesives for Motors

Here is a small selection of our most popular adhesive grades suitable for use in a range of electric motor applications. If you can't see exactly what you require, please contact our technical advisors with information about your application and your particular requirements and we will make a recommendation. The Permabond team provides support through the design phase, sample trials and production line integration. Whether you require technical support, custom formulations or small batch production, please contact us.

***Coil Winding, Potting, Encapsulation, Torriods & Transformers***

Ferrites, magnets and coils are found in other electrical components as well as electric motors. Permabond adhesives are ideal for use in these applications.

## Electric Motor Magnet Bonding Product Data

| Technical Information | 737 | 920 | 2011 | ES550 | ES560 | ES578 | ET530 | ET538 | MT382 | TA437 | TA452 | TA459 | TA4246 | HM162 | MH199 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Typical application | Magnet / ferrite bonding. | Wire tacking, torroid bonding. | Wire tacking, bonding paper sleeves onto motor prior to winding. | Magnet bonding, rotor to shaft. Wire reinforcement on rotor tangs. | Low viscosity coating for wires, coils etc. Ideal for potting. | Bonding heat sinks. | Potting and coating, coating copper wire coils. | Wire reinforcement on rotor tangs. | Potting and encapsulation. | Magnet bonding, bonding brush holder to bracket and bracket to housing. | Magnet / ferrite bonding. | Magnet / ferrite bonding. | Magnet / ferrite bonding. | Retaining bearings to shaft or frame. | End plate gasketing / sealing. |
| Features | Single part, moisture cure cyanoacrylate adhesive with good impact resistance. Rubber toughened. | Single part, moisture cure cyanoacrylate adhesive with high temperature resistance. | Single part, moisture cure cyanoacrylate adhesive. Non-drip. | Heat cure single part epoxy. Toughened for extra impact resistance. | Heat cure single part epoxy with low viscosity and good capillary action. | Heat cure single part epoxy with good thermal conductivity properties. | Low viscosity 2-part epoxy. Cures at room temperature. | Toughened 2-part epoxy. Cures at room temperature. | Low viscosity, self levelling, soft, slightly flexible modified 2-part epoxy. | High temperature resistant structural acrylic. Can be used with or without initiator. | 2-Part 1:1 low odour acrylic adhesive for use where ventilation is poor. | Structural acrylic resin + initiator. Non-acidic formulation is ideal for sensitive parts or sealed motors. | Structural acrylic resin + initiator. High level of toughening. | Single component anaerobic retainer. | Single component anaerobic gasketmaker. |
| Colour | Black | Clear, colourless | Clear, colourless | Silver-grey | Cured: Translucent | Black | Clear, colourless | Grey | Charcoal black | Orange/red | Brownish purple | Blue | Amber | Green | Red |
| Viscosity (mPa.s) | 2000-4000 | 70-90 | Gel | Thixotropic paste | 1000-3000 | Thixotropic paste | Mixed: 400-800 | Mixed: Thixotropic paste | Mixed: 13,000-30,000 | 20rpm: 40,000 2.5rpm: 130,000 | Mixed: 4500 | 20rpm: 20,000 2.5rpm: 80,000 | 23,000 | 1000 | 20rpm: 75,000 2rpm: 225,000 |
| Maximum gap fill (mm) | 0.5 | 0.15 | 0.5 | 5.0 | 0.1 | 5.0 | - | 5.0 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.2 | 0.5 |
| Handling time (steel) | 15-20 sec. | 15-20 sec. | 5-10 sec. | 130°C: 75 minutes 150°C: 60 minutes 170°C: 40 minutes | Potting: 100°C: 30 min. *plus* 120°C: 30 min. Bonding: 100°C: 60 min. 120°C: 40 min. | 130° C: 75 min. 150°C: 60 min. 170°C: 25 min. | 8-12 hours | 3-5 hours | 105-120 min. | 15-20 min. (no initiator) 1-3 min. (with Initiator 41) | 6-9 min. | Fixture: 20-40 sec. Handling: 40-75 sec. | Fixture: 1-2 min. Handling: 2-4 min. | 5 min. | 20 min. |
| Full strength (cured at 23°C) | 24 hours | 24 hours | 24 hours | | | | 72 hours | 72 hours | 72 hours | 24 hours | 24 hours | 24 hours | 24 hours | 24 hours | 24 hours |
| Shear strength Steel (MPa) | 19-23 | 19-23 | 20-24 | 27-41 | 14-20 | 27-41 | 8-12 | 18-20 | 4-7 | 14-20 | 20-24 | 20-25 | 33-35 | 30 | 8 |
| Service temperature range (°C) | -55 to +120 | -55 to +250 (requires post-cure) | -55 to +120 | -40 to +180 | -40 to +180 | -40 to +180 | -40 to +100 | -40 to +100 | -40 to +120 | -55 to +200 | -55 to +130 (150 peak) | -55 to +165 | -40 to +120 | -55 to +200 | -55 to +200 |
| Thermal conductivity W/(m.K) | 0.2 | 0.1 | 0.1 | 0.55 | 0.1 | 1.3 | 0.2 | 0.55 | - | 0.1 | - | 0.1 | 0.1 | 0.2 | 0.19 |

*Application: Bonding electric window motor magnets*

Permabond TA459, a two component, structural acrylic rapidly bonds the motor magnets in this enclosed system.

***Benefits of Permabond structural acrylics:***

- Very high impact & shear strength
- Excellent durability
- Fast fixture speed- efficient process
- No mixing required
- Ambient cure - energy efficient
- Good shelf life - no refrigeration or freezing needed
- TA459 is non-corrosive to copper components

*Adhesive used: Permabond TA459 with Initiator 43*

*Application: Bonding computer fan motor magnets*

Permabond 737 bonds the motor magnets and motor housing into the frame.

***Benefits of Permabond cyanoacrylate adhesives:***

- Instant fixture - no clamping necessary
- Ambient cure - energy efficient
- Easy process for these small components

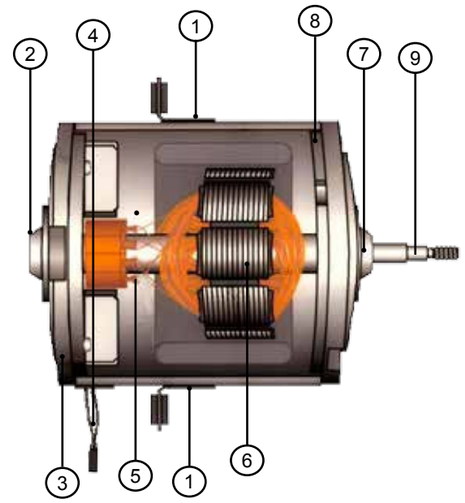
*Adhesive used: Permabond 737*

## Motor Applications

***High Strength Bonding - Gasketing - Plate Sealing***

Permabond's magnet bonding adhesives will provide outstanding strength performance on substrates such as steel, ferrite, neodymium and other magnet materials for motors and brushless motors.

1. Bonding mounting brackets
2. End plate sealing
3. Bonding brush holder to bracket & bracket to housing
4. Wire potting
5. Wire reinforcement on rotor tangs
6. Paper sleeves onto motor prior to winding
7. Bearings to shaft or frame
8. Magnet bonding
9. Bonding rotor to shaft



# Permabond Adhesives

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**Adhesives for: Design • Manufacturing • Assembly • Maintenance • Repair & Overhaul**

Permabond's history of developing and manufacturing engineering adhesives spans **four decades** and three continents. Today, Permabond Engineering Adhesives Ltd (Europe & Asia) and Permabond LLC (Americas) provide technological solutions to engineers all over the world, with offices and facilities in America, Asia and Europe, backed by a high-tech **ISO 9001:2008** certified production plant in Europe.

• **Technical** – Our chemists and technicians are available to provide application assistance, custom formulation, in-house prototype testing, joint product development programs and much more.

• **Training** – Permabond's knowledgeable sales group will provide your staff with the information they need to maximize the efficiencies, cost savings, and safety benefits Permabond products generate.

• **Sales** – From preliminary project appraisals and product needs assessments through to process reliability analysis, Permabond's knowledgeable sales group will support you from product concept through to production.

This brochure contains information on our most popular products, if you don't see exactly what you need, or would like assistance in selecting the best product for your application, please contact us:


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