Adhesives for E-Motors
When manufacturing modern e-motors, it is essential to improve the efficiency, for example by minimizing the air gap between magnet and winding. Since conventional methods, such as mechanical clamping or wrapping reach their limits due to high tolerances, bonding is the solution.

The requirements imposed on the e-motor components to be joined (and therefore also on the adhesives used) are high. In this respect, recurring buzz words such as temperature-resistant, media-resistant, gap-filling, impact-resistant and tension-equalizing are often used. The adhesives specially developed for e-motors have precisely these properties.

The overview on the left shows a selection of DELO® adhesives used in specific e-motor applications according to their properties.
Magnet bonding

More and more e-motor magnets are bonded as adhesives have several property and process advantages over conventional mechanical joints:

- Tolerance compensation
- Evenly distributed stress
- Easy to automate
- Reduced vibration noise
- Good corrosion protection
- No component damage during joining

Your benefits

- High temperature stability up to +430°F
- Excellent media resistance
- Good gap filling
- Fast light fixation (< 10 s)
- Tension-equalizing

Find the right adhesive …

DELO®-ML DB140 DB180
- Dual curing anaerobic / light
- Fixation in less than 10 s with DELOLUX® 20 or DELOLUX® 80

DELO®-ML 5327
- Anaerobic curing
- Temperature resistance up to +390°F
- Fast fixation with activator

DELO-DUOPOX® SJ9665 DELO®-PUR 9694
- 2C adhesives
- Peel resistance

DELO DUALBOND® SJ2718
- 1C epoxy
- Fast induction curing
- Light fixation

DELO® MONOPOX HT2980
- 1C epoxy
- Impact resistance
- Fast induction curing

DELO® MONOPOX SJ2981
- 1C epoxy
- High run resistance

DB = Dual Bonding
HT = High Temperature
SJ = Structural Joining
Bond the stator laminations to the housing is more advantageous than conventionally joining these components by pressing or shrinking:

- Equalize tensions between the stator and housing with dissimilar CTEs
- Heat not mandatory
- More cost-efficient production
- Improved acoustics by damping properties of the adhesive
- Larger production tolerances possible

**Your benefits**

- High temperature stability up to +390 °F
- Fast light fixation for short cycle times (DELO®-ML DB)
- Accelerated curing with activator (DELO®-ML)
- Curing at room temperature (except for DELO® MONOPOX)

**Find the right adhesive …**

**FAST FIXATION**

- DELO®-ML DB140
- DELO®-ML DB180
- Dual curing anaerobic/light
- Fixation in less than 10 s with DELOLUX 80

**HIGH TEMPERATURE STABILITY ≥ +390 °F**

- DELO®-ML 5327
- Anaerobic curing
- Fast fixation with activator

**IMPACT-RESISTANT**

- DELO-DUOPOX® SJ8665
- 2C epoxy
- Peel resistance
- Curing can be accelerated by heat

**GAP-FILLING > 250 μm**

- DELO DUALBOND® SJ2718
- 1C epoxy
- Good flow behavior
- Fast induction curing
- Light fixation

---

**DB = Dual Bonding**  **SJ = Structural Joining**
Shaft bonding

Similar to shaft-to-hub bonds in mechanical engineering, the shaft of e-motors is bonded to the bearing, rotor package and commutator. Anaerobic-curing, low-viscous adhesives are preferred as the bonding gap is narrower due to very low tolerances. Adhesive bonds have the following advantages over classical form- or force-closed joints:

- Low component production costs
- Easy to automate
- No clearance, no slip
- No friction or contact corrosion

Your benefits

- Fast fixation by activator or light (DELO®-ML)
- Curing at room temperature (DELO®-ML, DELO-DUOPOX®)
- Very high temperature stability up to +430°F (DELO® MONOPOX)

Find the right adhesive …

DELO®-ML DB140
- Dual curing anaerobic/light
- Fixation in less than 10 s with DELOLUX 80

DELO®-ML 5327
- Anaerobic curing
- Temperature resistance up to +390°F
- Fast fixation with activator

DELO-DUOPOX® SJ8665
- 2C epoxy
- Peel resistance

DELO DUALBOND® SJ2718
- 1C epoxy
- Good flow behavior
- Fast induction curing
- Light fixation

DELO® MONOPOX HT2860
- 1C epoxy
- Temperature stability up to +430°F
- Impact resistance

© metabo
Casting compounds are used in e-motors to protect sensitive components from humidity, media or mechanical stress. Therefore, DELO®'s adhesives are used in the automotive industry due to these special challenges. Possible applications:

- Secure coil wires against vibration
- Cover soldered and welded contacts to protect them against corrosion
- Partial protection of windings from abrasive substances
- Stator casting

Your benefits

- Excellent resistance to aggressive substances (e.g. gear oil)
- Outstanding thermal resistance and low thermal expansion combine to minimize tensions between cast and component
- Very fast fixation or curing by light

Find the right adhesive…
DELO® is a technology leader, generating about 30 percent of its sales revenues with products developed in the last three years. In addition, 15 percent of revenues are invested in the research and development of adhesives and associated equipment.

These statistics are a result of the enormous laboratory expertise in the Windach headquarters: Comprehensive analytics and lab tests make it possible to find the right adhesive for every bonding task, including those in e-motor bonding.

In addition to chemical-physical characterization of adhesives, life cycle tests, application-specific test methods and process simulations are performed.
The data and information provided are based on tests performed under laboratory conditions. Reliable information about the behavior of the product under practical conditions and its suitability for a specific purpose cannot be concluded from this. It is the customer’s responsibility to test the suitability of a product for the intended purpose by considering all specific requirements and by applying standards the customer deems suitable (e.g., DIN 2304-1). Type, physical and chemical properties of the materials to be processed with the product, as well as all actual influences occurring during transport, storage, processing and use, may cause deviations in the behavior of the product compared to its behavior under laboratory conditions. All data provided are typical average values or uniquely determined parameters measured under laboratory conditions. The data and information provided are therefore no guarantee for specific product properties or the suitability of the product for a specific purpose. Nothing contained herein shall be construed to indicate the non-existence of any relevant patents or to constitute a permission, encouragement or recommendation to practice any development covered by any patents, without permission of the owner of this patent. All products provided by DELO® are subject to DELO®’s General Terms of Business. Verbal ancillary agreements are deemed not to exist.

Contact

DELO Industrial Adhesives
Headquarters

Germany · Windach / Munich

China · Shanghai
Japan · Yokohama
Malaysia · Kuala Lumpur
Singapore
South Korea · Seoul
Taiwan · Taipei
Thailand · Bangkok
USA · Sudbury, MA

www.DELO-adhesives.com