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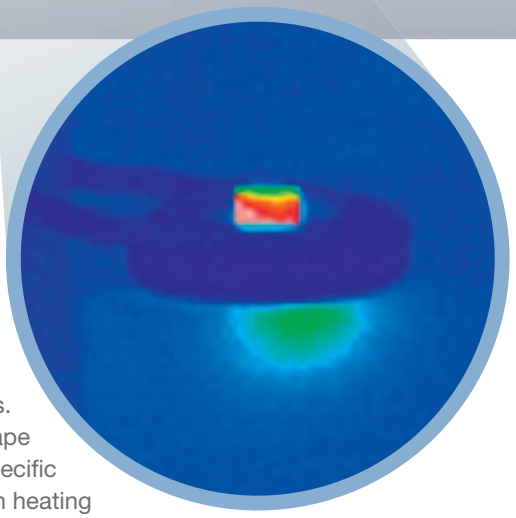
DELO
Leading by intelligent bonding technology

# Induction curing for short cycle times

Heat-curing DELOMONOPOX® epoxy resins are mainly used in bonded connections with high requirements on the temperature range of use and media resistance. Most products cure in air convection ovens at temperatures around +302 °F (+150 °C) within 40 minutes. Metal components must be preheated for another 30 minutes. If the components must be fixed during this period, expensive joining appliances are required.

**Induction saves time and costs**
These costs can be saved by induction curing as the curing time is reduced by up to 90 %. This technology is suitable for all electrically conductive materials made of steel, copper, aluminum and others. Thanks to fast heating in seconds, even of massive metal components, to up to +356 °F (+180 °C), clearly shorter curing times (partly shorter than 1 min) are achieved compared to oven curing.



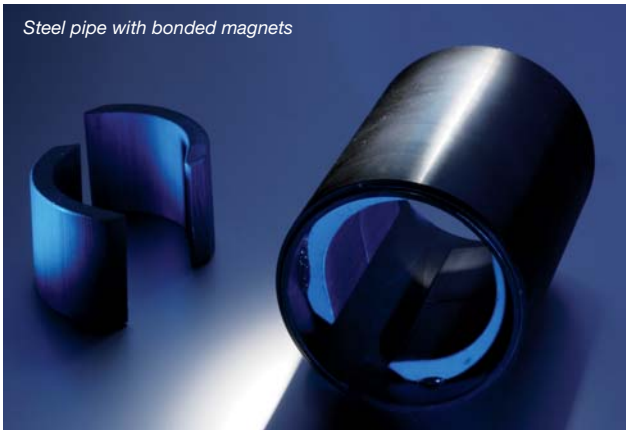
**Flexible use**
An induction coil consists of one or several windings. The exact number and shape are adapted to the specific application task. Induction heating depends on the strength of the magnetic field, the position of the coil and the material of the component.

**DELOMONOPOX®**

- Firm to touch after fast inductive heating in seconds
- Good adhesion, for example to metals and magnets
- High impact resistance
- Gap-filling
- High temperature stability and resistance
- Good resistance to chemicals and humidity
- Tension-equalizing variants available

**Your benefits**

- Increased production capacity: Fast inductive curing in seconds for short cycle times
- Optimized production flow: Immediate firmness to touch after the end of inductive heating enables in-line process
- Increased production flexibility: Easy adjustment of the bonding process and the induction coil for disparate component geometries
- Efficiency: Technically and economically ideal solution compared to oven curing



*Steel pipe with bonded magnets*

*Induction coil with pyrometer*

# Bonding of magnets into steel pipes

**Components to be bonded**

- Stator pipe: black, zinc-plated steel, diameter 3.15 in (80 mm)
- Magnet: HF8, H x W x T = 2.36 in x 1.57 in x 0.28 in (60 mm x 40 mm x 7 mm)

**Bonding process**

- Adhesive application (DELOMONOPOX® MG063) into the steel pipe – two beads per magnet
- Insertion of 4 to 6 magnets, depending on the motor type, with special gripper for fixture during curing
- Inductive heating of the components for approx. 40 s at +284 °F (+140 °C) for adhesive curing
- After the end of inductive heating, firmness to touch is achieved
- Postcuring of the adhesive on the cooling rail for approx. 10 min by the heat capacity of the pipe and the magnets

**Further application examples:**

- Bonding of magnets into stator or pole housings
- Bonding of pocket magnets
- Bonding of magnets to metal rings

# Adhesives for induction curing

| | **DELOMONOPOX** One-component epoxy resins | | | | | |
|---|---|---|---|---|---|---|
| | **AD066** | **AD286** | **AD289** | **AD295** | **AD298** | **MG063** |
| **Special features** | very fast curing<br>unfilled | tough-hard<br>very high chemical resistance | high impact resistance<br>high run resistance<br>good adhesion to nickel-plated magnets | very hard<br>fulfills ECSS Q-70-02<br>good adhesion to nickel-plated magnets | very hard<br>high run resistance<br>good adhesion to nickel-plated magnets | tough-hard<br>high run resistance<br>good adhesion to nickel-plated magnets<br>unfilled |
| **Tensile shear strength** | 2,610 psi (18 MPa) | 4,785 psi (33 MPa) | 6,525 psi (45 MPa) | 4,350 psi (30 MPa) | 4,350 psi (30 MPa) | 3,045 psi (21 MPa) |
| **Tensile strength** | 6,525 psi (45 MPa) | 9,280 psi (64 MPa) | 9,570 psi (66 MPa) | 7,250 psi (50 MPa) | 7,250 psi (50 MPa) | 5,075 psi (35 MPa) |
| **Elongation at tear** | 1.4 % | 2.8 % | 3.2 % | 1.4 % | 1.4 % | 1.9 % |
| **Young's modulus** | 420 ksi (2,900 MPa) | 551 ksi (3,800 MPa) | 450 ksi (3,100 MPa) | 798 ksi (5,500 MPa) | 798 ksi (5,500 MPa) | 435 ksi (3,000 MPa) |
| **Curing** | fast induction curing in seconds possible | | | | | |
| **Temperature range of use** | –40 to +356 °F (–40 to +180 °C) | –67 to +392 °F (–55 to +200 °C) | –67 to +392 °F (–55 to +200 °C) | –40 to +392 °F (–40 to +200 °C) | –40 to +392 °F (–40 to +200 °C) | –40 to +320 °F (–40 to +160 °C) |

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