

# Adhesive Bonding for Magnet Assemblies

Adhesives are used to bond magnets to magnets for complex parts as well as for bonding to stators, rotors, pole pieces and other structural components. Adhesives may be high strength epoxies in some cases and adhesive backed polymer films in others.

1. Surface preparation techniques for bonding vary with the magnet coating.



*Bead Blasting*



*Sand Blasting*



*Knurling*

2. Bonding plated surfaces may take some customized procedures. Typically both the metal hub and magnet are plated for corrosion resistance.
3. Curing temperature will affect magnetized magnets and assemblies. Care should be taken to ensure that the adhesive curing temperature is not higher than the magnet's Curie temperature. Irreversible magnetic losses will occur when the magnet temperature is raised to the level of most adhesive cure temperatures.
4. When bonding NdFeB materials it is best to avoid adhesives and process chemicals containing chlorine and fluorine.
5. Teamwork with your magnet and adhesive suppliers is highly recommended. Adhesive companies have temperature versus time curing data
6. Because the metal hub and magnet have different expansion coefficients, a proper glue gap must be determined using data from the metal, magnet and adhesive suppliers.

Grade	Size (mm)	Wall thickness (mm)	Safe Gap (one side) (mm)
45H	OD29.9 X ID23.9 X 19.5	3.0	0.08
45H	OD29.9 X ID23.9 X 39.5	3.0	0.06
42SH	OD19.4 X ID14.8 X 11.0	2.3	0.04
42SH	OD28.5 X ID23.5 X 14.0	2.5	0.06
35SH	OD40.4 X ID34.4 X 22.0	3.0	0.05
42SH	OD20.0 X ID16.0 X 18.0	2.0	0.05

**Test method:** Heat/hold magnets with shaft at 120° C for 2 hours, no cracking.

**Glue:** Loctite 326

**Thermal expansion:**

- > Radial Magnets: 0-1x10E-6/K
- > Shaft: 15-20x10E-6/K
- > Glue: 60-100x10E-6/K

Safe gap is related to magnet grade, ID, wall thickness, height and glue.

*Example of glue gap recommendation from Radimag*

## Some of the companies providing adhesive products and expertise are:

**Masterbond** (epoxies, UV cure adhesives, acrylics)

www.masterbond.com

154 Hobart St, Hackensack, NJ 07601

(201) 343-8983

**Henkel Adhesives** (new owners of Loctite, Hysol and Eccobond Adhesives)

www.henkel-northamerica.com

1345 Gasket Dr, Elgin, IL 60120

(847) 468-9200

**3M** (numerous high-performance adhesives)

www.3m.com

3M Center

St. Paul, MN

55144-1000, USA

1-800-831-0658

**Lord Adhesives** (numerous acrylics, urethane and epoxy based adhesives)

www.lord.com

+1 877 275-5673

**Cotronics** (various specialized epoxies and other bonding agents)

www.cotronics.com

131 47th Street

Brooklyn, NY 11232

718-788-5533

**Panacol** (specialized in light curing adhesives particularly for high production environments)

www.panacol.com

142 Industrial Ln, Torrington, CT 06790

(860) 738-7449

**H.B. Fuller Cyberbond** (wide range of custom products)

www.cyberbond1.com

(630) 761-0341

401 N Raddant Rd

Batavia, IL 60510

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