

After the PS one will need to make low speed power generation devices using strong magnets. How to glue them on so they are strongly in place becomes an issue. The following tells how.

## Sticky Business – How to Glue Neodymium Magnets

### About Adhesives and Glue

In so many applications, some form of glue or adhesive is used to hold a magnet in place. With so many questions about glue, we thought we'd share some of the things we've learned over the years of gluing neodymium magnets.

### Make Sure the Surfaces are Clean

While we're by no means a bunch of adhesive experts like the folks at [3M](#) or [Loctite](#), we've glued our fair share of magnets in various assemblies, projects, products and test rigs. For specific details, be sure to read the instructions on the exact adhesive you're using. We've found that they all seem to start with something along the lines of, "Clean the surface before applying the glue."

That can't be stressed enough. The surfaces must be clean. It's amazing how a little bit of greasy fingerprints can reduce the strength and repeatability of a glue bond. You can use isopropyl alcohol with a swab or cloth. There are some products sold as adhesive primers, usually made of alcohol or acetone. They are another way of making sure the surface is clean.

### Scratch the Surface

Many adhesives have specific instructions for surface preparation of steel or aluminum. While they never seem to have specific recommendations for nickel-plated neodymium magnets, we've followed their recommendations for metals. For example, check out the top of page 4 of [this spec](#) for 3M's [DP-100](#) Epoxy Adhesive. For bonding to steel, it says:

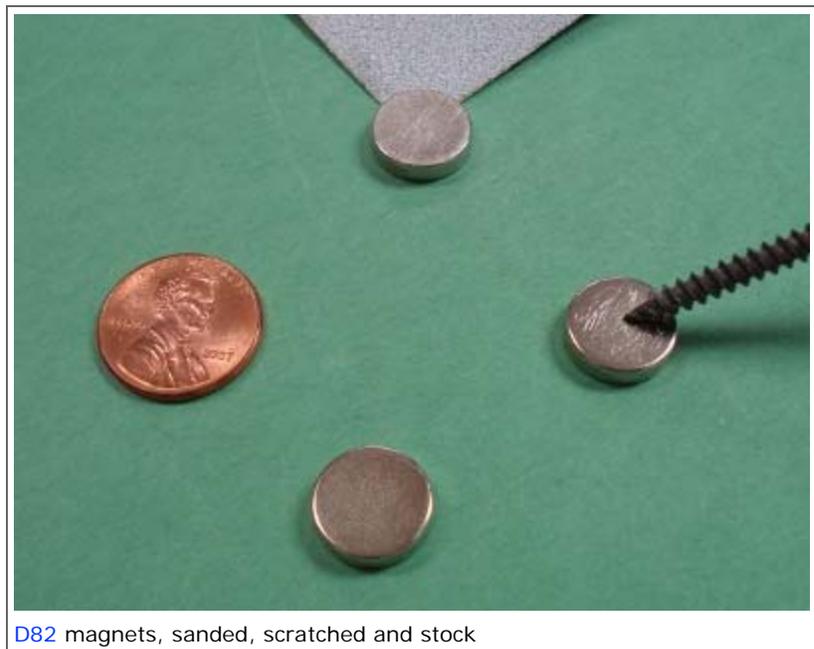
1. Wipe free of dust with oil-free solvent such as acetone or isopropyl alcohol.
2. Sandblast or abrade using clean fine grit abrasives

All epoxies and many other adhesives call for roughening of an especially smooth surface. Use a light grit sandpaper to lightly sand a little bit of the nickel plated surface prior to gluing. After sanding, be sure to clean the dust off the magnet first!

For some sizes, you can even just scratch the surface a little with a sharp nail, which works almost as well.

### What Glue Should I Use?

There are a number that usually work quite well. Here's a list of a few of the basics you might choose from:



D82 magnets, sanded, scratched and stock

- Two-Part [Epoxy](#) (often sold as 5-minute epoxy in stores) Most epoxies work well, but pay attention to the cure-times.
- [Cyanoacrylate](#) (super glue or crazy glue)
- Urethane adhesives (sold as [Gorilla Glue](#))
- [JB Weld](#) see updates below
- [Liquid Nails](#)
- [Mod Podge](#)
- Silicone adhesives

In a majority of applications we see, epoxy works best. It's generally good at bonding with both the nickel plating of our magnets and many other surfaces.

<http://www.kjmagnetics.com/blog.asp?p=sticky-business-how-to-glue-neodymium-magnets>

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## magnet bonding BLOCKS HEAR AND IMPACT STUDY

SUBSTRATE (BLOCK)	MAGNET	BLOCKSHEAR BOND STRENGTH, PSI, PER ASTM D4501		IMPACT BOND STRENGTH PER ASTM D950 UP TO 10 FT.-LB.	
		Avg.	Predominant Failure Mode	Impact Value	Predominant Failure Mode
<b>Product 392/7387</b>					
Mild Steel	Ferrite	2749	Adhesive Failure to Magnet	>10	Magnet
Mild Steel	Alnico	2951	Adhesive Failure to Magnet	>10	None
Mild Steel	Neodymium	2998	Adhesive Failure to Magnet	>10	Adhesive
E-coat	Ferrite	2698	Magnet Substrate Failure	>10	Magnet
E-coat	Alnico	2926	Block Substrate Failure	5.9	Adhesive
E-coat	Neodymium	2467	Block Substrate Failure	>10	Magnet
Zn. dichr.	Ferrite	1497	Adhesive Failure to Block	>2.6	Adhesive
Zn. dichr.	Alnico	1993	Block Substrate Failure	6.6	Adhesive
Zn. dichr.	Neodymium	2071	Block Substrate Failure	>7.3	Magnet
<b>Product 332/7387</b>					
Mild Steel	Ferrite	1440	Adhesive Failure to Magnet	>10	Magnet
Mild Steel	Alnico	2651	Adhesive Failure to Magnet	>10	None
Mild Steel	Neodymium	3183	Cohesive Failure	>10	Magnet
E-coat	Ferrite	1239	Adhesive Failure to Block	6.5	Adhesive
E-coat	Alnico	2180	Cohesive Failure	8.7	Adhesive
E-coat	Neodymium	1695	Cohesive Failure	>6.8	Mixed
Zn. dichr.	Ferrite	668	Adhesive Failure to Block	>1.1	Adhesive
Zn. dichr.	Alnico	729	Adhesive Failure to Block	5.6	Adhesive
Zn. dichr.	Neodymium	964	Adhesive Failure to Block	>6.6	Mixed
<b>Product 326/7649</b>					
Mild Steel	Ferrite	1455	Mixed Mode	>10	Magnet
Mild Steel	Alnico	1574	Adhesive Failure to Block	>10	None
Mild Steel	Neodymium	1418	Adhesive Failure to Block	>10	Mixed
E-coat	Ferrite	901	Adhesive Failure to Block	>7.0	Magnet
E-coat	Alnico	2643	Block Substrate Failure	8.1	Adhesive
E-coat	Neodymium	908	Adhesive Failure to Block	>9.9	Magnet/Adhesive
Zn. dichr.	Ferrite	1292	Adhesive Failure to Magnet	>10	Magnet
Zn. dichr.	Alnico	1590	Block Substrate Failure	7.0	Adhesive
Zn. dichr.	Neodymium	1590	Block Substrate Failure	>7.1	Mixed
<b>Product E-214HP</b>					
Mild Steel	Ferrite	4774	Magnet Substrate Failure	>10	Magnet
Mild Steel	Alnico	7775	Adhesive Failure to Block	>10	None
Mild Steel	Neodymium	5891	Adhesive Failure to Magnet	>10	Magnet
E-coat	Ferrite	4616	Block Substrate Failure	>10	Magnet
E-coat	Alnico	5930	Block Substrate Failure	>10	None
E-coat	Neodymium	4638	Block Substrate Failure	>10	Magnet
Zn. dichr.	Ferrite	4462	Block Substrate Failure	>9.8	Magnet
Zn. dichr.	Alnico	4574	Block Substrate Failure	9.3	Adhesive
Zn. dichr.	Neodymium	4918	Block Substrate Failure	>8.6	Mixed
<b>Product 380</b>					
Mild Steel	Ferrite	1987	Adhesive Failure to Block	>9.2	Magnet
Mild Steel	Alnico	2656	Adhesive Failure to Block	>10	None
Mild Steel	Neodymium	1515	Adhesive Failure to Block	>10	Magnet
E-coat	Ferrite	2406	Magnet Substrate Failure	>8.9	Adhesive
E-coat	Alnico	3593	Block Substrate Failure	>9.8	None
E-coat	Neodymium	3077	Block Substrate Failure	>10	Magnet
Zn. dichr.	Ferrite	1410	Adhesive Failure to Block	>8.5	Magnet
Zn. dichr.	Alnico	1615	Block Substrate Failure	4.9	Adhesive

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e-214hp epoxy looks best

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### technical product information

Product Number/Activator	392/7387	332/7387	326/7649	E-214HP	380
Key Product Features	Ultra Fast, High Thermal Resistance	Highest Thermal, Impact & Shock Resistance	Fast Fixturing, High Strength	High Strength, Heat Cure	Low Viscosity, Small Gaps
Chemical Type	Modified Acrylic	Modified Acrylic	Urethane Methacrylate Ester	Epoxy	Cyanoacrylate
Viscosity, cP	60,000	200,000	18,000	150,000	200
Cure Speed	Fixture Full 30 seconds 24 hours	1 minute 24 hours	40 seconds 24 hours	40 minutes @120°C 24 hours	15 seconds 24 hours

*For additional Technical Information, request Technical Data Sheets and Material Safety Data Sheets by calling 1-800-562-8483.*

### ordering information

Product Number	392	332	Activator 7387	326	Activator 7649	E-214HP	380
25 ml Syringe	39205	33201					
30 ml Cartridge						29339	
50 ml Bottle	39250			32629			
300 ml Cartridge	39275	33275				29340	
1 Liter Bottle	39280	33290		32685			
Pails	17507 15 liters	17601 12 liters				29341 5 gallons	
1 oz Bottle							38050
1 lb Bottle							38061
2 kg Bottle							18494
1.75 oz Bottle			18861		19269		
25 gm Aerosol Can					21347		
4.5 oz Aerosol Can			21088		21348		
1 qt Can			18862				
1 gallon Can					19266		

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## **Epoxy Adhesives**

Loctite offers a complete line of one-part and two-part epoxy and urethane adhesives for structural bonding, potting and encapsulating. The Loctite® Durabond® line contains 14 application-specific products designed to outperform the competition in all aspects: better adhesion, better flow, less odor, improved clarity, higher strength, and greater durability. All two-part Durabond® Structural Adhesives are packaged in easy-to-use, side-by-side cartridges for use with our manual dispensers and mix nozzles.

### **Loctite® E-214HP High strength, temperature resistant, non-sag Durabond® Epoxy Adhesive**

A one-component, heat cure epoxy. Grey, temperature resistant, high strength, non-sag. **Bonding Type:** Epoxy

[http://www.gluguru.com/magnet\\_bonding.htm](http://www.gluguru.com/magnet_bonding.htm)

**The Glu Guru™ Adhesive Tech Center**

940 Telser Road . Lake Zurich, IL 60047

**1-800-323-5158**