

IMPORTANT HEALTH & SAFETY INFORMATION - **EXTREME** POWER MAGNETS

YOU MUST READ THIS BEFORE HANDLING THE MAGNETS ENCLOSED.

"the biggest danger comes from two magnets spaced apart which, then move closer, and suddenly leap together without warning and with extreme acceleration and MASSIVE force".

▶ **Liability**

Magnet Expert Ltd does not accept responsibility for damage that has been caused by the improper handling of magnets. With the purchase of these magnets, you confirm that you have read and understood the following warnings. If you are giving magnets as a gift, please be sure to include this information sheet in the package.

▶ **Risk Assessments**

Conduct a risk assessment before removing the magnet from its protective container.

Look for any steel objects and make sure they are 500mm away at all times.

Extreme power magnets have a VERY HIGH level of magnetic energy and they will jump ferociously towards a steel object or worse, another magnet. If you are holding the magnet, you will not be able to restrain or stop it and if your fingers are caught in between the magnet and the steel surface, then the tips of your fingers will be crushed.

▶ **Factors which affect Magnetic Force**

When in contact with steel which is at least 10mm thick, an Extreme Power magnet will exert over 100 kgs of force, i.e. you will need to apply at least 100 kgs of force to pull it off vertically.

If the steel is thinner, then it will not be able to absorb all the magnetism from the magnet and the pull will be proportionally less. e.g. a 100 kg pull magnet will need only 10 kgs of force to pull it off of thin sheet metal which is only 1mm thick because 90% of the magnetism is wasted and simply passes through the sheet steel.

It is 5 times easier to slide a magnet than it is to pull it vertically off (assuming a coefficient of friction of 0.2).

This is useful to know if you need to remove the magnet from steel (slide it to an edge, but be careful of it leaping back again when it is first separated).

▶ **Understanding Force Vs Distance**

As magnets get closer to each other or closer to a steel object, the attracting force increases dramatically.

Force follows an 'inverse square law' relationship with distance and maximum hold is achieved in direct contact.

If your finger is caught between two magnets, the magnets will compress your finger, the force will therefore increase, as a result they will compress even further, become more powerful, get closer, apply more force etc. etc.

If you do get the tip of your finger trapped, try to resist pulling your finger out of the magnets, you are likely to rip the end of your finger off, instead try to insert a large screwdriver into the gap between the magnets to prevent further compression and try to free the trapped finger. Once free, seek urgent medical attention.

▶ **Danger of breaking or chipping**

The most common cause of broken magnets is when two magnets are released and allowed to collide together.

A combination of **massive acceleration** and **high forces** will cause one or both magnets to chip or shatter.

Please do not allow this to happen and then try to return them to us as 'broken in the post'. The chips are usually magnetically pulled back by the main magnets but it is conceivable that they may fly off at high speed into someone's eye. Eye protection is therefore advised. Chips and broken magnets are quite sharp, so cuts are possible.

▶ **Explosive Atmospheres**

Attracting magnets can cause sparks on impact which will be dangerous in explosive atmospheres.

▶ **Dangers for children**

You must ensure that children cannot gain access to these Extreme Power Magnets, they would risk serious injury.

▶ **Magnetically sensitive items**

Neodymium magnets are very much stronger than "ordinary" magnets. Keep a safe distance (500mm+) between the magnets and all objects that can be damaged by magnetism. These include mechanical watches, heart pacemakers, CRT monitors and televisions, credit cards, diskettes and other magnetically stored media.

▶ **Heart Pacemakers**

It is widely thought that Heart Pacemakers can be stopped from functioning whilst in range of a magnetic field produced by a Neodymium magnet. It is thought that the Pacemaker will continue to work once the magnet is removed from the close proximity of the Heart Pacemaker.

▶ **Surface Plating - wearing & chipping**

Neodymium Magnets are usually plated with 3 layers of protective plating. First a layer of Nickel, then a layer of Copper and then a final layer of Nickel. This plating can wear away in the course of normal use if it is sliding or impacting onto a steel surface. If the plating layers are worn away, then the magnet will be exposed to corrosion and since the magnets contain a high percentage of iron, they will rust easily. It is always better to use the magnet in a way that mechanically prevents it from ever touching the part that it is attracting. A mechanical stop which holds the magnet 0.2mm away from the attracted part will ensure a very long life of the magnet.

▶ **Cutting or drilling Neodymium Magnets**

Neodymium magnets can be secured in place with adhesive or in some cases, with countersunk screws.

Magnets are sintered and extremely hard and brittle. You should never attempt to cut or drill into a magnet unless using diamond tooling and coolant (as the dust from cutting is very flammable).

You **MUST** read the other side of this sheet **BEFORE** handling your magnets.

Practical Tips for Handling Neodymium Magnets

1 - Neodymium Magnets can **jump** towards each other from very large distances.



- A combination of high forces and massive acceleration will cause them to chip, crack or shatter.
- If your fingers are caught inbetween, they can **CRUSH** or even **cut the tips of your fingers off**
- This risk increases as the magnets get larger. Always conduct a risk assessment before unpacking.

2 - Storing Neodymium Magnets.



- Neodymium magnets do not need keepers.
- They should be stored individually in the containers in which they were supplied.
- Non compressible material spacers of plastic or wood in either end of the container will make it easier to separate the magnets if two containers do stick together.

3 - Separating Neodymium Magnets that are stuck together.



- It is 5 times easier to slide neodymium magnets apart than it is to pull them apart.
- Use a wooden table or desk, overhang one magnet and apply strong downward pressure.
- Once separated, keep it moving to a safe distance (500mm+) to avoid unexpected 'snap-back.'
- Thick timber and non magnetic clamps should be used to restrain one of the magnets, they are most dangerous and unpredictable when they are in the process of being separated.

4 - Customer Support If you need further advice, please call us on **01777 874 520** or e-mail: support@first4magnets.com

EXTREME MAGNETIC POWER WARNING



30 cm³+
Neodymium
Magnets

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