Magnets. What Preppers Need To Know About Them

Even though magnets are used in many areas of life, you may think that you can just scavenge them as needed after a major crisis hits. Bad idea! This is how you can easily create a situation, where you overlook having the proper magnets for all your needs as well as ones that can be used until new ones become available.

Read the next article to learn about the different kinds of magnets, how they are used, and why you need to consider adding each of them to your survival stockpile.

Why Not Just Create Magnets Later On?

Many people that don’t have magnets on their stockpile list tend to think that they can simply pick up some magnetic earth ores, or find some way to make magnets using a furnace and metal casting equipment. While you may be able to melt the metal used for magnets, you may still not be able to machine the final product let alone create uniform magnetic fields.

These technologies require both time and money to master. In most cases, these skills may be within the range of a larger survivor or prepper community, but they may be a bit beyond a homestead for a single family or small group. In these situations, your best bet is to stockpile the magnets you are most likely to need.

Since each person or group will be interested in different devices and models, it is best to learn about each kind of magnet and then see which ones will be best for your personal needs.

Can I Barter Magnets in the Post Crisis World?

Newer and more powerful magnets tend to be more expensive. You can still watch for sales and other bargains on magnets that may not be of major interest to you, and then use them for barter later on. Just remember, however, that magnets also tend to be heavy and take up a lot of room.

Therefore, unless you store them at a dedicated bug out location, it may not be feasible to carry away your entire supply from a major crisis location.

4 Types of Magnets to Learn About

Ceramic/Ferrite Magnets

Ferrite or ceramic magnets are the most common and cheapest magnets on the market. Even though they also generate the weakest magnetic fields, they are very useful for a wide range of applications. This includes applications where the magnet must change polarity quickly, or demagnetize and magnetize very quickly.

Ceramic magnets are made by taking iron oxide and other powders and placing them in a mold. The powder is heated until it forms a solid mass, which is then milled back down to tiny particles. During the heating process, oxygen availability may be limited, much as it is during the production of charcoal or bone char.

These milled particles are again placed into a mold that represents their final shape. As the ferrites are heated, they may also be placed in a magnetic field so that all of the particles are aligned in a specific direction.

wikipedia.org

Ceramic magnets are made from a range of different materials such as hematite, magnetite and other iron oxides. There are two different kinds of ceramic magnets that are named based on their composition and usage.

- “Soft” ferrite magnets contain nickel, manganese, or zinc in their composition. These magnets are called “soft” because they are very easy to magnetize, and then also lose this particular property with very little effort. As a result, soft magnets are ideal for transformers, AM radio antennas, and some power supplies.
- “Hard” ferrite magnets are include strontium, barite, and other iron oxides that make them permanent magnets. Even if there is no power being applied to the magnet, hard ferrites will continue to generate a magnetic field. Interestingly enough, at the molecular level, these magnets retain a “memory” of their orientation from times when added energy was applied to them. As such, hard ferrites are often used to make cassette tapes, computer hard drives, and other data storage devices.

Pros and Cons

- Advantages – Overall, you will find that ferrite magnets are the cheapest forms that you can buy. They come in a variety of shapes and sizes and lend themselves well to a wide range of applications. Since ferrite magnets do not rely on rare earth metals, they are also easier to make.

- Disadvantages – If you are looking for a “one magnet that does everything”, ferrite magnets will not meet your needs. They are not strong enough to be used seriously in power generating systems nor are they strong enough to use for pulling weights.

Prepper Applications

Hard and soft ferrites are best used for building communications devices and data storage systems. Perhaps just as important, iron oxide dust can also be used to shield devices from radar signatures. For example, the coating on stealth fighters and bombers includes ferrite particles because they can easily absorb radar. If you decide to have a homestead above ground, it may be of some help to see if you can take advantage of this technology.

You can also use ferrite particles for body armor or garments that might shield you from radar devices intended to spot individuals. This is especially important if you are cut off from your bug out location, you become surrounded, or something else comes up that makes it very important to be as invisible to radar scanners.

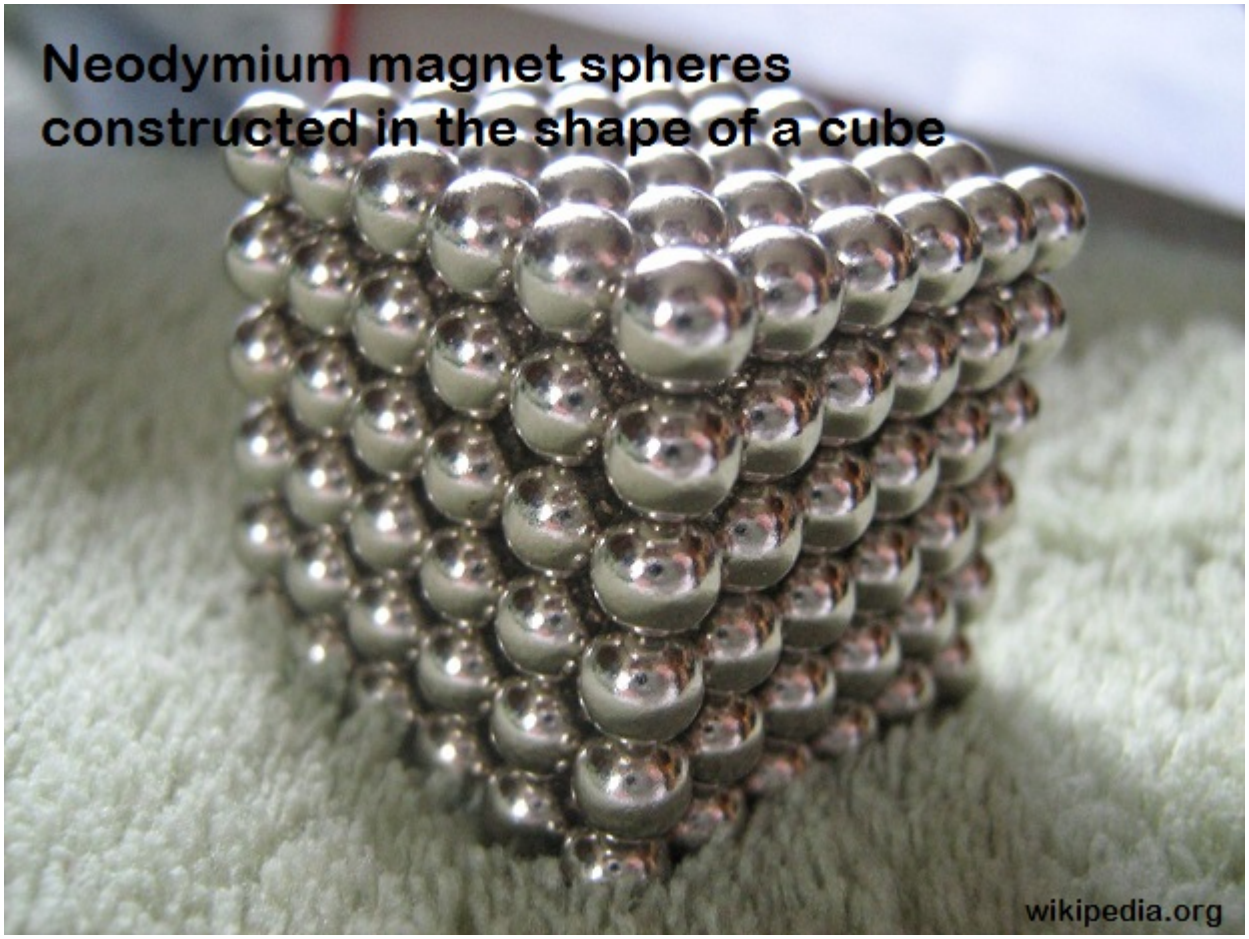
Neodymium Magnets

These magnets are made of three elements: neodymium, iron, and boron. Neodymium magnets are the most powerful on Earth. As such, they generate fields that are useful for power generation and generating force to either pull objects or push them away. They are also commonly used in modern equipment to create smaller, more powerful motors for tools, computer hard drives, and other applications where more torque or speed is needed in a smaller device.

Neodymium magnets are relatively new on the market, and were first made by Sumimoto Special Metals and General Motors in 1987. Even though Neodymium magnets are classified as “rare earth magnets”, each of the three elements used to make them

is very common. Since neodymium rarely exists alone, however, it must be separated from surrounding materials.

Up until 2015, the basic process for making Neodymium magnets was similar to the one used to make ferrite magnets. Unfortunately, this sintering method does not allow for the production of neodymium magnets with uniform magnetic fields. A new method which starts off with a mixture that is about as soft as clay before heating. This method allows for much greater control of the shape of the field that each magnet produces. This new method will be used beginning in 2017.



Pros and Cons

- Advantages – Neodymium magnets come in a wider range of strengths than other magnet types. You can also get neodymium magnets in smaller sizes than other magnets and still get a larger or more powerful magnetic field from them.

- Disadvantages – Perhaps the strength of neodymium magnets is also its greatest disadvantage. In this case, even smaller magnets can cause serious injuries if body parts get caught between two magnets trying to connect to each other.

Neodymium magnets also tend to be more brittle than other magnets. As a result, when they do come together, they can break apart because of the force of the collision.

When using or storing neodymium magnets, it is best to keep them away from computers, magnetic storage media, and other electronic devices. Even though many modern computer hard drives use neodymium magnets for their motors, an external magnet can still erase all the data on the drive or ruin the disk.

Finally, you must be very careful when adding neodymium magnets to any given device. If the surrounding materials are not strong enough to overcome the effects of the magnetic field the entire device can be ruined when the magnets pull free or break through to different areas.

Prepper Applications

Neodymium magnets are best used for power generation. You can use them to build smaller, more efficient motors for wind turbines as well as water wheels. For example, if you want to build a wind turbine that will run on a breeze from a windowsill, neodymium magnets will allow you to build a much lighter, yet more powerful motor. If you tried to build the same turbine with ferrite magnets, it would take a lot more wind to turn the propeller. Since neodymium magnets also make stronger magnetic fields, they will also induce more current in nearby coils.

You can also use neodymium magnets to build stronger power tools. This is especially important if you want to use battery powered tools as opposed to ones that plug into an electric

socket. Since the overall motor size is much smaller, you can also choose smaller batteries that will charge up faster. In this case, you will also have a wider range of batteries to choose from.

For example, you may get enough sustainable power from a car battery to power a neodymium magnet based power tool, while similar tools with ferrite magnets might require Lithium Ion or other more compact batteries.

Even though there is relatively little information about this topic, those who are best equipped to survive are going to be those that innovate as opposed to simply reusing and reinventing the same old things. In this case, neodymium magnets have more than enough power for lifting and pulling objects. Once you can overcome gravity, you can also create propulsion. No matter whether you are concerned about the loss of power farm tools, cars, or other transport devices, it is entirely possible that neodymium magnets can form the basis for a magnetic engine.

Video first seen on electronicsNmore.

Samarium Cobalt Magnets

Samarium Cobalt magnets are permanent rare earth magnets made from the elements Samarium and Cobalt. As with Neodymium, Samarium is also fairly common, but must be isolated from other materials.

Samarium is also primarily extracted from China, although large amounts are also found in the United States and Brazil. Overall, Samarium Cobalt magnet are a bit weaker than Neodymium magnets, however they are still much stronger than ferrite magnets.

There are two basic kinds of Samarium Cobalt magnets:

- SmCo5 magnets are made in such a way that the ratio of

Samarium to Cobalt is 1 atom of Samarium to 5 atoms of Cobalt. These magnets are very powerful, and they are also easier to adjust than Sm2Co17 magnets.

- Sm2Co17 magnets are made in a ratio of 2 atoms of Samarium to 13 – 17 atoms of other metals. The second metal mix always includes Cobalt, and it may also include Copper, Iron, Hafnium, and Zirconium. These magnets are stronger than the SmCo5 magnets, and can also be used in higher temperature ranges than most other magnets.

As with other magnet types, Samarium Cobalt magnets start off with the construction of an ingot that must be broken down into a powder. This powder is placed in a mold and reheated in the presence of a magnetic field so that the particles align in a uniform manner. After the magnets cool, they are ground down and refined to complete the shaping process.

Pros and Cons

Advantages

- Motors, vehicles, and many other devices make a lot of heat because of friction between moving objects. Unfortunately, for some strange reason, magnets tend to lose their ability to generate a magnetic field when temperatures go up. For example, even though neodymium magnets are very powerful, they can easily lose their magnetic field as the temperatures go up. Even though Sm2Co17 magnets are not as powerful as Neodymium magnets, they can withstand much higher temperatures.
- Samarium Cobalt magnets also work better in freezing temperatures that would also pose problems for other classes of magnets.
- Samarium Cobalt magnets are also ideal for situations where corrosion or oxidation would present a problem. Since these magnets do not corrode or oxidize, you will not need to coat them with other materials.

Disadvantages – Samarium Cobalt magnets are more brittle than Neodymium magnets and will shatter if you allow them to crash into each other. It is also much harder to produce uniform magnets that will produce uniform fields. As a result, you may get inconsistent results with different magnets.

Prepper Applications

Usually, Samarium Cobalt magnets are used in some guitars, expensive headphones, pumps, turbines, compressors, some automobile motors, and some communications equipment. If you plan to use air compression for tools or wish to use other air based technologies, you will find these magnets very important.

Even though you can still use ram pumps and the Archimedes screw for water delivery, it also never hurts to have a few Samarium Cobalt magnets on hand to build or rebuild conventional pumps.

If you happen to be advanced in the area of transmitter and receiver technologies, you can use Samarium Cobalt magnets to create microwave range vacuum tubes.

In a post crisis world, more than a few survivors are bound to be as concerned about black market radar technologies used by any number of criminals as well as those systems used by collapsing or collapsed government agencies. As such, you may need to know how to build jamming systems that are a bit more complicated than working with ferrite magnet dust.

Since Samarium Cobalt magnets are commonly used in radar and associated systems, it may also be possible to use them to build jamming devices. While this may seem like an advanced topic, once you know the basics of electronics and how to read schematics, you may will find that you can build jamming or cloaking systems that can be used in conjunction with other methods.

For example, you can still take advantage of natural ground signatures and features to help with disguising your presence, and then use electronic equipment as an added layer of protection.

Alnico Magnets

Most Alnico magnets are made of Aluminum (Al), Nickel (Ni), and Cobalt (Co), Iron, Copper, and Titanium. When compared to other magnets, they are a bit stronger than ferrite magnets, but not as strong as Samarium Cobalt or Neodymium magnets. Nevertheless, when Alnico magnets were developed in the 1930's, they became very popular, and still are today.

As a prepper, you are likely to find Alnico magnets in older motors and many devices that were made well into the 80's. Even though they are being phased out in favor of Samarium and Neodymium magnets, they are still very important and have their place in a well rounded survival stockpile.

Alnico magnets are also cast first as ingots which are broken down into a powder form. Next, these magnets are sintered, or reheated in the presence of a magnetic field so that the particles align to create a more uniform magnetic field.

Unlike other magnets made with this process, Alnico magnets can be aligned so that a magnetic field can only be generated in one direction (anistropic), or they can be magnetized to go in many directions (isotropic). Overall, transistor magnets are more powerful.

Pros and Cons

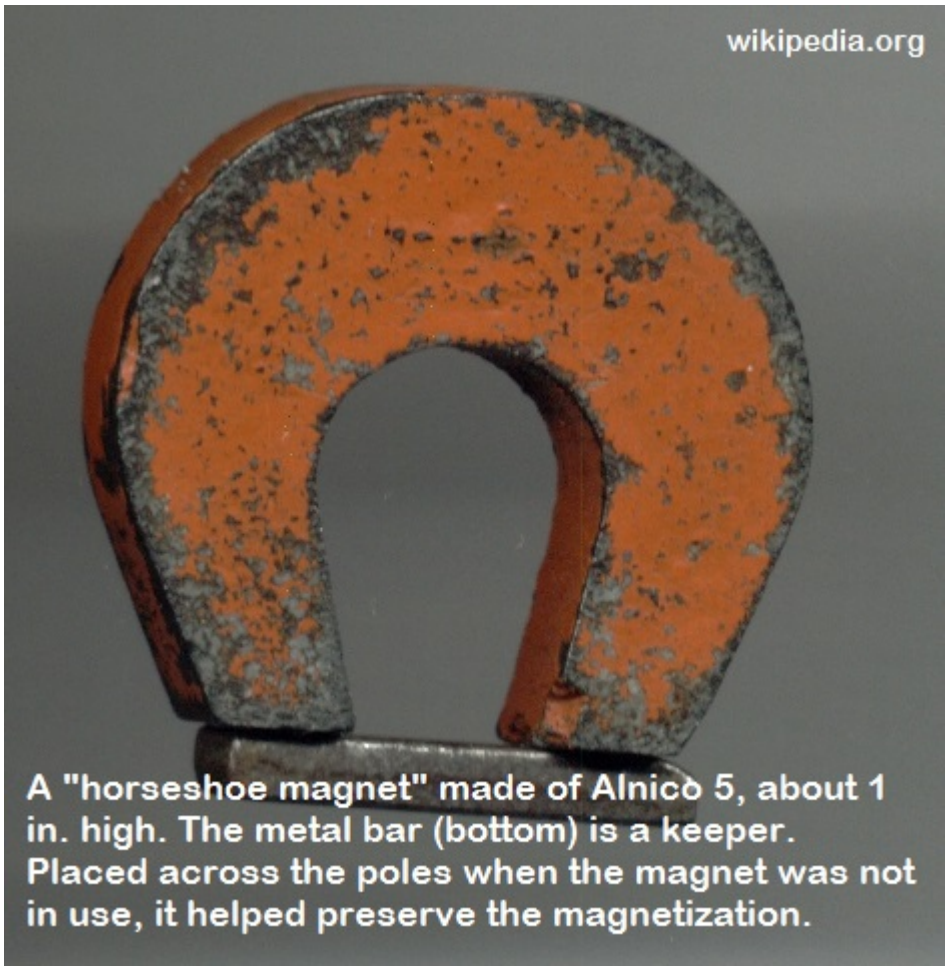
- Advantages – As with Samarium magnets, Alnico magnets hold up well at high temperatures. In fact, even if the magnet is red hot, it will still produce a usable magnetic field. Alnico magnets can be magnetized and demagnetized easily. As a result, this makes them much better than ferrite magnets for communication devices.

They are used in circuits to help improve the faithful reproduction of sounds as well as to expand the range of sounds that can be duplicated. Since Alnico magnets are also stronger than ferrites, they can also be used to make smaller devices.

- Disadvantages – Alnico magnets are also similar to other magnets in the sense that they are very brittle. This makes it hard to change their shape by machining or using other tools that may cause them to shatter. Even though Alnico magnets are not as powerful as some other magnets, you should also avoid letting them crash into each other.

Even though the ease of magnetization and demagnetization is a good property to have for some applications, it can also make it difficult to store these magnets. In some cases, even if they are sitting in a circuit, pairs of magnets can demagnetize each other with relative ease.

You will need to include protective plates in any design that uses these magnets. If you need to use an Alnico magnet to replace another type of magnet in a device, do not forget to add a plate of steel to help reduce the loss of the magnetic field. Even if you are storing Alnico magnets outside of a circuit, they will still need to be kept with steel plates so that they do not become demagnetized.



Prepper Applications

Alnico magnets can be used in communications equipment, musical instruments, amplifiers, and motors. If you are interested in rebuilding older electronics equipment and keeping it in good condition, chances are you will need Alnico magnets.

When purchasing these magnets make sure that you keep a good supply of anistropic and isotropic magnets on hand. You should also know how to interchange these magnets with ferrite magnets since you may want to improve older systems by adding these magnets and support circuits as needed.

Overall, choosing the best magnets for survival needs is not as simple as knowing whether or not the magnet is a permanent magnet or one that requires electricity to be magnetized.

Even if any given electronic circuit looks simple, or a motor

looks very small, trying to use a magnet with the wrong strength or shape field will ruin the equipment. As a result, you may need to store a large number of magnets in order to make sure that you have every type that you will need in the post crisis world.

If you want to downsize on the number of magnets that you store in a stockpile, then you will also need to narrow down the age and nature of the devices that you use in the post crisis world.

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