

What is Degaussing, And How Is It Used for Data Destruction?

Degaussers disrupt and eliminate magnetic fields, for example, those of hard drives. But what is degaussing, and why does it matter for destroying sensitive data?



ABSTRACT

One thing is certain about our age of technology: Individuals and businesses rely heavily on electronic devices to store and process information. We are talking about computers, tablets, mobile phones... even credit cards. All of these have become essential to our daily lives. Which leads to the question: What happens when these devices need to be disposed of or reused? And how can you make sure the information in them is made truly irretrievable?

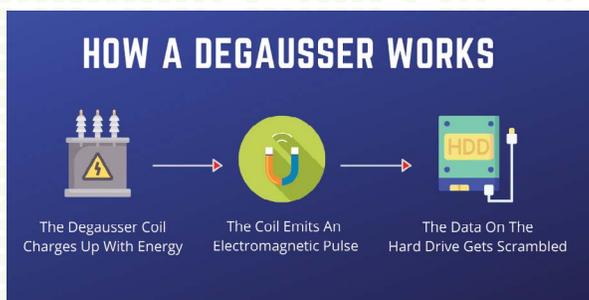
In this article, we will explain everything you need to know about degaussing magnetic storage media. First, we will go through the process degaussers follow and why it helps deal with [secure data destruction](#). Then, we will see the different types of degaussers and how they deal with different media. And lastly, we will cover some of the challenges and limitations degaussers have today.

WHAT IS A DEGAUSSER?

Degaussing demagnetizes or neutralizes the magnetic field that is used in data storage. This can be done to any magnetic media devices, such as video tapes, hard drives, or floppy discs.

A degausser is a machine commonly used to delete data from magnetic storage devices like hard drives, floppy disks, and cassette tapes. The name comes from the word “degaussing,” which is a process that removes or neutralizes magnetic fields.

The technology has been around for a few decades. In fact, it was initially used by the military to erase sensitive data from tapes. Today, though, businesses, government agencies, and individuals use degaussers daily to destroy the information stored in drives and other media.

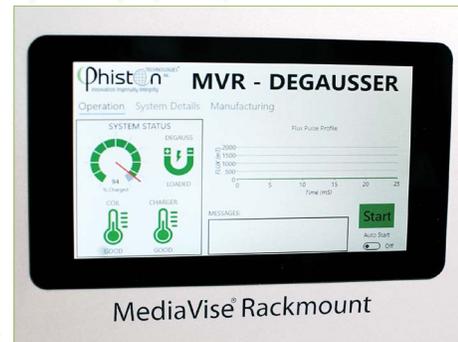


How Does a Degausser Work?

The way a degausser works is relatively simple. The device creates a powerful magnetic field that can disrupt the magnetic orientation (or magnetic domain) of the particles present in storage media.

The result of the degaussing process is the complete erasure of data stored in electronic devices, so they can

be disposed of safely or reused for other purposes. The information is then made irrecoverable, and in most cases, the drives are also rendered unusable.



WHAT KINDS OF DEGAUSSERS ARE THERE?

There are a few different types of degaussers available on the market, from smaller handheld units to industrial-scale machines capable of destroying data in seconds.

Typically, businesses and individuals use smaller degaussers to deal with devices like cassette tapes and floppy disks, while larger equipment is reserved for hard drives and bulkier storage media.

Here are the different types of degaussers in some detail:

- **Portable degaussers:** These handheld devices are small and designed to erase data from small magnetic media. They are often chosen by individuals and small businesses.
- **Drawer-style degaussers:** These machines are designed to handle larger magnetic media, such as hard drives, reel-to-reel tapes, and cassettes. Drawer-style degaussers have a large magnetic coil inside a drawer, and the media is placed inside the drawer and exposed to the magnetic field.
- **Conveyor-belt degaussers:** These degaussers are designed for high-volume erasing of large quantities of magnetic media. You need to place the media on a conveyor belt, and the machine will move it through a powerful magnetic field that erases all the data stored in it.
- **Wand-style degaussers:** These are also handheld devices, although in this case, that in this case use a magnetic wand to erase data from small or sensitive magnetic media. These wands are popular for use on credit cards and ID badges.
- **Bulk erasers:** These degaussers are industrial-grade machines designed for erasing large quantities of magnetic media quickly and efficiently. Bulk erasers are often used by data centers and other large organizations that need to dispose of a large number of hard drives and other magnetic media.

The type of degausser to use will depend on the type and the volume of magnetic media you need to erase.

ARE ALL DEGAUSSERS EFFICIENT?

The efficiency of a degausser depends on the strength of the magnetic field that is being applied versus the strength of the media being treated.

The ideal degausser coercivity ratings should be two to three times stronger than that of the device. This means that the more coercive your storage media is, the stronger the degaussing equipment will have to be.

DEGAUSSING HARD DRIVES - MAGNETIC MEDIA SANITIZATION

Degaussers are a crucial tool for securely erasing data from magnetic storage media and protecting sensitive information from falling into the wrong hands. However, they cannot be used for all types of data destruction.

What Hard Drives Can You Degauss?

Although these machines are capable of erasing data from a variety of media, the most important thing to

consider when it comes to degaussers is that they are designed to deal with magnetic media (or media that uses a magnetic field to store information).

Degaussers can erase data in the following storage devices:

- **Hard drives:** Degaussers can erase data from both internal and external hard drives (2.5 and 3.5 inches), including traditional hard disk drives (HDDs) and, in some cases, solid-state drives (SSDs). However, it's important to note that SSDs may require a more powerful degausser than HDDs, as they use different types of magnetic storage (you can read more about the limitations of degaussers in the next section).
- **Magnetic tapes:** Degaussers are commonly used to erase data from magnetic tapes such as Digital Linear Tape or DLT, Quarter Inch Cartridge or QIC, Linear Tape-Open or LTO, and Advanced Intelligent Tape or AIT, among others. Using a degausser to erase a magnetic tape is a relatively straightforward process, but it's important to follow the manufacturer's instructions to ensure that the data is completely and securely erased. For example, you should make sure you choose a degausser with the correct power (some might be too strong for older or denser tapes) and prepare the tape by removing labels and stickers to ensure the entire tape is exposed.
- **Floppy disks:** While floppy disks are less commonly used today, some businesses and organizations still find them helpful for specific applications. Degaussers can effectively erase data from floppy disks (including 3 1/2-inch, 5 1/4-inch, and 8-inch). As with other magnetic media, degaussers can securely erase all the data stored in the floppy by exposing it to a strong magnetic field.
- **Credit cards and ID badges:** Some degaussers are specifically designed to erase data from credit cards, ID badges, and other types of magnetic stripe cards. However, because these types of media use a lower magnetic field strength than hard drives or magnetic tapes, they require a degausser specifically designed for this purpose.
- **Other magnetic media:** Degaussers can also erase data from other types of magnetic media, such as reel-to-reel tapes, cassette tapes, and even some types of magnetic strip media used in public transportation systems.

LIMITATIONS OF DEGAUSSERS

Because the technique of degaussing is specifically designed to demagnetize (or, in some cases, neutralize) fields, typically by rearranging or randomizing the polarity of magnetic domains, there are shortcomings and limitations when using them on other types of media.

For instance, degaussers need certain magnetic forces to match those of the storage media coercivity. If your degausser is not strong enough and you are using a media with high coercivity, you might not get the data completely erased.

Degaussing can also be a slow process and takes a large manual effort. If you need to sanitize a lot of devices regularly, it might not be a scalable solution. Also, degaussers are typically very expensive because they are built using rare earth magnets and metals and have high operational costs.

Lastly, it's important to reiterate that degaussing a magnetic media will render it unusable. Thus, you will also need to deal with the disposal of the drive.

A Note on HAMR and MAMR Drives

At this point, it is not possible to degauss heat-assisted magnetic recording devices (or HAMR). There are also questions about the effectiveness of using this technique on microwave-assisted magnetic recording (or MAMR) hard drives.

Disposing of a Degaussed Drive

An important consideration is that once a hard drive or other magnetic media has been degaussed, it may still contain physical components that need to be disposed of properly.

Always check with your local regulations regarding electronic waste disposal before throwing away any electronic device, as some regions may require that electronic devices be disposed of in a specific manner. Make sure you also remove any remaining components, such as the metal casing, circuit boards, and other parts, before disposing of them. Many of these components can often be recycled.

If the degaussed drive also contains non-magnetic media, such as SSDs or USB drives, these will need to be securely erased using a different method, such as overwriting, before being disposed of. In some cases, it may also be necessary to physically destroy the degaussed drive in order to ensure that no data can be recovered from it. This can be done by shredding the drive, crushing it, or otherwise rendering it unusable.

DEGAUSSERS, DATA SECURITY, AND REGULATORY COMPLIANCE

In 2018, an MIT study titled "[A Remembrance of Data Passed: A Study of Disk Sanitization Practices](#)" looked into 158 disk drives acquired from eBay and various computer shops, swap meets, and salvage yards. According to their analysis, 74% of the drives' data was recoverable, and 17% were fully operational.

Even when more than half of the drives had been formatted, it took little effort to retrieve the old information. Information that, by the way, contained sensitive data like credit card details! This is, unfortunately, quite a common scenario. Just last year, a community health center that neglected to correctly dispose of hard drives exposed nearly 100,000 people's data.

In summary, simply deleting files is not enough to make a device unworkable. Degaussing, however, does ensure data destruction - something many industries must comply with following specific procedures.

Avoiding Heavy Fines

If you do not dispose of data storage media correctly, and a data breach occurs, your business can be found liable and have to face thousands, if not millions, of dollars in potential fines and lawsuits.

If your company is subject to data retention rules, for example, you should always make sure you correctly dispose of the information when the time comes.

Although you can use a handheld device, as we mentioned above, the coercivity of the machine needs to be at least two times stronger than that of the media you want to sanitize. Which means that, if you are dealing with hard drives, you will need a strong coil or permanent magnet degausser (or you can risk not dealing with the magnetic alignment correctly and leaving some data exposed, potentially breaking regulatory compliance).

A better choice is to instead use a professional service that has not just the correct tools to do the job but also the expertise and certification (like GSA Schedule 70 or NAID AAA) to understand the needs of your company.

CONCLUSION

It's important to note that not all degaussers are created equal, and some may not be suitable for erasing certain types of magnetic media. While there is no protection method against hacks that are 100% effective, data destruction can certainly help you prevent the data from falling into the wrong hands.

When choosing a degausser, it's important to ensure that it is appropriate for the type of media you need to erase to ensure that all data is securely erased and cannot be recovered.

As we covered in this article, degaussers are only effective when used on magnetic media, such as hard drives, magnetic tapes, and floppy disks. They will not work on SSDs, USB flash drives, or other non-magnetic devices.

It's vital to keep in mind that the degaussing process will typically destroy the magnetic media (or at least cause significant damage to it), so you should also plan for disposal.

To ensure you are using the proper technology to deal with your media, you should use products that are designed to deal with the changing compliance demands and the natural evolution of technology. Our Phiston machines are capable of destroying all types of storage devices (and the information they carry), making the data unreadable and unrecoverable.

Our range of products includes powerful degaussers as well as SSD destroyers, HDD destroyers, and powerful disintegrators. Contact us today to find out more.

THE PHISTON ADVANTAGE

At Phiston Technologies, we believe in innovation, proactive product development, and secure destruction of data. Our goal is simple: destroying your media to preserve and promote data security. We build products to ensure complete media destruction.

As data storage continues to evolve, so will the need to advance current data destruction products. Phiston will always be ready to provide security solutions to keep your organization safe and in compliance.

Phiston as a company is a leader in end-of-cycle media destruction and has various products that can handle all. Our clients include some of the largest tech companies in the world, and our devices are deployed across all 50 states and in 49 different countries.