Helium Drives

What is a helium hard drive?

A helium hard drive is an often also „Enterprise" marked 3.5" hard disk drive (HDD) with 8 TB or more capacity and an internal enclosure that is filled and hermetically sealed with helium gas rather than oxygen.

Why fill a hard drive with helium?

When it comes to inflating for air buoyancy, helium, the second lightest element, is typically the choice gas over hydrogen as it is nonflammable.

Filling a hard drive with helium creates a unique low-density environment where the internal hardware can operate more efficiently. Helium has about 1/7 the density of air, resulting in lower turbulence compared to air. Less friction requires less rigidity in platter thickness, allowing engineers to not only use thinner platters but also fit additional platters within each enclosure—resulting in greater capacity and greater speed. While the maximum number of platters that can currently fit in a standard air drive is six platters, the maximum in a helium drive is 10 platters.

What are the benefits of using helium in hard drives?

Along with significant capacity advantages and internal performance improvements, the use of helium hard drives can also yield more energy-efficient environments. Smaller vibrations between molecules generate less heat, meaning helium-filled drives can run cooler than air-filled hard drives and require less power and cooling.

Another benefit of helium-filled hard drives is lower turbulence. Disks spinning in helium create significantly less noise. This less turbulent environment can culminate in a more reliable and stable disk operation.

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What makes a helium hard drive difficult to shred?

In order to keep the helium inside, chassis are more solid and often provide for a second sheet steel cover above the bolted steel cover.

Up to 10 platters are squeezed into the chassis for maximum data storage capacity, filling the complete space inside. Thus, more motor power is required for shredding and the first cut does not create easily manageable single shreds, but compacts the platters to a solid aluminum block during cutting. This requires a lot more cuts to come to smaller shred sizes, reducing the throughput capacity and increasing wear.

Some HDD´s feature two or three read / write heads to reduce the access time and latency. These fill the gaps between the platters and come along with rare-earth magnets and solid metal brackets. Thus, even more motor power is required for shredding and magnet particles collect within the shredding unit.

How to process helium drives?

Helium drives must only be processed on approved machines. If possible, disassemble the HDD and process the data platters and pcb-board only. When this is no option, feed a single HDD and wait until it is mostly processed. Only then feed the next HDD. Expect much longer feed intervals compared to regular HDD´s.