SONY
make.believe

Sony® LTO™ Data Media Storage Tapes

Speed. Durability.
Compatibility. Reliability.

ULTRIUM LTO

Time-tested innovative technology

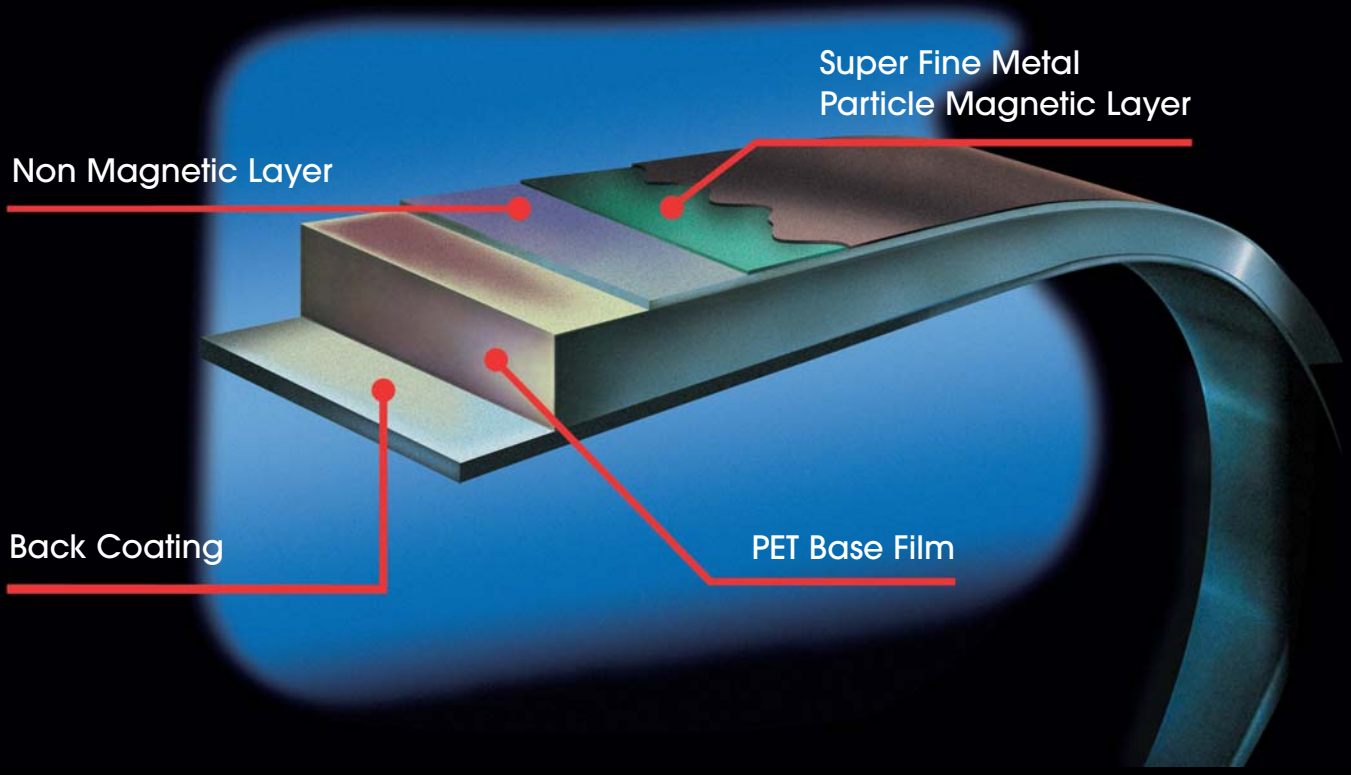
Sony LTO media has been tested to meet and exceed even the most intense storage conditions. Manufactured to meet the standards developed by the LTO consortium companies, Sony LTO media is guaranteed to work with the various LTO stand-alone drives and automated systems.

Sony media is engineered to the highest standards, with every tape benefiting from more than 60 years of tape manufacturing experience at the same Sony facility. From the Soni-Tape KA series in 1950 to Betacam® tapes in 1982, DDS tapes in 1989, and AIT Advanced Intelligent Tape™ to LTO tapes of today, Sony has clearly developed a knowledge and expertise that guarantees the best quality, reliability and performance. With such rich heritage, Sony LTO tape embodies our commitment to excellence and your satisfaction.

Coating Technology

The storage capacity of magnetic tape has increased dramatically in recent years. This means that tape must be designed to have high recording density in order to save more data in less space. To realize this, it is essential to coat the tape surface with a thin magnetic particle layer. Today, this magnetic tape layer has become thinner than 100 nanometers (one nanometer is one-millionth of a millimeter).

Aiming for even greater storage density, Sony is continuing to pursue technological advancements to create an even thinner layer of magnetic particles. Our advanced thin-layer coating technology is now capable of uniformly applying magnetic particles as thin as some tens of nanometers over the entire tape surface.



Let us explain this advanced technology by considering the process of painting an automobile: For the paint to have the required thickness, you might need to apply one quart of paint per car. Now, imagine how much paint you would need, if you were to coat the entire car surface using Sony's thin-layer coating technology.

The answer is: an amount less than one teaspoon. Sony's thin-layer coating technology would allow this small quantity of paint to uniformly cover the entire car surface. With magnetic particles as small as tens of nanometers, Sony's thin-layer coating technology allows a few particles lying on top of each other (3-layer) to cover the entire tape surface without gaps, enabling reliable and durable storage of large amounts of data.

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Magnetic Particle Technology

Sony is proud of its technology that enables each of the nanometer size magnetic particles to be evenly encapsulated by the binder. This enhances the characteristics of the data storage tape containing your precious data, providing precise and stable writing and reading of data as well as enabling these characteristics to be maintained for many years. You probably already know that the sweet coating on the outside of a pill keeps the person swallowing it from tasting the bitter medicine inside. However, this coating also plays another very important role. The coating helps by blocking things outside from coming into contact with the essential ingredients inside the medicine, enabling it to retain its quality and function.

The magnetic particles of data storage tape also needs a sugar coating. Even though these particles are so small that they are measured in the nano-scale, every tiny magnetic particle is encapsulated with a carefully selected material called a binder.

The binder acts as the sugar coating, carefully protecting the functionality (i.e. stored data) of the magnetic particles, much like the sugar coating protects the essential ingredients of the medicine.

Sony has been developing technology that will enable even smaller particles measuring a mere 30nm in size to be encapsulated by the binder.

Gentle Tape that is soft to the Drive Head

At Sony, we are always thinking about data storage tape. In particular, we are always wondering if the tape is as gentle as can be.

When stored data is read by the drive heads, there is a harsh contact between the tape and the head, causing wear and creating static electricity. Sony's design philosophy is to alleviate such phenomenon helping to provide stable media performance even after many tape read/write cycles.

Sony has developed a technology that allows the electrical resistance and the surface roughness of tape to be within the optimum values for the system. This dramatically reduces damage to the head and tape that holds your data, allowing for continuous stable writing and reading.

Some high-density writing and reading heads are so delicate that they can be damaged just by the static electricity in the tape. We know that tape is treated harshly in the drive. That is why Sony has designed our tapes to both resist and not cause damage to other components.

Imagine storage tape as fabric. You want fabric that is strong and still comfortable to wear. You want a fabric like silk, that is strong enough to be used in parachutes, yet remain soft enough for your favorite pajamas.

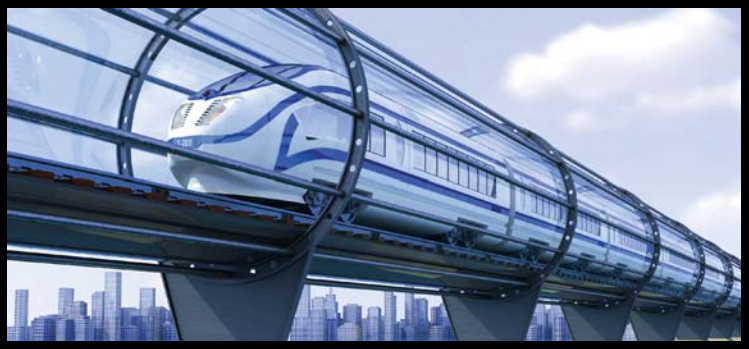
Sony storage tapes are like the finest silk for your drive. They minimize wear to drive heads while protecting your valuable data.

"Sony's design philosophy is to alleviate such phenomenon helping to provide stable media performance even after many tape read/write cycles."

Reliable Data Storage at High Speeds

With linear storage tapes, the head reads the data by passing over the numerous data tracks on the tape in which the data is stored. If the data tracks were wide enough, the head could easily pass over the tracks without guidance. However, in high-density storage formats, the track width is extremely narrow so the only way to keep the head oriented on the data tracks is to carefully guide its position. In the case of data storage, a pre-recorded servo signal is used to guide the head along a track range called the servo tracks. Since these tracks serve as the standard for guiding the head, they are just like train tracks.

For a train to run safely, the rails must be laid equally spaced throughout the track length. Sony's unique servo writer enables the error of spacing to be extremely small. So even when tapes deform because of environmental factors such as temperature and humidity, the servo tracks remain safely uniform. Sony uses a base film with enhanced rigidity for its storage tapes and controls the tapes to contract or expand properly. This allows elimination of reading errors, realizing reliable recording and playback characteristics.



If the servo signal bandwidth was 1,400mm, the same width as a train track, Sony minimizes the variation in track width from temperature-humidity differences to only 2mm. In fact, we now have the technology to reduce distortion: tens of nanometers (one nanometer is one-millionth of a millimeter) to one-half. This precise control is now being applied to Sony storage tapes .30nm in size to be encapsulated by the binder.

> "Sony uses a base film with enhanced rigidity for its storage tapes and controls the tapes to contract or expand properly."

Sony LTO Ultrium® Line Up

LTO ULTRIUM 5

Storage Capacity of 1.5 TB (native) 3.0 TB (compressed)
Transfer Rate of 140MB/s (native) 280MB/s (compressed)

Sony's LTO 5 tape cartridge delivers new functionality to support the ever-increasing requirements of today's data-rich storage environments. Users can now create two partitions within the cartridge, addressing both file control and space management. This feature can help to increase access speed, which is important for storing rich media files. The LTO-5 cartridge adds this feature while still retaining the hardware-based encryption introduced with LTO-4 technology, which helps to protect the storage and transport of sensitive information.

LTO ULTRIUM 4

Storage Capacity of 800GB (native) 1,600GB (compressed)
Transfer Rate of 120MB/s (native) 240MB/s (compressed)

Sony's LTO 4 cartridge features a native storage capacity of 800GB and a native transfer rate of 120MB/sec to support today's data and media storage requirements. Sony LTO 4 cartridges will also work in conjunction with your LTO 4 drive to support 256-bit hardware-based data encryption, adding another layer of security. (Also available with WORM technology.)

LTO ULTRIUM 3

Storage Capacity of 400GB (native) 800GB (compressed)
Transfer Rate of 80MB/s (native) 160MB/s (compressed)

Sony's LTO 3 tape cartridge features a storage capacity of 400GB native (800GB compressed) and a transfer rate of 80MB/second native (160MB/second compressed). Armed with A3MP technology, superior tracking stability and an ultrasonically welded shell, Sony LTO 3 maximizes your data protection. (Also available with WORM technology.)

LTO ULTRIUM 2

Storage Capacity of 200GB (native) 400GB (compressed)
Transfer Rate of 40MB/s (native) 80MB/s (compressed)

Sony's LTO Ultrium 2 tape cartridge features 200GB native (400GB compressed) storage capacity. Fully compatible with all LTO Ultrium 2 tape drives, Sony's LTO 2 cartridges are designed for long life, superior reliability and provide up to 80MB/s compressed data transfer. Sony's 4KB high-durability non-contact IC memory chip allows fast access for file location and retrieval. The unique Sony Servo-Writer minimizes critical tracking errors that dramatically improves data writing and reading accuracy.

LTO ULTRIUM 1

Storage Capacity of 100GB (native) 200GB (compressed)
Transfer Rate of 20MB/s (native) 40MB/s (compressed)

Sony's LTO 1 tape cartridge features a storage capacity of 100GB native (200GB compressed). An ultra-thin magnetic layer helps to provide high reliability and durability. Sony's precision tape manufacturing technology brings out the full potential of LTO for high reliability back-up and archive.

For more information, visit our website at sony.com/lto

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