

# Forget Mothballs: Techniques for Safeguarding Backup Tapes

*By Masaki Hattori  
Sony Electronics Inc.*

Backup and disaster recovery has gained tremendous exposure over the past several years as companies realize that critical data is the lifeblood of their business. Backed up data serves as a link to the past (and present) if a data outage occurs. Imagine where your company would be if its data could not be restored following an outage. All customer relationships would be history, along with financial transactions, product development files, business processes, and much more.

The recent barrage of government record-keeping mandates is further pushing the importance of effective storage. Companies are now required to store regulated data for certain amounts of time. Depending on the industry and the regulation, this time period could stretch past several decades.

Write Once Read Many (WORM) tape storage technology is gaining popularity for its ability to comply with government mandates, as well as general backup and disaster recovery requirements. WORM-enabled tape also features a low cost per gigabyte and a long shelf life, and can be easily transported and stored offsite.

Most companies often forget about stored tape media, or mishandle it during the shipping process. Magnetic data tapes can survive most situations, but are susceptible to errors under abuse. This can lead to compromised data integrity if stored records ever need to be retrieved. It's important to handle and store magnetic tape cartridges properly to ensure that data is available if a disaster ever strikes or an audit ever occurs.

## Top Tips for Storing Tape Cartridges

### *Stay away from stray magnetic fields*

Tape storage has a tempestuous love/hate relationship with magnetic fields. The recording process for tape storage media is dependent on the active magnetic material. Unfortunately, magnetic materials are also used to erase and write over previously recorded information. As a precaution, always keep tape cartridges away from stray magnetic fields because even small magnetic sources can compromise data stored on the tape.

If you're storing backup tapes offsite for disaster recovery purposes, make sure you thoroughly test your tape storage locations for magnetic fields. A tape's magnetic fields, and thus its content, can be corrupted by something as innocent as an industrial floor cleaner. When in doubt, test first.

### ***Store tapes at recommended temperatures and humidity***

Most manufacturers recommend storing tape cartridges at a temperature between 59 degrees Fahrenheit and 77 degrees Fahrenheit, and between 40 percent and 60 percent humidity. A good rule of thumb is to check your own comfort level. If you're comfortable, chances are your tapes are comfortable, too. Also make sure to avoid sudden temperature changes, even within the recommended range, because tape can expand or contract. If a sudden temperature change is expected, try to give the tape 24 hours to adjust to the new climate before use. If condensation occurs, wipe off any dew from the shell or reel and allow the tape to dry naturally. Make a working copy when the tape is dry.

### ***Keep the storage environment clean***

Tape media is reliable in most environments, but can be compromised by dirt and other impurities. Be sure that the offsite storage area is as free of contaminants as possible, including dust, dirt, moisture, smoke, fingerprints, mold, etc.

### ***Avoid physical shock***

Be careful not to drop tape cartridges. If a cartridge has been exposed to physical shock, such as being dropped, examine it closely prior to use. Look for broken pieces and lightly shake the cartridge to see if pieces are rattling inside. If the cartridge appears to be damaged, do not insert it into the tape drive. This could further the problem by damaging the tape drive in addition to the tape.

### ***Do not touch the tape media***

Do not open the tape access door on the cartridge and do not touch the tape media. Dirt and oil from fingers can cause impurities on the tape, which can compromise the data integrity.

Some tapes, such as AIT, SAIT and LTO, contain data chips within the cartridge to speed file access times. Keep the chip surface clean and protect it from dust, fingerprints, water drops and other liquids. If the surface does become dirty, gently wipe it off with a soft, dry cloth.

### ***Rewind or forward tape cartridges every three years***

Over time, long periods of inactivity can cause the tape layers within stored cartridges to stick together. To prevent this from happening, "exercise" tapes every three years by fully rewinding or forwarding the tape. Rewind or forward the tapes at slower speeds whenever possible to maintain high performance.

### ***Store tapes upright in their cases***

Stacking tape cartridges on top of each other can warp their shells, so always store tapes upright on either their sides or ends. Whenever possible, make sure to keep the cartridges in their original cases.

### ***Put labels on correctly***

Only apply labels where they belong on the tape. This may seem obvious, but it often causes unnecessary tape failures. Improperly placed labels can interfere with cassette loading, degrade the tape alignment or even peel off inside the recording mechanism.

## **Transporting Tapes to the Storage Facility**

Disaster recovery planning often involves storing data cartridges offsite in locations far from the original network. This ensures that the data is available if regional disasters, such as earthquakes and hurricanes, occur. There are numerous problems that could potentially arise during the shipping process; most notably, prolonged X-ray exposure.

Increased security at airports has resurfaced the X-ray concern. Studies have found that traditional X-ray systems have no effect on magnetic tape cartridges. However, airports have also implemented explosive detection systems in the years since the World Trade Center tragedy. The effect of explosive detection systems prompted some additional testing by Sony to ease user concerns.

Sony tested a variety of magnetic tape cartridges with varying degrees of susceptibility to erasure and found that the explosive detection systems used did not impact the data recorded on the tapes.

Unfortunately, there are many different types of X-ray and explosive detection systems used across the globe. For example, different radiation intensity and frequency are often used; the speed of the conveyor belt could mean longer exposure time during X-rays; electric motors could be positioned differently on the conveyor belt; etc. These variations make it almost impossible to definitively rule out the possibility that data could be compromised by X-ray systems. The following tips can be easily implemented to safeguard against data integrity issues.

Before shipping or carrying cartridges through the airport security check, test the process with a sample tape. Be sure to test the sample after you arrive at the destination point.

Critical data cartridges should be stored in a carry on-container. During the security inspection, the container should be given to the attendant for hand inspection.

Avoid mailing magnetic tape cartridges through services like the United States Postal Service that inspect packages with X-ray machines. Special arrangements may be possible to inspect the packages by hand.

If an X-ray inspection is completely unavoidable, try to minimize X-ray exposure by reducing multiple passes through the machine.

Always make a backup copy of your critical data tapes before shipping or transporting the original tape. Redundancy is inexpensive and easy with modern tape technology.

In summary, properly transporting and storing magnetic data cartridges offsite is an important step in the backup and disaster recovery process. It's also crucial for compliance with government storage regulations. The steps outlined in this article are designed to safeguard data integrity by minimizing the chances of damaged tape cartridges during transportation and long periods of storage. For more tips on improving your data storage strategies, visit <http://www.mediabysony.com>.

*Masaki Hattori is the marketing director for data media in the Media & Application Solutions division of Sony Electronics.*