

# **The Cost Savings of Certified for Reuse® Linear Tape-Open (LTO) Tape Media**

**White Paper**

**Dual-Life® Tape Company**

## **Cost Savings of Certified for Reuse LTO Tape Media**

The cost of all tape media, including the popular Linear Tape-Open (LTO) tape media, is one of those significant budget line items that is causing IT directors to comment, "How can such small pieces of tape be costing my department so much?" The truth is these little pieces of media cost up to \$50 or more each new and even a medium size organization can require hundreds of new pieces of media each year. The cause for this increase in media use is two fold. First of all the total amount of electronic information is growing sharply. In late 2000, the University of California Berkeley completed a seminal study on the growth of digital information. The Berkeley study found that 93% of all newly created information was digital and that the amount of digital information is doubling every year.

At the same time, there is increasing legal and regulatory pressure to store electronic information longer. Following the Enron and Arthur Anderson scandals, congress passed the Sarbanes-Oxley Act that requires financial audit information be stored for five years with severe penalties for non-compliance. The combined impact on tape media for electronic information storage is resulting in increasing media costs and unmanageable budgets.

### **Background**

Why tape media is still the number one choice for electronic information storage? The reasons are that tape media is widely available, easy to use, can be easily transported and provides the lowest cost per GB (gigabyte) of any storage media. But even with its low cost per GB, tape media is still a major budget cost. Your tape budget is directly impacted by total storage growth. Industry experts agree that total storage growth is in the range of 40-50% annual. It is no wonder that a means of reducing tape media costs is so desirable.

Linear Tape-Open (or LTO) is a popular new magnetic tape data storage technology originally developed in the late 1990s as an open standards alternative to the proprietary magnetic tape formats that were available at the time. Seagate, Hewlett-Packard, and IBM initiated the LTO Consortium, which directs development and manages licensing and certification of media and mechanism manufacturers. LTO-5 is the most recent version and can hold 1.6 TB of uncompressed data in the same size cartridge. LTO offers the highest capacity and is available from the widest number of vendors.

Re-cycled LTO tape media is available and offers substantially reduced cost (20% to 50%) as compared to new LTO tape media. But there exists some debate whether or not re-cycled LTO tape media is a viable alternative to new LTO tape media due to some unique magnetic properties of LTO tape media and other potential problems we will discuss further in this paper. Some new tape manufacturers claim that all re-cycled tape media is not as reliable and poses too many risks to be considered as a viable alternative to new. This argument seems to be contrary to the normal practice of getting the most from all of our resources - for example toner cartridges - where re-cycling and reuse is common. This white paper will explore the myths and challenges that exist regarding re-cycling LTO tape media and introduce Certified for Reuse® LTO Tape media.

## **Re-cycled or Redeploying LTO Tape Media**

So why consider purchasing re-cycled LTO tape or redeploying your used LTO tapes? Obviously the main reason is cost. In today's cost conscience business environment, using less expensive media can add up to real savings for an organization. Even for a typical IT department, the number of pieces of tape media can be thousands and represent a major portion of the IT expense budget. Take for example a LTO tape that sells for \$50 per tape new. Re-cycled tape media that sells for 20% to 50% less, offers a savings of \$10,000 to \$25,000 per 1,000 tapes purchased. Obviously there is a major cost incentive to consider re-cycled tape media.

Keep in mind re-cycled LTO tape media can be used in combination with new tape media. For example, most general applications for back up or archive can be quite suitable for re-cycled tape media. These applications may not require more expensive new tape media. In addition decommissioned cartridges could be erased and redeployed within the same enterprise or to another data center within an organization. These are just some examples of using re-cycled tape media and there are certainly others. But before you consider purchasing any re-cycled tape media; let's examine some of the common myths against the use of re-cycled tape media in general.

## **Supply of Used LTO Tape**

New LTO tape media is designed and engineered to perform reliably for years. In fact, you might argue that tape media is made too well because in practice it is very uncommon for tape media to be used for its entire life span. Rather tape media is more commonly used for only a small percentage of its useful life span and a very small fraction (1-5 tape mounts vs. 500+ mounts) of its designed durability. For example LTO tape media that is used for routine data protection is often written once and stored on the shelf for weeks and months and such individual pieces can number in the thousands for a typical size organization. Tape being used for data archive may be properly stored and then erased and processed as re-certified.

## **Common Myths**

Tape manufacturers would like you to believe that the use of any re-cycled tape media, including LTO tape media, creates an unacceptable risk to your organization. Obviously there is a major financial incentive to their position. If they can reduce (or eliminate) the sale of re-cycled tape media, then sales of new tape media would increase along with their company profits. But let's set aside the financial motivation behind these myths and examine the merits of each argument against the use of re-cycled tape media. The most common arguments against the use of re-cycled tape media are that it can expose your environment to tape errors due to contamination, it has a limited lifespan and it has no warranty. Without question re-cycled media carries a risk of errors as does new tape media, but provided the re-cycled tape media is handled by a reputable tape media certification facility and all proper processes are followed, the assumption that all re-cycled tape media carries a higher contamination and error risk than new tape is not justifiable. Table one describes some common arguments against the use of re-cycled tape media and a response that sets the record straight.

**Table One – Myths against the use of Re-cycled Tape Media**

**Myth #1** – “Re-cycled tape media is unreliable.”

*Due to the design and testing that goes into the manufacturing process, tape media is able to perform reliably for many, many years. The majority of used tape media has been used for only a small percentage of its useful life span and is perfectly suitable for certification for reuse.*

**Myth #2** – “Re-cycled tape media can expose valuable organization data.”

*Tape media always needs to be protected to prevent the loss of valuable organization data. Only Certified for Reuse® tape is completely erased either onsite or in a secure facility to guaranty 100% data destruction. The Dual-Life® process fully erases tapes so no data is ever recoverable.*

**Myth #3** – “The only way to dispose of tape media is to grind it up.”

*The practice of grinding of tape not only costs but it adds chemical spoilage to land fills. The better practice that is endorsed by the U.S. Dept. of Navy<sup>1</sup> is to completely erase tape using proper means and then use the tape again. Secure data destruction, not wasteful media destruction.*

**Myth #4** – “Re-cycled tape media is sometimes packaged as new.”

*Properly Certified for Reuse® tape media is erased, cleaned and tested to perform like new tape media. This includes re-packaging the tape media with the original manufacturer description so that the media type is clearly identified. A carton label is attached clearly marking the product as being Certified for Reuse® and each tape is also clearly identified as Certified for Reuse®.*

**Myth #5** – “Re-cycled tape media will not save money.”

*The costs savings of Certified for Reuse tape media are substantial (20% to 50%) and realized immediately with the initial purchase. In the long-term you can lower the total cost of managing tape media when upgrading to new tape media types, re-cycling old media types and avoiding destruction costs.*

**Myth #6** – “Re-cycled tape media has an undetermined useful life.”

*Certified for Reuse® tape media and new tape media are the same in this regard. No manufacturer of new or re-cycled tape can guarantee the useful life of any tape.*

**Myth #7** – “No single test can be performed to identify possible tape integrity issues.”

*True. The Certified for Reuse® tape process submits each piece of tape media to multiple tests, far more stringent than even new tape undergoes after manufacture, including inspection, cleaning, magnetic reconditioning, erasure and testing before the media is re-packaged. Tape that fails to pass these tests is never identified as Certified for Reuse®.*

**Myth #8** – “Re-cycled tape media is not covered by warranty.”

*Any Certified for Reuse® tape that is found to contain defects and will not perform to manufacturer specifications will be replaced by the dealer. This is a far simpler and more comprehensive warranty than most new tape manufacture’s warranties.*

**Myth #9** – “The potential for contamination to be introduced into your data center...”

*Properly Certified for Reuse® tape media is full-length surface cleaned, tested and packaged tape media and can introduce less contamination into your data center than newly manufactured tape.*

**Myth #10** – “Re-cycled tape media may result in compliance violations.”

*Compliance violations that can impact tape media are a matter of IT Staff and Legal concern and involve new, re-used and re-cycled tape media alike.*

<sup>1</sup> <http://enviro.nfesc.navy.mil/ps/eqifs/section7/MagMedia5.pdf>

## **Challenges of LTO Tape Eradication**

Tape erasure is a common practice with many tape formats, but LTO presents some unique challenges. LTO uses magnetic servo bands to function and it is difficult to erase just the data without rendering the tape unusable. LTO media is laid out with 4 data bands positioned between 5 narrow servo bands. The data bands are numbered 3,1,0,2 across the tape and are filled individually, in numeric order. The head unit straddles the 2 servo bands that border the data band that is being written or read. The servo bands are used to keep the head precisely aligned within the data band. The servo bands themselves are magnetic and if they are erased the LTO media is no longer functional. Due to these magnetic servo bands, data cannot be magnetically erased using bulk magnetic erase methods without also erasing the servo bands.

To erase LTO media and keep the servo tracks intact, the only method available has been to re-write over the existing data using a standard tape drive. This is the preferred method when LTO media is in active use. When LTO media reaches end-of-life, the challenge is how to fully erase the tape to completely remove all existing information? It can take hours to perform a full overwrite pass on LTO media and for total security the official Department of Defense specifications call for three complete overwrites to cover all residual signals. This would take over six hours per tape making it an impractical solution. And when faced with the task of erasing hundreds or thousands of LTO tapes, the total time required could be weeks or months.

Commercial vendors who claim that they can securely “sanitize” or “eradicate” LTO media face the same challenge. If they actually performed a complete, full tape write pass on each LTO tape, the total time necessary would make the project unmanageable, and unprofitable. Even if they do guaranty a full overwrite, there are write skips and inter-record gaps with any standard tape drive leaving some residual data intact. Additionally, a standard tape drive writes at the same signal strength as the previous data covering but not eliminating it. The bottom line, some data remains. If you believe your LTO tapes are being fully erased and your data is completely removed, you are probably mistaken. The best that most commercial vendors can do is over write a very short file at the beginning of the LTO tape with a new end of file (EOF) mark. The remaining 99.9% of the data remains on the tape blocked from view of standard tape drives, but accessible through available forensic procedures.

## **Dual-Life Certified for Reuse® LTO Tape Media**

Re-cycled LTO tape media that is sold by commercial vendors is not a secure or reliable product due to the magnetic properties of LTO tape media and the difficulty erasing LTO tape media as described above. Dual-Life Tape Company took a very close look at the problem of LTO media eradication and came up with a solution. Using proprietary new equipment, Dual-Life can now safely, quickly and completely erase the entire length of all four data bands on all LTO media, from before the start of data to past the end of data, and Dual-Life is the only re-cycled LTO tape vendor in the industry able to honestly make this claim.

Overwriting data using a tape drive cannot ensure that all files at the beginning and the end of tape are 100% destroyed as a tape drive cannot write beyond the normal data area, header files and buffer zones. Some data will remain.

The LTO tape media that Dual-Life produces is branded "Certified for Reuse" and it is stamped with the "Certified for Reuse" symbol for authenticity. When shopping for LTO tape media always look for the "Certified for Reuse" logo as a guarantee that the tape was processed according to the highest quality standards that only Dual-Life Tape Company delivers. The following pages will describe steps Dual-Life takes to produce the highest quality LTO tape media in the industry.

## **Dual-Life has the LTO Erasing Solution**

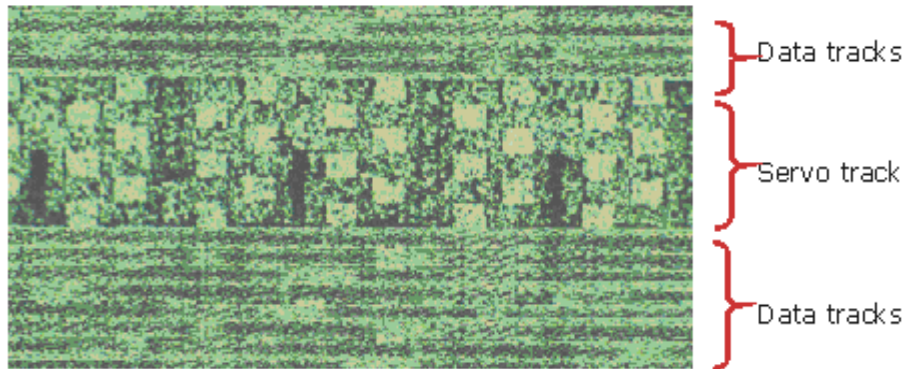
The solution that Dual-Life pioneered is a breakthrough for the tape industry. It involves a new device designed specifically to erase LTO Media. (See figure 1.) The device itself is similar to a LTO drive but the internal mechanicals and electronics have been greatly modified. Key to the design is a high power, precision magnetic erase head that replaces the standard write head. This new erase head aligns perfectly to the LTO data bands retaining the existing servo bands. The device mounts the tape and streams the tape over the erase head at full streaming speed. All four data bands are 100% full-length erased virtually from "pin-to-hub" in two passes in less than three and a half minutes. (See figure 2.)

- The high power magnetic erase head applies a high energy magnetic field with full saturation at ten times the power of the standard write head. It totally penetrates through both the magnetic media coating and substrate eliminating previous signals by magnetically reorienting the entire length of the tape media. This erases and magnetically reconditions the entire tape.
- A full length, continuous "always on" erase cycle is performed for each tape. This ensures total data elimination of the entire tape, every time with no write skips, gaps, interruptions or mistakes. (See figure 3.)
- Data destruction is 100% complete, including all address and header files. The resulting LTO tape cannot be read, on any equipment, ever period. Tapes won't even load on a LTO tape drive after the erase process. Only after the full certification process is completed will the cartridge load properly.
- Every single tape is fully erased with recorded proof. Using proprietary software, each tape is tracked by date and serial number. A written confirmation and permanent record of erasure is completed and kept for every tape.

Figure 1. Dual-Life LTO Erase Device

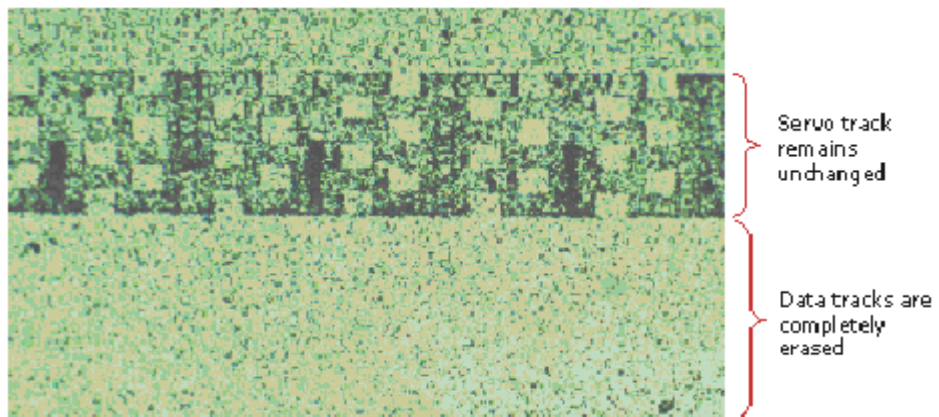


Figure 2. Data and Servo Tracks



There are several servo tracks on a tape, with the data tracks between the servo tracks. A correctly designed erase head erases all the data tracks but none of the servo tracks.

Figure 3. Erasing the Data Tracks, but not the Servo Tracks



After erasure all data tracks have been removed but the servo tracks remain.

## **Dual-Life Reconditions LTO**

Dual-Life is the only supplier of Certified for Reuse LTO tape media that offers 100% erasure of LTO tape media. This ensures that every tape you receive contains no foreign information and your security is ensured. To further guarantee the quality of its Certified for Reuse LTO tape media, Dual-Life performs a proprietary seven-step tape cleaning, reconditioning and certification process.

### **Seven-Step Process**

1. Full Surface Tape Cleaning

During each of two full-length passes for erasure, the tape is cleaned using sapphire blades. This cleaning process removes dust, dirt and tape debris from the tape surface. A clean tape reduces errors and extends the tape and drive life. Dual-Life is the only vendor who offers full-length tape surface cleaning for LTO.

2. Tape Edge Scanning and Evaluation

During the erasure process, the entire tape reference edge is scanned using optical / laser scanning. The scanning detects tape damage that can cause errors. Tapes where edge damage is detected are removed and not certified. Only tapes that pass the tape edge scan are accepted as Certified for Reuse media. Dual-Life is the only vendor who offers full-length tape reference edge evaluation for LTO.

3. Precision Rewind and Retention

A full-length, non-stop, precision, tension controlled tape rewind is performed on each tape. Smooth and properly tensioned tape improves performance, reduces edge damage and promotes longer tape life. Dual-Life is the only vendor that performs a full precision tape rewind of every LTO tape media it certifies.

4. Performance Evaluation

A total tape cartridge performance evaluation is performed on each LTO tape. Any errors or operational issues are recorded and all bad and marginal tapes are identified for elimination. Dual-Life is the only vendor to evaluate all key tape performance criteria.

5. Internal Memory Date and Service Stamp

At the completion of the cleaning, erase, reconditioning and certification process, the RFID chip inside every tape is stamped for date, confirmed erasure, service performed, tape condition and all other service level parameters. This extra step ensures that a permanent date record of service remains with the tape. Dual-Life is the only vendor to record complete LTO service history permanently into each tape.

## 6. Tape Reset to "Blank Tape" Status

Every tape is reset with a single, new FID file. The FID file is located at the head of the tape and it provides blank tape status (zero file marks) to the tape drive for the next use. Dual-Life® Certified for Reuse LTO tape media is always ready to write, totally blank tape with full write capacity to performs like new.

## 7. Process and Security Verification

As a final quality assurance step, a confirmation of total erasure is performed to verify that the tape security is reset. This is your 100% assurance that the Certified for Reuse tape you buy contains no residual data and is fully reconditioned to look and perform like new.

This seven-step process is the most stringent in the industry and is the reason that Dual-Life stands behind all of its Certified for Reuse LTO media with a 100% satisfaction guarantee, exclusive one year performance guarantee, and a lifetime materials and workmanship warranty. No other data tape supplier, including all the new tape manufacturers, can match this level of assurance.

## How to Shop for LTO Media with Confidence

When shopping for used LTO tape media, you are advised to use the same precautions that apply to any purchase. First, insist that the tape dealer provide specifications and warranty on the products it offers. You should also ask for references and talk to other users who have experience with the dealer. And lastly, verify the tapes are identified as being "Certified for Reuse". There should be complete documentation available and each tape marked clearly with the Certified for Reuse® stamp showing that it has been through this strict process assuring you it is completely erased and has passed all tests for quality, appearance and performance.

### Questions when shopping for Re-Cycled Tape Media

1. Was tape sorted by date of manufacture, factory, and condition?
2. How tape was fully erased? (Equipment, process, verification.)
3. What are all the steps taken with each piece of media re-cycled? (Request list of steps.)
4. Specific processes for Evaluating? Testing? Cleaning? Stamping?
5. Are certification test results available for each piece of tape media?
6. How are tapes marked and stamped after testing is complete?
7. How are the re-cycled tapes packaged for delivery? (See it.)
8. Is sample tape media available for evaluation and testing? (Test it.)
9. What's the warranty and return policy for defective media? (Read it.)
10. Are references available? (Request list.)

## **Conclusion**

Certified for Reuse® LTO tape media by Dual-Life Tape Company offers a significant cost savings (20% to 50%) as compared to new LTO tape media of the same type. New tape manufacturers would have everyone believe that re-cycled LTO tape media is not reliable and poses too much risk to an organization to be considered useful. Only Dual-Life is able to offer Certified for Reuse LTO Tape Media that performs like new without the common risks of re-cycled tape media.

LTO tape media presents challenges for re-cycling due to its magnetic servo track design. Dual-Life is the only company that offers LTO Certified for Reuse tape media that is 100% erased and certified. Dual-Life uses its own proprietary erasure devices to safely and quickly erase every LTO tape from "pin-to-hub". The Dual-Life Seven-Step Reconditioning process ensures that every tape passes the most stringent quality tests and performs like new.

Hundreds of IT departments coast-to-coast, from small to Fortune 50 companies, are benefiting from this smart alternative. When shopping for new or used LTO tape media make certain you look for the stamped logo that shows the tape is "Certified for Reuse". Only Dual-Life Certified for Reuse tape media is 100% guaranteed to look and perform like new, or your money back.

The logo consists of the letters 'DL' in a large, bold, black sans-serif font. A thick horizontal line is positioned directly beneath the letters.

**Dual-Life®**

**For more information contact your Dual-Life rep:**