



New Cleaning Technology from Exabyte

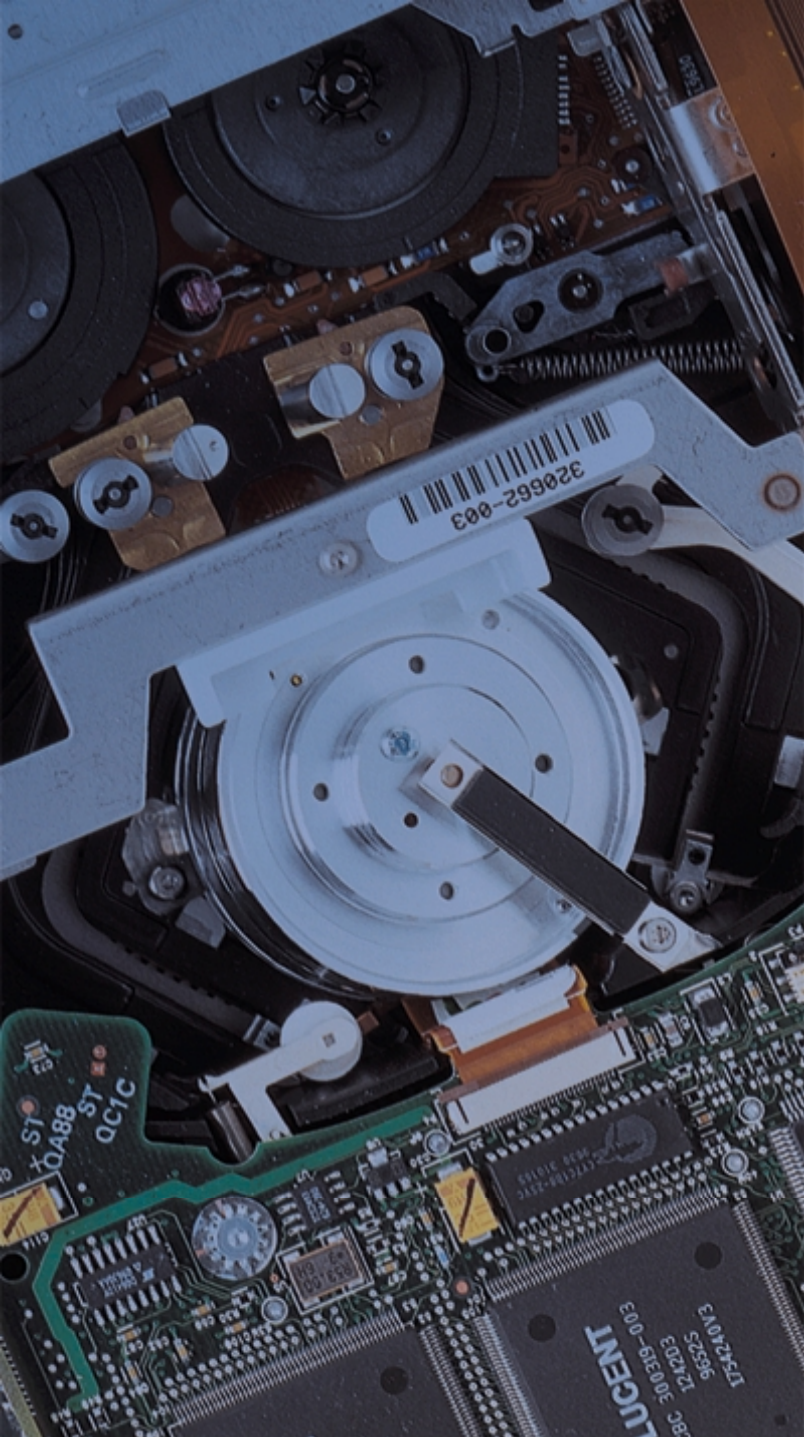
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 **Exabyte**



New Cleaning Technology from Exabyte

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Tape Paths Must Be Cleaned

- Sources of Contamination
 - ◆ Head staining
 - Binders
 - Lubricants
 - ◆ Oxides
 - ◆ Air born dust
- Effects of Contamination
 - ◆ Head clogging
 - ◆ Head to tape separation
 - ◆ Media damage
 - ◆ Data loss



Traditional Cleaning Methods

- Do nothing until the drive fails
 - ◆ Pioneered by home VHS users
 - ◆ The largest singled root cause of failure for tape drives is lack of cleaning
- Cleaning Cartridges
 - ◆ Cloth based tape with cleaning fluid
 - ◆ Abrasive MP tape
 - ◆ Abrasive AME tape



Traditional Cleaning Methods

- Cleaning wheels
 - ◆ Pioneered by the video industry
 - ◆ Only good for removing loose debris, not effective for stains
 - ◆ Cleaning can be automatically invoked by the drive
 - ◆ Foam type
 - Good cleaning
 - Poor debris retention
 - ◆ Stacked Cloth
 - Excellent cleaning
 - Excellent debris retention



Traditional Cleaning Methods

- Cleaning blades
 - ◆ First used by half inch reel-to-reel tapes
 - ◆ Good for removing loose debris from media
 - ◆ Can also remove lubricant and cause media damage
- Burnishing heads
 - ◆ Used on high end helical scan data drives
 - ◆ Rotating heads that remove media debris and smoothes the media surface before the media contacts the read/write heads



Impacts of Not Cleaning

- Error rates increase
 - ◆ Backup may fail due to time window constraints
 - ◆ Backup may fail due to lack of tape capacity caused by rewrites
- False field failures
 - ◆ Drives are returned to the factory maintenance



Impacts of Cleaning

- Manual intervention required
 - ◆ Some one must insert the cleaning tape
 - ◆ For unattended, overnight backup, the backup operation may abort and not complete
- Cleaning can be automated in tape libraries
 - ◆ Intelligent software needed
- Premature head failures due to over-cleaning with abrasive media



A New Approach to Cleaning is Needed

- No operator intervention required
 - ◆ Cleaning indicators are ignored
 - ◆ Drive knows when it needs to be cleaned and should be able to completely clean itself
- Effective stain removal is needed
 - ◆ New media is smoother and allows stain to accumulate
- Head wear must be minimized
 - ◆ Aggressive cleaning tapes cause premature head failure



A Total Cleaning Solution from Exabyte

- Stacked cloth cleaning wheel
 - ◆ Automatically invoked by the drive
 - ◆ Removes loose debris
 - ◆ Prevents head clogs

- Burnishing heads
 - ◆ Keeps media clean
 - ◆ Prevents head clogs



A Total Cleaning Solution from Exabyte

- Cobalt Series Media with SmartClean Technology
 - ◆ Low abrasivity cleaning media included at the beginning of each tape cartridge
 - ◆ Removes staining caused by binders and lubricants
 - ◆ Use of cleaning media is under the control of the drive
 - No operator intervention required
 - Prevents head wear due to over cleaning





Cobalt Series Media

- Leader tape
- Cleaning Media - 2.25 m
- Tape recognition window
- AME Media - 225 m
- Trailer tape



Load and Cleaning Process

- The tape loads on AME media section
- The tape then moves in reverse across the recognition window
- The cartridge type is recognized
- The tape is then positioned at LBOT
- A cleaning operation can be performed at any time by rewinding into the cleaning tape area
- Cleaning is triggered by drive read/write data



AME Media

AME media is thin-film media

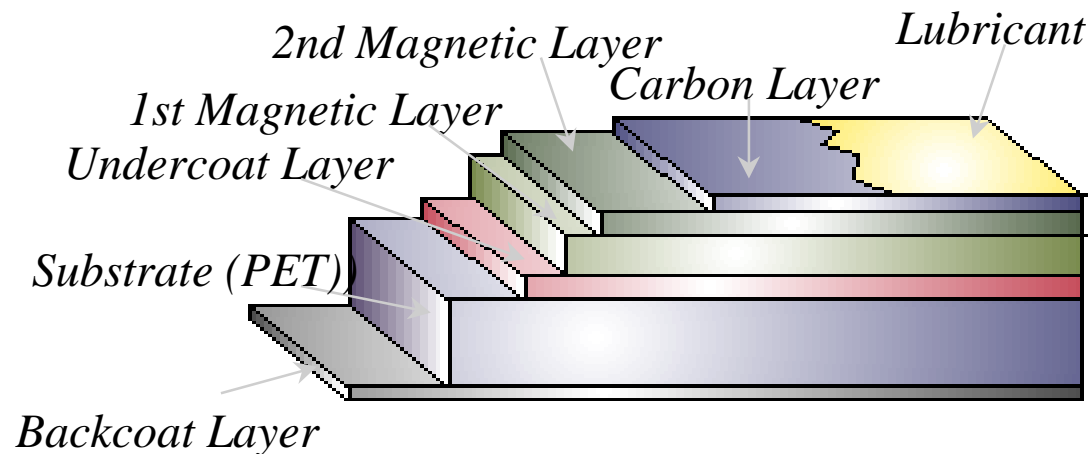
Feature

- Diamond-like Carbon Coating
- Thinner magnetic layer
- High Areal density

Lifetime warranty

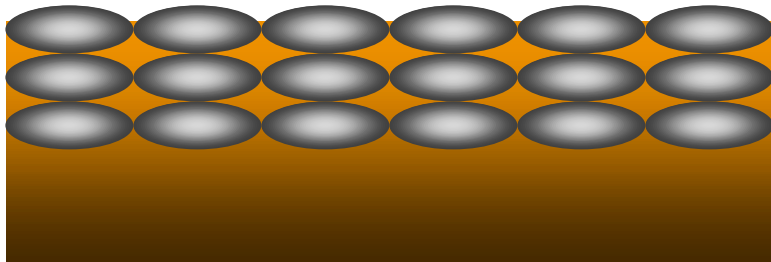
Benefit

- Longer head life due to low abrasion
- Longer Media/Higher Capacity
- High capacity, Fast transfer rate
- Guaranteed long-term data security



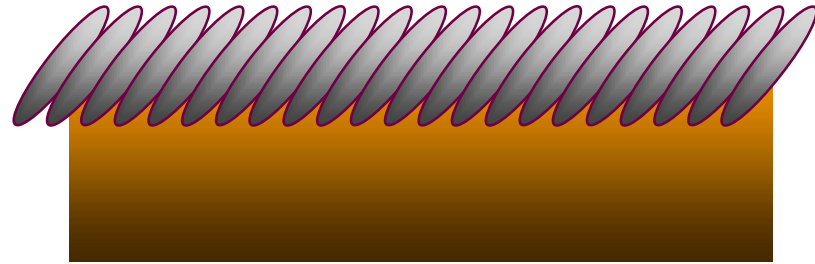


Comparisons: MP & AME



MP

Traditional MP coating processes result in a lower density distribution of particles. The disk industry stopped using this coating technology over a decade ago.



AME

With AME, the domains are more vertically aligned for higher density and superior signal output. State of the art for the disk industry