

**Fujifilm NANO CUBIC Coating Technology -Potential For 1TB Data
Storage Tapes
and 3GB Flexible Magnetic Disks**

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NANO³ (NANO CUBIC) Technology

Fujifilm NANO CUBIC Coating Technology - Potential For 1TB Data Storage Tapes and 3GB Flexible Magnetic Disks

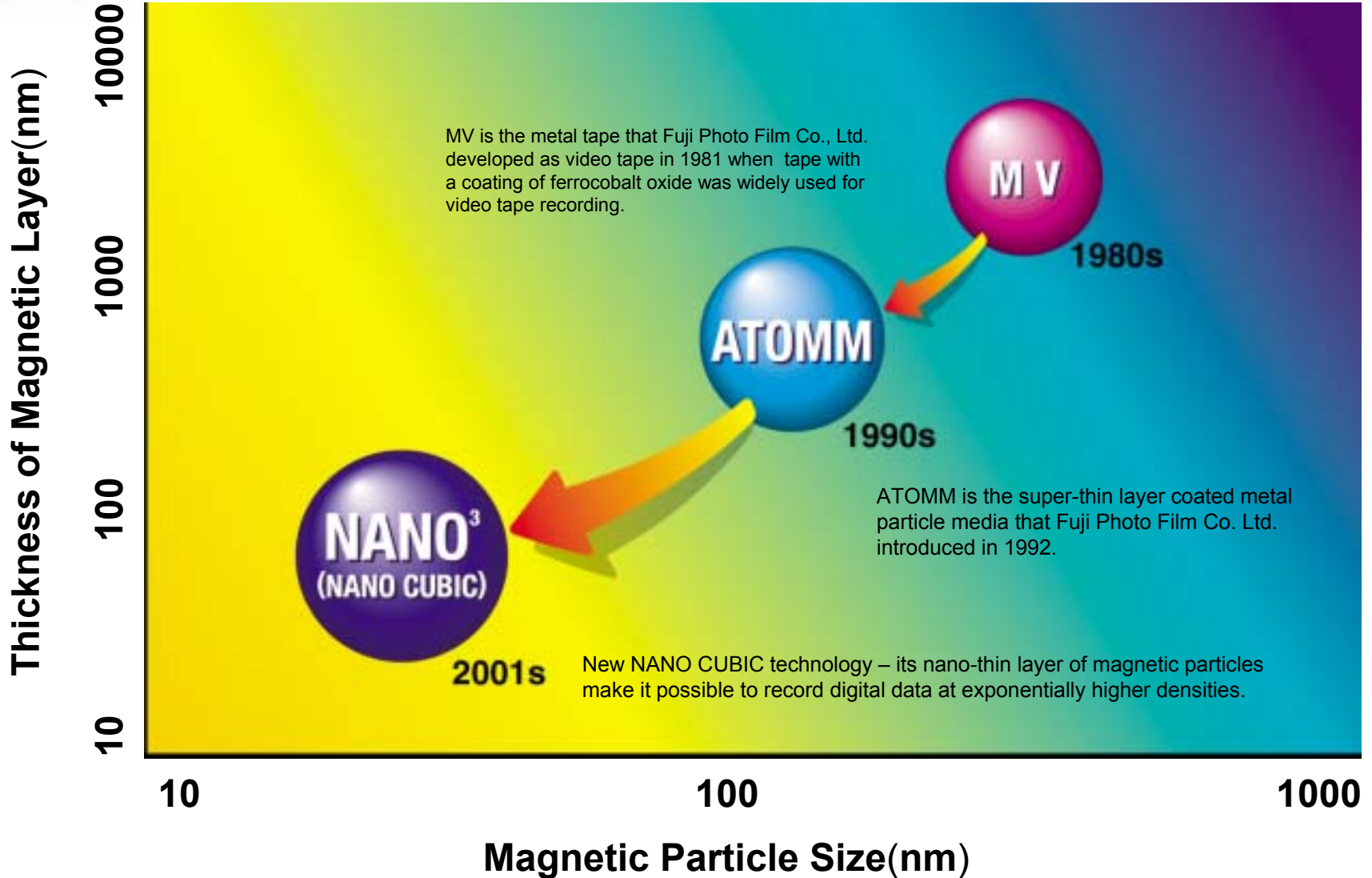
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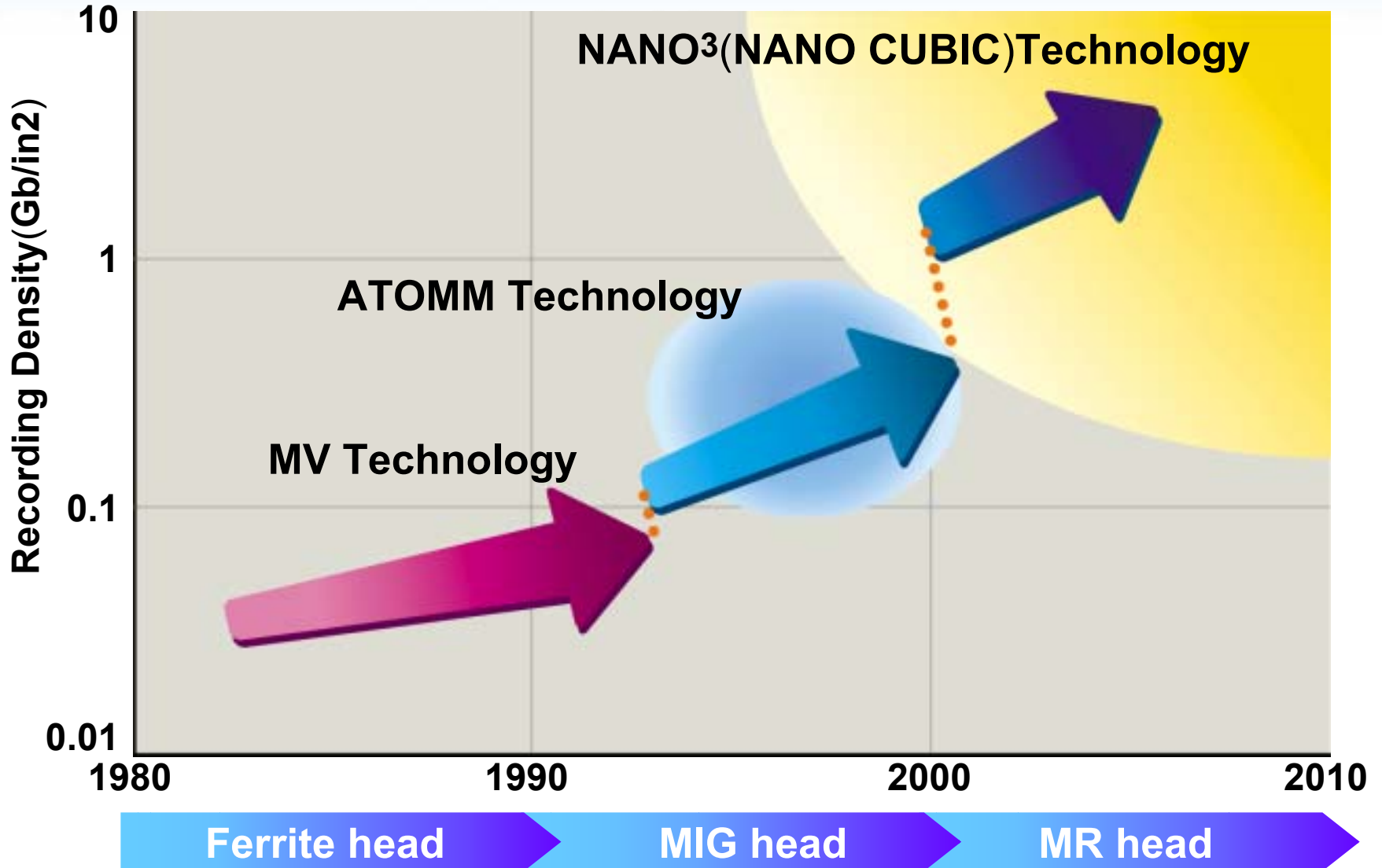
Technology change to NANO³ (NANO CUBIC) technology



Fujifilm NANO³ (NANO CUBIC) Technology

- ❑ NANO CUBIC technology is an ultra-thin layer coating that results in higher resolution for recording digital data, ultra-low noise and high signal-to-noise ratios that are ideal for magneto-resistive (MR) heads.
- ❑ NANO CUBIC Coating Technology has one-tenth the thickness of current magnetic layers with more than 10 times greater recording densities - potential for 1TB data storage and digital video tapes, plus 3GB magnetic flexible disks.
- ❑ Fujifilm will continue to develop ATOMM technology products for use in inductive-head *and* MR-head systems. NANO CUBIC technology products will be developed for MR, GMR and TMR head systems.
- ❑ NANO CUBIC coating technology can be applied cost-effectively to mass production manufacturing processes, requiring only small modifications to current ATOMM Technology coating equipment.

Evolution of Recording Density with Magnetic Layer Coated Recording Medium



Three Technologies of NANO³ (NANO CUBIC) Technology

❑ NANO Coating Technology:

- NANO CUBIC technology employs an advanced precision coating process that can control the thickness of the magnetic layer on a nanometer scale.

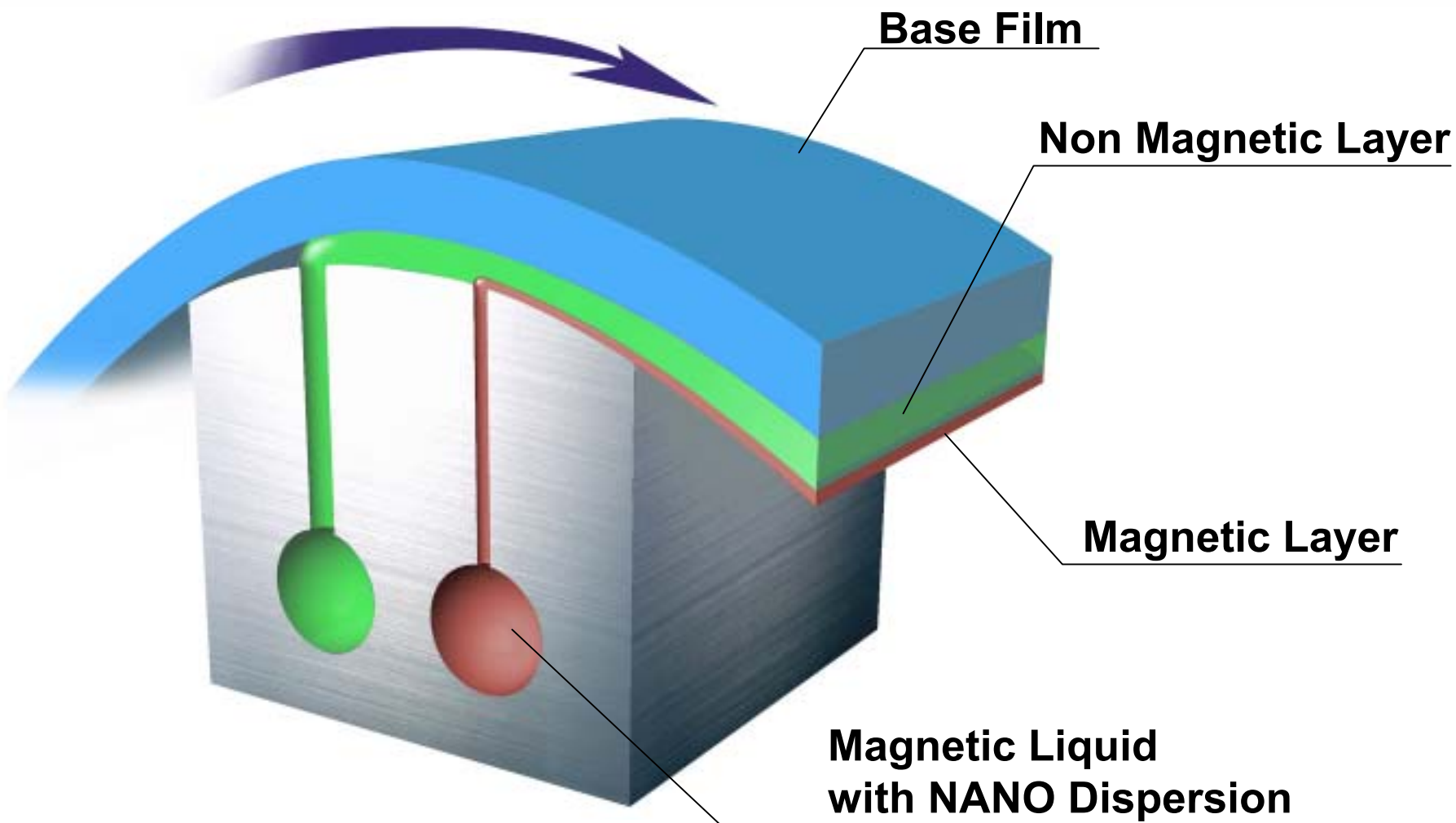
❑ NANO Particle Technology:

- Two types of magnetic particles were developed for NANO CUBIC technology, both tens of nanometers in size:
 - **acicular ferromagnetic alloy particle**
 - **tabular ferromagnetic hexagonal barium ferrite particle**

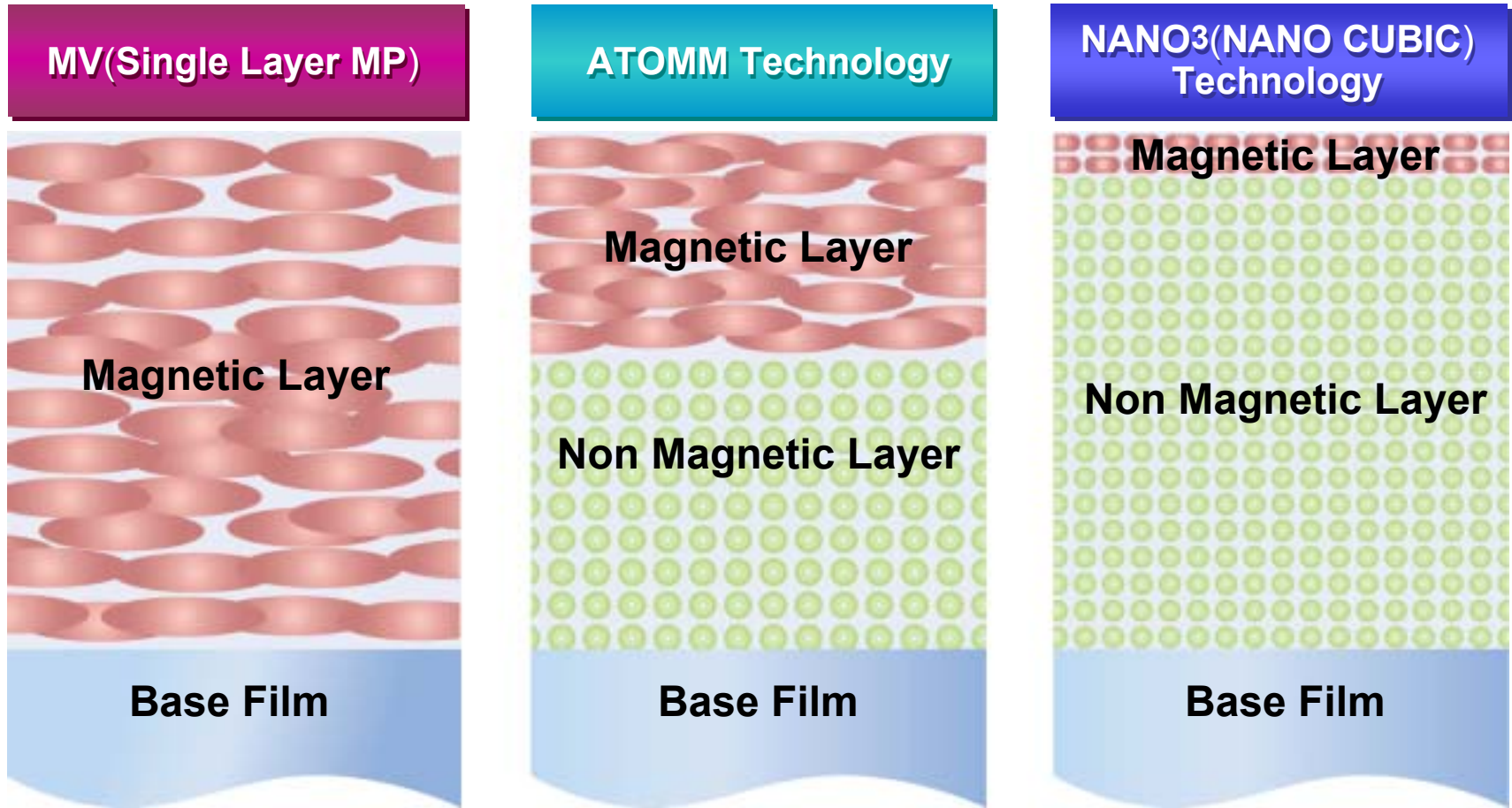
❑ NANO Dispersion Technology:

- NANO CUBIC technology uses a special organic binder material that has the ability to thoroughly disperse particles in the coating solution so that a uniformly packed structure of the layer is realized.

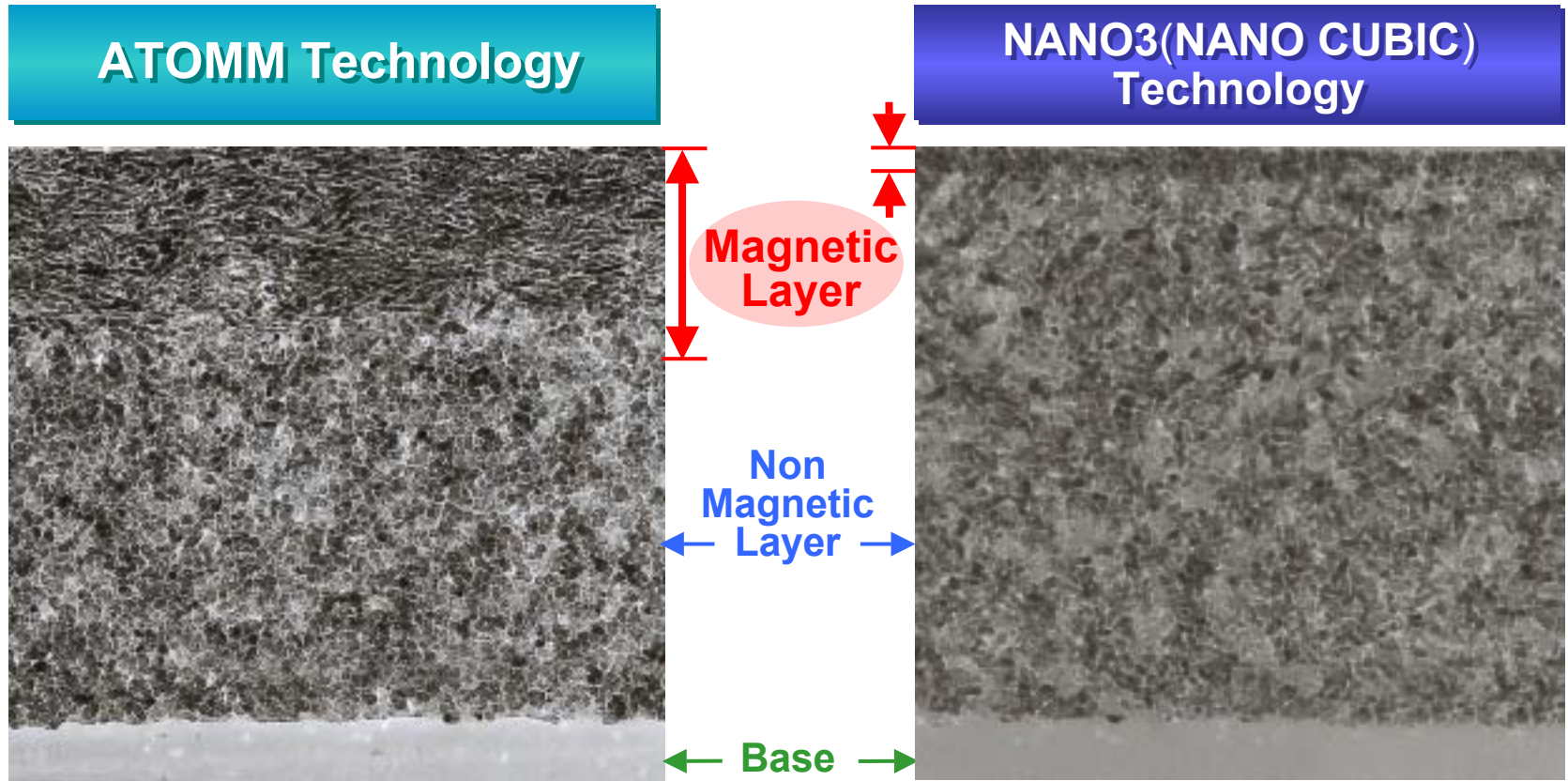
NANO Coating



Construction of NANO^3 (NANO CUBIC) Technology

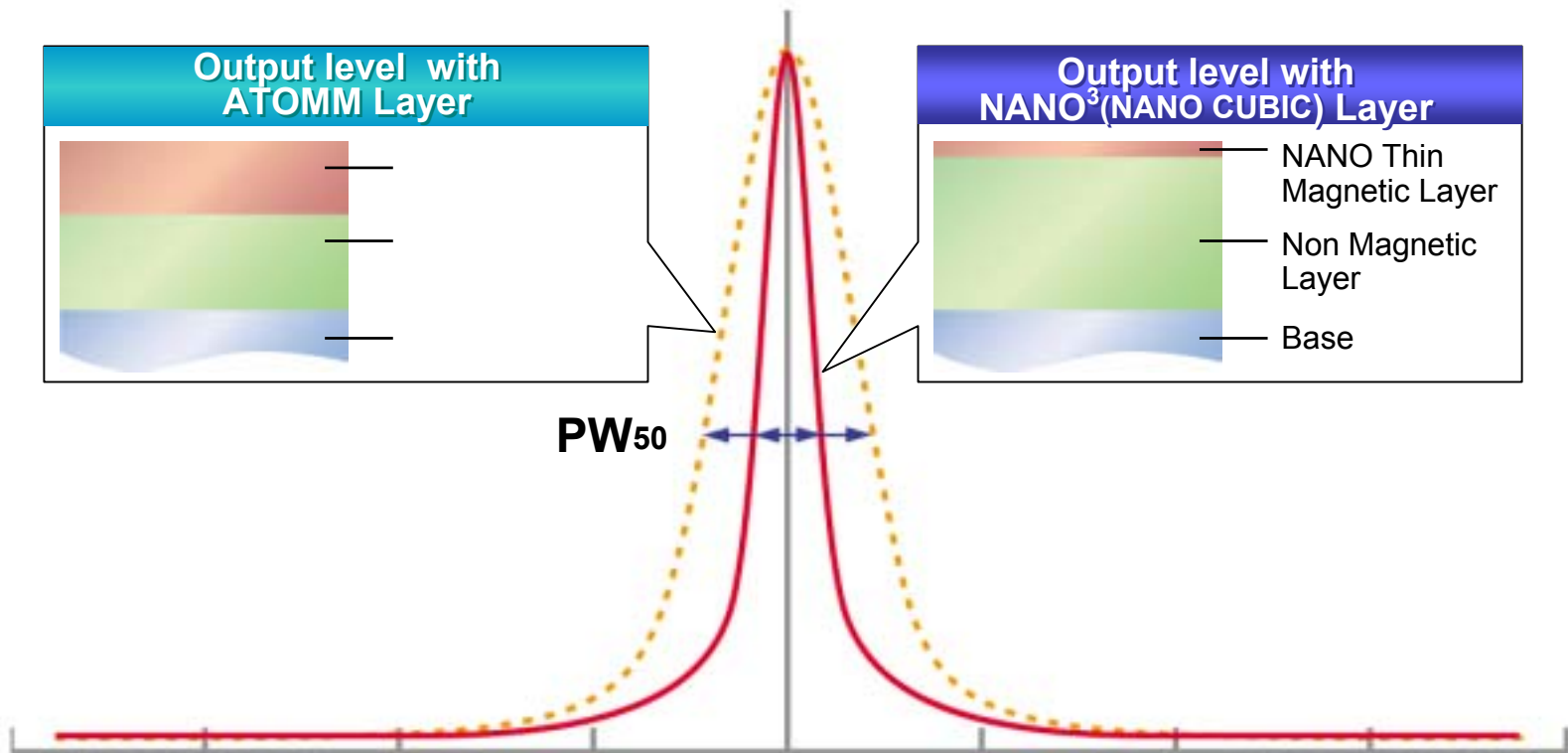


Photograph of Cross-Section of Tape



High Resolution

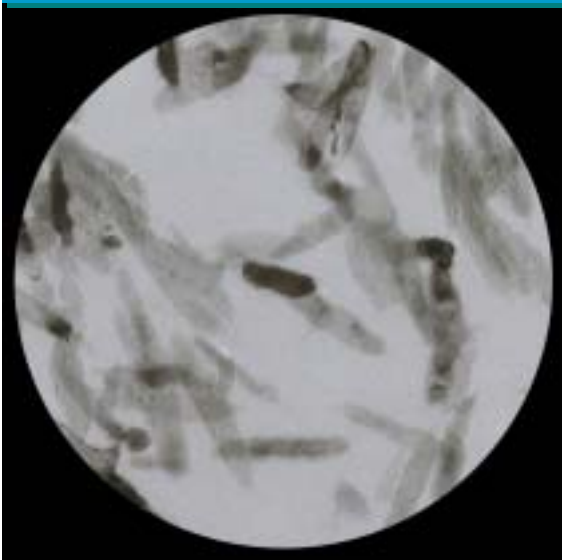
- ➔ In order to achieve high density recording, the isolated pulse shape must be very sharp, produce little jitter and have a narrow width at its 50% threshold (PW_{50}).
- ➔ PW_{50} is reduced by using a very thin magnetic layer.



Photograph of Magnetic Particle

ATOMM Technology

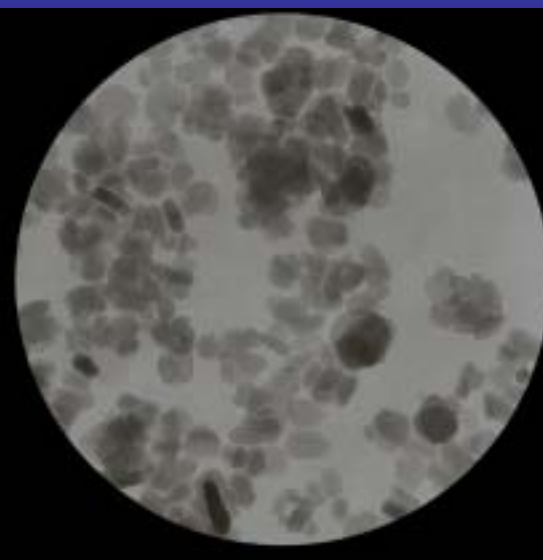
MP



NANO³(NANO CUBIC)Technology

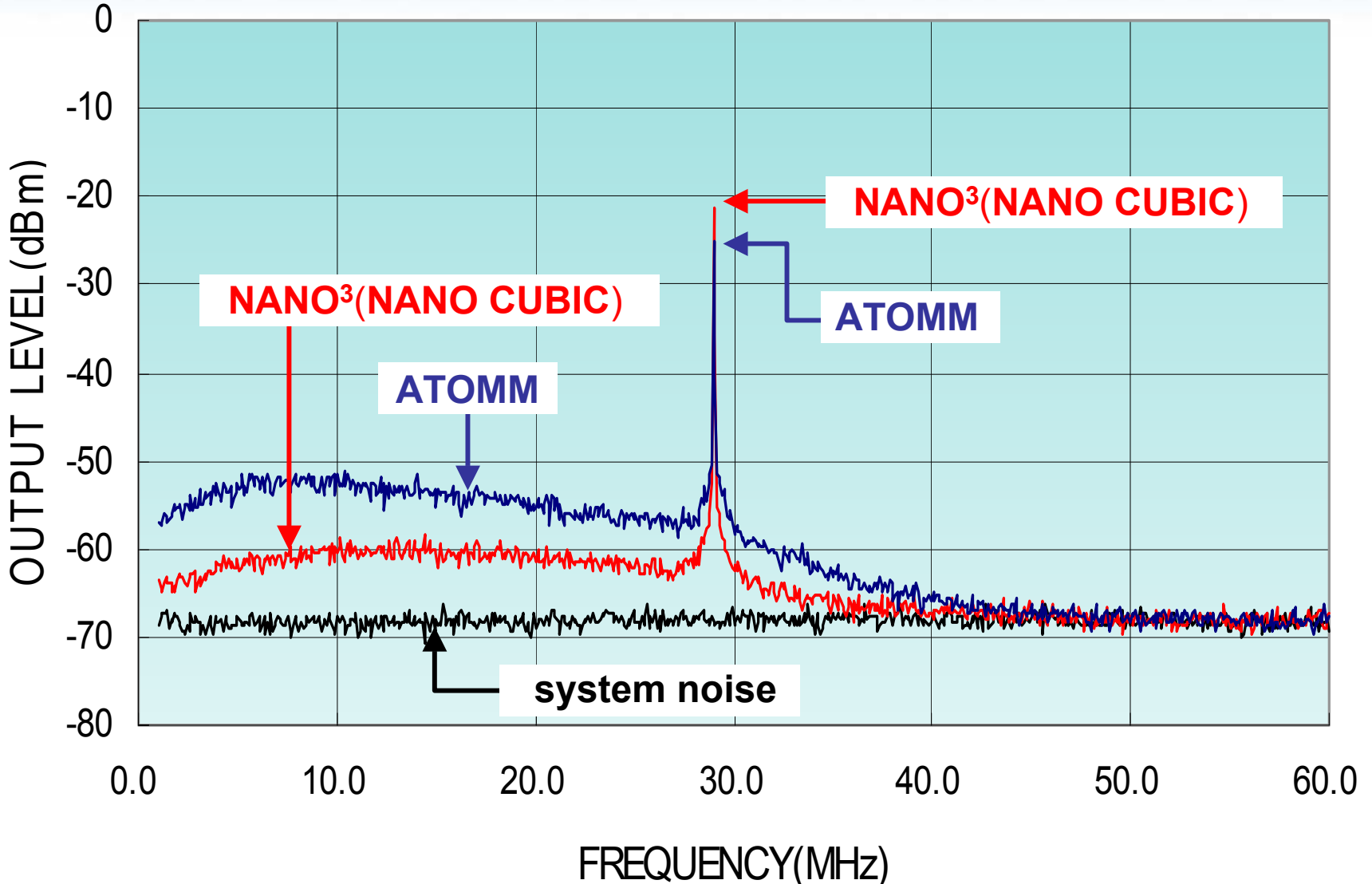
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Barium ferrite



Modulation Spectrum

Relative speed : 8.2m/s
Recording Signal : 180kfc



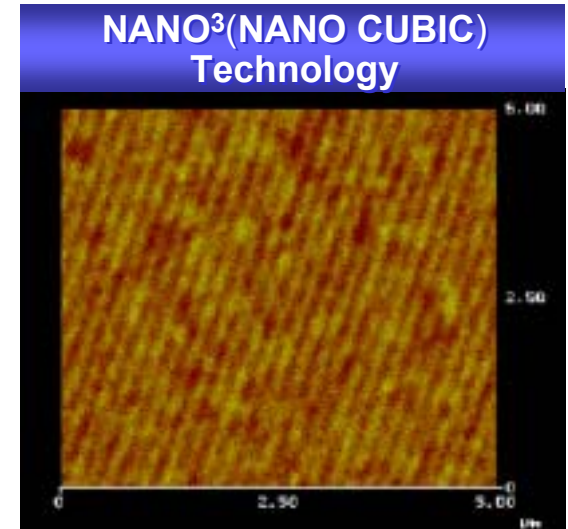
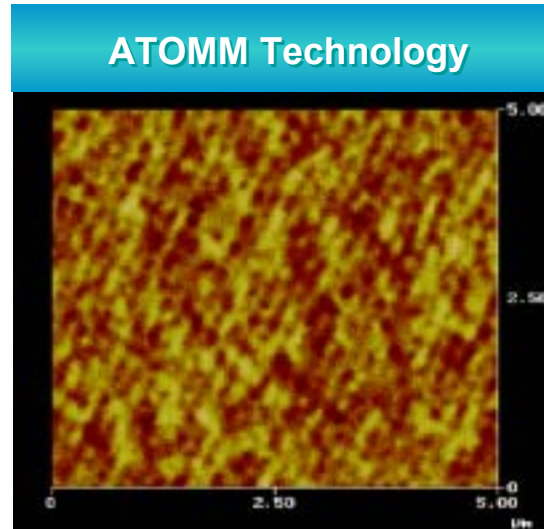
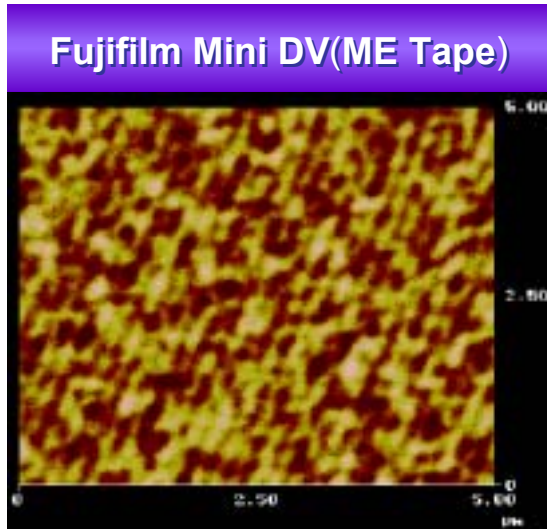
MFM Image of Recorded Signals on Magnetic Layer

NANO³(NANO CUBIC)Technology

Thin Magnetic Layer
Fine Grain Magnetic Particle

Sharp Magnetization
Transition

High Resolution



This photograph is an observation of the track of the recorded tape magnified by MFM. (Magnetic Force Microscope) MFM observes the intensity of the magnetic field which occurs from the recorded tape directly. Sharper pattern image of MFM means high resolution media.

Fujifilm NANO³ (NANO CUBIC) Technology

- ❑ Fujifilm announced NANO CUBIC Technology on November 6, 2001 and has begun to work with drive manufacturers to develop new, high capacity magnetic storage products using NANO CUBIC technology.

❑ Thank You!

❑ Questions?