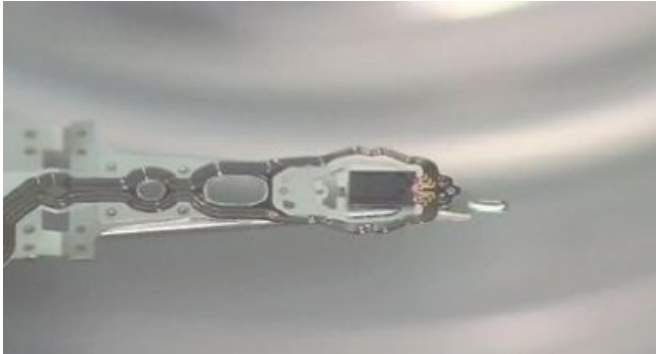


# TDK sees hard drive breakthrough in areal density

3 October 2012, by Nancy Owano



The magnetic head for thermal assist recording. Credit: via Tech-on.

(Phys.org)—TDK has realized increased areal density of its hard disk drives. TDK has set a new record, compared to previous areal density at 1Tbit/inch<sup>2</sup>, with the new stat of increased density to 1.5Tbits/inch<sup>2</sup>. The point of all this is that TDK can say it will offer 1TB of storage per platter in a 2.5-inch hard drive, and 2TB of storage per platter in a 3.5-inch drive. TDK used a technique that combines platter technology from Japanese firm Showa Denko (Showa Denko Platters) with their refined read-write heads. Showa Denko's disk platter is based on perpendicular magnetic recording with discrete track recording (DTR) superimposed on it.

Perpendicular [magnetic](#) recording was an idea that languished for many years, says a TDK technology backgrounder, because the complexity of high-density magnetic recording technology stymied commercial development. "This method demands highly sophisticated thin-film process technologies to form microscopic single poles between multiple thin layers. Beyond that, a number of complex issues arise when trying to miniaturize single poles," said TDK. "One particularly difficult problem is overcoming pole erasure, the deletion of

[magnetic data](#) due to remanent magnetization at the tip of the pole."

As magnetic head manufacturers, TDK says it is now drawing on nano-level thin-film multilayering and processing technologies that clear the technological hurdles one by one.

TDK features a Tunneling Magneto-Resistance (TMR) head, which uses thermal assist recording and a near-light field. (Researchers from Hitachi describe thermally assisted recording as an extension to perpendicular magnetic recording. In thermally-assisted recording, says Hitachi, magnetic grains can be made smaller while still resisting [thermal fluctuations](#) at room temperature.)

Consumers are to see these hard drives using thermal assisted magnetic heads in 2014. Before that, though, TDK will officially unveil its new [hard-drive technology](#) this week at [CEATEC Japan 2012](#). At CEATEC, the company will also show a thermal assist recording method based on near-field light by using an actual HDD supporting the method.

A significant side story belongs to Showa Denko, which, among other divisions, engages in hard disk media. Showa Denko also has a confident grasp of the disk drive market: "We expect that demand for hard disk drives (HDDs) will continue to grow by about 10 percent annually. "

Hard disk drives for years have been a dominant device for storage of data. Greater capacities and lower prices have kept the hard drive from falling victim to SSD technology. Showa Denko believes HDDs still have nowhere to go but up because of notebook demand, cloud computing, and current requirements for high-capacity servers at data centers, expected to increase.

To meet the demand, the company intends to "speedily commercialize the sixth-generation PMR

([perpendicular magnetic recording](#)) media, and develop the next-generation SWR (shingled-write recording) media."

**More information:**

via [Tech-on](#)

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