

TRANSLATION

Asahi Shimbun newspaper, May 21, 2005.

"Perpendicular recording" is commercialized.

Ten-fold capacity will be possible. Soon (it will be) launched.

Thirty-year-long research (realizes) hard disk drive technology from Japan.

Hard disk drive (HDD) is indispensable for information storage for PCs. A new product that employ Japanese invention will be soon launched. The technology is perpendicular recording by which high areal density is possible. Thirty years later from Dr. Shun-ichi Iwasaki, the director of board, Tohoku Institute of Technology, proposed the fundamental principle, perpendicular recording is commercialized.

"In order to respond to the demand of large capacity storage, all HDD will be changed into "perpendicular," Hosashi Takano, R&D director, Hitachi Global Storage Technologies said. They announced a HDD prototype of 230 Gbit per square inch in April, which was improved by perpendicular recording technology, while conventional product is only 80 Gbit per square inch. In future areal density of 1000 Gbit per square inch will be possible.

In HDD digital information is stored as aligned small magnets in ferromagnetic thin film on a glass or aluminum disk substrate. In perpendicular recording the magnets are rotated by 90 degrees from the horizontal direction of current (longitudinal) HDD.

Superior stability

Recording density grows twice a year to satisfy the demand of large capacity information storage. Minimum grain size of the ferromagnetic thin film reached 7 nano-meter in average. Technically the grains can be smaller, but in longitudinal recording, recorded information gradually disappear because of the thermal effect that weakens neighboring magnets each other. In perpendicular recording even small grains are stable due to the attracting (magneticstatic) interaction.

It looks like an easy idea, but the announcement by Prof. Iwasaki of Tohoku University was the first. "I would like to accomplish not an improvement, but principle innovation. Everybody considered nothing is possible except "horizontal", I concluded based on the history and philosophy of technology.

Overcome ironical criticism

High density performance of perpendicular was recognized from the early stage. Japanese researchers drove forward. However multiple improvements increased recording density of longitudinal recording. There were ironic comments such as "most important contribution of perpendicular recording is the acceleration of horizontal recording technology."

Commercialization of perpendicular recording will be initiated by Toshiba, who have already announced by the end of June, 2005. Hitachi global storage technology is planning to ship the perpendicular by the end of this year, 2005. Seagate technology, USA, "If the market requests, we can launch perpendicular products within this year".