

Main Focus



Optical data storage – How long will it last?

by Yoshinobu Mitsuhashi, Chair, ISO/IEC JTC 1/SC 23, Digitally recorded media for information interchange and storage

In just a few short years, DVDs have become the most successful consumer entertainment product in history, quickly eclipsing the earlier success of videotape and compact discs.

But their popularity is not confined to consumer electronics. Optical discs also play an important role in the professional digital universe, and now dominate both markets. The number of optical disc drives sold worldwide in 2007 is estimated to be in excess of 550 million, with a market value of USD 21 billion.

A new need arises

Standardization of optical discs was first discussed at the Topical Meeting on Optical Data Storage of 1983¹⁾, and the first ISO technical committee plenary on the subject was held in 1985, with participation from researchers, engineers and technocrats from industry and academia.

1) Sponsored primarily by the Optical Society of America (OSA) and IEEE, professional association for the advancement of technology.

ISO standards for optical discs are developed within joint technical committee ISO/IEC JTC 1, *Information technology*, subcommittee SC 23, *Digitally recorded media for information interchange and storage*. Until relatively recently, SC 23 focused exclusively on specifications for interchangeability of media, developing standards for technologies such as CD-ROM and various types of DVD.

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Users are, of course, constantly seeking media with higher capacity and higher data transfer rate. In particular, however, there is a growing demand for archival digital data and increasing concerns about the archival life of optical media. In response to market demand, ISO/IEC JTC 1/SC 23 has begun to address data archiving issues.

Reliable system

In this respect, ISO/IEC 10995, *Information technology – Digitally recorded media for information interchange and storage – Test method for the estimation of the archival lifetime of optical media*, was published in 2008. It provides a simple method for estimating the useful life of DVDs.

A further standard, ISO/IEC 29121:2009, *Information technology – Digitally recorded media for information*

interchange and storage – Data migration method for DVD-R, DVD-RW, DVD-RAM, +R, and +RW disks, was published in February of this year.

Together, these two standards provide a reliable system for DVD archiving applications.

By following ISO/IEC 10995, users can select high-quality DVDs with a short practical measuring time for an archiving system. Users are advised to measure a specified initial recording performance according to ISO/IEC 29121. Discs for data storage should be checked periodically with the test frequency described in the standard.

About the author



Yoshinobu Mitsuhashi, Chair of ISO/IEC JTC 1/SC 23, *Digitally recorded media for information interchange and storage*, graduated from Tokyo Institute of

Technology in 1964 and joined Electrotechnical Laboratory (now Advanced Industrial Science and Technology). Since then he has studied optical information processing. In 1983, Dr. Mitsuhashi became active in standardization of optical discs, and was head of the Japanese national mirror committee for ISO/IEC JTC 1/SC 23.

If the recording performance is within a specified level, the disc is classified into one of three categories :

- Suitable for continued use
- The data on the disc should be migrated to another disc as soon as possible
- The data on the disc should be copied to another disc immediately to the extent that the data can be retrieved.

Essential steps for longevity

The typical life of an optical disk is said to be 30 years, but in reality that may be anywhere from one year to a century or more. In a recent US government survey of 4 483 users, a majority considered archival longevity of more than 40 years to be important²⁾. While the industry can supply discs of high enough quality to survive for 40 years, disc drives generally cannot meet that standard. For this reason, users should change drives periodically as technology advances.

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For archival optical disc applications, it is essential not only to select a quality disc, but also to migrate data on the disc periodically. In 2008, a non-profit organization, Archive Disc Test Center³⁾, was established in Japan to estimate the useful life of optical discs. ISO/IEC JTC 1/SC 23 will continue its discussion of the necessity of standard media and standard drives to further promote archival optical disc applications. ■

2) Optics & Photonics News, May 2007.

3) www.n-adtc.org.