

OPTICAL MEDIA PRESERVATION

Optical discs are essential components in libraries, and store audio, video, and computer data. While optical discs are generally more reliable and durable than older media types, (magnetic tape, LPs and other records) environmental conditions and/or poor handling can result in lost information. This article will introduce the different types of optical media discs and offer a discussion of strategies for preservation of these materials.

The two broad types of optical discs are Compact Discs (CDs) and DVDs. Data is retrieved by both CDs and DVDs by devices that shine a laser light beam against the reflective layer allowing data transfer. The data layer, supported by the polycarbonate substrate can be metallic or dye-based, depending on the disc type.

In CDs, the reflective and data layers are just below the label and a thin sheet of polycarbonate substrate. A much thicker layer of the substrate supports and protects the bottom of the disc. The reflective and data layers of DVDs are in the center of the disc structure, housed between two equal layers of polycarbonate substrate.

Because the data layer of CDs is more exposed than DVDs, a thin metal lacquer layer is used to protect the surface of the CD. It is important to remember, however, that the top side of CDs is more sensitive and fragile than the bottom.

For preservation purposes, Gold CD-R (Compatible Disc-Recordable) and DVD-R (Digital Video Disc-Recordable or Digital Versatile Disc-Recordable) are preferred by experts over similar media (aluminum and silver) in terms of reliable long-term backup storage—gold referring to the reflective layer of the optical disc.

A distinction should be made between permanent storage and long-term storage.

“Digital archiving experts commonly acknowledge that no carrier is permanent.

Instead, one must maintain data transferred to storage and provide access and ensure integrity of the information for the long-term.” This requires staying abreast of technological advancements and migrating data from one existing media to the next. These steps must be taken to avoid media failure or “format obsolescence”—a real threat for technology when it is no longer supported. The machine required to play and read the discs must also be kept and maintained; otherwise, a significant loss may result. Risks involved with optical media will be covered in the care and handling section of this article.

Items to be aware of when looking for archival grade discs include the following: dye failure, use only premium long-life dye (organic and pthalocyanine-based); bonding failure, use only premium bonding agents and edge to edge coverage; scratches, careful handling and a scratch resistant coating; production quality, purchase only from the same lot by a factory with highly regarded quality control standards. Testing is a mandatory step in the process since conditions vary from machine to machine and from disc to disc. The media is delicate and the environment must be controlled. When these conditions are met, the life of a CD-R or DVD-R can be as long as 100 years. This is considerable compared to the average lifespan of five to ten years for non-archival quality optical discs. A stable room temperature of 65 to 75 degrees is suggested where relative humidity does not exceed 50 percent and does not fall below 30 percent. This is in compliance with ISO 9660 standards. It is also recommended to keep multiple copies for added protection. "One Master, stored under optimal conditions, one Working copy to be used for access purposes or copying, and one Safety copy to be stored at a different location." The container most suitable for storage is a rigid high quality case made from inert polyester placed vertically according to Icon, the Institute of Conservation.

There is still speculation on how reliable this media is and until standards for blank discs and recording devices are adopted, precautions should be taken to avoid risks that may be associated with this method. CD-RW and DVD-RAM, DVD-RW and DVD+RW are re-writable formats. These formats should not be used, or should be used with caution since new information could easily be written over existing data. If the original is no longer available, the loss could be permanent.

Source:

http://www.juliantrubin.com/encyclopedia/electronics/optical_media_preservation.html