

DVD at Digital Excellence

What is DVD?

DVD, an acronym for Digital Versatile Disc, is a compact, read-only format for storing digital video, audio, and computer information. Developed by a worldwide consortium of leading home entertainment, consumer electronics, software development and computer manufacturing companies, DVD aims to replace audio CD, videotape, laser disc, CD-ROM, and perhaps even video game cartridges.

The DVD format supports:

- Broadcast-quality video (resolution: 500 horizontal lines DVD vs. 240 lines VHS)
- Better-than-CD audio (96 KHz vs. 44.1 KHz)
- Multiple tracks: up to 8 audio soundtracks, 32 subtitles, and 9 video angles
- Massive computer data storage
- Single format for playback on any DVD player
- Backward compatibility with CD
- Multiple aspect ratio (viewer can choose either wide-screen or full-screen format)
- Interactive capabilities and random access
- Links to web sites (with Internet access on playback machine)

Unlike other digital storage schemes, DVD is based on standards designed to ensure compatibility between DVD-authored programs and DVD players. DVD standards specify how each kind of file—audio, video, karaoke, computer program, text or web page, for example—is stored on digital media and how it is to be played. Although a DVD program can be placed on any digital medium on which it can fit, most DVD programs end up on DVD discs.

What is a DVD Disc?

A DVD disc looks like a CD but can store much more digital information. While a CD can hold 650 MB, a double-sided, dual-layer DVD disc can hold up to 17 GB. The most common DVD disc—single-sided, one layer—still holds 4.7 GB, which is enough for seven audio albums or a full-length feature movie. Most DVD players can play either DVD discs or CDs.

DVD Recording Media

Two types of DVD-Recordable (DVD-R) media are available for recording DVD programs: DVD-R for Authoring Media and DVD-R for General Media. Because these two media types use different recording laser wavelengths, each must be recorded in the proper DVD-R drive. After recording, any playback device that supports DVD-R can play either type.

DVD-R Authoring Media was developed first. Intended for professional applications, this type allows testing and approvals prior to mass reproduction. It can be used as the finished product if only a few discs are needed, such as for museums or videowalls in retail stores.

DVD-R General Media, introduced in 2001, was developed to support a broad base of consumer applications. General Media contains content protection to prevent bit-by-bit copying of CSS-encrypted entertainment titles

Either DVD-R media type can contain any type of information, including authored DVD video titles. However, CSS-encrypted programs cannot be stored on either type. Both media types play equally well in any DVD video player or DVD-ROM drive that supports DVD-R.

DVD Disc Replication

DVD discs can be manufactured in a variety of ways. Disc capacities range from single-sided, single layer to dual-sided, dual-layer options. All DVD players have the ability to read all of the DVD capacities, from DVD-5 (lowest capacity) to DVD-18 (highest capacity). DVD players are required to read either side, but it may be necessary to remove the disc and turn it over. Of the many DVD disc capacities currently available, only DVD-5 and DVD-9 are widely used.

DVD-5 (4.7G)

- Single-sided, single layer disc
- One-off option

DVD-10 (9.4G)

- Double-sided, single layer disc
- Disc must be physically turned over to continue program

DVD-9 (8.5G)

- Single-sided, dual-layer

DVD-18 (17G)

- Double-sided, dual-layer disc
- Very difficult to manufacture—has become available only recently

DVD Copy Protection

There are four forms of DVD copy protection:

- Analog CPS (Macrovision)
- Copy Generation Management System (CGMS)
- Content Scrambling System (CSS)
- Digital Copy Protection System (DCPS)

DE can help you choose the type of DVD disc and copy protection that is best suited for your project.

DVD Application Formats

Besides specifying the physical format of a DVD disc (how data is encoded), DVD standards also specify application formats (the way programs are stored and played). Although DVD application formats continue to change, the most common categories are these:

DVD-Video

DVD Video holds video programs and can be played by a DVD-Video player connected to a TV or on computer configured to emulate a DVD player. DVD-Video players can also play audio CDs.

The audio component of DVD-Video is optimized for playback on Dolby Surround, Dolby Pro Logic, and Dolby Digital 5.1 surround sound systems. However, because DVD-Video uses a higher audio sampling rate than VHS or audio CDs, it offers superior digital sound on any home entertainment system.

DVD-ROM

The DVD-ROM format is designed to take advantage of computer resources such as the Internet. DVD-ROM can only be read by a DVD-ROM drive connected to a computer.

DVD Audio

This relatively new format doubles the fidelity of standard Compact Discs. It features up to 6-track audio as high as 96Khz rate at 24 bit sampling.

DVD-Video/Ram Hybrid

Content producers use this format to develop applications. This format provides video and audio plus computer support for text documents (Word, Excel, PDF).

DVD-Recordable

Recordable variations include DVD-R, DVD-RAM, DVD-RW, and DVD+RW.

DVD-Audio (Streaming DVD)

DVD supports two audio formats: PCM (uncompressed digital stereo) and Dolby Digital. Streaming DVD can include multiple audio channels--up to 8 separate audio streams and up to 32 subtitles. Although it produces lower-quality video, the DVD-Audio format allows streaming and interactivity.

DVD Players

Most DVD players support a standard set of features:

- Language choice for automatic selection of video scenes, audio tracks, subtitle tracks, and menus (requires additional content on the disc)
- Special effects playback: freeze, stop, slow, fast, and scan (no reverse play or reverse step)
- Parental lock
- Programmability (playback of selected sections in a desired sequence)
- Random play and repeat play
- Digital audio output (PCM stereo and Dolby Digital)
- Compatibility with audio CDs

Some players support additional features. If these features are included in your DVD presentation, make sure your intended audience can take advantage of them:

- Component (YUV or RGB) video output for higher-quality picture
- Progressive-scan component (YUV or RGB) output for highest-quality analog picture
- Six-channel analog output from internal audio decoder
- Recognition and output of DTS Digital surround audio tracks
- Compatibility with video CDs
- Reverse single frame stepping
- RF output (for TVs with no direct video input)
- Multilingual on-screen display
- Digital zoom (2x or 4x—this is a player feature, not a DVD disc feature)
- MP3 audio playback capability

Why Use DVD?

- High-quality, multi-channel audio differentiates DVD from all other video formats—no other media allows for switching between languages or enables such a range of compressed and non-compressed audio delivery formats.
- DVD has the unique ability to support multi-angle video streams. Up to nine angles may be present within a video program. This feature provides multiple points of view for sporting events, music videos and movies, allowing the viewer to change angles without breaking the video or audio continuity.
- Very large audio and video files can be stored on a single DVD disc—133 minutes of full-motion video can fit on a single-sided, single-layer disc and over eight hours can fit on a double-sided, dual-layer disc.
- DVD's large storage capacity and fast playback support higher resolution, resulting in superior-quality video, audio, and still images
- Multiple tracks enable multiple languages, multiple versions, or multiple releases to be included on a single disc.
- DVD feature films can include extras such as original trailers, interviews, biographies, comments by directors and authors about their work, multiple languages, and direct access to individual scenes.

- Large storage capacity plus instant access capabilities provided by menus and branching in navigation commands support complex, full-featured applications.

Digital Excellence Can Help You Take Advantage of DVD!

- Digital Excellence offers full creative and technical support for developing new high-quality DVD presentations. Our DVD authoring capabilities and our ability to create and manage your audio, video and software assets will help you unleash the tremendous potential of DVD to inform, educate and entertain.
- DE features professional DVD Authoring using real-time MPEG2 encoding. All programs can be professionally mastered to DLT for duplication at any facility.
- Our video hardware includes playback units for most commercial master formats, including Betacam, Digital Betacam, 1” type “C” reel-to-reel, D-2, DVCAM, DVCPRO, and others.
- Our Video Suite includes state-of-the art Avid NLE with 3-D effects and graphics, full closed-captioning services, and on-site recording studios using Pro-Tools 24-track workstations to enhance audio.
- DE’s outstanding creative team has substantial experience in meeting client needs, including script and title screen translations and the creation and testing of multiple-language DVD presentations for domestic and international audiences.
- DE provides reliable and timely DVD replication and packaging services such as design, artwork preparation and the printing of covers, folders, guides, inserts and other ancillary components.
- We offer drop shipping and product fulfillment services from our 68,000 square foot facility in the heart of the Midwest.

Contact Digital Excellence for cost and lead-time information and to find out more about our full range of DVD authoring capabilities!