



DVD Creation Guidelines

There are three primary components to DVD content:

1. Menu Graphics
2. Video
3. Audio

All three components must be correctly formatted into the appropriate type of files needed for the DVD authoring process. Video Transfer often prepares these files for our customers from their analog or digital media as part of our authoring and duplication services. However, in some cases, customers prefer to prepare these files themselves. Therefore, graphic files used to create menu backgrounds are occasionally supplied by customers who wish to maintain aesthetic control as well as save money. The purpose of this guideline is to convey those technical specifications that must be adhered to for content files to be used in the DVD authoring process without modification. Additionally, this guide will suggest practices that enhance the visual quality of the results.

Menu Graphics

Title Safe

Title safe refers to the area in the center of a video screen where text can safely be positioned without any risk that part of the text will be lost because it runs off the edge of the screen. Video monitors are typically “over scanned” meaning that all edges of an image will spill off the sides of the screen in order to insure that images completely fill the screen. Graphic designs for video must always take this into account by keeping critical content away from the edges.

The central **90%** of the screen area is commonly considered safe for titles. Keeping titles within this area will insure that no text is cut off and that enough of a margin will appear around the text to present an appealing image. Graphic design software often permits the display of guidelines to assist the designer in this regard.

Aspect Ratio

A digital image's aspect ratio refers to the ratio of the number of pixels across its width to the number of pixels across its height. Images for video must have an aspect ratio of either 4:3 (standard) or 16:9 (widescreen). Video monitors may also have an aspect ratio of either 4:3 or 16:9. DVD players can display images with either aspect ratio on either type of monitor.

When an image's aspect ratio matches the monitor's aspect ratio, the image is displayed full-screen, such that the full image will appear using the entire surface of the screen.

When a standard width 4:3 image is displayed on a wide 16:9 monitor, the DVD player will position the image in the horizontal center of the screen with black or other colored borders on either side. This is referred to as a pillar-boxed image, since the borders on either side resemble pillars.

When a wide 16:9 image is displayed on a standard width 4:3 monitor, the DVD player will position the image in the vertical center of the screen and place black or colored borders above and below the image. This is referred to as a letterboxed image, since the image shares the shape of a common letter.

When creating graphics for DVD menu backgrounds, it is important to have the aspect ratio of the graphics match the aspect ratio of the associated video content. This way, all visual content will appear in the same manner on the screen.

Pixel Aspect Ratio

The individual pixels that make up a video image are not square as one might imagine they would be. In fact, each pixel is rectangular and its exact shape depends on both the television standard and the image's aspect ratio. When creating DVD menu graphics, the pixel aspect ratio as well as the image's horizontal and vertical pixel count must match the associated video content.

Image Dimensions for DVD

Graphic images for DVD menu backgrounds must conform to the following dimensions, pixel aspect ratios, and color modes as follows:

| Television Standard | Image Width (Pixels) | Image Height (Pixels) | Pixel Aspect Ratio | Safe Title Width | Safe Title Height | Color Mode |
|---------------------|----------------------|-----------------------|--------------------|------------------|-------------------|------------|
| NTSC (4:3) | 720 | 480 | 0.9 | 648 | 432 | 8 Bit RGB |
| NTSC (16:9) | 720 | 480 | 1.2 | 648 | 432 | 8 Bit RGB |
| PAL (4:3) | 720 | 576 | 1.09 | 648 | 518 | 8 Bit RGB |
| PAL (16:9) | 720 | 576 | 1.46 | 648 | 518 | 8 Bit RGB |

It should be noted that some image editing software such as Adobe Photoshop have image size presets that correspond to the above requirements.

Menu Buttons/Highlights

When a user selects an item on a DVD menu, the selected item is highlighted. Highlighting is accomplished by making a graphical element appear. That element can take a number of forms such as an underline, an outline, an arrow, or a dot. When working with Photoshop, all highlight elements must be placed together on a layer that is dedicated for this purpose. This layer must not contain any elements or imagery other than those used for the purpose of highlighting. All graphical elements used for highlighting must be of a single color with a RED value of 255 and GREEN and BLUE values of 0.

Video

Video files that can be used “as is” for DVD creation are rarely supplied by customers since these files are produced by specialized encoding software. Video for DVD is therefore often submitted as a videotape or a standard video file. While any type of file or videotape can be used, some choices produce better results than others. The best results can be obtained with files and tapes that do not utilize aggressive compression or data rate reduction.

The best file formats for DVD are uncompressed or lightly compressed formats. 10 Bit QuickTime ProRes 422 (HQ) is an example of a file type that will work very well. A low data rate file such as DV will produce less optimal results.

Similarly, the best tape formats are those employing the least compression. Digital Betacam is an example of a tape format that will work very well. DV tapes will produce less optimal results.

HD videotapes and files may be used to create DVDs; however, since DVD only supports standard definition video, HD video must be down-converted as part of the video encoding processes.

Audio

Audio can be mono, stereo or 5.1 surround. Mono and stereo audio can be handled in the usual manner and submitted on videotape or as part of a file. Since 5.1 audio requires 6 discrete audio channels, more than most videotapes support, it must sometimes be submitted separately from the video. A good method is to use 6 separate .wav files of 16 bit, 48 kHz PCM audio. Each of the six channels must be contained in its own file. Each audio file must match the video exactly so that no lip sync problems arise anywhere from start to finish.

More Information

Advanced DVD features such as motion menus, complex navigation, multiple camera angles, subtitles, and alternate language support may raise questions not covered here. In that case, please contact Video Transfer for additional assistance.