



File formats

[Photoshop User Guide](#)[Saving and exporting](#)**Note:**

If a supported file format does not appear in the appropriate dialog box or submenu, you may need to install the format's plug-in module.

Choosing a file format

Graphics file formats differ in the way they represent image data (as pixels or vectors), and support different compression techniques and Photoshop features. To preserve all Photoshop features (layers, effects, masks, and so on), save a copy of your image in Photoshop format (PSD).

Like most file formats, PSD supports files up to 2 GB in size. For files larger than 2 GB, save in Large Document Format (PSB), Photoshop Raw (flattened image only), TIFF (up to 4 GB), or DICOM format.

The standard bit depth for images is 8 bits per channel. To achieve greater dynamic range with 16- or 32-bit images, use the following formats:

Formats for 16-bit images (requires Save As command)

Photoshop, Large Document Format (PSB), Cineon, DICOM, IFF, JPEG, JPEG 2000, Photoshop PDF, Photoshop Raw, PNG,

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Portable Bit Map, and TIFF.

Note:

The Save **For Web** & Devices command automatically converts 16-bit images to 8-bit.

Formats for 32-bit images (requires Save As command)

Photoshop, Large Document Format (PSB), OpenEXR, Portable Bitmap, Radiance, and TIFF.

About file compression

Many file formats use compression to reduce the file size of bitmap images. *Lossless* techniques compress the file without removing image detail or color information; *lossy* techniques remove detail. The following are commonly used compression techniques:

RLE (Run Length Encoding) Lossless compression; supported by some common Windows file formats.

LZW (Lemple-Zif-Welch) Lossless compression; supported by TIFF, PDF, GIF, and PostScript language file formats. Most useful for images with large areas of single color.

JPEG (Joint Photographic Experts Group) Lossy compression; supported by JPEG, TIFF, PDF, and PostScript language file formats. Recommended for continuous-tone images, such as photographs. JPEG uses lossy compression. To specify image quality, choose an option from the Quality menu, drag the Quality pop-up slider, or enter a value between 0 and 12 in the Quality text box. For the best printed results, choose maximum-quality compression. JPEG

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Applies to: **Photoshop CC**

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files can be printed only on Level 2 (or later) PostScript printers and may not separate into individual plates.

CCITT A family of lossless compression techniques for black-and-white images, supported by the PDF and PostScript language file formats. (CCITT is an abbreviation for the French spelling of International Telegraph and Telekeyed Consultive Committee.)

ZIP Lossless compression; supported by PDF and TIFF file formats. Like LZW, ZIP compression is most effective for images that contain large areas of single color.

Maximize compatibility for PSD and PSB files

If you work with PSD and PSB files in older versions of Photoshop or applications that don't support layers, you can add a flattened version of the image to the saved file.

Note:

If you save an image in an earlier version of Photoshop, features that version doesn't support are discarded.

- 1 Choose Edit > Preferences > File Handling (Windows) or Photoshop > Preferences > File Handling (Mac OS).
- 2 From the Maximize PSD and PSB File Compatibility menu, choose any of the following:

Always Saves a composite (flattened) image along with the layers of your document.

Ask Asks whether to maximize compatibility when you save.

Never Saves only a layered image.

Note:

Choose Ask or Never if you want to significantly reduce file size.

Photoshop format (PSD)

Photoshop format (PSD) is the default file format and the only format, besides the Large Document Format (PSB), that supports all Photoshop features. Because of the tight integration between Adobe products, other Adobe applications, such as Adobe Illustrator, Adobe InDesign, Adobe Premiere, **Adobe After** Effects, and Adobe GoLive, can directly import PSD files and preserve many Photoshop features. For more information, see Help for the specific Adobe applications.

When saving a PSD, you can set a preference to maximize file compatibility. This saves a composite version of a layered image in the file so it can be read by other applications, including previous versions of Photoshop. It also maintains the appearance of the document, just in case future versions of Photoshop change the behavior of some features. Including the composite also makes the image much faster to load and use in applications other than Photoshop, and may sometimes be required to make the image readable in other applications.

You can save 16-bits-per-channel and high dynamic range (HDR) 32-bits-per-channel images as PSD files.

Photoshop 2.0 format

(Mac OS) You can use this format to open an image in Photoshop 2.0 or to export an image to an application supporting only Photoshop 2.0 files. Saving in Photoshop 2.0 format flattens your image and discards layer information.

Photoshop DCS 1.0 and 2.0 formats

Desktop Color Separations (DCS) format is a version of the standard EPS format that lets you save color separations of CMYK images. You can use DCS 2.0 format to export images containing spot channels. To print DCS files, you must use a PostScript printer.

Photoshop EPS format

Encapsulated PostScript (EPS) language file format can contain both vector and bitmap graphics and is supported by virtually all graphics, illustration, and page-layout programs. EPS format is used to transfer PostScript artwork between applications. When you open an EPS file containing vector graphics, Photoshop rasterizes the image, converting the vector graphics to pixels.

EPS format supports Lab, CMYK, RGB, Indexed Color, Duotone, Grayscale, and Bitmap color modes, and does not support alpha channels. EPS does support clipping paths. Desktop Color Separations (DCS) format, a version of the standard EPS format, lets you save color separations of CMYK images. You use DCS 2.0 format to export images containing spot channels. To print EPS files, you must use a PostScript printer.

Photoshop uses the EPS TIFF and EPS PICT formats to let you open images saved in file formats that create previews but are not supported by Photoshop (such as QuarkXPress). You can edit and use an opened preview image just as any

other low-resolution file. An EPS PICT preview is available only in Mac OS.

Note:

EPS TIFF format and EPS PICT format are more relevant to earlier versions of Photoshop. The current version of Photoshop includes rasterization features for opening files that include vector data.

Photoshop Raw format

The Photoshop Raw format is a flexible file format for transferring images between applications and computer platforms. This format supports CMYK, RGB, and grayscale images with alpha channels, and multichannel and Lab images without alpha channels. Documents saved in the Photoshop Raw format can be of any pixel or file size, but they cannot contain layers.

The Photoshop Raw format consists of a stream of bytes describing the color information in the image. Each pixel is described in binary format, with 0 representing black and 255 white (for images with 16-bit channels, the white value is 65535). Photoshop designates the number of channels needed to describe the image, plus any additional channels in the image. You can specify the file extension (Windows), file type (Mac OS), file creator (Mac OS), and header information.

In Mac OS, the file type is generally a four-character ID that identifies the file—for example, TEXT identifies the file as an ASCII text file. The file creator is also generally a four-character ID. Most Mac OS applications have a unique file creator ID that is registered with the Apple Computer Developer Services group.

The Header parameter specifies how many bytes of

information appear in the file before actual image information begins. This value determines the number of zeroes inserted at the beginning of the file as placeholders. By default, there is no header (header size = 0). You can enter a header when you open the file in Raw format. You can also save the file without a header and then use a file-editing program, such as HEdit (Windows) or Norton Utilities (Mac OS), to replace the zeroes with header information.

You can save the image in an interleaved or non-interleaved format. If you choose interleaved, the color values (red, green, and blue, for example) are stored sequentially. Your choice depends on requirements of the application that will open the file.

Note:

A Photoshop Raw image is not in the same file format as a camera raw image file from a digital camera. A camera raw image file is in a camera-specific proprietary format that is essentially a "digital negative," with no filtering, white balance adjustments, or other in-camera processing.

Digital Negative format (DNG)

Digital Negative (DNG) is a file format that contains the raw image data from a digital camera and metadata that defines what the data means. DNG, Adobe's publicly available, archival format for camera raw files, is designed to provide compatibility and decrease the current proliferation of camera raw file formats. The Camera Raw plug-in can save camera raw image data in the DNG format. For more information about the Digital Negative (DNG) file format, visit www.adobe.com and search for the term "Digital Negative." You'll find comprehensive information and a link to a user forum.

BMP format

BMP is a standard Windows image format on Windows-compatible computers. BMP format supports RGB, Indexed Color, Grayscale, and Bitmap color modes. You can specify either Windows or OS/2 format and a bit depth of 8 bits/channel. For 4-bit and 8-bit images using Windows format, you can also specify RLE compression.

BMP images are normally written bottom to top; however, you can select the Flip Row Order option to write them from top to bottom. You can also select an alternate encoding method by clicking Advanced Modes. (Flip Row Order and Advanced Modes are most relevant to game programmers and others using DirectX.)

Cineon format

Developed by Kodak, Cineon is a 10-bits-per-channel digital format suitable for electronic composition, manipulation, and enhancement. Using the Cineon format, you can output back to film with no loss of image quality. The format is used in the Cineon Digital Film System, which transfers images originated on film to the Cineon format and back to film.

DICOM format

The DICOM (Digital Imaging and Communications in Medicine) format is commonly used for the transfer and storage of medical images, such as ultrasounds and scans. DICOM files contain both image data and headers, which store information about the patient and the medical image.

GIF

Graphics Interchange Format (GIF) is the file format commonly used to display indexed-color graphics and images in HTML documents. GIF is an LZW-compressed format designed to minimize file size and electronic transfer time. GIF format preserves transparency in indexed-color images; however, it does not support alpha channels.

IFF

IFF (Interchange **File Format**) is a general-purpose data storage format that can associate and store multiple types of data. IFF is portable and has extensions that support still-picture, sound, music, video, and textual data. The IFF format includes Maya IFF and IFF (formerly Amiga IFF).

JPEG format

Joint Photographic Experts Group (JPEG) format is commonly used to display photographs and other continuous-tone images in HTML documents. JPEG format supports CMYK, RGB, and Grayscale color modes, and does not support transparency. Unlike GIF format, JPEG retains all color information in an RGB image but compresses file size by selectively discarding data.

A JPEG image is automatically decompressed when opened. A higher level of compression results in lower image quality, and a lower level of compression results in better image quality. In most cases, the Maximum quality option produces a result indistinguishable from the original.

Large Document Format (PSB)

The Large Document Format (PSB) supports documents up to 300,000 pixels in any dimension. All Photoshop features, such as layers, effects, and filters, are supported. (With documents larger than 30,000 pixels in width or height, some plug-in filters are unavailable.)

You can save HDR, 32-bits-per-channel images as PSB files.

Note:

Most other applications and older versions of Photoshop cannot support documents with file sizes larger than 2 GB.

OpenEXR format

OpenEXR (EXR) is a file format used by the visual effects industry for HDR images. The film format has high color fidelity and a dynamic range suitable for use in motion picture production. Developed by Industrial Light and Magic, OpenEXR supports multiple lossless or lossy compression methods. An OpenEXR file supports transparency and works only with 32 bits/channel images; the file format stores the values as 16 bits/channel floating point.

PDF

Portable Document Format (PDF) is a flexible, cross-platform, cross-application file format. Based on the PostScript imaging model, PDF files accurately display and preserve fonts, page layouts, and both vector and bitmap graphics. In addition, PDF files can contain electronic document search and navigation features such as electronic

links. PDF supports 16-bits-per-channel images. Adobe Acrobat also has a Touch Up Object tool for minor editing of images in a PDF. For more information about working with images in PDFs, see [Acrobat Help](#).

Note:

The Touch Up Object tool is mainly for last-minute revisions to images and objects. It's best to do image editing in Photoshop before saving as PDF.

Photoshop recognizes two types of PDF files:

Photoshop PDF files Created when Preserve Photoshop Editing Capabilities is selected in the Save Adobe PDF dialog box. Photoshop PDF files can contain only a single image. Photoshop PDF format supports all color modes (except Multichannel) and features that are supported in standard Photoshop format. Photoshop PDF also supports JPEG and ZIP compression, except for Bitmap-mode images, which use CCITT Group 4 compression.

Standard PDF files Created when Preserve Photoshop Editing Capabilities is *deselected* in the Save Adobe PDF dialog box, or by using another application such as Adobe Acrobat or Illustrator. Standard PDF files can contain multiple pages and images. When you open a standard PDF file, Photoshop rasterizes vector and text content, while preserving pixel content.

PICT File

PICT format is used in Mac OS graphics and page-layout applications as an intermediary file format for transferring images between applications. PICT format supports RGB images with a single alpha channel and Indexed Color,

Grayscale, and Bitmap mode images without alpha channels.

Note:

Though Photoshop can open raster PICT files, it cannot open QuickDraw PICTs or save to PICT format.

PICT Resource

(Mac OS) A PICT resource is a PICT file but takes a name and resource ID number. The PICT Resource format supports RGB images with a single alpha channel, and Indexed Color, Grayscale, and Bitmap mode images without alpha channels.

You can use the Import command or the Open command to open a PICT resource. However, Photoshop cannot save to this format.

Pixar format

The Pixar format is designed specifically for high-end graphics applications, such as those used for rendering three-dimensional images and animation. Pixar format supports RGB and grayscale images with a single alpha channel.

PNG format

Developed as a patent-free alternative to GIF, Portable Network Graphics (PNG) format is used for lossless compression and for display of images on the web. Unlike GIF, PNG supports 24-bit images and produces background transparency without jagged edges; however, some web browsers do not support PNG images. PNG format supports

RGB, Indexed Color, Grayscale, and Bitmap mode images without alpha channels. PNG preserves transparency in grayscale and RGB images.

Portable Bit Map format

The Portable Bit Map (PBM) file format, also known as Portable Bitmap Library and Portable Binary Map, supports monochrome bitmaps (1 bit per pixel). The format can be used for lossless data transfer because many applications support this format. You can even edit or create such files within a simple text editor.

The Portable Bit Map format serves as the common language of a large family of bitmap conversion filters including Portable FloatMap (PFM), Portable Graymap (PGM), Portable Pixmap (PPM), and Portable Anymap (PNM). While the PBM file format stores monochrome bitmaps, PGM additionally stores grayscale bitmaps, and PPM can also store color bitmaps. PNM is not a different file format in itself, but a PNM file can hold PBM, PGM, or PPM files. PFM is a floating-point image format that can be used for 32-bits-per-channel HDR files.

Radiance format

Radiance (HDR) is a 32-bits-per-channel file format used for HDR images. This format was originally developed for the Radiance system, a professional tool for visualizing lighting in virtual environments. The file format stores the quantity of light per pixel instead of just the colors to be displayed onscreen. The levels of luminosity accommodated by the Radiance format are far higher than the 256 levels in 8-bits-per-channel image file formats. Radiance (HDR) files are often used in 3D modeling.

Scitex CT

Scitex Continuous Tone (CT) format is used for high-end image processing on Scitex computers. Contact Creo to obtain utilities for transferring files saved in Scitex CT format to a Scitex system. Scitex CT format supports CMYK, RGB, and grayscale images and does not support alpha channels.

CMYK images saved in Scitex CT format often have extremely large file sizes. These files are generated for input using a Scitex scanner. Images saved in Scitex CT format are printed to film using a Scitex rasterizing unit, which produces separations using a patented Scitex halftoning system. This system produces very few moiré patterns and is often demanded in professional color work—for example, ads in magazines.

TIFF

Tagged-Image **File Format** (TIFF, TIF) is used to exchange files between applications and computer platforms. TIFF is a flexible bitmap image format supported by virtually all paint, image-editing, and page-layout applications. Also, virtually all desktop scanners can produce TIFF images. TIFF documents have a maximum file size of 4 GB.

TIFF format supports CMYK, RGB, Lab, Indexed Color, and Grayscale images with alpha channels and Bitmap mode images without alpha channels. Photoshop can save layers in a TIFF file; however, if you open the file in another application, only the flattened image is visible. Photoshop can also save notes, transparency, and multiresolution pyramid data in TIFF format.

In Photoshop, TIFF image files have a bit depth of 8, 16, or 32 bits per channel. You can save HDR images as 32-bits-per-channel TIFF files.

WBMP format

WBMP format is the standard format for optimizing images for mobile devices, such as cell phones. WBMP supports 1-bit color, which means that WBMP images contain only black and white pixels.

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