

# Achieving Reliable Print Output with Transparency



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# Achieving Reliable Print Output with Transparency

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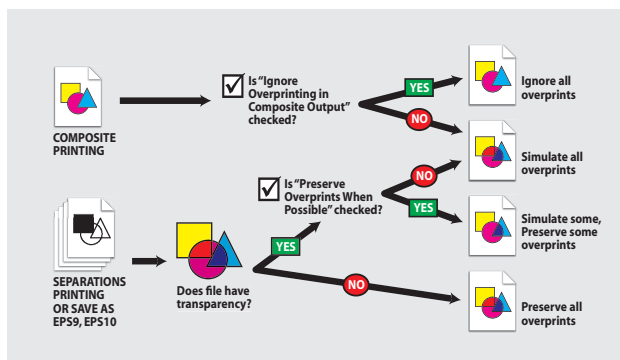
## Achieving Reliable Print Output with Transparency: Late Breaking News (9/29/2001)

On September 26, 2001 at Seybold San Francisco, Adobe announced and demonstrated Illustrator 10 and InDesign 2.0. Both of these products provide significant improvements for reliable printing of transparency. The document you are currently reading, however, was developed before these products were announced. Some of the problems described here have in fact been addressed and corrected. In particular, most problems related to interactions between transparency and overprinting and with linked documents have been resolved. Adobe is currently working on a revision to this document that will include detailed information on Illustrator 10 and InDesign 2.0. This revision should be available by the time these products are released. In the meantime, below is a short synopsis of the improvements provided by each application.

### Improvements in Illustrator 10

A number of significant changes were made to Illustrator 10 to provide customers preparing content for output on high-quality printing presses. These changes are as follows:

- The Raster/Vector slider (formerly known as the “Quality/Speed” slider) lets you choose a value from 0 to 100 (Illustrator 9 has only five settings).
- The default setting for the Raster/Vector slider is set to 100 (Illustrator 9 used the middle setting, or 50, as the default). This provides the highest possible quality results.
- Overprinting is properly preserved in more cases (see chart).



- The flattener in Illustrator 10 respects object stacking order. This means opaque objects that overlap transparent objects are not affected by flattening and that it is no longer necessary to always embed linked documents that interact with transparent objects.
- The optional Flattening Preview plug-in helps to identify and in some cases correct problems before they occur.
- Print performance has been greatly improved.

You can find more information on improvements made to Illustrator 10 for transparency (including how to setup and use the new Flattening Preview plug-in) in the document “Adobe Illustrator 10 Flattening Guide”, using this link: [http://www.adobe.com/products/illustrator/pdfs/ai10\\_print.pdf](http://www.adobe.com/products/illustrator/pdfs/ai10_print.pdf)

### Improvements InDesign 2.0

Transparency is now fully supported by InDesign 2.0, which allows users both to create transparent design elements directly in their layouts and to incorporate ‘live’ unflattened transparency from Illustrator and Photoshop in the form of native files and PDF 1.4. InDesign 2.0 also provides the improved flattener controls that Illustrator 10 implements plus the additional ability to define “flattener styles” which further simplify this critical workflow step. Different styles can be applied to individual spreads for even finer control. InDesign 2.0 also provides improved support for mixing overprinting and transparency and linked files. You can find more complete information on transparency support in the InDesign 2.0 User Guide.

# Achieving Reliable Print Output with Transparency

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**A practical troubleshooting guide for prepress service providers who work with the new transparency features of Adobe® software**

## What you will find here

This reference and troubleshooting guide gives you, a prepress service provider, the information you need to obtain consistent, high-quality output from files that contain objects created with the new transparency features in Adobe® software (specifically, Adobe Illustrator® 9.x).

It explains how transparency is processed (“flattened”) when documents are exported or printed, and how flattening affects your workflow. It also tells you what controls Adobe applications give you over flattening.

This document may also be of interest to sophisticated production personnel and creative professionals who prepare content that contains transparency for high-end print output. This guide has three sections:

Section 1: General Guidelines for Reliable Output. Basic steps and information you should know when working with or processing files with transparency from Illustrator 9.x.

Section 2: Solutions for Your Workflow. In-depth how-to information about specific issues you might encounter in jobs that have transparent content.

Section 3: Controlling Flattener Settings & Results. How to use the controls in Adobe products for managing flattening and transparency.

## Applications covered by this document

This document is primarily about how to work with Adobe Illustrator 9.x files that contain transparency. It also provides some information about using Adobe Acrobat® 5 for printing PDF 1.4 files that have transparency. This document will be updated as more Adobe products are enhanced to support transparency workflows. Check [www.adobe.com](http://www.adobe.com) for updates.

*Note: Use Illustrator 9.02 for the best results. This update is available at no charge from [www.adobe.com](http://www.adobe.com).*

# Section 1: General Guidelines for Reliable Output

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## Section Overview

This section describes the basics of the new transparency model, how it could affect your work, and the general guidelines to follow for achieving good results.

## New transparency options present new prepress challenges

The need to handle transparency and transparency effects (such as drop shadows) for images, text, and line art is standard practice in high-end prepress environments. In fact, you are already quite familiar with that in Adobe Photoshop®.

Adobe has recently implemented a new transparency model that allows graphic designers to apply transparency and transparency-based effects to almost any object, including text, vectors, gradients, and imported graphics. This support is implemented in Adobe Illustrator 9.x.

The new transparency model allows you to optimize certain existing workflow practices. For instance, you are probably using Adobe Photoshop to add drop shadows to type and vignettes to images. With a tool such as Illustrator 9.x, you can apply effects like these directly to the affected objects. In addition, the effects remain “live” so that when type is edited, for example, the applied drop shadow changes with it. You should also be able to directly output layouts containing creative transparency effects without recreating them in Adobe Photoshop as a complete raster file.

Like any new technology, however, the upgraded transparency capability also exposes different and sometimes unfamiliar results across applications and file formats. Thus you may already be receiving jobs with transparent design elements and have been unable to achieve results that are acceptable to you or your customers.

There is a lot to learn about Adobe’s new approach to transparency and how it changes existing workflow practices. The degree to which you will need to study this guide and deepen your understanding of transparency will depend on a number of factors, including:

- The complexity of the jobs you receive.
- The prepress tools you use.
- The workflow techniques you employ.
- The kinds of devices you prepare output for.

The rest of this section gives you enough information to understand the basic issues around transparency, address many common problems, and process most jobs successfully. Section 2 goes into greater detail about handling transparency in specific workflow scenarios.

## How transparency changes your workflow

Adobe's new transparency capabilities may affect your prepress workflow in the following ways:

**1** Three types of files you typically receive could now contain content to which transparency has been applied:

- Native Adobe Illustrator 9.x files.
- Illustrator 9.x graphics that have been saved as PDF or EPS.
- Page layout files that contain artwork exported as PDF or EPS from Illustrator 9.x.

**2** The transparent design elements in these files may not have been optimally prepared (“flattened”) for printing or separations, so you may have to adjust or compensate for this in your workflow. Flattening is a necessary step that converts all transparent design elements into a format that PostScript devices can print. It should be done as late in the process as possible—preferably by you, the prepress service provider.

**3** Your ability to inspect and adjust for inadequate flattening depends on the format of the files you receive:

- **Illustrator 9 native and Illustrator 9 EPS files** let you use Illustrator 9 to inspect and adjust the flattening settings for optimal output from all applications that can read and print these formats.
- **PDF files that have been saved from Illustrator 9 with the “Preserve Illustrator Editing Capabilities” option selected** (in the Adobe PDF Format Options dialog box) will let you use Illustrator 9 to restore live transparency and inspect and change the flattener settings.
- **Transparent artwork received in any other format** will have been flattened and may not print as you expect on your high-end equipment. You will be unable to inspect or adjust the flattening settings for these files, although if you have access to the original Illustrator 9 artwork you can re-save them with more appropriate settings. These formats include PostScript, Illustrator 8 EPS (or earlier), DCS, PDF 1.2 and 1.3, GIF, JPEG, BMP, and non-Photoshop 6.0 TIFF images.

*Note: When saving as PDF in Illustrator 9, PDF 1.3 is listed as “Acrobat 4” in the Save As dialog box, and PDF 1.4 is listed as “Acrobat 5.”*

The more you understand flattening and the characteristics of the target output device (e.g., its resolution and its ability to reproduce the colors you have chosen for a given job), the easier it will be to choose how and when you flatten your customers' documents. Also, the later in your workflow that flattening occurs, the more likely you are to achieve acceptable, repeatable results.

### TRANSPARENCY CAN SHOW UP IN MANY WAYS.

While many customers apply transparency using the Illustrator 9.x Transparency palette, not all uses of transparency are obvious in a file. Transparency is also automatically applied as a side effect of using some styles, brushes, live effects, and non-normal blending modes (e.g., Add or Multiply). Transparency may also be introduced when a designer incorporates previously created content that contains live transparency in the Illustrator 9 file.

## Why you can experience unexpected transparency results

### All transparency must be flattened

The Adobe PostScript® language does not support Adobe's transparency in native device-independent format. For this reason, PostScript desktop printers, Adobe PostScript Level 2 high-end printers, and most Adobe PostScript 3 high-end production devices and RIPs cannot accept and process "live" transparency information on the fly.

To print correctly, all transparent objects in a graphic must, at some point in every workflow, be flattened. Flattening converts the objects from a device-independent format into a format that is visually equivalent but does not contain transparency; this format can be represented in PostScript. In Adobe applications, flattening automatically occurs any time the transparent artwork is either:

- Printed from its native program (e.g., Illustrator 9) or a program that supports the originating program's native format.
- Saved in a file format other than a native format, so it can be placed or linked to other applications in the design or prepress workflow. Typically, a file is saved into a non-native, flattened format using "Save As" or "Export" to make an EPS or another file, or when the document is converted to PostScript by printing to disk. Flattened formats include PostScript, EPS, DCS, PDF 1.2 and 1.3, GIF, JPEG, BMP, and non-Photoshop 6.0 TIFF images.

#### NOT ALL EPS FILES ARE CREATED EQUAL

Illustrator 9.x can save files in its own (Illustrator 9) EPS format, as well as in EPS formats that are compatible with earlier versions of Illustrator, such as Illustrator 8 or Illustrator 7.

Transparency is always flattened when saved to EPS. However, Illustrator 9 EPS (if it has not been re-saved by another program after being created) retains the transparency information within its code, enabling these files to have their live transparency restored if the file is opened again in Illustrator 9.x.

#### THE FUTURE OF PRINTING LIVE TRANSPARENCY: POSTSCRIPT 3

PostScript 3 printers that support Adobe PDF 1.4 (Acrobat 5) files will accept and process the "live" transparency that can be saved in PDF 1.4 files. This capability is built into the new PostScript Language version 3015, which was released to Adobe OEM partners in spring 2000.

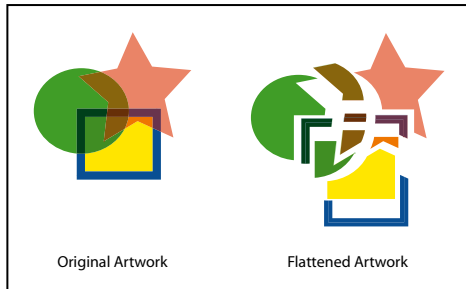


## How flattening changes the artwork

At its simplest, the process of flattening converts all the overlapping elements in a stack of transparent objects into a format that captures the look of the original transparency for printing.

To achieve this effect, an Adobe application's flattener software examines the interactions at every point of the transparency and does four things to the artwork:

**1** It cuts the transparent art apart and represents overlapping transparent regions by discrete, abutting elements, each with its own color. (See Figure 1.)



**Figure 1. A Simple Example of Flattening.**

*Flattening cuts transparent art apart to represent overlapping areas as discrete pieces that are either vector objects or rasterized areas. This example involves only vector objects. As artwork becomes more complex (mixing images, vectors, type, spot colors, overprinting, etc.) so does the flattening and its results.*

**2** It retains the integrity of the original transparent objects as much as possible (e.g., type stays type, vectors stay vectors), but it may rasterize some type or artwork when necessary, based on the file's complexity and the flattener settings in effect at the time.

**3** It sets the resolution of rasterized areas to a specific, device-dependent value that is defined by the flattener settings in effect at the time.

**4** If overprinting is also used in the file, the flattener, by default, may process the overprinting objects as it would process overlapping transparent objects. See “Overprinting may not be preserved:” on page 6 for details about when this can occur.

## The bottom-line effects on your workflow and output

Flattening makes several alterations that directly affect prepress workflows and output quality. If the original Illustrator 9 artwork files are available, you can often fix these issues (see Sections 2 and 3).

**Transparency will not be “live” and editable anymore:** Although the result still looks transparent, the formerly transparent objects in flattened artwork are opaque, and will not be transparent to other objects in other applications (i.e., it is no longer “live” to other objects). In addition, some of the original objects may themselves be transformed into less editable formats. (For example, vectors can become rasterized and type may become outlines or be rasterized.)

Adjusting transparency attributes and objects after flattening requires going back to the original source file, making changes, and then exporting (flattening) it as a new file. This is analogous to standard editing practices with imported graphics today.

For more information, see the inset, “Going Native—Keeping Transparency Live and Editable” on page 10.

**Rasterization may cause visible changes:** The flattener’s need to occasionally convert vectors to rasterized areas (or type to outlines) can produce undesirable visual results, such as jaggies, color stitching<sup>1</sup>, or thickened stroke widths. This is especially true when the flattener rasterizes only a portion of a larger, more complex design. The flattener’s decision to rasterize is based on the type of objects being flattened (type, gradients, spot colors, and so on), on the file’s complexity, and on the flattener’s Quality/Speed settings that are in effect at the time you Save As/Export or print.

**Resolution may not match your device:** Flattening can create rasterized regions that have a resolution that is significantly lower than your final output device resolution. This is because the flattener has no knowledge of the final output device or its parameters. Instead, it applies the resolution settings that are in effect from the native application during flattening. Objects that remain in vector format will remain device independent and will correctly scale to match the resolution of the output device.

**Colors may be unexpectedly changed:** The use of transparency can change colors in several unexpected ways. First, applying certain blending modes to objects in a document—another way of working with transparency—means the flattener will redefine the mix of process colors used to represent the overlapping regions. This may introduce process inks that the document’s designer did not originally specify.

Second, if color management is involved in the workflow, colors involved in transparency may become more device-dependent and may not match your actual press conditions after being flattened. This can happen if you have not carefully chosen the working space profile for the document.

Finally, the use of spot colors in conjunction with transparency may yield unexpected results. Correct spot color separations will only be obtained when the Illustrator 9 document is saved as Illustrator 9 EPS. Exporting in other formats (e.g., Illustrator 8 EPS or PDF 1.3) will result in spot colors being converted to process equivalents.

**Overprinting may not be preserved:** When overprinting instructions are applied to objects in a file that also contains transparency, the flattener may become involved in processing the overprinting. One of three things will happen, depending on how the overprinting objects interact with other elements in the file:

- For objects that sit completely over other objects in the file (i.e., do not touch the background), the overprinting instructions between objects in the file will be preserved. That is, what you see on press will be what you expect.
- For objects that sit completely over the background, overprinting instructions will not be preserved because the flattener, by default, will process the overprinting objects as it would process overlapping transparent objects. That is, it will cut apart and convert the overprinting areas into discrete, abutting objects. Visually, the output looks as if overprinting had been applied. However, all the PostScript instructions that would create plates to overprint inks on press are stripped out by the flattener, and the press results will not be what you expect.
- For objects that straddle other objects and the background, the flattener will retain overprinting instructions wherever it can—that is, only for those regions that sit over other objects rather than the background. Any regions that sit only on the background will be flattened as described in the second circumstance above.

When the resulting flattened file is placed into a layout, it will completely knock out any objects in that layout over which it is placed. Depending on how the designer applied overprinting in the original file, this behavior may or may not be acceptable.

Note that the flattened results described above work only when the artwork is saved in the Illustrator 9 EPS file format or printed directly from Illustrator. Overprinting instructions will not be preserved at all when the file is saved as an Illustrator 8 EPS or PDF 1.3 file. These overprinting instructions can also be ignored when printing to a composite printer (i.e., an inkjet printer) from Illustrator, which can be desirable for proofing. See “Printing Separations” in Section 2.

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1. Color stitching is the visible color transition between objects whose coloring would otherwise be expected to be identical. It most commonly occurs when a portion of a vector object is rasterized by the flattener.

**Transparency effects may be lost after image replacement:** When the flattener encounters a transparent region of a document that involves images (e.g., transparent type and a drop shadow that fall over an image), it will use whatever image data is present during flattening to render the overall effect requested. Thus if the image involved was only a low-resolution proxy image, that image information will be used. When that proxy is subsequently “swapped out” with a final, high-resolution image (using OPI, APR, or manual methods), the rendered transparency effect will be lost.

Transparency information can be retained by performing image replacement prior to flattening and embedding graphics in Illustrator 9 instead of linking them (see “Using Image Replacement” in Section 2).

### The cumulative effect

The variables listed above are not the only ones that can affect flattening results. Others include the complexity of the transparency, whether fonts used in the transparency are available during flattening, and whether external files used in the transparency are linked or embedded. Even the file format and settings used during flattening can make a striking difference in the final printed piece.

As these and other flattening issues accumulate, it becomes clear how some transparent elements and files might not flatten and print as well as others. The following section provides useful tips for achieving successful output for standard jobs.

## Recommendations for successful output

To minimize the impact of transparency-related issues, Adobe recommends the following for you and your customers:

- Whenever possible, use file formats that preserve live transparency—e.g., native Adobe application files (Illustrator 9)—as hand-off files or source files for placement in layouts or other documents.
 

**Reason:** You have control over the flattener and resolution settings in your shop, up to the time you must print or save the artwork to a non-native file format (such as to PostScript for trapping).
- Save files in Illustrator 9 EPS format for all transparent artwork that is to be used in a page layout application, especially if you intend to make separations.
 

**Reason:** Illustrator 9 EPS correctly preserves spot color plates, which otherwise are not retained during flattening, so this format is suitable for separations. More importantly, you can open Illustrator 9 EPS files in Illustrator 9.x and adjust flattener and resolution settings to match output conditions in your workflow.<sup>2</sup>
- Do not mix overprinting and transparency in the same document if the actual on-press effects depend on overprinting, such as spot color tints over an image or manually added traps.
 

**Reason:** The presence of transparency anywhere in a document triggers the flattener to analyze overprinting as a form of transparency. In some design circumstances, the flattener will need to simulate the overprinting and remove overprinting instructions from the PostScript stream.

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2. An Illustrator 9 EPS remains editable only if it retains the Illustrator 9-specific information that’s embedded in the file. Once the file is saved to a non-Illustrator 9 EPS format, this information is removed, and the file loses its ability to be flattened again. For instance, placing an Illustrator 9 EPS into a page layout application and then saving the resulting file as EPS strips out the Illustrator 9 information. That EPS can be opened in Illustrator 9, but you cannot edit its transparency or flattener properties. Many techniques described in this document depend on the integrity of the exported Illustrator 9 EPS file.

- When using PDF 1.3 for separations, make sure the PDF is created in the right way to support the transparency: first export the Illustrator document as Illustrator 9 EPS, then use Acrobat Distiller® to make a PDF 1.3 file. (See “Working with Placed Graphics” in Section 2.)

**Reason:** Spot colors and fonts will not be preserved in the flattening process that is used when you export into PDF 1.3 directly from Illustrator 9.

- If you are flattening a document, inspect it to:

Determine if spot colors are being used. This will require that the file be saved in Illustrator 9 format. (See “Printing Separations” in Section 2.)

Determine if overprinting and transparency are being used together in the document. During flattening, the overprinting might be simulated, and the overprinting instructions might be removed. (See “Overprinting Instructions are Lost” in Section 2.)

Determine (if possible) whether the Difference, Exclusion, Hue, Color, Saturation, or Luminosity blending mode was used in the document. Once flattened, these blending modes will not separate as expected in regions that use spot colors with these blending modes.

Make sure all the fonts are present and properly installed. Otherwise, the flattener will substitute them with fonts that may not fit the original text’s bounding box in the same way, and it cannot be corrected later.

Look for any low-resolution proxy images (FPOs). A document must be “fattened”—contain all high-resolution final images—before it is flattened for proper results. This means performing image replacement manually before flattening a document. In Illustrator 9 it also means embedding rather than linking to images involved in transparency. (See “Using Image Replacement” in Section 2.)

If you are using color management, be sure the document’s working color space is set to your intended output device before flattening. This ensures that transparent objects are assigned suitable in-gamut colors. (See “Handling Color Conversions” in Section 2.)

- Embed (do not link) EPS and bitmap images that are placed as part of an Illustrator 9 transparency.<sup>3</sup>

**Reason:** Linking stores an image’s information outside of the source document, so the flattener cannot read the data if the linked file is involved in a transparency. Linked files will print first, beneath everything else on the page. Embedding the file in Illustrator 9 enables the flattener to correctly process the file’s contents for transparency-based effects.

- Review a document’s current Quality/Speed flattener settings and adjust to best match final output conditions. (See Section 3.)

**Reason:** The flattener settings you choose can greatly affect the quality of the printed piece. If you flatten before separations, use the highest quality setting for the best results. For quicker proofing, lower quality settings may be acceptable.

- Review the current Rasterization Resolution settings and adjust as appropriate for the final output device’s resolution and line screen. (See Section 3.)

**Reason:** If this setting is too low, stitching artifacts may occur. Generally, the Rasterization Resolution should be no less than 2x your intended line screen (e.g., rasterize at 300 ppi for 150 lpi output) and no more than the full resolution of the intended output device (although this can result in significantly larger flattened files). Your shop’s standard may vary.

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3. This technique will not work with DCS 2.0 (pre-separated), duotone, tritone, or quadtone files because Illustrator 9 cannot embed these types of graphics. These files are often used when creating images in Photoshop for use in Illustrator 9.

- Review the current Raster Effects Resolution settings (if raster effects are used) and adjust as appropriate for the final output device's resolution and line screen. Note that adjusting this setting will change the size and appearance of certain pixel-based raster effects in the file. (See Section 3.)

**Reason:** If this setting is too low, stitching artifacts may appear. Typically, the Raster Effects Resolution should match what you use for drop shadows created in Photoshop, which might be less than the resolution used for images. Your shop's standard may vary.

- If you are unsure about the effects that flattening will have on a document, run proofs at different flattener (and related rasterization) settings to ensure that you are comfortable with the results before going to plate. (See Section 3.)

**Reason:** Some files with transparency print just fine the first time out. Others require fine-tuning. Making a composite proof may be a less expensive way to verify any changes that may be needed for the file before making film or plates.

#### HOW TO CONTROL FLATTENING IN ILLUSTRATOR 9

Section 3 of this document describes the four settings available in Illustrator 9.x for controlling variables during flattening. These settings are:

The flattener's Quality/Speed setting (File>Document Setup>Transparency panel)

The Rasterization Resolution setting (File>Document Setup>Printing & Export panel)

The Mesh Resolution setting (File>Document Setup> Printing & Export panel)

The Raster Effects Setting (Effects>Rasterize>Raster Effects Settings)

#### WHY ILLUSTRATOR 9 EPS FILES—AND WHY NOT PDF 1.4 FOR NOW?

You should ask your customers to save artwork that uses transparency in Illustrator 9 EPS format before placing it into other applications. Currently, only Illustrator 9 EPS lets you go back and revise flattener settings to correct problems before they occur.

This is because Illustrator 9 EPS format holds all the pre-flattened transparency information inside of it. You can open the Illustrator 9 EPS in Illustrator 9 and restore the "live" transparency objects for editing and resave with new flattener settings.

PDF 1.4 supports live transparency in a similar manner. However, there are not yet enough high-end prepress tools and RIPs available to take advantage of it as an application-neutral exchange format that can also produce high-end color separations.

## Where to go next

The more you know about transparency and the effects of flattening, the better prepared you will be to intercept problems.

This section provided a high-level overview of what to expect when receiving and processing transparent files. We encourage you to read Sections 2 and 3 to understand:

- How to address the effect of flattening on specific workflow steps.
- How to use the flattener controls in Adobe software.

**GOING NATIVE—KEEPING TRANSPARENCY LIVE AND EDITABLE**

Adobe's transparency attributes stay in a "live and fully editable" form while in their native application or one that supports native file formats. This means:

They are "live" in that they will interact with other objects that are placed beneath them, allowing those objects to show through the transparency. These objects also retain a very high degree of (or complete) device independence.

They are "editable" in that the transparency attributes and/or transparent objects can be freely altered and changed to the extent that the receiving application can support such editing. (For example, some applications may allow you to reduce the opacity of type, alter the color/shape of a drop shadow, or edit transparent text.)

**LIVE AND EDITABLE DEPENDS ON FORMAT AND APPLICATION**

Transparent content is both live and editable within the application in which it is created. It can also be both live and editable when placed as a native file within another document. The extent to which it is editable in the receiving application depends on the editing features of that application.

Transparent content is neither live nor editable when placed as a non-native (i.e., flattened) file within another document. The notable exception to this is the Illustrator 9 EPS format. This format includes additional application-specific information that allows Illustrator to "reconstitute" transparency in a live and editable form.

## Section 2: Solutions for Your Workflow

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### Section Overview

This section describes what you can do to minimize problems or prevent them altogether in standard print production workflows.

### Transparency-related issues to watch for

Despite your best efforts to head off transparency problems, some transparency issues will almost always arise. Typical changes to be concerned about include, in order of likelihood of occurrence:

- 1 Spot colors may convert to process.
- 2 Overprinting instructions may not be preserved.
- 3 Vector objects may get rasterized at too low of a resolution.
- 4 Type may get merged into (“baked into”) low-resolution images.
- 5 Hairlines and strokes may fatten (generally only a problem on lower resolution output devices).
- 6 Type may be converted to filled strokes (i.e., thicken).
- 7 You may get unexpected or missing plates when printing color separations.

Some additional transparency interactions currently have no workarounds for optimal printing. New versions of Adobe software will likely address some of these interactions. However, until that happens, be on the alert for the following elements when they are mixed with transparency:

- Pre-separated content (DCS files).
- Duotone, tritone, quadtone, images.
- Placed (linked) files.
- Images that are to be replaced after flattening has been done (e.g., in workflows using an OPI server).

### Go with your own flow

The degree to which any of the effects of flattening will affect your work often depends on whether the flattened results are appropriate (or not) for the next step of your workflow.

For instance, type that gets converted to outlines cannot be changed with a touch-up tool. If the file is to be immediately color separated for printed output, this is unlikely to be an issue. At other points in the workflow, however, it may cause a problem. Similarly, you may not be able to map one spot color to another color after flattening, but if the next workflow step is trapping, you may not need to.

Because it is all a tradeoff, the goal is to maximize the value of transparency and minimize the effects of the transformation to a flattened file.

#### **TREAT FLATTENING LIKE PRE-SEPARATED CONTENT**

It is useful to understand that workflows involving flattened art are not dissimilar to those that involve pre-separated content—something you are already familiar with.

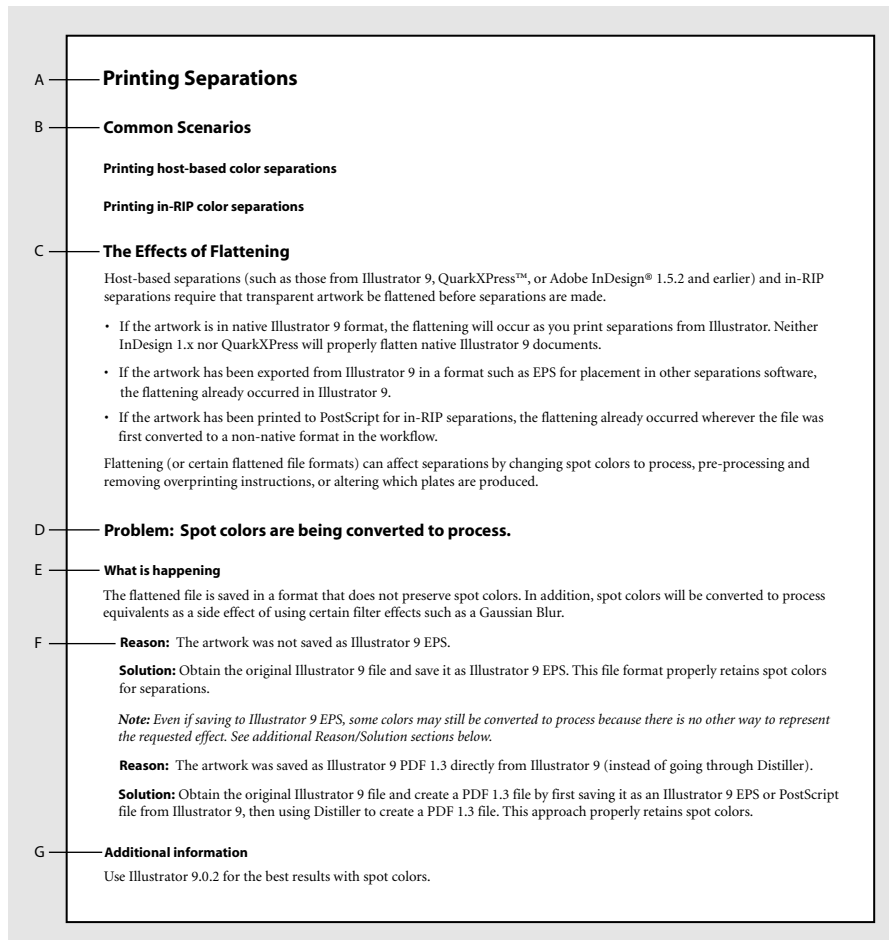
With pre-separated files, corrections can only be made by going back to a composite format. You cannot convert a spot color to process, fix a trap, change image resolution, or replace an image after separations are done. Similarly, flattening binds artwork into a representation that precludes making certain changes unless you return to the original version.

This is why it is so important to use Illustrator 9 native or Illustrator 9 EPS files. Illustrator 9 EPS lets you return to a live, unflattened version of the transparency to change not only the transparency attributes, but also the flattener settings for your particular output device.



## About these solutions

You are unlikely to encounter significant problems if you follow the recommendations in Section 1. However, when a file requires some special attention, you may find a solution for it here. Figure 2 illustrates the conventions used in this section to present the problems and solutions.



**Figure 2. How the Solutions Are Organized and Presented.**

- A.** Related Problems are organized by the Workflow Step at which they typically occur during prepress.
- B.** Each Workflow Step lists specific Common Scenarios in which the Problem will be encountered.
- C.** The “Effects of Flattening” explains how flattening can influence the expected output.
- D.** Each Problem statement has its own subsection.
- E.** “What is happening” gives a behind-the-scenes look at what is going on during flattening or printing.
- F.** Each Problem has one or more specific Reasons. Solutions are presented to correspond to each Reason.
- G.** Some Problems include related Additional Information at the end.

Table 1 summarizes the Workflow Steps in this section, the most common Problems you may encounter, and where to find potential Solutions.

**Note:** This section documents some of the most important and common problems of working with transparency files. Fixes for some of these will be addressed in future releases of Adobe software. You may, however, encounter other problems that have not yet been reported. If you can’t find a particular problem statement in here, look for an update to this document on the Adobe web site, or contact Adobe Technical Support for further assistance.

**Table 1: Workflow Steps That Can Be Affected by Transparency**

<b>Workflow step</b>	<b>Issues to know about</b>	<b>Potential Solutions</b>
Printing color separations (host-based or in-RIP)	<ul style="list-style-type: none"> <li>• Spot colors may convert to process</li> <li>• Overprinting instructions may be lost</li> <li>• Plates may be unexpected or missing</li> <li>• Black overprinting from RIP may not work</li> </ul>	<p>See page 15.</p> <p>See page 16.</p> <p>See page 16.</p> <p>See page 17.</p>
Creating proofs (composite desktop, composite digital contract, or film-based digital contract)	<ul style="list-style-type: none"> <li>• Composite proof may not show overprinting as it is seen on screen</li> <li>• Overprinting may not show for placed Illustrator 9 files.</li> </ul>	<p>See page 18.</p> <p>See page 18.</p>
Working with placed graphics	<ul style="list-style-type: none"> <li>• Graphics may not interact with transparent artwork</li> <li>• EPS graphics may print poorly</li> <li>• White box may appear in EPS graphics and cover objects beneath</li> <li>• Text converted to outlines may become bitmapped</li> <li>• Type over image may be rasterized</li> <li>• Placed native Illustrator 9 files may produce unexpected results</li> <li>• Duotones, DCS, etc., files will not print as part of transparency</li> </ul>	<p>See page 20.</p> <p>See page 21.</p> <p>See page 21.</p> <p>See page 22.</p> <p>See page 22.</p> <p>See page 22.</p> <p>See page 22.</p> <p>See page 23.</p>
	<ul style="list-style-type: none"> <li>• Spot colors or overprinting may not print from placed PDF 1.3 file</li> <li>• Placed PDF 1.3 file may print poorly</li> <li>• Placed PDF 1.4 may fail to place, print, or separate</li> <li>• Illustrator 9 screen redraw may be slow</li> </ul>	<p>See page 23.</p> <p>See page 24.</p> <p>See page 24.</p> <p>See page 24.</p>
Performing image replacement (OPI, APR, or manual)	<ul style="list-style-type: none"> <li>• Transparency with image may be poor or lost after replacement</li> <li>• Low-resolution version of image may print</li> </ul>	<p>See page 26.</p> <p>See page 26.</p>
Handling color conversions	<ul style="list-style-type: none"> <li>• Output device may not be able to reproduce some colors</li> <li>• Colors may become jaggy or irregular (color stitching)</li> </ul>	<p>See page 27.</p> <p>See page 28.</p>

## Printing Separations

### Common Scenarios

#### Printing host-based color separations

#### Printing in-RIP color separations

### The Effects of Flattening

Host-based separations (such as those from Illustrator 9, QuarkXPress™, or Adobe InDesign® 1.5.2 and earlier) and in-RIP separations require that transparent artwork be flattened before separations are made.

- If the artwork is in native Illustrator 9 format, the flattening will occur as you print separations from Illustrator. Neither InDesign 1.x nor QuarkXPress will properly flatten native Illustrator 9 documents.
- If the artwork has been exported from Illustrator 9 in a format such as EPS for placement in other separations software, the flattening already occurred in Illustrator 9.
- If the artwork has been printed to PostScript for in-RIP separations, the flattening already occurred wherever the file was first converted to a non-native format in the workflow.

Flattening (or certain flattened file formats) can affect separations by changing spot colors to process, pre-processing and removing overprinting instructions, or altering which plates are produced.

### Problem: Spot colors are being converted to process.

#### What is happening

The flattened file is saved in a format that does not preserve spot colors. In addition, spot colors will be converted to process equivalents as a side effect of using certain filter effects such as a Gaussian Blur.

**Reason:** The artwork was not saved as Illustrator 9 EPS.

**Solution:** Obtain the original Illustrator 9 file and save it as Illustrator 9 EPS. This file format properly retains spot colors for separations.

*Note: Even if saving to Illustrator 9 EPS, some colors may still be converted to process because there is no other way to represent the requested effect. See additional Reason/Solution sections below.*

**Reason:** The artwork was saved as Illustrator 9 PDF 1.3 directly from Illustrator 9 (instead of going through Distiller).

**Solution:** Obtain the original Illustrator 9 file and create a PDF 1.3 file by first saving it as an Illustrator 9 EPS or PostScript file from Illustrator 9, then using Distiller to create a PDF 1.3 file. This approach properly retains spot colors.

**Reason:** A filter effect, such as a Gaussian Blur, that does not preserve spot colors, was applied to one or more spot colored objects.

**Solution:** There is currently no workaround for this problem.

**Problem: Overprinting instructions are lost.****What is happening**

Either the flattened file is saved in a format that does not preserve overprinting instructions, or the file contains overprinting objects that fall completely or partially over the background of the file. Both of these scenarios only apply when the file contains both transparency and overprinting. Files that contain only overprinting will not be flattened and will retain overprinting instructions.

**Reason:** The artwork contained both transparency and overprinting and was not saved as Illustrator 9 EPS. All overprinting instructions were processed by the flattener and the results of overprinting simulated in the resulting file.

**Solution:** Obtain the original Illustrator 9 file and save it as Illustrator 9 EPS. This file format properly retains overprinting.

**Reason:** The artwork contained both transparency and overprinting but some of the overprinting objects (or portions of those objects) covered the background. The overprinting for those objects (or portions of those objects) was simulated by the flattener, and the corresponding overprinting instructions were removed.

**Solution:** There is generally no way to work around this problem unless overprinting instructions are re-applied to the affected objects after flattening. This is best done using options available from within your layout program or proprietary printing system. This limitation will be addressed in future versions of Illustrator.

**Additional information**

This problem also applies to Illustrator's Filter > Color > Overprint Black option.

**Problem: Unexpected plates are created, or expected plates are missing, when separations are generated.****What is happening**

The effects created by applying certain blending modes to overlapping objects may introduce process inks that the designer did not originally specify. For example, if a document that uses only cyan and black process inks includes objects to which the Difference blending mode has been applied, the result will be the unexpected introduction of magenta and yellow process inks. When the document is separated, four rather than two plates will be created.

**Reason:** The artwork uses Difference, Exclusion, Hue, Color, Saturation, or Luminosity blending mode.

**Solution:** Creation of or removal of process color plates is a side effect of the design decision to use these blending modes. Aside from consulting with your designer, there is no workaround for this issue.

**Problem: Black type overprinting specified with a proprietary printing system does not work.****What is happening**

Based on the flattener settings in effect at the time, some or all of the type in a document may have been converted into outlines or been rasterized. Proprietary systems that include options to set black type to overprint are therefore unable to recognize the type as type, so their setting does not work. As a result, the converted type will knock out whatever it is placed over in the final design.

**Reason:** Type was either rasterized or converted to outlines because the file is too complex, or the Quality/Speed setting is too low.

**Solution:** Obtain and open the original file in Illustrator 9 and review the Quality/Speed setting to be sure it is at level 5 (Highest Quality setting). If it is not, increase the Quality/Speed setting to level 5, resave as Illustrator 9 EPS, and try the black type overprinting again. Even at setting 5, the flattener may need to convert some type into outlines, in which case there is no other workaround to this problem.

## Creating Proofs

### Common Scenarios

#### Creating composite desktop proofs

#### Creating composite digital contract proofs

#### Creating film-based digital contract proofs

### The Effects of Flattening

Some composite printing/proofing systems can improve on the normal simulation of spot colors by using additional inks or colorants to extend the CMYK color gamut. Many other composite proofing devices rely on proprietary color conversion methods to convert custom spot colors into a proofing device's reproducible color range or gamut. The composite usually matches on-press results better.

For either system to work, the device's PostScript interpreter must be able to read the spot color names from the print stream. However, if flattening has converted spot colors to process color equivalents, the spot color names and color values are stripped out from the print stream, and the device's color engine cannot perform the proper optimization or transformation. Therefore the results of a composite simulation may not be as good as those normally achieved with these special classes of composite printers.

**Problem: The composite proof and on-screen preview of overprinting from Illustrator 9 do not match.****What is happening**

Overprinting instructions that the flattener would normally process before printing a file are being ignored because of options set in the print dialog box.

**Reason:** This occurs when printing composites from Illustrator 9 with the “Ignore Overprinting in Composite Output” setting turned on.

**Solution:** Make a new composite proof from Illustrator 9 with the “Ignore Overprinting in Composite Output” option turned off (Print dialog box, Adobe Illustrator 9 panel).

**Problem: A placed EPS file printed as a composite proof does not show overprinting.****What is happening**

The receiving application is interpreting the EPS in a way that ignores the pre-calculated overprinting preview color information in the file. Instead, the application is using the file’s embedded color-separations information for printing the composite. There is nothing wrong with the exported EPS, and it will separate correctly. Only the preview is being affected.

**Reason:** The receiving application cannot read the EPS file’s overprinting preview information.

**Solution:** The file will separate correctly: this is only a problem with the composite preview, and can, in effect, be ignored. If you need a proof of just the EPS file showing overprints, you can print the composite from a different application, such as Illustrator 9.x, that can read the pre-calculated overprinting preview color information. However, if you need a proof of the EPS in context, there is currently no specific workaround for this issue.

## Working with Placed Graphics

### Common Scenarios

#### Placed graphics used as part of transparent art in Illustrator 9

#### EPS, native Illustrator 9, and DCS/multi-tone graphics placed from Illustrator 9 into other applications

#### Placing PDF 1.3 files

#### Placing PDF 1.4 files

### The Effect of Flattening

There are two circumstances that can create transparency-related issues with placed graphics (EPS, JPEG, PDF, and others):

- A graphic is being included as part of the transparent artwork in Illustrator 9 or a transparent-savvy application. Graphics must be embedded into Illustrator 9 for the flattener to process them correctly with the rest of the transparency.
- An Illustrator 9 graphic containing transparency is saved as EPS for placement into another application that does not understand transparency (such as InDesign 1.5 or QuarkXPress). For some EPS formats from Illustrator, such as those meant to be compatible with earlier versions of the application (e.g., Illustrator 8) or PostScript Level 1, flattening can change spot colors to process, remove overprinting instructions, or alter which plates may be produced. It may also produce poor-quality output, such as shifts in resolution or color stitching.

***Note:** An Illustrator 9.x EPS file contains an EPS (PostScript) portion and a native Illustrator 9.x portion. When an Illustrator 9.x EPS file is placed in any application other than Illustrator, only the EPS portion is used. Which Illustrator version you prefer to work with determines your control over flattening. If you request Illustrator 8 EPS files, instruct your customers to adjust the Quality/Speed and resolution settings to suit your needs. You will be unable to adjust these settings after the file is saved in Illustrator 8 EPS (unless you have access to the original Illustrator 9 file and can resave it). If you request Illustrator 9 EPS files, you can add value to your services, and reserve the option to re-open and adjust values as needed.*

#### A special note on Illustrator 9 EPS

Illustrator 9 EPS is encoded with two different PostScript descriptions of the colors used:

- A description for separations, in which spot colors are retained but flattened (i.e., the plates cannot be changed).
- A description for composite output, in which overprinting is simulated and spot colors are converted to process to match what is on screen.

Additional PostScript logic built into the file automatically determines which description to use when the EPS file is RIP'd. This logic correctly recognizes “composite separation” devices, such as Extreme and PostScript 3 RIPs, and chooses the color description that is suitable for making separations.

For more information, see also “Using Image replacement” in Section 2.

## Problem: Graphics or images placed into Illustrator 9 do not interact with transparent artwork when printed.

### What is happening

The artwork is ignored by the flattener for inclusion in the transparency, and the element is printing at the bottom of the page layering.

**Reason:** The file is linked to, instead of embedded in, the Illustrator 9 artwork. (The flattener does not interact with linked files.)

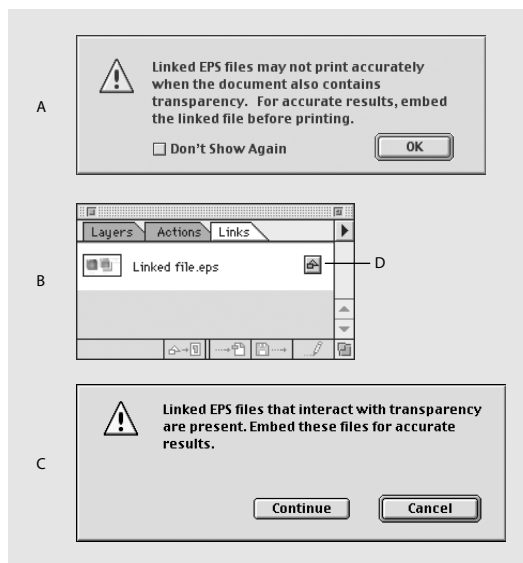
**Solution:** Obtain the original Illustrator 9 document and graphic or high-resolution image, embed the graphic/image into the document (Links palette, Embed Image command), and print from Illustrator 9 or resave it as Illustrator 9 EPS.

**Note:** Any EPS that is pre-separated (such as DCS artwork) or is a multi-toned image (such as duotones, tritones, and quadtones) will not embed in Illustrator 9. The solution described above of embedding an EPS to get proper transparency interaction will not work with these kinds of EPS files. If the source file for the linked DCS is available, reopen the DCS file in the application that created it, and resave it in another format that Illustrator 9 can embed.

### Additional information

It is possible that your customers will have only placeholder images in the file, so you will need to handle graphics replacement step yourself. If final color and artwork is being prepared off-site, you will need to obtain these files before proceeding.

As shown in Figure 3, if you do not embed the EPS graphic, Illustrator will display a warning when you place the graphic anywhere in a document that contains transparency effects, and again when you print the document if the linked graphic actually interacts with transparency. A small warning icon will also appear to the right of the EPS graphic's name in the Links palette if that graphic interacts with transparency. Moving the placed graphic so that it no longer interacts with transparency causes the warning icon to disappear. (There may be a delay before this icon appears or disappears from the palette.)



**Figure 3**

- A. If you attempt to link an EPS file into an Illustrator document that contains transparency anywhere, Illustrator displays a warning.
- B. If the linked EPS actually interacts with the transparency, it presents an icon in the Links palette.
- C. When you print you will get another warning. The document may not print correctly unless you first embed the EPS graphic.
- D. This icon indicates that the placed EPS interacts with transparent artwork.



**Problem: Placed EPS graphics print poorly.****What is happening**

The flattened EPS file contains rasterized regions or color information that is inappropriate for the final output device, resulting in problems such as resolution and color stitching artifacts within the transparent areas.

**Reason:** The Quality/Speed and Rasterization Resolution settings in effect during EPS export were not optimized for the output device.

**Solution:** If the file is an Illustrator 9 EPS (or the original Illustrator 9 file is available), open it in Illustrator 9, reset the flattener's Quality/Speed and Rasterization Resolution settings, and resave the file as Illustrator 9 EPS. See Section 3 for how to change these settings.

**Reason:** The original Illustrator 9 file contained files that are linked to, instead of embedded in, the Illustrator 9 artwork. (The flattener does not interact with linked files, so it cannot produce the proper EPS output.)

**Solution:** Obtain the original Illustrator 9 artwork and graphics, embed the graphics into the document (Links palette, Embed Image command), and print from Illustrator 9 or resave it as Illustrator 9 EPS for placement in the other application.

**Problem: A white box appears around a placed EPS and covers other objects in the layout.****What is happening**

During export, the flattener processes transparency against an imaginary white background—the art board—and fits an opaque white rectangle (a matte) tightly around the artwork. In some cases, this rectangle may be insignificant. In others, it may cover a large area relative to the artwork it contains. When the flattened artwork is subsequently placed in another layout, the matte may obstruct other design elements in the layout. This is particularly noticeable when the art uses live transparency effects, such as drop shadows, that are at the outermost edge of the graphic's area.

**Reason:** The flattener has created a rectangular white matte around the transparency, but the matte is still visible beyond the edges of the transparent effect.

**Solution:** There is no way to avoid creating the matte during flattening. However, flattening the artwork using the highest Quality/Speed setting (level 5) can, in some cases, reduce the size of the matte and solve the problem.

If you are already using level 5 to flatten, then your only choice is to recreate the graphic to mimic the desired final of the art on the page. This involves recreating the placed graphic to include the design elements from the page layout program that will be covered by the rectangular white matte, and then resaving and placing the new graphic. To do so, edit the original Illustrator 9.x file or EPS graphic and incorporate copies of the affected page layout design elements (if possible). If these cannot be copied, you can recreate the affected layout design elements from scratch in Illustrator. In some cases, you may be able to use Photoshop for the same purpose.

**Problem: Text converted to outlines is bitmapped.****What is happening**

Transparent areas can be flattened using a resolution that is different from that used in the document as whole. If the flattener's Rasterization Resolution setting is lower than the resolution required by the final output device, and lower than the document at large, these areas may appear bitmapped and jaggy.

**Reason:** The flattener settings are not appropriate for the resolution and quality required by the output device.

**Solution:** Open the Illustrator 9 EPS or native Illustrator 9 file, increase the Rasterization Resolution and Quality/Speed settings to match the requirements of the output device, and export as Illustrator 9 EPS.

**Note:** *The Rasterization Resolution should not literally match the resolution of the output device. Rather, it should match the resolution you would use to reproduce images on that device (i.e., lpi x 2). See "Resolutions and their interactions in Section 3 for details.*

**Problem: Transparent type over an image is rasterized.****What is happening**

A region of the image transparency is too complex for the given Quality/Speed setting, and the flattener has rasterized some or all of it, including any transparent type in the region.

**Reason:** The Quality/Speed setting is too low (e.g., 2, 3, or 4).

**Solution:** Obtain the Illustrator 9 EPS or original Illustrator 9 artwork and high-resolution image, increase the flattener's Quality/Speed setting to level 5 for maximum quality, and print from Illustrator 9 or resave it as Illustrator 9 EPS.

**Problem: A placed native Illustrator 9 file produces unexpected results on screen and in print.****What is happening**

Native Illustrator 8 files and earlier were based on PostScript and could be parsed by any application that can read EPS files. Native Illustrator 9 files, by contrast, base the description of their graphic objects on the PDF 1.4 language, not on PostScript. Thus applications that try to import the document in its native format (i.e., PDF 1.4) cannot get the right results. This issue will disappear as more applications begin to support PDF 1.4.

**Reason:** The application cannot support the PDF 1.4 file format that is used for native Illustrator 9 files.

**Solution:** Open the file in Illustrator 9 and export as Illustrator 9 EPS for placement in another application.

**Problem: DCS, duotones, tritones, and quadtones do not print as part of a transparency.****What is happening**

The artwork is not being seen by the flattener for inclusion in the transparency, and the graphic is printing at the bottom of the page layering.

**Reason:** DCS (preseparated), duotone, tritone, and quadtone files (typically EPS, although multi-tone images may also be Photoshop or PDF) can only be linked to Illustrator artwork and be passed on to the printing device; they cannot be embedded. However, files that interact with a transparency must be embedded for the flattener to process them.

**Solution:** For DCS images that use only process inks: If the source file for the linked DCS is available, reopen the source file in the application that created it, and resave it in another format that Illustrator 9 can embed (e.g., EPS). If you have the right software, you may be able to recombine the DCS file into a composite format, and resave it in another format that Illustrator 9 can embed.

For DCS images that use one or more spot color channels: If the source file for the linked DCS is available, reopen the source file in the application that created it, and resave it in another format that Illustrator 9 can embed (e.g., EPS).

For multi-tone images: There is no workaround for duotones, tritones, and quadtones, which are represented using spot-colored rasters.

**Note:** *Illustrator 7.x and later can separate linked DCS 1.0 files and multiple-file DCS 2.0 files that do not contain spot colors. Only Illustrator 8.x and later can separate linked single-file DCS 2.0 files or multiple-file DCS 2.0 files that contain spot colors.*

**Problem: Spot colors or overprinting does not print from placed PDF 1.3 files.****What is happening**

Spot colors and overprinting instructions are not being preserved in the PDF 1.3 file. (This is a side effect of Illustrator 9's PDF distilling process, not of the flattener.)

**Reason:** The artwork was saved as Illustrator 9 PDF 1.3 directly from Illustrator 9 (instead of going through Distiller).

**Solution:** Obtain the original Illustrator 9 file and create a PDF 1.3 file by first saving it as an Illustrator 9 EPS or PostScript file from Illustrator 9, then using Distiller to create a PDF 1.3 file. This approach properly retains spot colors.

**Tip:** *Acrobat 4 or 5 will tell you which application produced a PDF file (File > Document Info).*

**See also**

For more information on working with overprinting, see the problem statement "Overprinting instructions are lost" under "Printing Separations" in Section 2.

**Problem: A placed PDF 1.3 file prints poorly (e.g., resolution artifacts or color stitching).****What is happening**

The resolution settings or amount of rasterization done on the flattened file is creating abutting areas with different resolutions or color spaces.

**Reason:** The Quality/Speed or Rasterization Resolution settings that were in effect for flattening are inappropriate for the intended output device.

**Solution:** Obtain the original Illustrator 9 file set the proper Quality/Speed and Rasterization Resolution settings for the flattener (see Section 3 for details). Save the file as Illustrator 9 EPS, then use Distiller to create a new PDF 1.3 file.

**Problem: A placed PDF 1.4 fails to place, print, or separate.****What is happening**

All live transparency in the PDF 1.4 file is ignored by a receiving application that does not support live transparency (such as InDesign 1.5 or QuarkXPress). Symptoms include an opaque version of the transparency, failure to print, or other inconsistent or unexplained results.

**Reason:** The file was not saved in a flattened format that the application can import.

**Solution:** Open the PDF 1.4 file in Illustrator 9 and save it as Illustrator 9 EPS for placement in another application. If you prefer to place a PDF 1.3 file, first save the PDF 1.4 document as an Illustrator 9 EPS or PostScript file from Illustrator 9, then use Distiller to create a PDF 1.3 file.

***Note:** Any PDF 1.4 file that was created using Distiller 5 does not contain live transparency because PostScript or Illustrator 9 EPS files that are passed to Distiller are already flattened. For a PDF 1.4 file to retain live transparency, it must be created from Illustrator 9. Acrobat 5 can open, view, and print any PDF 1.4 file. When printed from Acrobat 5, the file's transparency will be flattened in the same way that it would be from Illustrator. See Section 3 for more details about the flattener settings in Acrobat 5.*

**Problem: Illustrator 9 screen redraw is slow when a document contains transparency.****What is happening**

Adding transparency to a document can sometimes affect how often, and how quickly, Illustrator's code redraws the screen as you move around in the application. In particular, having transparency in a file that also has several automatically updated linked graphics can cause the application to check for file updates more frequently than it might otherwise. Thumbnail previews of a transparency must also be updated each time an adjustment is made, which can slow down performance. The Illustrator 9.02 update provides many performance enhancements that improve screen redraw speeds.

**Reason:** You are not using Illustrator 9.02.

**Solution:** Download and install the free Illustrator 9.02 update from <http://www.adobe.com/products/illustrator/update.html>.

**Reason:** Illustrator is configured to automatically update linked objects when the original files change.

**Solution:** Configure Illustrator to Manually Update links or to Ask When Modified links occur. (File > Preferences > Files & Clipboard > Files > Update links pop-up menu.) These options control how often Illustrator 9 attempts to check linked files for changes, so they reduce the time required to redraw the screen. For more information on these preferences, see Illustrator 9 online Help: Setting Up Artwork in Illustrator > Managing linked and embedded images > Specifying how to update links.

**Note:** Any external graphics that are involved in a transparency must be embedded, not linked, to the Illustrator 9 file. See the problem statement “Graphics placed into Illustrator 9 do not interact with transparent artwork when printed” under “Working with Placed Graphics,” above.

**Reason:** The Layers and/or Transparency palette is configured to display thumbnail previews.

**Solution:** Turn off thumbnail previews. Choose Palette Options from the pop-out menu of the Layers palette, then uncheck Thumbnails > Layers. Choose Hide Thumbnails from the pop-out menu of the Transparency palette to turn off thumbnails.

## Using Image Replacement

### Common Scenarios

#### Using manual methods

#### Using server-based OPI image replacement

#### Using RIP-based APR image replacement (part of Scitex printing systems)

### The Effect of Flattening

Imported images are often involved in transparency. Customers may provide artwork with placeholder or sample images in place, expecting you to replace them with the high-resolution versions prepared separately. Flattening, however, only applies to whatever is present in the document at the time of flattening. This leads to two different issues:

- The flattener in Illustrator 9.x does not follow links, so all external files must be present—embedded—to ensure the proper and expected results. See “Working with Placed Graphics” in Section 2.
- The flattener can only operate on whatever data is present at the time a document is exported or printed. Replacing images that interact with transparency (or to which transparency effects, such as feathered edges, have been directly applied) after flattening will result in partial or total loss of the desired effect.

Image replacement is usually done automatically, using a system such as OPI or APR (part of Scitex Brisque) just before or as part of final output. Neither of these automatic methods occur before flattening. Therefore, image replacement when transparency is involved must as a rule take place well before final output.

**Problem: Transparency effects are poor or lost after image replacement.****What is happening**

The flattened file contains transparent areas that include low-resolution image information, and the high-resolution image is clipping out or replacing those areas, causing some effects to be lost or to appear “cut up” or “jaggy.”

**Reason:** The file was flattened using the low-resolution version of the image, then the image was replaced with a high-resolution version.

**Solution:** Obtain the Illustrator 9 EPS or original Illustrator 9 artwork and high-resolution image, manually embed the high-resolution image into the document (Links palette, Embed Image command), and print from Illustrator 9 or resave it as Illustrator 9 EPS.

**Problem: The low-resolution version of an image is printing.****What is happening**

The high-resolution image information is not available in the flattened graphic, and automatic image replacement is not working.

**Reason:** The file was flattened using the low-resolution version of the image, and saved in a format that the automatic system cannot read.

**Solution:** Obtain the Illustrator 9 EPS or original Illustrator 9 artwork and high-resolution image, manually embed the high-resolution image into the document (Links palette, Embed Image command), and print from Illustrator 9 or resave it as Illustrator 9 EPS.

## Handling Color Conversions

### Common Scenarios

#### Dealing with color gamut

#### Using color management

#### Avoiding color stitching

### The Effect of Flattening

The flattener causes colors to be converted in two ways that may not be desirable or expected:

- The color blending that occurs when rendering the appearance of transparency applied to objects may use a color space that does not provide a good match with the color gamut of the intended output device. For instance, colors may be converted from SWOP CMYK to Adobe RGB—two gamuts that do not generally match each other very well.
- Spot colors, whether they are used in transparency or not, are converted to process to avoid color stitching artifacts that can often result if they were only converted to process when they interacted with transparency. This only occurs if the user chooses to save the document in a format other than Illustrator 9.x native or Illustrator 9 EPS.

Color stitching may also occur where vectors and rasterized objects abut in a flattened file because some printer drivers and proprietary high-end printing systems use different color management algorithms for processing vectors and rasterized graphics. While not a new problem, it is more acute when transparency is involved.

For information on handling spot color conversions, see “Printing Separations” in Section 2.

### **Problem: The output device cannot reproduce some colors in the flattened document.**

#### What is happening

The flattener has created a new color to simulate the blend between two transparent objects, but it has used a color working space that does not match the color gamut of the intended output device.

**Reason:** The working space profile of the document is different from that of the intended output device.

**Solution:** Obtain the Illustrator 9 EPS or original Illustrator 9 artwork.

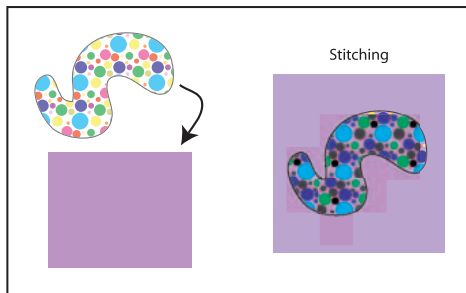
If you are using color management, choose a working space profile for the document that better or exactly matches final output conditions before flattening. This ensures that transparent objects are assigned suitable in gamut colors.

If you are not using color management, first make sure the document is using the correct color model for your intended output device (e.g., CMYK for an offset press using SWOP inks). If the results are still not acceptable, consider enabling the minimal amount of color management (by selecting the policy called “Color Management Off” in Illustrator and selecting a working space profile that matches your intended output device. See “Setting up color management” in the Illustrator 9.x Help document).

## Problem: Colors are jaggy and irregular (color stitching).

### What is happening

The flattener settings are causing regions to be cut up in ways that create visual discrepancies in colors that should otherwise match in the printed file (color stitching). The color areas appear jagged and may include unexpected or noticeable color transitions between raster and vector objects. See Figure 4.



**Figure 4**  
Color stitching looks like jaggies with color.

**Reason:** The Quality/Speed setting may be too low for the flattener to make good choices about how it defines which vector regions to rasterize.

**Solution:** Obtain the Illustrator 9 EPS or original Illustrator 9 artwork, increase the Quality/Speed setting up one level, and print from Illustrator 9 or export it as Illustrator 9 EPS. This is less likely to trigger rasterization as easily. An alternative is to use the lowest Quality/Speed setting (Lowest/Fastest) and rasterize all areas of the illustration that contain transparency, so that color stitching isn't an issue.

**Reason:** The printing device is making special optimizations for color depending on the type of object—e.g., image data is handled differently than vector data—or the printer has a particular color rendering dictionary enabled that is causing unexpected color output for vector and raster data. This is common for composite printers that allow for “intelligent” or “vivid” color treatment of images.

**Solution:** Disable these printer optimizations if possible before printing. This is usually done through a device-specific “tab” in an application's printer setup panel.



# Section 3: Controlling Flattener Settings & Results

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## About this section

This section explains how to flatten art in specific Adobe products, so you can make the best choices for your workflow or transparency job.

It is likely you will have to do the flattening to optimize transparent files for your target press conditions. You can either ask for native files and do the initial flattening in your shop, or you can open placed Illustrator 9 EPS files in Illustrator 9, flatten them again, and relink them in the layout.

If you receive PDF 1.4 files that contain live transparency (these files are not flattened<sup>4</sup>), you can also use Illustrator 9 or Acrobat 5 to flatten the file before or during printing. However, we recommend using Illustrator 9 because its editing and flattening options are more appropriate for high-end prepress workflows.

Ideally, all flattening should be done as close as possible to the end of your workflow. Until all prepress tools are transparency-aware, however, flattening will continue to occur upstream, when saving to Illustrator 9 EPS or other formats.

## What are your points of control?

All Adobe products use the same flattener technology, but the features are exposed differently. In general, the flattener uses four interrelated settings that fall into two categories:

- 1 Quality/Speed of the flattening—controls the tradeoff between how much of the transparency will be rasterized, and how fast the flattening process goes.
- 2 Resolutions used during flattening—controls what resolution (in pixels per inch) any rasterized transparent areas will receive during flattening. Three kinds of rasterization settings can come into play:
  - Rasterization Resolution—the resolution that the flattener applies to areas it needs to rasterize because they are too complex for the current Quality/Speed setting. The Rasterization Resolution is intended primarily for vector objects, but in some cases it may also be applied to type or images.
  - Raster Effects Resolution—the resolution that is applied to all raster effects (e.g., drop shadows or vignettes) that have been used in the file, whether or not they are involved in the transparency.
  - Mesh Resolution—the resolution applied to any meshes and gradients that are involved in the transparency.<sup>5</sup>

How the flattener applies these three settings is explained in this section under “Resolution settings and their interactions” on page 31.

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4. Only PDF 1.4 files that are produced directly from Illustrator 9 will remain unflattened and retain their live transparency. PDF 1.4 files that were created using Distiller are flattened and any transparency is no longer live.

5. The Mesh Resolution setting is not new with transparency. This setting manually controls the resolution of all meshes printed to PostScript Level 1 and Level 2 RIPs that do not support the PostScript 3 “Smooth Shade” operator. The Mesh Resolution setting is completely ignored when mesh objects are not involved in transparency and are printed to a PostScript 3 RIP.

Your degree of control over flattening can also depend on the complexity of the original transparency content, and which file format was used to save the flattened document. Much like when compressing a JPEG file you choose between quality and compression, with flattening, you may have to trade off among many attributes.

#### **ADOBE APPLICATIONS DIFFER IN THEIR SUPPORT FOR LIVE TRANSPARENCY**

Adobe software currently supports transparency at varying levels. Some applications can create, print, and save (flatten) transparency for use in other applications. Some merely accept that flattened information as imported files and pass it along for printing. Others can both accept native files with live (unflattened) transparent objects and support their manipulation and adjustment within the layout.

Currently, full support for live transparency exists only in Illustrator 9. Adobe Acrobat 5 also supports live transparency in the form of PDF 1.4, but is missing one flattener control—Rasterization Resolution—that Illustrator provides.

## **Quality/Speed settings**

During processing, the flattener subdivides the artwork into specific regions and examines each region to determine if it has any transparent objects. For every region containing transparency, the flattener assesses whether the objects involved can be kept in their original form (e.g., vectors as vectors, type as type), whether they can be converted to a related form (e.g., type to outlines), or whether that entire region must be rasterized because of its complexity.

The Quality/Speed setting lets you determine how hard the flattener will work to keep objects in their original form. Table 2 explains the five settings in detail, but in general:

- At Lowest/Fastest (setting 1), the flattener rasterizes all information in the file.
- At Highest/Slowest (setting 5), the flattener tries to keep all transparency information in its original form. The flattener may not be able to represent all objects as vectors, however.
- Intermediate settings affect the degree to which the flattener rasterizes (or does not rasterize) complex areas of a transparency, as determined by the number of paths, the number of objects, the degree of overlap between the objects, and the type of objects in that area.

The complexity of the document is the primary influence on flattening. In some cases, there may be no difference among the results you get with settings 2 through 5. In general, we recommend using only setting 1 or 5. Setting 1 is most appropriate for proofing to a low-resolution device. Setting 5 is best for final high-resolution work.<sup>6</sup> Some regions that involve many intersecting transparent objects must be rasterized no matter what setting you select. Experiment with the settings to find the best result for your printing environment.

### **File size tradeoffs**

In the end, choice of the Quality/Speed setting may not actually provide control over printing speed as indicated. For example, at the Lowest /Fastest setting, the entire document is rasterized, increasing the resulting file size. If the flattened file becomes large enough, printing speed actually decreases, as it takes longer to load and increases the burden on the RIP's memory.

6. As an alternative to using setting 5, some customers use setting 1 to create final output for files that contain no spot colors. This rasterizes all the artwork (i.e., there can be no PostScript errors). However, it is even more important that low-resolution proxy images are replaced with embedded high-resolution final versions before flattening. You will also be unable to alter the file after it is flattened.

**Table 2: The Quality/Speed Settings for the Flattener**

Setting	General Effect	When to use it	Notes
Setting 1 Lowest/Fastest	Rasterizes all artwork according to Rasterization Resolution settings.	To print or export very complex artwork with many transparent objects; for low-resolution proofs of complex transparencies.	At higher resolutions, the size of saved files or print spool files may be large and may take longer to print.
Setting 2 Lower/Faster	Retains simple vector objects, but rasterizes more complex areas involving transparency.	To print artwork containing only a few transparent objects, or when you are working on a system with low memory.	For Illustrator 9 files, some printing devices may produce color stitching and make hairlines (lines that are a device pixel wide) appear thicker or disappear, depending on print order. <sup>a</sup>
Setting 3 Medium/Medium	Retains most objects as vector data, but rasterizes very complex transparent regions.	To achieve a balance between the speed of the flattening process and the number of regions that are rasterized.	This is the default position. It reduces color stitching and hairline weight issues for some printers.
Setting 4 Higher/Slower	Retains most of the illustration as vector data, and rasterizes only extremely complex areas. To minimize any color stitching artifacts, rasterized areas are clipped to the affected objects' paths (unless the resulting clip would be too complex).	To achieve a higher quality scalable output.	This position reduces color stitching and hairline weight issues for some printing devices.
Setting 5 Highest/Slowest	Retains vector data to the greatest extent possible.	To achieve the highest quality resolution-independent output and least image degradation.	This setting the most time- and memory-intensive for flattening complex illustrations.

a. This problem is corrected in Acrobat 5 and will be corrected in Illustrator 10.

## Resolution settings and their interactions

Rasterizing primarily occurs during flattening in two cases:

- **When rasterizing atomic regions.** Flattening divides the transparency of a document into a collection of discrete areas called atomic regions. Any atomic region that contains an image and/or multiple gradient or mesh objects will be rasterized. The flattener usually applies the Mesh Resolution to this area, unless the atomic region has one or more images, in which case it applies the maximum of their resolutions, up to the current Rasterization Resolution. The flattener also clips the resulting raster with the affected region's outline, thus preserving all vectors in a resolution-independent form. Rasterizing atomic regions can happen at Quality/Speed settings 2 through 5.
- **When rasterizing a complexity region.** A complexity region is an area in the document that is too complex to retain objects in vector form—it has too many objects and would take too long to flatten. Therefore the region needs to be rasterized. Rasterizing this area involves rasterizing all the vector objects, images, and text inside the area. Scalable vector objects are rasterized at the Rasterization Resolution. It is therefore critical that the Rasterization Resolution be set to a value that closely matches the characteristics of the chosen output device. See below, “What settings are right?” for details.

When text in a transparency must be converted to outlines but the font is not available (for example, the font is protected), the flattener will treat the text as a regular image and rasterize it using the current Rasterization Resolution setting.

Similarly, any raster-based live effects (which are already rasterized with the Raster Effects Resolution before flattening) are treated by the flattener as regular images.

Note that the flattener may also rasterize regions that include objects set to overprint. When this happens, the flattener first creates a set of objects that simulate the mixing of inks that would have occurred on press and then creates the rasterized region. (For more details on overprinting see “Overprinting may not be preserved:” on page 6 of this document.)

### What settings are right?

If a file comes in as a native Illustrator 9 file or an Illustrator 9 EPS file, you can change the resolution settings and flatten the file to match target press conditions. Any other file format is already flattened in way that locks down the resolution for rasterized areas. The important thing to remember is that, whenever possible, you should set the resolutions to accommodate your target press conditions before flattening.

*Note: Choosing a higher resolution may increase the size of the resulting flattened file—depending, of course, on how much of the artwork is actually rasterized.*

Here are some rules of thumb (your workflow requirements may vary):

- **The Rasterization Resolution** would equal your standard image resolution, such as the customary formula, Line Screen  $\times 2$ . As explained under “A final word about images and transparency” below, you must carefully choose a value for this setting to avoid resampling of an image in a transparency. Alternatively, you could use a value equal to the full resolution of the intended output device. Bear in mind that this approach may significantly increase the size of the flattened document.
- **The Raster Effects Resolution** would match what is commonly used for drop shadows created in Photoshop (e.g., 150 dpi). This resolution applies to all raster effects used in Illustrator, including live raster effects and resolution-dependent filters (e.g., Gaussian Blur). Changing this setting may radically change the appearance of some raster effects.
- **The Mesh Resolution** would equal what you typically use when printing documents that contain meshes and gradients to Level 1 or 2 RIPs that do not support the Smooth Shade operator. Location of this setting varies by application.

Keep in mind that the flattener applies the Rasterization Resolution to all rasterized image data it finds in a region—whether that setting is higher, lower, or equal to the image data’s original resolution. Therefore, images and live raster effects may occasionally be inappropriately up- or downsampled for the final output device. This is especially likely if the resolution values among the images, flattener, and/or final output device differ significantly.

You can either make sure the Rasterization Resolution is appropriate for the device before flattening, or make sure that image data starts at a resolution that has the least discrepancy with the Rasterization Resolution. For example, a 300dpi drop shadow created in Photoshop that gets resampled at 600dpi during flattening will look better than a drop shadow that started at 72dpi. A close match among the Raster Effects Resolution, image resolutions, and Rasterization Resolutions, all of which should be appropriate to the final output device, is best.

In general, the higher the Rasterization Resolution setting, the better the results (especially for flattened type). However, choosing a very high Rasterization Resolution, such as 2400dpi, will often generate significantly larger intermediate files, but may have no visible effect on the quality of the output. Some trial and error may be needed.

### A final word about images and transparency

It is important to understand that rasterizing affects everything in the region that is being rasterized—including bitmap (already rasterized) images. If a part of an image is involved in a rasterized region, that part will get resampled during flattening, using the Rasterization Resolution (if it falls into the complexity region). At other times it may get re-rasterized at a different resolution (if it is part of an atomic region that gets rasterized). When this resolution is lower than the image’s resolution, that part of the image will be resampled (usually downsampled) and you will get stitching artifacts. To avoid this, be sure to set the Rasterization Resolution to the same resolution as the final version of the image, and to replace all proxy images with final images before flattening. (See “Using Image Replacement” in Section 2.)

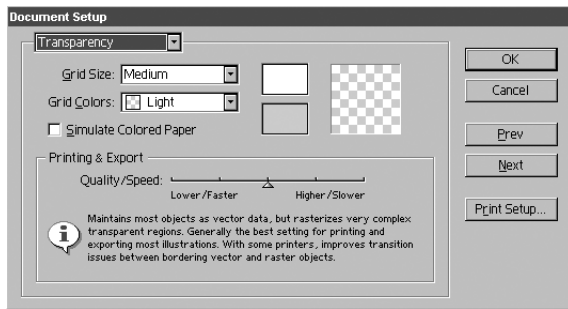
## The flattening controls in Adobe products

While all Adobe products apply the same flattener technology, their user interfaces differ in which flattener controls they expose and how they are implemented.

### Controls in Adobe Illustrator 9.x

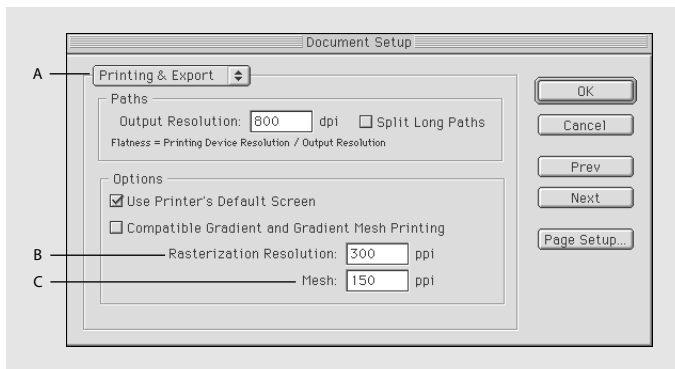
Illustrator 9 has three locations for controlling the settings that affect flattened transparency:

- Quality/Speed slider — File > Document Setup, Transparency panel:



The Transparency panel in Illustrator’s Document Setup dialog box provides a slider for controlling how much of the art gets rasterized during flattening.

- Rasterization Resolution and Mesh Resolution — File > Document Setup, Printing & Export panel:



- A. Use the Printing and Export panel in Illustrator’s Document Setup dialog box.
- B. To set the Rasterization Resolution.
- C. Mesh Resolution.



