

The Flattening Preview Palette

Lubomir Bourdev

September 5, 2001

The Flattening Preview palette allows the user to visually preview the expected result when flattening transparency (usually as part of printing to a PostScript printer). This interactive, near-realtime feedback increases the predictability of the flattening process, simplifies the print workflow and allows for a more targeted control over the flattening parameters.

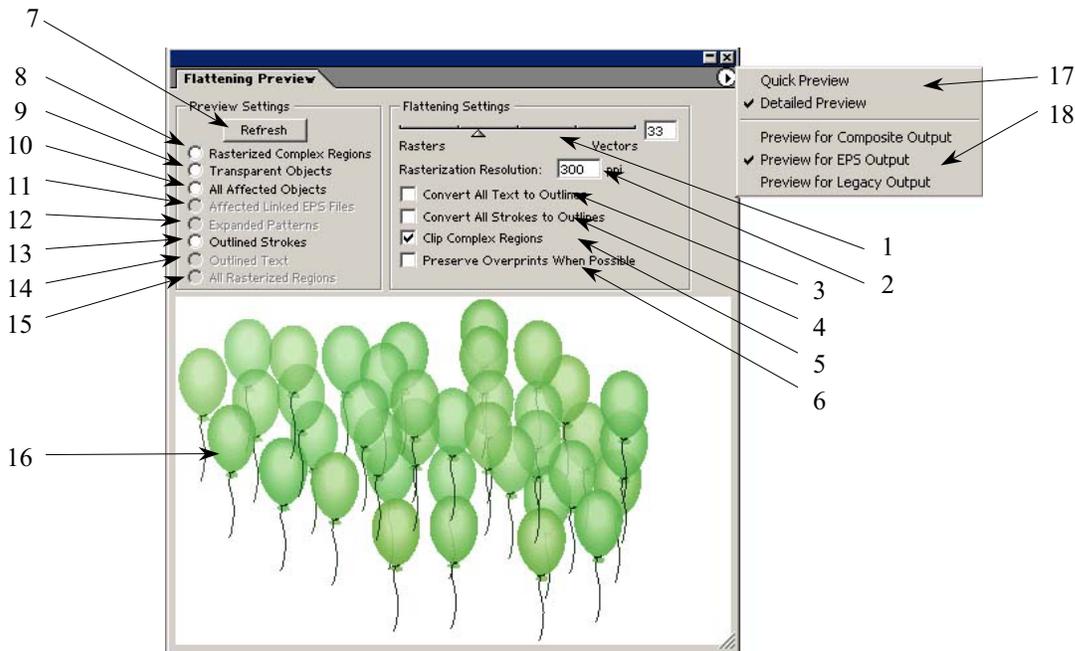


Figure 1. The Flattening Preview Palette

The Flattening Settings (items 1..6)

The flattening settings (items 1..6) in the palette are identical to those in the Document Setup dialog; changing the controls in the palette results in changing the controls in the Document Setup dialog and vice versa. The Ignore Overprinting in Composite Output checkbox mirrors the one in the Print Dialog. (The flattening settings are duplicated in the palette because making quick changes is more convenient and doesn't require opening a modal dialog).

Note that for documents that don't contain transparency, and therefore don't require flattening, the flattening settings are ignored. You can use the "Transparent Objects" preview option (item 9) to determine whether the document contains transparency.

Flattening Slider (item 1)

Flattening a document involves breaking the overlapping transparent objects into small pieces. For most documents, the number of such pieces and the time to compute them is reasonable, but some complex documents result in many thousands of such pieces, many of which may be smaller than a pixel. Flattening such documents may take considerable time and resources and, for some print jobs, it might be better to

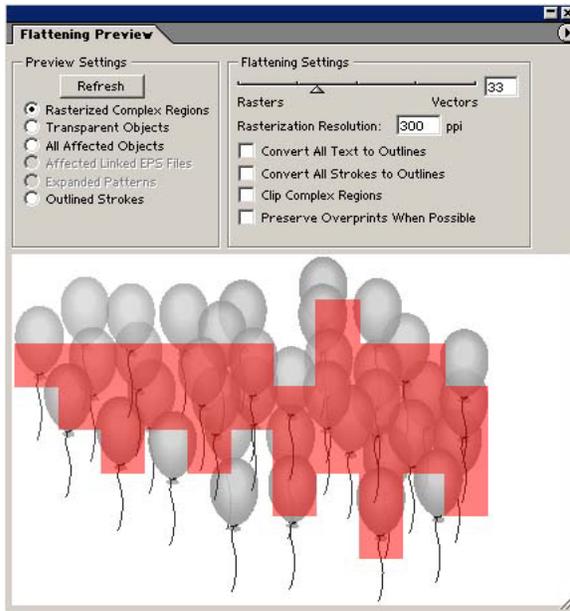


Figure 2. Previewing the areas in the document that would be rasterized for performance reasons.

settings only areas that contain transparent objects may get rasterized. When the slider is in the leftmost position (0), all objects, transparent or not, will get rasterized.

For fairly complex files flattening at the rightmost position is usually slower, but for simple files it is generally faster compared to flattening at the leftmost position.

You can use the “Rasterized Complex Regions” radio button (item 8) to preview the areas that will get rasterized for performance reasons (see Figure 2).

Rasterization Resolution (item 2)

The rasterization resolution is the resolution that is used to rasterize complex areas, as described in the previous section. The default value of 300ppi is usually appropriate. However if small fonts or fine objects will get rasterized, or if the output is a high quality print, higher values (600ppi or more) are necessary. Using very high values is not recommended, as it can degrade performance and increase spool size without noticeable quality improvement. The Flattening Preview palette does not preview how the areas will rasterize at the current rasteration resolution. Changing the rasteration resolution has no effect on the flattening preview, but it is important parameter for the flattening process and is included for completeness.

“Clip Complex Regions” Checkbox (item 5)

When we need to rasterize for performance reasons, as described in the previous sections, we rasterize all objects in a given region in the document. The document is divided into an invisible grid and only some cells in this grid, where complexity is high, get rasterized. This type of rasterization can result in objects some parts of which get rasterized and others remain in vector form. The vector/raster boundary follows the invisible grid and not existing objects’ paths (see Figure 2). Many printer drivers process rasters differently from vectors – they have special “Vivid Color” or “Intelligent Color” options for better previews of photos. (usually those settings are on by default, sometimes such settings are set in the printer itself, and in some cases disabling them is not possible). Therefore rasterizing for performance reasons, as described above, can be a source of stitching problems along the vector/raster boundary.

rasterize very complex areas in the document, rather than trying to preserve them in vector form. Such rasterization, however, can occasionally degrade the quality of the print job.

Choosing whether and how aggressively to rasterize depends on the user’s intent (fast proof vs. high-quality print), the time and computing resources available.

The flattening slider in Illustrator 10 controls the degree of rasterization of complex areas in the document. The rightmost position (100) is the default and the recommended one. In this position no areas in the document will get rasterized for performance reasons. (Note that some rasterizations may still happen because there is no other way of representing the result in PostScript, as described in the section for the All Rasterized regions event). The intermediate positions (1..99) result in rasterizing areas that are complex and preserving simple ones in vector form. For example, a single transparent pattern may be preserved intact, while portions of overlapping patterns may get rasterized. In the intermediate

The Clip Complex Regions checkbox allows us to significantly minimize and usually eliminate any visible stitching problems by clipping the rasterized areas along the paths of existing objects. Since there is already color discontinuity along objects' paths, any such stitching problems will not be noticeable. This checkbox should be used with caution because in some cases it may result in extremely complex clip path that can take significant time to compute and may result in errors when printing.

You can use the “Rasterized Complex Regions” radio button (item 8) to preview the clipped rasterized complex regions when this checkbox is checked. Figure 3 illustrates what happens when we enable this checkbox for the same file shown on Figure 2.

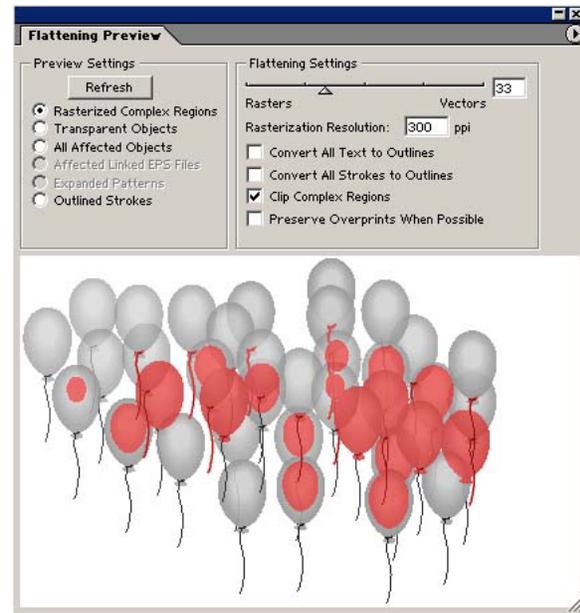


Figure 3. The rasterized complex regions when “Clip Complex Regions” is enabled.

“Convert All Text to Outlines” Checkbox (item 3)

Usually text is preserved in native form after flattening. There are some cases where text will be converted to outlines – when it is used as a clip, when it has a pattern fill or a stroke, when it is used in a very complex region and interacts with many other transparent fonts. Sometimes only portions of a transparent text that overlap gradients or images may get converted to outlines.

Small fonts converted to outlines may appear noticeably thicker, especially in lower-end printing systems. Use the Convert All Text to Outlines to convert all text to outlines in the document, which will result in consistent appearance for all text. This option, however, may make small fonts less readable and may significantly degrade flattening performance in documents that have a lot of text. It is often preferable to manually convert to outlines only selected text objects.

You can use the “Outlined Text” radio button (item 14) in Detailed Preview mode to see where text gets converted to outlines.

“Convert All Strokes to Outlines” Checkbox (item 4)

Usually only strokes involved in transparency are converted to outlines and the ones not involved are preserved in native form.

A thin stroke converted to outline may look slightly thicker, especially in lower-end printing systems. In some documents where we have thin strokes next to each other some of which are involved in transparency, the discrepancy may be noticeable. Use the Convert All Strokes to Outlines checkbox to convert all strokes in the document to outlines, which will result in their consistent thickness. This option, however, changes the appearance of strokes and may significantly degrade performance in documents that have a lot of strokes. It is often preferable to manually convert to outlines only selected strokes.

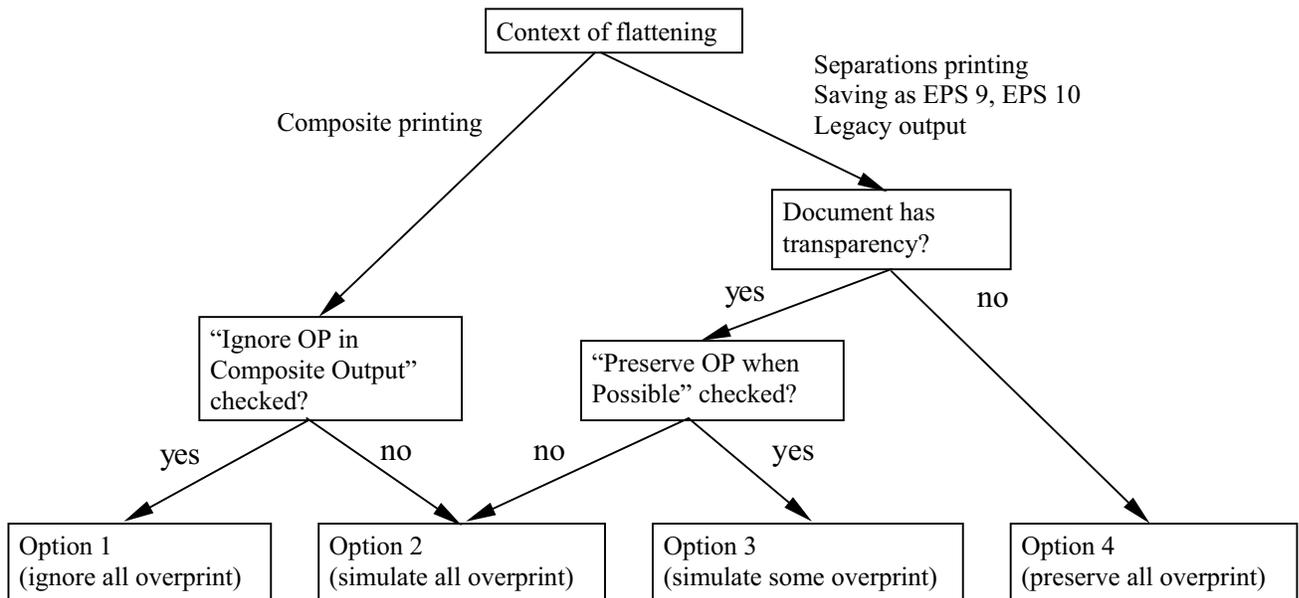
You can use the “Outlined Strokes” radio button (item 13) to preview which strokes get converted to outlines.

“Preserve Overprints When Possible” and “Ignore Overprinting in Composite Output” Checkboxes (item 6)

There are four options for treating overprint:

1. *Ignore overprint instructions for all objects.* This is useful, for example, to preserve the legacy AI8 behavior when printing to a composite printer (composite printers usually ignore overprint instructions).
2. *Simulate the appearance of overprint (flatten the overprint) for all objects.* This option is useful when simulating overprint to a composite printer. This option causes overprint to be treated as a special blending mode, and all overprinted objects will be treated as transparent. Notice that this option will cause documents containing overprint, but otherwise opaque, to be flattened (unless we are printing to separations). Notice also that flattened overprint will not work against a new background if the flattened file is placed in an aggregate application.
3. *Simulate overprint for objects involved in transparency, but preserve native overprint instructions for objects not involved in transparency.* This option makes sense when printing to a separations printer, in which case simulated or native overprint will end up producing the same appearance. By preserving some objects’ overprint in native form, we are decreasing the set of objects involved in transparency, and thus improving the performance of flattening and quality of the output. **CAUTION:** If you intend to save the file to EPS 9 or 10 and place it in an aggregate application, use this option carefully as it may produce unexpected results – since some overprint will be preserved and some flattened, the effect is that only some objects will overprint against the background in the aggregate application.
4. *Preserve native overprint for all objects.* This option is only possible for documents that contain no transparency.

Which option is in effect depends on the context of flattening, the Ignore Overprinting in Composite Output checkbox, and the Preserve Overprints When Possible checkbox. This can be determined by the following diagram:



The context of flattening can be selected from the palette’s menu.

Why Some Flattening Settings are Disabled

The flattening settings apply to the current document. When no document is open all flattening settings are disabled.

When the flattening slider is at the rightmost position (100), we will never rasterize for performance reasons and therefore in this case the Rasterization Resolution and the Clip Complex Regions checkbox are disabled. (In general if in the current settings we don't rasterize for performance reasons, these settings are irrelevant). When the slider is at the leftmost position (0) the entire document will be rasterized. Therefore all four flattening checkboxes (items 3..6) are disabled.

When flattening for legacy output all text gets converted to outlines. In this case the Convert All Text to Outlines checkbox is checked and disabled.

The Preview Settings (items 7..18)

The preview settings allow you to preview whether and where in the document certain events take place. You can use this information to make changes to the flattening controls or the document. Press the Refresh button (item 7) and in a few seconds the current document will be displayed in the preview window (item 16). If the document contains no transparency, all event radio buttons will be disabled. Otherwise, only radio buttons for events that take place in the document will be enabled. If you select an event, the preview will turn black and white, and the area where the event takes place will be marked in color. You can pan and zoom in the preview window, but be sure to have the entire document in view when previewing an event, so that you can see all regions where the event takes place.

Sometimes an event radio button may be enabled, and yet previewing the event will not show any areas. This could happen if the areas where the event took place are completely hidden behind opaque objects.

When the document or flattening settings change, the preview is no longer accurate and the preview window will be cleared. You will need to refresh the preview again.

Quick vs. Detailed Preview Mode (item 17)

Most of the preview events can be computed very quickly. The “Outlined Text” (item 14) and “All Rasterized Regions” (item 15) events, however, may take significant amount of time to compute and are only available in the Detailed Preview mode. Use that mode only if you need to preview these two events. The quick preview is as accurate as the detailed preview.

Selecting the Flattening Output Context (item 18)

The result of flattening and the set of flattening controls depend on the context in which the flattener is used. The palette allows for previewing three different contexts:

- *Preview for EPS Output*
This is the context of saving an EPS file, but it is very similar to separations printing and it usually can provide reliable preview of flattening when printing to separations. Note that the printable layers settings in the separations setup dialog are ignored and “Printable, Visible Layers” is assumed.
- *Preview for Composite Output*
This is the context of printing to a composite printer. In this mode overprint behavior is controlled by the “Ignore Overprinting in Composite Output” checkbox in the Print dialog, which is mirrored in the palette (item 6). For more information on this checkbox, please refer to the checkbox description below.

- *Preview for Legacy Output*
This is the context of saving as AI8, PDF 1.3, EPS 8, and the “Flatten Transparency” command. For this workflow all text is converted to outlines and the corresponding checkbox is checked and disabled.

Previewing the flattening process when printing to a non-PostScript printer is not supported.

“Rasterized Complex Regions” Radio Button (item 8)

Use this radio button to preview which areas in the document will get rasterized for performance reasons. The boundary of the previewed area has a higher probability for stitching problems (depending on the print driver settings and the rasterization resolution). You may use the “Clip Complex Regions” checkbox to minimize the possibility of stitching problems. You may want to increase the Rasterization Resolution if small fonts fall into the rasterized areas. If a small font, or a fine stroke, is partially rasterized, you may want to convert it to outlines beforehand. Another option is to change the area that will get rasterized by readjusting the flattening slider.

“Transparent Objects” Radio Button (item 9)

Use this radio button to preview which objects are sources of transparency. If there are no such objects, the document will not be flattened and the flattening settings are not relevant.

The most common source of transparency are transparent objects, objects with blending modes or opacity masks. Certain styles and effects may contain transparency inherently. Overprinted objects may be treated as sources of transparency if they are involved in transparency or overprint needs to be flattened.

“All Affected Objects” Radio Button (item 10)

This option shows all objects that are involved in transparency. That includes transparent objects and objects that are overlapped by (or very close to and later in paint order than) transparent objects. The previewed objects will be affected by the flattening process – their strokes or patterns will be expanded, portions of them may get rasterized, etc. These transformations are captured by the next five events.

“Affected Linked EPS Files” Radio Button (item 11)

This option shows all linked EPS files that are affected by transparency. In Illustrator such files will be printed first, under all other objects. To prevent this you may consider expanding those linked files.

“Expanded Patterns” Radio Button (item 12)

This option shows all patterns that get expanded because they are involved in transparency.

“Outlined Strokes” Radio Button (item 13)

This option shows all strokes that get outlined because they are involved in transparency or the “Convert All Strokes to Outlines” checkbox is checked. Outlined strokes may appear slightly different than native ones, especially very thin strokes and when printed to lower-end printers. To maintain stroke consistency you may consider manually converting certain strokes to fills or selecting the “Convert All Strokes to Outlines” checkbox (see its description for the consequences). The preview does not show how the appearance of strokes changes when they get converted to outlines.

“Outlined Text” Radio Button (item 14) (available in Detailed Preview mode only)

This option shows all areas where text is converted to outlines. Text converted to outlines may appear slightly different than a native text, especially small fonts and when printed to lower-end printers. To maintain text consistency you may consider manually converting certain text to outlines or selecting the “Convert All Text to Outlines” checkbox (see its description for the consequences). The preview does not show how the appearance of strokes changes when it gets converted to outlines.

“All Rasterized Regions ” Radio Button (item 15) (available in Detailed Preview mode only)

In some cases some objects or intersections of objects need to be rasterized because there is no other way of representing them in PostScript. The simplest example of this is the intersection of two transparent gradients. Such type of rasterization is not controlled by the flattening slider and can happen even at its rightmost (100) position.

Rasters of this kind are clipped along objects’ paths. The objects that get rasterized contain no edges and are usually gradients or gradient meshes with low color frequency and the Gradient Mesh Resolution from the Document Setup is usually used. (unless images are involved). Therefore such rasters are usually not a source of stitching or quality problems.

Note that this option shows all cases where rasterization happens during flattening. It does not show objects that are rasterized upstream and are not re-sampled during the flattening process (such as regular images or live effects not involved in transparency).

What the palette does not preview

The palette does not preview how rasterized areas would look like with the current rasterization resolution (no matter how much you zoom, you will never see rasterized pixels).

You cannot preview any stitching problems, as these depend on the print driver settings. (however you can preview the areas where stitching problems can potentially happen).

The preview does not show how the appearance of a stroke or text changes when they get converted to outlines.

The preview does not provide any feedback as to how much time and memory the flattening process would need and how long the spool file will be. Certain options can significantly affect performance and the near-realtime preview may be misleading that flattening will be quick too.

The preview is not intended for precise previewing of how spot colors, overprint or certain blend modes will look like. Please use the Overprint Preview mode in Illustrator to properly preview spot colors, overprint and blending modes as they would appear on the printout.

Previewing the flattening process when printing to a non-PostScript printer is not supported.