

User Guide

Inklination® FineArt 3D

version 1.4



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Inklination's pen-and-ink technology is covered by U.S. Patent No. 5847712.

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Foreword

Nowadays, three-dimensional computer graphics and digital technologies seem to have relegated traditional illustration to infrequent uses. That's a shame. For sure, photo-realism and cool digital effects have an important role to play. But traditional illustration has much to offer too. Indeed, through the years, professional illustrators have developed many techniques that they commonly use to convey their subject clearly. By combining these techniques with the appeal of artistic rendering, they are able to create images that are both clear and visually appealing.

InkInkination FineArt 3D is our way to bring traditional pen-and-ink illustration to 3D computer graphics. With this tool, it is possible to create traditional illustrations from 3D CAD models. We made two important decisions when we designed this product: (1) that it would be a plug-in renderer, rather than a stand-alone product, and (2) that, when faced with the choice, we would emphasize rendering quality over rendering speed.

The first decision has two important consequences. First, the many users of Quick-Draw 3D-savvy applications can quickly start working with FineArt 3D, without having to learn a new 3D environment. Second, we can deliver this product as a low-cost add-on, rather than a more complex, and therefore more expensive, application.

The second decision influences the way you work with FineArt 3D. Indeed, complex 3D models may take a little while to render; but we think that the result is worth it.

The release of InkInkination FineArt 3D would not have been possible without the help of many individuals. InkInkination would like to thank Taweewan Siwadune and Jeremy Salesin. We are also very grateful to Richard Diehl and Robin Landsbert, and all our beta testers, including Michael Leckman, Barry Maggert, Robert Pederson, and CJ Shumate. The pen-and-ink technology was invented in the Department of Computer Science and Engineering at the University of Washington, by a very dynamic group of people that included David Salesin, Michael Salisbury, Sean Anderson, Ronen Barzel, and Georges Winkenbach.

Happy rendering,

Georges Winkenbach, Ph.D.
President
InkInkination, Inc.

For more information about InkInkination and other exciting illustration products, visit our Web pages at <http://www.inkInkination.com>.

System Requirements

InkInclination FineArt 3D (thereafter referred to as FineArt 3D) has the following minimum system requirements:

- A Macintosh computer with a PowerPC processor (PPC 603 or faster recommended).
- Mac OS 8.0 or newer.
- QuickDraw 3D 1.5.4.
- A client application that support QuickDraw 3D plug-in renderers.
- Enough memory to run the host application with an extra 10 to 20 MB left for QuickDraw 3D.
- A display with thousands or millions of colors.

Notes

1. Quickdraw 3D 1.5.4 is bundled with QuickTime 3, which can be downloaded free of charge from Apple's Web site at <http://www.apple.com/quicktime>.
2. The amount of memory that FineArt 3D requires depends on the complexity of the 3D model, the size of the rendering window, and whether shadows are also rendered. Several more megabytes of memory may be required for rendering complex and large images.
3. Rendering high-resolution pen-and-ink images requires applications that support InkInclination's FineRes™ technology. As of February 3rd, 1999, Microspot has pledged support for FineRes with 3D World 3.1 due out soon. (For a most up-to-date list of application supporting FineRes™, check our Web site at <http://www.inkInclination.com>).

Installing InkInclination FineArt 3D

If you downloaded FineArt 3D from the Internet

Depending on what Internet browser you are using, and how it is setup, you may end up with one of three items: a folder named "Ink_FineArt 3D folder," a binhex file named "Ink_FA3D_10.hqx," or a self-extracting archive named "Ink_FA3D_10.sea."

If you have the folder, you are ready to install and you can proceed to Section *Easy Installation with the Installer* below.

If you have a binhex archive, you can use a utility such as Aladdin Systems StuffIt Expander™ or MindVision Software MindExpander™ to decode the binhex file and obtain a self-extracting archive.

Finally, if you have the self-extracting archive, you can simply double-click on it to run it like an application. You will be prompted for a location where to save the extracted

files. When the extraction is complete, you will have a folder named “Ink_FineArt 3D folder.”

Easy Installation with the Installer

The easiest way to install FineArt 3D is to double-click on the Installer application and follow the instructions. Note that the installer will quit all currently running applications, so you should save your work first.



Double-click on *Installer* to install Inklin-
ation FineArt 3D on your startup drive

Registering Inklination FineArt 3D

About the Trial version

The trial version of FineArt 3D is fully functional; but it prints a “demo” watermark on every rendering. To eliminate this watermark, you must buy a registration key from Inklination. As a registered user, you will also be able to buy future upgrades of this product at a special price.

How to register

To register FineArt 3D you first need to purchase a registration key from Inklination. This can most conveniently be done on-line by visiting Inklination’s home page at <http://www.inklination.com>.

Once you have a registration key, bring up the *Renderer Options* dialog (see Section “Fine Art 3D Rendering Options” on page 12). Enter your name, customer key and registration key in the corresponding fields, and click the *Register* button. That’s it! You now have a fully enabled copy of FineArt 3D.

Technical support

Technical support is available on-line from Inklination’s Web pages at [http://www.inkli-
nation.com](http://www.inkli-
nation.com). Technical support is also available by phone and fax, from Monday through

Friday from 9:00AM to 5:00PM Pacific time. Please, have your customer key ready when you call us, or write it on you fax.

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What's New

Version 1.4

Version 1.4 is significantly speedier, up to twice as fast depending on the model and rendering style. We've also added a feature that makes it possible to generate high-resolution images with some applications that do not support our FineRes technology. Finally, we've also corrected a number of small bugs.

Version 1.3

We decided that an and illustration program should have an elegant user interface. So, for version 1.3, we upgraded the UI. It is now attractive; but it hasn't lost its simple functional layout. Version 1.3 is also optimized so that applications that render large images by tiling several horizontal bands will work significantly faster. This new feature is especially useful with Microspot's 3D World. Finally, this new version also fixes a bug that would cause the renderer to sometimes freeze when a large object hides another object containing many small polygons.

Version 1.2

Version 1.2 brings many improvements:

1. FineArt 3D is now fully compatible with MetaCreations' Infini-D 4.5.
2. We fine-tuned the crosshatching algorithm and the strokes. The strokes are now spaced closer together in light areas. These changes should yield better results when using the default 'Thin' stroke thickness.
3. We fine-tuned the outline strokes. Outlines now look smoother, resulting in finer illustrations.
4. Polygons and shapes assigned the 'edges' fill-style are now rendered as outlined only. This is useful for applications such as 3D World that use the 'edges' fill style for grids.
5. A bug that caused incorrect shading with spot lights has been fixed.
6. A bug that caused spurious outline edges in VectorWorks, with orthographic cameras, has been fixed.
7. A bug that would cause the renderer to crash, most notably with Infini-D, has been fixed.

Version 1.1

Version 1.1 brings two new features. They are *Special Lighting Styles*, and *Custom Colors*. *Special Lighting Styles* consists of three new illumination models, High Contrast, Overexposed, and Bright Sun. Their aim is to make it easier to create elegant pen-and-ink images from 3D models that have been conceived for photo-realistic rendering. These lighting styles are described in detail in Section "Lighting styles" on page 14. *Custom Colors* allows you to choose any color for the paper (background) and ink. It's described in Section "Custom colors" on page 16.

Another important change in version 1.1 is the use of temporary memory. Until now, FineArt 3D used the application's memory. From version 1.1, it uses temporary memory instead. In most cases, you should not notice the difference. However, if you run out of memory, the remedy is now different. See Section "Problem: frequent blank renderings" on page 24 for the new memory-usage directives.

Version 1.1 also includes a number of improvements and bug fixes. Most of these improvements, as well as the new features, are the direct result of customer feedback. Please, keep your comments coming our way, so that we may continue refining this product.

What Is InkInclination FineArt 3D

FineArt 3D is three things at once:

- **A pen-and-ink renderer** – it uses a new, patented technology to create images that resemble traditional pen-and-ink illustrations.
- **A plug-in renderer for QuickDraw 3D** – as such, it requires both QuickDraw 3D and a host application that knows how to use plug-in renderers.
- **A non-interactive renderer** – depending on the speed of your computer, the complexity of the 3D model, the rendering options that you have selected, and the size of the rendering window, FineArt 3D can take from a few seconds to several minutes to generate an image.

These three characteristics, as well as the host application, have some implications on the way FineArt 3D is used. In the next few sections, we'll examine how FineArt 3D is used from some of the most common QuickDraw 3D host applications. In each case, we'll examine how to render with FineArt 3D, how to open the *Renderer Options* dialog, and some of the pitfalls to look for.

Using FineArt 3D with Microspot 3D World

To render with FineArt 3D:

1. Choose *Renderer Options* in the *Palettes* menu to open the *Renderer Options* palette.
2. In the *Renderer Options* palette, click on the *Renderer* pop-up menu, and select *FineArt 3D*.

To open FineArt 3D's Options dialog:

Continuing from step 2 above, click on the *Options* button in the *Renderer Options* palette.

Known Issues

- If you are using 3D World 3.0, you should turn off the grid before rendering with FineArt 3D.
- You may find the Interactive module, which is part of the optional Pro-Pack family of plug-in modules for 3D World, very useful. It automatically switches to the Interactive renderer when an object is manipulated, and then re-renders with FineArt 3D. Another very useful module is *Use Offscreen*, which reduces the number of redraws.

Using FineArt 3D with Diehl Graphsoft Minicad 7

To select FineArt 3D as the QuickDraw 3D renderer:

1. Choose *Document Preferences* in the *File* menu.

-
2. Click on the *QD3D* tab button.
 3. Click on the *Rendering Engine* pop-up menu and select *FineArt 3D*.

To open FineArt 3D's Option dialog:

Continuing from step 3 above, click on the *Options* button.

To render with FineArt 3D:

1. Click *OK* to close the *Document Preferences* dialog.
2. Choose *Rendering* → *QuickDraw 3D* from the *View* menu.

Using FineArt 3D with Diehl Graphsoft VectorWorks 8

To render with FineArt 3D:

Choose *Rendering* → *FineArt 3D* from the *View* menu.

To open FineArt 3D's Options dialog:

View *FineArt 3D* still selected as the renderer, choose *Rendering* → *FineArt 3D Options* from the *View* menu.

Using FineArt 3D with MetaCreations Infini-D 4.5

To render a view with FineArt 3D:

1. Select the view you wish to render.
2. Click on the *Display* command tab in the Command Floater.
3. In the *Render* area, choose either *Flat*, *Gouraud*, or *Phong* from the left pop-up menu.
4. Also in the *Render* area, choose *Inklination FineArt 3D* from the right pop-up menu.

Infini-D automatically presents FineArt 3D's options dialog before rendering the current view.

To use FineArt 3D with Infini-D's Final Renderer:

1. Choose *Render* in the *File* menu.
2. In the *Render* panel, make the following selections: (1) choose either *Flat*, *Gouraud*, or *Phong* from the *Quality* pop-up menu; (2) choose *Inklination FineArt 3D* from the *Renderer* pop-up menu.
3. In the Image panel, choose either Millions, Thousands, or 256 from the Depth pop-up menu.
4. Click on either *Render* or *Add to Queue*.

Note that the choices mandated in the four steps above are essential to render successfully with FineArt 3D. However, the *Final Render* setup dialog offers more options, such as for example *Output Size*, which you can set much as you would for any other type of rendering.

Know Issues

1. **When rendering with shadows, you must enable *backfaces* for all the objects in the scene. When backfaces are not enabled, Infini-D does not send all the geometry to the renderer. The result is partial or missing shadows.**
2. Infini-D 4.5 does not keep track of progress correctly when rendering with FineArt 3D.
3. If the amount of memory on your Mac allows it, go in the *Preferences* dialog, click on the *Rendering* tab, and set the *Block Sizes* to *Gargantuan* (far right). In most cases, FineArt 3D will render much faster.
4. When rendering with the final renderer, be sure to follow the recommendation in Issue 3 above. If Infini-D is allowed to render an image by tiling with smaller blocks of pixels, incorrect shadows and visible seams may occur. That is because Infini-D tries to outsmart the renderer by sending it only the objects that are visible within a given tile. Unfortunately, objects outside the tile may cast shadows. If these objects are not made available to the renderer, their shadow will be missing. Setting the block size to *Gargantuan* insures that Infini-D renders the entire image as a single block of pixels.
5. You can not use *Command-period* to interrupt long renderings in Infini-D. However, you can switch to another renderer in the middle of a long rendering with FineArt 3D just as you would with any other renderer. (You may need to hold the mouse down on the renderer popup list for a few seconds.)

Using FineArt 3D with Artifice Design Workshop 1.8

To render with FineArt 3D:

1. Choose *Lights & Textures* from the *View* menu to create a shaded rendering.
2. Choose *Rendering* → *Renderer* → *FineArt 3D* from the *View* menu.

To open FineArt 3D's Options dialog:

Continuing from step 2 above, choose *Rendering* → *Renderer* → *Configure Renderer* from the *View* menu.

Know Issues

The sky and ground backdrops tend to yield poor pen-and-ink renderings, and therefore should be disabled. To disable them, choose *Sun & Shading Settings* from the *Arrange* menu and deselect *Draw Sky Backdrop* and *Draw Ground Backdrop*.

Using FineArt 3D with Vertigo 3D Hot Text 1.5

To select FineArt 3D as the renderer:

1. In the Vertigo 3D HotText window, click on the *Scene* tab.
2. Choose *Fine Art 3D* from the *Final Render* pop-up menu.

To open FineArt 3D's Options dialog:
Continuing from step 2 above, click on the *Options* button.

To render with FineArt 3D:
Click on the *Preview* button on the left-hand side of the Hot Text window.

Known Issues

Vertigo Hot Text does not support directional lights. Therefore, you will not be able to render shadows with FineArt 3D.

Using FineArt 3D with Autodesys Form-Z 2.9

To select FineArt 3D as the renderer:

1. Choose *Display Options* from the *Display* menu.
2. Click on the *QuickDraw 3D Options* button.
3. Choose *Inkination FineArt 3D* from the *Rendering Type* pop-up menu.

To open FineArt 3D's Options dialog:
Continuing from step 3 above, click on the *Options* button.

To render with FineArt 3D:
Choose *QuickDraw 3D* from the *Display* menu.

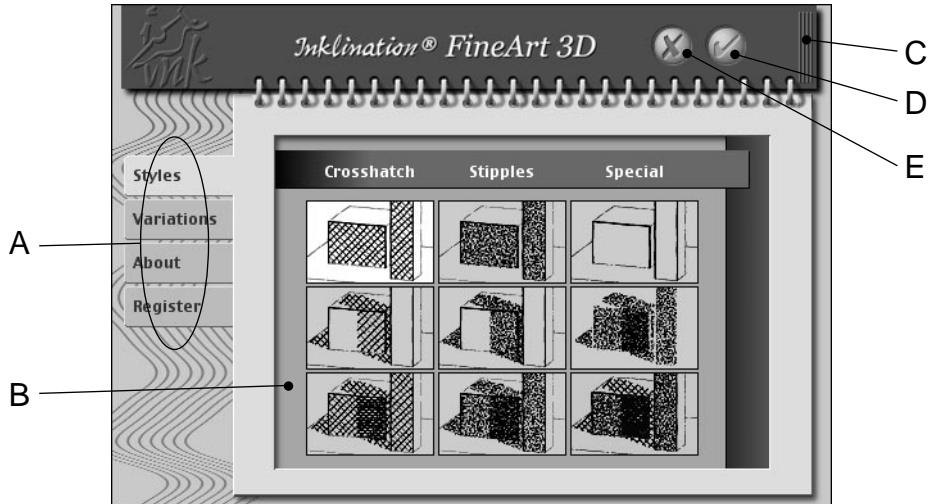
Known Issues

1. Saving the content of the rendering window to an image file does not work well in Form-Z 2.9 when rendering with QuickDraw 3D (the problem occurs with any QuickDraw 3D renderer, not just FineArt 3D). To save the rendered pen-and-ink image, used *Grab Image* from the edit menu, and paste the image into an image-editing application such as Adobe Photoshop.
2. In Form-Z' *QuickDraw 3D Rendering Options* dialog, remember to check the *Render Using Smooth Shading* option.
3. Form-Z tends to re-render the content of the window often when QuickDraw 3D is selected for rendering. With a non-interactive renderer such as FineArt 3D, it can cause annoying lags and slowdowns. To avoid this problem, remember to switch back to wireframe rendering once you are done with the pen-and-ink image.

Fine Art 3D Rendering Options

FineArt 3D is designed to be simple to use. All rendering options are available through two easy palettes: the *Style* palette and the *Variations* palette. Both palettes are accessible from the *Renderer Options* dialog.

Anatomy of the Renderer Options Dialog



The main elements of the Options dialog are:

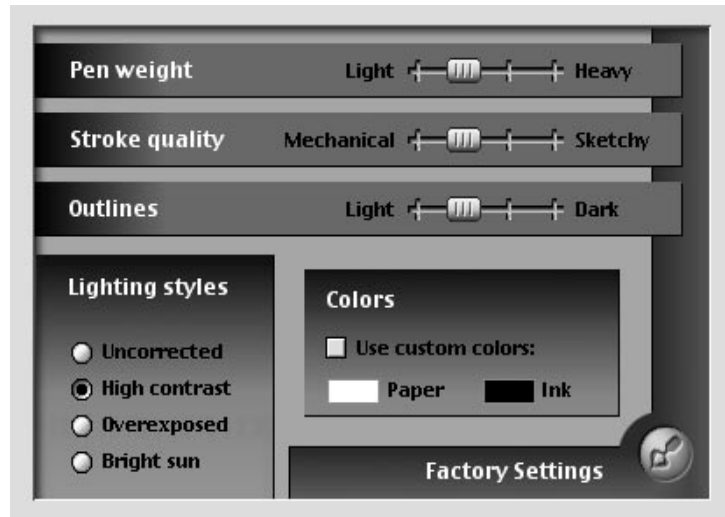
- A **The Tab buttons** – click on one of these tabs to bring up the corresponding palette.
- B **The palette area** – changes according to which tab is clicked. This example shows the *Styles* palette.
- C **Drag bar** – click on this bar to drag the dialog to a different position. (The drag bar is only available with some host applications.)
- D **Apply button** – click on this button to confirm the dialog selection and return to the host application.
- E **Cancel button** – click on this button to cancel the dialog, discard all the changes, and return to the host application.

Styles Panel

The *Styles* palette offers nine different rendering styles to choose from. The styles vary from one another by what type of marks – crosshatch or stipple marks – is used for rendering tone values, and whether shading, shadows, and/or outlines are rendered.

The styles available in the first column of buttons use crosshatch to generate tone values. From top to bottom they are: (1) shading only, (2) shadows only, and (3) shading and shadows. The second column of buttons offers the same options, but using stipple marks instead of crosshatch for creating tone values. Finally, the third row offers special styles, which are: (1) outlines only, (2) stipple marks for shading and shadows with no outlines, and (3) stipple mark for shading and crosshatch for shadows.

Variations on Rendering Styles

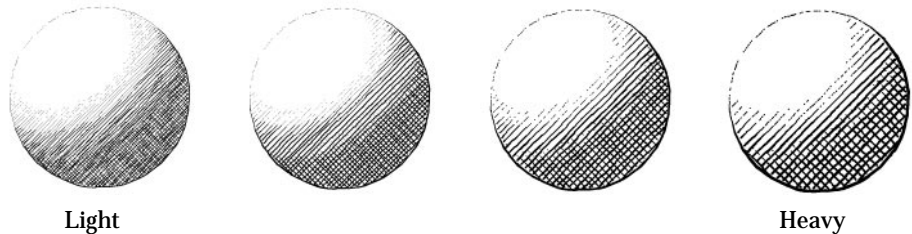


The variation palette lets you modify the different rendering styles with options that affect the weight of the pen used for tracing strokes, the quality of the strokes used for rendering crosshatch and outlines, the darkness of the outlines, the lighting style, and the colors used for creating the image.

Pen weight slider

As its name indicates, this slider affects the weight of the pen use for drawing the strokes.

Pen thickness samples:



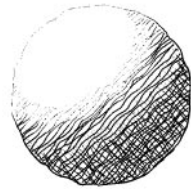
Stroke quality slider

This slider controls how much caffeine FineArt 3D consumes before rendering the image. When set to Mechanical, FineArt 3D is caffeine-free. At the other extreme, when the slider is set to Sketchy, FineArt 3D consumes at least five cups of caffeine-loaded java before getting to work.

Stroke quality:



Mechanical



Sketchy

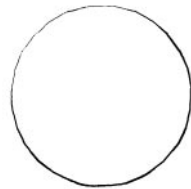
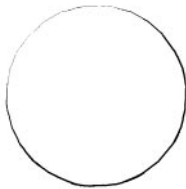
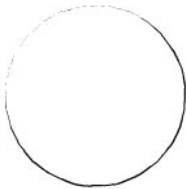
Outlines slider

This slider affects the darkness of the strokes used for outlining the different shapes in the 3D scene.

Outline darkness:



Light



Dark

Lighting styles

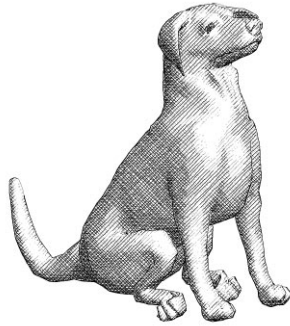
The various lighting styles are explained and compared in the following table:

Lighting styles:



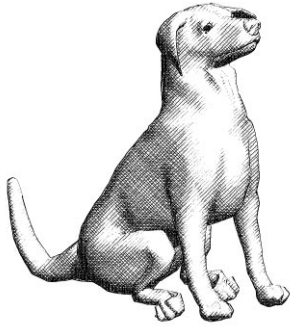
This image shows the 3D model rendered with a traditional shaded renderer (in this case, QuickDraw 3D Interactive).

Lighting styles:



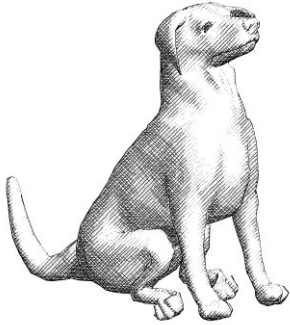
Uncorrected

The Uncorrected setting creates an images whose tone closely mimics that of the shaded rendering.



High contrast

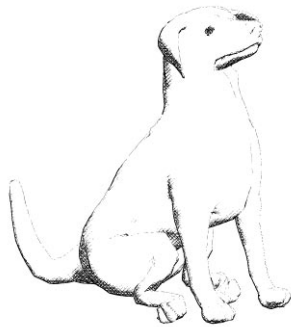
The high-contrast mode brightens light areas and darkens dark areas. It is the default lighting mode.



Overexposed

This mode brightens light areas and leaves dark areas untouched.

Lighting styles:



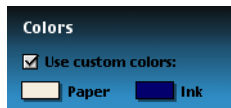
Bright sun

This setting affects only the light that is designated as the shadow caster, also called the sun. It effectively boosts the intensity of the sun, so that any surface that is exposed to it becomes washed out. It is useful for special effects and architectural rendering.

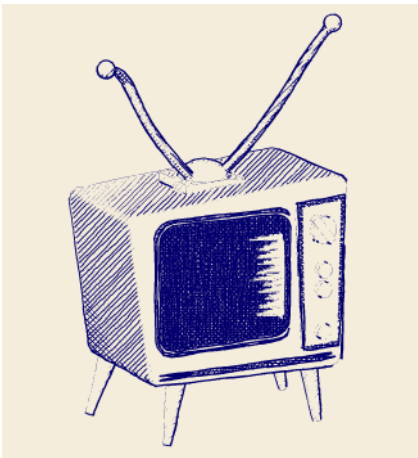
Custom colors

FineArt 3D supports colors other than black and white for the ink and paper.

To use custom colors:



First check the *Use custom colors* box. Then, click on each color swatch to choose custom colors for the ink and paper.

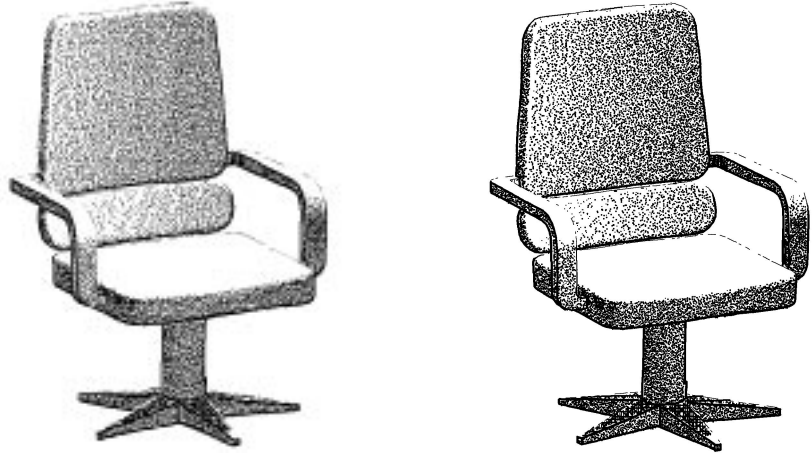


All subsequent renderings will use the selected colors. To return to black-and-white rendering, simply check-off the *Use custom colors* box.

Creating High-Resolution Pen-and-Ink Images

FineArt 3D is based on Inklination's FineRes™ technology. This technology offers several advantages:

-
1. Images rendered with FineRes™ look consistent at all resolutions. When rendered at high-resolutions – 300 dot per inch and above – images are crisp and closely resemble what you get on-screen.



Inklination's FineRes™ technology provides consistent results at all resolutions. The image on the left shows the original rendering as it appears on-screen. The image on the right shows the same image rendered at 600 dpi. (Note: you need to print this page to better appreciate the quality of the 600 dpi image.)

2. Rendering large high-resolution images uses less memory with FineRes™.
3. Finally, rendering large high-resolution images is faster with FineRes™.

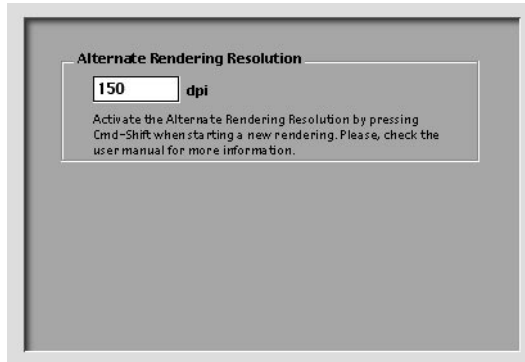
FineArt 3D can only take advantage of FineRes™ when the host application has been updated to support it. Fortunately, it takes relatively little effort to make use of it, and we expect that application developers will update their products quickly.

What to do if your host application does not support FineRes™

As of January 27, 1999, Microspot has implemented FineRes™ in 3D World 3.1 due out later in 1999. If you are using a different host application, that does not yet support FineRes™, let the manufacturer of that product know that you would like them to take advantage of this technology.

Alternately, with some applications, you can use the Alternate Rendering Resolution feature available in the Expert Panel. This feature is described in detail in the next chapter.

Alternate Rendering Resolution (ARR)



The Alternate Rendering Resolution (ARR) feature, found in the *Expert* panel, provides a way to generate high-resolution pen-and-ink images from some host applications that do not support Inklinator's FineRes technology. Using this feature successfully requires some care; you must manually synchronize the resolution at which the application thinks it is rendering, with the resolution at which FineArt 3D is actually rendering¹. However, it is well worth the effort.

In most cases, using ARR involves three main steps:

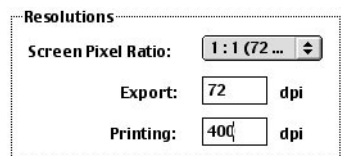
1. Select an image or printing resolution in the host application.
2. Set the Alternate Rendering Resolution in FineArt 3D to the same value.
3. Activate ARR when generating the image.

This process is explained in more details, for each application, in the following sections.

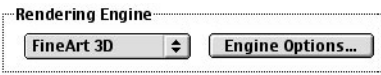
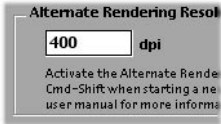
Printing high-resolution images with VectorWorks 8

To setup VectorWorks and FineArt 3D for high-resolution printing:

1. Choose Preferences → *Document Preferences* from the *File* menu. In the resulting dialog, select the *QD3D* panel. Set the printing resolution as desired (in this example, 400 dpi).



1. Applications that support FineRes do this automatically.

<p>2. Still within the <i>QD3D</i> panel, choose FineArt 3D from the <i>Rendering Engine</i> popup menu. Then, click the <i>Engine Options</i> button to bring up FineArt 3D's rendering options dialog.</p>	
<p>3. Click on the <i>Expert</i> tab to bring up the <i>Expert</i> panel. Set the <i>Alternate Rendering Resolution</i> to the same printing resolution you chose in Step 1 above.</p>	
<p>4. Close FineArt 3D's dialog by clicking on the <i>Apply</i> button, and VectorWorks' <i>Document Preferences</i> dialog by clicking on the <i>OK</i> button.</p>	

To print the content of a window into a high-resolution pen-and-ink image:

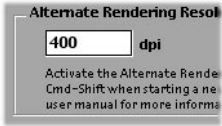
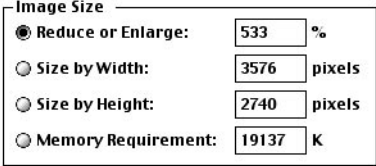
<p>5. First, you must render the window in pen and ink. To do so, select <i>FineArt 3D</i> from the <i>View</i> → <i>Rendering</i> menu.</p>
<p>6. Once rendering in pen and ink is done, you are ready to print it. Choose <i>Print</i> from the <i>File</i> menu.</p>
<p>7. In the <i>Print</i> dialog, select all the print options as you would normally do. Press and hold the <i>Command</i> and <i>Shift</i> keys, and click on the <i>Print</i> button. Hold the two keys down until you hear two beeps; they signal that FineArt 3D is using the Alternate Rendering Resolution for rendering the image.</p>

Important notes

1. This method only works if the entire printout fits on a single sheet of paper.
2. This method does not work for exporting high-resolution images to files.
3. You do not have to wait for the rendering to be completed in Step 5. Instead, you can interrupt the rendering with *Command-.'*. You will end up with a blank window. Proceeding to Step 6 will print the correct image.

Creating high-resolution images with Design Workshop 1.8

Design Workshop does not support the concept of resolution directly. Yet, it is possible to create high-resolution images with the help of an image-editing application such as Adobe Photoshop. Here's how it works:

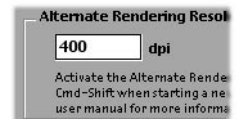
<p>1. Bring up FineArt 3D's Options dialog (see Section "Using FineArt 3D with Artifice Design Workshop 1.8" on page 10,) go to the Expert panel by clicking on the <i>Expert</i> tab, and set the <i>Alternate Rendering Resolution</i> to the desired resolution, in this example 400 dpi.</p>	
<p>2. Render the content of the window with FineArt 3D as described in "Using FineArt 3D with Artifice Design Workshop 1.8" on page 10.</p>	
<p>3. To create a high-resolution picture file, choose <i>Export 2D → Pixel Image</i> from the <i>File</i> menu.</p>	
<p>4. Select the <i>Reduce or Enlarge</i> radio button. In the corresponding text field, enter the value $100 \times (R/75)$ where R is the Alternate Rendering Resolution that you chose in Step 1. In this example, we set the text field to $100 \times (400/75) = 533$.</p>	
<p>5. Press and hold down the <i>Command</i> and <i>Shift</i> keys, and click on the <i>Export</i> button. Keep holding the two keys down until your hear two beeps; they signal that FineArt 3D has accepted the Alternate Rendering Resolution. (If you get an alert box asking whether you wish to replace an existing file, keep holding <i>Command</i> and <i>Shift</i> down has you click <i>Replace</i>.)</p>	
<p>6. The image file that you created in Step 5 contains a high-resolution image. However, Design Workshop labeled it as a 72 dpi image (screen resolution). To ensure that it prints properly, you must open it in an image-editing application, such as Adobe Photoshop, and set its resolution to the resolution chosen in Step 1.</p>	

Creating high-resolution images with HotText 1.5

FineArt 3D

Vertigo Hot Text lends itself very well to the use of Alternate Rendering Resolution. For instance, the “FineArt 3D” 3D text above was created with Hot Text. Here’s how to do it:

1. Bring up FineArt 3D’s options dialog (see “Using FineArt 3D with Vertigo 3D Hot Text 1.5” on page 10), and go to the *Expert* panel. Set the *Alternate Rendering Resolution* to the resolution of the Photoshop document you are working with (in this example 400 dpi)



2. Setup and preview the Hot Text effects as you normally would.
3. When you are ready to apply the filter, press and hold the *Command* and *Shift* keys, and click on the *OK* button. Hold the two keys down until you hear two beeps; they signal that FineArt 3D has accepted the Alternate Rendering Resolution. That’s all there is to it!

MiniCad 7, Form-Z, and Infini-D 4.5

Alternate Rendering Resolution can not be used with these applications.

About Resolution and Style

The resolution that you are using affects the style of the pen-and-ink rendering to some extent. At resolutions below 288 dpi, FineArt 3D generates images that have a soft look, much like renderings on screen. At resolutions at or above 288 dpi, FineArt 3D switches to a crisp pen-and-ink look. Here’s an example:

150 dpi
400 dpi

Setting Up 3D Models for Rendering with FineArt 3D

Avoid Using Complex Textures

FineArt 3D currently does not support complex textures such as those that are typically used to depict wood, bricks, marbles, and other patterns. Instead, FineArt 3D uses the diffuse colors¹ assigned to the various objects in the scene when evaluating the tonal values. When a complex texture is assigned to an object, it may mask an underlying diffuse color that looks completely different. Therefore, to achieve predictable results, we recommend that only simple colors, without textures, be assigned to the objects in the scene.

Assign Distinct Colors to Different Objects

To draw the delicate outline strokes that contribute greatly to the elegance of its renderings, FineArt 3D builds an internal representation of the various objects in the scene. In some cases, it must do so from a simple stream of triangular facets coming from the host application. One important clue that it uses, to determine which facet belongs to which object, is the colors of the facets. Assigning different colors to the various objects helps FineArt 3D to distinguish these objects.

Choose One Directional Light to Cast Shadows

FineArt 3D supports ambient, point, spot, and directional² light sources. However, it will only compute shadows from a *single directional light*. When rendering shadows, to achieve consistent results we recommend that you turn shadow casting on for one directional light, and turn shadow casting off for all other light sources.

-
1. Diffuse colors are also often referred to as *Flat*, *Plastic*, *Simple*, or *Surface* colors.
 2. Directional light sources are sometimes also referred to as *Distant*, or *Parallel* lights, or simply *Sun*.

Tip: Improving the rendering speed

In designing FineArt 3D, we have chosen to emphasize the rendering quality over the rendering speed. A consequence of this choice is that very complex 3D models can take a while to render. Here's a few suggestions that may help you deal with this issue:

- Try to keep your 3D model as simple as possible. For instance, if there are a lot of small objects that are hidden behind larger ones, delete them.
- Likewise, while making adjustments in preparation for the final rendering, considering simplifying the 3D model by hiding all non-essential objects, if the host application allows it.
- Choose a rendering style that does not use shadows, at least until you are ready to create the final rendering. Shadows can more than double the rendering time.
- If possible, enable back-face removal (also called back-face culling).
- Render into smaller windows.

Tip: rendering small images

If you need to generate a very small image, for instance to fit in a narrow column of text, you may find advantageous to first render it into a larger window. Then use an image editing application, such as Adobe Photoshop, to reduce it to its final size. There are at least two reasons to do it this way:

- Many applications limit the smallest window size that you can get.
- With a larger window, it is easier to preview the rendering.

In this case, you may find that using *Medium* or even *Thick* for the *Pen Thickness* (see “Variations on Rendering Styles” on page 13) yields better looking strokes after reduction.

Tip: preview with the QuickDraw 3D Interactive renderer

If you have a choice of renderer for previewing the 3D model, you may find that the QuickDraw 3D's Interactive renderer yields tone values that most closely match FineArt 3D's rendering style. That is not a coincidence; FineArt 3D was designed that way. Other renderers, because of difference in the way they compute illuminations, may not work as well to help you setup the light sources in the scene.

Tip: cancelling long rendering

With most host applications, a long rendering can be cancelled by pressing the *Command* and *Period* keys simultaneously. You may need to hold the keys down a few seconds before it takes effect.

Problem: frequent blank renderings

If you frequently get a blank window when rendering with FineArt 3D, you are probably running out of memory. (FineArt 3D dutifully report such errors to the host application. However, many applications simply ignore these errors instead of reporting them to the user.) There are a number of things you can do to work around this problem:

- Choose a rendering style that does not include shadows. Rendering shadows can as much as double the amount of memory required.
- Render into a smaller window.
- Quit all other active applications to free memory.
- Assign less memory to the host application.

The last recommendation may seem counterintuitive. Since version 1.1, FineArt 3D uses temporary memory for most of its memory needs. Temporary memory refers to memory that is used neither by the Mac OS nor by any currently running application. By diminishing the amount of memory allocated to the host application, more temporary memory is made available, thus increasing the chance that FineArt 3D will be able to complete the rendering.

Problem: incorrect shadows or no shadow

FineArt 3D supports shadow-casting from a single directional light source. (Such lights are also frequently referred to as distant lights, parallel lights, or simply Sun.) If there are several directional lights that cast shadows in your 3D model, FineArt 3D will only use one of them. To get consistent results, it is recommended that you turn off shadow casting for all but one directional light.

Furthermore, note that you will not be able to get shadows with applications that do not provide directional light sources, such as Vertigo HotText.

Problem: incorrect outlines with MiniCad and VectorWorks

Sometimes additional outline edges may appear with Minicad and VectorWorks. They are caused by so called cracks in the geometry. For instance, they often appear above and below window opening in walls.

These cracks result from the way these two applications prepare the model before sending it to QuickDraw 3D for rendering. They are not exclusive to FineArt 3D; these cracks sometimes also cause artifacts with other renderers. But FineArt 3D is much more sensitive to them.

Unfortunately, there is nothing we can do at the level of the renderer to address this problem. To alleviate, or sometimes even eliminate the problem completely, you can try to use an axonometric projection, rather than a perspective projection.

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