



User Guide

3D Print™ Software



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Rev. A

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Symbols

The following symbols are used on the ProJet x60Pro system and in this manual.

	General Caution: User should use care to avoid possible damage to equipment.
	Hot Surface: User should use care when working near or on the labelled item.
	High Voltage: User should use appropriate electrical safety precautions.

3DPrint™ User Guide

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1 Overview

3DPrint is a Windows-based software program designed to easily and quickly manipulate, annotate, and preview 3D modeling data before printing it on a 3D Systems 3D Printer.

1.1 File Formats You Can Import And Print With 3DPrint

Current file types supported are listed below.

NOTE: The quality of data read through each of these file types is highly variable due to the way the source programs treat their data.

- *.zbd* files are build files created by the 3DPrint Software.
- *.zpr* files are part files created by a number of software packages from other companies. 3DPrint supports versions 1, 2, and 3.
- *.stl* files are monochrome 3D model files exported by several 3D CAD packages.
- *.wrl* (also known as *VRML*) files are color files that are exported by many 3D CAD packages.
- *.ply* files are 3D color model files exported by several 3D CAD packages.
- *.3ds* files are color files created in Autodesk 3D Studio Max.
- *.fbx* files are used by a number of Autodesk products, such as Revit, Maya, and Motionbuilder.

GIS files are Geographic Information System files, and are often in the *VRML* file format.

Legacy file types supported:

- *.bld* files are build files created by versions of the legacy ZPrint software.

1.2 Computer System Requirements

Computer operating systems and hardware change frequently. Please check out the latest recommendations on our 3DS Central Web site, in the Products section under your printer model, under Software: 3dscentral.3dsystems.com.

1.3 3DPrint Installation

IMPORTANT: *To avoid problems that may occur during printing, ensure that all screen savers and your power management software are turned off on the computer driving your 3D Printer. Most screen savers and power management software can be turned off in the main Windows screen settings. For additional instructions on how to disable your hardware and software power management, please consult your computer hardware Owner's Manual.*

NOTE: You must have Administrator rights to install 3DPrint correctly.

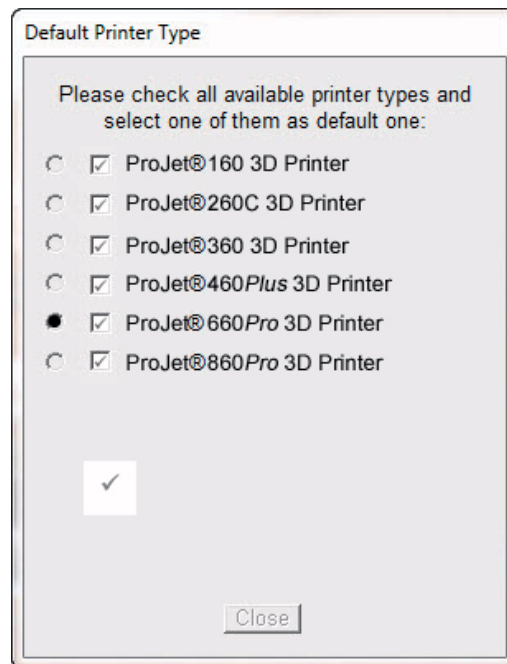
If you encounter any problems during 3DPrint installation, please contact your local Reseller, or visit the support section of our Web site: 3dscentral.3dsystems.com.

1. Close all running applications and insert the 3DPrint Installation media (typically a USB thumb drive) into your computer.
2. If the installer does not automatically start, double-click on your drive icon. Double-click on the *Setup.exe* icon. This starts the 3DPrint installation.
3. After *Setup.exe* is launched, you have the option to install the 3DPrint application.
4. Read the licensing agreement carefully.
5. Select the destination directory. The Setup program prompts you for a selection and will suggest *C:\Program Files\3DPrint Software* as the default directory.
6. It takes several minutes for 3DPrint to install and then you are returned to the desktop.
 - If this is your first time using 3DPrint, proceed with the remainder of this chapter to setup 3DPrint defaults for the printer type and printer settings, and to check the powder type.
 - If your local Reseller has already setup 3DPrint for you, you can skip the remainder of this chapter and proceed with *Chapter 2 3DPrint Main Window*.

1.4 Choose The Default Printer

When you run 3DPrint for the first time, the **Default Printer Type** dialog opens where you select the printer that is connected to the computer running 3DPrint, as the default printer.

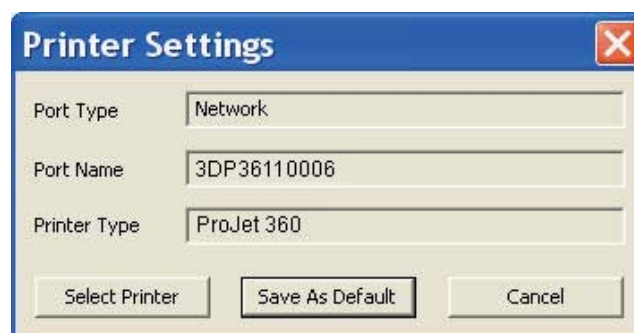
- Check each printer that is accessible through your network (can be one or more). Each printer you check will appear in the **Powder Settings** dialog where you can view the powder settings for that printer.
- Click the radio button beside the printer you want to designate as the default. Only one printer can be the default, but you can change the default at any time by reopening this dialog in 3DPrint (**Settings > Printer Type Settings**).
- In the following example, we checked five printers that are available through our network. The **ProJet 660 3D Printer** is selected as the default.



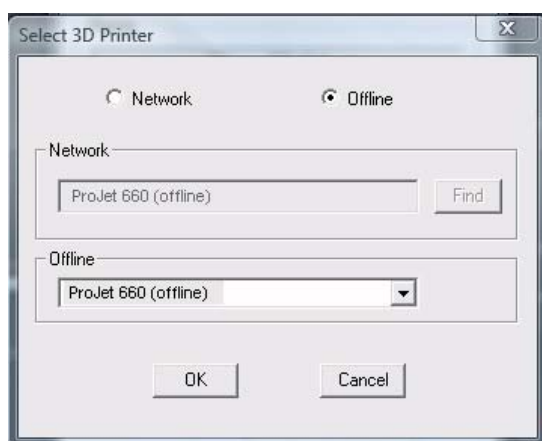
- Click **Close** when finished. The 3DPrint Splash screen appears. This screen will close on its own after a moment, or you can click **OK** to close it immediately.
- Next, the **Open** dialog appears where you select a file to load in 3DPrint. Browse to the directory on your system where your files are located. The next time access the **Open** dialog, it will show the path you last browsed to for selecting files.
- Select a file and click **Open**. The file opens in the 3DPrint main window. Continue with the next section to choose settings for your default printer.

1.5 Choose The Default Printer Settings

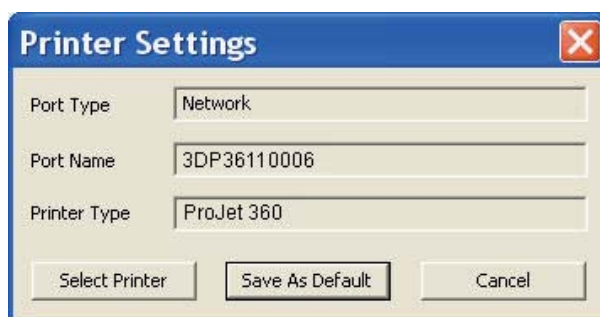
1. In 3DPrint, select **Settings > Printer Settings** to display the **Default Printer Settings** dialog.



2. The **Port Type** field should display **Network**. To select a different printer, choose **Select Printer** and follow the steps below. **Note:** the “Serial” port option is no longer available.
3. When **Select 3D Printer** dialog opens, choose **Network**. The printer your computer is connected to will show up as an option. Select your 3D Printer and click **OK**.
4. To connect to another printer, click the **Find** button and select the printer from the **Network Printers** drop-down list. Choose an Online printer and click **OK**.
5. Click **OK** on the **Select 3D Printer** dialog.



6. When the **Select 3D Printer** dialog closes, the **Default Printer Settings** dialog reopens for you to save your settings. Click the **Save As Default** button.
- The printer listed in the **Port Name** field is saved as the default printer and the **Port Type** field shows **Network** or **Offline**.



NOTE: If you experience difficulty locating your printer through 3DPrint, please contact your local

Reseller, or visit the support section of our Web site:
3dscentral.3dsystems.com.

1.6 Check The Default Powder Type Settings

1. In 3DPrint, select **Settings > Powder Settings**.

- The **Powder Settings** dialog opens and lists each printer previously selected in the **Default Printer Type** dialog.
- The default printer is **bolded** and expanded to show the materials available for use with the printer.
- The default powder type is also shown in **BOLD** and its settings populate the right side of the **Power Settings** dialog.

2. Select a powder type to view its settings.

Important: Powder settings cannot be changed unless you create a custom powder type (see Section 8.1 “Create Custom Powder Types”), however, you can override the **Layer Thickness**, **Bleed Compensation**, **Anisotropic Scaling**, and the **Fixture Clearance** settings for an individual build. We do not recommend changing these, but should you need to:

- Select **File > 3D Print Setup** to check/uncheck the **Bleed Compensation** option, or to choose a different **Layer Thickness**.
- Select **Transform > Anisotropic Scaling** to change the **X**, **Y**, and **Z** settings.
- Select **Edit > Make Fixture** to change the **Fixture Clearance** value.

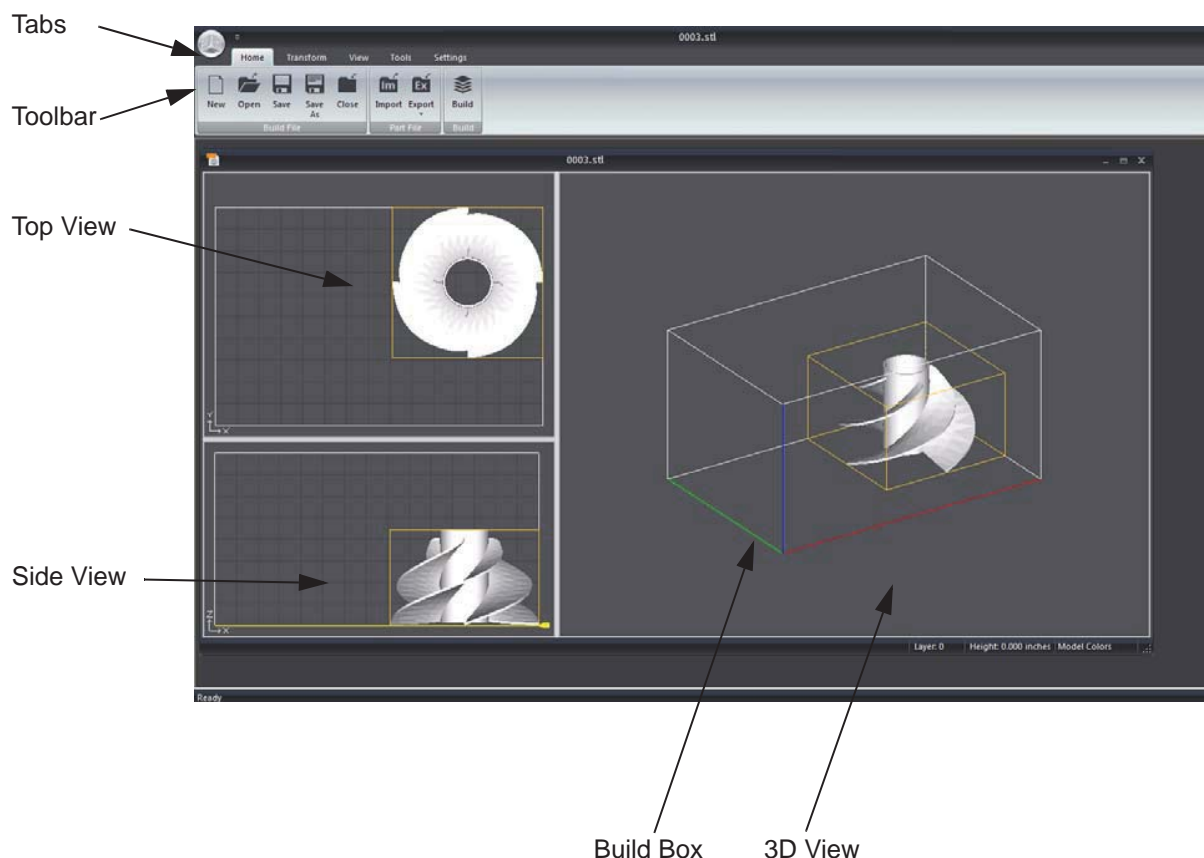
3. When finished, click **Close**.

2 3DPrint Main Window

The 3DPrint Main Window has two viewing modes - 3D and 2D (Cross-Sectional). Explore the features of the Main Window in the sections below.

2.1 The 3D View

When a file is opened in 3DPrint, it is loaded into the main window and its contents are visible in the **3D**, **Top**, and **Side Views** of the Build Bed.



The 3DPrint main window showing the Top, Side, and 3D Views.

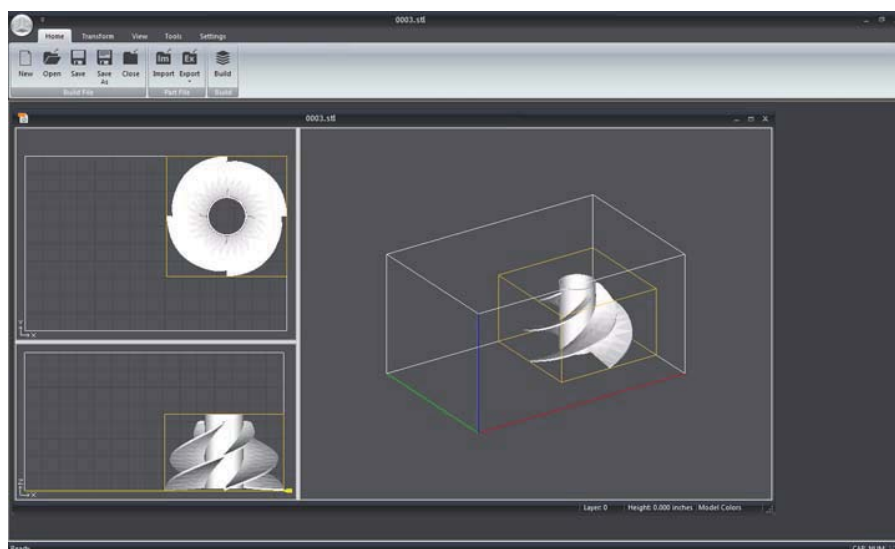
- The **Top View** is a 2D representation of the Build Bed in the Y-X plane.
- The **Side View** is a 2D representation of the Build Bed in the Z-X plane. It also provides the Layer Slider, which you can click and drag to move up and down the layers of the part.
- The **3D View** is an interactive representation of the Build Bed where you can quickly change the angle from which the part is viewed using one of the **View** icons.

- To resize any view, point the cursor on the vertical or the horizontal borders. When you see the cursor change to the Resize tool (two small arrows pointing away from each other), left-click on the border and drag to resize.

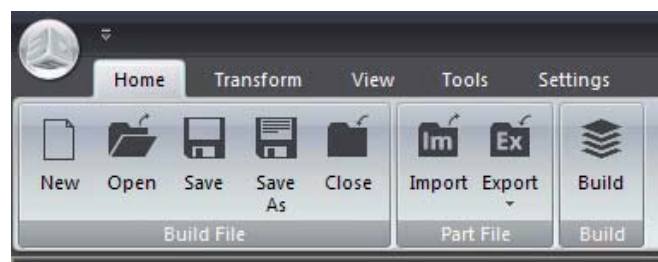
2.2 The 3DPrint Tool Bars

3DPrint is designed to make the most-commonly used functions easy to find and use. The screen has **tabs** across the top, with a **toolbar** below that. The toolbar changes depending on which tab is selected.

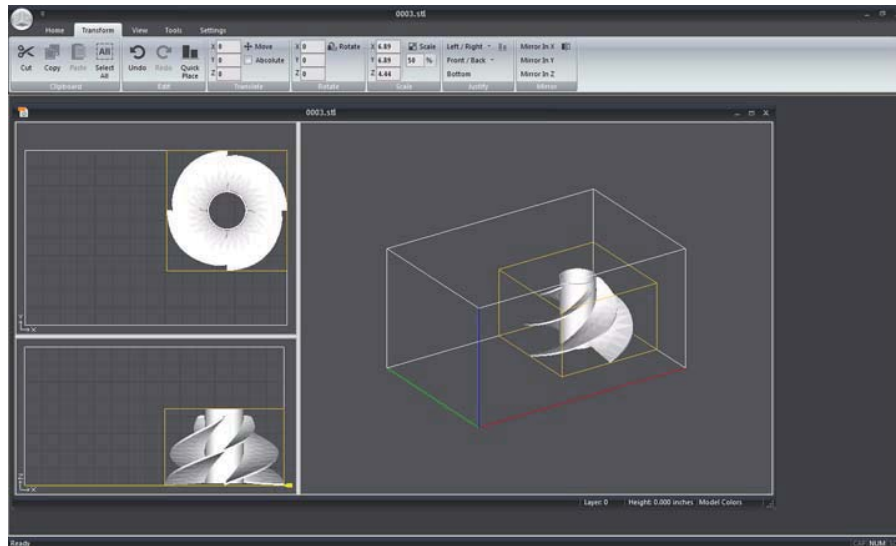
2.2.1 Home



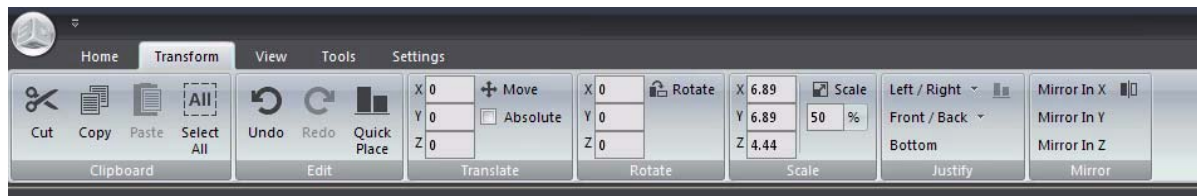
The Home tab provides access to the most frequently used tools, such as file Save and Save As, as well as Import and Export to bring files into 3DPrint or export them to another application.



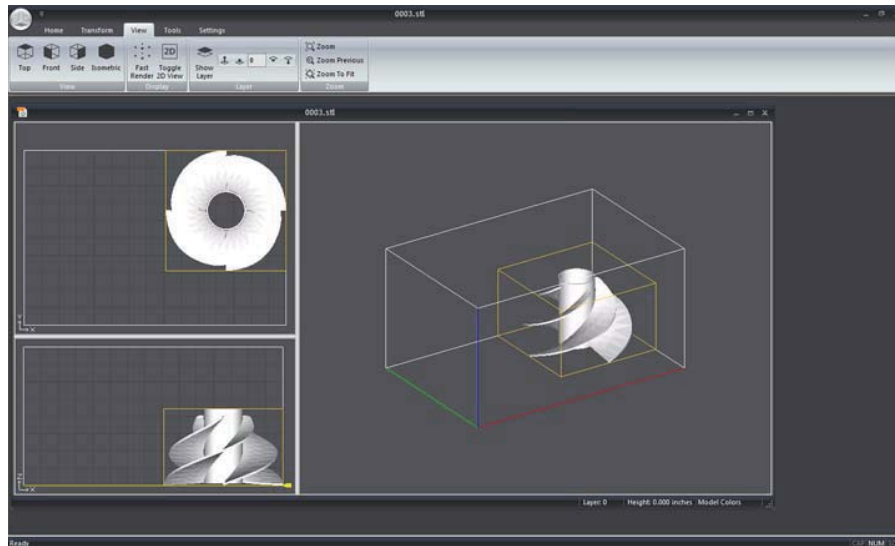
2.2.2 Transform



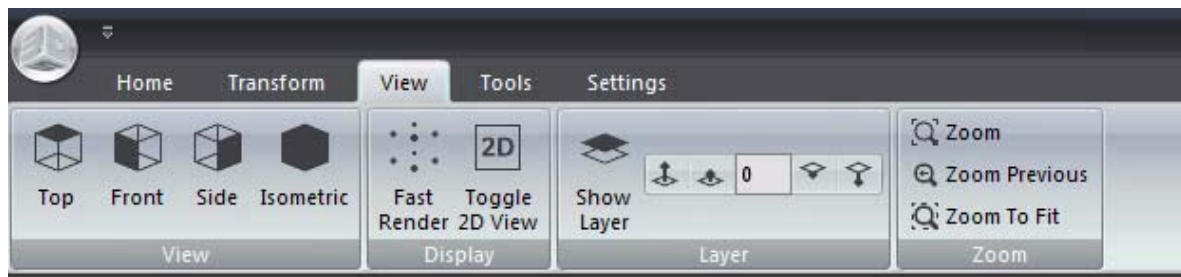
The Transform tab provides tools to move, scale, rotate and mirror your part, as well as copy and paste (to make copies of your part)



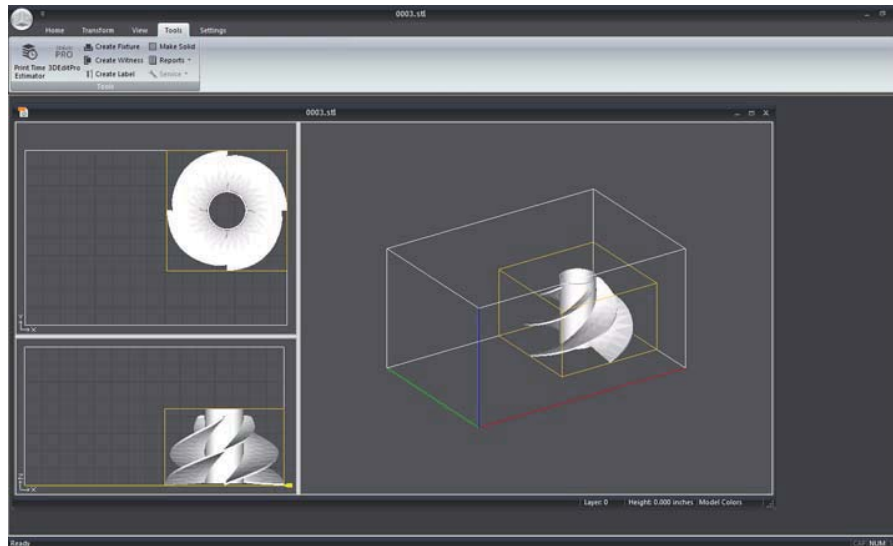
2.2.3 View



The View tab allows you to view the part from different sides, as well as turn on the 3D View so you can look at a cross-section of the part.

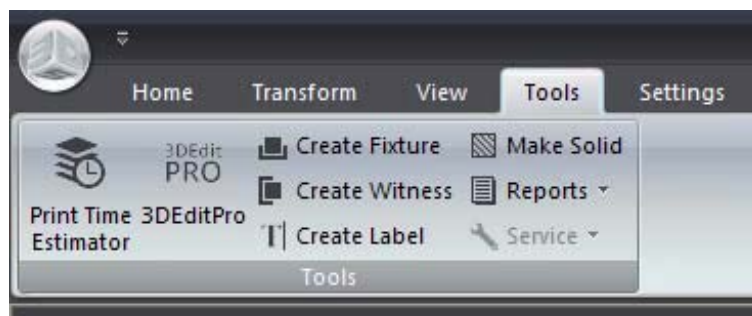


2.2.4 Tools

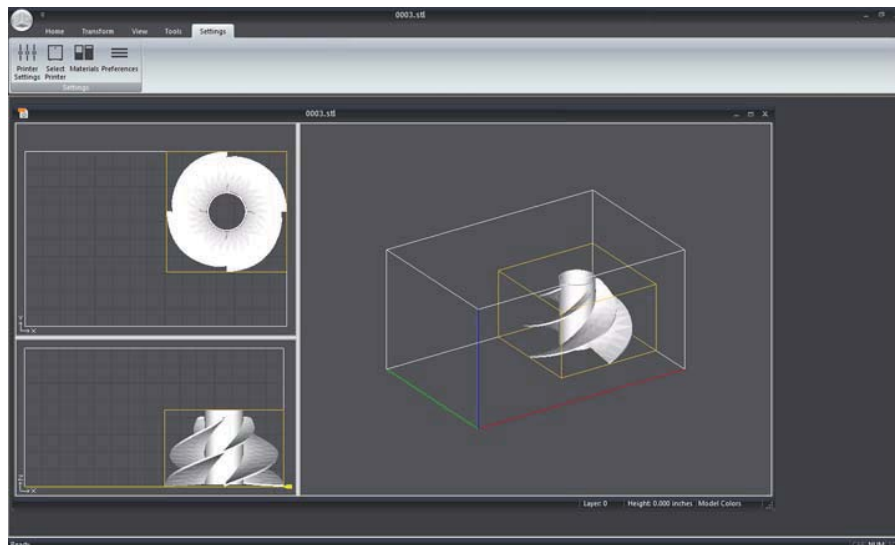


The Tools tab gives you access to the Print Time Estimator (how long the job will take to print) as well as Create a Fixture (Fixture to support parts while printing), Create Witness (create a “witness” shell to improve color in the part, and Create Label (for creating an embossed label on your part).

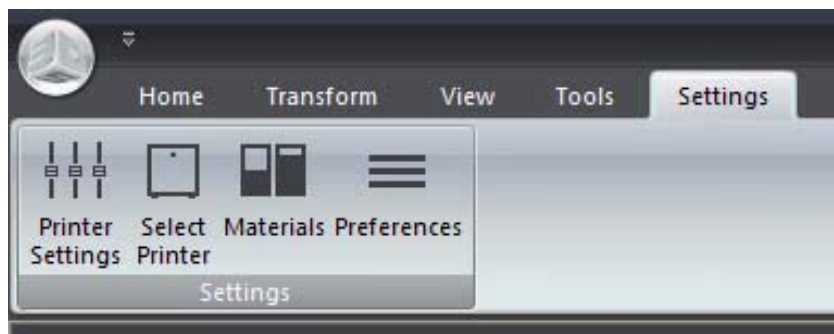
These functions will be described in more detail in later sections of this manual.



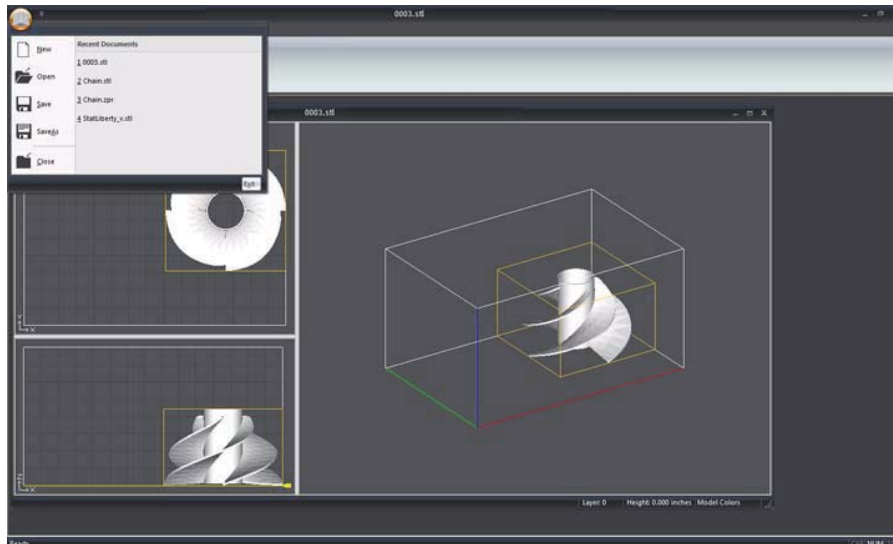
2.2.5 Settings



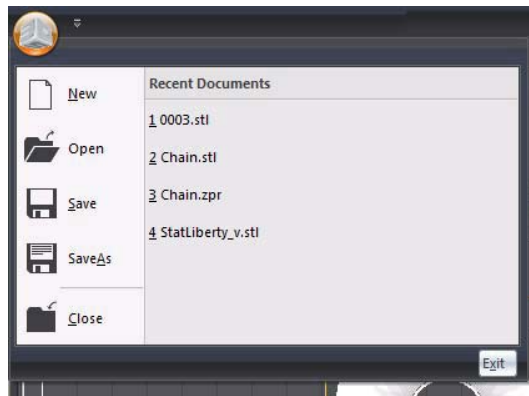
The Settings tab provides access to the Printer Settings, Select Printer, Materials, and Preferences. These settings are for advanced users who want to fine-tune their printer's performance, or to work with a number of different printers. In most cases the default settings should be used.



2.2.6 Ribbon Button



The Ribbon button provides access to file functions such as Open, Save, etc.



2.3 Keyboard/Mouse Shortcuts

Press This Key/Button:	To Do This:
A	To move up one layer
Z	To move down one layer
Shift A	To move up ten layers
Shift Z	To move down ten layers
Left Mouse Button	Drag the mouse to rotate the Build Bed in 3D View, or to move a part in the Side or Top Views.
Turn the Mouse Wheel	Zoom the Build Bed in 3D View, or scale the part in Side or Top Views.
Shift + Left Mouse Button	Pan the Build Bed in 3D View.
Ctrl + Left Mouse Button	Select a part without moving it in Side or Top View. Drag the mouse to Zoom the Build Bed in 3D View.
Ctrl + Z	Undo last action
Ctrl + Y	Redo last action

3 Setup The Build

3.1 Overview Of Part And Build Files

A **Part file** is a file that is created in a 3D modeling software package. Some examples of Part files are files that have an *.stl*, *.zpr*, *.wrl*, *.ply*, or *.3ds* extension. **Build files** (which are also called Part or Document files) have a *.zbd* or *.bld* extension and are unique to the legacy ZPrint software and to 3DPrint. Build Files include the set of Part files oriented in the Build Bed.

You can open a single Build file, or multiple Part files, into the 3DPrint main window. When you save changes, or exit 3DPrint, 3DPrint prompts you to save the Part file(s) as a *.zbd* file (a Build file). Save a Part file as a Build file to keep all of the modifications that you have made to the part(s), along with the printer/powder settings you have selected for that build.

You cannot open a combination of Build files and Part files into the 3DPrint main window. Only one Build file at a time can be loaded into the main window. If you try to open more than one *.zbd* file into the same window, 3DPrint will ask you to select a single document (Build) file, or several Part files.

3.2 Part Orientation

3.2.1 Overview - Part Orientation

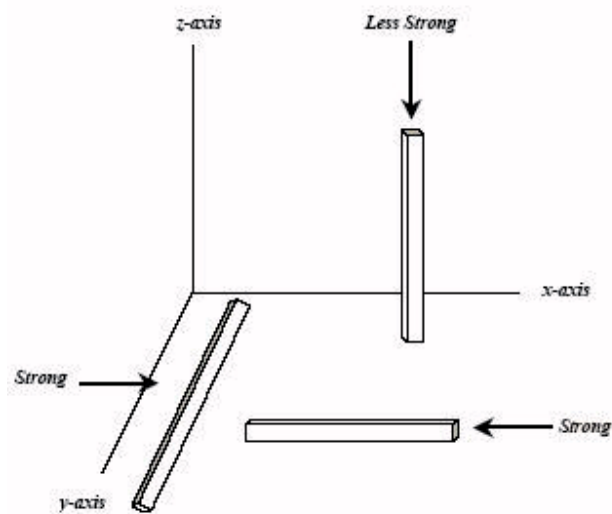
Parts that lie in the X-Y plane will be stronger than those aligned on the Z-Axis. If a part has a particularly delicate feature, especially one shaped like a thin rod, align that feature in the X-Y plane for the greatest strength. If a part has particularly delicate features that are supported only by unprinted powder, build a Fixture for the part to reduce the chances of breaking the feature during powder removal.

Do not tightly pack multiple parts into the Build Bed. If multiple parts are tightly packed, it may be difficult to lift them out of the Build Bed with proper support. If a delicate part is being built with other more solid parts, add a Fixture to the delicate part to protect it during powder removal.

3.2.2 Speed, Strength and Accuracy

The orientation of a part in the Build Bed impacts printing speed, finished part strength, and finished part accuracy.

- **Printing Speed.** The 3DPrint Software automatically positions parts in the Build Bed for maximum build speed by placing parts with the smallest dimension in the Z-Axis.
- **Strength.** The ultimate strength of an uninfiltated part will be somewhat affected by its orientation within the Build Bed. The part will be strongest along the X-Axis and Y-Axis and less strong along the Z-Axis. This is because the cross sections are printed in continuous strips along the Y or the “fast” axis (the print head’s direction of travel); in bands across the X or the “slow” axis (the fast axis direction of travel); and in laminated layers along the Z-Axis. Once a part is infiltrated, it uniformly takes on the strength characteristics of the infiltrating product.



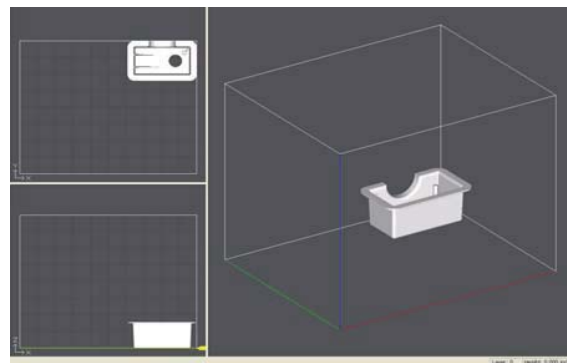
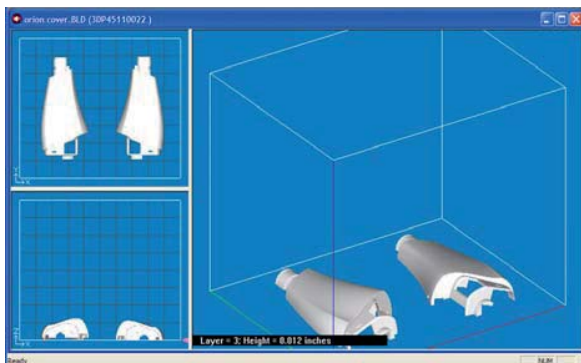
- **Accuracy.** The accuracy of your part depends on how clean the printer is, your printer/powder settings, and the materials you choose for post-processing. You can also employ 3DPrint features like Anisotropic Scaling to adjust for expected shrinkage and bring your parts into true scale.

3.2.3 Parts Containing an Opening or Hollow Area

Automated vs. Manual Depowdering

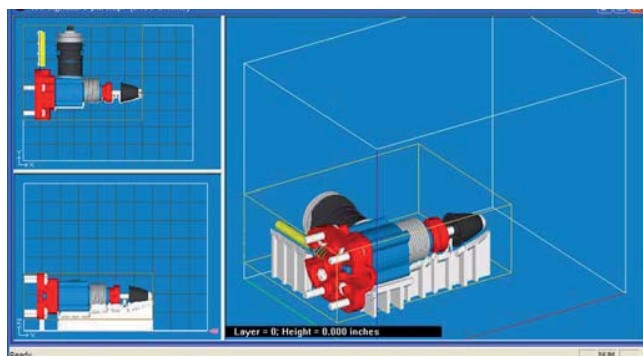
- If you are using a ProJet 460*Plus* or 660*Pro* with Automated Gross Depowdering, place the hollow side of a part facing down in the Build Bed to allow powder to evacuate during automated powder removal.
- If you are using a ProJet 160, 260C or 360 with Manual Gross Depowdering, place the hollow side of a part facing up in the Build Bed to allow easier access during manual powder removal.

Depending on how the part is imported into 3DPrint, you may need to use the **Rotate** feature to correctly orient the part. If the part is delicate, create a Fixture to give it extra support and additional protection during powder removal.



3.2.4 Parts Containing Overhangs

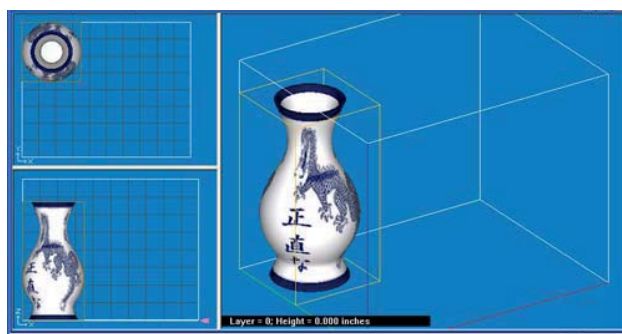
For delicate parts and parts with overhangs, create a Fixture, or create a Fixture for the area of the part that needs support. Unsupported overhangs are placed on the rear-most side of the Build Bed, as close to the bottom of the Build Bed as possible.



An example of a part with two Fixtures to support the overhangs

3.2.5 Parts Containing Cylindrical Features

Cylindrical features will be more accurate when the cylindrical axis is parallel to the Z-Axis.



3.3 Opening and Selecting Files

3.3.1 Open Files In 3DPrint

When you launch 3DPrint, the **Open** dialog displays for you select a file to print. Use the **Open** dialog to load a single Build file (.zbd, .bld), or one or more Part files (.3ds, .wrl, .stl, .ply, .zpr, etc.), into 3DPrint.

By default, when a file is opened or imported, 3DPrint will:

- **Warn you if any piece of the part falls out of Build Bed bounds.** To change this option, see Section 8.5.1 “General Tab”.
- **Orient imported parts for the fastest print times.** To change this option, see Section 8.5.3 “Import/Export Tab”.

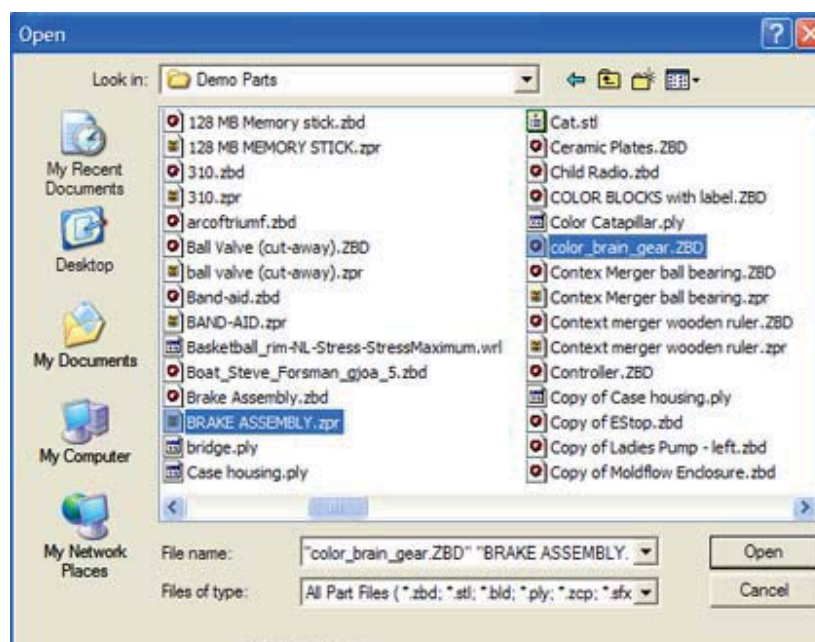
- **Fast Render parts larger than 300 thousand facets.** To change this option, see Section 8.5.2 “Rendering Tab”.

If a Part file is created with dimensions that are too large for display in 3DPrint, 3DPrint evaluates the file and determines the largest units that can be used for displaying the part. Choose to change the units in the **Choose Units** dialog, or keep the selection that 3DPrint chooses and click **Next** to proceed. Changing the Display Units does not change the part dimensions, or the units the part was created with.

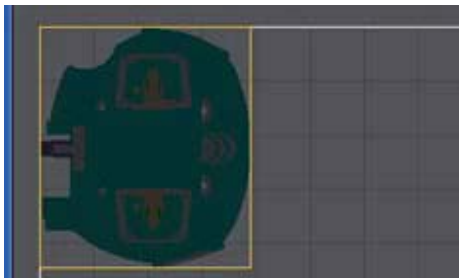
Important: *.wrl (vrmf) files will always import in meters.* After importing a *.wrl* file, if you cannot see the model, or see only a part of it, close the window and reopen the file. Change the Display Units to millimeters or centimeters when the **Choose Units** dialog appears.

3.3.2 Add Parts To An Existing Build

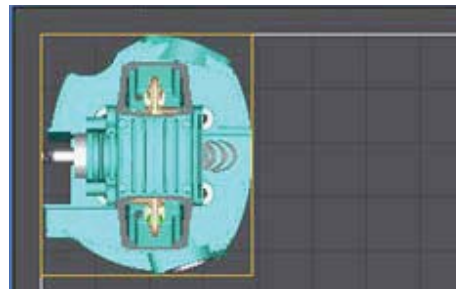
You can add multiple part files to an existing build. Select **Home > Import**. In the **Open** dialog, hold down the **Ctrl** key and click on multiple files to select them. When finished, click **Open**. 3DPrint positions each subsequent part in the Build Bed for the fastest print times.



If a Part file opened in 3DPrint is rendered dark and the slices are not visible in the cross-sectional (2D) view, it often means the back facets of the file are showing. If this is the case, the part will not print properly. To correct the file in 3DPrint, select the part (see next section) and then select **Settings > Normals > Invert All Normals**.



Normals Inverted



Normals Corrected

3.3.3 Part Selection

- To select a single part in any view of the 3DPrint main window, left-click directly on the part with the mouse. A yellow wire frame appears around the part indicating that part that has the current focus.
- To select multiple parts, hold down the **Shift** key and left-click on each part. All selections have the current focus when any operation is performed.
- To select all the parts in your build at the same time, choose **Edit > Select All**.
- To de-select a single part, left-click once on any area in the Build Bed that does not contain the part. When multiple parts are selected, hold down the **Shift** key and click directly on a part to de-select.
- To de-select multiple parts at the same time, click once on any area in the Build Bed that does not contain a part.

3.4 The Right-Button Pop-Up And Transform Menus

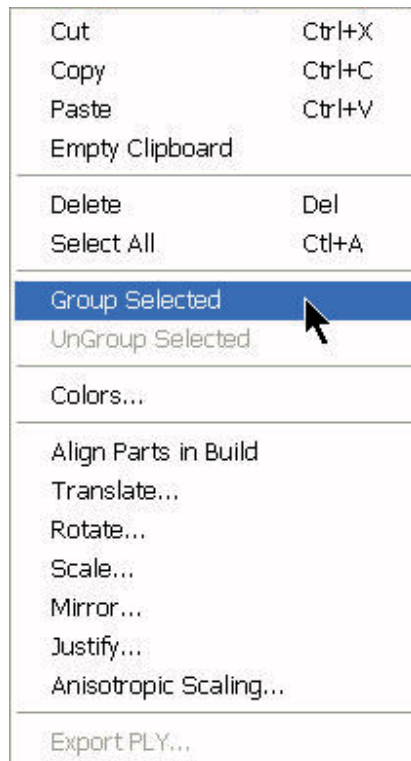
After a Part file is loaded into 3DPrint, it can be copied, translated, rotated, scaled, mirrored, justified, and - if the file is a monochrome part - the entire part can be painted. These tools are available on the **Right-Button Pop-up**, and the **Transform** menus.

- For information about using the **Create Label**, **Create Solid**, and **Create Fixture** commands, please refer to those sections later in this chapter.

3.4.1 The Right-Button Pop-Up Menu

The Right-Button Pop-Up Menu is accessed by clicking the right mouse button. It is also called the Right-click Menu. Depending on whether a part is selected or not, different choices in the menu will be active.

- The **Right Button Popup** Menu is a quick-access menu of commands that are a combination of the **Edit** and **Transform** menu commands, plus the **Export .ply** command, which is also on the **File** menu.



- To make additional copies of your part in 3DPrint, select the part, then choose **Edit > Copy**, or press **Ctrl-C** on your keyboard. Paste the file by choosing **Edit > Paste**, or by pressing **Ctrl-V** on your keyboard. You may copy and paste between different open windows within the same 3DPrint session.
- Any copied part is kept on the clipboard until the clipboard is emptied. If you have copied and stored a large part, or several parts on the clipboard, empty the clipboard by selecting **Edit > Empty Clipboard**. Emptying the clipboard will reduce the amount of memory used.
- To delete a part, select the part and choose **Edit > Delete**, or press the **Delete** key on your keyboard.
- Any action that has been applied to a part can be undone. Choose **Edit > Undo**, or press **Ctrl Z** on your keyboard, to cancel the last action applied to the part.

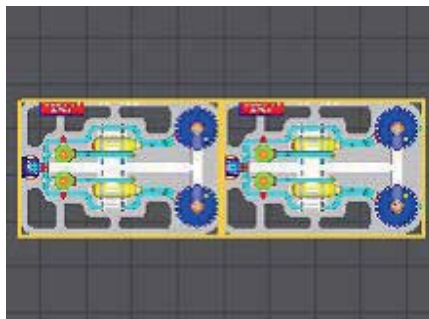
3.5 Transform The Part

3DPrint allows you to transform an individual part, or a group of parts. When transformed individually, the center of transformation is located in the middle of the part. When a group of parts is transformed, the center of transformation is located in the middle of the group. Following is an illustration to help clarify the differences between individual and group transformations.

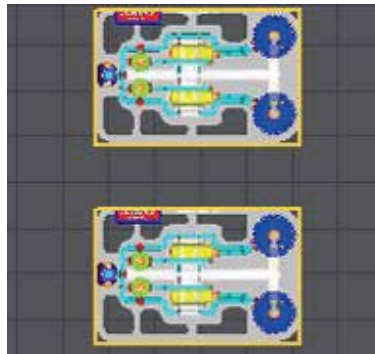
- Here, two parts are shown in the 3D View.



- When both parts are selected and **Transform > Rotate** is chosen, the parts will rotate and reorient relative to their individual centers.



- When both parts are selected, and **Transform > Rotate** is chosen, the parts will rotate and reorient themselves relative to the center of the group, as shown below.



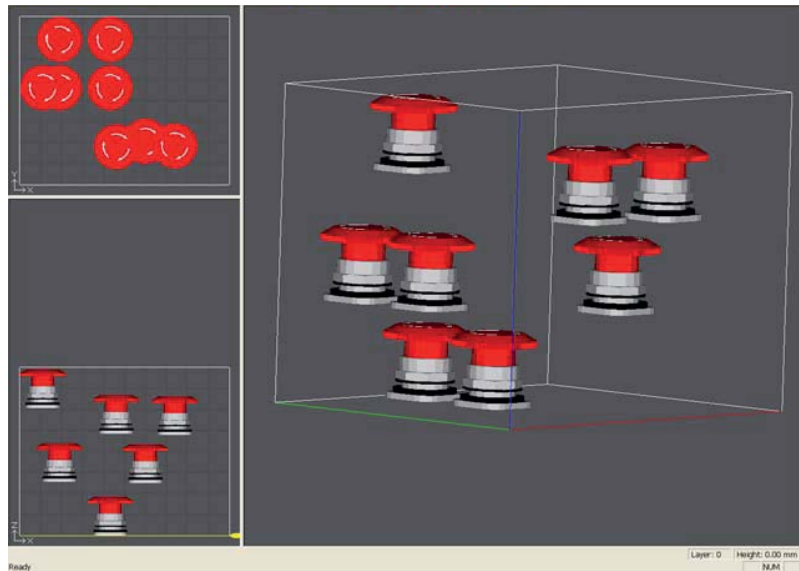
3.5.1 Copying Parts

- To make additional copies of your part in 3DPrint, select the part, then choose **Transform > Copy**, or press **Ctrl-C** on your keyboard. Paste the file by choosing **Transform > Paste**, or by pressing **Ctrl-V** on your keyboard. You may copy and paste between different open windows within the same 3DPrint session.
- To delete a part, select the part and choose **Transform > Delete**, or press the **Delete** key on your keyboard.
- Any action that has been applied to a part can be undone. Choose **Undo**, or press **Ctrl Z** on your keyboard, to cancel the last action applied to the part.

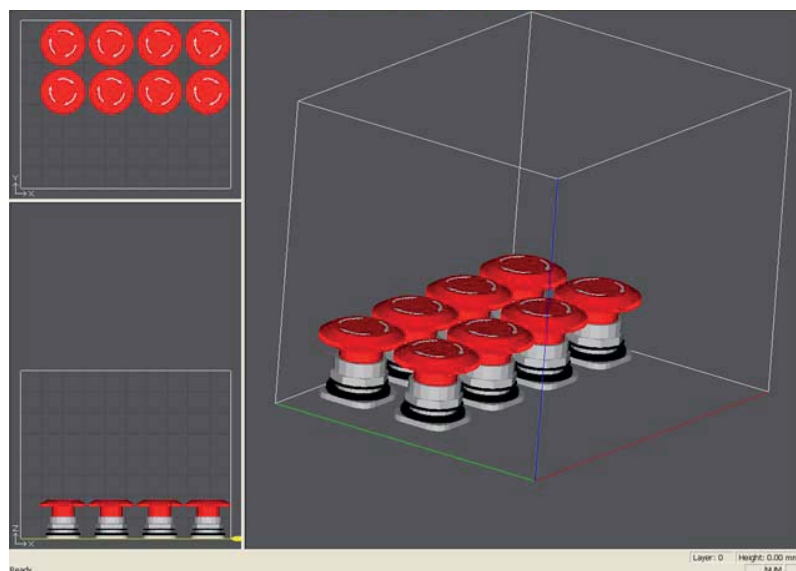
3.6 Align Parts in Build

Aligning the parts in the build volume places them in the most efficient location for printing.

For example, assume the original constellation of parts looked like the screenshot below.



Selecting **Transform > Quick Place** will line up the parts for the fastest printing, as shown below.



3.7 Translate (Position) Parts

You can translate (or position) a part manually using the mouse, or you can use the **Translate** dialog.

- **Manual:** Select the part(s) in the 3DPrint **Top** or **Side** Views. Press the left mouse button and drag the mouse to reposition the part.
- **Translate Dialog:** Select **Transform > Translate** and enter the distance to move the part in the **X**, **Y**, and **Z** fields. The default values of 0,0,0 represents the lower-left corner of the Build Bed.
- **Move relative to the current position:** Enter the distance to move the part in the **X**, **Y**, and **Z** fields, and click **OK**. The part moves to the specified location.
- **Move to this coordinate location:** Select the **Move to this coordinate location** option. The current location of the part populates the **X**, **Y**, and **Z Move** fields. Enter a new value in one or more of these fields and click **OK**. The part moves to the specified location.

3.8 Rotate Parts

- To rotate a part, select the part and choose **Transform > Rotate**. In the **Rotate** dialog, specify the plane and degree of rotation, and click **OK**.
- To keep a group of parts in the same relative orientation, rotate the parts as a group. Select each part and then choose **Transform > Rotate**.

3.9 Scale Parts

Select the part and choose **Transform**. If you scale a part and it does not fit into the Build Bed, 3DPrint prompts you with a warning telling you an object is extending beyond the Build Bed boundaries and draws a red wire frame around the part.

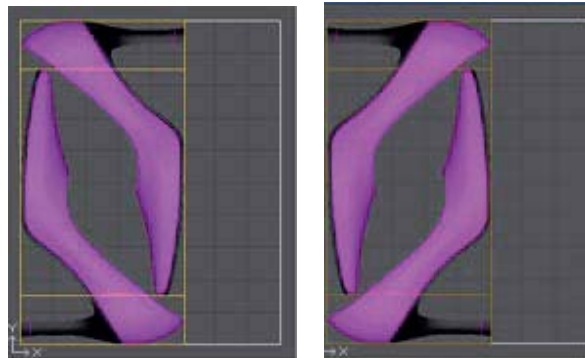
In the **Scale** dialog boxes, you have several options:

- Scale the part as an absolute percentage of its size when it was first brought into the build volume by entering a percentage.
- Scale a part to a specific size by entering dimension values directly in the **X**, **Y**, and **Z** fields.

3.10 Mirror Parts

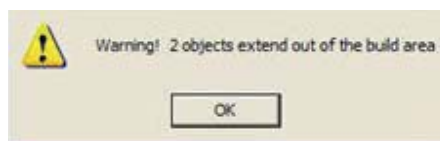
The Mirror feature will inverse the orientation of a part in the **X**, **Y**, or **Z** Axis. The software does this by placing a plane in the center of the part.

- Select a part and select **Transform > Mirror**. The software will not create a separate part. It will take the selected part and invert its orientation.
- Mirror a group of parts by selecting the parts and then choosing **Transform > Mirror**.

*Original Orientation**Mirrored Orientation*

3.10.1 Parts Extending Outside The Build Bed Boundaries

IMPORTANT: When changing the orientation of a part in the Build Bed, you may find that a part exceeds the boundaries of the Build Bed. When this happens, the part is highlighted in a red wire frame and a warning message appears.



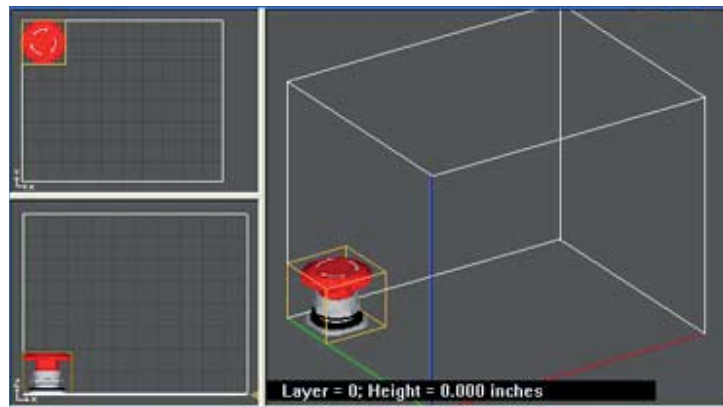
To reorient the part, select the part and either move it with the mouse in the **Top** or **Side** Views, or use the **Justify** dialog or the **Align Parts in Build** dialog. You may need to scale the part if it does not fit in the Build Bed.

NOTE: If you do not want 3DPrint to warn you when a part extends beyond the Build Bed, uncheck the **Warn if entity is out of Build Bed bounds** option in the **Settings > General Preferences > General** tab.

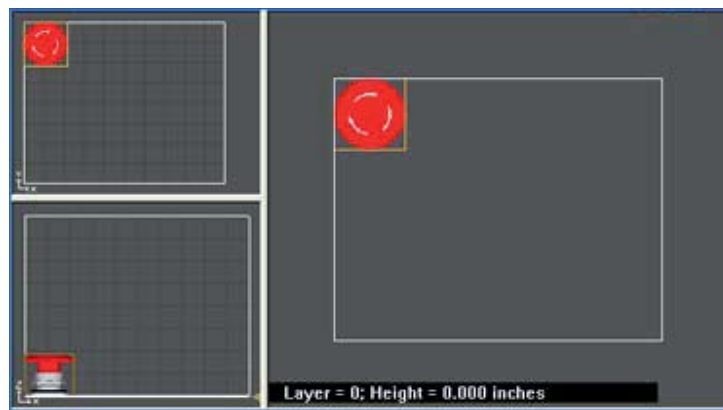
3.11 Create Label

3DPrint can make a label (raised or flat) on the surface of a part in a variety of fonts and colors. If the part is an .stl file (monochrome), the label will be the same color as the part, if color is applied.

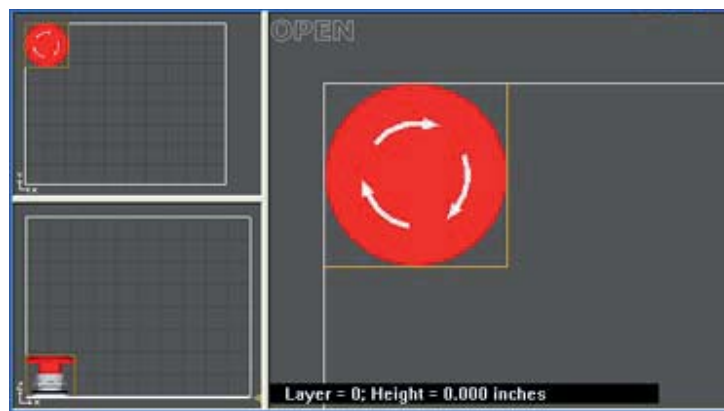
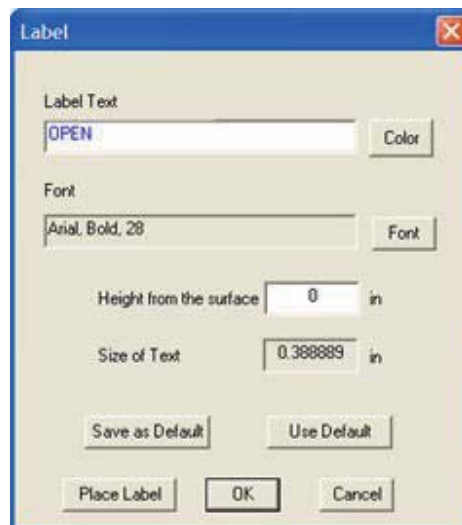
1. In the 3DPrint **3D View**, select the part you want to label.



2. Orient the view so the surface receiving the label is facing you.



3. Select **Tools > Create Label** to display the **Label** dialog.
4. Type in the label text, choose a font color, size, and enter the height to raise the label from the surface of the part. (If you want a flat label, enter a zero (0) in the **Height from the surface** field.) The label text appears in the top, left corner of the 3D View.

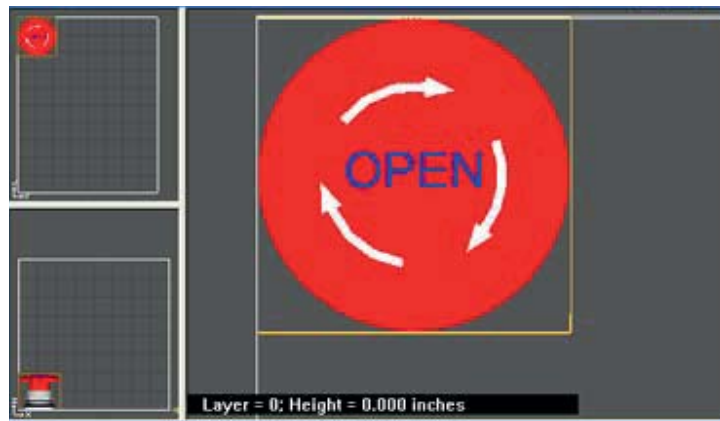


5. Click **Place Label**.
6. In the 3D View, point the mouse on the label text and press the left mouse button. Drag the text to the area of the part you want the label to appear. The label will project straight down onto the surface. (Labels are trimmed to follow the surface they reside on, as long as the surface is solid.)

IMPORTANT: If the label does not fit the part, click the **Place Label** button again and change the text font or size. When finished, click **Place Label** again and use your mouse to move the label to the part.

NOTE: If you try to project a label onto an empty surface area, 3DPrint will display an error message. You can correct this by changing the text font size to a size small enough to allow the label to fit onto the surface.

Most font types work well with labelling, but there are a few exotic fonts that may create bad edges on the part. If this is the case, 3DPrint will prompt you to change the font.

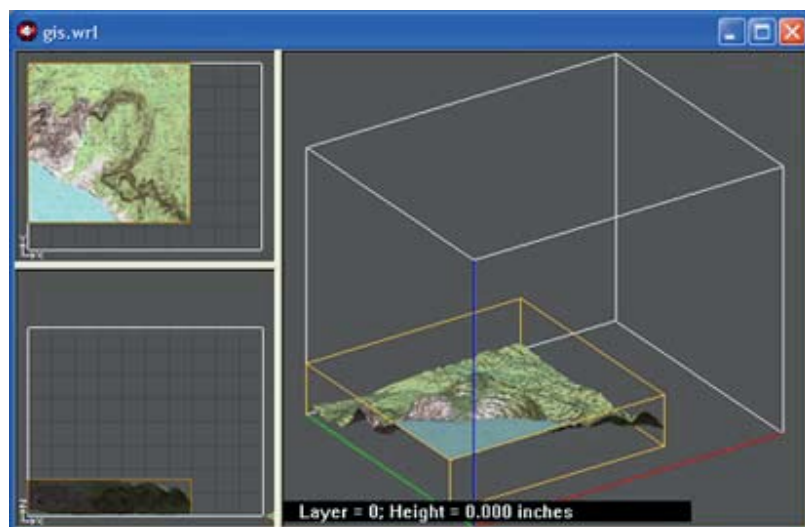


- When you are satisfied with the label placement, click **OK** in the **Label** dialog. If you need to start over, select **Edit > Undo Label**.

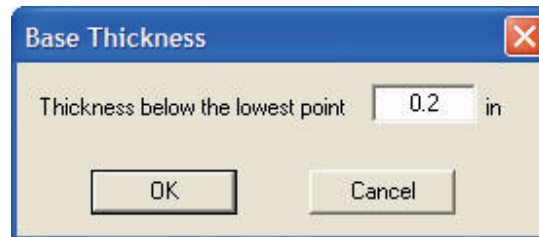
3.12 Make Solid

Make Solid is a feature that generates a solid base for a single rectangular surface. We recommend generating a solid base when printing *G/S* (Geographical Information Systems) files.

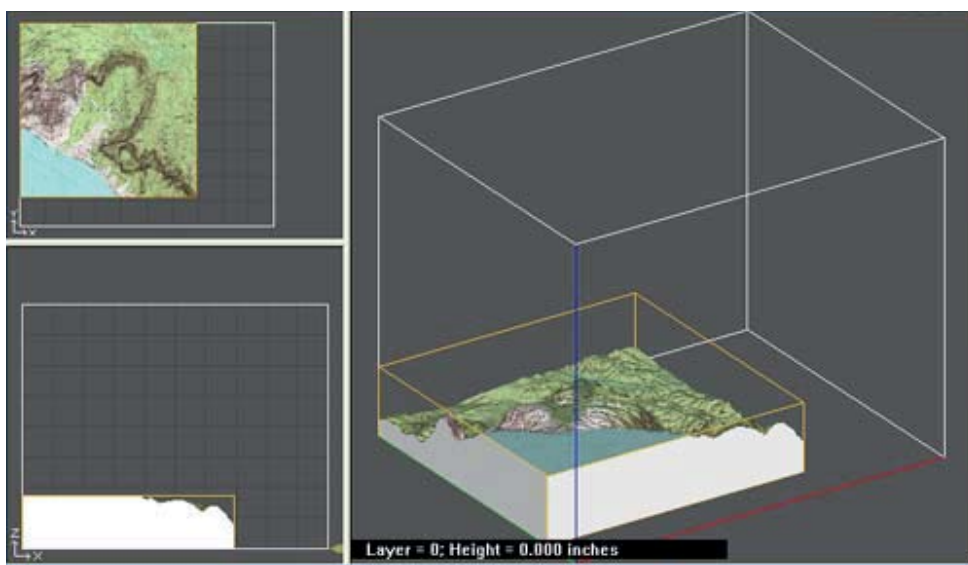
- Open a *G/S* file in 3DPrint and select the part.



- Select **Tools > Make Solid**.
- In the **Base Thickness** dialog, enter a value for the base thickness and press **OK**.



4. 3DPrint generates the base. Because a solid base is heavy, it is recommended that you justify the part placement to the bottom of the Build Bed, so it is resting on the Build Bed platform and not on powder.



3.13 Create Fixture

3.13.1 Overview

A Fixture is a grid-shaped object with a top surface between the bottom-most surface of the part (without actually touching the part) and the bottom of the Build Bed. Generate a Fixture for an entire part, or for a portion of a part, that needs additional support.

3DPrint evaluates the part geometry and generates the smallest Fixture necessary, with minimum use of materials. Fixtures also provide these benefits:

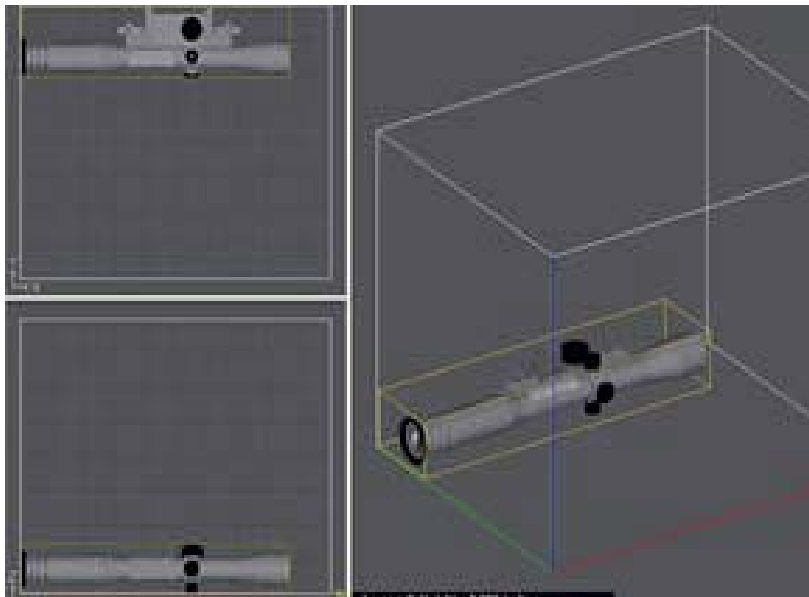
- Supports parts during automatic powder removal cycle. (ProJet 660*Pro* and 460*Plus* only)
- Keeps multiple parts from bumping into each other, or into the Build Bed walls, during automatic powder removal (when used with the **Make Bumper** option). (ProJet 660*Pro* and 460*Plus* only)
- Supports delicate, thin parts for easy removal from the printer and handling during post-processing.
- An option for creating Fixtures with holes to allow powder that is trapped between the part and the Fixture to escape.
- Increases accuracy in the Z-Axis for parts with large overhangs.

- Helps prevent “squash” effects for hollow cylindrical parts, or parts with overhangs.

NOTE: “Squash” effect results from an overhang being supported only with unprinted powder. For example, if a part is a hollow round cylinder, the weight of the powder above the cylinder will cause it to “squash” to something slightly less than round, if there is no support underneath.

3.13.2 Create a Fixture for an entire part

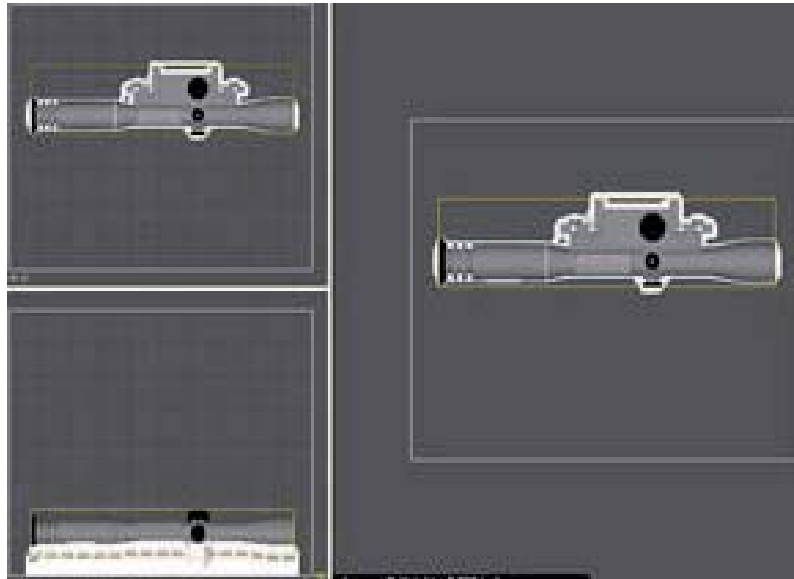
1. Select the part in 3DPrint.
2. Select **Tools > Create Fixture**. 3DPrint orients the part in the 3D View for building the Fixture.



3. There are two features you may choose to enable for a Fixture:
 - **Make Bumper:** To add a bumper to a fixture, check the Make Bumper check box. A bumper will be generated on the Fixture base.
 - **Holes between walls:** Powder may get trapped between the Fixture and the part. You can generate a Fixture with holes at the grid intersections to allow powder to escape during powder removal. A zero (0) in this field means no holes are generated on the Fixture. The higher the percentage, the larger the holes will be on the Fixture.

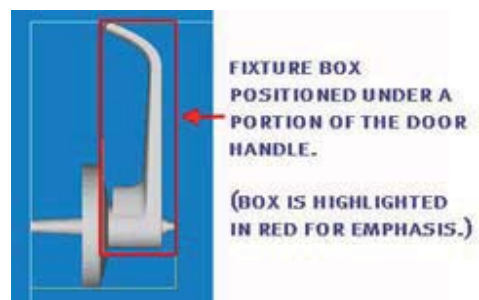
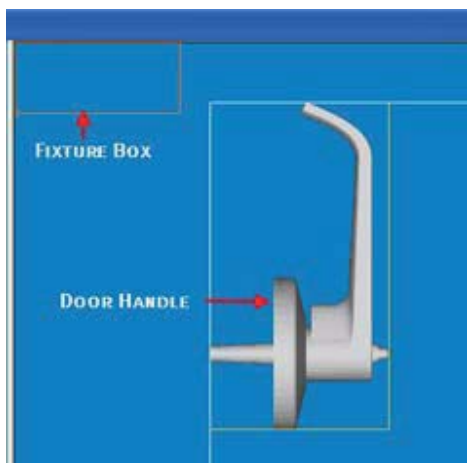
- Click **OK**. The Fixture is generated.

The fixture is shown in white on the screen.



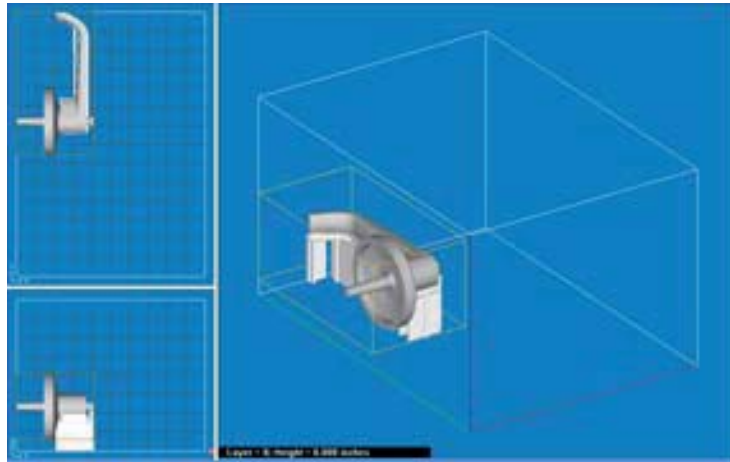
3.13.3 Create a Fixture for a portion of a part

- Select the part in 3DPrint. 3DPrint orients the part in the 3D View for building the Fixture.
- Select **Tools > Create Fixture**.
- In the 3D View, click on the wire frame in the top, left corner, press **Shift** and drag the box to an area of the part that you want to support.



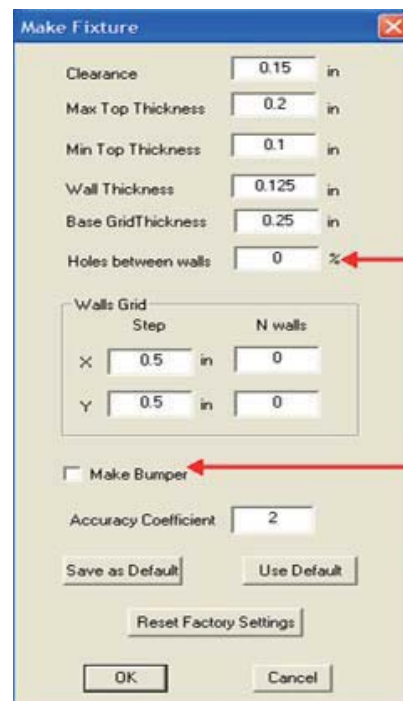
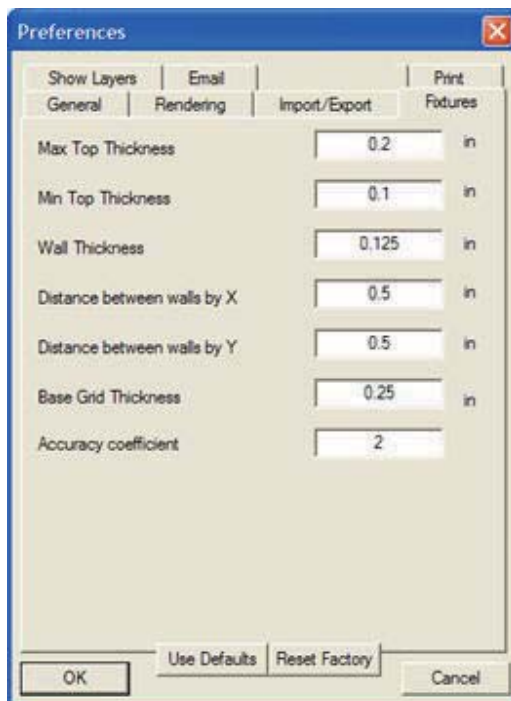
- To Resize: Click on the box and drag the mouse to resize the box.
 - To Rotate: Click on the box, press **Ctrl** and drag the mouse to rotate the box.
- When you have positioned the box, click **OK** in the **Create Fixture** dialog. The Fixture is generated for the specified area.

The fixture is shown in white on the screen.



3.13.4 Default Fixture Settings

The default Fixture settings are located on the **Settings > General Preferences > Fixture** tab. These are the settings that populate the **Create Fixture** dialog, which is the dialog used to create a Fixture for a part. Most users will only need to utilize the **Holes between walls** and the **Make a Bumper** options when generating a Fixture and will not need to change the other settings.

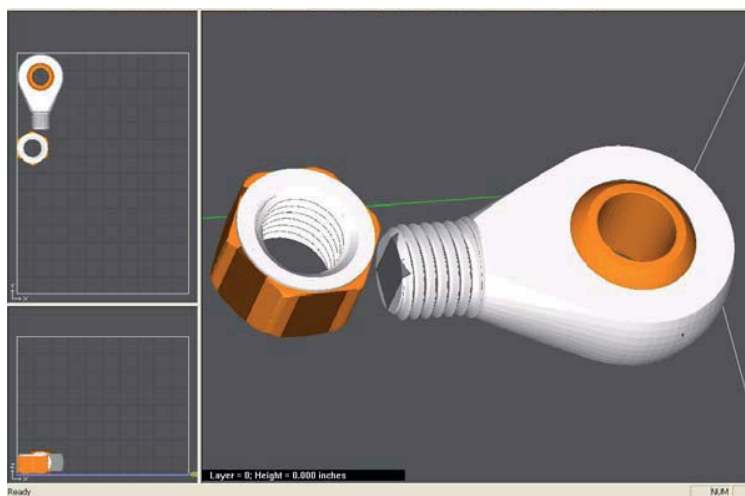


3.14 Witness Part

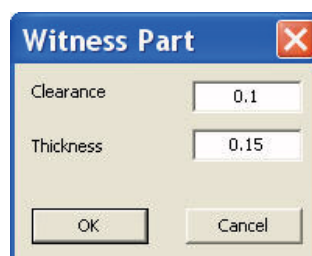
In situations where the color and surface quality must be the best possible, 3DPrint gives you the ability to generate a “witness part”. A witness part is an additional thin shell of grey material that is created with a small offset from the actual part. It is situated along the surfaces of the part that the printhead first approaches as it is printing. Printing the witness part causes the printheads to fire just before they have to begin printing the part. This “primes” them so the colors on the part are crisp and true.

3.14.1 Create A Witness Part

1. Select your part in 3DPrint.



2. Select **Tools > Create Witness Part**.
3. The Witness Part dialog appears.

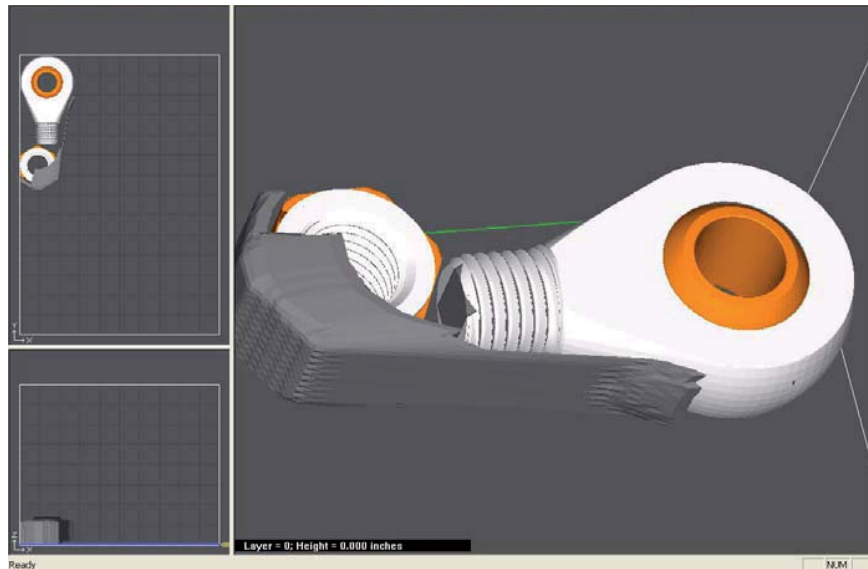


4. Enter the values for Clearance and Thickness.

NOTE: It is recommended that you use the default settings as they are configured for your printer powder type.

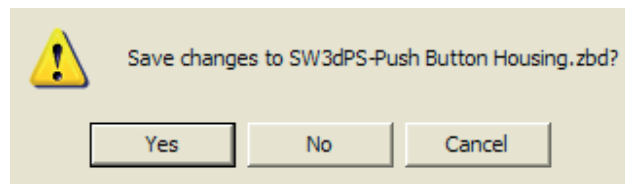
- Clearance is the spacing between the part and the witness part.
- Thickness is the thickness of the witness part

5. Click **OK**. The witness part is generated.



3.15 Save Your Work

When you work on a Part file and exit 3DPrint, or make changes to a Part file and need to save, 3DPrint will prompt you to save the file as a Build file (*.zbd). A Build file contains all of the modifications that you made in 3DPrint to the part(s) and the settings you selected for the build. The Part file remains unchanged and is saved with its original file data.

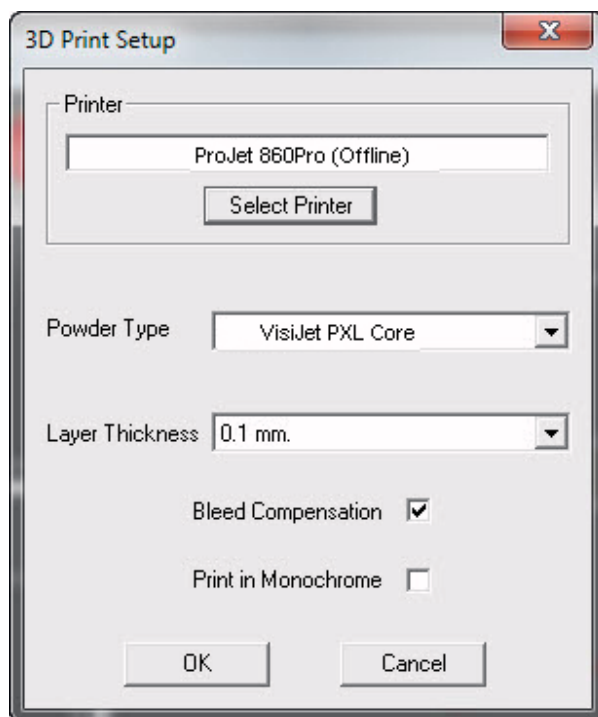


4 Print The Build

After you have finished working on your part in 3DPrint, it is time to set up the printer and print your part.

4.1 3D Print Setup

The **3D Print Setup** dialog is where you confirm or change the printer and powder settings for the current build. Always check your settings in this dialog before starting a print job.



3D Print Setup Dialog

Select **Settings > Printer Settings > 3D Print Setup** to open the **3D Print Setup** dialog. Most users will not need to change the settings in this dialog, but should you need to, do the following:

- To change Printers, choose **Select Printer**. Choose a connection option and then select the **Find** button to browse for the printer that is connected to your computer.
- To change the **Powder Type** and **Layer Thickness**, open the drop-down list for each. The powder types listed are those that are available for the printer displayed in the **Printer** field.
- Ensure the **Bleed Compensation** option is checked (available on ProJet 460*Plus*, 660*Pro* and 860*Pro*). This option is checked by default for the ProJet 460*Plus*, 660*Pro* and 860*Pro*. See Section 8.4 “Bleed Compensation Overview” for additional information.

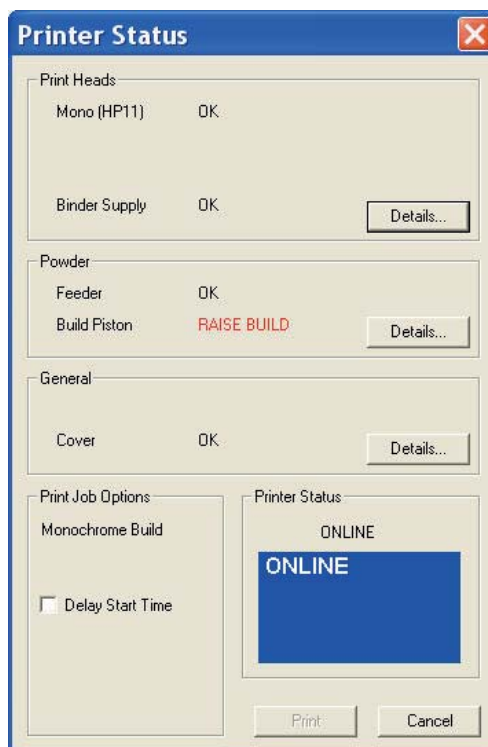
NOTE: Changes made in this dialog will not change your default settings in the **Powder Settings** dialog. To change the default powder settings, please see Section 8.1 “Create Custom Powder Types”.

4.2 3D Print With The ProJet 160 and ProJet 360

The following instructions are for the ProJet 160 and 360 only.

1. After confirming the printer and powder settings for the current print job, select **Home > Build**

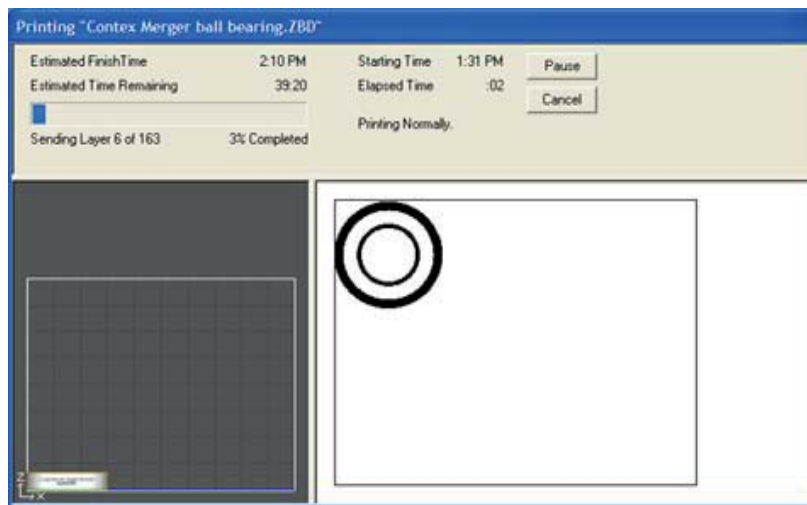
The **Printer Status** dialog opens.



2. 3DPrint checks each item in the **Printer Status** dialog prior to printing to ensure there are enough materials to complete the current build. See Chapter 5 of this guide for instructions if you see a message to **Add Powder**, **Add Binder**, **Change Print Head**, **Raise Build Bed**, or **Close Cover**.
3. Click the **Details** button to view usage information specific to the print head, the binder, and the powder levels.
4. Check or uncheck your **Print Job Option** for the current build.
5. The **Print** button is enabled when each item displays **OK**. Click **Print** to start your build. After you click **Print**:
 - The printer will automatically fill the Build Bed with powder and spread a layer to ensure the top surface is smooth.
 - The printer will service the print head.
 - If you changed the print head, the printer will perform an automatic purge on that head to prepare it for binder, then print a purge block to help flush any remaining black ink out of the HP11 print head.
6. The **Printing** dialog opens and reports the build status.

4.2.1 The Printing Dialog

The **Printing** dialog opens after the build is started. It reports the status of the print job for the duration of the build, including the Estimated Finish Time, Estimated Time Remaining, Starting Time, Elapsed Time, the Layer that is currently printing, and the % completed.



4.3 3D Print With The ProJet 260C and 460Plus

The following instructions are for the *ProJet 260C and 460Plus* only.

1. After confirming the printer and powder settings for the current print job, select **Home > Build**
2. The **Printer Status** dialog opens.



3. 3DPrint checks each item in the **Printer Status** dialog prior to printing to ensure there are enough materials to complete the current build. See Chapter 5 of this guide for instructions if you see a message to add powder, to add binder, to change one or both print heads, to raise build, or to close the cover.
4. Click the **Details** button to view usage information specific to each print head, the binder, and the powder levels.
5. Check or uncheck your **Print Job Options** for the current build.

Important: The **Empty Build Piston after Printing** option is checked by default. When checked, the printer automatically removes the bulk of the powder from the Build Bed after the part is printed and dried. If you are printing a part with especially delicate features, build the part with a Fixture, or uncheck this option.

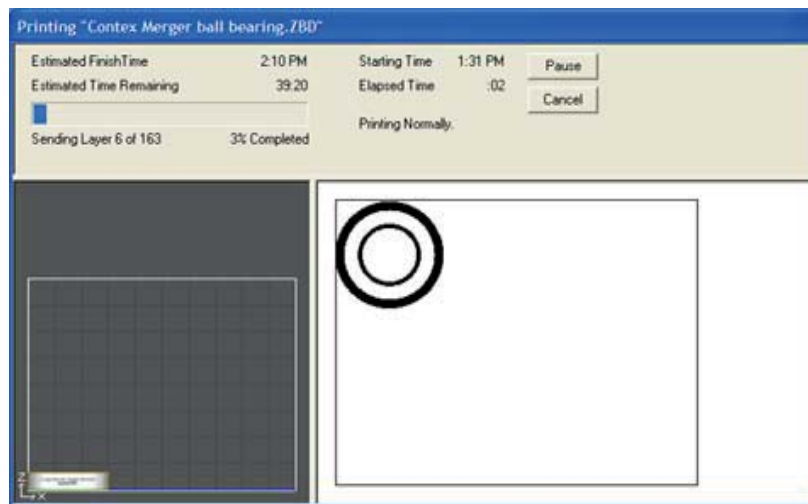
6. The **Print** button is enabled when each item, (except the **Head Alignment** and the **Build Temperature** items) displays **OK**. Click **Print** to start your build. After you click **Print**:
 - The printer will automatically fill the Build Bed with powder and spread a layer to ensure the top surface is smooth.
 - The printer will service the print heads. If you changed an HP11 print head, the printer will perform an automatic purge on that cartridge to prepare it for binder.
 - The printer will run a print head alignment before the build if the text message **Will Be Performed** is shown in the **Printer Status** dialog. See Chapter 7 for more information.

- You can start the build while the printer is still warming up, however, the printer top cover must be closed.

7. The **Printing** dialog opens and reports the build status.

4.3.1 The Printing Dialog

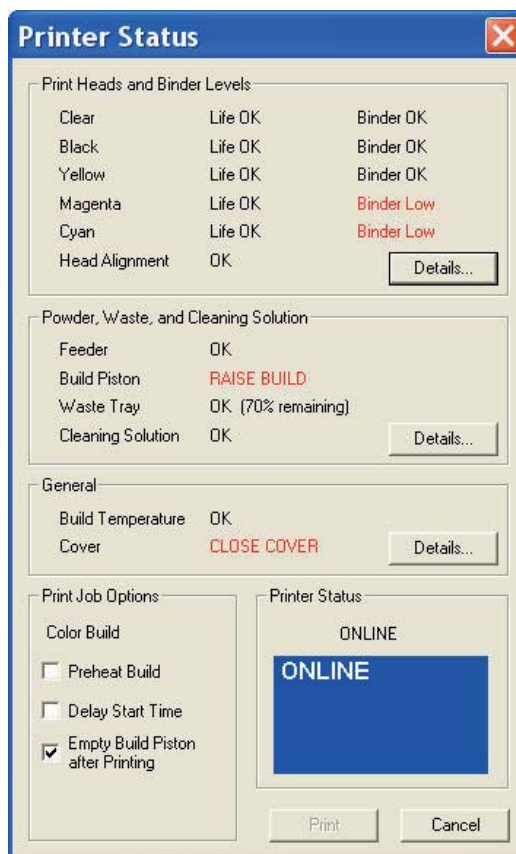
The **Printing** dialog opens after the build is started. It reports the status of the print job for the duration of the build, including the Estimated Finish Time, Estimated Time Remaining, Starting Time, Elapsed Time, the Layer that is currently printing, and the % completed.



4.4 3D Print With The ProJet 660Pro and 860Pro

The following instructions are for the *ProJet 660Pro and 860Pro only*.

1. After confirming the printer and powder settings for the current print job, select **Home > Build**
2. The **Printer Status** dialog opens.



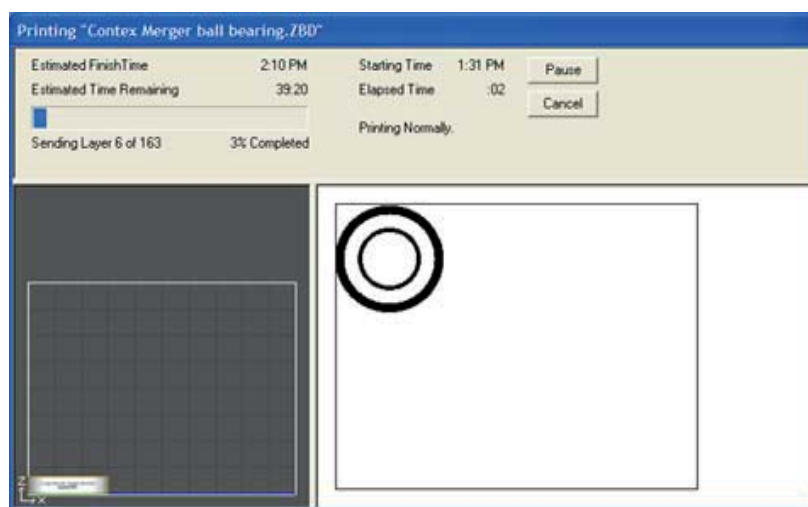
3. 3DPrint checks each item in the **Printer Status** dialog prior to printing to ensure there are enough materials to complete the current build. See Chapter 5 of this guide for instructions if you see a message to add powder, to add binder, to change one or both print heads, to raise build, or to close the cover.
4. Click the **Details** button to view usage information specific to each print head, the binder, and the powder levels.
5. Check or uncheck your **Print Job Options** for the current build.
Important: The **Empty Build Piston after Printing** option is checked by default. When checked, the printer automatically removes the bulk of the powder from the Build Bed after the part is printed and dried. If you are printing a part with especially delicate features, build the part with a Fixture, or uncheck this option.
6. The **Print** button is enabled when each item, (except the **Head Alignment** and the **Build Temperature** items) displays **OK**. Click **Print** to start your build. After you click **Print**:
 - The printer will automatically fill the Build Bed with powder and spread a layer to ensure the top surface is smooth.
 - The printer will service the print heads. If you changed an HP11 print head, the printer will perform an automatic purge on that cartridge to prepare it for binder.

- The printer will run a print head alignment before the build if the text message **Will Be Performed** is shown in the **Printer Status** dialog. See Chapter 5 for more information.
- You can start the build while the printer is still warming up, however, the printer top cover must be closed.

7. The **Printing** dialog opens and reports the build status.

4.4.1 The Printing Dialog

The **Printing** dialog opens after the build is started. It reports the status of the print job for the duration of the build, including the Estimated Finish Time, Estimated Time Remaining, Starting Time, Elapsed Time, the Layer that is currently printing, and the % completed.



4.5 Obtain Information About The Build

In addition to the **Printing** dialog, 3DPrint has several reporting features that provide useful information about each print job you execute. They include the Print Time Estimator, Part Statistics, View Log File, View Detailed Report, and Print 3D Image. Following is a description of each.

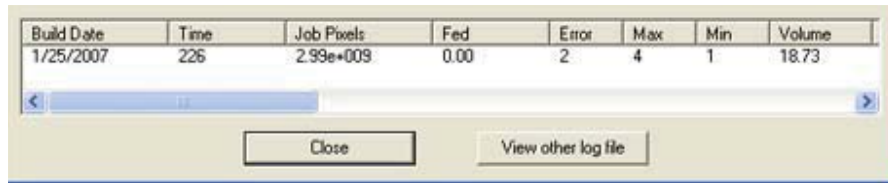
4.5.1 Print Time Estimator

- Select **Tools > Print Time Estimator** to view information related to the build before you send it to print. The **Time Estimation Report** will estimate how long the part will take to print in color or monochrome, estimate the binder usage, and detail other information related to the build including the date, build file name, printer and powder type, build height, layer thickness, number of layers, and the part volume, area, and surface to volume ratio.
- To save a text file of the **Time Estimation Report**, choose one of the **Report** buttons and browse to a directory for saving the file. The **Brief Report** contains everything you see in the **Time Estimation Report**. The **Full Report** includes everything in the **Brief Report** plus the part file name, width, depth, height, volume, and area dimensions.

4.5.2 View Log File

The Log File is a record 3DPrint maintains of each print job run on your printer. Select **Tools > Service > View Job Log** to view a log of each build printed on the printer in chronological order by date. Click

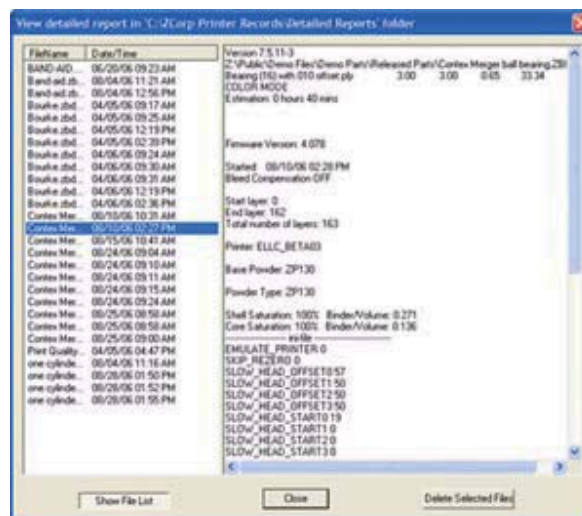
the **View Other Log File** button to select text files of job logs stored in the *Printer Records\Print Logs* directory.



View Log File Dialog

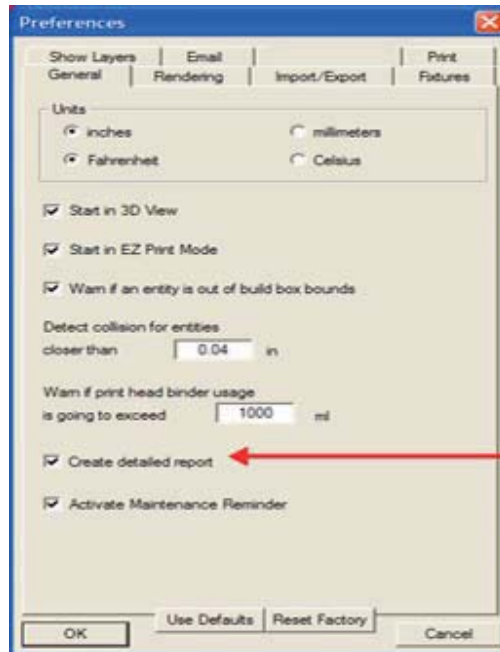
4.5.3 View Detailed Report

3DPrint writes a Detailed Report of every build printed on your printer and saves it as a text file in the *Printer Records\Detailed Reports* directory, (unless you choose to save the file to a different directory). The name of the text file consists of the name of the build and a file version. If the same print job is printed several times, a new text file is written for each print job, and the files are distinguished by number.



The **View Detailed Report** dialog acts as a simple file manager for each report generated. It allows you to view the list of files, to sort them by File Name or Date/Time, to view the contents of each file, and to delete files.

3DPrint will generate a Detailed Report for every build. If you do not want to generate a Detailed Report for every build, uncheck the **Create Detailed Report** option in the **Settings > General Preferences > General** tab.



5 The Printer Status Dialog

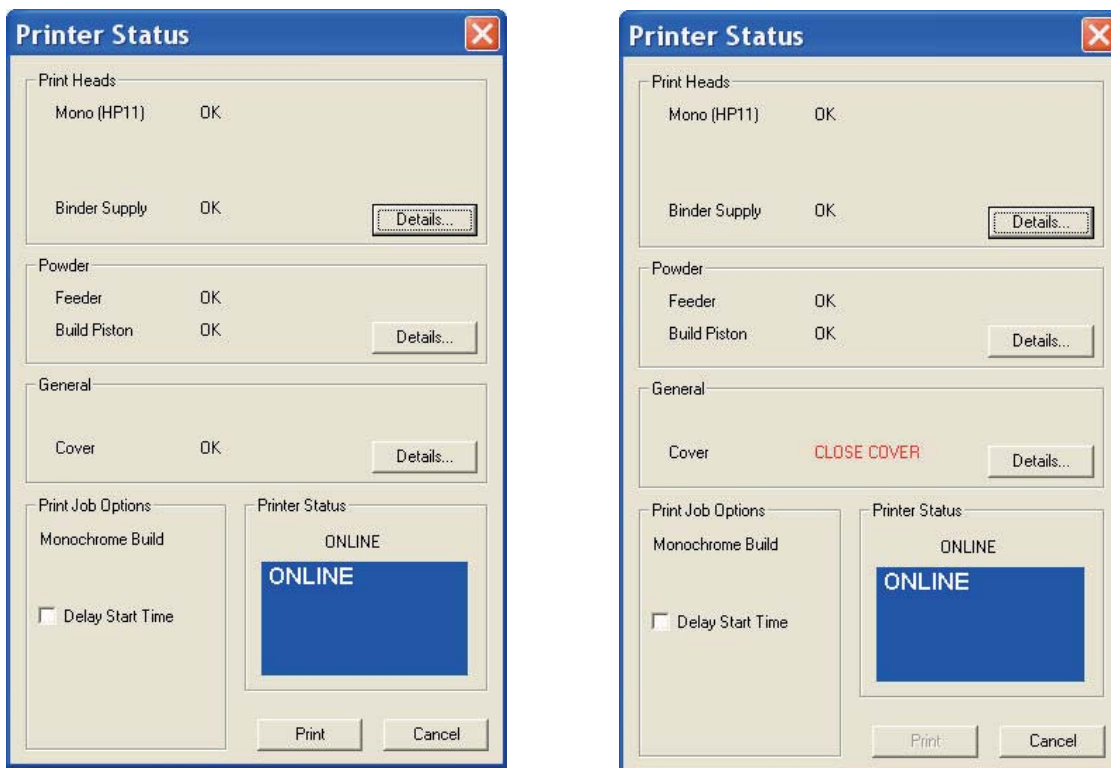
The printer status dialog provides valuable information about what's happening with your printer, including the amount of binder and powder available, and whether or not there is enough of each to complete your build.

5.1 About the Status Dialog

When you start a print job, 3DPrint checks the printer to ensure there are enough materials to complete the job and that the printer is properly prepared for printing. If the printer does not have enough powder, binder, or print head life to complete the job, a message appears in the **Printer Status** dialog telling you what you need to do to get the printer ready to print.

Important: *Do not add powder or binder to the printer, or change a print head, unless you see a message telling you to in the Printer Status dialog.*

5.1.1 Status Dialog - ProJet 160 and ProJet 360 Only

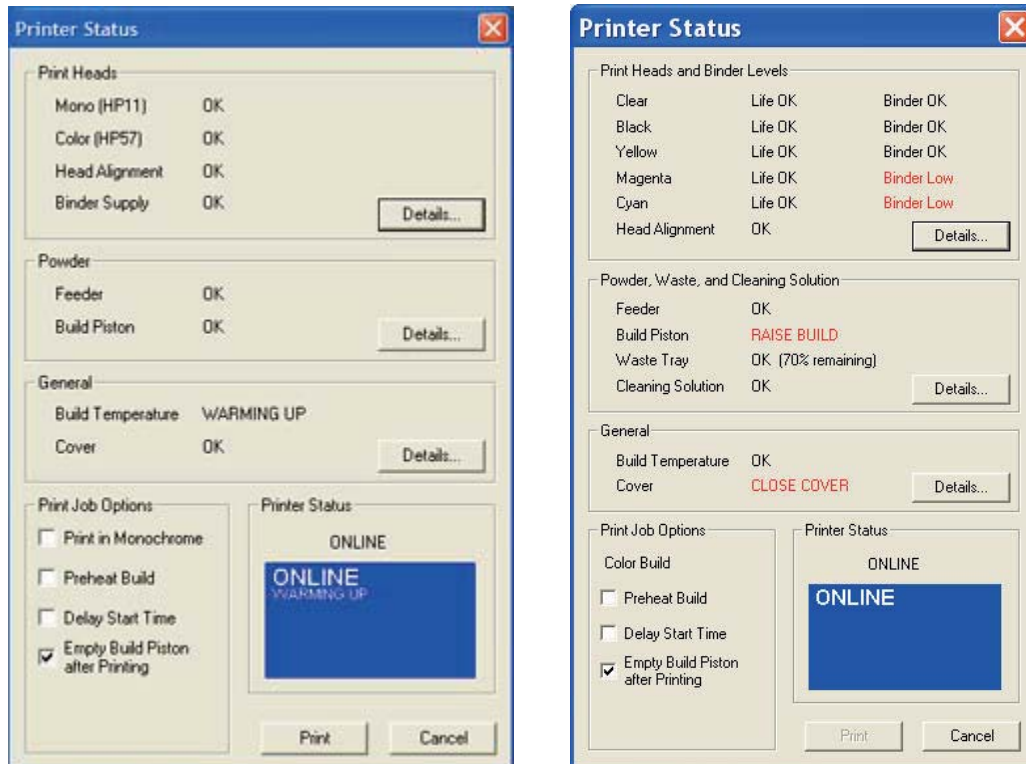


In the example above, the **Printer Status** dialog on the left is ready for printing. Notice that each item shows **OK** and the **Print** button is enabled. From here you would choose your Print Job Options and click **Print** to start the job. Before the printer starts printing your file, it will first:

- fill the Build Bed with powder
- print a Purge Block (if the print head is new)
- spread a layer to ensure the Build Bed surface is smooth
- service the print head

If there are not enough materials to complete the job, or the printer is not properly prepared, messages appear similar to the example on the right above. When any **one** of these messages appears, the **Print** button is disabled. The remainder of this chapter describes how to clear a message in the **Printer Status** dialog and start the build.

5.1.2 Status Dialog - ProJet 260C, ProJet 460Plus, ProJet 660Pro and ProJet 860Pro



In the example above, the **Printer Status** dialog on the left (a ProJet 260C or 460Plus) is ready for printing. Notice that each item shows **OK**, (except for the Build Temperature), and the **Print** button is enabled. From here you would choose your printing options and click **Print** to start the job. Before the printer starts printing your file, it will first:

- fill the Build Bed with powder
- spread a layer to ensure the Build Bed surface is smooth
- service the print heads
- run an alignment pattern if a print head was replaced or removed for cleaning

If there are not enough materials to complete the job, or the printer is not properly prepared, messages appear similar to the example on the right above (a ProJet 660Pro or 860Pro). When any **one** of these messages appears, with the exception of Head Alignment and Build Temperature, the **Print** button is disabled. The remainder of this chapter describes how to clear a message in the **Printer Status** dialog and start the build.

3DPrint allows you to continue and print if:

- The printer build temperature is still warming up.
- A Head Alignment will be performed. This is run before the part begins to print.

5.2 The Details Button

Click **Details** to view the usage status for Printheads, Powder, and Binder. The **Details** dialog shows the amount of materials remaining and the amount required for the build (both in ml).

5.3 Change Print Heads

3DPrint checks the status of the print head(s) before every build. If a print head needs to be changed, 3DPrint displays **CHANGE PRINT HEAD** in the **Printer Status** dialog. You will not be able to start the build until you have changed the appropriate print head.

- Do not change the print head(s) unless prompted to in the **Printer Status** dialog.
- When the HP11 print head is changed, the printer runs an automatic purge cycle to clear the print head of its black ink and prepare it for clear binder.
- When a color print head is replaced, or removed from its slot for cleaning, the printer will run the Auto-Alignment pattern to properly align the print heads before the next build is started.

For details on replacing a print head, refer to the **User Guide** for your printer.

5.4 Add Binder

3DPrint evaluates the geometry of a part and determines if there is enough binder to complete the job. If not, 3DPrint displays **ADD BINDER** in the **Printer Status** dialog. You cannot start the build until you add binder to the printer.

For details on adding binder, refer to the **User Guide** for your printer.

5.5 Add Powder To The Feeder

3DPrint evaluates the geometry of the part to determine if there is enough powder in the Feeder to complete the build. If not, 3DPrint displays **ADD POWDER** in the **Printer Status** dialog. You cannot start the build until you add powder to the Feeder.

Do not add powder unless all of the powder in the Build Bed, Overflow (front and rear), and Deck has already been returned to the Feeder, via a vacuuming operation.

For details on adding powder, refer to the **User Guide** for your printer.

5.6 Build Piston (Build Bed)

The Build Bed platform must be in its proper position at the top of the Build Bed in order for the printer to fill the bed and spread a layer of powder before starting a print job. If you see **RAISE BUILD**, go to the printer and select **PREP BUILD CHAMBER > CONTINUE** to raise the platform to its proper position.

5.7 Cover

The printer cannot start a print job when the top cover is open. If the top cover is open, go to the printer and close it.

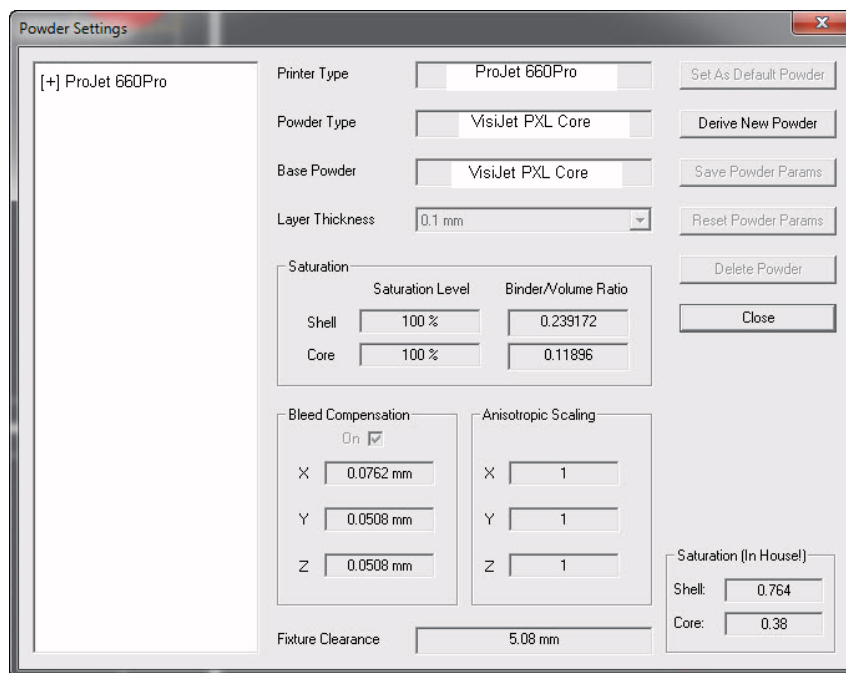
6 Advanced Settings

This section explains more advanced functions of 3DPrint, such as creating custom Powder Types and exporting files.

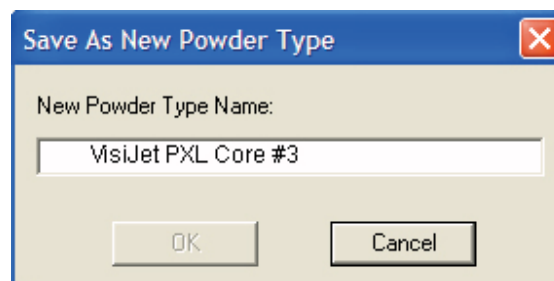
6.1 Create Custom Powder Types

There may be occasions when you need to fine-tune your powder settings. To do so, follow the steps below. The examples show a ProJet 660Pro as the target printer, but the same general steps apply for all printers.

1. Select **Settings > Powder Settings** to display the **Powder Settings** dialog. Select the Powder Type for your printer type from the left panel. This becomes the *Base Powder* of your custom powder type.

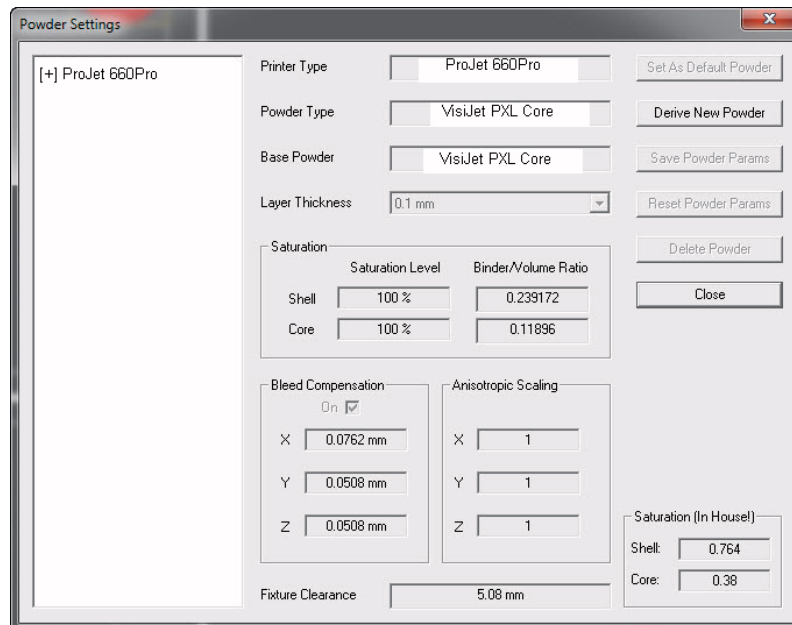


2. Select **Save As New Powder**. Type in a unique name for the new powder. You cannot duplicate powder names.



3. Enter new values for the **Layer Thickness**, **Shell** and **Core Saturation Level**, **Bleed Compensation**, and the **Fixture Clearance**.

- If you need to discard the new settings and return to the original settings, click the **Reset Powder Params** button *before* you save your changes. After you click the **Save Powder Params** button, the **Reset Powder Params** button is disabled.



- To make the new powder type your default powder for all of your builds, click the **Set As Default Powder** button. The default powder is highlighted in bold and these settings are applied to each build unless you set a different powder type as the default.

NOTE: Custom powder type settings are saved on the local directory of your computer. If the build is setup on a different computer, you will not have access to those powder types.

- To delete a new custom powder, highlight the powder type and select the **Delete Powder** button. Confirm your action in the following prompt:

6.2 Saturation Values Overview

- In general, the saturation settings for high performance powders are constant for all parts. The default saturation values, suggested by 3DPrint, are designed to successfully print a majority of parts.
- In general, bulkier parts will print more successfully with a lower saturation setting and delicate parts will print better with a higher saturation setting.
- Default values are defined in terms of percentage. The recommended saturation values are always 100%.
- Saturation values may be changed by percentage. When changing any value corresponding to shell saturation, the relative core saturation is also changed. The saturation values displayed are a percentage of the recommended saturation value.
- You may manually override the core percentage, if needed.

6.3 Bleed Compensation Overview

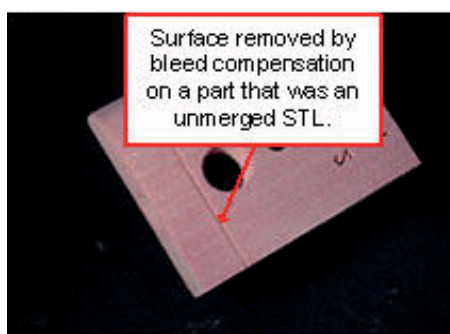
Binder printed on powder has a tendency to spread slightly, causing surfaces of a part to migrate outwards. This is known as “bleeding” and to compensate for this, it is necessary to determine the Bleed Compensation value to apply to a part. Once that value is determined, a small amount of thickness is shaved off of all surfaces during the printing process to keep the part in true perspective.

For printers with more than one print head, the Bleed Compensation is also affected by the quality of the print head alignment. *Proper print head alignment is very important in minimizing shrinkage and expansion effects during printing.*

Bleed Compensation values will differ according to the printer and powder type used. The recommended Bleed Compensation values for the powder type used with your printer have been preset in ZPrint. For most users, these values will never need to be changed.

- 3DPrint will recommend values for the X-, Y-, and Z-Axis when using a Base Powder. You may override these values when you create a custom powder type. See [Section 6.1 “Create Custom Powder Types”](#) for more information.
- *ProJet 360, 460Plus, 660Pro and 860 only* - 3DPrint keeps Bleed Compensation checked (On) by default. Uncheck **Bleed Compensation** in the **3D Print Setup** dialog to turn off Bleed Compensation for the current build.

WARNING: *A part may be contained in one file but may consist of several parts. If the parts are not merged together, bleed compensation will remove a shell from each separate part. This may cause the part to be separated into several pieces. Applying Bleed Compensation may leave a stripe (shown below) on parts that are not merged.*



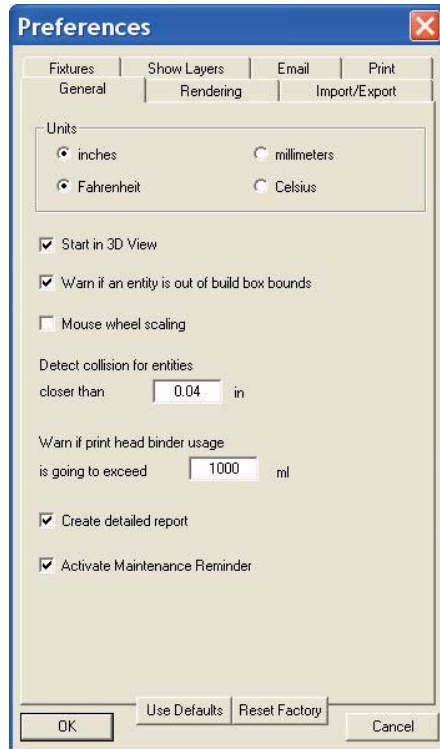
6.4 General Preferences Settings

To view 3DPrint preferences, select **Settings > General Preferences**. The **Preferences** dialog consists of eight tabs. Click on a tab to view default settings used in ZPrint. In most instances, (such as when using Collision Detection, the Make Solid, or the Make Fixture operations), you can override these default settings and input different values or options for the current build using other dialogs.

Each tab contains four buttons, which are described below. Following is a reference section for the options on each **General Preferences** tab:

- **OK** - Click **OK** to save changes and to update 3DPrint with the current settings.
- **Use Defaults** - Click **Use Defaults** to save the current settings as new default settings in ZPrint.
- **Reset Factory** - Click **Reset Factory** to clear the current settings and reset the original default settings that were shipped with ZPrint.
- **Cancel** - Click **Cancel** to close the **Preferences** dialog without saving changes.

6.4.1 General Tab



Preferences – General Tab

Units: Inches and Fahrenheit are the defaults. The Unit settings tell 3DPrint the way that part dimensions and layer thicknesses are displayed in the software, but they do not change the underlying dimensions for the part.

Start in 3D View: Checked by default. Opens your files in 3DPrint in 3D view. At times, parts may take a long time to load and open due to facet size. Importing the file in 2D view reduces the time it takes to open a model in 3D view.

Warn if an entity is out of build box bounds: Checked by default. Enables 3DPrint to display a warning message when your part, or a piece of it, is outside the Build Bed. 3DPrint encloses the object with a red wire frame if it is residing outside of the Build Bed.

Mouse Wheel Scaling: When selected, allows you to change the size of your part by clicking on the part in the Side or Top View, then spinning the mouse wheel.

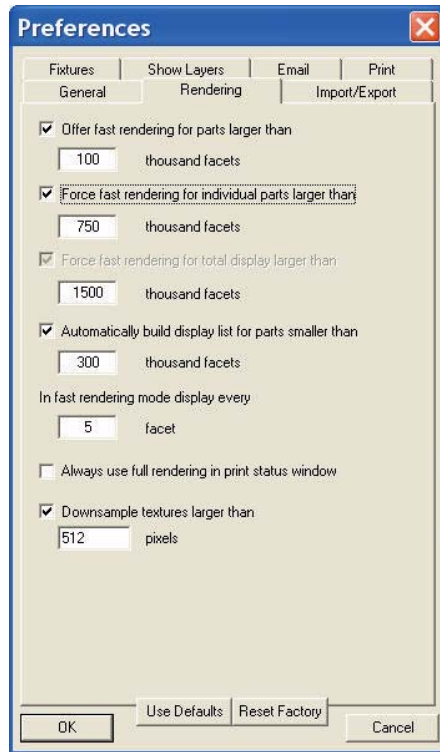
Detect collision for entities closer than: 3DPrint offers a default collision value for the printer and powder type. Any value entered into this field as a new default will only be in effect when using this combination of printer and material system.

Warn if print head binder usage is going to exceed: Tells 3DPrint to check before printing, whether you will exceed the binder usage value shown in this field. A warning message appears informing you that the print head might not complete the build. You may choose to change the print head, or close the warning and take no action.

Create detailed report: Checked by default. Logs the details of each print job. To view the report details, select **View > View Detailed Report**.

Activate Maintenance Reminder: Checked by default. Alerts you when it is time to refill the wash fluid, grease the slow and fast axis, or grease the piston screws.

6.4.2 Rendering Tab



Preferences – Rendering Tab

In fast rendering mode display every: Enter a value in this field to accelerate displaying large files in 3DPrint during fast rendering. The default value is to display every fifth facet. In cases where a file contains a large amount of facets, even fast rendering can be slow. To decrease the time it takes to render, change the facet value to a higher number in order to decrease the number of facets rendered. For example, if the facet value was 500, the software would render every 500th facet.

Offer fast rendering for parts larger than: Check this option to have 3DPrint prompt you to use fast rendering before drawing a part with more than the designated number of facets entered in the **Thousand Facets** field.

You may override these setting for an individual build by selecting **Fast Rendering** on the **View** menu.

NOTE: If you have a very fast computer video display, set the facets threshold higher, or uncheck this option. If your computer is slow to draw and refresh the screen, set the facets threshold lower. The recommended threshold is 100,000 facets.

Force fast rendering for individual parts: Models larger than this setting will be fast rendered, even if the rest of the build is not. Improves performance and utility in a mixed build where some models are simple and others have a high facet counts.

Force fast rendering for total display larger than xxx thousand facets: Improves computer stability and display performance with very high facet count models.

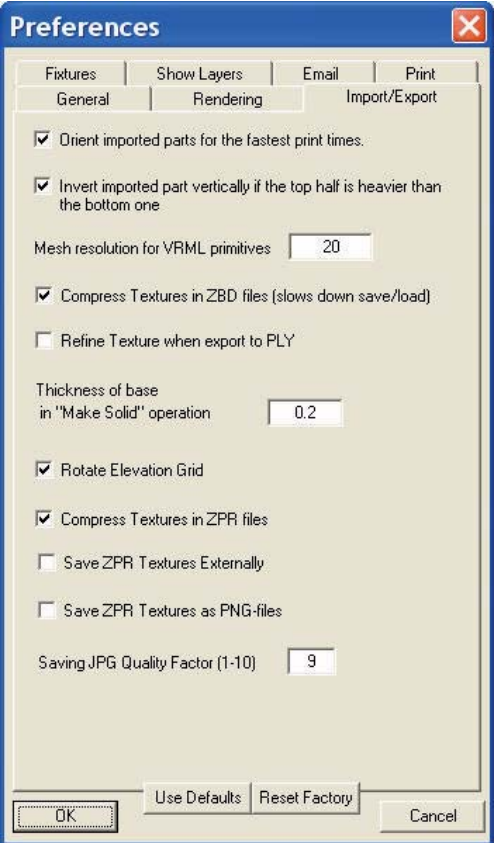
Automatically build display list for parts smaller than: Check this option to view the build list for parts that are smaller than the designated amount of facets entered in the **Thousand Facets** field.

Building the display list pre-compiles facets in OpenGL. This makes rotating, zooming, and panning in 3D smoother. This operation varies in processing time depending on the file size. If the part will not be viewed in 3D, it is not necessary to build the display list. To prevent the software from automatically building the display list, set the threshold to a higher value. You may manually build the display list after you have opened or imported a file by choosing the **Make Display List** icon on the Tool-bar.



Always use full rendering in print status window: In most cases, full rendering can be used in the Printing dialog during printing. For large files, displaying the status of a print job is delayed due to rendering updates. In these situations, uncheck this option and use full rendering. When this option is unchecked, the Printing dialog uses the same rendering mode as the main window.

6.4.3 Import/Export Tab



Preferences – Import/Export Tab

Orient imported parts for the fastest print times: Checked by default. Orients a part with the smallest dimension printing in the Z-axis for the fastest print times. Uncheck this option if you do not want 3DPrint to automatically orient the part.

Invert imported part vertically if the top half is heavier than the bottom one: Checked by default. Orients a part so that the heavier half is at the bottom of the build bed. Printing the part with the lighter side towards the top prevents the weight of the heavier half from damaging the part during powder removal.

Mesh resolution for VRML primitives: The default setting is **20**. Set the number higher to increase the number of facets and make your file larger. Set a lower number to reduce the facets.

Compress Textures in .zbd files (slows down save/load): Checked by default. Saves texture maps with compression. Compress texture maps if you have limited computer resources. The trade-off is compressed files take longer to open and save.

Refine texture when export to .PLY: Unchecked by default. Applies to .wrl/texture map files and increases the number of facets by four times in texture mapped parts, which significantly increases the fidelity of the rendering. The export option is for exporting a .PLY file into third-party software for manipulation, if needed.

Thickness of base in “Make Solid” operation: Creates a solid base for surfaces that are rectangular. The height of the base is determined by the value entered in this field.

Rotate Elevation Grid: Checked by default. Orients the part in the **XY** plane. Most *GIS VRML* files contain an *Elevation Grid* where the main landscape plane is oriented parallel to the **XZ** plane (not the **XY** plane), meaning you have to manually rotate the model.

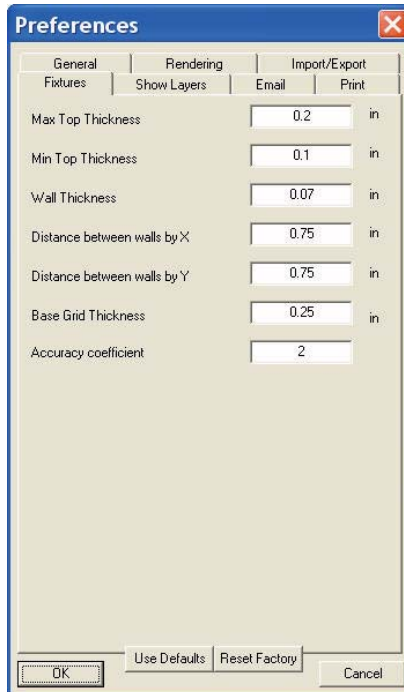
Compress textures in .zpr files: Check to save texture maps with compression. Compression saves computer resources, but compressed files take longer to open and save.

Save .zpr textures externally: Check if you want to save texture maps separately from a .zpr file. In most cases, the texture maps are saved as .png files.

Save .zpr Textures as .png files: Unchecked by default. When checked, saves .zpr texture maps as .png files, which do not lose detail when compressed and then uncompressed.

Saving .jpg Quality Factor (1-10): Relates to exporting .zpr files. On a scale of 1-10, 1 means no loss of quality, 10 is the greatest loss of quality.

6.4.4 Fixtures Tab



Preferences – Fixtures Tab

Max Top Thickness: The maximum thickness of the top surface.

Min Top Thickness: The minimum thickness of the top surface. The lower this value is, the better the fixture will cradle the part.

Wall Thickness: Sets the thickness of the Fixture wall.

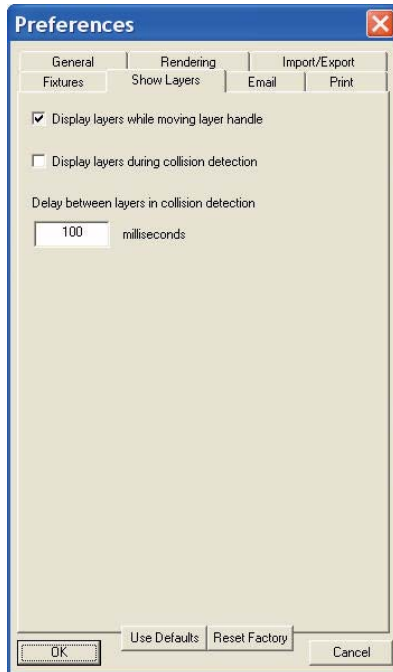
Distance between walls by X: The distance between the Fixture walls in the **X** direction.

Distance between walls by Y: The distance between the Fixture walls in the **Y** direction.

Base Grid Thickness: Determines how high the part is moved from the bottom of the build box to accommodate the fixture base.

Accuracy coefficient: Set the value for separating the part and the fixture for parts that have vertical, or nearly vertical, walls. The smaller the degree of separation, the better the fixture will follow the shape of the part. Run Collision Detection to see if the fixture is touching the part. If it is, increase the Accuracy Coefficient by a small amount and rerun Collision Detection.

6.4.5 Show Layers Tab



Preferences - Show Layers Tab

Display layers while moving layer handle: Check this option to view layers in real time while moving the layer handle up or down in the front view of the main window in either 2D or 3D view.

Display layers during collision detection: Check this option to display layers while running collision detection.

Delay between layers in collision detection: Input a value for displaying layers while running collision detection. A higher number will display at a slower rate than a lower number.

Display current layer number and height in 3D view: Check this option to display the number and height of a selected layer while in 3D view.

6.4.6 Email Tab

Preferences - Email Tab

Recipient e-mail address: Enter the email address of the person who will receive notification about the current build. Email notification is activated *only* when an email address is entered in this field. You may enter multiple recipients addresses if they are separated by a space and/or a semi-colon.

Sender e-mail address: Enter the email address of the sender or printer. The address cannot contain any separators (i.e. spaces, commas, colons, semi-colons, or tabs). Some SMTP servers require the **Sender** field to be a valid email address. Check the validity of the Sender email address by clicking the **Test e-mail** button.

If the name of your printer is not recognized as a valid Sender address, enter an email address for the computer that controls the printer, or leave the **Sender** field blank. In the latter case, the recipient email address will be used as the Sender.

SMTP server IP-address: This field should be left blank unless email notification is not working properly. Consult your system administrator and enter an IP address of your company's SMTP server. We recommend entering a numerical IP address (not a domain name).

Notify when job is complete: Notifies you when your print job is complete.

Notify when job is aborted: Notifies you when your print job is aborted.

Notify when powder tray is full: Notifies you when your powder tray is full.

Notify when waste bottle is full: Notifies you when the waste bottle is full.

Notify when binder is low: Notifies you when the binder is low.

Notify if an error occurred: Notifies you when an error has occurred.

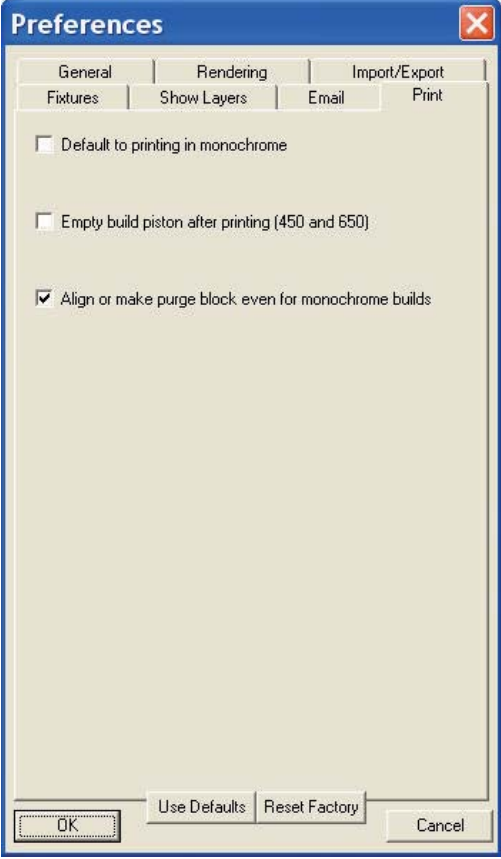
Notify when the job is going to finish in: Notifies you when your print job will finish at the time specified in the minutes field.

Authentication: In some cases, when entering an SMTP address, the server will ask for login information. Authentication allows you to input a user name and password to use when connecting to a server.

Test E-Mail: Make sure that your combination of Recipient/Sender email addresses works with your system. Click the **Test E-Mail** button to open a dialog for entering the subject and text of the testing message.

Test that your message was sent, but more importantly, received. If you have problems with sending email, we recommended leaving the **Sender e-mail address** field blank.

6.4.7 Print Tab

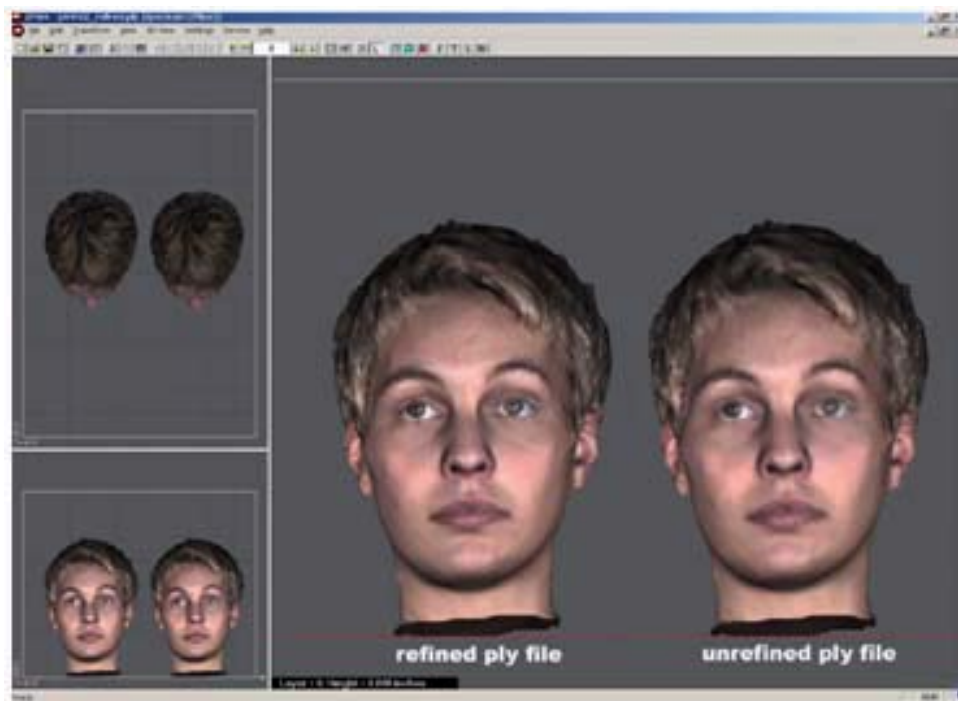
 <p>Preferences - Print Tab</p>	<p>Default to printing in monochrome: Check this option to print all builds in monochrome.</p> <p>Empty build piston after printing: On printers equipped with automated gross powder removal (<i>ProJet 460Plus</i>, <i>660Pro</i> and <i>860Pro</i>), this runs a depowdering cycle after the build is complete and has finished its drying cycle.</p> <p>Align or make purge block even for monochrome builds: The printer will run an alignment pattern (for color printers) or print a purge block (for monochrome printers) even when the build is monochrome.</p>
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6.5 Export .ZPR, .ZPR2, .PLY, or .STL Files

3DPrint has file export capability for .zpr, .zpr2, .ply and .stl files when you need to export a part from the build and alter it. You can only export one .ply, .zpr, or .zpr2 file at a time. You can export multiple .stl parts and keep them relative to each other when they are imported into a third-party software application.

To export a part as a .ply file or a .zpr file:

1. Select the part. (Only one .ply or .zpr file can be exported at a time.)
2. Choose **Home > Export > Export PLY** (or **Export ZPR**, or **Export ZPR2**). The part exports with the same scale and orientation. When exported, all parts (except texture maps) retain their texture and color quality.
 - For texture maps, the software will triangulate the part and then assign a color to each triangle. The color and texture of the part may need to be refined. To refine the color and texture, go to **Settings > General Preferences > Import/Export** tab. Check the **Refine texture when export to PLY** option.



7 Service Menu

The Service Menu is where you will find everything you need to maintain and update your printer.

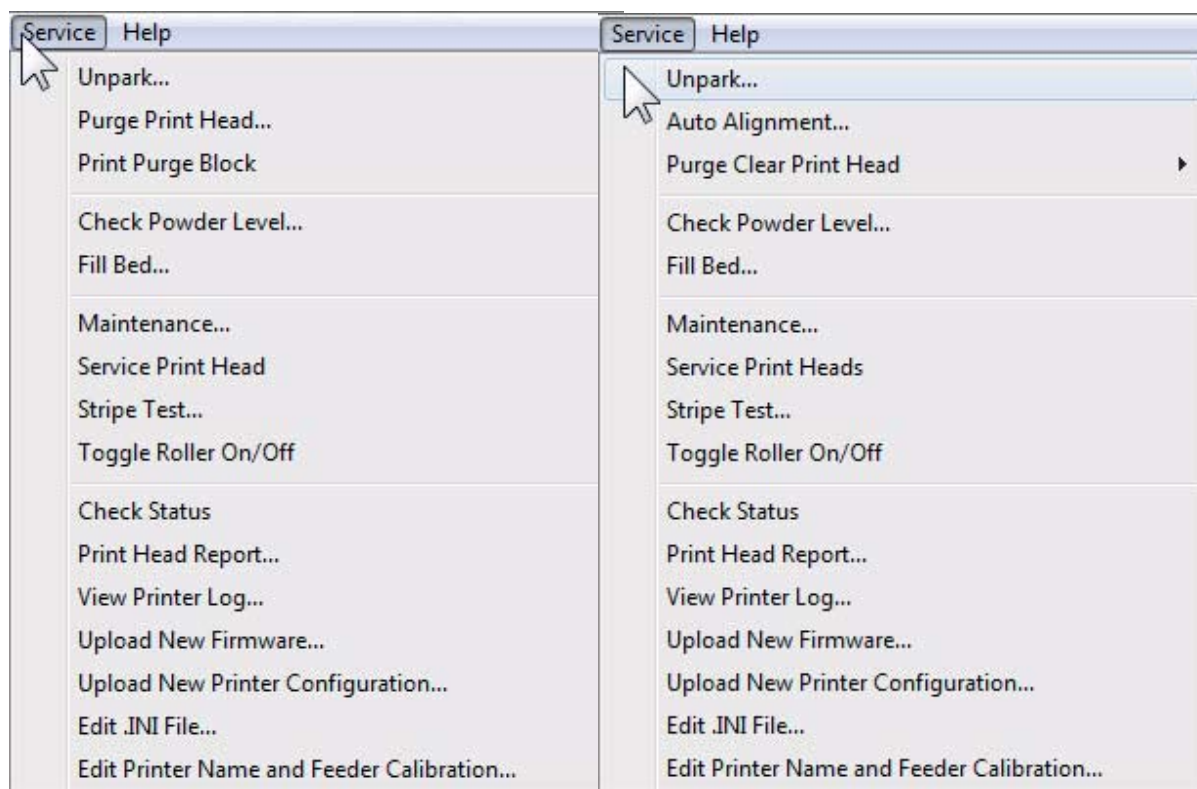
3DPrint communicates with the printer during routine service procedures. You can also view status information directly at your 3D Printer, and activate several service functions, should there be a need.

The **ProJet Service Menus** are described below.

7.1 Service Menus by Printer

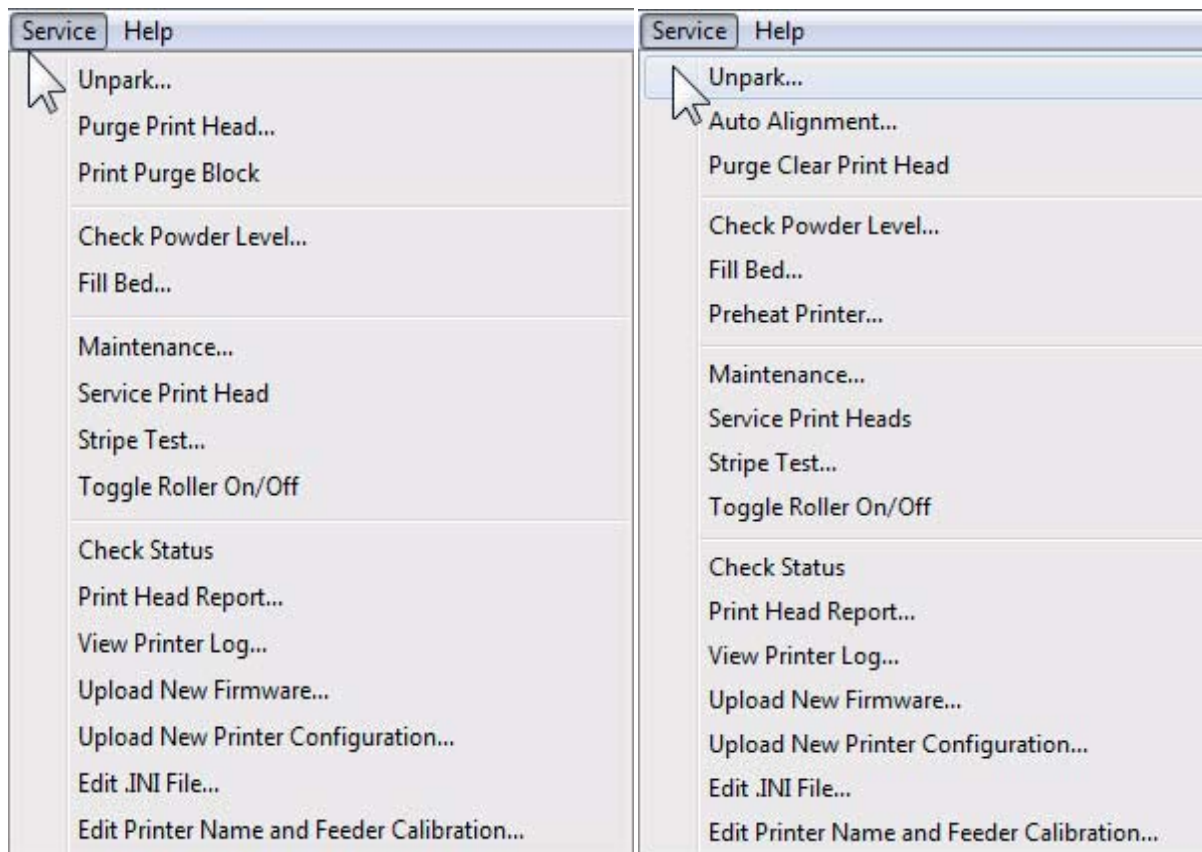
ProJet 160

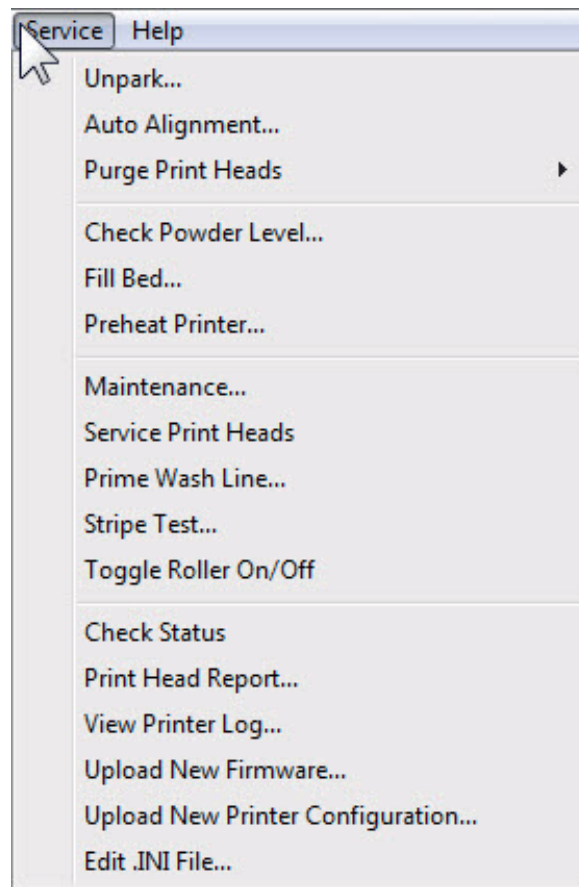
ProJet 260C



ProJet 360

ProJet 460Plus



ProJet 660Pro/860Pro

7.2 ProJet Service Menu Items

The following general **Service** Menu items are available.

NOTE: Some details of the menu will vary depending on the printer. Refer to your printer's *User Manual* for details.

Service Menu items are as follows:

Unpark. Unparks the Fast Axis and carriage for cleaning or servicing.

Auto Alignment. Aligns the print heads after they have been changed (color printers).

Purge Print Heads. Select after changing a print head and before running the alignment test. This runs binder through the print head, replacing the HP ink with binder.

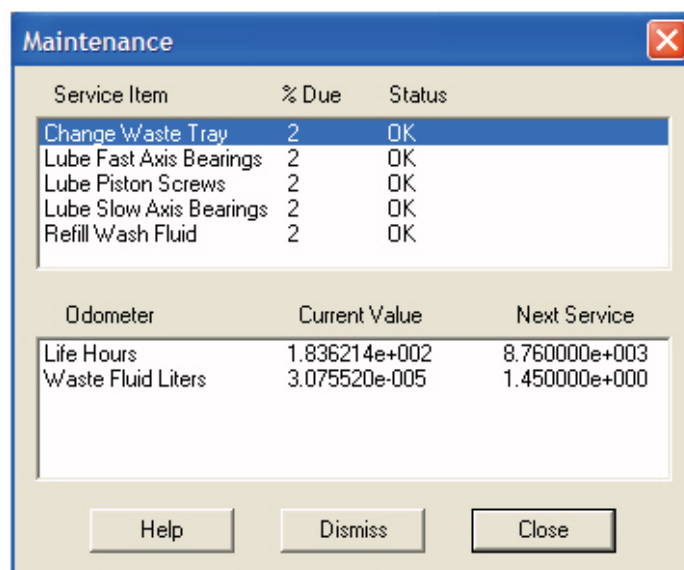
Print Purge Block. Prints a small flat block under the part to help flush the last remnants of black ink out of the HP 11 print head (monochrome printers).

Check Powder Level. Select to have the system check whether there is enough powder in the Feeder and if there is enough room in the Build Bed to complete the current print job.

Fill Bed. Prepares the build to print by filling the Build Bed with powder. This is the equivalent of selecting the **Fill Bed** command on the Control Panel.

Preheat Printer. Heats the printer to the proper temperature before printing. This may add some time to your overall print time. (ProJet 460Plus, 660Pro, 860Pro)

Maintenance. Select to view the status of the Fast Axis Bearings, the Slow Axis Bearings, the Piston Screw, the Wash Fluid, and the Waste Tray service items. 3DPrint will automatically prompt you when it is time to perform maintenance on any of these items.



An example of the Maintenance dialog

Service Print Heads. Select to service the print head if it is not printing well.

Prime Wash Line. Select to push wash fluid through the fluid lines when you first start up your Printer or when you have run out of wash fluid. (ProJet 660Pro and 860Pro)

Stripe Test. Select to print a stripe test to check the functionality of the print heads.

Toggle Roller On/Off. Select to activate the roller independently for easy cleaning.

Check Status. Checks how much powder is in the Feed Piston, the remaining room in the Build Bed, and the 3DPrint Firmware version.

Print Head Report. Select to view a report of the number of mL printed, temperature levels, and flow rates for the current print heads.

View Printer Log. Select to view the printer log that records historical printer performance.

Upload New Firmware. Select to upgrade the Firmware for your 3D Printer. Contact your local service provider, who will provide you with any required upgrades and instructions for installing. Or, check for updates on the Support section of our Web site: 3dscentral.3dsystems.com.

Upload New Printer Configuration. Select to replace the entire .ini file in the printer. Please only use under the instruction of the 3D Systems Service Department, or an authorized Service Representative.

Edit .INI File, and Edit Printer Name and Feeder Calibration. These features are used during diagnosis. They should only be modified under the instruction of the 3D Systems Service Department, or an authorized Service Representative.

8 Troubleshooting

If you should experience any problems using your 3DPrint software, look through the topics here for solutions. If you still have trouble, contact your local service provider. Online, you can find information in the Support section of our Web site at 3dscentral.3dsystems.com. If you still unable to resolve the problem, contact 3D Systems directly using the information at the end of this section.

8.1 The 3DPrint Software Crashes

Review the following sections if you experience a software crash or problems rendering in these situations:

- When opening or importing a part
- During a **Create Label**, **Create Fixture**, or **Create Solid** operation

8.1.1 Artifacts with Rendering or Labeling

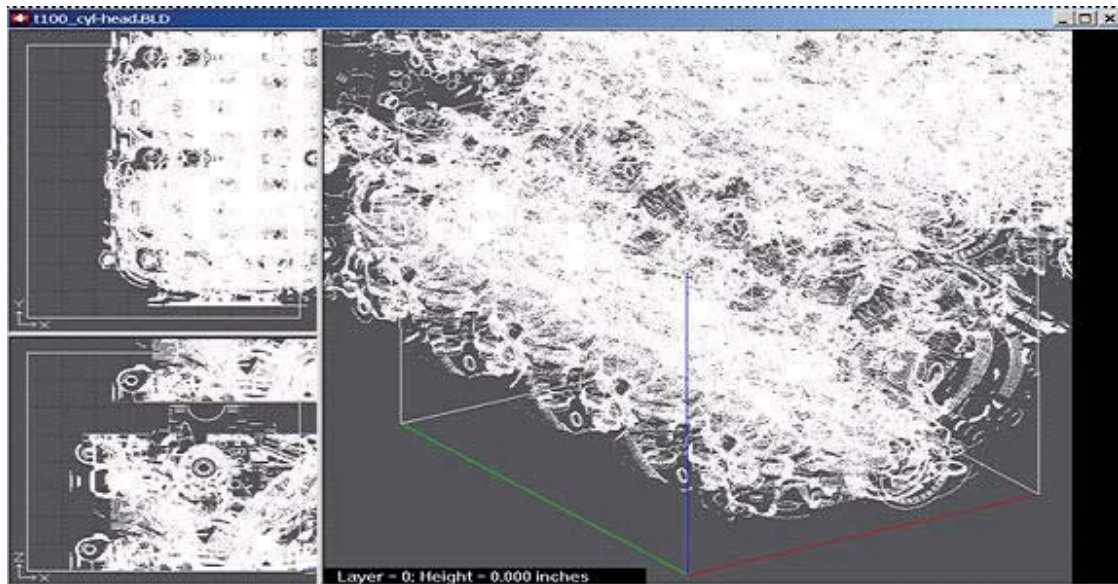
These problems may be due to heavy use of Open GL drivers or there may be some interference with the Open GL driver. To correct these problems, try the following steps:

- **Update Drivers**
Make sure you have the latest drivers installed for your graphics hardware. Check the hardware manufacturer's Web site for details.
- **Set Hardware Acceleration**
Do not change the hardware acceleration setting for your graphics hardware. Leave the setting at either the factory default, or at the highest acceleration level.
- **Downsample Textures**
This is found under **Settings > General Preferences**, on the **Rendering** tab. This allows you to specify the level at which very large, detailed textures will be downsampled (simplified). If you have large textures applied to your parts, this can speed up your display performance.
Note that this applies only to the part as it is displayed on the screen, and does **not** affect how the part actually prints.
- **Set Fast Rendering**
Set 3DPrint to use Fast Rendering for what's currently displayed by selecting **View > Fast Render**. You may also want to change the default Fast Rendering settings to reduce the number of facets being displayed. These are found under **Settings > General Preferences**, on the **Rendering** tab.
- **Force fast rendering for individual parts**
Make sure this is turned on. Models larger than this setting will be fast rendered, even if the rest of the build is not. Try setting to a lower number.
- **Force fast rendering for total display larger than xxx thousand facets**
Make sure this is turned on. Total displays larger than this setting will be fast rendered. Try setting to a lower number.

If the above steps do not solve the problem, please contact your local Reseller, or visit the Support section of our Web site at 3dscentral.3dsystems.com.

8.2 Black Area on Screen

If a new window is created while all or part of it is off-screen, the area that is off-screen will not be drawn and may not refresh when the window is moved back onto the screen. To fix this rendering issue, force a refresh by minimizing and then restoring the window, or select **Refresh** on the **View** menu.



8.3 Errors with E-mail Notification

8.3.1 Error with DNS Lookup

When the computer does not detect an Internet provider, the following dialog box appears. Check your Internet connection and try again. If you continue to experience problems, please contact your network administrator or your local service provider.



8.3.2 No Permission to Send E-mail

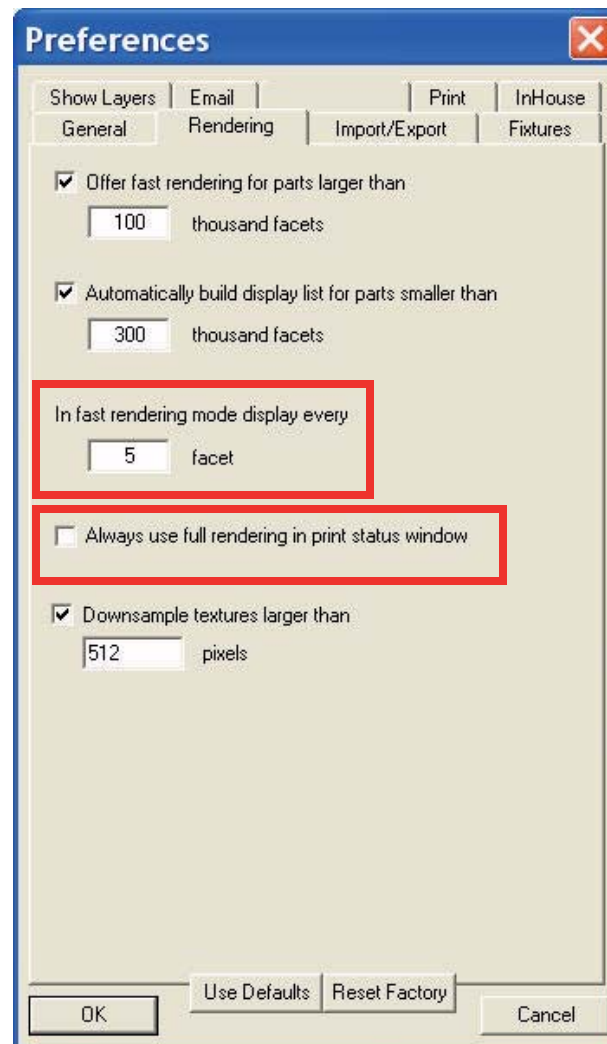
When the computer does not have permission to send E-mail due to firewall settings or administrator rights, the following dialog box appears. See with your network administrator for permissions.



8.4 Errors When Printing

If the computer freezes during printing or displays a 'low memory' or 'out of memory' error, uncheck (deselect) the box for "Always use full rendering" (go to the **Settings > General Preferences > Rendering** tab).

You can also try reducing the detail for rendering. Change the fast rendering mode to display every 150 facets. Continue to increase this number if you find that it takes too long to render at this setting.



8.5 Contact 3D Systems

If you have any questions about your 3D Printer or the ZPrint/ZEdit Software, please contact your local Reseller/Service Provider. If they are unable to help, contact us directly.

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