

ZPrint™ Software Manual

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ZPrint™ Software Manual

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1 Overview

ZPrint is a Windows-based software program designed to easily and quickly manipulate, annotate, and preview 3D modeling data before printing it on a Z Corp. 3D Printer. ZPrint includes the latest version of ZEdit - an easy-to-use tool designed to optimize color output when applying texture maps, templates, text, or paint to a part. ZEdit also includes several diagnostic tools for isolating and correcting simple file problems prior to printing a job.

1.1 What's New In ZPrint

- Generate Fixtures with bumpers around the base.
- Generate Fixtures with holes to allow powder to escape during automatic powder removal.
- .3ds file import capability.
- Texture map format support for .bmp, .jpg, .png, .tif, .tga, and .gif files.
- Zoom capability in 2D View.
- All display operations available in 3D View are now available in 2D View.
- Full .zpr file support - versions 1, 2, and 3. Load and save .zpr files with compressed or external transparent texture maps.
- Browse capability for missing/referenced texture map files. If a texture map referenced by a vrm, .3ds, or .zpr file is missing, when you browse to its directory, it is added to the search path.
- Load .vrm/2 assembly files with in-line instructions. (The assembly is given by a set of .wr files.)
- Confirmation prompt when you close ZPrint during printing through either the **Exit** command or the **X** window control. When confirmed, the ZPrint application shuts down, any unsaved data is saved, the log files are updated, and the printer stops printing the current job.
- (ZPrinter® 450 only) Automatic real-time monitoring of the LCD Display, powder, binder, and ink levels.

1.2 File Formats You Can Import And Print With ZPrint

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.

Current file types supported:

.zbd files are build files created by the ZPrint Software.

.zpr files. ZPrint supports versions 1, 2, and 3.

.stl files are monochrome 3D model files exported by several 3D CAD packages.

.wr (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.

.gis files are Geographic Information System files.

.sfx files are 3D color model files exported by SolidView Pro.

Legacy file types supported: .zcp / .zec / .bld files.

1.3 Computer System Requirements

Each Printer Type listed requires the Recommended System to run ZPrint advanced operations like part labelling and Fixture generation. *Laptops are not supported.* These system configurations may require a higher performance computer based on file size and type. For more information, please contact your local Reseller, or visit our Website at www.3dpuser.com.

1.3.1 ZPrinter® 450

Recommended System:

- Windows® 2000 Professional; Windows XP® Professional; Windows Vista™ 32-bit Operating Systems
- 3.2GHz processor or better (recommended)
- 2GB RAM or better (strongly recommended)
- True Color Graphics
- 64 MB Video Card, or better
- 1024 X 768 pixels, or better
- 16-bit or better with graphics card accelerated for OpenGL
- 1GB free space
- Ethernet 10/100 Base T

1.3.2 ZPrinter® 310 Plus

Recommended System:

- Windows® 2000 Professional; Windows XP® Professional; Windows Vista™ 32-bit Operating Systems
- 2.0 Ghz Pentium III chip or higher
- 1GB of RAM or more
- 16-bit color, or better
- 64 MB Video Card, or better
- 1024 x 768 pixels or better screen display
- Graphics card accelerated for OpenGL
- 1GB of free hard drive space after OS and utilities are loaded
- Ethernet port (10/100 Base T)

1.3.3 Spectrum Z™ 510®

Recommended System:

- Windows® 2000 Professional; Windows XP® Professional; Windows Vista™ 32-bit Operating Systems
- 3.2GHZ or better (recommended)
- 2GB or better (strongly recommended)
- True Color Graphics
- 64 MB Video Card, or better
- 1024 X 768 pixels, or better
- 16 bit or better with OpenGL acceleration
- 1GB free space
- Ethernet 10/100 Base T

1.3.4 Z®406

Recommended System:

- Microsoft Windows® NT 4.0; Windows® 2000 Professional; Windows XP® Professional Operating Systems
- Personal computer using a 850 MHz Pentium III chip, AMD Athlon, or better
- 512 MB of RAM or more
- True Color Graphics
- 64 MB Video Card, or better
- 1024 X 768 pixels, or better
- Graphics card accelerated for OpenGL

1.3.5 Z®810

Minimum System:

- Microsoft Windows® NT 4.0, Windows® 2000 Professional; Windows XP® Professional Operating Systems
- Personal computer using a 1 GHz Pentium chip or higher
- 1 GB of RAM
- True Color Graphics
- 64 MB Video Card, or better
- 1024 X 768 pixels, or better
- Graphics card accelerated for OpenGL

Recommended System:

This system configuration may require a higher performance computer based on file size and type. For more information, please contact your local Reseller, or visit our Website at www.3dpuser.com.

1.4 ZPrint/ZEdit 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 ZPrint correctly and either the Windows® 2000 Professional, Windows XP® Professional, or the Windows Vista™ 32-bit Operating System must be running.

If you encounter any problems during ZPrint installation, please contact your local Reseller, or visit our Website at www.3dpuser.com.

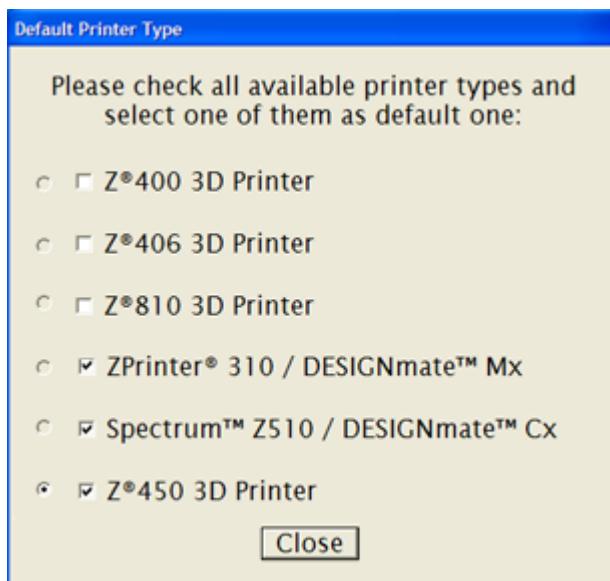
1. Close all running applications and insert the ZPrint CD into your CD-ROM drive.
2. If the installer does not automatically start, double-click on your CD-ROM drive icon. Double-click on the *Setup.exe* icon. This starts the ZPrint installation.
3. After *Setup.exe* is launched, you have the option to install the ZPrint and/or the ZEdit applications.
4. Read the licensing agreement carefully.

5. Select the destination directory. The Setup program prompts you for a selection and will suggest the C:\Program Files\ZPrint Software as the default directory.
6. It takes several minutes for ZPrint to install and then you are returned to the desktop.
 - If this is your first time using ZPrint, proceed with the remainder of this chapter to setup ZPrint defaults for the printer type and printer settings, and to check the powder type.
 - If your local Reseller has already setup ZPrint for you, you can skip the remainder of this chapter and proceed with *Chapter 2*.

1.5 Choose The Default Printer

When you run ZPrint for the first time, the **Default Printer Type** dialog opens where you select the printer that is connected to the computer running ZPrint, 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 ZPrint (**Settings > Printer Type Settings**).
- In the following example, we checked three printers that are available through our network. The **Z®450 3D Printer** is selected as the default.

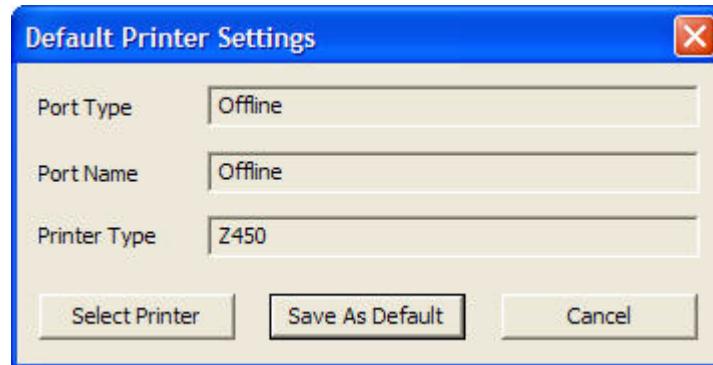


- Click **Close** when finished. The ZPrint Splash screen appears. This screen will close on its own after a moment, or you can click **OK** to close it immediately.

- Next, the **Open** dialog appears where you select a file to load in ZPrint. 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 ZPrint main window. Continue with the next section to choose settings for your default printer.

1.6 Choose The Default Printer Settings

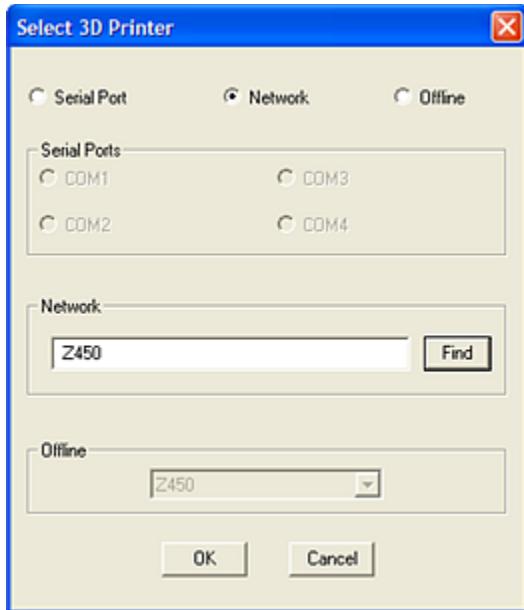
1. In ZPrint, select **Settings > Printer Settings** to display the **Default Printer Settings** dialog.



2. The **Port Type** and **Port Name** fields should both display **Offline**. To select on Online printer, choose **Select Printer**.
3. When **Select 3D Printer** dialog opens, choose either **Serial Port** or **Network**. The printer your computer is connected to will show up as an option. Select your 3D Printer and click **OK**.
 - If connecting to a printer on a network, click the **Find** button and select the printer from the **Network Printers** drop-down list. Choose an Online printer and click **OK**.

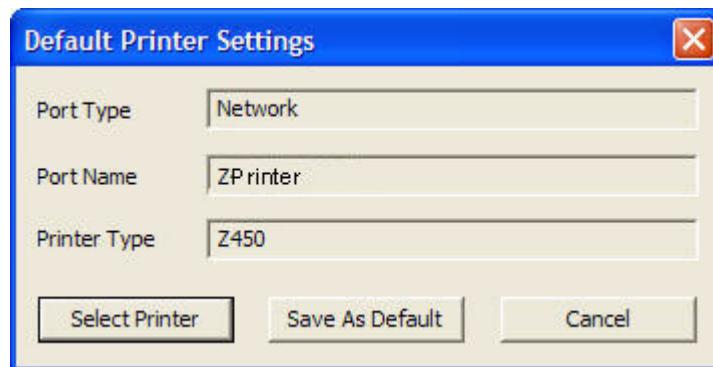
NOTE: ZPrinter® 450 machines are accessed only through a Network connection.

4. Click **OK** on the **Select 3D Printer** dialog.



5. 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 either **Network** or **Serial**.



NOTE: If you experience difficulty locating your printer through ZPrint, please contact your local Reseller, or visit our website at www.3dpuser.com.

1.7 Check The Default Powder Type Settings

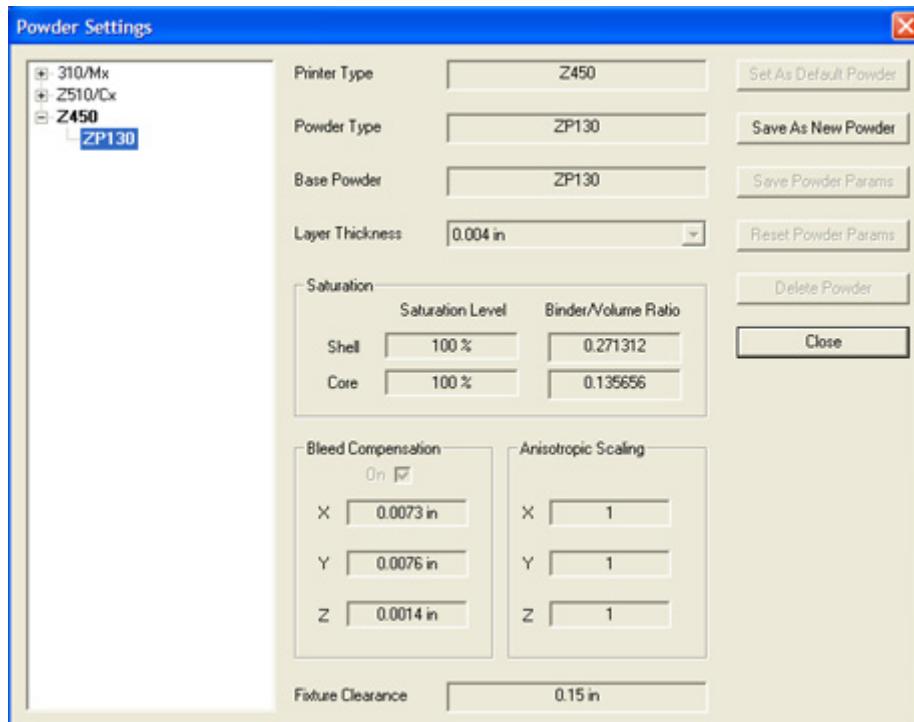
1. In ZPrint, select **Settings > Powder Settings**.
 - The **Powder Settings** dialog opens and lists each printer previously selected in the **Default Printer Type** dialog.
 - The default printer is **bolded** and expanded to show the materials available for use with the printer.

- The default powder type is **bolded** 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](#)), 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 for Anisotropic Scaling.
- Select **Edit > Make Fixture** to change the **Fixture Clearance** value.

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



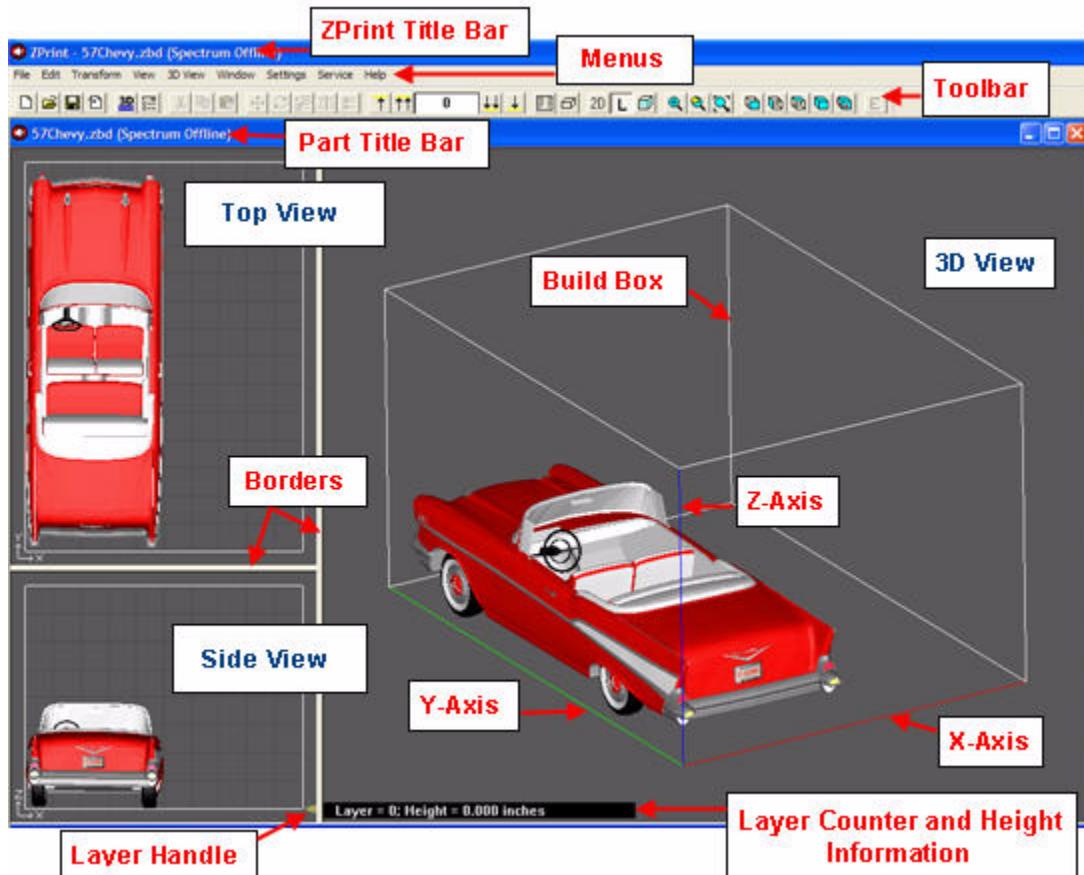
The Powder Settings Dialog

2 ZPrint Main Window

The ZPrint Main Window has two viewing modes - 3D (Three Dimensional) and 2D (Cross-Sectional).

2.1 The 3D View

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

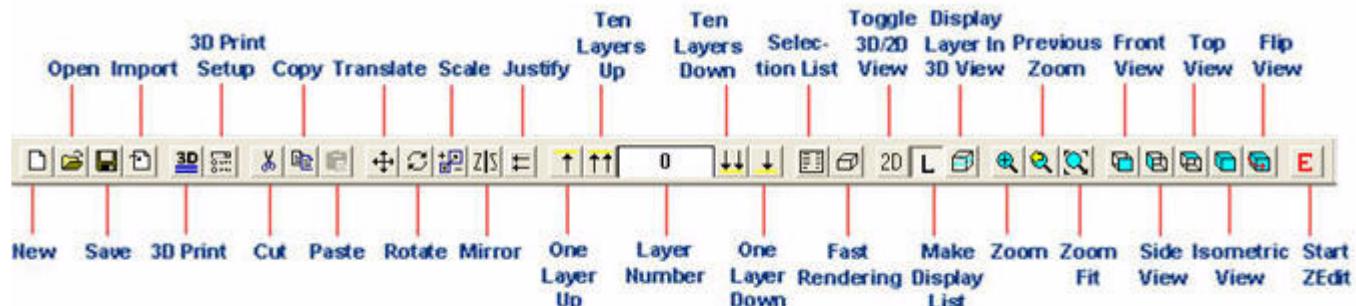


The ZPrint main window showing the Top, Side, and 3D Views.

- 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.
- The **3D View** is an interactive representation of the Build Bed where you can quickly change the part orientation using one of the **View** icons. A description of each View icon can be found in *Section 2.3*.
- 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.

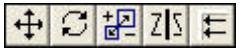
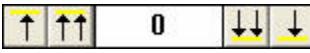
2.2 The ZPrint Toolbar

In ZPrint, point the cursor on any Toolbar icon to view a text description of the icon.



2.3 The ZPrint Toolbar Descriptions

	New: Opens a new, blank ZPrint main window. Open: Displays the Open dialog where you select files to load into ZPrint. Save: Saves the current ZPrint session and any changes to a file. Import: Displays the Import dialog for importing one or more files into ZPrint.
	3D Print: Displays the Printer Status dialog (ZPrinter® 450) or the Printing Options dialog (all other Printers). 3D Print Setup: Displays the 3D Print Setup dialog where you check or change your Printer , Powder Type , Layer Thickness , or Bleed Compensation settings for the current build.
	Cut: Select a part and use Cut to remove the part from the view without deleting it. Copy: Select a part and choose Copy to copy the part. Paste: Select Paste to place a cut or copied part into the ZPrint main window.

	<p>Translate: Displays the Translate dialog. Choose to move a part a specified distance on the X-, Y-, or Z-Axis, or a combination of the three. The default coordinate position (0,0,0) is the lower-left corner of the Build Bed.</p> <p>Rotate: Displays the Rotate dialog. Choose to rotate a part in the XY, XZ, or YZ planes by a specified amount.</p> <p>Scale: Displays the Scale dialog. Enter the percentage by which to scale a part and then choose to fit the part relative to the X-, Y-, or Z-Axis. (The range of values you can scale a part is between 0.0001 and 10,000.)</p> <p>Mirror: Displays the Mirror dialog. Choose to mirror a part in the X-, Y-, or Z-Axis direction.</p> <p>Justify: Displays the Justify dialog. Choose to orient the part in the Build Bed by selecting options for Left or Right, Front or Back, and Bottom orientations.</p>
	<p>Layer Selection and Number: Use the single and double Up and Down arrows in 2D view to view cross-sectional layers. Single arrows represent moving up/down one layer at a time; double arrows represent moving up/down ten layers at a time. The Layer Number field displays the current layer you are viewing. You can also enter a number and press Enter to view the specified layer.</p>
	<p>Selection List: Displays the Entity Selection dialog and lists each part that is currently opened in ZPrint. The currently selected part is highlighted in the Entity Selection dialog.</p> <p>Fast Rendering: Fast Rendering creates a point-cloud rendering of the part, which speeds up processing during transformations.</p>

	<p>3D/2D View: Toggle between 3D and 2D views.</p> <p>Make Display List: Manually builds the Display List, (which enables smooth rotating, zooming, and panning).</p> <p>Display Layer in 3D View: Turns layering on so you can view a cross-section of the part. ZPrint highlights the specified layer.</p>
	<p>Zoom: Changes the cursor to a plus sign for drawing a box around the area of a part that you wish to zoom. In this mode, hold down the left mouse button and drag the mouse to draw a box. When you release the mouse button, the contents of the box fills the 3D View.</p> <p>Previous Zoom: Returns you to the previous view.</p> <p>Zoom Fit: Maximizes the entire part in 3D View.</p>
	<p>Front View: Orient a part in the 3D View by its front side.</p> <p>Side View: Orient a part in the 3D View by its side.</p> <p>Top View: Orient a part in the 3D View by its top side.</p> <p>Isometric (3D) View: Orient a part in the 3D View as 3D (Isometric).</p> <p>Flip View: Flips a part in the 3D View to its opposite side.</p>
	<p>Start ZEdit: Opens a selected part in ZEdit with the same orientation it has in ZPrint. Use ZEdit to add annotations, engineering templates, labels, paint, and texture maps to a part.</p>

2.4 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.
Shift + Left Mouse Button	Pan the Build Bed in 3D View.
Ctr + Left Mouse Button	Drag the mouse to Zoom the Build Bed in 3D View.

2.5 3D View Menu Display Options

Display Layer in 3D View: Check to highlight the currently selected layer in 3D View.

Display Build Box: Check to toggle the display of the wire frame that represents the printer Build Box in the 3D View. The Build Box is also called the Build Bed.

Background Color: Select to change the ZPrint main window background color.

Gloss: Check to give parts with color a greater 3D visual effect.

Build Display List: The **Build Display List** command is a mostly hidden function that enables smooth rotation, zooming, and movement of a part when working in ZPrint. By default, ZPrint enables this feature for parts that are smaller than 300,000 facets. When parts that are larger than 300,000 facets are opened in ZPrint, the software will not build a Display List, and the rotation, zooming, and movement of the part will take longer to execute.

When you need to work on a file that is larger than the default facet value, you have these options:

- Change the default facet value to a larger number on the **Setting > General Preferences > Rendering Tab**. Open the file in ZPrint and the Display List is generated. See *Section 7.5.2 - Rendering Tab* for additional information about changing the default facet value.

- Open the file in ZPrint and build the Display List by checking the **Build Display List** command on the **3D View** menu, or by clicking the **Build Display List** icon on the Toolbar .
- When you only want to print a large file, there is no need to build a Display List.

2.6 The 2D (Cross-Sectional) View

2D View displays a part as a cross-sectional layer and has all the operations that are available in 3D View such as zooming and moving a part. Click the **2D** icon on the Toolbar to switch the view from 3D to 2D. Use the arrows on the Toolbar to move through the part layers one or ten layers at a time, or drag the Layer Handle (in the Side View) up and down to view layers.

To do this:	Toolbar	Menu	Keyboard Shortcuts
Move up one layer		View > One Layer Up	A
Move down one layer		View > One Layer Down	Z
Move up ten layers		View > Ten Layers Up	Shift A
Move down ten layers		View > Ten Layers Down	Shift Z

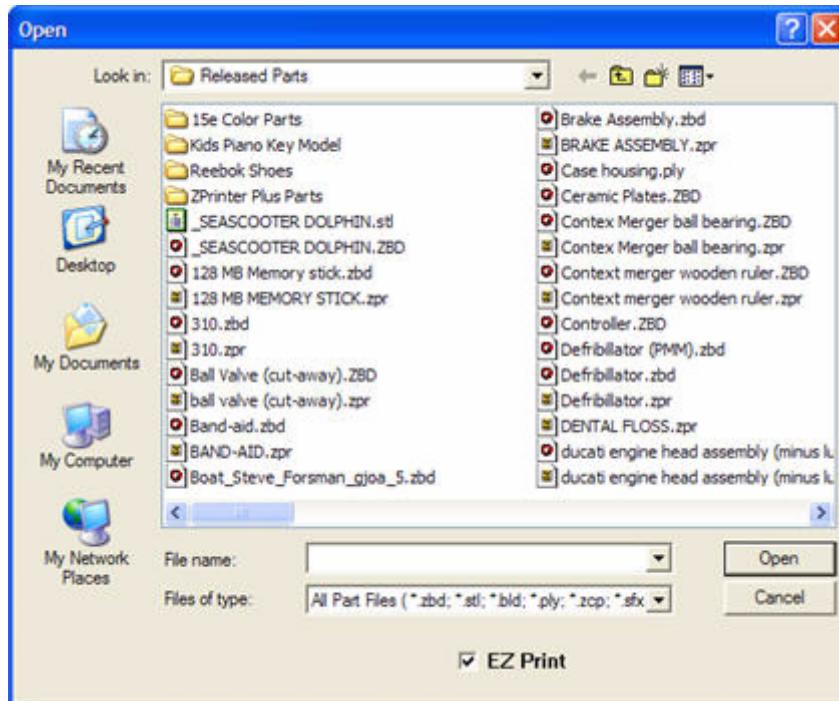
3 EZ Print For ZPrinter® 310 Plus

EZ Print mode is **only** available to customers using a **ZPrinter® 310 Plus** printer. **EZ Print** will print a single part using the settings for your default materials.

- Ensure the Firmware is version 10.138 or higher. Please visit our Website at www.3dpusers.com and click on the link for your printer type for more information regarding Firmware.

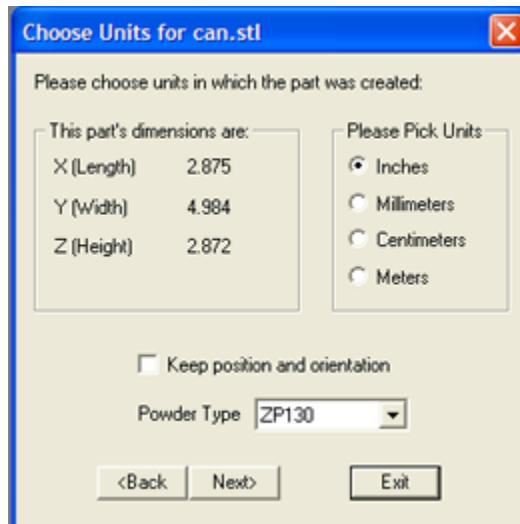
EZ Print is useful for users who may need assistance in building a part. **EZ Print** automates some functions and eliminates the need for the user to manually setup the part prior to printing. Check the **EZ Print** checkbox when you select a file from the **Open** dialog box, or select **EZ Print** mode at any-time from the **Settings > General Preferences > General** tab dialog.

1. Select **File > Open** to display the **Open** dialog.
 2. Select a file and check the **EZ Print** checkbox to continue in **EZ Print** mode. Click **Open**.
- If you are opening a **.zbd** file, the software will omit generating a Fixture and show the **Ready to Print** dialog, (shown in Step 7).

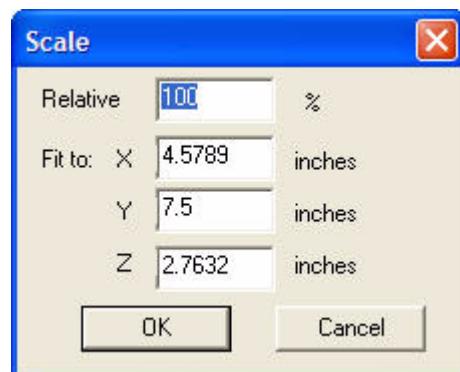


- If you are opening a **.zbd** file and the default powder is not the material associated with your printer type, the software will give you the option to either:
 - Proceed with the current powder settings
 - Proceed with the default powder settings
 - Cancel out of **EZ Print** mode

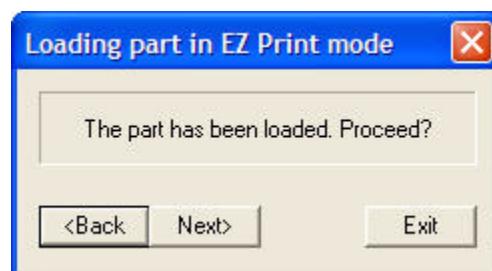
3. Select the display units for viewing the part in ZPrint and click **Next**. If you need to go back to the previous step and start again, click the **Back** button.



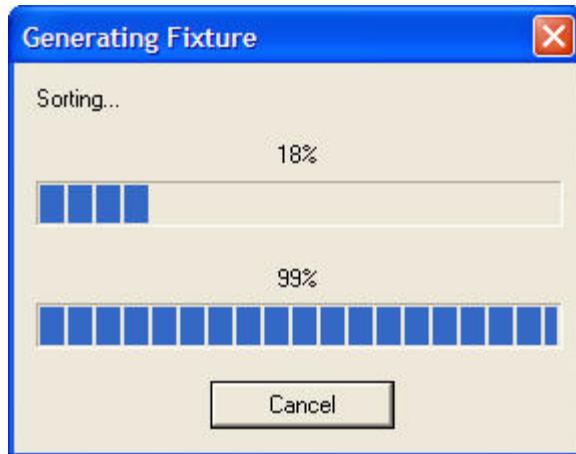
4. If the part is too big to fit in the Build Bed, ZPrint will prompt you to change the scale.



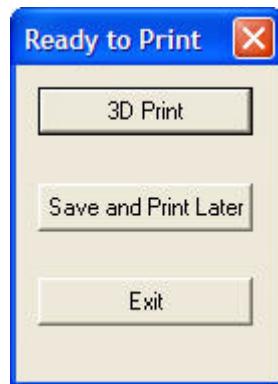
5. Once the part is loaded, ZPrint will ask if you want to proceed. Select **Next** to continue, or **Back** to return to the previous dialog.



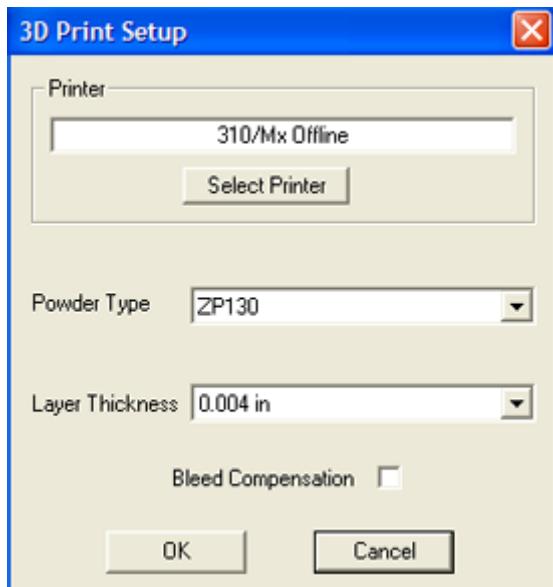
6. When **Next** is selected, the software creates a Fixture. It will go through Collision Detection to make sure the Fixture and the part are not touching. If any collisions are found, ZPrint will regenerate the Fixture with a higher accuracy level.



7. After the Fixture is created, the **Ready To Print** dialog appears. Click **3D Print**.

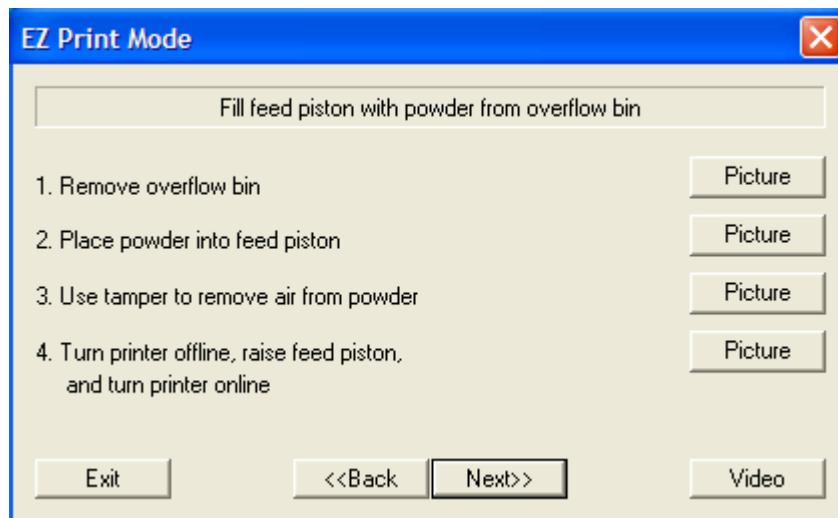


NOTE: The printer must be a **310/Mx Printer** and it must be connected through a serial port or a network connection. Selecting a printer other than a 310/Mx, or an Offline printer, will not allow you to continue in **EZ Print** mode.



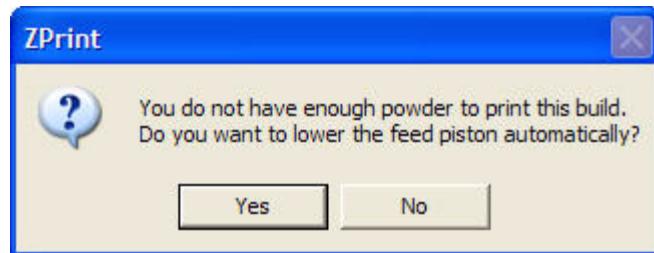
8. The software will take you through several steps to prepare the printer. Complete the steps in each dialog that appears. If you need help, or do not understand a step, click the **Picture** or **Video** buttons.

- a. Fill feed piston with powder from the overflow bin.

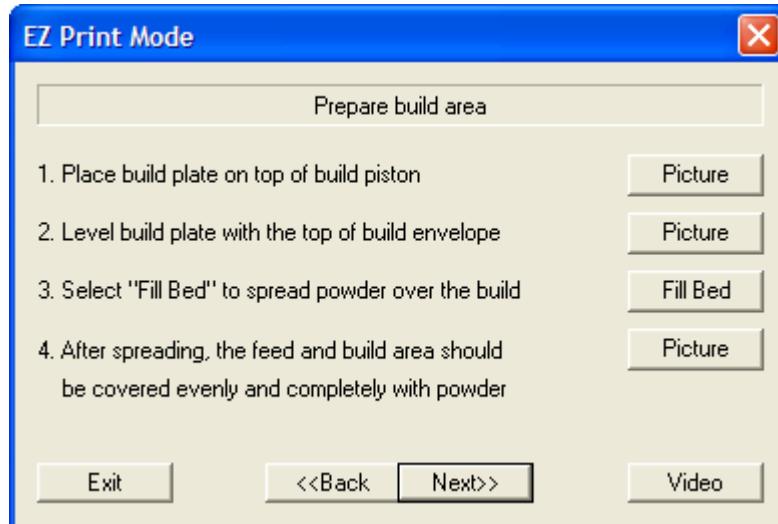


- b. Fill feed piston with fresh powder.

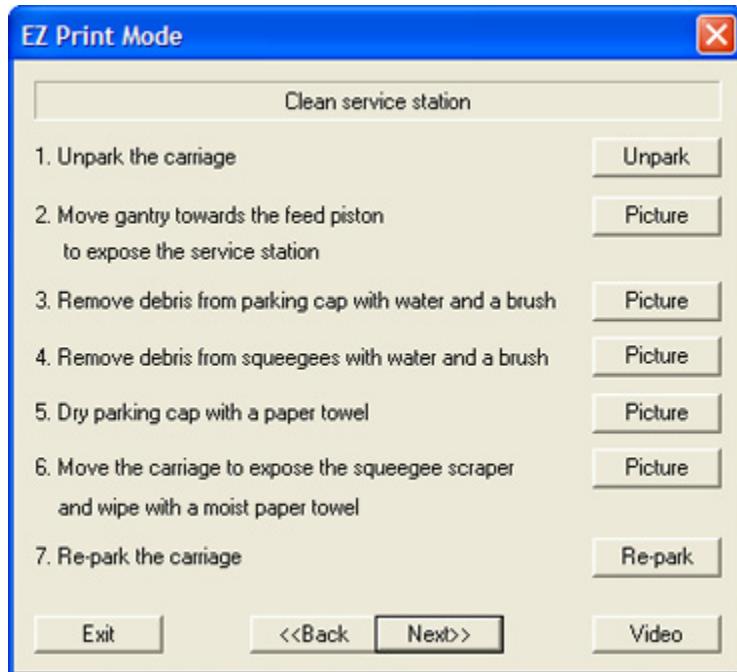
If you still do not have enough powder to complete your build after recycling powder from the overflow bin, the software will prompt you and then drop the feed piston to the level required to complete the build. It will not drop the feed piston completely to the bottom.



- c. Prepare build area. Complete the steps and then click **Next**.



- d. Clean service station. Complete the steps and then click **Next**.



e. Check fluid containers

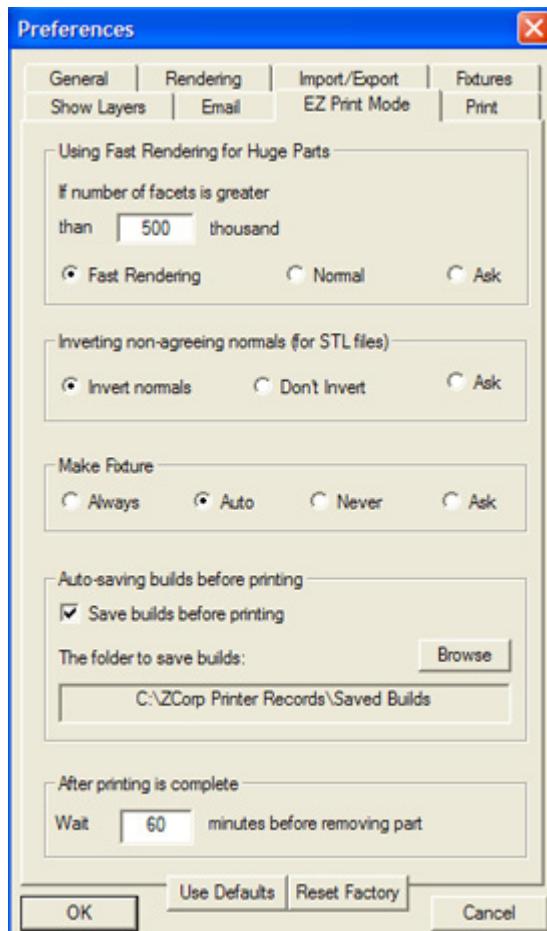


9. When all the steps to setup the printer are complete, the software will start printing your part. ZPrint saves your .zbd file prior to printing.
10. When the print job is completed, ZPrint begins a drying cycle and starts to countdown the time before you can remove the part from the Build Bed.
11. When the part is ready to remove, ZPrint displays the dialog shown below. This dialog contains links to video clips about how to remove, depowder, and infiltrate a part. Remove and post-process the part.



3.1 Change The Default EZ Print Settings

Select the **General Preferences > Settings > EZ Print** tab to change the default settings for **EZ Print** mode. See *Section 8.5.7* for complete information about changing the **EZ Print** preferences.



4 ZEdit™

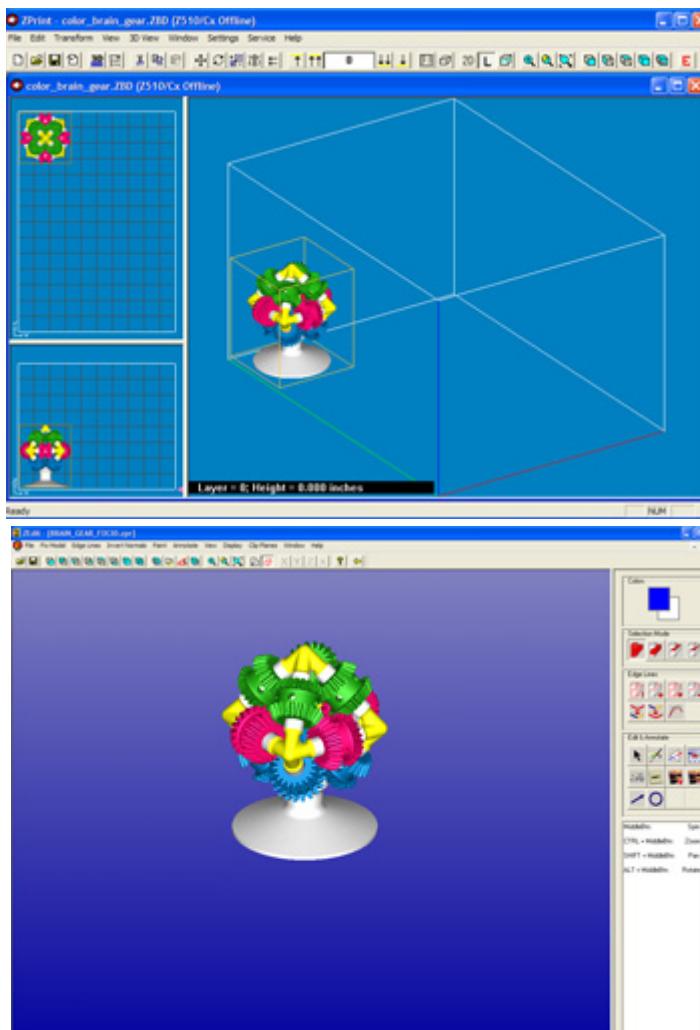
ZEdit™ Software was developed by a team of software developers and application engineers as a tool to help those who use HD3DP™ (high-definition 3D printing) to optimize the color output of their models. ZEdit works in conjunction with ZPrint. Use ZEdit to apply color to a part with a texture map, engineering template, text, or paint. ZEdit also has several diagnostic tools for locating and correcting simple file problems before you start the print job.

ZEdit is compatible with .3ds, Lightwave, Wavefront, AutoCAD, .stl, and .zbd files. For more information, please refer to the [ZEdit™ Software Manual](#).

There are two ways to load your part into ZEdit:

- Select a part in ZPrint and then press the ZEdit icon .
- Select a part in ZPrint and then select **Edit >Start ZEdit**.

When your part opens in ZEdit, it has the same orientation it had in ZPrint. The advantage of loading a part into ZPrint first is that you can scale the model, and then bring it into ZEdit to label or paint. When you exit ZEdit, choose whether to update the part in ZPrint with the changes made in ZEdit. For more information, please refer to the [ZEdit™ Software Manual](#).



5 Setup The Build

5.1 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*, *.3ds*, or *.zec* extension. Build files (which are also called Part or Document files) have a *.zbd* or *.bld* extension and are unique to ZPrint. 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 ZPrint main window. When you save changes, or exit ZPrint, ZPrint 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 ZPrint 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, ZPrint will ask you to select a single document (Build) file, or several Part files.

5.2 Open Files In ZPrint

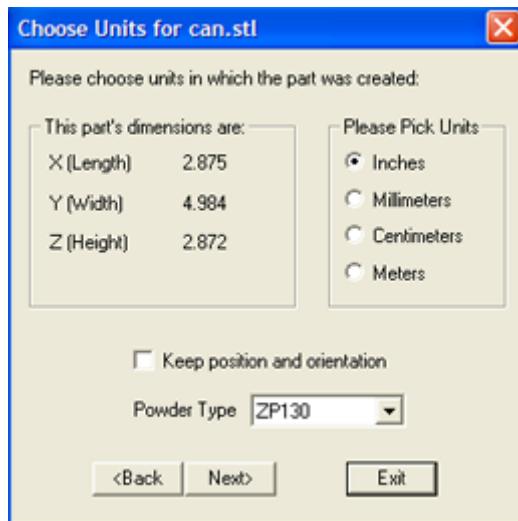
When you launch ZPrint, the **Open** dialog displays for you select a file to print. Use the **Open** dialog to load a single Build file (*.zbd*, *.bld*), or one or more Part files, (*.3ds*, *.wrl*, *.stl*, *.ply*, *.zpr*, *.gis*, etc.), into ZPrint.

By default, when a file is opened or imported, ZPrint 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*.

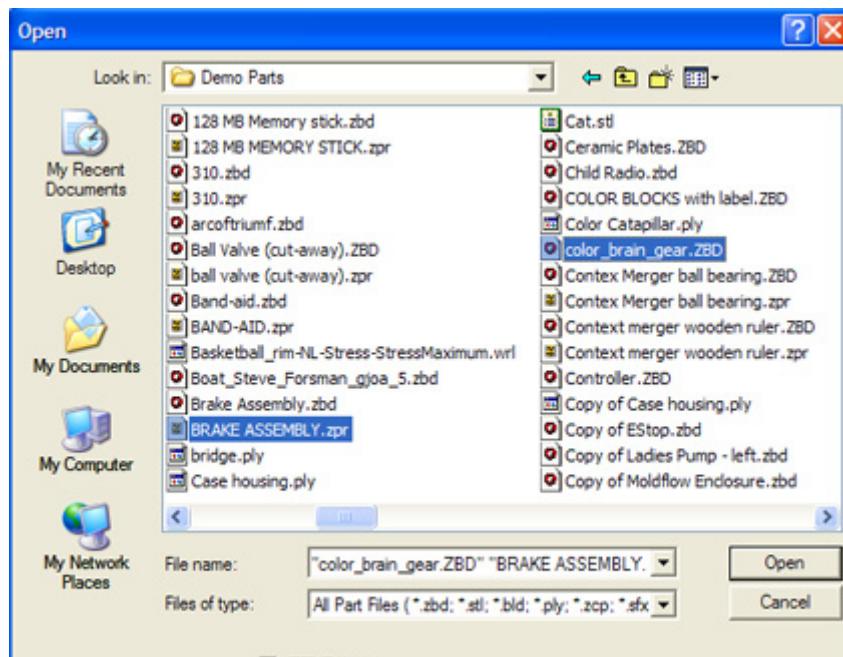
If a Part file is created with dimensions that are too large for display in ZPrint, ZPrint evaluates the file and determines the largest units that can be used for displaying the part. Choose to change the units in the **Choose Units** dialog, or keep the selection that ZPrint chooses and click **Next**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

Important: *.wrl (vrml) 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.

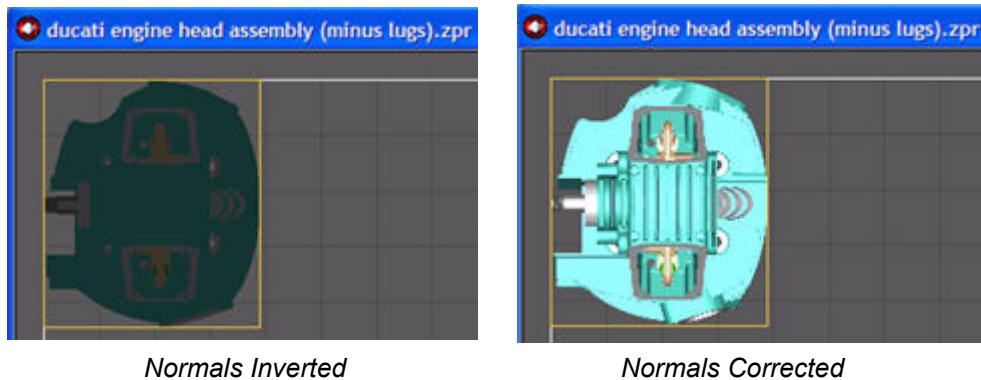


5.2.1 Add Parts To An Existing Build

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



If a Part file opened in ZPrint 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 ZPrint, select the part (see next section) and then select **Edit > Normals > Invert All Normals**.



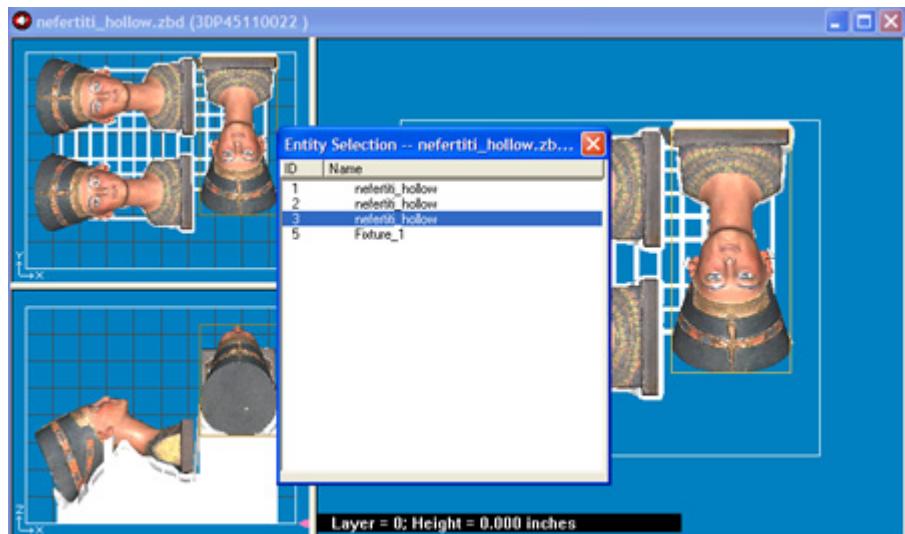
5.3 Part Selection

- To select a single part in any view of the ZPrint 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.

5.4 Selection List

Another way to select a part is by using the Selection List, which is accessed on the ZPrint Toolbar. The Selection List will list each part that is open in an active ZPrint window.

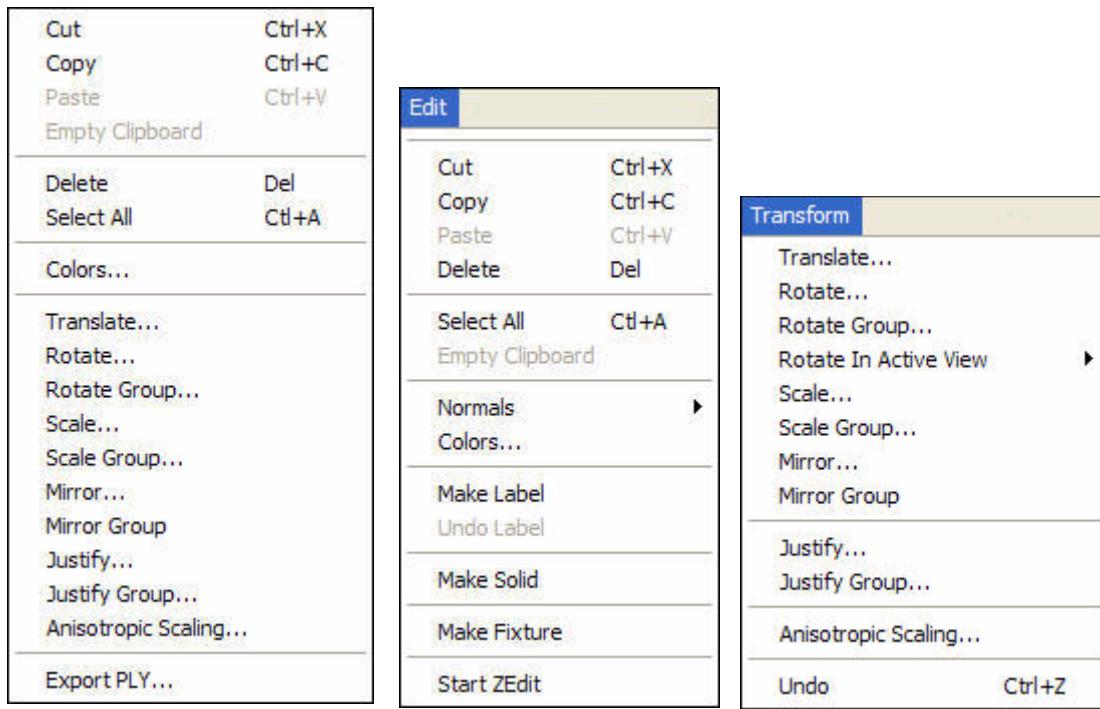
Click the  icon on the Toolbar to display the **Entity Selection** dialog. Click on a part to select it. To select multiple parts, press the **Ctrl** button and click on multiple parts.



5.5 The Right-Button Pop-Up, Edit, And Transform Menus

After a Part file is loaded into ZPrint, 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 Popup**, the **Edit**, and the **Transform** menus.

- An action that have been applied to a part using the **Transform** menu can be undone. Choose **Transform > Undo**, or press **Ctrl Z** on your keyboard, to cancel the *last* transformation applied to the part. **Undo** cannot undo multiple actions and only applies to the commands on the **Transform** menu.
- For information about using the **Make Label**, **Make Solid**, and **Make Fixture** commands, please refer to those sections later in this chapter.
- 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.



Right Button Pop-Up Menu

Edit Menu

Transform Menu

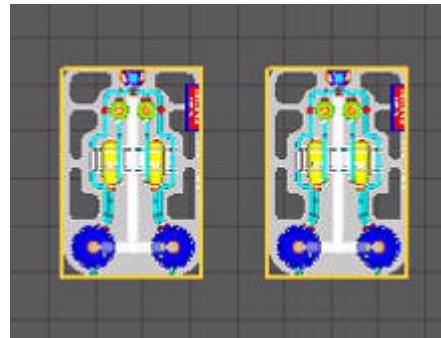
5.6 Edit Menu

- To make additional copies of your part in ZPrint, 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 ZPrint 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.

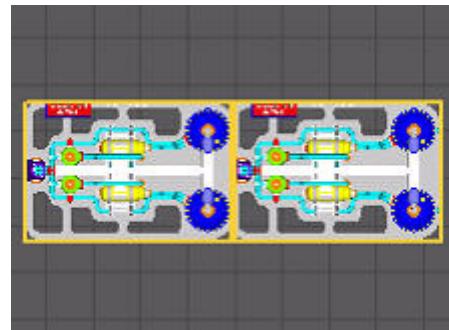
5.7 Transform The Part

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. Here is an illustration to help clarify the differences between individual and group transformations.

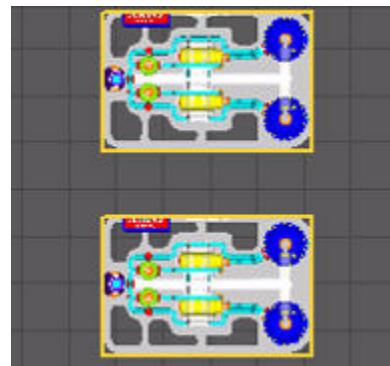
- Here, two parts are shown in the 3D View.



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



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

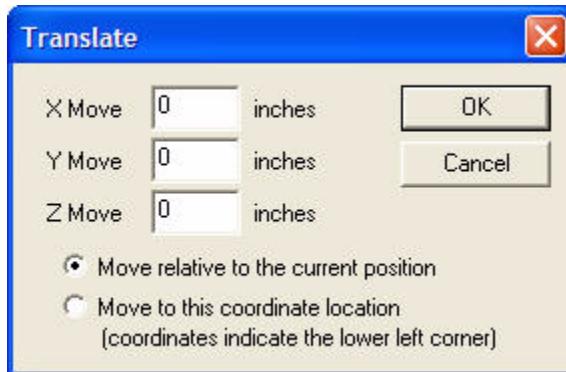


5.8 Translate (Position) Parts

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

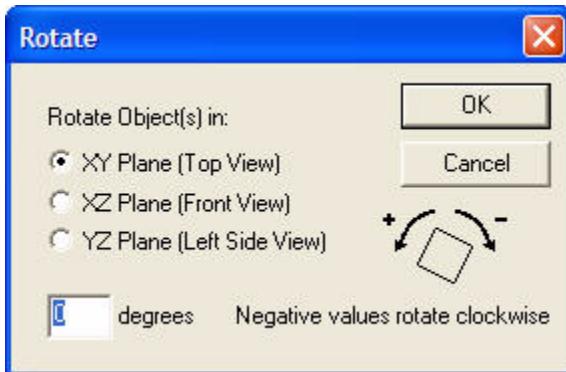
- Manual:** Select the part(s) in the ZPrint **Top** or **Side** Views. Press the left mouse button and drag the mouse to reposition the part.
- Translate Dialog:** Select **Transform > Translate** and enter the distance to move the part in the **X**, **Y**, and **Z** fields. The default values of 0,0,0 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.



5.9 Rotate Parts

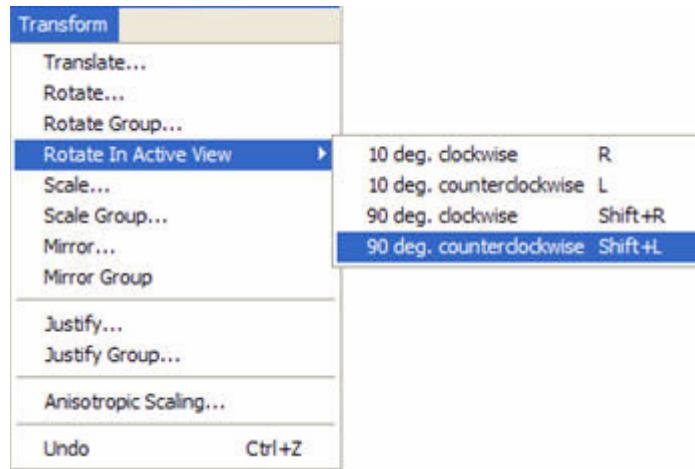
- To rotate a part, select the part and choose **Transform > Rotate**. In the **Rotate** dialog, specify the plane and degree of rotation, and click **OK**.
- To keep a group of parts in the same relative orientation, rotate the parts as a group. Select each part and then choose **Transform > Rotate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



5.10 Rotate in Active View

Select **Transform > Rotate in Active View** to rotate a part in a specified view.

- Select one or more parts in the **Top** or **Side** Views.
- Choose an option on the **Transform > Rotate in Active View** submenu.

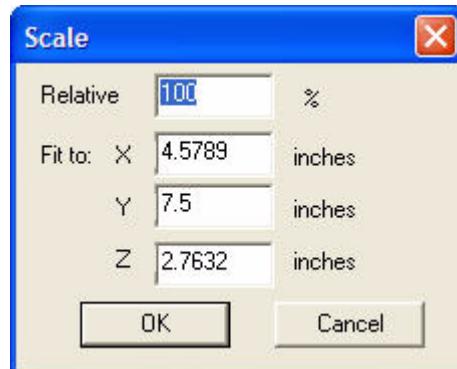


5.11 Scale Parts

Select the part and choose **Transform > Scale**. If you scale a part and it does not fit into the Build Bed, ZPrint 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. See *Section 5.13.1* for additional information.

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

- Scale the part relative to the units the file is configured for by entering a percentage in the **Relative** field. Click the cursor in any of the **X**, **Y**, or **Z** fields to update those values. Click **OK**.
- Scale a part by entering values in the **X**, **Y**, and **Z** fields.
- Scale a group of parts by selecting **Transform > Scale Group**. Change the **Relative** value and click **OK**.

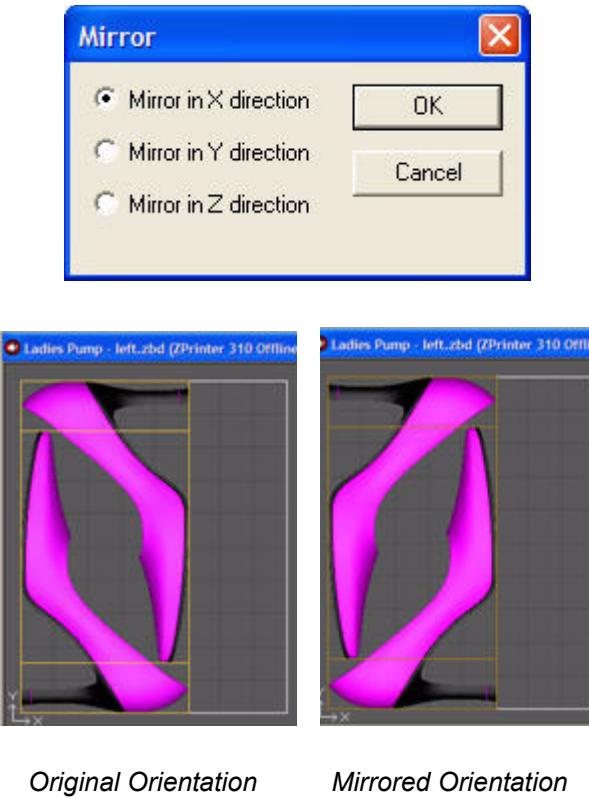


5.12 Mirror Parts

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 Group**.

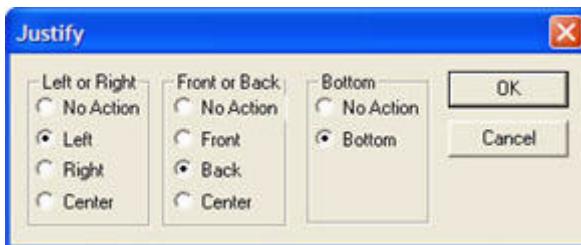


5.13 Justify Parts

The Justify feature will align a part to a specified location in the Build Bed. Select the part and choose **Transform > Justify**. You may justify the part to the center, left, right, front, back or bottom of the Build Bed. To justify a group of parts, first select the parts and then choose **Transform > Justify Group**.

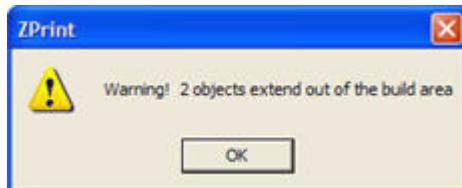
Important: If you select two or more parts to justify and do not use the **Justify Group** command, ZPrint will justify all the selected parts to one position, essentially deleting all but one part. If this happens:

- Press **Ctrl Z** to undo the action
- Re-select the parts
- Select **Transform > Justify Group**
- Choose your settings and click **OK**



5.13.1 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.



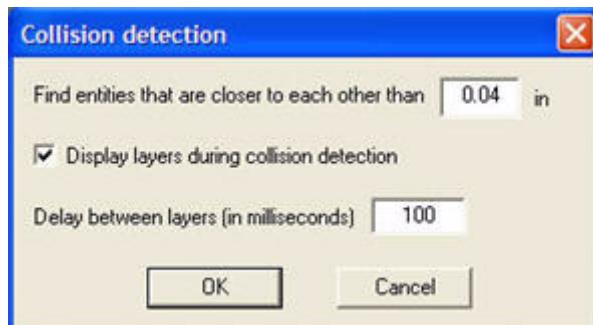
To reorient the part, select the part and either move it with the mouse in the **Top** or **Side** Views, or use the **Justify** dialog. You may need to scale the part if it does not fit in the Build Bed.

NOTE: If you do not want ZPrint 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.

5.14 Collision Detection

Collision Detection is a function that you run prior to printing to see if parts are touching or overlapping each other. It is important to run Collision Detection when you are printing multiple parts in the same build, or when using Fixtures. See [Section 5.22 Run Collision Detection](#) for additional information.

1. Select **View > Collision Detection**. Check the **Display layers during collision detection** option and click **OK**.
2. If ZPrint detects overlapping or touching parts, a warning message is displayed. It tells you exactly which layer the collision exists on. If no collision is detected, ZPrint returns a confirmation that no collision was found.
3. After correcting overlapping or touching parts (by repositioning the parts in the Build Bed view), run **Collision Detection** again to ensure there are no more collisions.



5.15 Apply Color To Monochrome Parts

Select **Edit > Colors** to apply color to single or multiple monochrome part(s) (.stl files).

NOTE: It is recommended that you use ZEdit for painting parts. In ZEdit, you can apply multiple colors to part surfaces, shells, or triangles with full painting capability using the cursor.

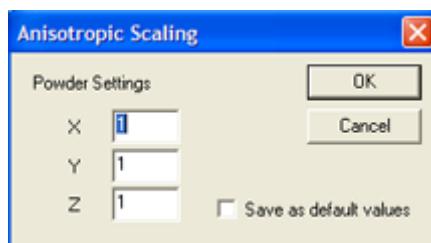
1. Load an .stl file and select the part.
2. Choose **Edit > Colors**.
3. Choose a color on the **Color** palette and click **OK**. The color is applied to the selected part.

5.16 Anisotropic Scaling

Anisotropic Scaling varies for different types of geometries and powders. The recommended Anisotropic Scaling setting is what is used for each consumables combination that is selectable for any printer type. To override this setting and print a build using a different value, access the **Anisotropic Scaling** dialog and modify the current settings. See [Section 8.1 Create Custom Powder Types](#) and [Section 8.3 Anisotropic Scaling](#) for additional information.

Changing the values in the Anisotropic Scaling dialog applies to the current build only. Most users will not need to change the default settings for Anisotropic Scaling.

1. Select the part and select **Transform > Anisotropic Scaling**.
2. Enter values for the **X**, **Y**, and **Z** Axis. (A range of 0.8 - 1.2 is the recommended scale for ZPrinter® 450.)
3. Click **OK**. The Anisotropic Scaling settings are applied to the part for the current build only.



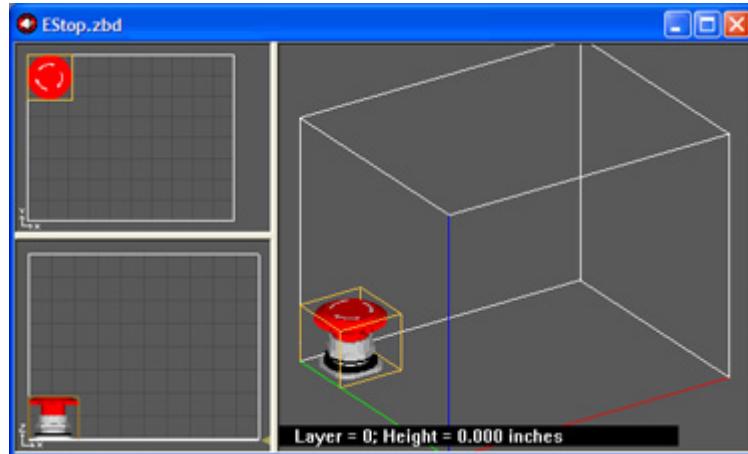
5.17 Adding Geometry

Adding geometry is another way of saying you can add labels to a part, create a solid base for rectangular parts, or create a Fixture for parts that have delicate features, or for parts that need a base for easy removal and handling during post-processing. See the following *Make Label*, *Make Solid* and *Make Fixture* sections for information on how to use these features.

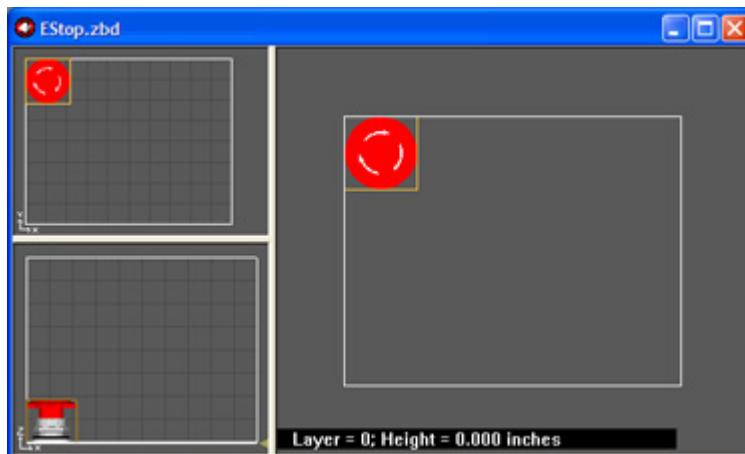
5.18 Make Label

ZPrint 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.

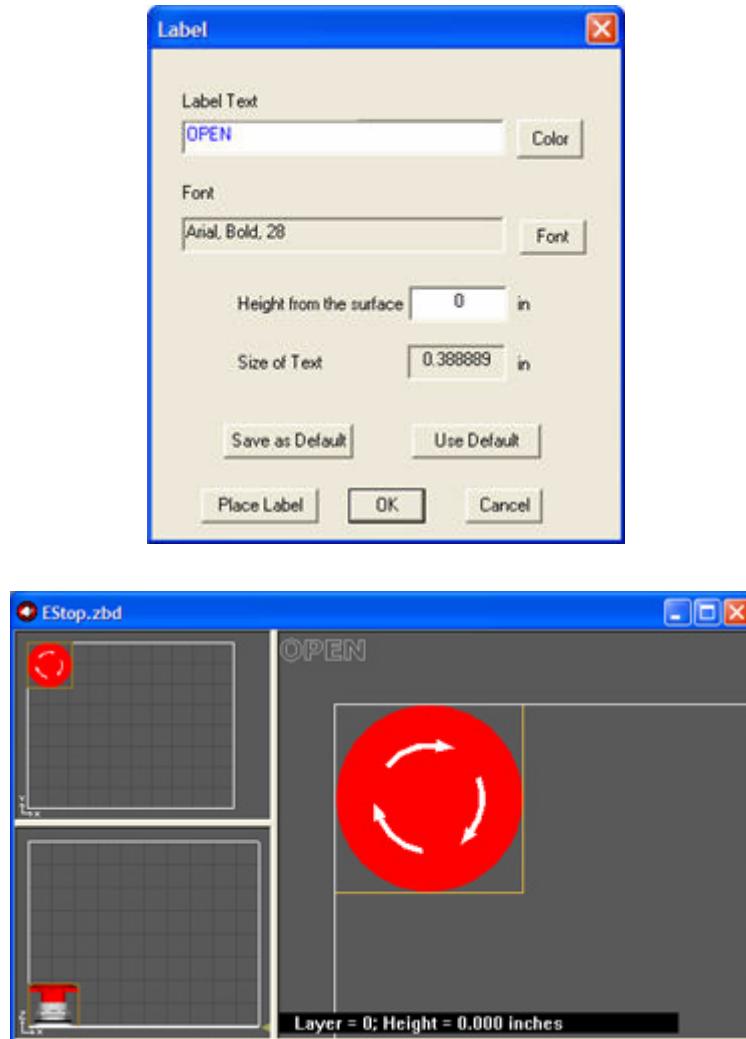
1. In the ZPrint 3D View, select the part you want to label.



2. Orient the part so that the surface receiving the label is facing up.



3. Select **Edit > Make 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.

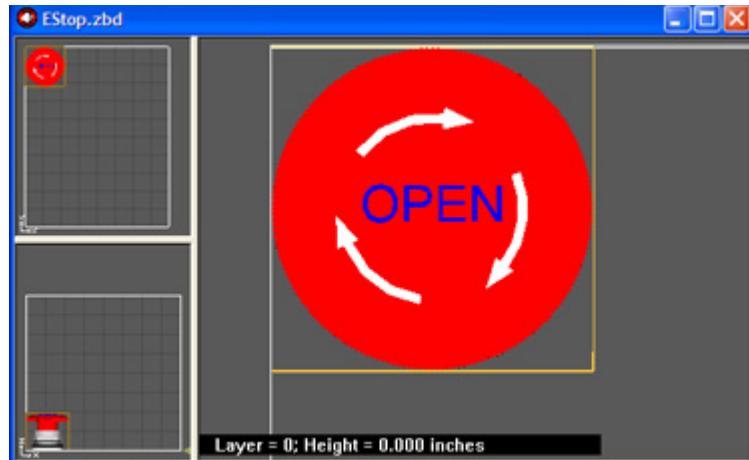


5. Click **Place Label**.
6. In the 3D View, point the mouse on the label text and press the left mouse button. Drag the text to the area of the part you want the label to appear. The label will project straight down onto the surface. (Labels are trimmed to follow the surface they reside on, as long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

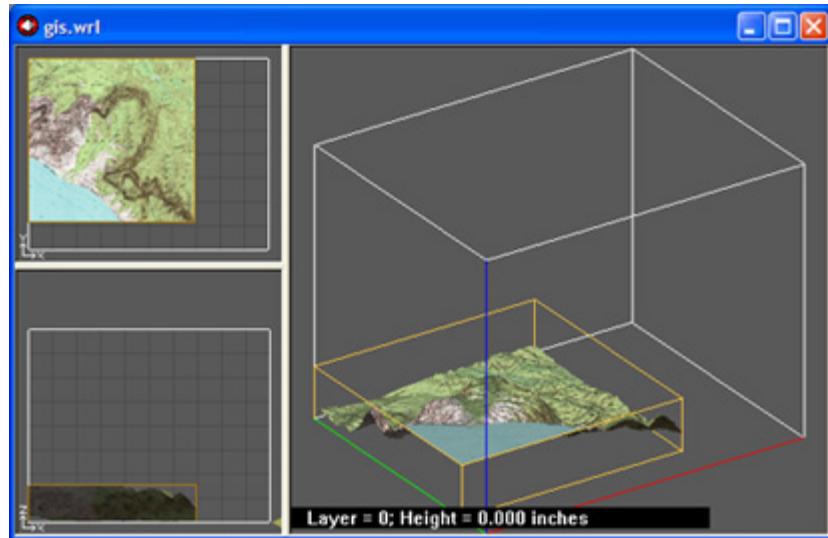


- When you are satisfied with the label placement, click **OK** in the **Label** dialog. If you need to start over, select **Edit > Undo Label**.

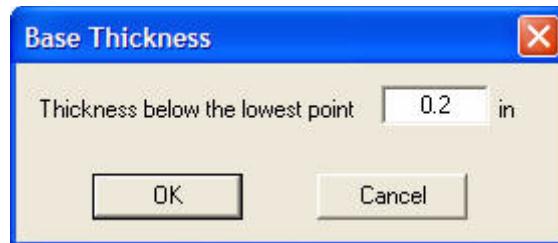
5.19 Make Solid

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

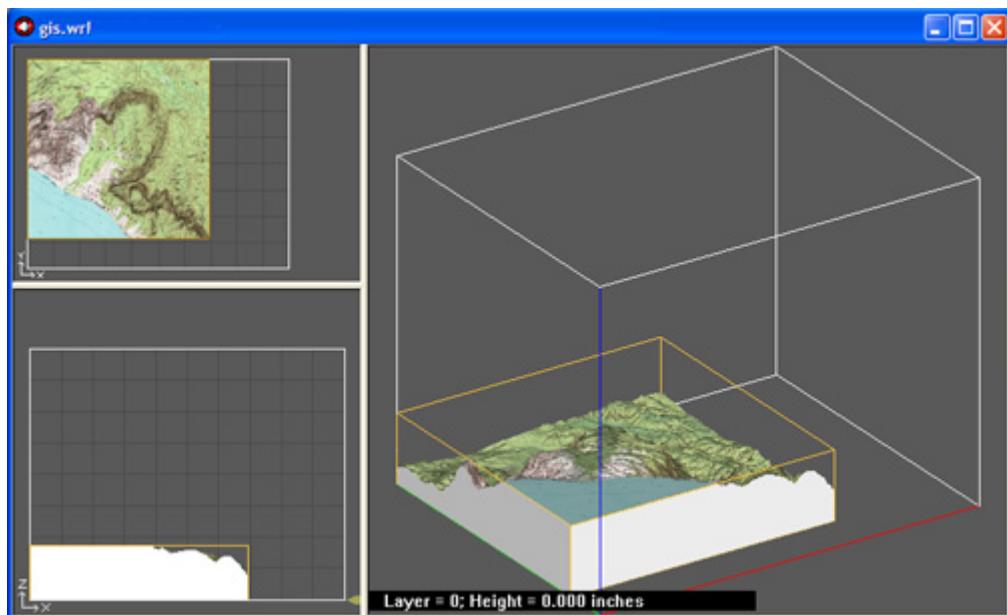
- Open a **.gis** file in ZPrint and select the part.



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



4. ZPrint 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.



5.20 Make Fixture 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.

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

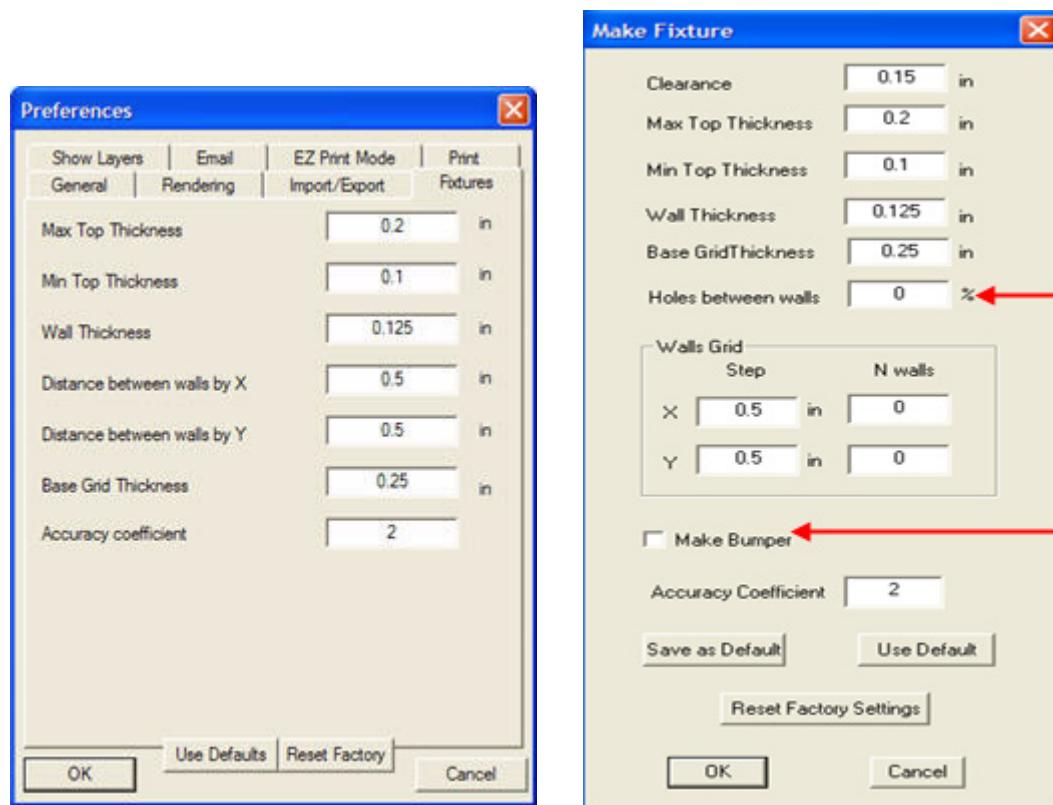
- Supports parts during automatic powder removal cycle. (ZPrinter® 450 only)
- Keeps multiple parts from bumping into each other, or into the Build Bed walls during automatic powder removal. (ZPrinter® 450 only)
- Supports delicate, thin parts for easy removal from the printer and handling during post-processing.

- A Bumper option for creating fixtures with bumpers around the base. Bumpers will prevent a part from bumping into the walls of the Build Bed, or into other parts.
- 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, such as a scope, 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.

5.21 Default Fixture Settings

The default Fixture settings are located on the **Settings > General Preferences > Fixture** tab. These are the settings that populate the **Make 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.



5.21.1 Create A Fixture For An Entire Part

1. Select your part in ZPrint.

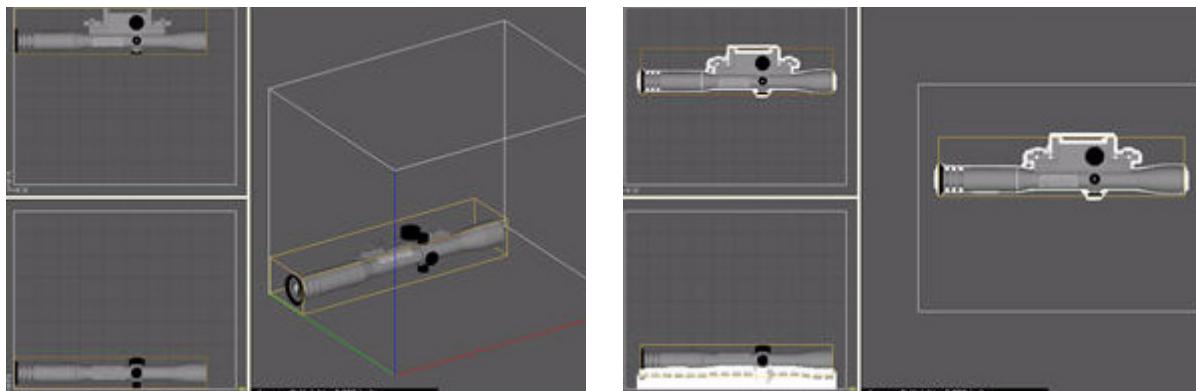
2. Select **Edit > Make Fixture**. ZPrint orients the part in the 3D View for building the Fixture.

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

3. There are two features you may want to add to your Fixture:

- **Make Bumper:** To add a bumper to a fixture, check the **Make Bumper** checkbox. 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 automatic 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.

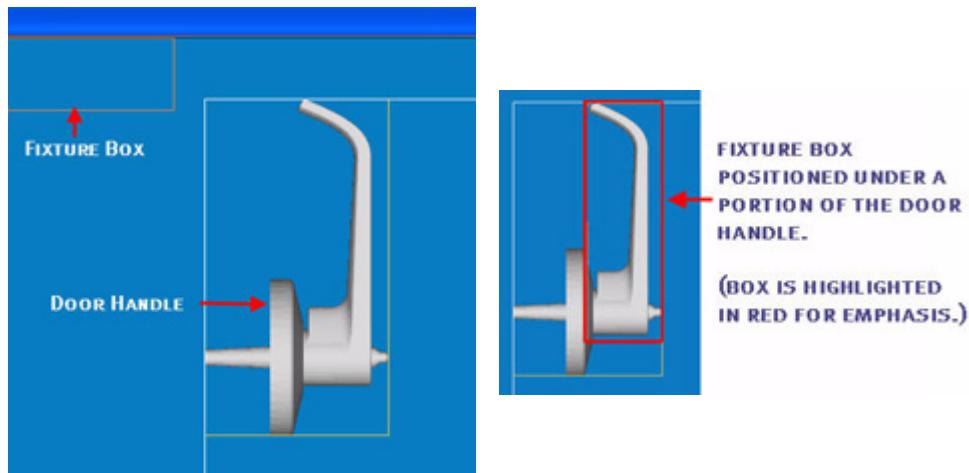
4. Click **OK**. The fixture is generated.



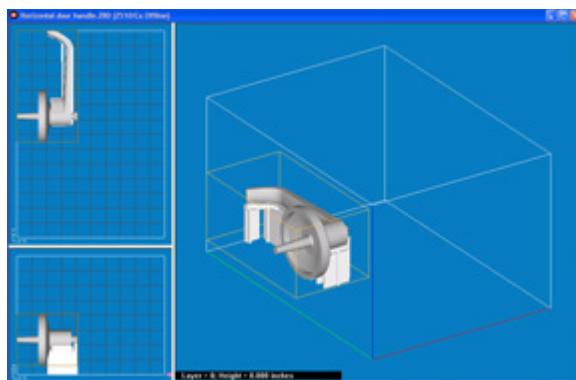
5. Select **View > Collision Detection** before printing to ensure the Fixture is not touching the part. If the Fixture is touching the part, do the following:
 - Select the fixture and press **Delete** on your keyboard.
 - Open the **Make Fixture** dialog and increase the **Accuracy Coefficient** value by 1 (one).
 - Click **OK** to regenerate the Fixture.
 - Run **Collision Detection** again.

5.21.2 Create a Fixture For A Portion Of A Part

1. Select the part in ZPrint. ZPrint orients the part in the 3D View for building the Fixture.
2. Select **Edit > Make Fixture**.
3. In the 3D View, point the mouse on the **Fixture Box** in the top, left corner. Press the **Shift** key and the left mouse button. Drag the box to an area of the part that you want to make a support for.



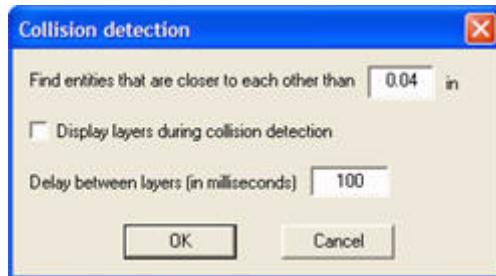
- **To Resize the Fixture Box:** Point on the box, press the left mouse button and drag the mouse to resize.
 - **To Rotate the Fixture Box:** Point on the box, press the **Ctrl** key and the left mouse button. Drag the mouse to rotate.
4. When you have positioned the box, click **OK** in the **Make Fixture** dialog. The Fixture is generated for the area under the Fixture Box.



5.22 Run Collision Detection

Use the **Collision Detection** feature whenever you print multiple parts in the same build, or print parts with Fixtures. **Collision Detection** checks the layers of each part (and Fixture) to ensure they are not touching or overlapping each other. Printing parts that are too close together in the Build Bed, or are touching, will result in the surfaces of the parts adhering to each other.

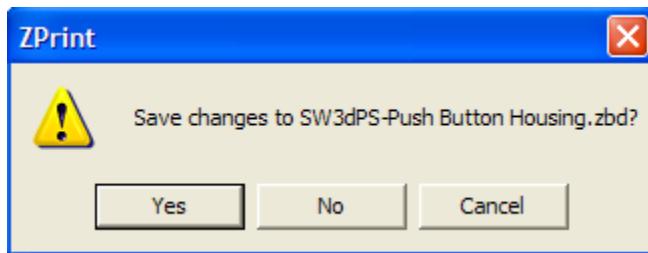
1. Select **View > Collision Detection**.
2. Choose your options in the **Collision Detection** dialog and click **OK**.
 - It takes the software a few minutes to go through the part layers. If a collision is detected, a warning appears and identifies which layer the collision is detected on. Correct the collision by adjusting the part position and run **View > Collision Detection** again. Continue in this manner until there are no collisions reported by ZPrint.



5.23 Save Your Work

When you work on a Part file and exit ZPrint, or make changes to a Part file and need to save, ZPrint will prompt you to save the file as a Build file (*.zbd). A Build file contains all of the modifications that you made in ZPrint 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.

When working in ZEdit, there are several additional saving options for updating parts when exiting ZEdit and returning to ZPrint. See the [ZEdit™ Software Manual](#) for complete information.

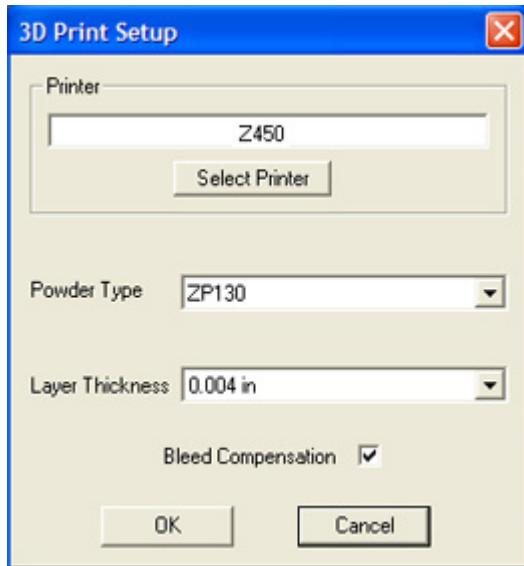


6 Print The Build

After the build is setup in ZPrint, you can proceed with printing.

6.1 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 **File > 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.
- **ZPrinter® 450 only -** Ensure the **Bleed Compensation** option is checked. See [Section 8.4 - Bleed Compensation](#) 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](#).

6.2 3D Print With The ZPrinter® 450

The following instructions are for the **ZPrinter® 450 only**. All other printer types should skip this section and go to [Section 6.3](#).

1. After confirming the printer and powder settings for the current print job, select **File > 3D Print**, or select the  icon on the Toolbar. The **Printer Status** dialog opens.

- ZPrint checks each item in the **Printer Status** dialog prior to printing to ensure there are enough materials to complete the current build. See *Chapter 7* 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.
- Click the **Details** button to view usage information specific to each print head, the binder, and the powder levels.

2. 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.

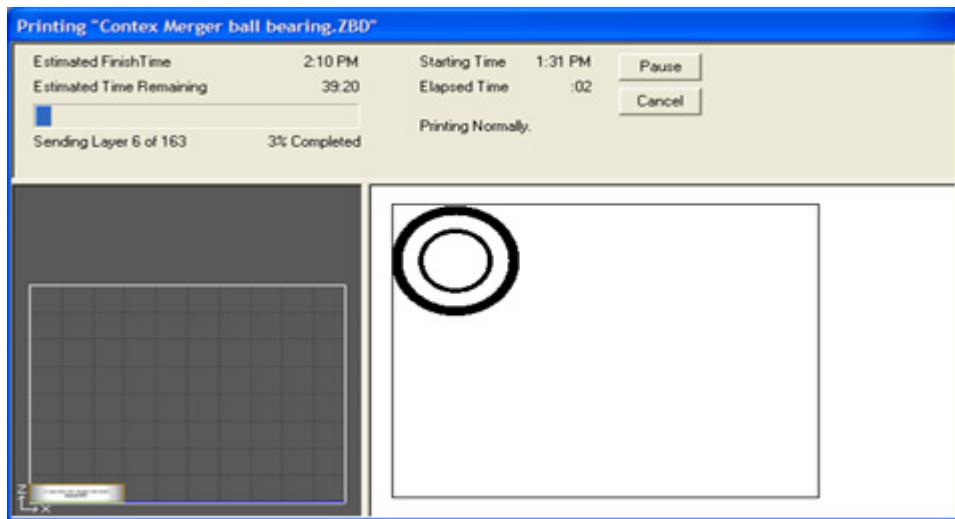
3. The **Print** button is enabled when each item, (except the **Head Alignment** and the **Build Temperature** items) displays **OK**. Click **Print** to start your build. After you click **Print**:

- 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.

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

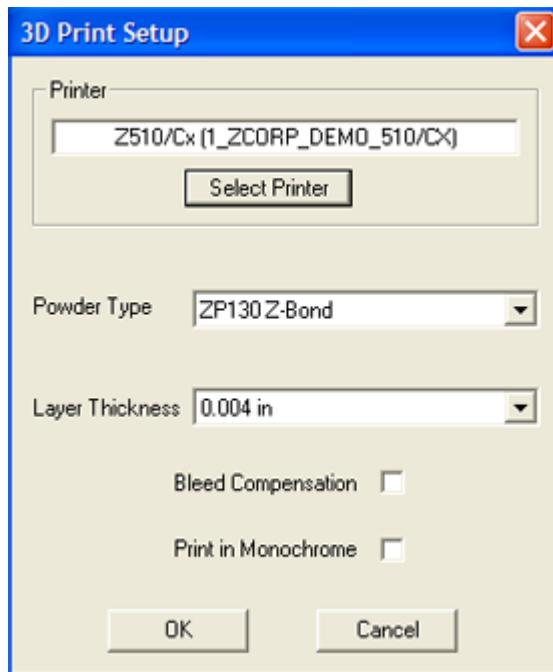
6.2.1 The Printing Dialog

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.



6.3 3D Print for Z®406, ZPrinter® 310 Plus, Spectrum Z™510, and Z®810 Printers

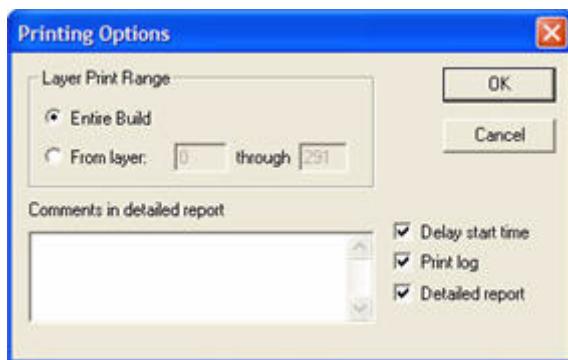
The **3D Print Setup** dialog may show different options available depending on the type of printer you are using. Always check your settings in this dialog before starting a print job.



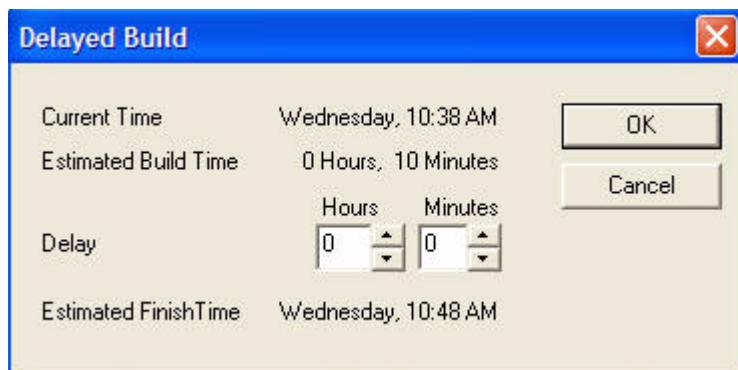
3D Print Setup Dialog for the Spectrum Z™510

1. Select **File > 3D Print Setup** to open the **3D Print Setup** dialog. Most users will not need to change the settings in this dialog, but if 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.
2. After confirming the settings for the current print job, select **File > 3D Print**, or click the **3D Print** icon .
3. The **Printing Options** dialog box displays.

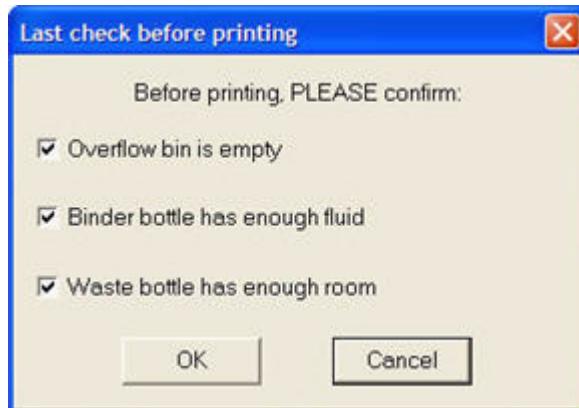


- Layer Print Range:** Choose to print the entire build or a range of layers.
- Delay start time:** If you check this option, the **Delayed Build** dialog displays *after* the **Printing Options** dialog closes. Input how many hours and minutes to delay your build, or use the up/down arrows to select the hours and minutes. The estimated finish time will change as you input values for the hours and minutes.



Print Time Delay Dialog Box

- Print log:** Check this option to include the current build in the Print Log. We recommend enabling the print log for every build.
 - Detailed report:** Check this option to create a detailed report for the current build. The report details the specifics of each part in the build. For more information, please see *Section 6.4.4*.
4. After you have selected your printing options and clicked **OK**, the software will prompt you to check the following:

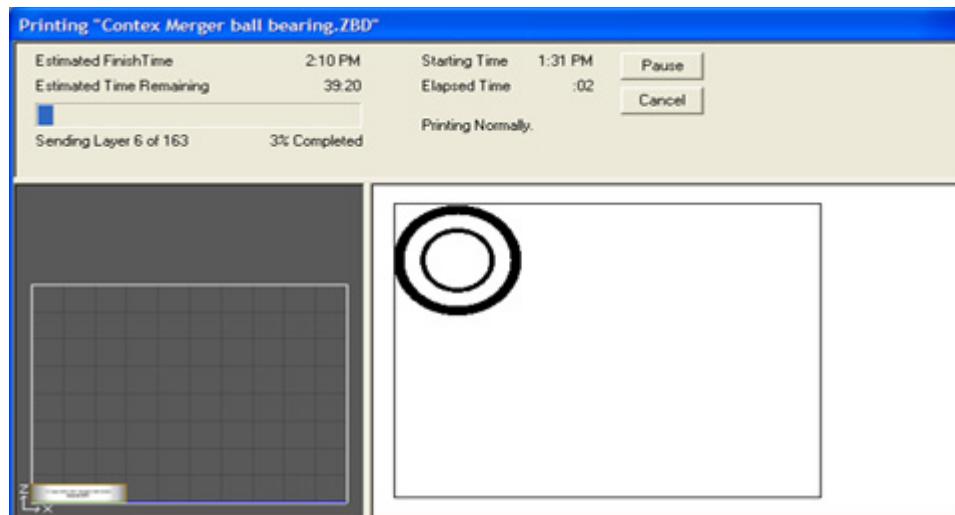


5. After each item is confirmed and checked, the **OK** button is enabled.

- When the printer is ready to print, it runs a system status check. For example, with the Z®406 and the Z®810 3D Printers, if you are printing a color model but are in Monochrome mode, ZPrint displays a prompt explaining you are in Monochrome mode and asks you to confirm that you want to continue printing the part.
- The **Activate Maintenance Reminder** option is enabled on the **Settings > General Preferences > General** tab by default. When enabled, ZPrint warns you if you do not have enough materials to complete your build, or if your print heads have reached a designated number of milliliters.

NOTE: The Z®406 and Z®810 3D Printers will warn you if you do not have enough powder, binder, and wash fluid. The Spectrum Z™510 will warn you if you do not have enough powder.

6. 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.

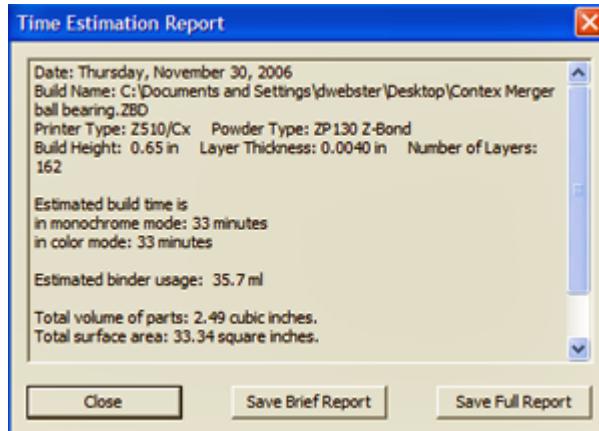


6.4 Obtain Information About The Build

In addition to the **Printing** dialog, ZPrint 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.

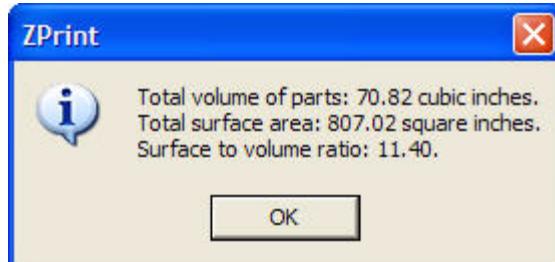
6.4.1 Print Time Estimator

- Select **File > 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.



6.4.2 Calculate Part Statistics

Select **View > Calculate Part Statistics** to view the surface area and volume of a build, prior to printing.



6.4.3 View Log File

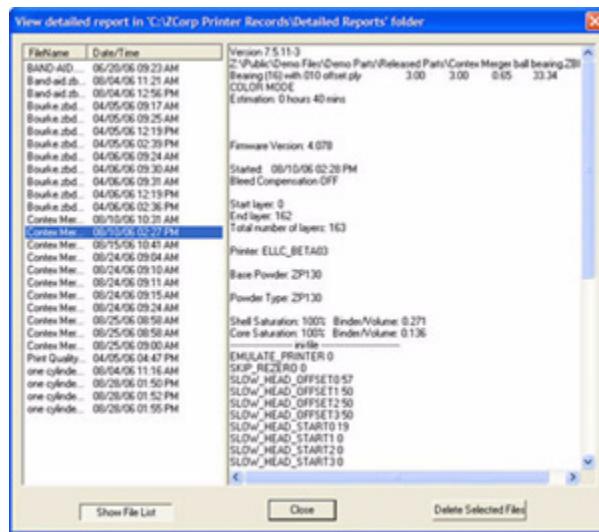
The Log File is a record ZPrint maintains of each print job run on your printer. Select **View > View Job Log** to view a log of each build printed on the printer in chronological order by date. Click the **View Other Log File** button to select text files of job logs stored in the *C:\ZCorp Printer Records\Print Logs* directory.



View Log File Dialog

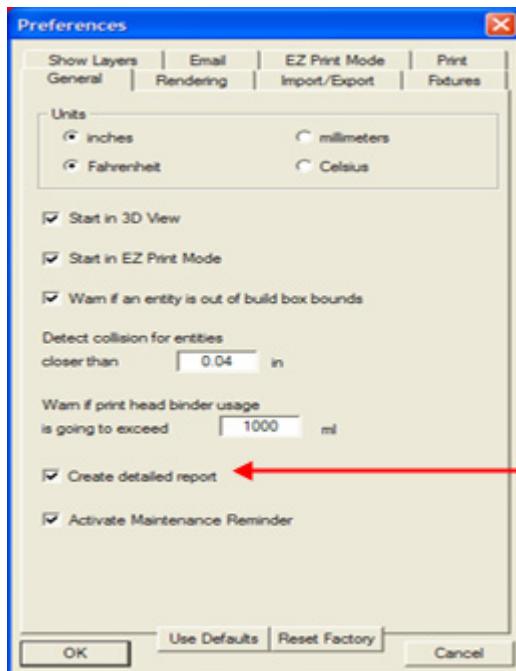
6.4.4 View Detailed Report

ZPrint writes a Detailed Report of every build printed on your printer and saves it as a text file in the *C:\ZCorp 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.

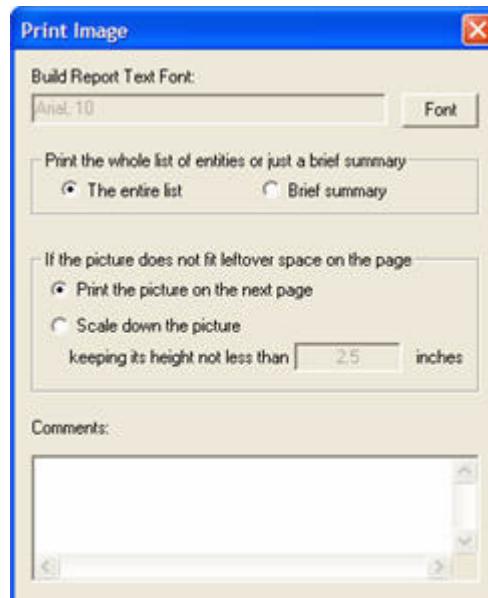
ZPrint will generate a Detailed Report for every build. If you do not want to generate a Detailed Report for every build, uncheck the **Create Detailed Report** option in the **Settings > General Preferences > General** tab.



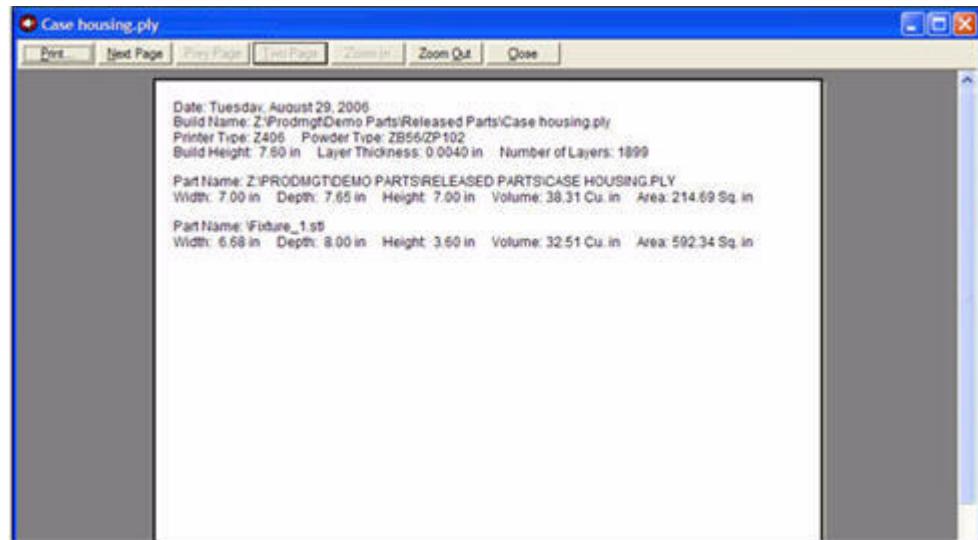
6.4.5 Print 3D Image

The **Print 3D Image** feature is for creating a printout of your build information along with an image of the part being printed.

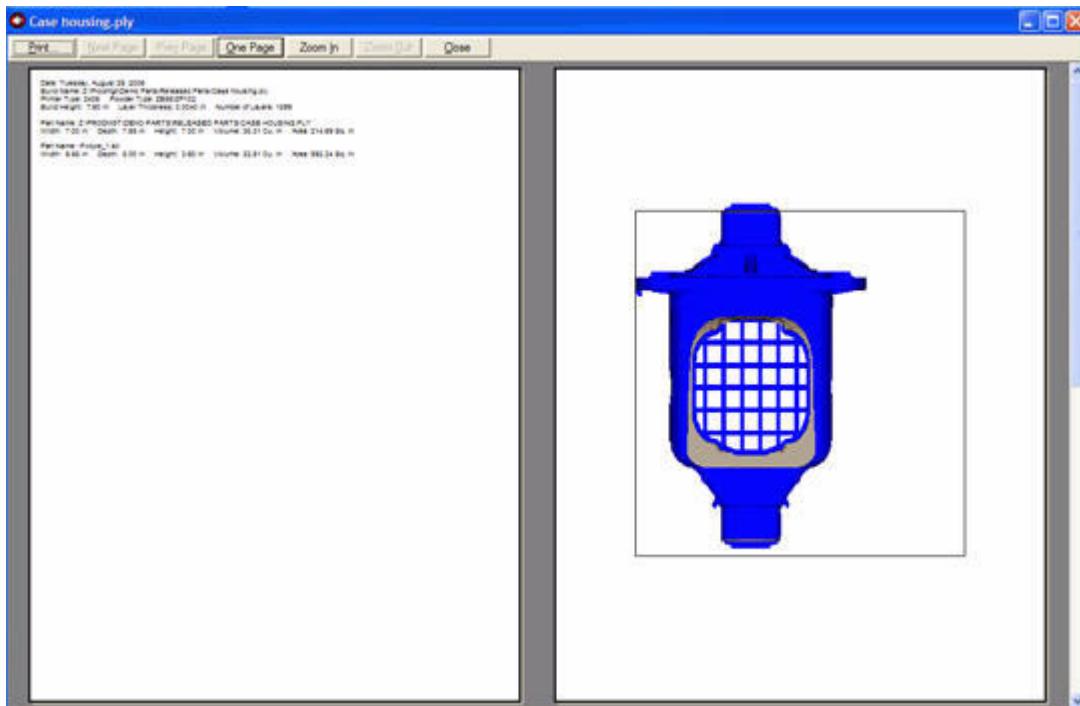
1. Select **File > Print 3D Image Preview** to display the **Print Image** dialog. Choose options for printing your build report, such as font type and size, a list of parts in the build or a summary, print image options, and any comments or notes you wish to add to the printout.



2. When you click **OK**, a print preview window similar to the following screenshot opens.



3. To see an image of the current build, click the **Two Page** button on the print preview window. The window divides into two pages, as shown below.



The Print 3D Image window showing the two-page layout

4. Select **File > Print 3D Image** to skip opening the print preview window and print only the build information.

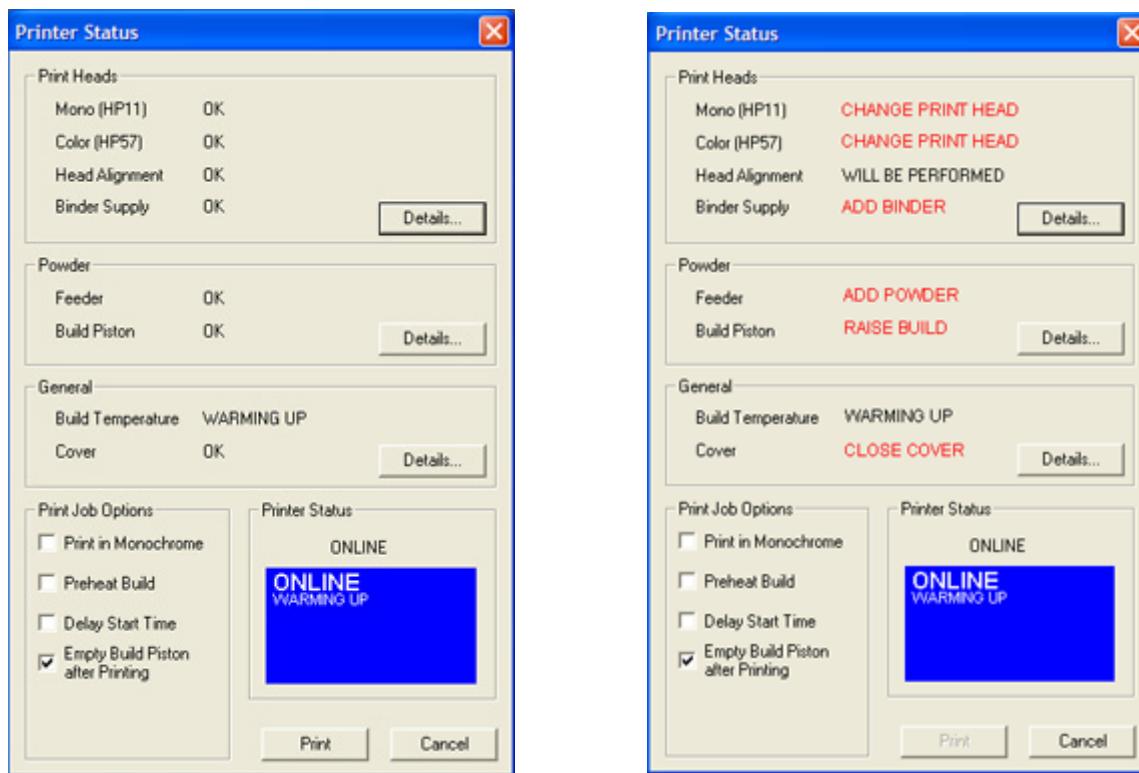
7 The Printer Status Dialog (ZPrinter® 450 Only)

When you click **3D** to start a print job, ZPrint 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.

NOTE: When calculating the ink usage for a build, if the ink used for any individual color is greater than 5.5ml to complete the build, ZPrint will reduce the color shell thickness from .025" (the default) to .015" in order to conserve color. When this is the case, ZPrint informs you via a message box. Click **OK** to continue printing using the reduced color shell thickness. The color shell thickness is a nominal value and will vary some depending on the print mode, rounding artifacts, and part geometry.

An alternative to printing with the adjusted color shell thickness is to click **Cancel** in the message box shown above and replace the HP57 printhead with a brand new cartridge. After replacing the printhead, click the **3D** icon and see if you get the color shell thickness message. It should be noted that extreme, or particularly complex builds may require an adjusted color shell thickness for printing anyway.

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.*



In the example above, the **Printer Status** dialog on the left 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. When any **one** of these messages appears, with the exception of Head Alignment and Cover, 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.

ZPrint 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.

7.1 The Details Button

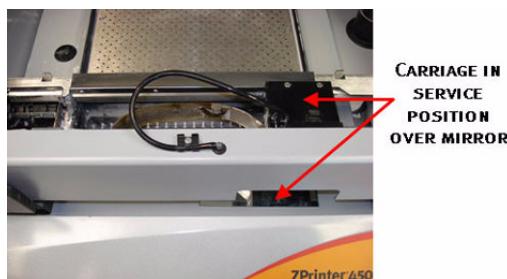
Click **Details** to view the usage status for Printheads, Powder, and Binder. The **Details** dialog shows the amount of materials remaining and required for the build in mls.

7.2 Change Print Head(s)

ZPrint checks the status of the print heads before every build. If a print head needs to be changed, ZPrint 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 heads unless prompted to in the **Printer Status** dialog.
- When the HP11 (black) print head is changed, the printer runs an automatic purge cycle to clear the print head of its ink and prepare it for binder.
- When either 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.

1. Select **Print Head > Change Print Head** on the printer LCD menu. The gantry moves to the service position.



2. Open the printer top cover and then open the carriage cover.
3. Lift both print head out of their slots and properly dispose of any empty cartridge(s).



4. Open an alcohol swab (included with your Startup Kit), and squeeze the tube to saturate the swab.
5. Wipe off all the pogo pins (inside the carriage) for both print heads with the alcohol swab.
6. Wet a paper towel with distilled water and wipe off the underneath of the carriage. When finished, press **Continue** on the LCD.



Important: Clean the underneath of the carriage every time you change a print head, and no less than every 3-6 weeks depending on your machine usage.

Residue buildup on the underside of the carriage could result in print head errors (such as 40006, or 2303:1). See the online *ZPrinter® 450 Troubleshooting Guide* (in ZPrint) for additional information.

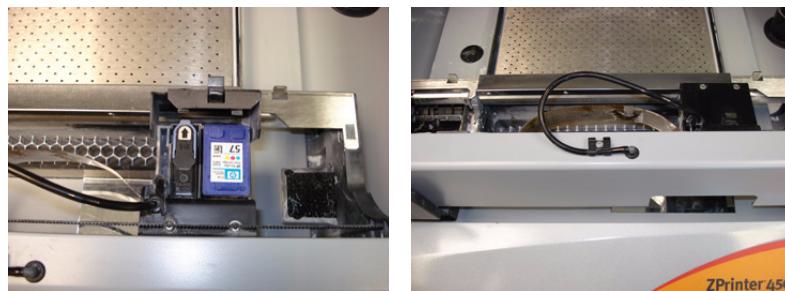
7. Remove all new cartridge packaging. Be sure to pull the tape tab off of the new cartridge.



8. Re-insert each cartridge. Press down firmly on the side of the pogo pins to securely fit a cartridge into its slot.



9. Close the carriage cover by pressing down until you hear the cover click shut.



10. Close the printer top cover and then press **Continue > Exit** on the LCD.

- The gantry reparks and the printer goes Online. The printer will run an auto-alignment pattern before starting the next print job to properly align the print heads.

7.3 Add Binder

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

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.

1. Pull the old binder cartridge out of its housing on the printer and dispose of the cartridge according to the label instructions.
2. Get a new binder cartridge and check the cartridge label for the correct orientation.
3. Insert the new cartridge into its housing. Ensure the cartridge is pushed all the way in. You should feel it gently snap into place.
 - If the cartridge does not snap into place, *do not force it*. Check the orientation on the label and try again.



7.4 Add Powder To The Feeder

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

1. At the printer, ensure that the Build Bed platform is raised to the top of the Build Bed. Select **Prep Build Chamber** on the LCD menu to properly position the platform at the top of the Build Bed.
2. Place a bucket of powder in the Fine Powder Removal chamber and remove the round fitting cap from the bucket cover.



3. Plug the vacuum hose into the fitting on top of the bucket.
4. Select **Vacuum** on the LCD menu. The vacuum automatically shuts off when the Feeder is full.
5. Return the vacuum hose to its stand, reinser the fitting cap if there is powder left in the bucket, and remove the bucket.
6. Select **Build Chamber > Spread Layer** to ensure the surface of the Build Bed is completely smooth.

7.5 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.

7.6 Cover

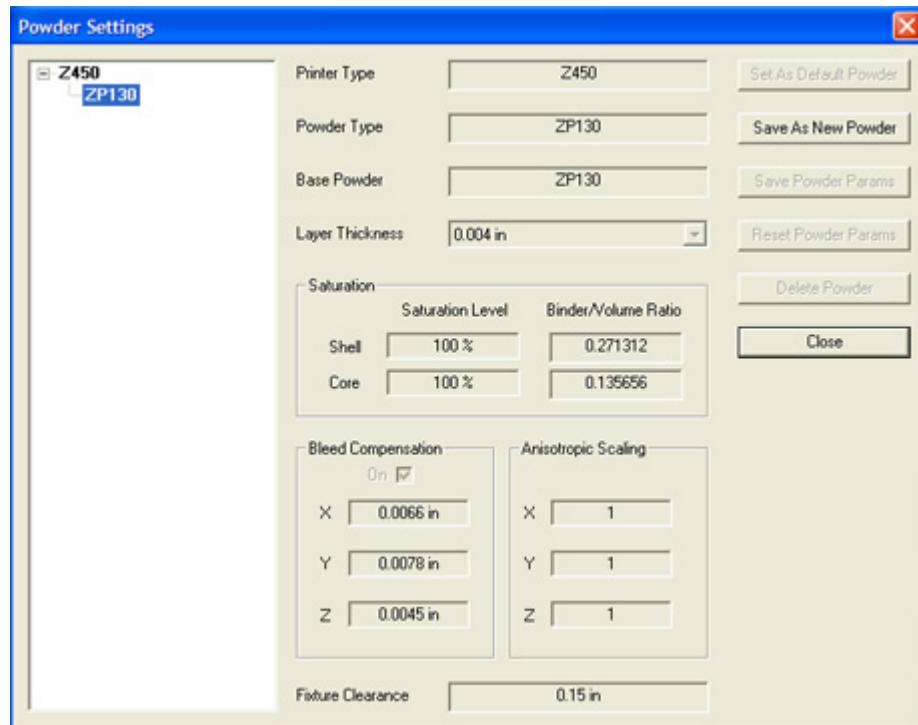
The printer cannot start a print job when the top cover is open. If the top cover is open, go to the printer and close it.

8 Advanced Settings

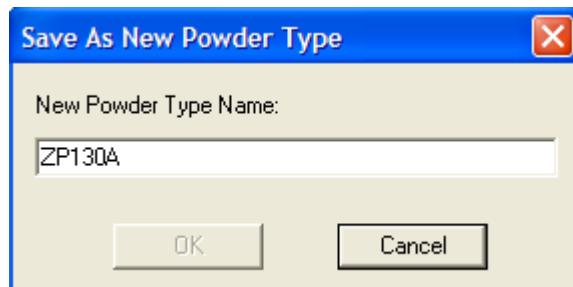
8.1 Create Custom Powder Types

There may be occasions when you need to fine-tune your powder settings. To do so, follow the steps below.

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.

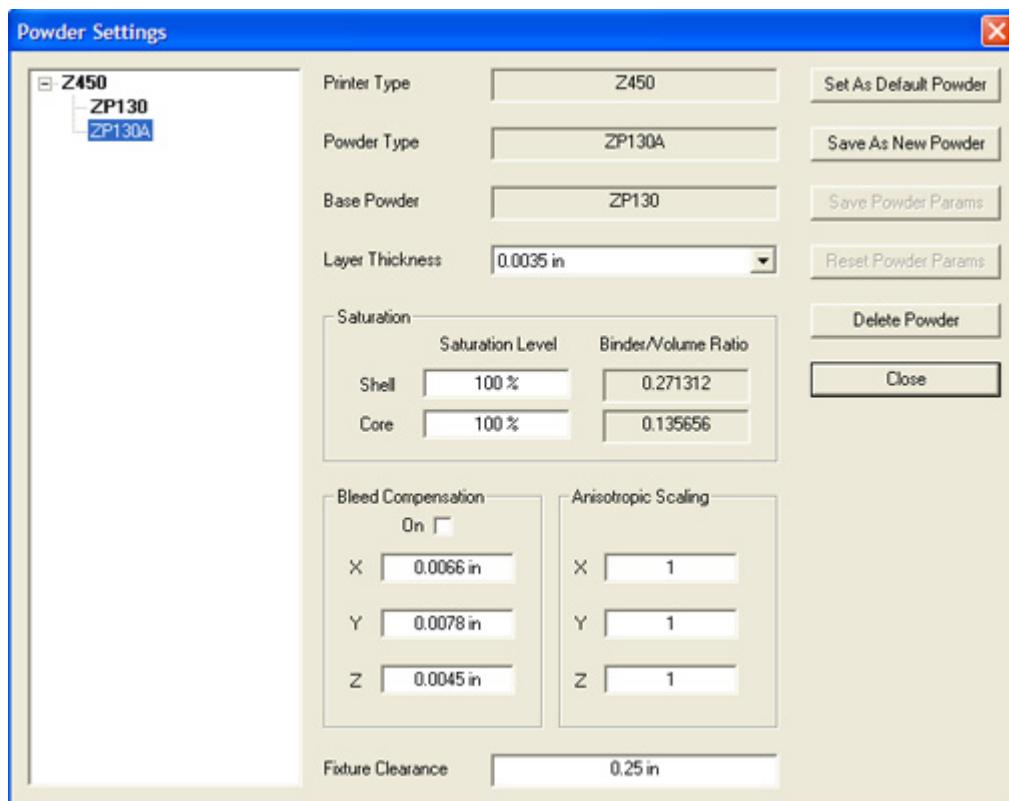


2. Select **Save As New Powder**. Type in a unique name for the new powder. You cannot duplicate powder names.



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.

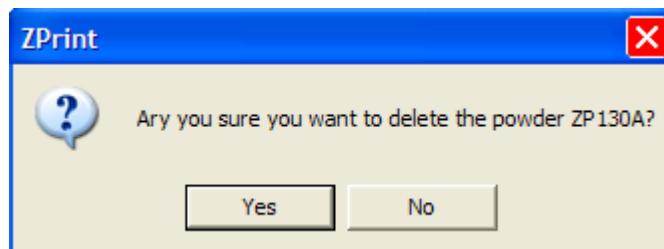


The example above shows the new settings for the custom powder type - ZP130A

4. 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 setting 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.

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



8.2 Saturation Values Overview

- In general, the saturation settings for high performance powders are constant for all parts. The default saturation values, suggested by ZPrint, 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.

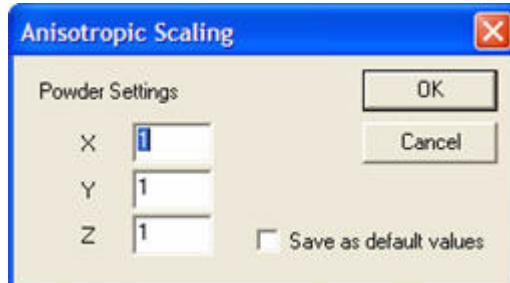
8.3 Anisotropic Scaling Overview

Anisotropic Scaling is mainly used with zp®14 (Investment Casting) and zp®15e (Elastomeric) powders, and operates as a simple multiplier. If you have experienced part shrinkage or expansion, it may be the result of humidity and temperature variations between operating environments. ZPrint sets the default powder settings for Anisotropic Scaling based on the powder type being used with your printer. These settings tell the printer how much to compensate for these part shrinkage or expansion differences.

NOTE: When Anisotropic Scaling is applied to a part, the physical part increases or decreases in size. The part rendered in ZPrint changes in appearance when Anisotropic Scaling is applied, but the dimensional values do not change and remain the same. It may be necessary to rescale and/or justify the part after applying Anisotropic Scaling.

Anisotropic Scaling values in the **Powder Settings** dialog are the default settings and cannot be changed. To apply different a Anisotropic setting to an individual part, select the part and then select **Transform > Anisotropic Scaling** and enter new values in the **Powder Settings** fields. The settings are applied to the current build only.

To keep the new settings as the default in the **Anisotropic Scaling** dialog, check the **Save as default values** option. The **Anisotropic Scaling** dialog updates with the new settings.



8.4 Bleed Compensation Overview

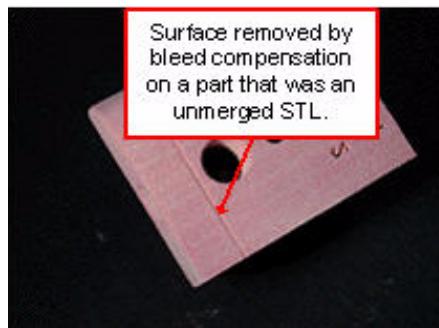
Binder printed on powder has a tendency to spread slightly, causing surfaces of a part to migrate outwards. This is known as “bleeding” and to compensate for this, it is necessary to determine the Bleed Compensation value to apply to a part. Once that value is determined, a small amount of thickness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

- ZPrint 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 8.1](#) for more information.
- **ZPrinter 450 only** - ZPrint 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.*



8.5 General Preferences Settings

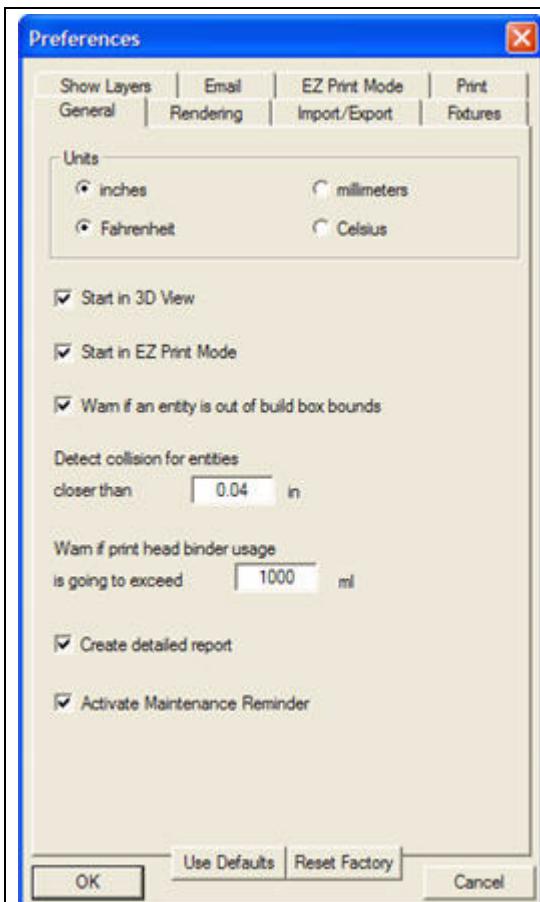
To view ZPrint preferences, select **Settings > General Preferences**. The **Preferences** dialog consists of eight tabs. Click on a tab to view default settings used in ZPrint. In most instances, (such as when using Collision Detection, the Make Solid, or the Make Fixture operations), you can override 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 ZPrint 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.

8.5.1 General Tab



Preferences – General Tab

Units: Inches and Fahrenheit are the defaults. The Unit settings tell ZPrint 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 ZPrint 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.

Start in EZ Print Mode: ZPrinter 310 Plus ONLY.

Checked by default. Runs the EZPrint Wizard that guides you through each step of the printing process. Choose to disable EZPrint or selected parts in the **Open** dialog by unchecking the **EZ Print** checkbox. For more information, see *EZ Print*.

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

Detect collision for entities closer than: ZPrint 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.

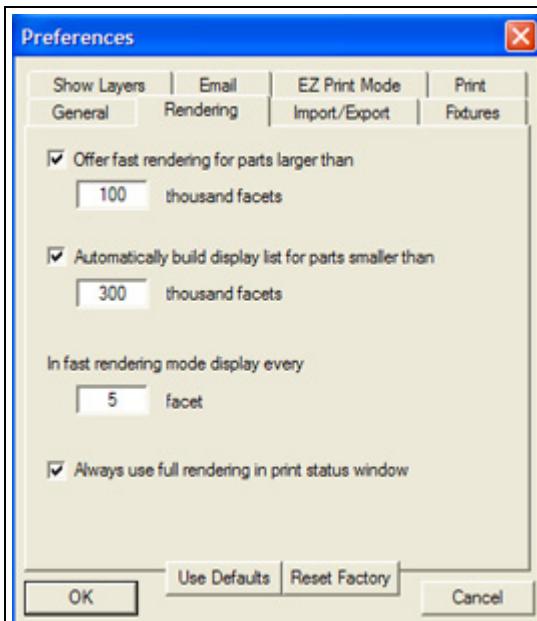
Warn if print head binder usage is going to exceed:

Tells ZPrint 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.

8.5.2 Rendering Tab



Preferences – Rendering Tab

Offer fast rendering for parts larger than: Check this option to have ZPrint 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.

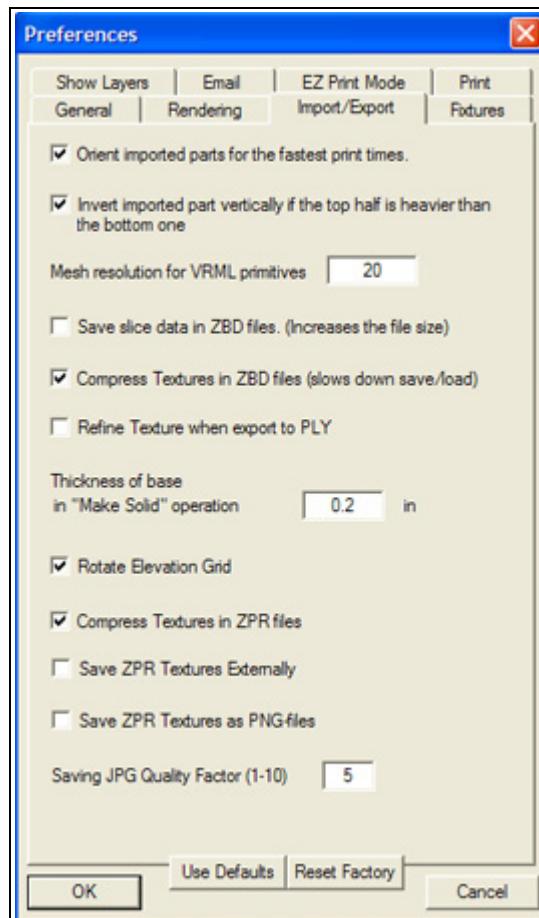
Automatically build display list for parts smaller than: Check this option to view the build list for parts that are smaller than the designated amount of facets entered in the **Thousand Facets** field.

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 Toolbar.

In fast rendering mode display every: Enter a value in this field to accelerate displaying large files in ZPrint 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.

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.

8.5.3 Import/Export Tab



Preferences – Import/Export Tab

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

Invert imported part vertically if the top half is heavier than the bottom one: Checked by default. Orient 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.

Save slice data in .zbd files: Unchecked by default. When checked, saves the slice data of a part. Normally, when you save a build file (.zbd), the slice information is discarded and the part is resliced when the file is opened. This is generally the best strategy for saving files as file size is significantly smaller and will take less time to open. However, once the file is opened, you will have to wait while the file slices the data.

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 .wr 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. Orient the part in the XY plane. Most G/S 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.

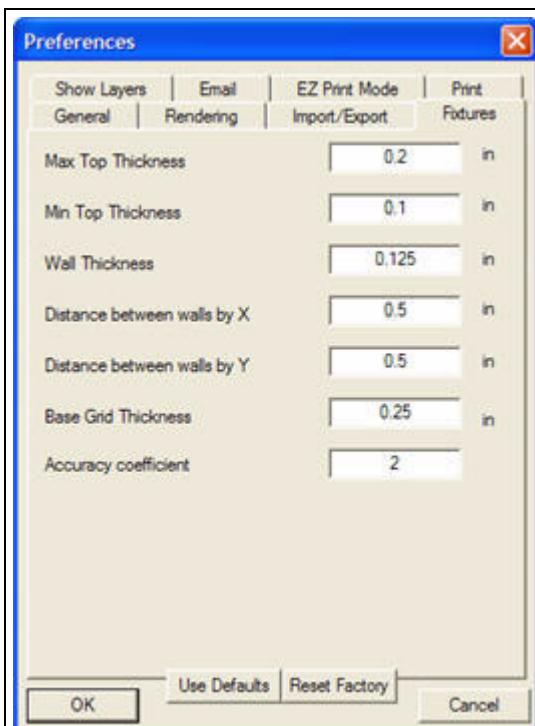
Compress textures in .zpr files: Check to save texture maps with compression. Compression saves computer resources, but compressed files take longer to open and save.

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.

8.5.4 Fixtures Tab



Preferences – Fixtures Tab

These are the default settings for generating Fixtures. See Sections 5.21-5.22 regarding Fixtures for more information.

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.

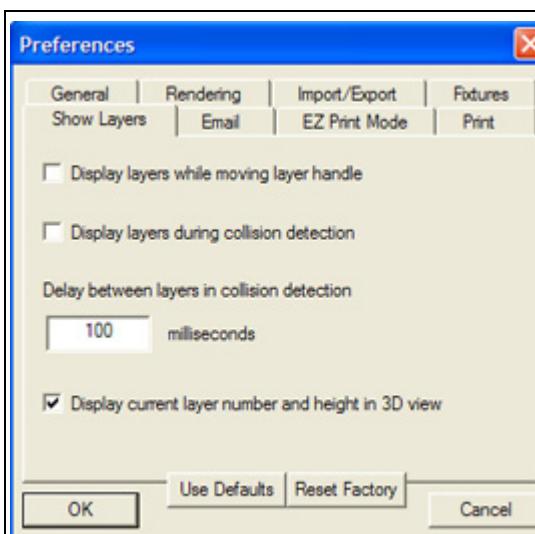
Distance between walls by X: The distance between the Fixture walls in the **X** direction.

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.

8.5.5 Show Layers Tab



Preferences - Show Layers Tab

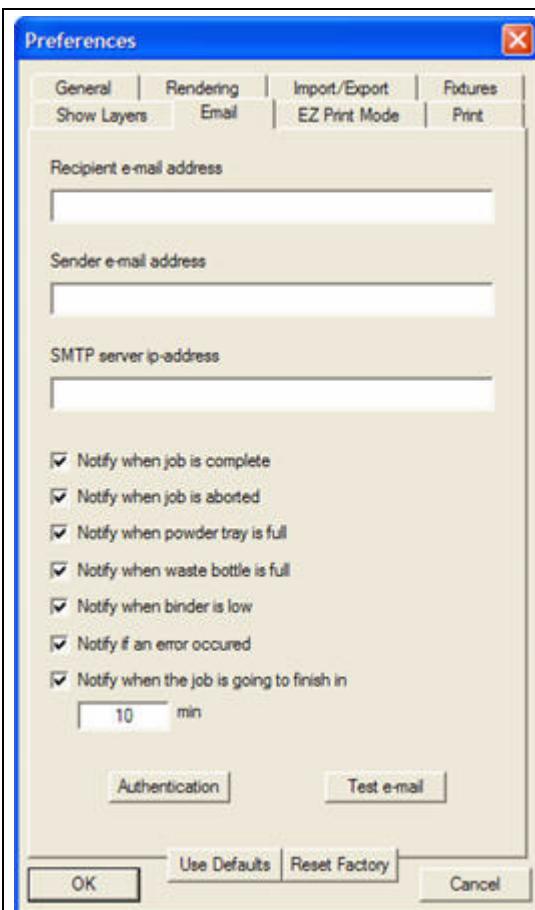
Display layers while moving layer handle: Check this option to view layers in real time while moving the layer handle up or down in the front view of the main window in either 2D or 3D view.

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.

8.5.6 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.

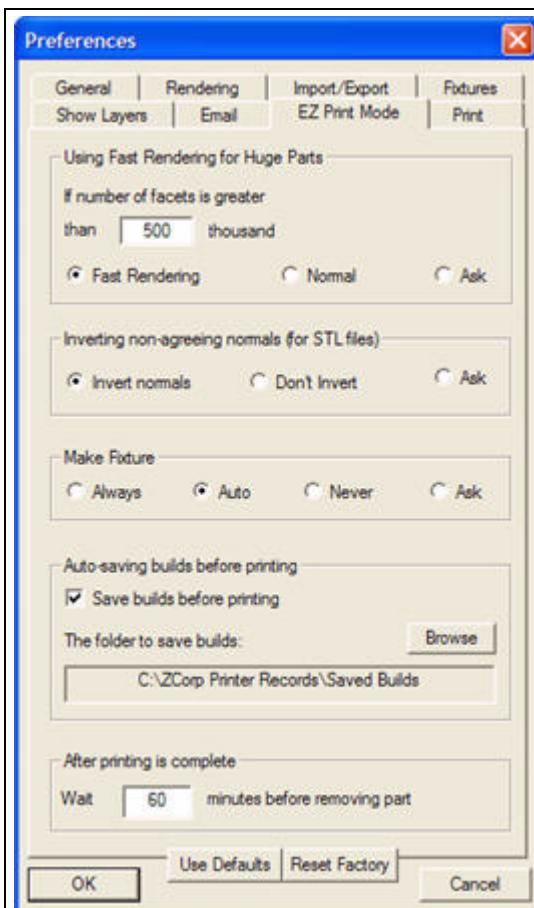
Notify when the job is going to finish in: Notifies you when your print job will finish at the time specified in the minutes field.

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.

8.5.7 EZ Print Mode Tab



Preferences - EZ Print Mode Tab

In **EZ Print Mode**, the process of printing a part is streamlined. Setup the **EZ Print Mode** tab and choose the options you want to have ZPrint prompt you with before you start a print. Be sure to check the **EZ Print** checkbox on the **Open** dialog, to activate **EZ Print Mode** in ZPrint.

Using Fast Rendering for Huge Parts: Choose to automatically use fast rendering, normal rendering, or to prompt you before rendering for the specified number of facets. By default, the **Fast Rendering** option is selected.

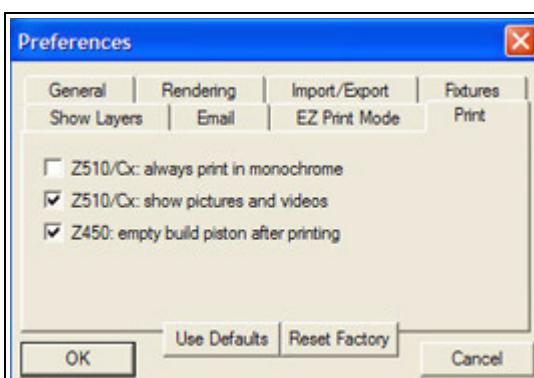
Inverting Non-Agreeing Normals (for .stl files): Choose whether to automatically invert normals, to not invert normals, or to be prompted before inverting normals for .stl files. By default, the **Invert Normals** option is selected.

Make Fixture: Choose whether to always create a fixture, to automatically create a fixture (which is determined when the base of a part is not a flat surface), to never build a fixture, or to prompt you before building a fixture. By default, the **Auto** option is selected.

Auto-saving Builds Before Printing: Check Save builds before printing to have ZPrint automatically save the build files to the specified directory, prior to printing. This option is checked by default and the default folder specified resides in your local directory.

After Printing is Complete: Enter a time for your parts to remain in the Build Bed after printing. There is a countdown timer after the part is printed that will tell you how many minutes have lapsed since the print job finished and when your part will be ready for removal. The default is **60** minutes.

8.5.8 Print Tab



Preferences - Print Tab

Spectrum Z™510: always print in monochrome: Check this option to print all builds on the Spectrum Z™510 printers in monochrome.

Spectrum Z™510: show pictures and videos: Check this option to view pictures and videos for setting up your printer. The tutorials begin after you press **3D Print**.

Z450: Empty build piston after printing: Default setting for the **Printer Status** dialog. Uncheck to prevent the build box from automatically emptying after a build.

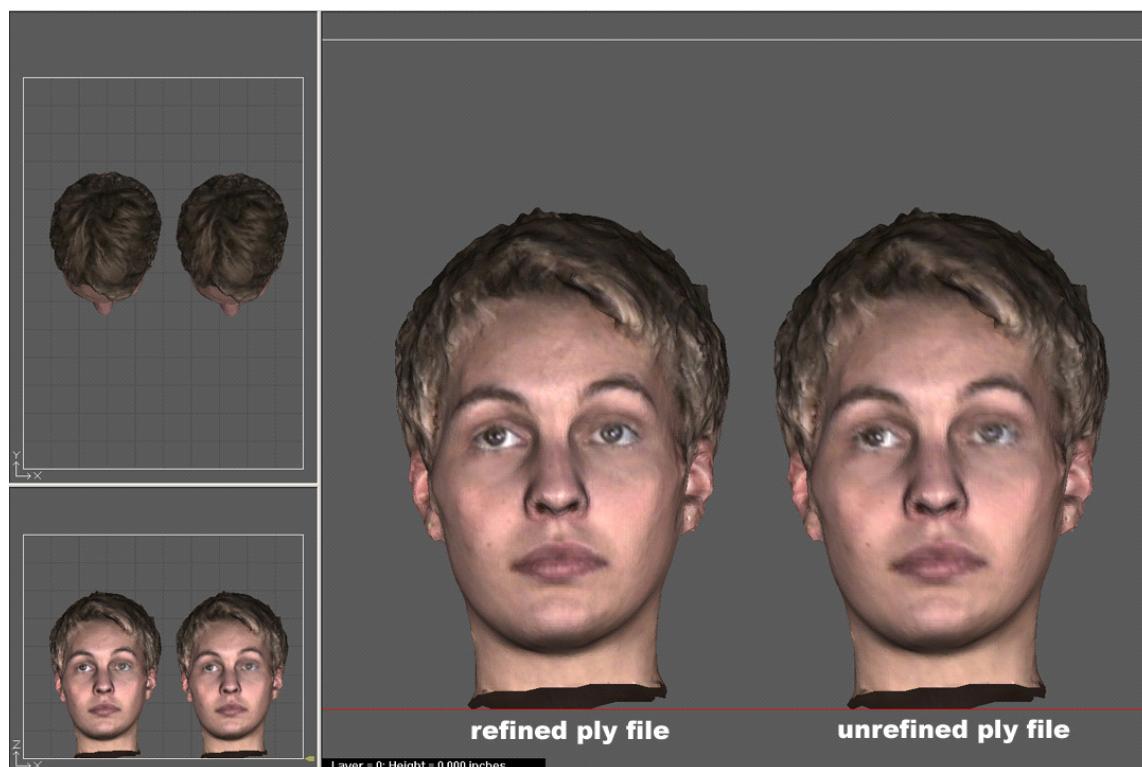
8.6 Export .ZPR, .ZPR2, .PLY, or .STL Files

ZPrint 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*, *.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 **File > 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.

NOTE: When you export *.stl* files, you can export multiple parts, keeping them relative to each other when they are imported into a third-party software application.



9 Service Menu

ZPrint 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 ZPrinter® 450 **Service** Menu is described below. If you own a ZPrinter® 310 Plus; a Spectrum Z™510; or a Z®406 Printer, you can use the ZPrinter® 450 **Service** menu as a reference. Everything on the 310 Plus/Z510/Z406 **Service** menus is defined below on the ZPrinter® 450 **Service** menu.

Z®810 Printer owners should reference *Section 9.2* for a description of its **Service** menu.

9.1 ZPrinter® 450/310 Plus/Z510/Z406 Service Menu

The following **Service** Menu is available for the ZPrinter® 450/310 Plus/Z510/Z406.



ZPrinter Service Menu

Unpark. Unparks the gantry and carriage for cleaning or servicing.

Change Print Head. Prepares the system to change a print head.

Auto Alignment. Align the print heads after they have been changed.

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

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.

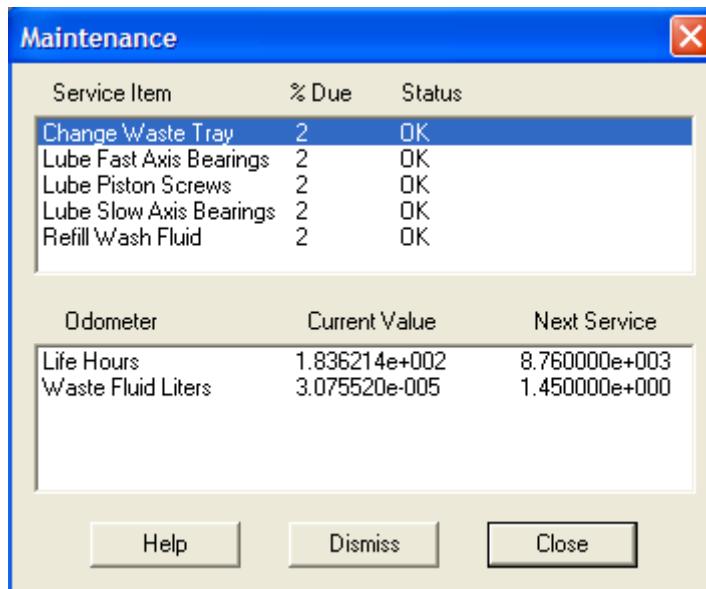
Drop Feed Piston. Lowers the feed piston automatically. This is the same as selecting the **Feed Down** button (310 Plus/510/406), or the **Build Chamber > Lower Platform** command on the ZPrinter® 450 LCD Panel.

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.

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. ZPrint will automatically prompt you when it is time to perform maintenance on any of these items.

Highlight a Service Item in the **Maintenance** dialog and click the **Help** button to open the procedure for the selected Service Item.



An example of the Maintenance dialog.

Bleed Air. Select to remove air from the fluid system. Use this feature only under the guidance of the Service Department, or an authorized Service Provider.

NOTE: Spectrum™ Z510 - Air bubbles that are smaller than .5" are normal and will not affect the print head life or the binder flow.

Service Print Heads. (Shortcut Key: **F3**) 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.

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

Toggle Roller On/Off. (Shortcut Key: **F4**) Select to activate the roller independently for easy cleaning.

Check Status. (Shortcut Key: **F1**) Checks how much powder is in the Feed Piston, the remaining room in the Build Bed, and the ZPrint 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. The *Z Corporation Service Department* will provide you with the required upgrades and instructions for installing.

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

Edit .INI File, Send File and Receive File. These features are used during diagnosis. They should only be modified under the instruction of the *Z Corporation Service Department*, or an authorized Service Representative.

9.2 Z®810 Service Menu

Only those items not referenced above are described for the Z810 Service menu.



Alignment. Select to align the print heads after changing them. For additional details, see the *Z®810 Hardware Manual*.

Change Binder Supply. Select to change between color and monochrome binder systems.

Flush Binder. This feature allows you to cycle fluid through the plumbing system, which is useful in changing the binder color or binder type, as described in detail in the *Z®810 Hardware Manual*.

Empty Overflow. Select to empty the overflow bin before each build.

Lube Fast Axis. Select to have the system position the gantry so the fast axis bearings can be lubricated. It also moves the gantry back and forth to lubricate the entire fast axis rail. (**NOTE:** *This feature is only available for Z®810 3D Printers with serial numbers of 80050 and up.*)

Lube Slow Axis. Select to have the system position the gantry so the slow axis bearings can be lubricated. It also moves the gantry, thereby spreading the grease onto the slow axis rails. (**NOTE:** *This feature is only available for Z®810 printers with serial numbers of 80050 and up.*)

Spit on Deck. Select to test the print quality of your print heads. This feature is used after changing print heads and can also be used when your print heads have reached a high pixel count.

Report Capabilities. Select to view a report of the build size and print modes.

10 Troubleshooting

10.1 The ZPrint Software Crashes

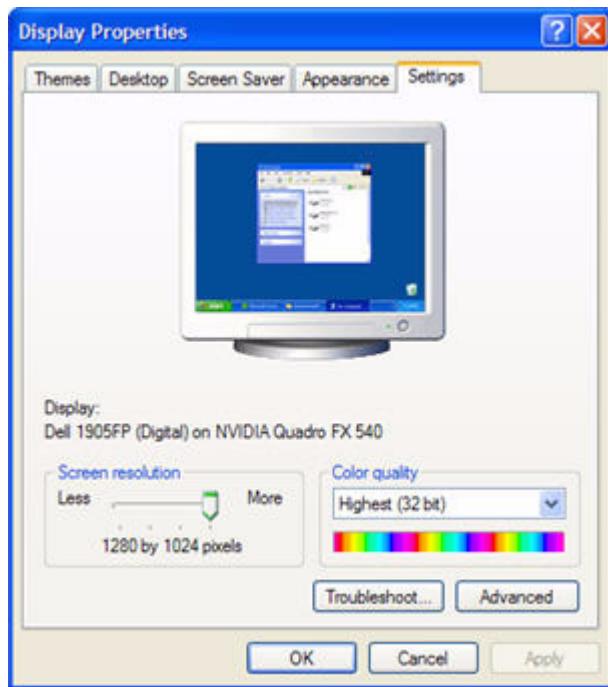
Review the following sections if you experience a software crash:

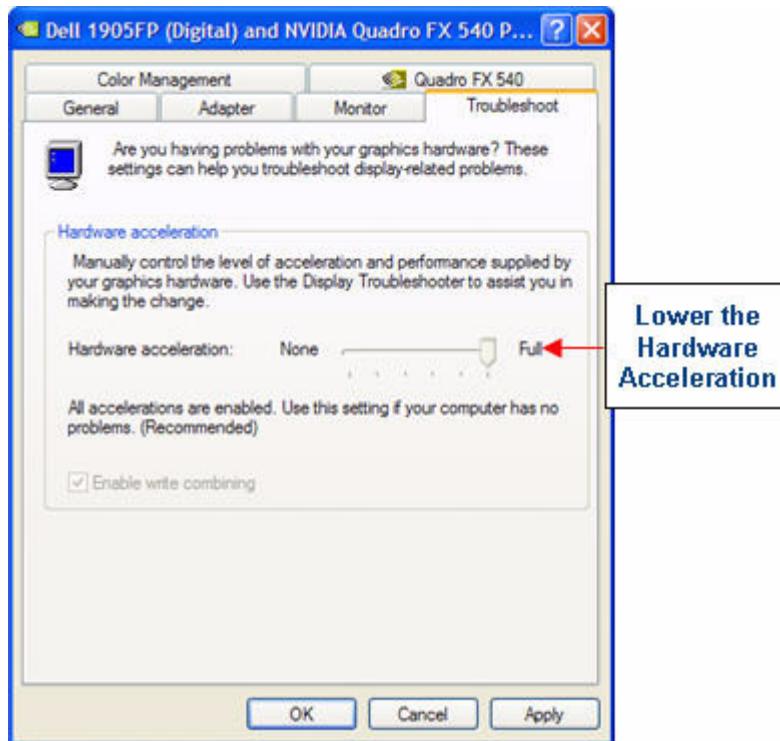
- Opening or importing a part
- During a **Make Label**, **Make Fixture**, or **Make Solid** operation

10.1.1 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, lower the hardware acceleration. You will need Administrator rights to change this setting. This setting is found on your system **Control Panel > Display > Display Properties** dialog (Windows), or you can right-click on your system desktop and select **Properties** on the popup menu.

When the **Display Properties** dialog opens, click the **Settings** tab and then click the **Advanced** button. This bring you to the advanced settings for your system. Click the **Troubleshooting** tab, locate the hardware acceleration bar and lower the settings by **one** level. If you continue to experience problems with rendering or labeling, continue to reduce the hardware acceleration. If reducing the hardware acceleration does not solve the problem, please contact your local Reseller, or visit our Website at www.3dpuser.com.



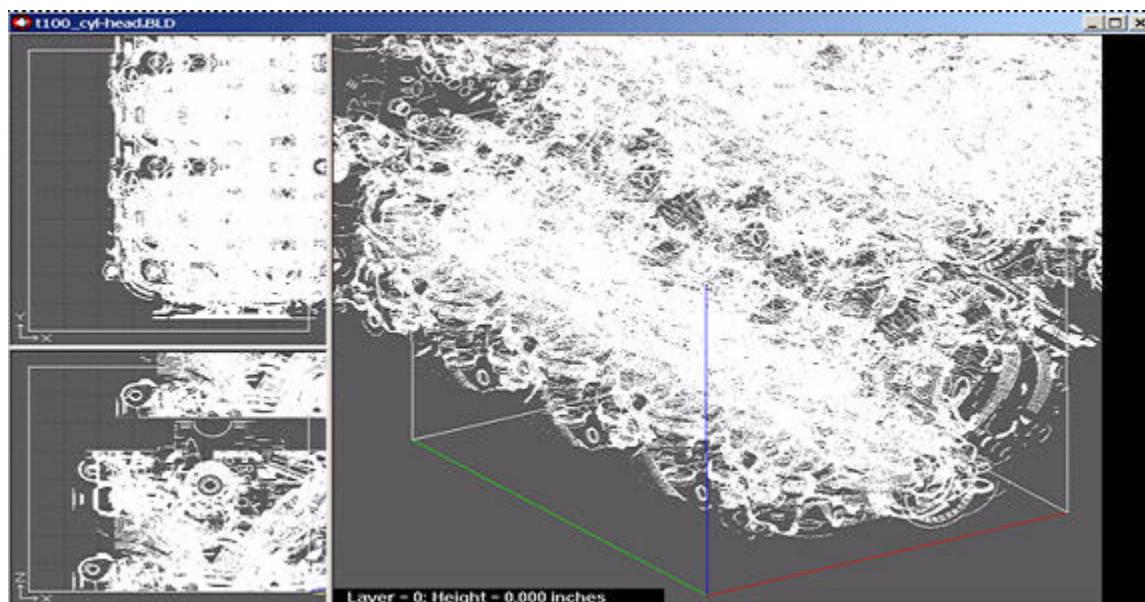


The following video drivers have been tested with the recommended hardware acceleration settings below:

Driver	Driver Version	Hardware Acceleration 1 (None or Lowest) – 6 (Full or Highest)
32 MB NVIDIA GeForce 2 MX with TV out	1.2.1.0	6 (Full)
32MB ATI Rage 128 Ultra	5.13.1.3217	5
64 MB NVIDIA GeForce 2 MX with TV out	1.5.2.0	6
Intel® 82845 G/GL Graphics Controller	6.13.1.3084	2
NVIDIA GeForce 2 GTS	3.11.0018	5
NVIDIA GeForce 2MX/MX400	2.9.4.2	4
Rage 128 Pro	5.0.0.136	3
Rage Fury Pro/Xpert 2000 Pro	5.13.1.219	5
S3 Inc. Trio 3D/2X Display Driver	3.3.10	5

10.2 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 maximizing and then restoring the window, or select **Refresh** on the **View** menu.



10.3 Errors with Email Notification

10.3.1 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 the [Service Department](#).



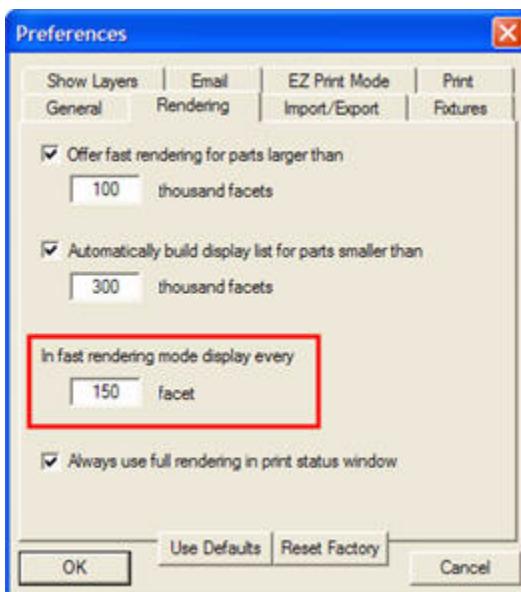
10.3.2 No Permission to Send Email

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



10.3.3 Errors When Printing

If the computer freezes during printing or displays a 'low memory' or 'out of memory' error, deselect the option to 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.



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