HP SmartStream 3D Build Manager

User Guide

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1 Introduction

Use the powerful 3D print-preparation capabilities of HP SmartStream 3D Build Manager to help make all of your 3D printing jobs successful:

1. Add parts to begin preparing the print job.

2. Rotate, size, and position parts on the bed.

3. Automatically locate and fix 3D geometry errors, adjust part colors, and hollow parts to use less material..

4. Send a printer-ready file to a connected 3D printer or save the printable file.

This preparation can save time and money by helping you to avoid the frustration of trial-and-error printing.

Interface overview

Here is a snapshot of the application with a model ready to be printed.
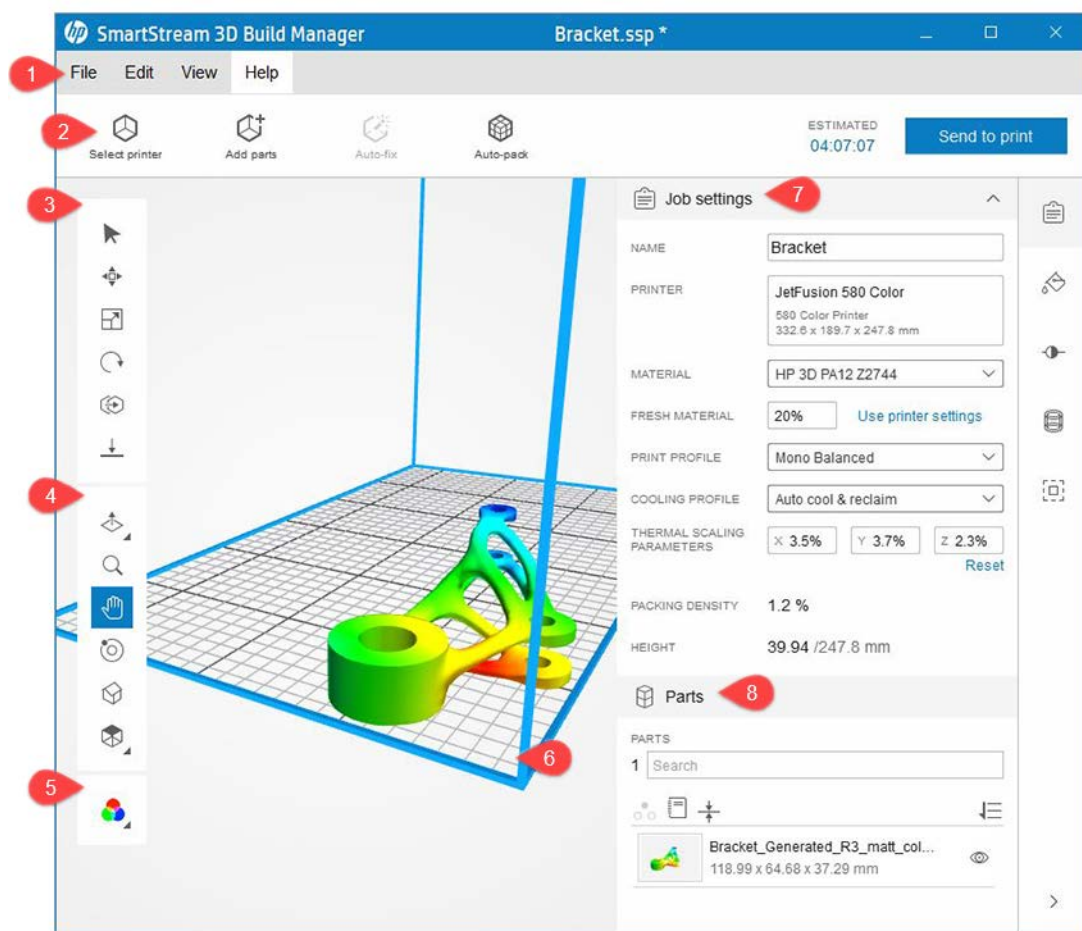
1. **Menu bar:** Provides file management tools, editing tools and preferences, viewing controls, and learning content.

2. **Action bar:** Provides common tasks for preparing jobs to print and estimating printing times.

3. **Transform toolbar:** Provides tools for manipulating parts in the build volume.

4. **Viewing toolbar:** Provides tools for manipulating the view and navigating within the viewport.

5. **Color view mode:** Offers a choice between geometry view, color view, and print view.

6. **Viewport:** The work area that includes the build volume. The build volume, typically indicated by blue boundary lines, is the printable volume.

7. **Content panel:** Contains five tabs along the right-hand side the provide access to groups of related tools.

8. **Parts panel:** Provides a list of all the items in the job, including actions to manipulate the list and interact with the parts and cages.

Toolbars

Transform toolbar

▶ Select

✥ Move

Scale

↻ Rotate

Duplicate

↧ Move to bed

Viewing toolbar

Cutaway

🔍 Zoom

✋ Pan

Orbit

Home view

Orthographic view

Color view toolbar

Color view

Content panel
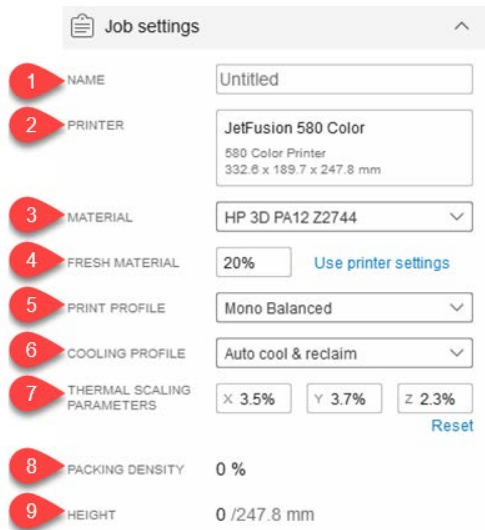
Content panel tabs

Job settings

Content panel tabs (continued)

⬥ Part color

◐ Color adjustment

⬚ Hollow

⬚ Caging

The **job settings tab** provides details about the job and the printer settings being used.

1. JOB NAME: The name of the job.

📝 IMPORTANT: Changing the job name here also changes the name of the file.

2. PRINTER: Identifies the selected printer.

3. MATERIAL: Some printers enable you to select a material.

4. FRESH MATERIAL: Some printers used recycled material. This setting enables you to select the amount of new material to be used.

5. PRINT PROFILE: Identifies the selected group of print settings.

6. COOLING PROFILE: Select a preset to determine how long the printer should wait to cool the parts.

7. THERMAL SCALING PARAMETERS: Compensation factor for distortion based on the print volume. The correct setting depends on the material. Change here if results are not as expected. Parts are scaled to accommodate the distortion.

8. PACKING DENSITY: The occupied proportion of the build volume up to the height of the highest positioned part.

9. HEIGHT: The height of all parts in the job. The maximum build volume height is also indicated. The build height updates as parts are added, moved, and removed.

The **part color tab** provides tools to sample the existing part colors, and to change them using existing and custom color swatches.
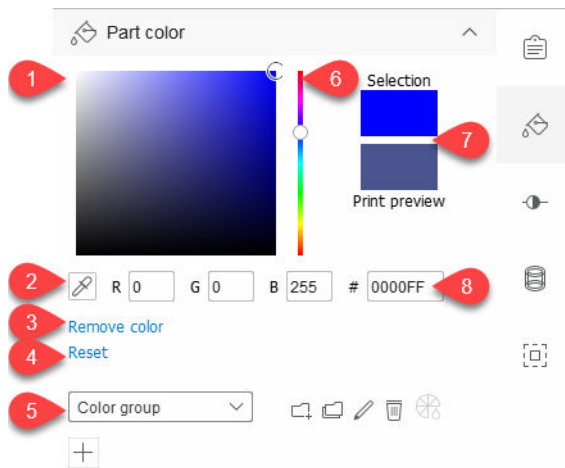
1. **Saturation/lightness area:** Drag to adjust the color of the selected part.

2. **Eyedropper:** Click the tool and select a color in the build volume to apply it to the selected part.

3. **Remove color:** Removes all color information from the selected part.

4. **Reset:** Returns the part to its initial color.

5. **Color swatches:** Select from default color groups to display the colors in the swatch area.

   ⊓ Add a new color group

   ⊏ Duplicate an existing color group

   ⟋ Edit an existing color group

   ⊟ Delete the selected color group

   ⊛ Generate a color proof

6. **Hue:** Drag the slider up or down to adjust the color of the selected part.

7. **Color preview area:** Displays the adjusted color of the selected part and provides a print preview.

8. **RGB/Hex value:** Enter a color value to apply it to the selected part.

The **color adjustment tab** provides tools to adjust the hue, saturation, and value of the selected part.

1. HUE: Drag the slider left or right to adjust the hue of the selected part.

2. LIGHTNESS: Drag the slider left or right to adjust the lightness of the selected part. Use **Reset** to return to the default values for the selected object.

3. SATURATION: Drag the slider left or right to adjust the saturation of the selected part.

The **hollow tab** enables you to hollow a solid part by choosing the resulting wall thickness after the hollowing is complete. Hollowing a part can reduce the amount of material used and increase printing speed.
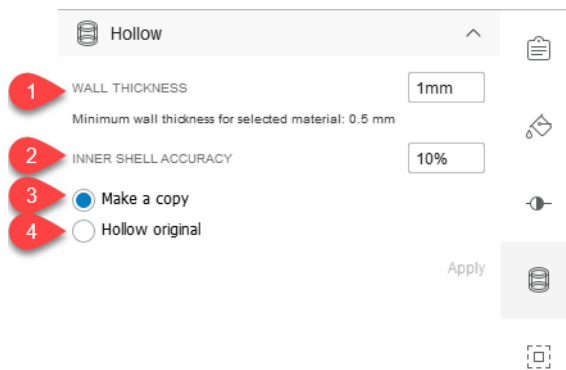
1.   WALL THICKNESS: Set the new wall thickness for the hollowed part.

2.   INNER SHELL ACCURACY: Adjust the accuracy of the hollowed wall thickness setting. Increasing accuracy may slow the creation of the inner shell. The more accurate, the longer it takes to create.

3.   **Make a copy**: Apply the hollowing settings to a copy of the original part.

4.   **Hollow original**: Apply the hollowing settings to the original part.

The **caging tab** enables you to create and modify a container, or cage, that enables you to group and print related parts.
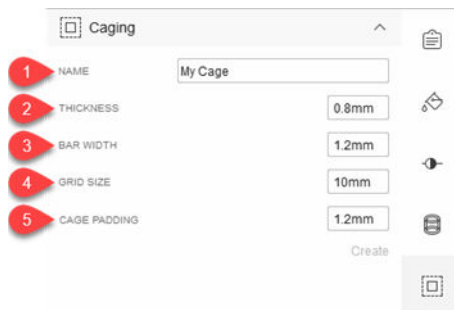
1.   NAME: Name the cage to be created around the selected parts.

2.   THICKNESS: Adjust the cage bar thickness.

3.   BAR WIDTH: Adjust the cage bar width. The value must be greater than or equal to the thickness value.

📝 NOTE: Increasing the thickness and bar width values can cause other cage-related values to be adjusted automatically.

4.   GRID SIZE: Adjust the size of the cage grid. The value must be at least double the bar width value.

5.   CAGE PADDING: Adjust the space between the parts and the cage. The value must be at least as much as the bar width value.

Parts panel
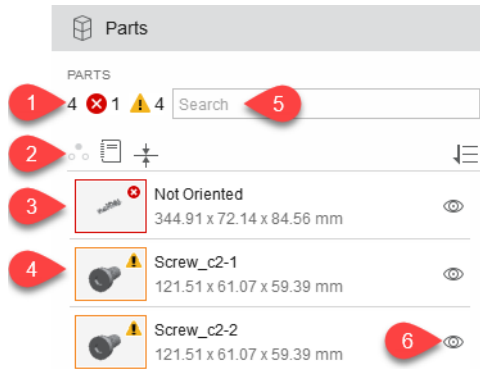
1. Total number of parts in the build volume and viewport and number of added parts with errors ⊗ and warnings ⚠. Use the color view toolbar to switch to geometry view to see the errors.

    💡 TIP: Click the number to select parts with issues.

2. Parts panel tools.

    ⊶ Isolate

    ▤ Part report

    ╪ Analyze wall thickness

    ↓≡ Sort parts list

3. Part with an error. The parts list shows a thumbnail image with an error icon ⊗ indicating one or more issues with that part. Each part also shows the part name and dimension information.

    💡 TIP: If the listed part shows an error, double-click the listed part for more details. You can auto-fix the issue, and/or create a part report.

4. Part with a warning. The thumbnail image has a warning icon ⚠ indicating that the part is out of bounds. Out-of-bounds parts are not included in the number of parts with errors.

5. Search for parts in the list. As you type, the parts list is filtered to show only those parts including those characters. Clear the search term to see the entire parts list again.

6. The hide/show tool 👁 enables you to control the visibility of each part in the build volume.

    💡 TIP: After a part has been hidden, right-click and choose **Show all**.

2 Preferences

About preferences

Preferences control default behaviors in the application. Once preferences are saved, they are retained and used each time you start the application. The **Preferences** dialog box has two tabs: **General** and **Command Center connection**.

General

The **General** tab provides settings for controlling the application.

- Global settings

    - **Language**: Select the desired language for the application and restart the application.

    - **Units**: Select the desired units of measurement: millimeters, centimeters, or inches.

    - **Reset all messages and warnings**: If not enabled, enable this setting to display the messages again.

- Parts

    - **On add/duplicate parts, auto-pack**: Select the default behavior for how you want imported or duplicated parts to be managed in the viewport.

        ○ **2D**: Automatically arranges all parts horizontally on the bed in the build volume. If there is no room, parts are placed outside the build volume in the viewport.

        ○ **3D**: Automatically arranges all parts horizontally and vertically within the build volume. If there is no room, parts are placed outside the build volume in the viewport.

        ○ **None**: Keeps the part arrangement as saved in the imported design file. This option can cause part collisions, including complete overlaps.

        ○ **Ask every time**: When parts are imported or duplicated, you are prompted to select an auto-packing option.

    - **Auto-pack tolerance**: Adjust part spacing precision. Lowering the tolerance increases accuracy but decreases performance. The default value is 5 mm and the minimum value is 1 mm.

    - **Show warning for out of bounds**: Select whether you want out-of-bounds warnings to be shown.

    - **Remind to check minimum wall thickness**: When enabled, after clicking **Send to print**, you are prompted to check parts for wall thickness issues before the job is actually sent.

    > **IMPORTANT:** If a wall thickness error is detected, each area of a part that has an insufficient wall thickness for the selected printer is colored red. The application cannot fix parts with wall thickness errors. You can only remove them from the build volume. Wall thickness errors do not prevent you from printing.

    - **Wall thickness surface coverage**: Defines the allowable tolerance for each part's wall thickness that can be thinner than the printer-defined capability without invoking a warning. For example, by default

the surface coverage value is set at 5%. If less than 5% of a part is too thin to print, a warning will not be shown. If more than 5% of a part is too thin to print, a warning will be shown

– **Separate 3MF components on import**: Choose to bring in as a single part or multiple parts to interact with in the build volume.

- **File locations**

  – **Path to save temporary files needed to send a print job**: Select the location to save temporary files created while sending the job to the printer.

  – **Path to save reports**: Select the location to save reports.

  > 🔅 **TIP:** To access that location, choose **File** > **Reports**.

  The application creates two different reports, part reports and job reports, to help you track issues with parts and to document the printing process. Reports are PDF files. The report names are based on the job name entered in the job settings tab.

  > 📝 **NOTE:** Changing the job name also changes the name of the file.

  The report names also include a date and time stamp, indicating exactly when the report file was generated. When you need to share reports, print or email the PDF files.

Command Center connection

The **Command Center connection** tab enables you to use an IP address and port number to connect to the Command Center to use the listed printers.

Set preferences

1. Open the **Preferences** dialog box using one of these methods:

   - Click **Edit** > **Preferences**.

   - Press **Ctrl+K**.

2. Make the changes you want to make on the appropriate tabs.

3. Click **Save**.

When you first start HP SmartStream 3D Build Manager, you will need to connect to a Command Center printer.

Connect to a Command Center printer

1. On the menu bar, click **Edit** > **Preferences**.

2. In the **Preferences** dialog box, on the **Command Center connection** tab, click **Autodiscover** or enter an IP address or hostname, and a port if applicable.


By connecting to Command Center server, a printer list will be automatically read from Command Center data.

IP ADDRESS / HOSTNAME   PORT
                                          Connect

Autodiscover

3. Click **Connect**.

4. Close the **Preferences** dialog box.

5. Open the **Select printer** dialog box using one of these methods:

- On the action bar, click ⬡ **Select printer**.

- In the job settings tab, click the currently selected printer.

6. From the list of printers, click the printer you want to use.

The selected printer is shown in the job settings tab.

JetFusion 580 Color

580 Color Printer
332.6 x 189.7 x 247.8 mm
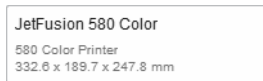
3 Adding parts

Add parts

📝 **IMPORTANT:** The application supports 3MF, OBJ, STL, and WML (VRML) files.

1. Open the **Open** dialog box using one of these methods:

   ● On the action bar, click 📦⁺ **Add parts**.

   ● Click **File** > **Add parts**.

   ● Press Ctrl+I.

2. Select the part files that you want to add.

3. Click **Open**. The parts are added, shown in the viewport, and listed in the part browser panel.

   📝 **NOTE:** Depending on the preferences you have chosen, added parts may be auto-packed for you.

   💡 **TIP:** If you make a mistake, choose **Edit** > **Undo** (Ctrl+Z), **Edit** > **Redo** (Ctrl+Shift+Z), or just start again. Choose **File** > **New** (Ctrl+N) to discard all changes.

4. If necessary, size the parts to fit in the build volume using one of these methods:

   ● Click **Scale to fit** so that parts will automatically be sized to fit, and click **OK**.

   ● Select the unit used to design the part originally, and click **OK**.

To fill the build volume

If you want to include as many of the same part as possible in the build volume, to make the most of the print job, add one part and click **Edit** > **Fill build volume**.

📝 **IMPORTANT:** You must have only one part selected.

Automatic part arrangement

You can have the application automatically pack the parts within the build volume for you at any time. If parts are outside the build volume (shown as yellow), using 📦 **Auto-pack** arranges as many parts as possible horizontally and vertically within the build volume for the most efficient printing of the job. The approximate part spacing is added to the minimum spacing value required by the selected printer, creating the total space between parts. A zero value means the parts will be printed as closely together as possible. If not all the parts will fit, they are aligned in the viewport outside the build volume. If all parts fit, the adjusting the spacing value may enable you to fit more parts into the build volume.

1. On the action card, click ▣ **Auto-pack**.

2. You have the opportunity to modify the **Approximate part spacing**.

3. Click **Auto-pack**.

# Automatic part and build checking

IMPORTANT: Use the color view toolbar to switch to geometry view to see the errors in the viewport.

When parts are added, the application automatically checks that the parts satisfy various conditions:

●   In bounds: Are the parts positioned within the build volume so that they can be printed?

●   Closed: Do the parts have holes?

●   Correctly oriented: Are the parts positioned so they can be printed properly?

●   Topologically valid: Are the parts printable?

Parts beyond the boundaries of the build volume are considered out of bounds. Out-of-bounds parts can usually be fixed by clicking ▣ **Auto-pack**, or by manually moving the out-of-bounds part into the build volume. Parts with holes, troublesome orientations, and topologically invalid parts can usually be fixed by clicking ✨.

IMPORTANT: Until these issues have been addressed, you will be prevented from printing.
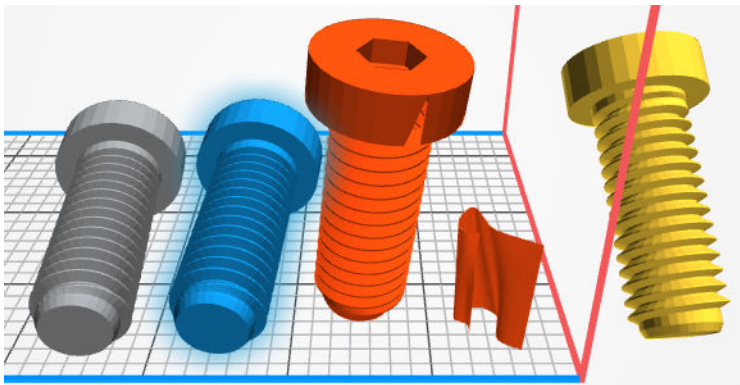
The application uses colors to indicate the status of parts:

●   Gray: The part is unselected. No issues detected.

●   Blue: The part is either being pointed at with the mouse or is selected. No issues detected.

●   Red: The part either has a repairable issue such as a hole (autofix) or an unrepairable issue (needs to be fixed in some other application or removed from the build volume). If a part is not repaired, printing is prevented. Red can also indicate areas of a part that have insufficient wall thickness for the selected printer. When sending to a printer, a warning is issued, but printing is not prevented.

●   Yellow: The part is not within the boundaries of the build volume (out of bounds), which prevents printing.

Optionally, the application can analyze parts for thin walls that may cause issues when printed. Acceptable wall thickness depends on the type of printer (see the printer's user guide). To check for wall thickness issues, click ✛ in the parts panel. If you do not check parts for wall thickness issues before you click **Send to print**, you will be reminded to do so then.

IMPORTANT: If a wall thickness error is detected, each area of the part that has an insufficient wall thickness for the selected printer is colored red. The application cannot fix parts with wall thickness errors. You can only remove them from the build volume. Wall thickness errors do not prevent you from printing.

About part reports

Part reports can be run at any time for selected parts. When no parts are selected, the report includes all parts in the viewport. Once created, a part report begins with a section listing parts with issues. If no parts have issues, the sort order set in the parts panel determines how parts are listed in the part report. For each part in the report, the part name, thumbnail image, and dimensions are provided. If a part has no errors, next to each part are some blank lines you can use to take notes. If there are errors, the error type is identified.
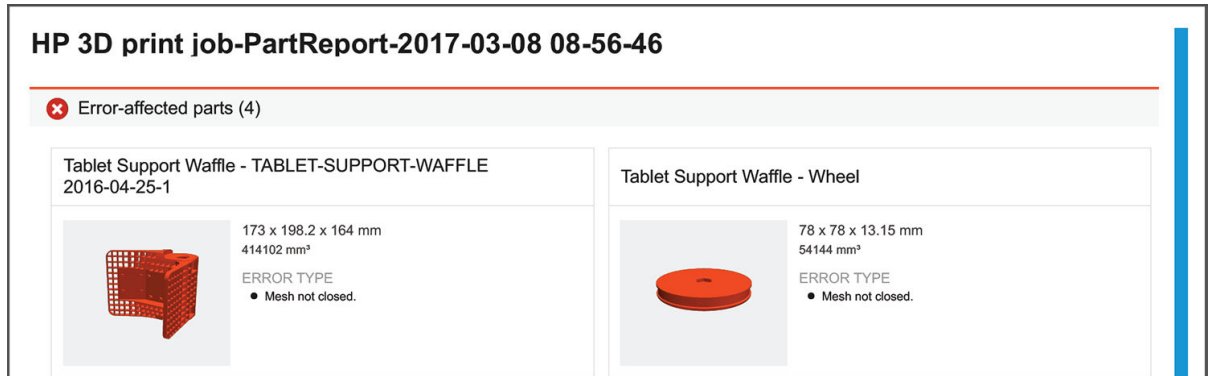
All reports are PDF files stored in the location defined in **Preferences**. You can browse to that location to review a report at any time.

Create a part report

You can create a part report in any of these ways:

- Right-click a part or selection and click **Part report**.
- In the parts panel, click 🗐.
- In a part's error dialog box, click **Part report**.

4 Working with parts

Select parts

Once parts have been added to the viewport, before you can manipulate them, you have to select them.

You can select parts in any of these ways:

- On the Transform toolbar, click ▶ and then click the part you want to select.

  > ☆ TIP: To select multiple parts, draw a selection box around the parts.

- Click a part in the parts list.

- Choose **Edit** > **Select all** (Ctrl+A) to select all parts in the viewport.

- Choose **Edit** > **Select all with errors** (Ctrl+E) to select all parts that have errors.

- Choose **Edit** > **Select all out of bounds** (Ctrl+B) to select all parts outside the build volume.

> ☆ TIP: With a part selected, right-click it and choose from a variety of actions, such as **Isolate** (hides all unselected parts), **Hide selection**, **Duplicate** (the **Edit** menu also has options for duplicating parts), and **Delete**.

Adjust the position of a part

1. Select the part you want to position.

2. On the Transform toolbar, click ⊕. The Move tools are shown around the part.

3. Use the Move tools to position the part or enter X, Y, or Z values for more precise location.

   > ☆ TIP: Drag the up arrow to show the Z value input box.

4. Also on the Transform toolbar, click ↻. The Rotate tools are shown around the part.

5. Use the Rotate tools to position the part or enter rotation angle values for more precise location.

> ☆ TIP: You can also use ⊥ to position a part on the bed in the build volume.

Resize (scale) a part

1. Select the part you want to resize.

2. On the Transform toolbar, click ⬀. The Scale tools are shown around the part.

3. You can resize the part in any of these ways:

- Use the scale handles.

- Enter individual X, Y, or Z values.

- Enter a percentage value.

Change the view

You can change the view in any of these ways:

- To pan the view:

    - Press and hold the mouse wheel while dragging the mouse to view the desired position.

    - On the Viewing toolbar, click ✋. Then click and drag the view to the desired position.

- To zoom the view:

    - Roll the mouse wheel forward to zoom in and backward to zoom out.

    - On the Viewing toolbar, click 🔍, click the view, and move the mouse forward to zoom in and backward to zoom out.

- To orbit the view:

    - Right-click while dragging the mouse to view the desired position.

    - On the Viewing toolbar, click ◎. Then click and drag the view to the desired position

- To select a preset view:

    ⛭ **TIP:** Selecting a preset view leaves the current tool selected.

    - From the **View** menu, choose **Fit all** (A), **Fit selection** (F), **Home** (H), **Front** (Ctrl+1), **Back** (Ctrl+2), **Left** (Ctrl+3), **Right** (Ctrl+4), **Top** (Ctrl+5), or **Bottom** (Ctrl+6).

    - On the Viewing toolbar, click ⬡.

    - On the Viewing toolbar, click 🧊 and select the desired position: ⬢ (top), ⬢ (right), ⬢ (front), ⬢ (bottom), ⬢ (left), or ⬢ (back).

Hollow a part

1. Select the part or parts to be hollowed. If no parts are selected, all parts in the build volume will be hollowed.

2. In the content panel, click ▤.

3. Set the wall thickness after hollowing. You cannot make the wall thickness thinner than the material and printer settings allow.

4. Choose to hollow a copy of the selection or the original selection itself.

5. Click **Apply**.

6. Once hollowed, you can use ⟁ to see the hollowed part..

Cut away a view

Cut away the build volume to look inside parts and to assess possible part conflicts and spacing. Using this view does not affect the printability of the parts, it affects only your view of them. If a part is completely cut away and hidden in the build volume, you can still select it in the parts list.

1. On the Viewing toolbar, click ⬧ and select the desired position: ⬧ (cut Z axis), ⬧ (cut Y axis), or ⬧ (cut X axis).

    ⓘ **TIP:** Place the **Cutaway** dialog box where needed.

2. Optionally, use any of the preset views (home ⬡ or view ⬢) or mouse shortcuts to pan 🖑 , zoom 🔍 , or orbit ◉ for a better view of the cut.

3. In the **Cutaway** dialog box, use the position tools to move the cutting plane to the desired location.

    ⓘ **TIP:** In the build volume, you can also click ➤ to drag the arrow and move the cutting plane to the desired location.

4. Optionally, click ▭ **Invert** to flip the cutting plane. Click ▦ **Section** to show a flat surface, or cap, across the sectioned parts. Use the slider or entry box to position the cutting plane accurately.

5. Click ⬧ again to turn off the cutaway view.

Change the color view

All parts in the viewport are affected by your color view selection.

On the color view toolbar, click one of these options.

⊗ Geometry view: Shows parts in a basic color scheme. Use this mode to view part errors and warnings.

⬤ Color view: Shows parts in their original colors and textures as designed.

⬤ Print view: Simulates how the parts will look when printed based on the selected material, printer, and printer settings.

Changing colors

The application offers several ways to manage part colors using the ⬤ tab (change color properties for all parts at once) and the ⬦ tab (change color properties for selected parts) on the content panel. On the ⬦ tab, some default color groups are available from the drop-down list. These are locked and cannot be modified, but they can be duplicated. You can also create your own color groups.

Create a color group

1. In the content panel, on the ⬦ tab, click ▭.

2. Enter a name for the color group.

3. Select a color using the eyedropper, RGB or hexadecimal values, or the saturation/lightness area.

4. Below the color group name, click ＋ to include the selected color in your color group.

    ⓘ **TIP:** You can add 13 color swatches. To remove one, right-click the color swatch and select **Delete**.

Modify a color group

1. In the content panel, click the ⬦ tab.

2. Select the color group to be modified and use one of these methods:

    *   Click ⬜ to create a copy.

    *   Click ✏ to change the name.

    *   Click 🗑 to remove it.

Create a color proof

When you have selected a color printer and a color group, the application enables you to load and print a sample part you can use to test the selected printer's color settings.

1. In the content panel, click the ⬦ tab.

2. Click 🎨. The new color proof part is added to the build volume ready to be printed.

Change a part color

1. On the color view toolbar, click 🔴 to view the part color changes.

2. Select a part and use one of these methods:

    *   Click 🖊 to choose a new color in the viewport.

    *   Click a color swatch in a color group.

    *   Enter RGB values or a hexadecimal value.

    The selected color is applied immediately in the viewport.

💡 **TIP:** With the part still selected, click **Remove color** or **Reset** to correct any unwanted changes.

Cage parts

Caging enables you to create a physical container, or cage, around selected parts to group and print them. Use caging to separate multiple outputs in one print job.

1. Select the part or parts to be caged.

2. In the content panel, click the ⬚ tab.

3. Name the cage.

4. Optional: Modify the cage properties or padding around parts within the cage.

5. Click **Create**.

    The cage is listed in the parts panel.

	My Cage	
	113.2 x 38 x 28.4 mm	👁
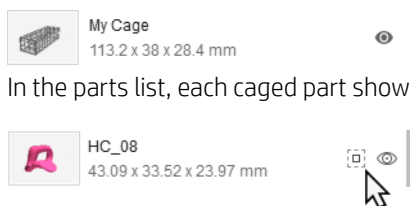
    In the parts list, each caged part shows a cage icon.

	HC_08		
	43.09 x 33.52 x 23.97 mm	⬚ 👁	

TIP: You can remove a part from a cage by either right-clicking a part in a cage or in the parts list and selecting **Unlink from cage**.

TIP: You can delete a cage by right-clicking it in the parts list and selecting **Delete**. Only the cage is deleted. The parts remain.

TIP: Recommended caging parameters are:
- Thickness: 0.8 mm
- Bar width: 1.2 mm
- Grid size: 10 mm
- Cage padding: 1.2 mm

5   Printing parts

Send a job to a printer

1.   You can start printing in any of these ways:

- On the action bar, click **Send to print**.

- Click **File** > **Send to print**.

- Press Ctrl+P.

2.   If prompted to analyze wall thickness:

- Click **Analyze**. If any wall thickness errors are found, click **Remove parts** and start printing again.

- Alternatively, click **Continue** to ignore the prompt and send the job to the printer regardless.

3.   The job is sent directly to the printer. Once printing has started, you can monitor the job from the printer's front panel using the Command Center.

> **NOTE:**   During slicing and file creation, you can cancel the job. Once the job is being sent, you can no longer cancel it.
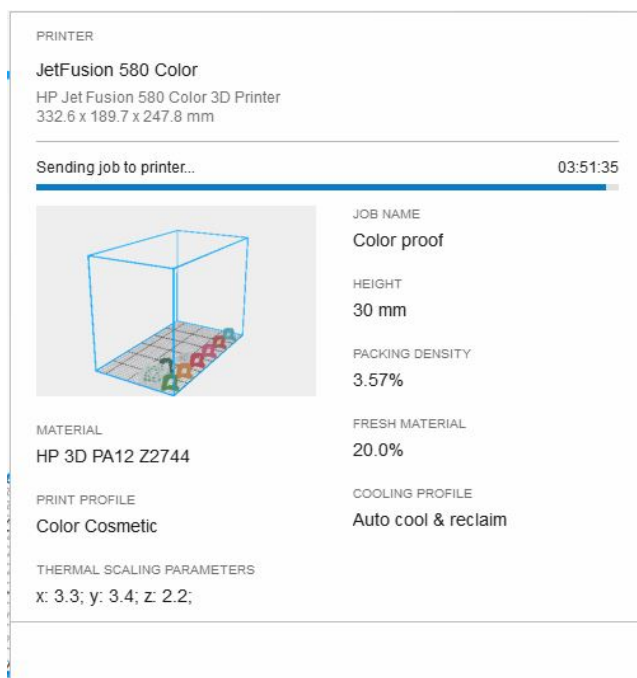
4.   Optional: Once the job has been sent to the printer, click **View job report** to see the PDF summary of the parts included in the print job.

5. Click **Done**.

About job reports

Job reports are run when you click **Send to print**. The sort order set in the parts panel determines how parts are listed in the job report. For each part in the r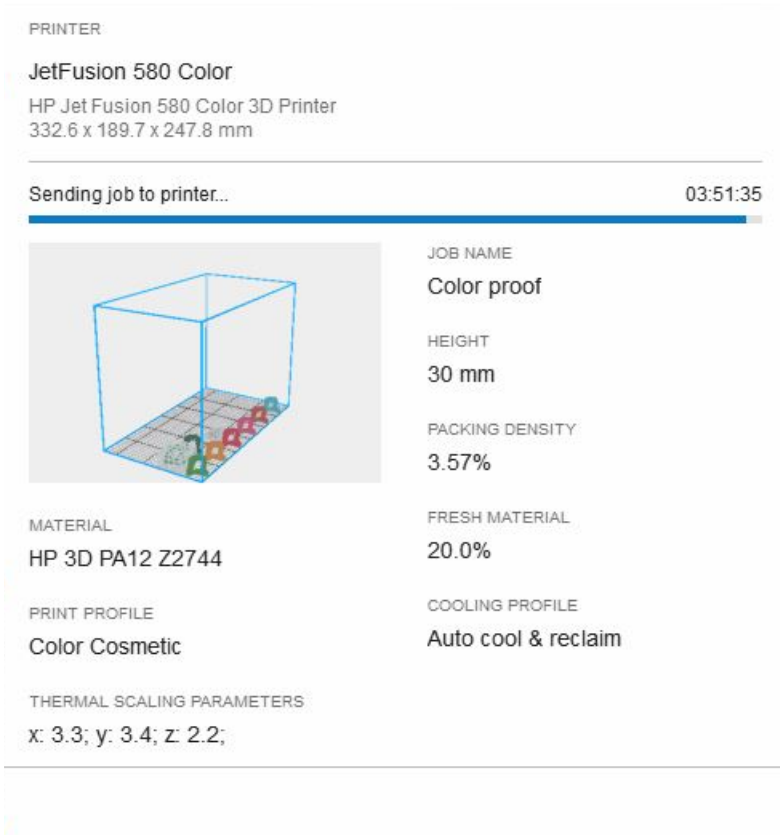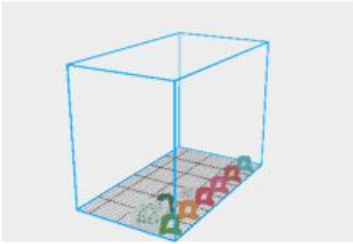eport, the part name, thumbnail image, and dimensions are provided. Next to each part are some blank lines you can use to take notes.

```
PRINTER

JetFusion 580 Color
HP Jet Fusion 580 Color 3D Printer
332.6 x 189.7 x 247.8 mm

Sending job to printer...                          03:51:35

                              JOB NAME
                              Color proof

                              HEIGHT
                              30 mm

                              PACKING DENSITY
                              3.57%

MATERIAL                      FRESH MATERIAL
HP 3D PA12 Z2744              20.0%

PRINT PROFILE                 COOLING PROFILE
Color Cosmetic                Auto cool & reclaim

THERMAL SCALING PARAMETERS
x: 3.3; y: 3.4; z: 2.2;
```

📝 **NOTE:** All reports are PDF files stored in the location defined in **Preferences**. You can browse to that location to review a report at any time.

6 Working with files

The application uses the following file formats:

- 3MF, OBJ, STL, and WML (VRML): These file formats can be added into the viewport with color and textures shown as authored.

- SSP: This file format is used to save a job.

Save a job

Saving a job as an SSP file includes all parts in the viewport and any fixes that may have been applied. Wall thickness checks are not saved.

You can save a job in either of these ways:

- Click **File** > **Save** (Ctrl+S) to save the job with the existing filename.

- Click **File** > **Save As** (Ctrl+Shift+S) to save the job with a new filename.

TIP: Once the job is saved, choose **File** > **Open** (Ctrl+O) at any time to use it again.

7 When you need help

See the HP Jet Fusion 3D Printing Solution documentation for more information.

Support website: http://www.hp.com/go/jetfusion3D4200/support

A   Software requirements

Supported operating systems

- Microsoft Windows 7 SP1, 64-bit (32-bit not supported)

- Microsoft Windows 8, 64-bit (32-bit not supported)

- Microsoft Windows 8.1, 64-bit (32-bit not supported)

- Microsoft Windows 10, 64-bit (32-bit not supported)

Minimum system specifications

- CPU: Intel Core i5 processor (i7 processor recommended)

- Memory: 16 GB RAM (64 GB recommended)

- Dedicated graphics card with 2 GB VRAM and DirectX 11 support (4 GB recommended)

- 1 GB free disk space for installation

- Ethernet, IPv4 or IPv6, 100 Mb/s

IMPORTANT: Running HP SmartStream 3D Build Manager in a virtual machine environment is not supported.

B   Keyboard shortcuts

The application provides you with a variety of shortcuts to help you to work more quickly.

Mouse-click method	Shortcut keys
File > New	Ctrl+N
File > Open	Ctrl+O
File > Save	Ctrl+S
File > Save as	Ctrl+Shift+S
File > Add parts	Ctrl+I
File > Send to print	Ctrl+P
File > Exit	Alt+F4
Edit > Undo	Ctrl+Z
Edit > Redo	Ctrl+Shift+Z
Edit > Duplicate	Ctrl+D
Edit > Duplicate multiple	Ctrl+Shift+D
Edit > Preferences	Ctrl+K
Edit > Select all	Ctrl+A
Edit > Select all with errors	Ctrl+E
Edit > Select all out of bounds	Ctrl+B
View > Fit all	A
View > Fit selection	F
View > Home	H
View > Front	Ctrl+1
View > Back	Ctrl+2
View > Left	Ctrl+3
View > Right	Ctrl+4
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