Best Practice

WSS™150 Water Soluble Support Material

Overview

WSS™150 is a support material that dissolves in water. It enables easy, hands free support removal using a dishwasher or still water.

WSS150 offers the following benefits:

- Hands-free support removal that does not affect the mechanical properties of the printed parts
- Printing a wider range of delicate parts, and ensuring that parts remain intact
- A simple workflow–print and place in a dishwasher/container.
- No special skill is required for the support removal process
- An automated process for series production
- Minimizes production time
- Minimizes the required labor

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This document describes recommendations and tips for achieving optimum quality and advanced mechanical properties when printing models with WSS150 support material.

A. Supported Printers
B. Preparing for Printing
C. Printing with WSS150
D. Removing Parts from the Build Tray
E. Removing the Support Material
F. Handling and Processing of the Wastewater
G. Related Compliance Documentation

Figure 1: Mayflower ship model printed with WSS150 (after support removal)

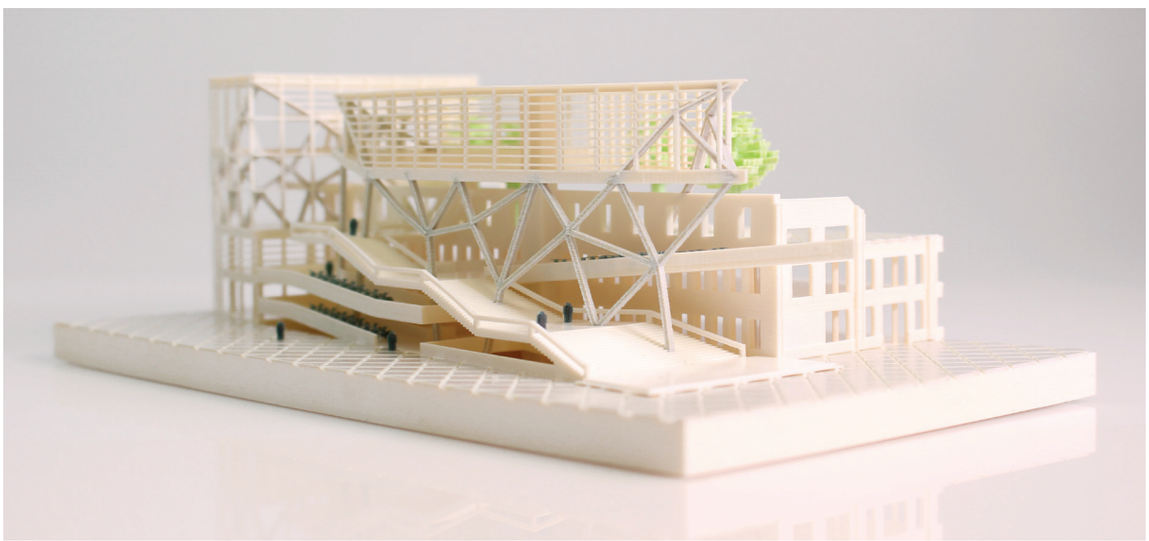

Figure 2: Architectural model printed with WSS150 (after support removal)

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Recommendations and Tips

A. Supported Printers

The following printers support printing with WSS150:

- J55™ Prime
- J35™ Pro

B. Preparing for Printing

Before printing with WSS150, make sure that you:

1. Clean the roller thoroughly. To do this, run the Routine Cleaning wizard.
2. Load the WSS150 cartridge in the printer.
3. Run the Material Replacement wizard
4. Run the Head Optimization wizard.

Note: WSS150 material does not contain a grid structure, and therefore, the grid type selection is not available.

Figure 3: Cleaning the roller

C. Printing with WSS150

When printing with WSS150, a frame is automatically printed around a part or a group of parts, as shown in Figure 4. The printed frame enables easy part removal and ensures the cleanliness of the tray and printer, since parts printed with WSS150 tend to ‘sweat’ when left on the tray for several hours.

Note: The printed frame slightly reduces the printable area on the build tray. The reduced area depends on the part geometry and tray arrangement.

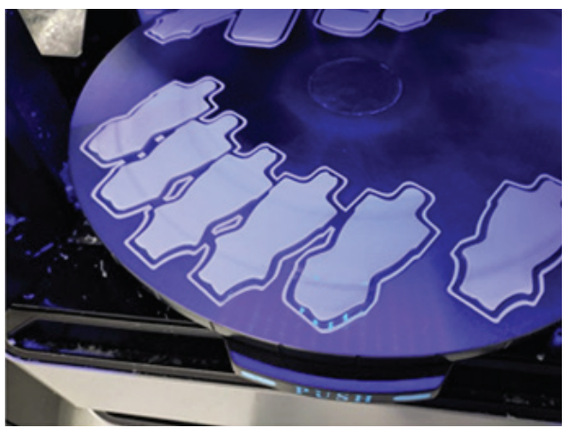

Figure 4: Printed frame surrounding the printed parts

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D. Removing Parts from the Build Tray

Carefully, using a scraper (supplied in the Start-Up kit), remove the printed parts from the tray as follows:

TIP: For easier and cleaner removal of the parts, spray the edges of the frame with 90% isopropanol (IPA—isopropyl alcohol) or ethanol (ethyl alcohol).

1. Put on protective gloves and eyewear.
2. Place one hand on top of the printed part to hold it in place.
3. Using the other hand, insert the corner of the scraper under the corner/edge of the printed part and slowly push the scraper under the part toward the center.

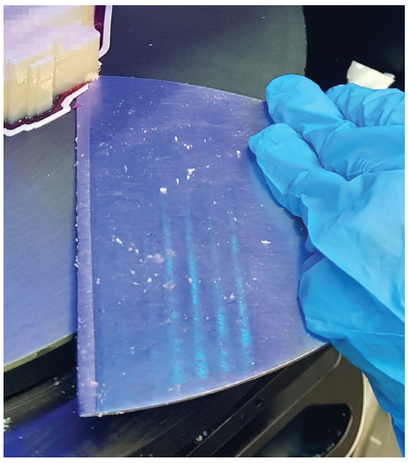

Figure 5: Removing the part with a scraper

Warning: Sharp Objet Hazard
Directing the scraper at of body parts can result in injury. When removing the parts, always push the scraper away from you.

E. Removing the Support Material

There are several simple ways to remove WSS150 from the printed part and achieve optimum quality. During the support removal process, always wear protective gloves.

Note: WSS150 cannot be removed using a waterjet or other mechanical removal methods.

Important: For handling and processing of the wastewater from the dissolved WSS150 support material, refer to section F, below.

Method A: Removing Support Using Tap/Still Water

- Hands free
- No post-processing
- Excellent for delicate, intricate channels or complex structures
- Excellent surface quality

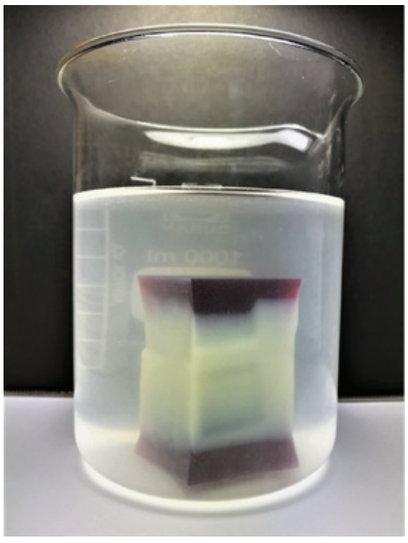

Figure 6: Soaking a printed part in tap water

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Place the printed part in a container filled with tap water at room temperature and wait until the support material dissolves completely. Soaking time depends on the printed part and the amount of support material.

Note: If the concentration of the dissolved support becomes high, you can replace the water in the container. The concentration of the dissolved support material in the water can be roughly assessed by visually inspecting the water. For parts that require long soaking periods, it is recommended to replace the water in the container once a day.

TIP: Elastico™ Printed Parts Surface and Appearance

- If the printed part has sticky or tacky surfaces, apply WD-40®, baby oil, or corn flour to the surface, leave it to dry and then wipe the part. This eliminates the stickiness.
- Occasionally, printed parts may have a milky appearance. This discoloration disappears once the part has dried.

Method B: Removing Support Using a Dishwasher

- Hands free
- No post-processing
- Fast and time efficient
- Excellent surface quality

The number of cycles required for removing the support depends on the dishwasher type. Most cases will require 1-3 cycles. More cycles might be required for very complex geometries.

- Place the parts in the dishwasher on a flat, rigid surface, such as a cooking grate, to prevent bending or curling.
- Place the part on the surface with the same orientation as it was printed.

Important: To ensure part quality of delicate features and geometries (wall thickness is less than 1.5 mm), remove the WSS150 in still water.

Figure 7: Cooking grate for placement of models in the dishwasher

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You can use the following dishwasher types:

- A countertop dishwasher—suitable for removing the support from parts with a wall thickness of more than 1.5 mm and no substantial overhangs.
- A programmable (professional) dishwasher—suitable for all geometries, except very delicate parts and substantial trapped support material.

Stratasys has tested the following dishwasher programs and recommends the following:

Part type	Program / cleaning cycle
Large and bulky parts	Wash at 50°C (or lower) Rinse at 70 °C (or lower)
Parts with wall thickness larger than 1.5mm and no substantial overhangs	Wash at 45°C (or lower) Rinse at 60 °C (or lower)
All geometries	Wash at 35°C for 3 hours

When selecting a dishwasher, follow these guidelines:

- The dishwasher should have cleaning cycles that meet the temperatures listed in the above table.
- Prefer a dishwasher with a long cleaning cycle (in minutes), at the temperatures listed in the table above, and with a water consumption of 6–9 liters.
- Longer cleaning cycles require less cycles and less waste consumption to clean the part, and result in less wastewater from your dishwasher.
- Examples of what to look for in the dishwasher guide:

	Cycle Description	Cycle Duration (min.)	Water Consumption (L)
1	Wash 50°C Rinse 70 °C	70	6
2	Wash 50°C Rinse 70 °C	120	7.8

TIP: You can find a variety of suitable dishwashers on Amazon.com by searching for the keywords *Countertop Dishwasher or Freestanding compact dishwasher*.

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F. Handling and Processing WSS150 Wastewater

When WSS150 is dissolved in water, the obtained waste solution should be disposed according to common regulatory guidelines.

The solution of WSS150 dissolved in water can be solidified using the Stratasys L2S™ solidifying powder. Once the wastewater solidifies it can be disposed of as solid waste according to standard landfill waste pursuant to common local regulatory guidelines.

For detailed instructions on waste handling and the solidification process of the WSS150 wastewater, refer to "WSS150 Wastewater Processing and Handling Using L2S".

Important: It is the customer's responsibility to comply with waste-water disposal guidelines established by local regulatory agencies and industrial standards, as well as any additional stringencies that might apply depending on a site's designated function (such as, whether it will be an office environment or an industrial setting).

G. Related Compliance Documentation

The material Safety Data Sheets (SDS) are available on Stratasys.com:

- For the SDS for WSS150, click here.
- For the SDS for L2S, click here.

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