SR-30 Soluble Support Removal Best Practices

Contents

- What is SR-30?
- What equipment do I need?
- How should I dispose of the used solution?
- How much SR-30 can I dissolve before changing the solution?
- How can I speed up dissolution time?

What is SR-30?

SR-30 is a proprietary soluble support material developed by Stratasys® that is optimized to work extremely well with ABS due to its unique adhesion properties. It is compatible with the MakerBot METHOD X 3D Printer using the Support 2XA extruder. Unlike PVA which is simply water soluble, SR-30 requires additional equipment for dissolution.

What equipment do I need?

- Circulation Tank that provides heat and circulation
- Ecoworks™ cleaning agent tablets
- Other equipment
    - Safety Gloves
    - Splash Resistant Safety Goggles
    - Stainless Steel Tongs
    - Stainless Steel Strainer

Circulation Tank

Recommended Circulation Tanks:

- SCA-1200HT
- CleanStation DT3

Circulation Tanks heat and circulate a solution water and wash agent around an immersed 3D print to efficiently dissolve support material (in this case SR-30) from the part. Without the aid of a heated circulation tank (or similar equipment) the support material is extremely difficult to dissolve, not to mention significantly more time consuming.

CAUTION: Make sure that parts are fully immersed in the solution. Parts can crack if they are not fully immersed or are 'bobbing' in and out of the solution. This is especially critical for small parts.

Temperature

Water temperatures between 70 - 75° C (158 - 167° F) are most effective for dissolving SR-30. Temperatures above 75° C (167° F) may cause parts to distort. Dissolve times with temperatures below 70° C (158° F) will take longer.

NOTE: Setting or allowing the tank temperature to reach a higher than indicated temperature is likely to damage printed parts.

Ecoworks™ Cleaning Agent Tablets

Ecoworks™ cleaning agent is designed to remove SR-30 support material from parts built using the FDM process with soluble support material. The cleaning agent is both user- and eco-friendly (with a pH of 10). Ecoworks comes in tablet or packet form and usage varies by tank type.

Ecoworks tablets are designed so that no personal protection equipment is required when handling the cleaning agent. **HOWEVER, MakerBot recommends using safety gloves and splash resistant safety goggles when handling Ecoworks tablets and dissolved Ecoworks solution.**

One Ecoworks tablet should be used for every 2 gallons (7.5 liters) of water.

Ecoworks Safety Guidelines

When using Ecoworks and a support cleaning system observe the following safety guidelines:

- Follow the manufacturer's operation and safety documentation. Understand how to properly and safely use the cleaning system before operation.
- Follow your company and local regulatory statutes regarding safety practices.
- Make sure the appropriate voltage range for your region has been selected. Avoid overloading the electrical outlet with multiple devices.

- Prior to operation, ensure that the system is placed on a flat and stable surface that is capable of supporting the system's weight.

- Ensure the system is well-grounded. Failure to ground the system may result in electrical shock, fire and susceptibility to electromagnetic interference.

- Use only the power cord supplied. Do not damage, cut or repair the power cord. A damaged power cord has risk of fire and electric shock. Replace a damaged power cord with an approved power cord.

- Do not allow metal or liquids to touch the internal parts of the system. Doing so may cause damage, fire, electric shock or other serious hazards.

Other Recommended Equipment

MakerBot recommends the following additional equipment for any support removal solution:

Safety Gear

- Safety Gloves
    - High temperature, waterproof, and chemical resistant.
- Splash Resistant Safety Goggles
- Stainless Steel Tongs
    - To remove large parts from hot solution.
- Stainless Steel Strainer
    - To remove small parts if not using a small parts basket

How should I dispose of the used solution?

A Waste Water Profile is available for SR-30 soluble support material. This profile is based on the dilution of used Ecoworks solution with an equal amount of freshwater. For example, when disposing of 4 gallons (15 liters) of used solution, dilute with 4 gallons (15 liters) of freshwater. Check your local, state, and/or international regulatory statutes for what pH level is acceptable for disposal.

MakerBot recommends that disposal procedures be verified by the proper authorities in your region. MakerBot cannot anticipate local, state, or international regulatory statutes. MakerBot cannot be held liable if the solution is not handled and disposed of properly. You may need to document how you dispose of the used solution.

How much SR-30 can I dissolve before changing the solution?

How often you change the solution is dependent on the tank you use, how you maintain it, and the complexity of your parts. As support materials are dissolved over time, the pH level will decrease and dissolve times will increase.

One Ecoworks tablet should be used for every 2 gallons (7.5 liters) of water.

Each tablet can dissolve 1.5 lbs. (0.68 kg) or approximately 40 cu. in. (655 cu. cm) of SR-30 support material.

Fresh solution of Ecoworks tablets dissolved in water has a pH of 9.8. If you suspect that the solution's pH is low, test the solution using a test strip or meter. The lower the pH, the longer it will take for SR-30 to dissolve.

How can I speed up dissolution time?

Parts with complicated geometry or large parts with tall overhangs will require more support material, and have longer dissolution times.

One way to cut down on dissolution time is to remove some support by hand. For SR-30, one technique is to put the part in a support removal system for an hour or two, wait for the SR-30 to soften up, then remove some of the support material using hand tools.

NOTE: Use care when removing support material by hand as small / delicate parts or features can easily be damaged or destroyed.

WARNING: Always wear safety glasses and safety gloves when removing support material by hand. The support material can be brittle and may cause cuts when manually broken off.

Changing the orientation of the part in MakerBot Print, or changing support settings may reduce dissolution time by using less support material. However, MakerBot recommends keeping the default settings to ensure part quality and dimensional accuracy.