### Table of Contents

1. **Disposal for Materials** .......................................................... 2
   1.1 0.1 VisiJet® Materials Overview ........................................... 3
   1.2 0.2 Disclaimer ........................................................................ 5
   1.3 0.3 Isopropyl Alcohol (IPA) and Polypropylene Glycol (PPG) Handling Guidelines ......................................................... 6
   1.4 0.4 Material Handling .............................................................. 7
     1.4.1 Burning finished parts ....................................................... 8
     1.4.2 Exposure control ............................................................. 9
     1.4.3 Handling finished parts .................................................... 10
     1.4.4 Ingestion ......................................................................... 11
     1.4.5 Loading Cartridges .......................................................... 12
     1.4.6 Packaging inspection ....................................................... 14
     1.4.7 Part building .................................................................... 15
     1.4.8 Personal protective equipment ......................................... 16
       1.4.8.1 Eye protection ............................................................ 17
       1.4.8.2 Respiratory protection ................................................ 18
       1.4.8.3 Skin protection .......................................................... 19
     1.4.9 Safety Information .......................................................... 20
     1.4.10 Sensitization .................................................................. 21
     1.4.11 Storage .......................................................................... 22
     1.4.12 Training .......................................................................... 23
   1.5 0.5 Part Post-Processing for VisiJet® SR200, HR200, DP200 and MX Materials .......................................................... 24
     1.5.1 0.5.1 Removing the Model From The Platform ...................... 26
     1.5.2 0.5.2 Removing Support Material From Part ......................... 28
       1.5.2.1 0.5.2.1 Removing Bulk Support Material ....................... 29
       1.5.2.2 0.5.2.2 Removing Residual Support Material .................. 30
     1.5.3 0.5.3 Finishing Part ........................................................... 32
   1.6 0.6 Disposal for Materials ........................................................ 33
Table of Contents

0.1 VisiJet® Materials Overview

0.2 Disclaimer

0.3 Isopropyl Alcohol (IPA) and Polypropylene Glycol (PPG) Handling Guidelines

0.4 Material Handling

- Burning finished parts
- Exposure control
- Handling finished parts
- Ingestion
- Loading Cartridges
- Packaging inspection
- Part building
- Personal protective equipment
  - Eye protection
  - Respiratory protection
  - Skin protection
- Safety Information
- Sensitization
- Storage
- Training

0.5 Part Post-Processing for VisiJet® SR200, HR200, DP200 and MX Materials

- 0.5.1 Removing the Model From The Platform
  - 0.5.1.1 Special Size Considerations For Cleaning ProJet™ 5000 Parts
- 0.5.2 Removing Support Material From Part
  - 0.5.2.1 Removing Bulk Support Material
  - 0.5.2.2 Removing Residual Support Material
- 0.5.3 Finishing Part

0.6 Disposal for Materials
0.1 VisiJet® Materials Overview

- Refer to the chart to identify the types of VisiJet® Materials used with a particular ProJet™ 3-D printers. This chart also includes material colors and support material that are used with a particular type of VisiJet® Material.

<table>
<thead>
<tr>
<th>VisiJet® Part Material</th>
<th>Material Color</th>
<th>VisiJet® Support Material</th>
<th>ProJet™ Printer</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR200</td>
<td>Natural, Gray, Blue</td>
<td>S100</td>
<td>SD 3000</td>
</tr>
<tr>
<td>SR200</td>
<td>Natural, Gray, Blue, HR200 Blue</td>
<td>S100</td>
<td>HD 3000, HD 3000plus</td>
</tr>
<tr>
<td>EX200</td>
<td>Natural</td>
<td>S100</td>
<td>SD 3000, HD 3000 &amp; HD 3000plus</td>
</tr>
<tr>
<td>DP200</td>
<td>Green</td>
<td>S100</td>
<td>DP 3000</td>
</tr>
<tr>
<td>MP200</td>
<td>Amber</td>
<td>S100</td>
<td>MP 3000</td>
</tr>
<tr>
<td>Crystal</td>
<td>Natural</td>
<td>S300</td>
<td>HD 3500, HD 3500plus, SD 3500</td>
</tr>
<tr>
<td>Proplast</td>
<td>Natural</td>
<td>S300</td>
<td>HD 3500, HD 3500plus, SD 3500</td>
</tr>
<tr>
<td>ProCast</td>
<td>Natural</td>
<td>S300</td>
<td>HD 3500, HD 3500plus, SD 3500</td>
</tr>
<tr>
<td>Techplast</td>
<td>Natural</td>
<td>S300</td>
<td>HD 3500plus, HD3500 plus, SD 3500</td>
</tr>
<tr>
<td>Dentcast</td>
<td>Natural</td>
<td>S300</td>
<td>DP 3500</td>
</tr>
<tr>
<td>Stoneplast</td>
<td>Natural</td>
<td>S300</td>
<td>MP 3500</td>
</tr>
<tr>
<td>MX</td>
<td>Natural</td>
<td>S300</td>
<td>ProJet™ 5000</td>
</tr>
</tbody>
</table>

NOTE: The pictures depict the format of the cartridge labels. The colors may vary depending on the material.
NOTE: It is important to match the material type with your printer type. Verify that you are loading the correct VisiJet® material into printer. To have a high quality part build, it is important to have the correct support material for the VisiJet® Part Materials.
0.2 Disclaimer

Nothing contained herein is intended to be and should not be relied upon as legal or medical advice. Users of VisiJet® materials should review the Safety Data Sheets (MSDS/SDS) for these materials, and independently determine their compliance with applicable laws. The information contained in this guide is necessarily general in nature and suggestions should be implemented only after review for applicability to specific situations. Users are responsible for implementing health and safety procedures that comply with governing laws.
### Isopropyl Alcohol (IPA) and Polypropylene Glycol (PPG) Handling Guidelines

#### Isopropyl Alcohol (90 - 100%) Safety and Handling Guidelines

**FLAMMABLE LIQUID AND VAPOR. HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. MAY CAUSE IRRITATION TO SKIN.** Refer to the MSDS sheet for more information.

**Personal Protective Equipment**

Safety Goggles, Chemical Resistant Gloves, Protective Clothing

**Handling and Storage**

Protect against physical damage. Store in a cool, dry, well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. Small quantities of peroxides can form on prolonged storage. Exposure to light and/or air significantly increases the rate of peroxide formation. If evaporated to a residue, the mixture of peroxides and isopropanol may explode when exposed to heat or shock.

**Disposal Considerations**

Empty containers can have residues, gases and mists are subject to proper waste disposal. Dispose of all wastes in accordance with federal, state METHODS and local regulations.

#### Polypropylene Glycol

**Personal Protective Equipment**

Safety Goggles, Chemical Resistant Gloves, Protective Clothing

**Handling and Storage**

Do not breath in vapors. Avoid eyes and skin contact. Store in a cool, dry place. Keep tightly closed.

**Disposal Considerations**

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.
0.4 Material Handling

- Burning finished parts
- Exposure control
- Handling finished parts
- Ingestion
- Loading Cartridges
- Packaging inspection
- Part building
- Personal protective equipment
- Safety Information
- Sensitization
- Storage
- Training
Burning finished parts

Burning finished (cured) parts, as required for investment casting applications, can produce carbon monoxide, oxides of nitrogen, and other potentially harmful gases/fumes. Concentrations of these products depend on burn-out temperature and conditions. Higher temperatures will assist in complete combustion of the material. Consult the Safety Data Sheet for further information.
Exposure control

The ProJet 3-D printers have a variety of built-in engineering controls designed to prevent operator exposure. Users should not try to change or disable these controls.
Handling finished parts

Finished (cured) VisiJet® parts can be handled or disposed of in the same manner as standard household plastic products. VisiJet® parts are not recyclable. VisiJet® part materials are not intended for and cannot be used for medical implants or food and drink applications.

The VisiJet® S100, S200 and S300 materials do not cure. No special measures are necessary in normal use of this product. Refer to the MSDS Sheet for detail information.

The VisiJet® S100 and S200 materials are not a hazardous waste as specified in 40CFR 261. Dispose in accordance with all Federal, State, Provincial and Local regulations.

B: Component Waste Numbers: No EPA Waste Numbers are applicable for this product's components.

Disposal Instructions: Avoid disposal. If possible, completely utilize product. Dispose of unused product in accordance with applicable Federal, State, Provincial and Local regulations.
Ingestion

Uncured materials are potentially harmful if ingested. Therefore, uncured materials must not be present where food and drink are stored, prepared or consumed and should not be ingested. As a precaution, after handling the materials, users should wash their hands with soap and water before consuming or preparing food.
Loading Cartridges

Material Cartridges

Do not load expired cartridges in the modeler. If a cartridge is a year or more beyond its expiration date, the modeler will reject it. Inspect each cartridge for leakage or physical damage before you remove it from the polybag (if applicable) and load it in the modeler. Refer to Packaging Inspection for more information on damage cartridges.

ProJet 3000 Series
Material Cartridges: VisiJet® support material (the white cartridge) must be loaded in the left feed slot, and VisiJet material (the black / gray cartridge) must be loaded in the right feed slot.

ProJet 3500 Series
Material Cartridges: VisiJet® support material (white labeled cartridge) must be loaded in the left material delivery system (MDM) and the build material (black and white labeled cartridge) must be loaded in the right material delivery system (MDM). NOTE: Before using the material cartridges, wipe cartridges off with a lint free wipe to remove cardboard dust to avoid dust and small shards of cardboard getting into the printer's material delivery modules.

CAUTION: Do not remove a cold material cartridge from the printer that has started the warming stage. Doing so could cause damage to the material cartridge and the MDM. Wait the required 15 minutes if it is necessary to remove cartridges.

CAUTION: When fully melted hot material cartridges are removed from the MDM, do not lay the cartridges on the side; the material will solidify in the vent cap cause the vent to clog. Do not reuse the cartridge in the MDM without turning the clogged vent cap, 1 1/2 turns. Doing so will cause the cartridge to collapse and may cause damage to the MDM.

CAUTION: Please keep cartridges clean to avoid any chemical or particulate contamination of the cartridge surface or cartridge cap. Any contamination can be transferred from the cartridges to the MDM and cause problems. The MDM must also be kept clean from chemicals or particulate contamination.

Installing Material Cartridges
Using a lint free wipe and IPA, wipe the cartridges on all sides including the handle and the colder cap to ensure that no chemical or particulate contamination are present before installing them into the MDM.
The two parts cartridge are installed into the right side of module. Push cartridges down into holder until they are fully seated.
The two support material cartridges are installed into the left side of module. Ensure they are fully seated into the two left side holders.
NOTE: If cartridges are not fully seated in holders, the drawer will not close.
Removing Material Cartridges
Each holder has a latch located at the front of cartridge holders. To remove cartridges, open drawer and pull latch up; lift cartridge out of module. Always use the latches to remove cartridges, never pull cartridges out by force.

The cartridge cap should be completely sealed before use.

Before use, ensure the bottle colder cap is sealed and no leakage is present.
Packaging inspection

Inspect the cardboard shipping carton containing VisiJet® materials upon receipt for signs of physical damage and leakage. Assuming no leakage is observed, store materials in their cartons until they are ready for use. If you find a leaking cartridge, call your authorized ProJet™ 3-D printer reseller or the 3D Systems' Customer Support Hotline, and arrange for return of the leaking cartridge, and replacement with a new cartridge. If you do not return the cartridge, dispose of it in accordance with local and other regulatory disposal requirements.

ProJet 3000: The VisiJet® CP200 carton should contain eight (8) cartridges and CPX200 should contain four (4) cartridges. The VisiJet® S200 should contain eight (8) cartridges sealed in poly bags.

ProJet 3500: Part and Support materials contain one (1) cartridge per carton.
Part building

If you find uncured material on the part or platform at the end of a build, this is an abnormal (and very unlikely) condition which indicates that your modeler requires servicing by a certified ProJet™ 3-D modeler service technician. Do not touch uncured material without protective gloves. Discontinue use of the modeler, pending service by the service technician.
Personal protective equipment

- Eye protection
- Respiratory protection
- Skin protection
Eye protection

In the event of a leak or spill of uncured material, wear safety glasses with side shields to provide eye protection.
Respiratory protection

Because of the ProJet 3-D modelers built-in engineering controls, respiratory protection is not necessary during normal operation. A NIOSH-approved dust mask is recommended when sanding cured VisiJet material parts.
Skin protection

Exposure to uncured material can occur under certain circumstances, such as when removing and disposing of the bin liner or waste bag (ProJet 3000) or when disposing of waste pan (ProJet 3500). To prevent contact, wear chemically resistant protective gloves. Nitrile or neoprene gloves are recommended. Do NOT use latex gloves.
VisiJet part materials (see list below) are classified as combustible according to 29CFR 1910.1200. VisiJet materials is a sensitizer and an irritant. Please refer to the Safety Data Sheet for more information.

### Part Materials

<table>
<thead>
<tr>
<th>SR200 (all colors)</th>
<th>HR 200</th>
<th>EX200</th>
<th>DP200</th>
<th>MP200</th>
<th>Crystal</th>
<th>Proplast (all colors)</th>
<th>Techplast</th>
<th>Procast</th>
<th>Dentcast</th>
<th>Stoneplast</th>
<th>MX</th>
</tr>
</thead>
</table>
Sensitization

Uncured material is a sensitizer and can cause allergic reactions. Nitrile or neoprene gloves are recommended when skin contact is possible. Do NOT use latex gloves. To avoid skin sensitization, do not allow uncured material to contact skin. In almost all cases, direct skin contact is necessary to cause skin sensitization. VisiJet materials is not known to cause sensitization by inhalation. Consult the Safety Data Sheet for specific information about sensitization potential.
Storage

<table>
<thead>
<tr>
<th>BUILD MATERIAL</th>
<th>SUPPORT MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shelf life</strong> - 1 yr</td>
<td><strong>Shelf life</strong> - 2 yr</td>
</tr>
<tr>
<td><strong>Climate</strong> - Cool, dry area with adequate ventilation</td>
<td><strong>Climate</strong> - Cool, dry area with adequate ventilation</td>
</tr>
<tr>
<td><strong>Temperature Range</strong> - 60°F (16°C) to 80°F (27°C)</td>
<td><strong>Temperature Range</strong> - 60°F (16°C) to 80°F (27°C)</td>
</tr>
<tr>
<td><strong>Maximum Storage Temp</strong> - 95°F (35°C)</td>
<td><strong>Maximum Storage Temp</strong> - 95°F (35°C)</td>
</tr>
<tr>
<td><strong>Environmental Conditions</strong> - No direct sunlight, heat, flames, or UV energy.</td>
<td><strong>Environmental Conditions</strong> - No direct sunlight, heat, flames, or UV energy.</td>
</tr>
</tbody>
</table>

**NOTE:** For optimal results, keep stored cartons closed and sealed until material cartridges are ready for use. Always check material “Recertification Date” before use. Do not load material cartridges into printer if cartridge date has expired. When printer detects an expired cartridge, it aborts the build and rejects the cartridge.

More detailed information on the VisiJet® part material and VisiJet® support material, relevant applicable safety precautions and remediation, and specific storage and disposal requirements, can be found in the Material Safety Data Sheet (MSDS) included in each case of VisiJet® material shipped by 3D Systems. Your organizations' Facilities Manager (or equivalent) should maintain a copy of the two MSDS documents, and provide ready, convenient access to these documents. If further information is needed, please contact 3D Systems’ Customer Hotline within the U.S. at (800) 793-3669 (or from outside the U.S.A. at +49 (0) 6151 357-357, or by visiting 3D Systems website.

**ProJet 3500 Only**

**Storing a Partially Used Material Cartridges**

It is important not to lay material cartridges that are partially used on their side. Doing so will cause material to seep through the vent cap and clogging cap. This will cause damage to the material cartridge if used for a later build.

To store a partially used material cartridges, insert cartridge into a plastic bag with the vent cap up; place cartridge into its original shipping carton's sleeves and carton. Do not remove a partially used Support cartridges from the MDM if the MDM is NOT heating; the material will solidify and cause a breakage.
Training

Employees should be trained in the hazards and management of VisiJet materials. Such training should be provided to new employees before they begin working with the modeler, or disposing of material waste.
0.5 Part Post-Processing for VisiJet® SR200, HR200, DP200 and MX Materials

This section describes techniques for post-processing and finishing ProJet 3-D models. It addresses support removal, sanding/surface preparation, painting, dyeing, and joining sections of parts produced in the modeler.

The modelers jet a part material layer-by-layer until the part is completed. During the build process, the system also jets a support material to support the part adhering it to the build platform throughout the building process. When completed, the user removes the part from the platform and removes the material rendering a finished part ready for end use as is, or sanding, painting, dyeing, or joining, as required.

Once the build is complete, the user must take the residual content off the part. Before post-processing or finishing models, read the MSDS for each of the VisiJet® Materials.

**Required Equipment**

- **ProJet Finisher Oven/ProJet Finisher XL**: These ovens are sold through 3D Systems and are temperature controlled blown air ovens. OR a Large consumer crock pots or industrial heat tanks with controlled heat capability. It is recommended to use separate crock pots/tanks for cleaning dark and light colored parts. It has been shown that the material pigment can leech out and color the liquid the part is submerged in. The two crock pots are to avoid discoloring the lighter natural parts. Additional crock pots are not necessary for users building with only one material.
- **Heated ultrasonic cleaner(s) with digital timer and temperature control.**
- **Corn oil in bulk quantity.** The corn oil acts as a solvent to remove trace wax from the surface and inner crevices of the parts.
- **A smaller crock pot or small industrial heat tank.** This tank is to be filled with water and dishwashing liquid and kept warm. Alternatively, the crock pots can be replaced by the ProJet™ Finisher Oven.
- **A medium to large bin.** This bin is for a final rinse in room temperature to warm water. It is preferred to perform the final rinse under warm running water. If warm running water is not available, the plastic bin can be used as an alternative.
- **Towels to completely dry parts.**
- **Compressed air to aide in drying parts after the washes and rinses (optional).**

**Typical Post Processing Area**

0.5.1 Removing the Model From The Platform

0.5.2 Removing Support Material From Part
0.5.1 Removing the Model From The Platform

**STEP 1: Remove Parts From Platform**

- Mechanical Action - Apply a quick light mechanical force such as tapping the platform with a small hammer or dropping the platform from a height of about 6" onto a hard, flat table to release the models from the platform. This method is not recommended for extremely delicate parts or parts with thin external structures.
- Freezing - Place platform into a freezer for 10-15 minutes. The differential contraction will separate the parts from the metallic platform. Take care not to leave parts in the freezer too long as it could affect accuracy.
- Scraping - Use flat putty knife or painter's tool to gently scrape parts off platform. **NOTE: Use this method carefully to avoid damaging the platform.**

0.5.1.1 Special Size Considerations For Cleaning ProJet™ 5000 Parts
0.5.1.1 Special Size Considerations For Cleaning ProJet™ 5000 Parts

ProJet™ Finisher XL
The ProJet™ Finisher XL is designed to accommodate larger parts and more parts created on the ProJet 5000. It functions in the same manner as the standard size ProJet Finisher and can be used to remove bulk wax from parts.

It is not recommended to use the wax bath option to remove bulk wax as the wax requirements to submerge large parts would be significant.

Corn Oil Bath/Ultrasonic
The size of tank and/or ultrasonic cleaner required will depend on the largest part typically being built. A typical size tank for cleaning a variety of large and small parts would be 25 gallon liquid capacity. The tank should have heating control and ultrasonic is optional. Jewelsmall (www.jewelsmall.com) is an online company that provides a variety of industrial ultrasonic cleaners. They have large and custom options available for designing an ultrasonic cleaner to meet specific customer needs.

Soapy Water Rinse
It is recommended to use warm running water with soap to remove the corn oil from large 5000 parts. A single part may not fit into a standard crock pot or heating tank. Filling a basin with warm, soapy water and pouring over the part is also effective.

Supporting Geometries During Cleaning
Because ProJet 5000 parts are generally longer and larger there is a potential for certain geometries to sag under their own weight when heated. Consideration must be given to these geometries and positioning in the oven should be taken to make sure long, thin features are supported during post processing.

Maintenance Of Cleaning Equipment
- The level of melted wax in the crock pots/tanks and in the finisher drip pan will increase over time. Once the liquid level reaches 1-2 inches from the top of the pot, pour excess wax into an appropriate storage container for disposal.
- Change the corn oil in the ultrasonic cleaners when parts no longer come out of the oil wax free or when the oil becomes cloudy in appearance.
0.5.2 Removing Support Material From Part

Supports are removed by placing the model in a controlled-heat environment that quickly melts the wax support material but with a temperature not so high as to adversely affect the model itself.

The use of solvents to remove all residual support material is not necessary, and not recommended, unless further finishing, for example painting, is required.

The recommended temperature for melting support wax from most parts is **60°C (140°F)**. Using a higher temperature will accelerate melting, but caution is required to prevent part warping.

The process for support removal consists of two basic steps. The next step in 0.5.2.1 Removing Bulk Support Material, describes how to remove the bulk support material and in 0.5.2.2 Removing Residual Support Material, describes how to remove the residual material. This process may need to be scaled up to accommodate larger parts built on the ProJet 5000 system.

- 0.5.2.1 Removing Bulk Support Material
- 0.5.2.2 Removing Residual Support Material
0.5.2.1 Removing Bulk Support Material

**STEP 2: Remove bulk wax from part(s)**

**Method 1:**
Place part into the ProJet Finisher oven or some other temperature controlled oven at 60°C (140°F). Allow support wax to drain from part until all bulk wax is removed from the part. Using a higher oven temperature will accelerate melting, but good time control is necessary to prevent part warping. Parts should not remain in high heat for any longer than is required to remove the bulk support wax.

**Method 2:**

**ALTERNATIVE USING CROCK POT AND WAX BATH:** Submerge part in a bath of paraffin wax at 60°C (140°F). The initial wax bath can be created by obtaining paraffin candle wax from the hobby store. Break the sheet of wax into small pieces and melt in a temperature controlled vat. As the wax melts and fills the vat, ladle off excess and dispose of the excess wax in the normal trash. Take care when disposing of hot, liquid wax not to melt the trash container. As a precaution, allow wax to cool to solid before disposing. **NOTE:** ONLY LEAVE PARTS SOAKING IN WAX BATH OR PROJET FINISHER AS LONG AS IT TAKES TO REMOVE BULK WAX FROM PART. MONITOR PERIODICALLY USING TIMERS AND REMOVE AS SOON AS BULK WAX CAN FALL EASILY FROM PART.

The submersion method may melt bulk wax faster than the drip method. Also, with the part completely submerged in liquid the effects of gravity on thin, fragile details can be minimized.

**Caution:** Employ reasonable precautions when working with the hot liquid wax and when handling models in an oven. Use tongs or similar utensils when placing models into or removing models from the vats. Protective eyewear and gloves should also be considered to prevent accidental contact with the hot liquid wax.

**MAINTENANCE OF CLEANING EQUIPMENT**

- The level of melted wax in the crock pots/tanks and in the finisher drip pan will increase over time. Once the liquid level reaches 1-2 inches from the top of the pot, pour excess wax into an appropriate storage container for disposal.
- Change the corn oil in the ultrasonic cleaners when parts no longer come out of the oil wax free or when the oil becomes cloudy in appearance.
0.5.2.2 Removing Residual Support Material

**STEP 3: Remove residual wax from part surface**

**Ultrasonic Cleaning**

Users cleaning parts with trapped cavities and other internal geometries or moving parts may require a more thorough cleaning method. This method involves placing parts in a heated ultrasonic cleaner filled with corn oil. It is recommended to select an ultrasonic cleaner with digital heat and temperature control. Jewelsmall is an online company that sells industrial ultrasonic cleaners. 3D Systems recommends the SH150-4L model for the majority of parts built on the ProJet. A larger cleaner may be required if larger parts are the norm.

The corn oil or another similar oil acts as a mild solvent that will penetrate internal areas where residual wax may pool and remove it while keeping the wax slightly above the melting point. Peanut oil, canola oil and light mineral oil may also be used.

Follow these steps:

- Fill the ultrasonic cleaner with corn oil. Set the temperature to approximately **55°C (131°F)**. During the first fill it is recommended to run the ultrasonic action for 30-45 minutes to accelerate heating.

- Place parts into corn oil bath and set ultrasonic cleaning cycle for 5-15 minutes depending on part size and quantity. Avoid cleaning for more than 30 minutes. The ultrasonic cleaning will shut off automatically when the cycle is complete.

- Corn oil bath should be changed out when oil becomes cloudy in appearance or parts still come out with a waxy feel.

**NOTE:** The ultrasonic action will generate additional heat energy even after the heater control is set. This can cause spikes in heating and distortion of parts if they are left in the ultrasonic cleaner for long periods of time.
• Remove parts from corn oil bath shaking off excess and place into heated crock pot of soapy water. Water should be kept warm, not scalding with dishwashing liquid to create a soapy bath. Dawn dish detergent is preferred as it has an anti-grease agent. Agitate parts in bath by hand for several seconds until oil is removed.
• Use low pressure compressed air to aid in blowing excess oil from the surface of the part.

**Final Rinse and dry**
• Running Water Method - Place parts under warm running water for several seconds as a final rinse. Use an absorbent towel to dry parts.
• Use low pressure compressed air to aid in blowing excess liquid from the surface of the part.

**Final Part Inspection**
• Inspect part carefully for any remaining wax or oil. Use an absorbent towel to wipe the surface completely dry. Use a cotton tipped applicator to carefully remove any small amounts of oil that may have pooled in crevices.

**SPECIAL CONSIDERATIONS FOR PARTS BUILT WITH VISIJET EX200:**
Because of the higher transparency of the EX200 material, parts must be cooled slowly to prevent internal crystallization which has the appearance of a spongy, crystalline structure along the surface of the part.

• It is recommended to allow parts to cool at room temperature as they should transition from a milky white to clear in a matter of minutes. Do not subject parts to sudden changes in temperature like rinsing in cold water or blowing with compressed air.
0.5.3 Finishing Part

Sanding
If desired the model can be hand sanded to remove layer lines and improve the surface finish for further processing. Dry sanding of the model is not recommended. Wet sanding with light application of water or oil prevents scratching and minimizes sanding dust. Sand with progressively finer grits of sandpaper - starting at 320 grit and progressing up to 2000 grit to achieve desired finish. Apply more water or oil frequently to keep the part wet.

Painting
It is highly recommended to use a primer on any ProJet parts prior to painting. Any lacquer-based automotive primer will perform well. A low cost option is to use RUST-OLEUM Automobile Primer (gray finish) in a spray can. The RUST-OLEUM Automobile Enamel is an effective topcoat. Follow the application instructions on the can to prime and paint parts. Touch painting can also be done using a water based acrylic paint. For large volume painting or painting very large parts a paint sprayer or airbrush within a paint booth. The size of the paint booth should be determined by the size and volume of parts that need to be painted.

Any lacquer-based automotive primer should prove satisfactory. Specifically in the US, "Specialty Plastic Primer" from RUST-OLEUM and the interior oil-base "Sealer-Primer Stainblocker" from KILZ have been used successfully. Both are white-pigmented primers that can be coated with almost any all-purpose spray paint, such as "Painter's Touch" from RUST-OLEUM.

The models also accept a water-based acrylic paint. Apply paint by using an airbrush techniques.

Dyeing
Equipment Needed:
- Heating element that will heat water to boiling.
- Metal or glass pots or jars for holding and heating water. Make sure your containers are rated for high temperatures.
- Rit Fabric Dye – You can use either Powder or Liquid form
- Tongs or string to recover parts after dyeing
- Finished parts that are completely dry

Process
1. Heat Your Water – Fill your container with enough water to fully submerge your part or parts. Begin to heat your water.
2. Add Dye – You don’t have to wait until your water is completely boiling. Once the first bubbles start to form and your water starts to move around, reduce your heat and pour in your bottle or packet of dye
3. Add Your Part – Place your part in your dye solution and let sit for 10-15 minutes. It’s a good idea to string your part up if the geometry allows for it. It makes it easier to recover your part from the dye bath. You can also use tongs, but that requires a little fishing.
4. Remove Part and Rinse – Remove your part from the dye solution and rinse under cold water to remove the excess dye. Again be careful not to splash liquid dye on your clothes or work area
5. Dry Part – Last step! Pat your part dry with absorbent cloth or blow dry with compressed air. Hold your part and make sure the color is not transferring to your hand. You’re all done. Enjoy your dyed part.

NOTE: Once the dye solution has cooled, pour dye into a Mason jar for storage and reuse.*

Joining
Sections the models can be joined using cyanoacrylate ("Super Glue.") Because of the wax component in the model material, wiping the joining surfaces with isopropyl alcohol to remove the embedded wax below the surface layer of the model helps to create a stronger bond. Although this should keep the model joined under normal conditions, this bond will only withstand small forces. If the model will be subjected to any moderate shear or tear forces, pin the mating surfaces to increase the strength of the bond.
0.6 Disposal for Materials

User Management
Users of the 3-D modelers should be informed about the potential hazards of VisiJet® SR200, HR200 and DP200 Materials prior to working with the 3-D modelers, or performing other duties which can result in exposure to uncured material, such as removal and disposal of bin liners and empty cartridges or waste bags.

Material Leaks and Spills
Leakage of material is HIGHLY UNLIKELY, and should NOT occur in the normal operation of the modeler. If a leak does occur, it is an indication of a serious printer malfunction. Spills of material are also unlikely, but could occur.

In the event of a spill or a leak, the first priority is to protect users from inadvertently touching the material. In the event of a spill or leak support material, it may be cleaned up without the use of protective gear and disposed of as ordinary office trash. In the event of a spill or leak of VisiJet® Build Material, the use of gloves and other protective equipment is required, to ensure that no direct contact with uncured plastic material is possible. If you are uncertain which material has spilled, assume it is uncured material, and handle accordingly with the recommended protective gloves and other safety gear.

In the event of a spill or leak, keep unnecessary personnel away. Refer appropriate personnel to the Safety Data Sheet for proper cleanup procedure. In the event of a leak within the modeler, discontinue use of the modeler, and contact 3D Systems or your authorized 3-D modeler reseller to arrange for a service visit to determine and repair the source of leakage.

Waste Removal (ProJet 3000 Series)
Three “waste” items must be removed from the 3-D modeler: a white cardboard liner holding empty support material cartridges, a black cardboard bin liner which holds empty build material cartridges, and a waste bag containing a combination of support and uncured materials. Wear protective gloves when removing any waste product from the modeler.

Waste Removal (ProJet 3500 Series)
The waste pan containing a combination of support and uncured materials must be removed from the printer. Wear protective gloves when removing any waste product from the modeler. Place materials in the plastic bag provided. If the waste pan is not damaged, the pan can be re-used or replace with a new waste pan.
Be careful not to spill, drop, or expose others to these materials, especially the build material cartridges and the waste bag. Dispose of all waste material in accordance with applicable regulations.

**Waste Removal (ProJet 5000)**
The “waste bag” is the only item that must be removed from modeler. Wear protective gloves when removing the waste bag.

**Regulatory Information**
Comply with all applicable local, state, and federal environmental and safety regulations when disposing of partially cured, or uncured VisiJet build materials.