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# 01.0 Introduction

Thank you for purchasing ProJet™ 3-D modeler system. We pride ourselves in our ability to offer customers three dimensional modeling solutions. The 3D System team is confident your system will provide many years of service.

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## 1.6 ProJet™ Systems Software

To install ProJet™ series upgrades, click on [ProJet™ Systems Software](#) to download the software and the software release notes that provide detailed installation instructions.

## 1.1 About this Guide

This guide describes how to create finished parts using the ProJet™ 3-D Modeler. It also provides user's with an understanding of key features, system requirements, and operating procedures.

Should additional questions arise, consult Section 11.0 [Troubleshooting](#) of this guide. If further assistance required, contact 3D Systems Technical Support or visit <http://www.3dsystems.com/> Web Site.

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## 1.3 Useful Documents

The documents listed below will help get the most out of your system, To access, click on the document title.

**ProJet™ 3-D Modeling Client Online Help:** Run the client software, select **Help > Help Topics** in the modelers window or in Build Preview window to launch the client online help. The online help provide detailed instructions on how to use the client software to setup, run, and manage build jobs.

**PROJET 3-D Modelers Quick\_Reference Guide.pdf:** Download to have quick reference on the control panel functions, how to load / remove cartridges, and how to run a test build.

**VisiJet® Material Handling and Post-Processing Guide:** This document has everything needed to guide you in safely handling and disposing of VisiJet® material, including relevant regulatory guidelines for material disposal worldwide. It also provides information on how to clean parts once the build process is completed.

**ProJet™ 3-D Modelers Facility Requirements Guide.** This guide provides the dimensional data that is required when the 3D System's Field Service Engineer installs the modeler. Click on the part number to view a copy for reference.

**VisiJet® Material Safety Data Sheets (MSDS's):** Ensure everyone who handles VisiJet™ materials is familiar with MSDS's and follows the safety guidelines. To order extra copies of MSDS's, request the appropriate document part numbers are located on the bottom left-hand corner of the MSDS.

## 1.4 What's Inside

**Safety:** Read prior to handling VisiJet® Materials or operating the modeler system. The safety sections inform you of handling the material properly and avoid damage and injury when operating the modeler. For more detailed material safety information, refer to VisiJet® Material Handling Guide.

**System Requirements:** Provides electrical requirements prior to plugging in your modeler for operation. For more detailed facility requirements information, see the ProJet™ 3-D Modelers Facility Requirements Guide.

**Familiarization:** Provides a brief description of the modeler system.

**Modeler Setup:** Provides information on preparing the 3-D modeler for builds using the software, and how to send test and demo builds to the modeler from your computer. Also refer to your online help for software instructions.

**Operations:** Describes loading and running the modeler; start and stop build jobs; monitor and control build jobs; unload build parts; and disposing waste material.

**Error Messges:** Defines the error messages you may see on the modeler's LCD and provide the actions to take.

**Finishing:**Provides information on finishing models.

**Maintenance:** List modeler maintenance procedures which must be done to ensure high part yield and low modeler down time. Semi-annual preventive maintenance requires a certified 3D Systems Technical Support Representative.

**Troubleshooting:** If problems occur with the modeler, look for solutions in this section first. It describes some common problems which can occur and suggests corrective actions.

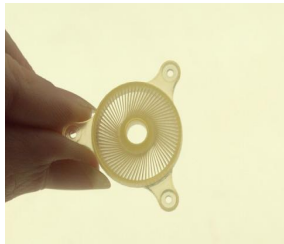
**Technical Support:** List of contact numbers of sale and support personnel for your modeler system.

## 1.5 Features and Benefits

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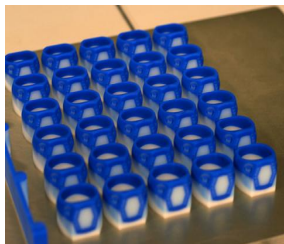
**ProJet™ HD3000** prints precision, durable plastic parts ideal for functional testing, design communication, rapid manufacturing, rapid tooling and more. It features selectable resolution choices for speed and quality.  
**Printing Mode:** High Definition(HD), Ultra High Definition (UHD)  
**Net Build Volume (xyz): HD Mode:** 298 x 185 x 203mm (11.75 x 7.3 x 8 inches); **UHD Mode:** 127 x 178 x 152mm (5 x 7 x 6 inches)  
**Resolution (xyz): \*HD Mode:** 328 x 328 x 606 DPI (xyz); 40µ layers**UHD Mode:** 656 x 656 x 800 DPI (xyz); 32µ layers  
**VisiJet® Materials:** *Part Materials:* EX200, SR200, HR200; *Support Material:* S100  
**Part Stacking and Nesting:** features part stacking and nesting capability in both build modes. The user can now utilize the entire build volume by stacking parts vertically in the z-direction to fill up the entire build envelop with parts. The user can control the space between layers to minimize support material usage and build time. Now, hours can be saved by stacking parts and submitting single, long builds overnight and weekends.



**ProJet™ HD3000plus** features a 60% expanded high definition build envelope and advanced print detail output. A new 16 micron print resolution delivers exceptional hard plastic parts with unmatched micro-detail and surface quality.  
**Printing Mode:** High Definition (HD), Ultra High Definition (UHD), Xtreme High Definition (XHD)  
**Net Build Volume (xyz): HD Mode:** 298 x 185 x 203mm (11.75 x 7.3 x 8 inches); **UHD Mode:** 203 x 178 x 152mm (8 x 7 x 6 inches);  
**XHD Mode:** 203 x 178 x 152mm (8 x 7 x 6 inches)  
**Resolution (xyz): HD Mode:** 328 x 328 x 606 DPI; 40µ layers**UHD Mode:** 656 x 656 x 800 DPI; 32µ layers;  
**XHD Mode:** 656 x 656 x 1600 DPI ; 16µ layers  
**VisiJet® Materials:** *Part Materials:* EX200, SR200, HR200; *Support Material:* S100  
**Email Notification:** Provides email notification to the user when their job begins, completes, aborts and if the system is low on material at any time during their build. Users can set their defaults and make changes as to what emails they will receive via the Job Options window.






**ProJet™ CPX3000** mass produces 100% wax patterns with unmatched surface quality, extreme fine detail and exceptional precision. RealWax patterns are ideal for casting jewelry, apparel, micro-detail medical instruments and devices, medical implants, electrical components, figurines, replicas, collectables and more.  
**Printing Mode:** High Definition(HD), Xtreme High Definition (XHD)  
**Net Build Volume (xyz): HD Mode:** 298 x 185 x 203mm (11.75 x 7.3 x 8 inches); **XHD Mode:** 127 x 178 x 152mm (5 x 7 x 6 inches)  
**Resolution (xyz): \*HD Mode:** 328 x 328 x 700 DPI (xyz); 36µ layers**XHD Mode:** 656 x 656 x 1600 DPI (xyz); 16µ layers  
**VisiJet® Materials:** *Part Materials:* CPX200 Wax; *Support Material:* S200  
**Part Stacking and Nesting:** features part stacking and nesting capability in both build modes. The user can now utilize the entire build volume by stacking parts vertically in the z-direction to fill up the entire build envelop with parts. The user can control the space between layers to minimize support material usage and build time. Now, hours can be saved by stacking parts and submitting single, long builds overnight and weekends.



**ProJet™ CPX3000plus** features a 60% expanded high definition build envelope with up to 20% increased print speed. A new 20 micron high resolution option delivers exceptional wax patterns with smooth surface quality and fine feature detail in less time.  
**Printing Mode:** High Definition (HD), Ultra High Definition (UHD), Xtreme High Definition (XHD)  
**Net Build Volume (xyz): HD Mode:** 298 x 185 x 203 (11.75 x 7.3 x 8 inches); **UHD Mode:** 203 x 178 x 152mm (8 x 7 x 6 inches);  
**XHD Mode:** 203 x 178 x 152mm (8 x 7 x 6 inches)  
**Resolution (xyz): HD Mode:** 328 x 328 x 700 DPI (xyz); 36µ layers**UHD Mode:** 656 x 656 x 1300 DPI; 20µ layers; **XHD Mode:** 656 x 656 x 1600 DPI, 16µ layers  
**VisiJet® Materials:** *Part Materials:* CPX200 Wax; *Support Material:* S200  
**Email Notification:** Provides email notification to the user when their job begins, completes, aborts and if the system is low on material at any time during their build. Users can set their defaults and make changes as to what emails they will receive via the Job Options window.



**ProJet™ CP3000** mass produces 100% wax patterns with smooth surface quality and exceptional precision, supporting almost unlimited applications capabilities. RealWax patterns are ideal for general foundry casting applications such as medium-sized to large mechanical parts for engines, pneumatics, aerospace, energy production and delivery, custom manufacturing equipment, restorations and other heavy equipment.  
**Net Build Volume (xyz):** 298 x 185 x 203mm (11.75 x 7.3 x 8 inches)  
**Resolution (xyz):** 328 x 328 x 700 DPI; 36µ layers  
**VisiJet® Materials:** *Part Materials:* CP200 Wax; *Support Material:* S200  
**Part Stacking and Nesting:** features part stacking and nesting capability in both build modes. The user can now utilize the entire build volume by stacking parts vertically in the z-direction to fill up the entire build envelop with parts. The user can control the space between layers to minimize support material usage and build time. Now, hours can be saved by stacking parts and submitting single, long builds overnight and weekends.

	<p><b>ProJet™ SD3000</b> prints high definition, durable plastic parts for engineering and mechanical design applications including functional testing, form and fit verification, rapid prototyping, design communication, rapid tooling and more.</p> <p><b>Net Build Volume (xyz):</b> 298 x 185 x 203mm (11.75 x 7.3 x 8 inches)</p> <p><b>Resolution (xyz):</b> 328 x 328 x 606 DPI (xyz)</p> <p><b>VisiJet® Materials:</b> <i>Part Materials:</i> EX200 (natural) &amp; SR200 (Blue, Natural &amp; Gray); <i>Support Material:</i> S100</p>
	<p><b>ProJet™ DP3000</b> accurately, consistently and economically manufactures precision wax-ups for dental professionals. The system can generate hundreds of units each cycle. The wax-ups have a smooth surface finish and can be cast or pressed with conventional techniques. The large build volume and optional part stacking and nesting capabilities enable unattended operation ideal for high-volume production.</p> <p><b>Printing Mode:</b> High Definition (HD); Ultra High Definition (UHD)</p> <p><b>Net Build Volume (xyz):</b> <b>HD Mode:</b> 298 x 185 x 203mm (11.75 x 7.3 x 8 inches); <b>UHD Mode:</b> 203 x 178 x 152mm (8 x 7 x 6 inches)</p> <p><b>Resolution (xyz):</b> *<b>HD Mode:</b> 328 x 328 x 606 DPI; <b>UHD Mode:</b> 328 x 328 x 606 DPI</p> <p><b>VisiJet® Materials:</b> <i>Part Materials:</i> DP200; <i>Support Material:</i> S100</p> <p><b>Email Notification:</b> Provides email notification to the user when their job begins, completes, aborts and if the system is low on material at any time during their build. Users can set their defaults and make changes as to what emails they will receive via the Job Options window.</p>
	<p><b>ProJet™ MP3000</b> can produce any size model with smooth surfaces. Multiple models can be built at one time. Works with any compatible intraoral, plaster or impression scanner. This Printing System is designed for use in laboratories with extended unattended operation, same day processing - helps you reduce time and cost.</p> <p><b>Printing Mode:</b> High Definition (HDX); Ultra High Definition (UHD)</p> <p><b>Net Build Volume (xyz):</b> <b>HDX Mode:</b> 298 x 185 x 203mm (11.75 x 7.3 x 8 inches); <b>UHD Mode:</b> 127 x 178 x 152mm (5 x 7 x 6 inches)</p> <p><b>Resolution (xyz):</b> *<b>HDX Mode:</b> 328 x 328 x 606 DPI; <b>UHD Mode:</b> 656 x 656 x 800 DPI</p> <p><b>VisiJet® Materials:</b> <i>Part Materials:</i> MP200; <i>Support Material:</i> S100</p>

- 1.5.1 Description and Definitions

## 1.5.1 Description and Definitions

Depending on the model of the ProJet 3000 3-D Production System, your system features different types of build styles to meet a variety of model making applications. Please refer to Features and Benefits that will describe your extended choices for your particular system.

### Description and Definitions

- **The High Definition (HD) Mode** allows the user rapid model making capability on a full platform. This mode produces high quality parts for concept models, verification designs and patterns for casting.
- **The Ultra High Definition (UHD) Mode** allows the users to build extremely high resolution parts with exceptional surface finish and superior accuracy. Models build in UHD mode are typically used for show models, fit testing and direct manufacturing using patterns for investment casting of jewelry and small components.
- **Expanded UHD Mode:** Provides the user with an Expanded Ultra High Definition (UHD) mode build envelope.
- **Expanded XHD Mode:** Provides the user access to the new Extreme High Definition (XHD) Mode that features a new print resolution with the same expanded build envelope available in UHD.
- **Email Notification:** Provides email notification to the user when their job begins, completes, aborts and if the system is low on material at any time during their build. Users can set their defaults and make changes as to what emails they will receive via the Job Options window.

### Part Stacking and Nesting

The new ProJet 3-D Production System, features part stacking and nesting capability in both build modes. The user can now utilize the entire build volume by stacking parts vertically in the z-direction to fill up the entire build envelop with parts. The user can control the space between layers to minimize support material usage and build time. Now, hours can be saved by stacking parts and submitting single, long builds overnight and weekends.

### Bounding Box Display Added to Print Preview

A few new features have been added to Print Preview to allow it to handle up to two gigabytes of part data on a single build.

- The **Bounding Box Display** has been added to Print Preview to allow file sizes that were previously too large for Print Preview to load successfully. The Bounding Box Display only displays the bounding extents of a given geometry and does not try to resolve the triangles required to display an entire geometry. See [Section 8.1 Preview Build Job](#).



- **Job Submission Checking** has also been added. Both the 3-D Modeling Client and Print Preview now check to make sure that the maximum allowable accumulated build file size on the machine is not exceeded during job submission. The maximum threshold for job submission is roughly two gigabytes or 40,000,000 triangles. See [Section 8.3 Submit a Build Job](#)  
The new **ProJet™ HD 3000plus** production system introduces new enhancements including an expanded build envelope for the UHD build mode, the new XHD build mode and email notification.

## 1.7 Packaging

### Packaging

**Do not** damage or discard any packaging materials or carton(s). If the modeler needs to be returned to the manufacturer, it should be shipped in it's original packaging. If other packaging is used, the customer will be responsible for any shipping damages that may occur.

Only Certified/Qualified Service Personnel can install the 3-D modeler.



## 02.0 Safety Symbols & Definitions



**UV Radiation Hazard:** Invisible UV radiation is accessible in the vicinity of this sign or behind the panel. Radiation can cause eye injury. Access panels are for service only and should be opened only by certified service personnel.



**Electrical Shock Hazard:** High voltage electricity is accessible in the vicinity of this sign or behind the access panel. High voltage can cause severe burns or death. Access panels are for service only and should be opened only by certified service personnel or trained maintenance personnel.



**Hot Surface Hazard:** A hot surface is accessible in the vicinity of this sign or behind the access panel. Avoid contact. Hot surfaces can cause severe burns. Access panels are for service only and should be opened only by certified service personnel or trained maintenance personnel.



**Harmful Irritant Warning:** Indicates that skin or eye irritation could result while exposed to a chemical composition.



**Caution:** Indicates something may happen that could cause loss of data, damage to equipment, or personal injury.

## 03.0 Safety Guidelines

Before using the modeler, your company should have a safety program in place. The safety program should:

- Label and point out hazardous equipment, materials, and procedures.
  - Explain what to do in case of an emergency.
  - Provide information about hazards of equipment and materials in the form of Material Safety Data Sheets (MSDSs). The MSDSs are provided with all materials supplied by 3D Systems.
- [3.1 General](#)
  - [3.2 Electrical](#)
  - [3.3 Ultraviolet \(UV\) Light](#)

## 3.1 General

The modeler is designed with built in safety features, improper use and malfunctions can cause injury to personnel. To prevent unsafe operation, the modeler will automatically shut down if unsafe conditions are detected.

Follow these safety guidelines when operating the modeler:

- Read and follow all modeler instructions.
- Follow all safety rules and heed all cautions and warnings in this guide.
- Do not attempt to open chamber door while build in progress.
- Do not use any material without reviewing the Material Safety Data Sheets (MSDS).
- Dress power and communication cables behind modeler to prevent tripping.
- Do not attempt to access, service, or adjust modeler components. Do not attempt to perform any maintenance procedures unless specifically trained to do so.

Operators are trained to operate system and perform all necessary tasks to create a part.

Certified service personnel are those who completed the 3D Systems service training package and certified to perform service tasks. Certification may occur at different levels, and service providers should only perform tasks they are authorized and certified to complete.

Do not ignore warning signs posted during modeler service operations.

If an error message appears on the modeler's LCD refer to [Section 10.0 Error Messages](#) within this guide before resuming operation.

To prevent potential skin-irritation and sensitization due to contact with waste material, follow all guidelines within [Build Material Safety](#).

To prevent pinch and crush injuries to the hand, use caution when replacing platform inside the build chamber.

## 3.2 Electrical

### DANGER



Hazardous voltage exists inside the modeler. Injury or death from electrical shock can result if you remove the printer's external panels. Panels should only be removed for service by trained and certified 3D Systems Technical Support personnel.

To prevent electrical shock, the modeler will not operate unless external panels are installed. Verify facility's [electrical](#) service rating before you connect power to the modeler.

## 3.3 Ultraviolet (UV) Light

### CAUTION



Hazardous UV radiation exists inside the modeler build chamber during build job. Eye injury or blindness can result if chamber door is opened while a build job is in progress. If a build job is running, abort build job before attempting to open chamber door.

To prevent eye injury, ultraviolet (UV) light inside the chamber will not operate when chamber door is open. When closed, the chamber door keeps UV radiation from escaping. The chamber door remains locked if build job is paused.

## 04.0 Build Material Safety

Users of the modeler should be informed of potential hazards of part material prior to working with a modeler, or performing duties which may result in exposure to uncured part material, such as removal and disposal of bin liners and empty cartridges, or waste bag.



- 4.1 Disposal
- 4.2 Health Hazards
- 4.3 Material Handling
- 4.4 Personal Protection Equipment
- 4.5 Regulatory Information
- 4.6 Spilled VisiJet® Material
- 4.7 Waste Removal
- 4.8 Material Storage

### 4.1 Disposal

Disposal of **fully cured** parts produced are not subject to regulations of any known agency worldwide. VisiJet® support material and cartridges may be disposed of in ordinary office trash.

**Uncured** part material waste is classified as regulated, and in some areas hazardous, requiring special packaging, transportation, and disposal. The disposal of partially cured or uncured model material must comply with all local, state, and federal environmental safety regulations. Applicable part "waste" includes cartridges (empty or full) and waste bag. Any materials used cleaning up uncured part material should be disposed of as uncured part material.



To find out facility disposal requirements, contact a local waste disposal provider. (Local environmental regulatory agency should have a list of qualified providers.) You will need to give disposal service provider a copy of the part material MSDS / SDS, and possibly other forms included in the Appendix of your **VisiJet® Material Handling Guide**, such as Waste Profile Worksheet and SNUR (Significant New Use Regulation - U.S. only). A report will be provided, indicating disposal requirements, as well as a quotation for regularly scheduled pickups. If assistance is needed locating a waste disposal provider, or completing a waste disposal form, contact local 3D Systems [Technical Support Hotline](#).

3D Systems assumes no liability or responsibility for proper disposal of uncured part material. Proper disposal of uncured part material is the sole responsibility of the user.

## 4.2 Health Hazards

### Health Hazards



Uncured VisiJet® model material is a sensitizer. Skin or eye irritation could occur when exposed to the chemical composition of the material. Any chemical may exert harmful effects if contacts or enters the body. VisiJet® part material is a sensitizer and irritant.

### Skin Sensitization



CAUTION: Uncured VisiJet® part material is a sensitizer. Skin or eye irritation could occur when exposed to the chemical composition of the material.

Uncured material is a sensitizer, and can cause allergic reactions if contacts skin without protective gloves. Refer to [personal protection equipment](#) for more information. To avoid sensitization, do not allow uncured material to contact skin. Consult the MSDS for specific information about the sensitization potential.

### Inhalation

Under normal operation, inhalation is not an expected route of entry.

### Ingestion



CAUTION: Uncured VisiJet® model material is toxic if ingested.

Uncured material is toxic if ingested. Uncured material must not be present where food and drink are stored, prepared, or consumed and not ingested. After handling modeler materials, wash hands with soap and water before consuming or preparing food.

### Handling Finished Parts

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

## Exposure control

The modeler has a variety of built-in engineering controls which are designed to prevent operator exposure. Do not try to change or disable these controls.

Appropriate hygienic practices should be followed, including washing with soap and water before meals, breaks, smoking, applying cosmetics, using toilet facilities, and after work.

Employees should be alerted to the need to clean and rinse off any contacted surface promptly in order to prevent further contamination. Ensure a convenient washroom location is provided with access to soap, water, and disposable paper towels.



## 4.3 Material Handling

### Emergency (MSDS)

Chemtrec USA (800) 424-9300; Europe +1-703-527-3887

### Packaging Inspection

VisiJet® material is packaged in cartridges. Eight cartridges are packaged in polybags, and placed in shipping cartons. Upon receipt of material shipments, inspect cardboard carton exterior for signs of damage and leakage. If leakage is observed, DO NOT open carton, and contact 3D Systems' [Technical Support](#) Hotline. If no leakage is observed, store materials in cartons until material is used.



### Part Building

If uncured material is observed on the part or platform after build, this is an abnormal condition, and is an indication the modeler requires servicing by 3D Systems. Assume any liquid or paste-like material is part material. Do not directly touch uncured part material without protective gloves. Discontinue use of the modeler, pending service by a 3D Systems Technical Support Representative.

### Flammability and Combustibility

Do not expose materials to heat at or above 230°F (110°C), flames, sparks, or any source of ignition. (Though the U.S. Department of Transportation does not consider VisiJet materials a "flammability hazard," they do classify them "combustible" based on flash points.) For more information on VisiJet material flash points and combustibility, see VisiJet® Material Handling and Post Processing Guide.

## 4.4 Personal Protection Equipment



Exposure to uncured model material may occur; when removing and disposing of the bin liners containing spent model material cartridges and waste bag. To prevent contact, wear chemically resistant protective gloves - nitrile or neoprene gloves are recommended. Do not use Latex gloves.



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



Because of the modeler's built in engineering controls, respiratory protection is not necessary during normal operation. A NIOSH-approved (or equivalent) dust mask is recommended when dry sanding cured material parts.

## 4.5 Regulatory Information

Support material has no known regulatory requirements.

In the U.S., **uncured** material is subject to special EPA disposal regulations and record-keeping requirements. "Uncured VisiJet® material" includes any model material cartridge (empty or full), and waste bag---about half of which is uncured model material. For complete disposal regulation details, see Appendix in your Material Handling Guide.

In the U.S., you must keep the following disposal records for five years after the date of disposal:

- The quantity of model material received (new or "virgin").
- The name and address of the shipping location (the "responsible party" - generally your waste disposal service provider).
- The quantity of model material shipped (disposed). For further information, see your Material Handling Guide.

For assistance, contact 3D Systems [Technical Support](#).

## 4.6 Spilled VisiJet® Material

Spills of material are HIGHLY UNLIKELY, and should NOT occur in normal operation of the modeler. If a leak occurs, it is an indication of a serious modeler malfunction.

The first priority is to protect users from inadvertently touching material. Spills of support material can be cleaned without use of protective gear, and disposed of as office trash. Handling uncured part material requires use of gloves and other [personnel protective equipment](#) to ensure no direct contact with uncured model material. If you don't know which material it is, assume it to be uncured model material, and handle accordingly - with the recommended personal protective equipment.

Promptly remove spilled material, dispose of waste material, and cleanup materials per local regulatory requirements. Discontinue use of the modeler, and contact 3D Systems [Technical Support](#) for a service visit to determine and repair the source of leakage.

Small spills of uncured liquid part material can be cleaned up using disposable towels, non-reusable rags, or absorbing materials such as sawdust, clay, diatomaceous earth, or activated charcoal. If spilled material is hot (liquid), wait until cools and gels before wiping up. After wiping up the spill, wipe surface with denatured or isopropyl alcohol and clean thoroughly with soap and water.

Consider avoiding placement of the modeler over carpeting, or consider use of barriers to avoid the possibility of carpet damage if spills were to occur.

Advise service provider involved, of the spilled material, and provide MSDS and other material information prior to contact with the material. Advise them of disposal requirements for model material and clean-up products if model material (uncured) is the spilled material. Use of heat above 65°C (149°F) may prove helpful in removing spilled model material from carpet.

Tools contaminated with model material should be cleaned prior to reuse. Solvents such as denatured alcohol or Iso-Propyl Alcohol (IPA), are normally required to clean equipment and tools. Wash with soap and water to remove any traces of excess model material or solvent. Contact solvent suppliers for information on proper handling of solvents if used for clean-up.

## 4.7 Waste Removal



**CAUTION:** Uncured model material is a sensitizer. Skin or eye irritation could occur when exposed to the chemical composition of the material.

[Wear protective gloves](#) before removing any waste product from the modeler. Be careful not to spill, drop, or expose others to these materials - particularly part material cartridges or waste bag. Dispose of all waste material appropriately per local regulatory requirements.

Remove support and modeling cartridges from the waste bins. If liners are contaminated with uncured modeling material, replace the liners. Dispose of waste bag containing both support and uncured model material. Replace with new waste bag.



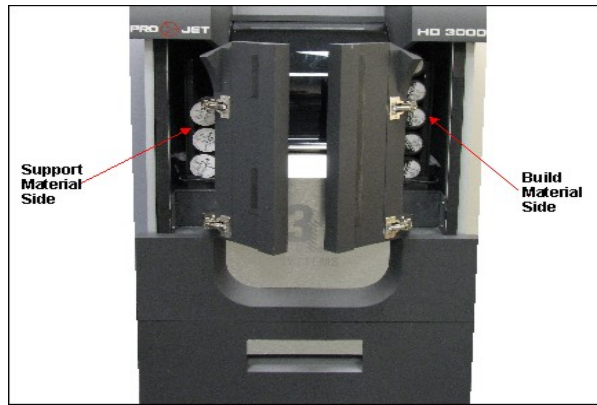
## 4.8 Material Storage

BUILD MATERIAL	SUPPORT MATERIAL
<b>Shelf life for HR200, SR200,MP200, DP200-</b> 2 yr	<b>Shelf life for S100-</b> 5 yr
<b>Shelf Life for CP200, CPX200-</b> 5 yr	<b>Shelf Life for S200-</b> 5 yr
<b>Climate</b> - Cool, dry area with adequate ventilation	<b>Climate</b> - Cool, dry area with adequate ventilation
<b>Temperature Range</b> - 60°F (16°C) to 80°F (27°C)	<b>Temperature Range-</b> 60°F (16°C)to 80°F (27°C)
<b>Maximum Storage Temp</b> - 95°F (35°C)	<b>Maximum Storage Temp</b> - 95°F (35°C)
<b>Environmental Conditions</b> - No direct sunlight, heat, flames, or UV energy.	<b>Environmental Conditions</b> - No direct sunlight, heat, flames, or UV energy.

**NOTE:** For optimal results, keep stored cartons closed and sealed, and do not open polybags until cartridge is ready for use.



Always check material "Best used by" date before loading cartridge. Do not load cartridges into modeler if about to expire. When modeler detects an expired cartridge, it aborts the build and ejects the cartridge if date is past expiration date for support material or more than one year past the expiration date for model material.



Support (**white**) cartridges must be loaded in the left side feed slot. VisiJet part (**black**) cartridges must be loaded in the **right** side feed slot. Before removing a cartridge from protective polybag and before loading into modeler, inspect the cartridge for signs of damage or leakage. Do not load a damaged or leaking cartridge. Dispose of it according to local regulations.

## 05.0 System Requirements

### Power Rating

Country	Voltage	Frequency	Amps (A)	Phase	Power Cord
USA	100-127 VAC	60 Hz	15 A	1	P/N 23417-802-XX
France	200-240 VAC	50 Hz	15 A	1	P/N 23417-802-XX
Germany	200-240 VAC	50 Hz	15 A	1	P/N 23417-802-XX
Hong Kong	200-240 VAC	50 Hz	15 A	1	P/N 23417-802-XX
Italy	200-240 VAC	50 Hz	15 A	1	P/N 23417-802-XX
Japan	100-127 VAC	60 Hz	15 A	1	P/N 23417-802-XX
Switzerland	200-240 VAC	50 Hz	15 A	1	P/N 23417-802-XX
United Kingdom	200-240 VAC	50 Hz	15 A	1	P/N 23417-802-XX



If connecting the modeler to a 200-240 VAC facility power outlet, connect the power cord (located inside modeler's country kit) to the external transformer. Connect the transformer's power supply to the facility's outlet.

## 06.0 Familiarization

The 3-D modeler system is a Multi-Jet-Modeling (MJM) line of modelers. The solid imaging modeler produces plastic prototype models from 3D solid Computer-Aided Design (CAD) models and through the modeler client software. The models are generated in a rapid prototyping (RP) environment. The primary features of the 3-D modeler are the user interface, build chamber, material feed slots, and waste material drawer. The back of the modeler houses the power switch, internet and the power cord connections.

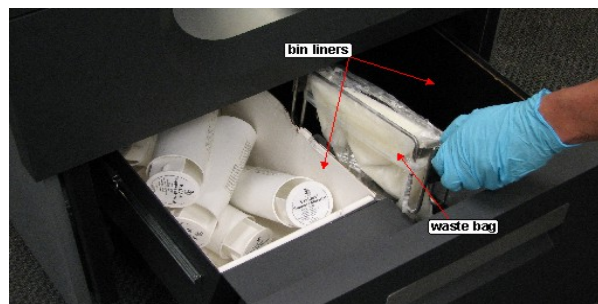




The three dimensional solid models built by the modeler consist of two materials (support material and part material). The support material is a wax based material providing adhesion to build platform, as well as, providing material used to produce supports required to build the model. The part material used to build the models is an ultraviolet (UV) curable material. After a layer of material is deposited in the build chamber, the part is exposed to a UV flashlamp. The UV energy is absorbed by the material converting a liquid model material to a solid polymer. When the build is complete the model (consisting of the two materials) is adhered to the build platform by means of the support material.



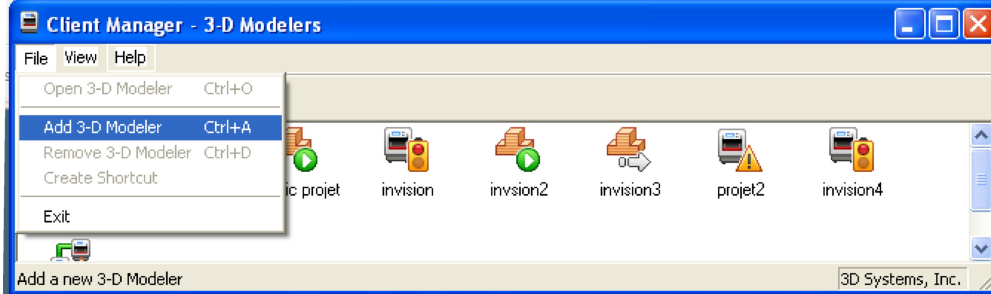
The material delivery system consists of two vertical stacks referred to as "magazines." The magazine on the left side of the machine holds nine support material (white) cartridges. The right side of the machine holds up to nine part material (black) cartridges. The magazine system feeds the cartridges to the modeler using a clamp feed system. As the cartridges are emptied, the clamp feed system releases the empty cartridge(s) into the waste drawer. Material waste is generated by two processes; cleaning the printhead array plate and planarization. The cleaning process involves purging jets and wiping the printhead array plate. Gravity pulls the waste material from the Head Maintenance Station (HMS) trough into the waste umbilical. The combined waste material is then purged. The printhead cleaning process is invoked automatically prior to test print and build jobs.



After the build is complete, the platform and the model is then removed from the modeler. A secondary operation, known as finishing, is required to provide a finished/cleaned model. Refer to your ProJet™ Finisher's Guide for more information.

## 6.1 System Functions

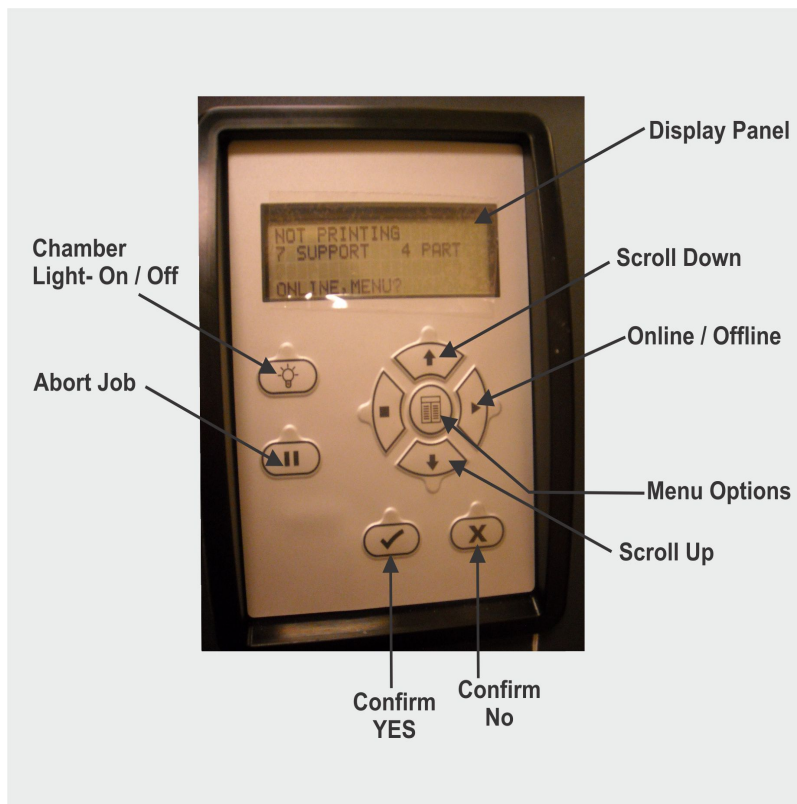
**Menus:** Menu names and menu options are capitalized in boldface text. Instructions for selecting menu options look like this: "Select **Menu**>**Option**." This means "select (click or highlight) the **Menu**, then select **Option** on the menu."



**Keys:** Keyboard key names are capitalized; for example, "Press the Enter key."

**Buttons:** Command buttons on the modeler's user interface are in boldface upper case text; for example, "Press the **ONLINE** button." The command buttons are: **MENU**, **LIGHT**, **PAUSE**, **ONLINE**, **YES**, **NO**, and **ABORT**.

**Display Text:** Text on the modeler's display appears in uppercase in this guide; for example, "When the display shows **PAUSE JOB? Y/N**, press **YES**."



## 07.0 Modeler Setup

To prepare and build part files, connect your PC and modeler to the network. For additional information refer to Facility Requirements Guide.

Component Type	Software Requirements
PC	Microsoft © Windows® 98, Millennium Edition (Me), New Technology (NT) 4 (SP 3+), 2000, or XP.

- 7.1 Power on Modeler
- 7.2 Add Cartridge and Install Build Platform
- 7.3 Install and Run ProJet™ 3-D Modeling Client Software
- 7.4 Create STL File(s) to Build
- 7.5 Submit Test Build
- 7.6 Build Demo

## 7.1 Power on Modeler

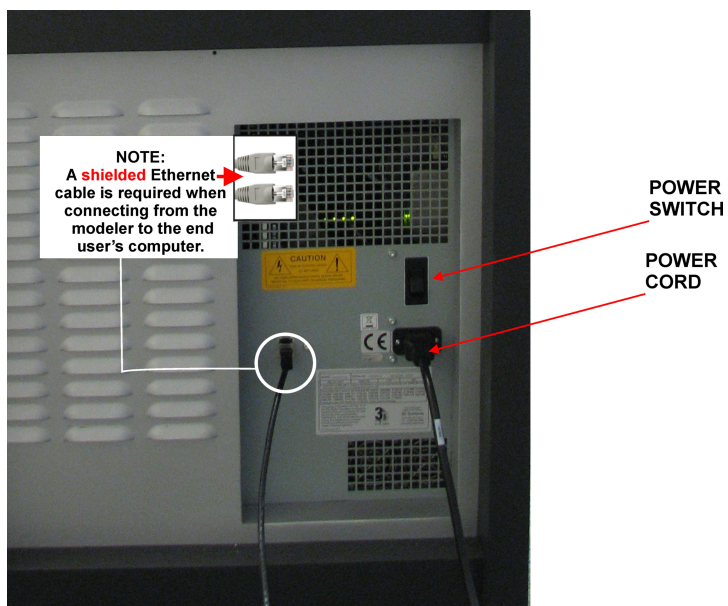


**WARNING:** Read and follow safety guidelines in [Electrical Safety](#). Ignoring these guidelines could result in death, bodily injury, or modeler damage due to electrical shock or fire.



**CAUTION:** Verify modeler's rear panel power switch is OFF. Connecting power with switch on can damage modeler and cause bodily injury or death due to sudden, unexpected mechanical motion.

1. Plug modeler power cord P/N 23417-802-XX into modeler's rear panel socket. Plug modeler power cord into a grounded power outlet.



2. If 200-240 VAC required, connect modeler power cord to external transformer in kit P/N 23418-801-XX, then plug transformer power cord into a grounded power outlet.



3. Place switch on the rear of modeler to the ON position.
4. Wait 4 hours for modeler to warm up before pressing **ONLINE** to start a build job.

**NOTE:** You can submit jobs to modeler while it is warming up.

## 7.2 Add Cartridge and Install Build Platform

### Add Cartridge

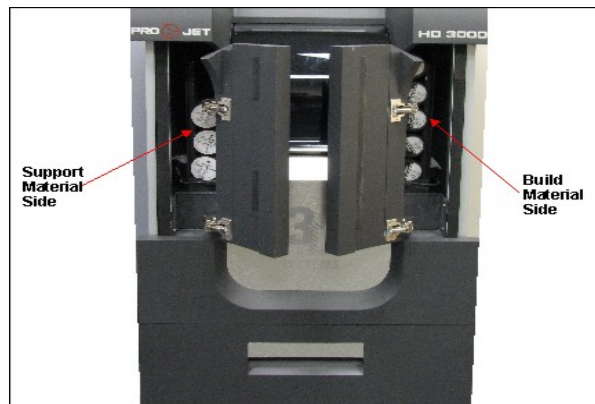
Add material to feed slot when it has 3 cartridges or less. When a feed slot has 3 cartridges or less, the operator panel displays **ADD SUPPORT** and/or **ADD PART**. Add 9 cartridges maximum per slot. 5 cartridges are visible when magazine feed slot is full.

**NOTE:** Before handling build material cartridges. Read Material Safety Data Sheet (MSDS).

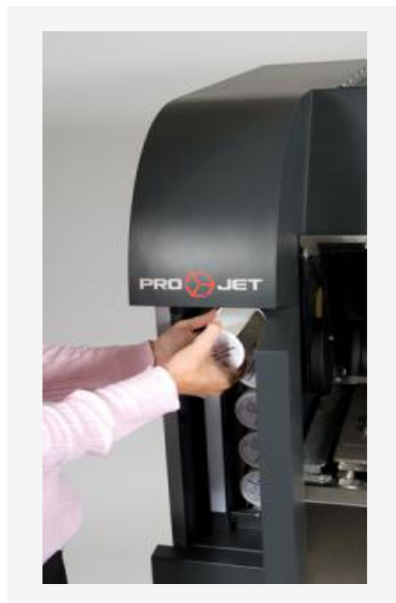
1. Unpack cartridge and MSDS/SDS Sheet. Remove cartridge's from poly bag.



2. Open left and/or right magazine feed slot doors. Insert support material (white) cartridges in left magazine feed slot. Insert model marterial (black) cartridges in right magazine feed slot.



3. Lower each cartridge into slot. Ensure flat of cartridge and label on cartridge is facing upward. Add eight cartridges maximum to each slot. Close both magazine feed doors.

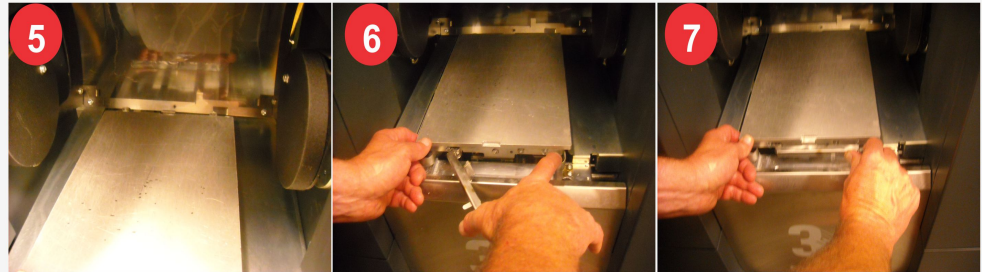


**NOTE:** For proper operation of the feed system, a minimum of three (3) support and three (3) build cartridges must be present.

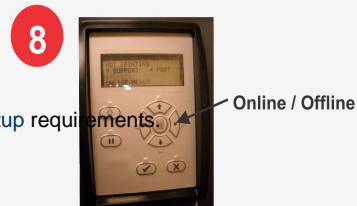
## Install Build Platform

**NOTE: Clean platform using Isopropyl Alcohol before installing into modeler.**

4. Open the chamber door.
5. Align platform's rear notch into x-carriage's locating tab.
6. Align platform's front notch into latch's front locating tab.
7. Press locking tab into the notch to secure.
8. Close the chamber door and press ONLINE.

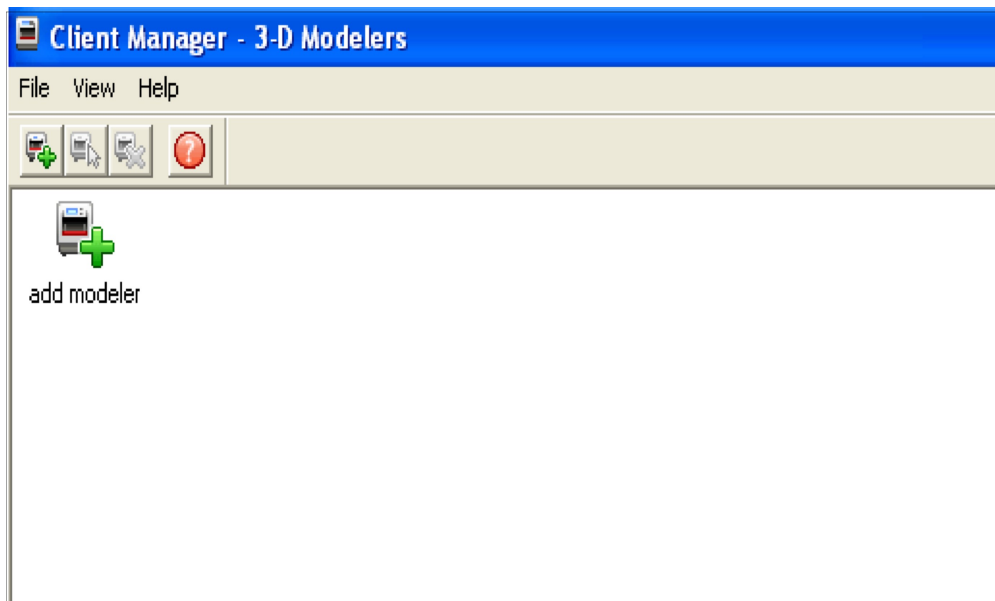


## 7.3 Install and Run ProJet™ 3-D Modeling Client Software



**NOTE:** Before installing software, ensure network and PC meet [Modeler Setup requirements](#).

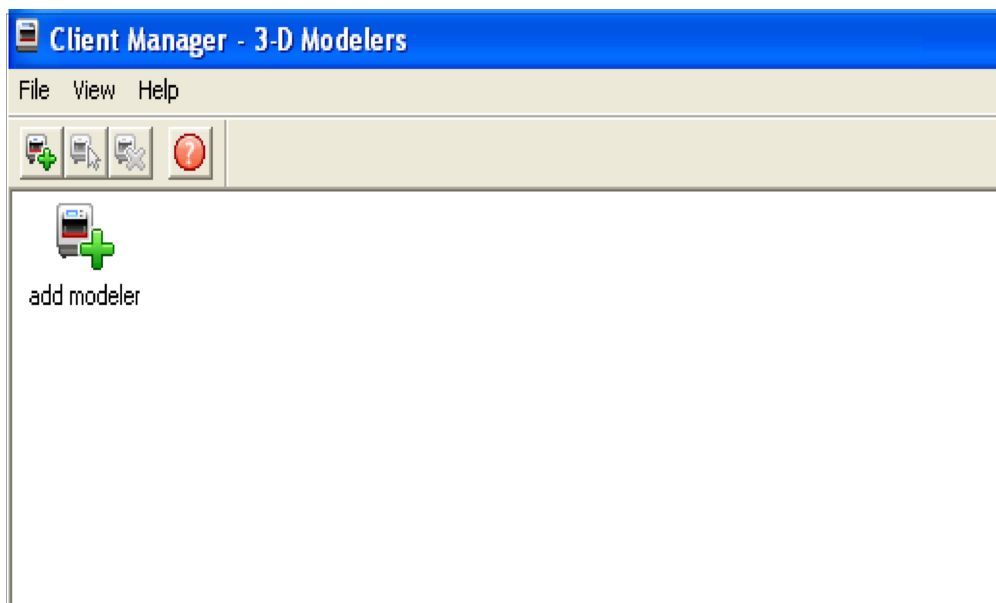
1. Load the **3-D Modeling Client Software** from CD packaged with the modeler accessories kit. An autorun file on the CD will automatically load when CD is inserted into ROM drive of the computer. If installation program does not start when loaded, select and run **Setup.exe** from the root directory of the ROM drive.
2. After successfully installing software, select **Start** from the **Program** menu and then select **>3-D Modeling Client** icon. The modeler window appears.



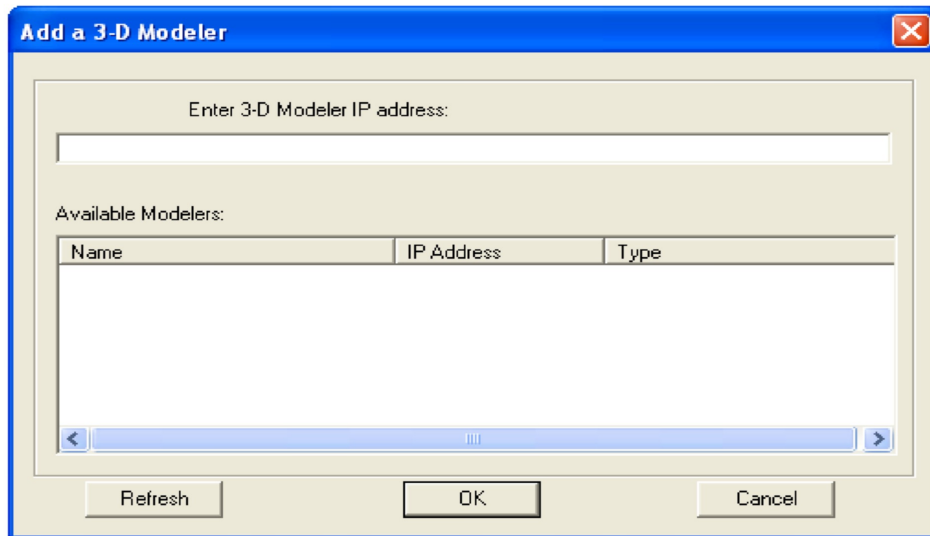
3. Power up modeler as described in [7.1 Power on Modeler](#). Establish a network connection between modeler and PC.



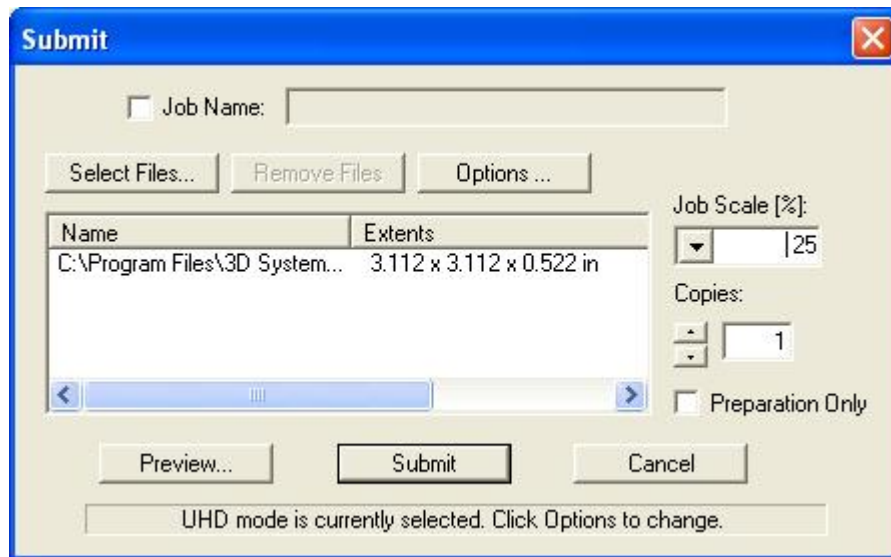
4. You can only submit build jobs to modelers having icons in the window. To create an icon for a modeler, click **Add modeler** icon (or choose **File > Add 3-D modeler**), the Add Modeler window appears, prompting to choose the modeler's IP address from list of available modelers.



5. Select the IP address for desired modeler, click OK. The client software prompts for a modeler name. After entering a name, an icon for the modeler appears in the 3-D Modelers window. Once an icon for a modeler exists, click it to add files for a build job, preview a build job, submit a build job, or manage a build job in progress.



- After the modeler is added, click on the icon in the 3-D modeler window or choose **File > Open 3-D modeler** to submit build jobs to the modeler, or manage build jobs in it's queue. If the modeler icon has a red lightning bolt, your PC is not communicating with the modeler. Jobs cannot be submitted to the modeler until communication is restored.



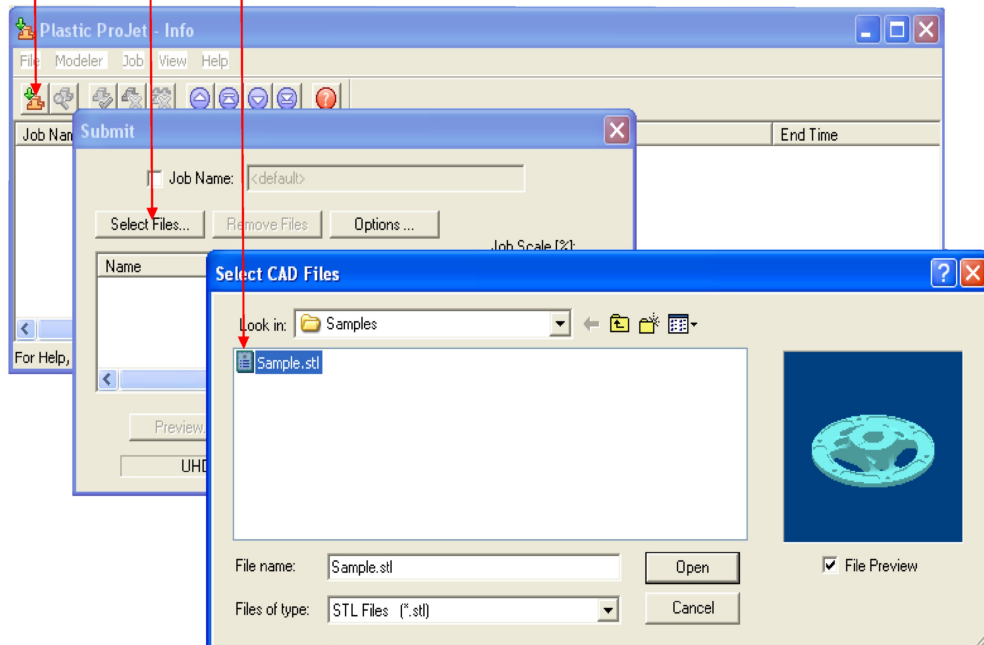
## 7.4 Create STL File(s) to Build

The modeler builds 3-D models from files using industry-standard **.STL (STereoLithography)** format. Most popular 3-D modeling CAD software packages can save files in STL format. Sample STL files are in the \3-D Modeling Client\Samples folder.

Click the **Submit** Icon

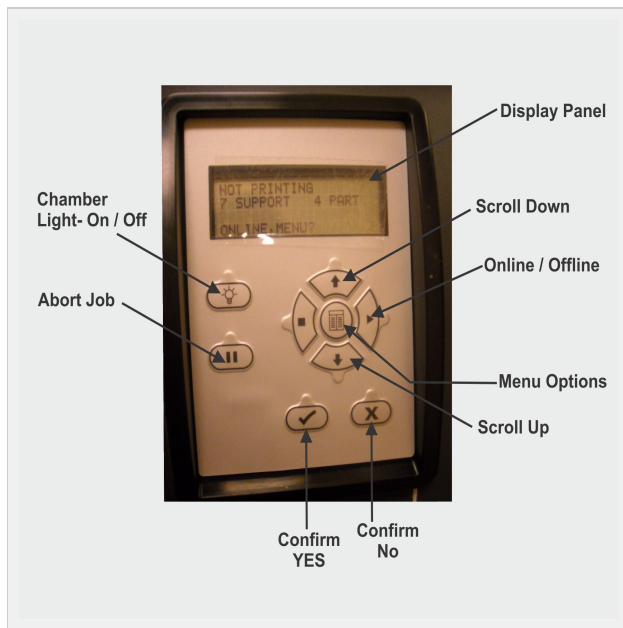
Click the **Select Files...**

Double Click on **Sample.stl** file



## 7.5 Submit Test Build

It is recommended to submit a Test Build prior to each build job to ensure part quality. Press **MENU**, scroll to highlight **TEST BUILD**.

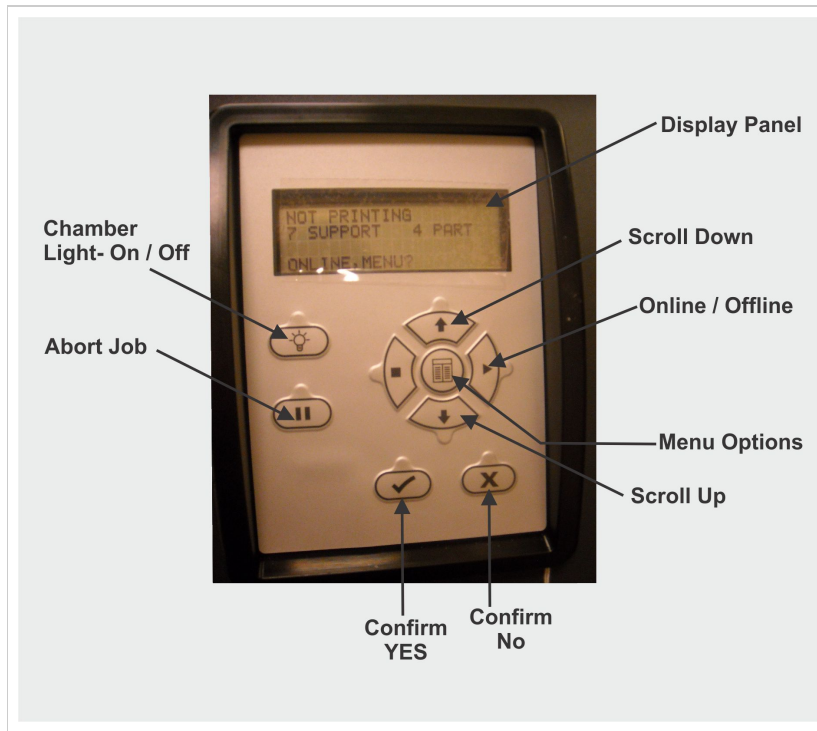


Press **YES**. The message **PLATFORM CLEAR DOOR CLOSED? Y/N** scrolls across the display. # Press **YES** if the platform is clear and the door is closed, otherwise press **NO**.



## 7.6 Build Demo

1. Press **MENU**, scroll to highlight **BUILD DEMO**. # Press **YES** on Operators panel; the system displays **PLATFORM CLEAR? Y/N**.
2. When platform is clear, press **YES**. The modeler starts demo build job.



## 08.0 Operations

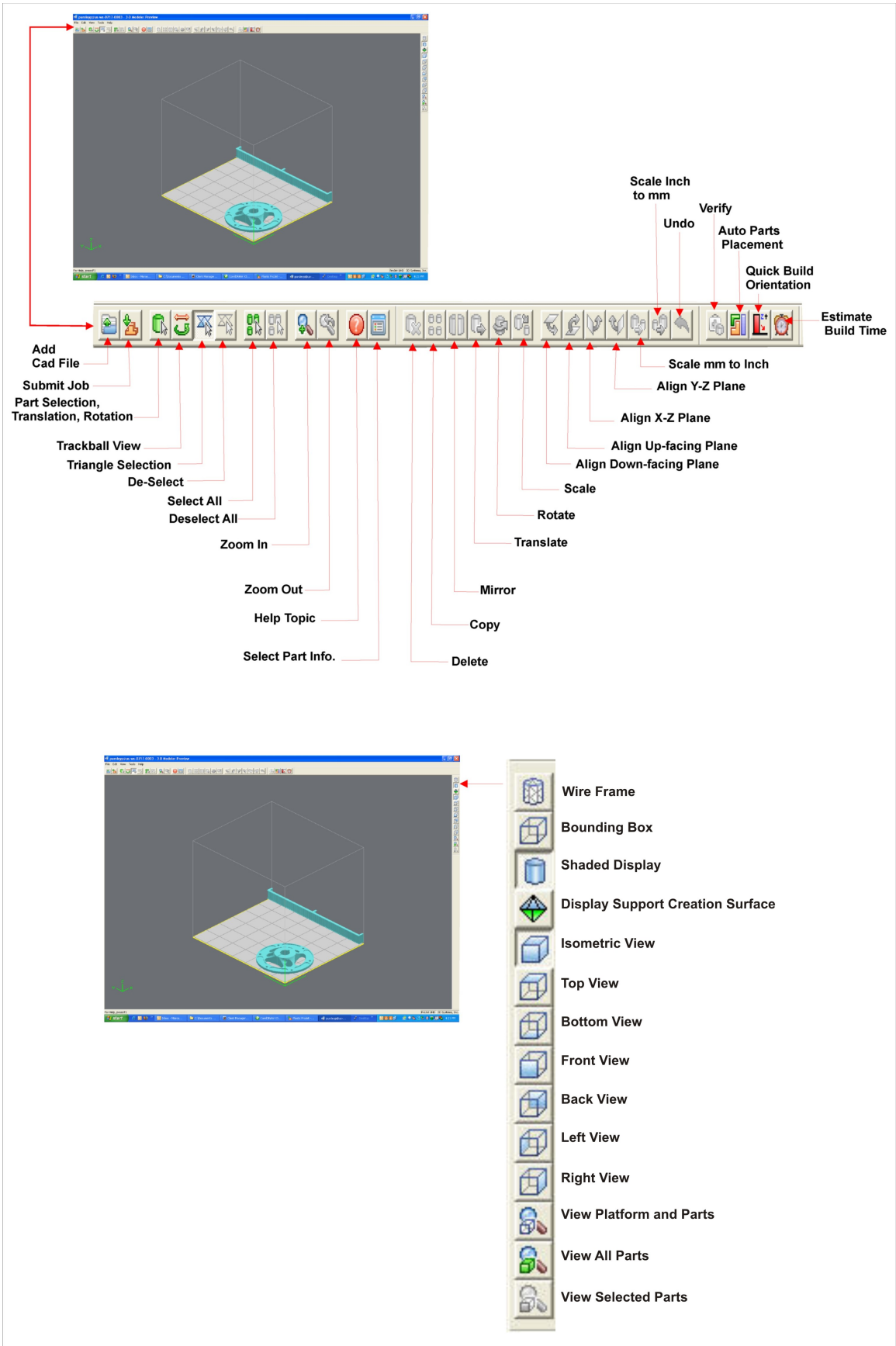
This section provides information on Previewing, Saving, Submitting, and Managing modeling jobs through the modeler's operator panel menu and 3-D Modeling Client Software. In addition this section describes how to remove the build platform, how to empty the waste drawer and how to shut down the modeler.

<b>NOTE</b>	Make certain the modeler is <b>Off-Line</b> during the job submittal process. Place the modeler on-line after the job is submitted.
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- 8.10 Shrink Compensation for ProJet VisiJet® Materials
- 8.1 Preview Build Job
- 8.2 Save a Build Job
- 8.3 Submit a Build Job
  - 8.3.1 Remove Build Platform
- 8.4 Manage Build Jobs
  - 8.4.1 Delete Build Jobs
  - 8.4.2 Pause Build Job
  - 8.4.3 Abort Build Job
  - 8.4.4 Repeat Build Job
- 8.5 Modeler Status
- 8.6 Empty Waste Drawer
- 8.7 Shutdown Modeler
- 8.8 Remove Part from Build Platform
- 8.9 3D Modeling Batch Submission for Production Environment

### 8.1 Preview Build Job

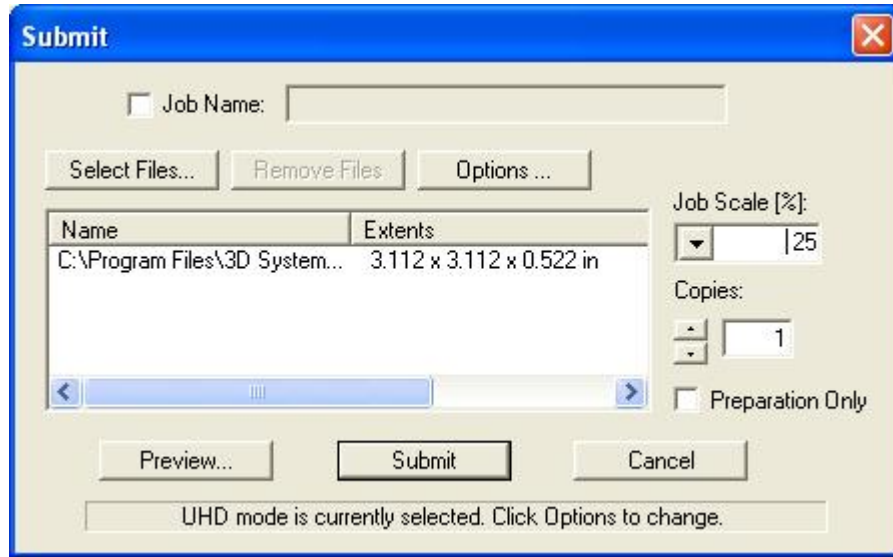
#### Preview Screen Icon Description



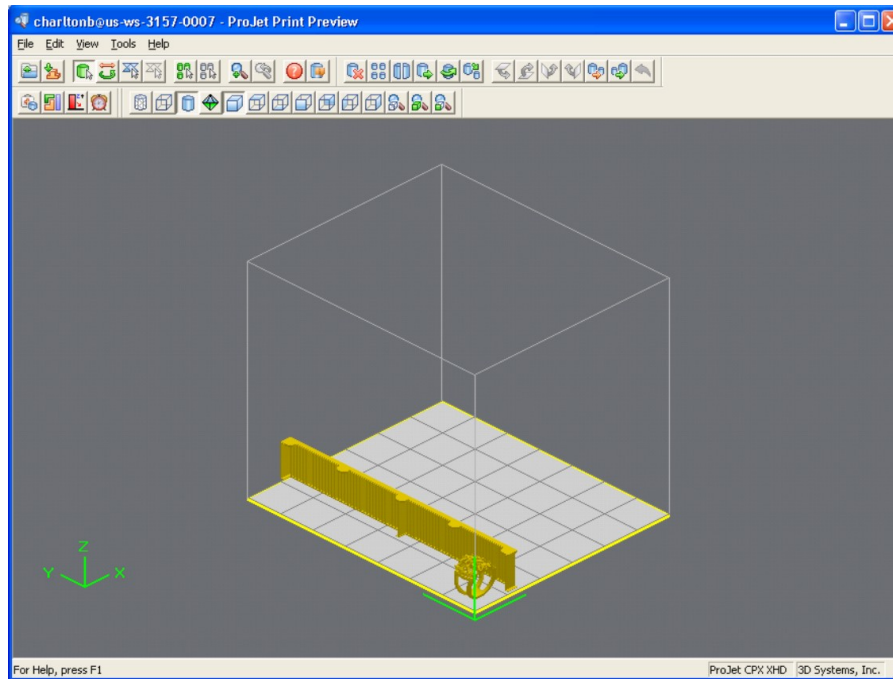
Preview build job before submitting.

Preview jobs before submitting them to the modeler.

1. Click the **Preview** button on the Client's Submit dialog box. At least one part must be added for build in the Submit dialog box before you are able to preview.

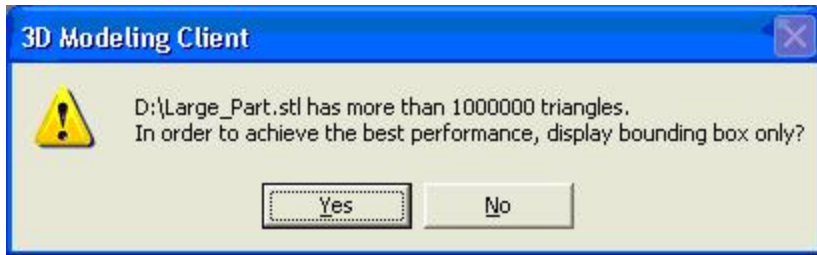


2. Highlight a Job Name in modeler's Info window, click the **Preview** button or choose **Job > Preview**. The print preview window will open as shown below.

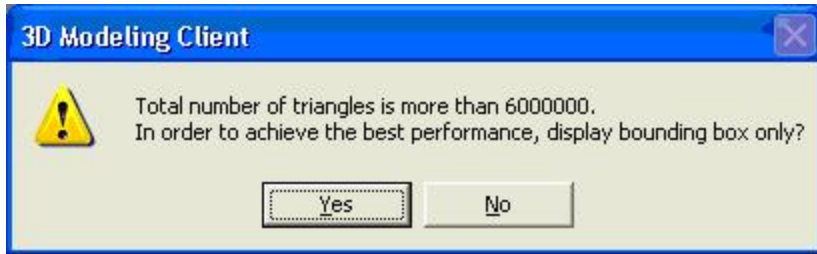


3. If the file you are trying to preview is beyond the threshold of a certain file size, the system will display one of the following two messages.

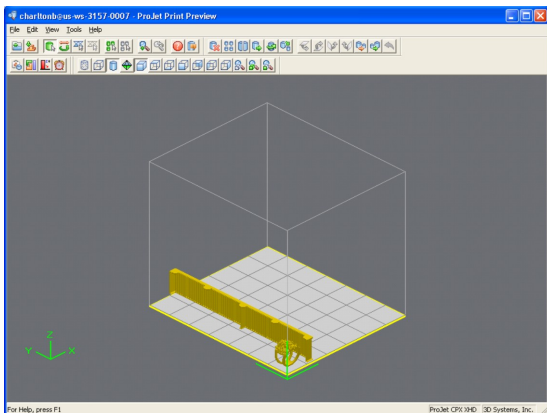
This message is displayed if the file size of the individual part is larger than 100 MB, (1,000,000 triangles).



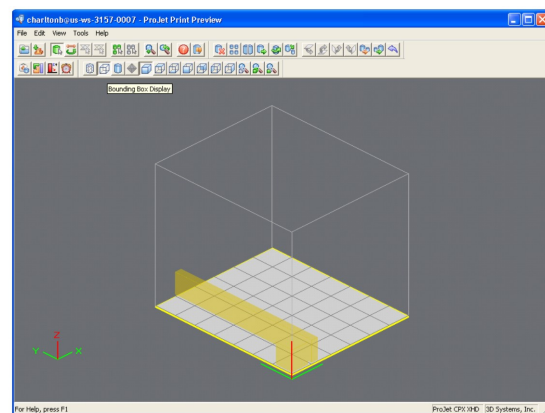
This message is displayed if the accumulated file size of multiple parts exceeds 300 MB, (6,000,000 triangles).



If you click **Yes**, the system will automatically switch to the **Bounding Box Display**. The **Bounding Box Display** only displays the bounding extents of a given geometry and does not try to resolve the triangles required to display an entire geometry. This is demonstrated in the figures below which show the conventional Shaded Display on the left and a Bounding Box Display on the right.

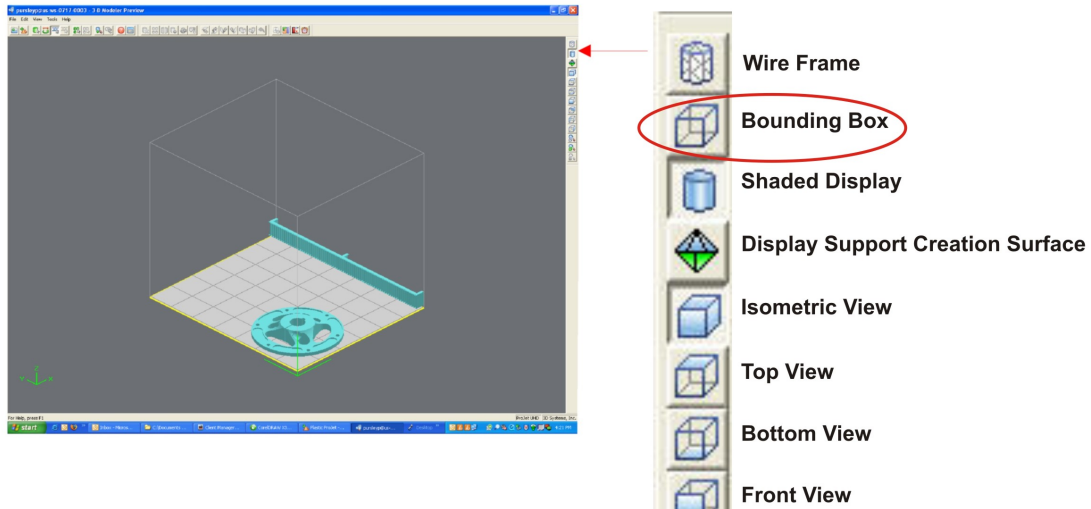


Shaded Display



Bounding Box Display

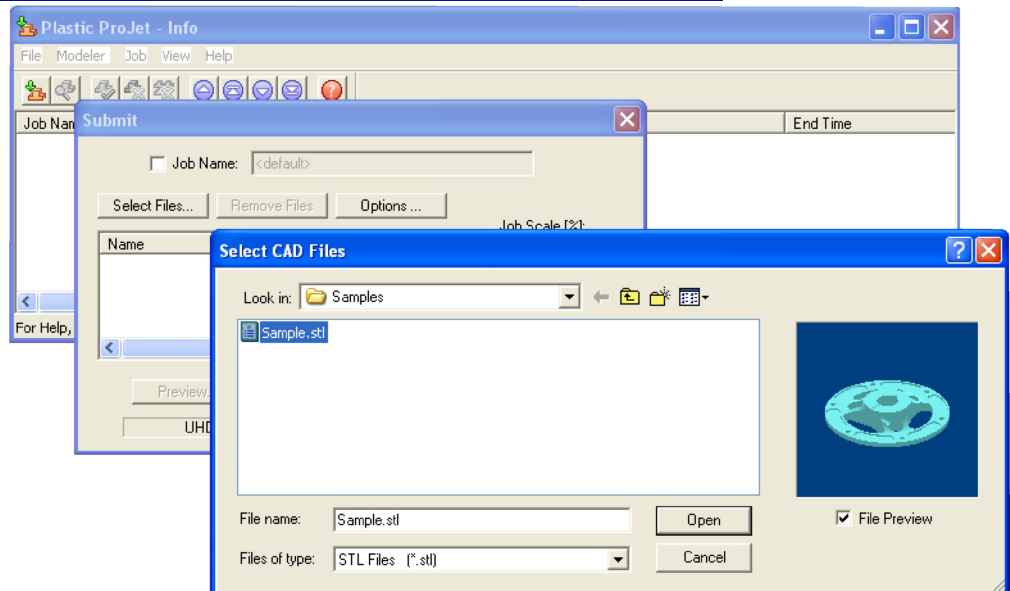
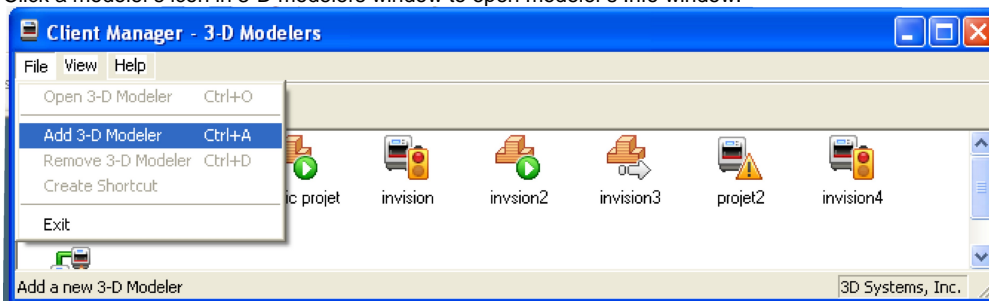
It is not mandatory to switch to Bounding Box Display. However, doing so will allow Print Preview the ability to load more parts into a single build envelope. The user can also access the Bounding Box Display manually via the "Views" toolbar, by clicking on the "Bounding Box Display" icon.



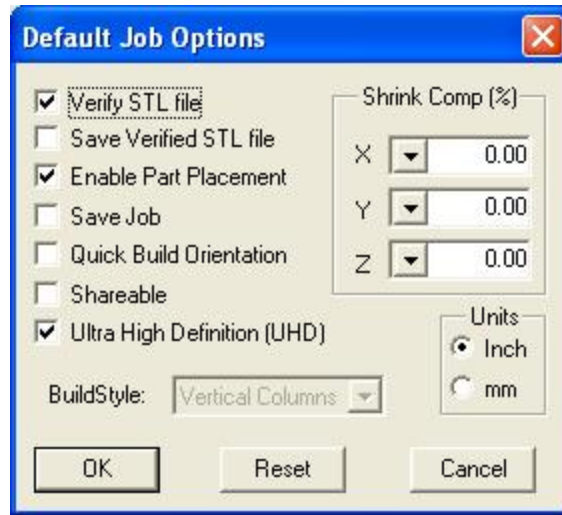
## 8.2 Save a Build Job

Prepare and save build job(s) on your PC. Later, submit the job, skipping preparation steps. A saved job is specific to a single PC and can only be built or deleted from that PC.

1. Click a modeler's icon in 3-D modelers window to open modeler's Info window.



2. Select Job name to be saved.
3. Choose **Job > Default Options**.

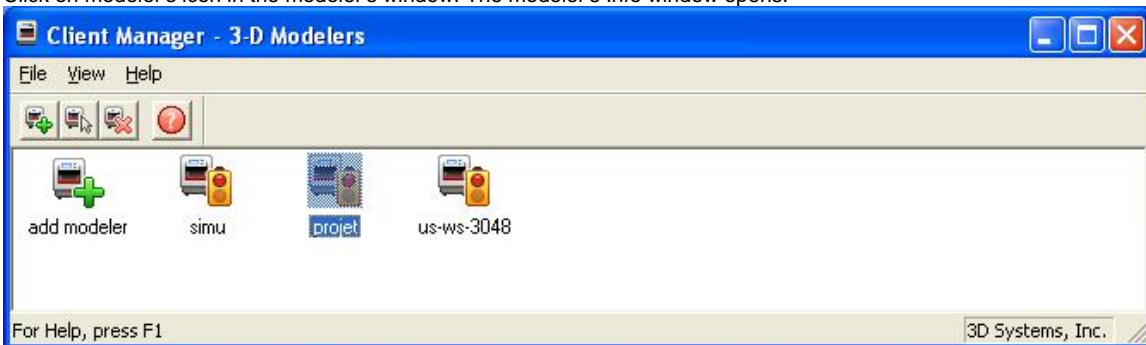


4. In the Default Job Options, select **Save Job**, then click **OK**.

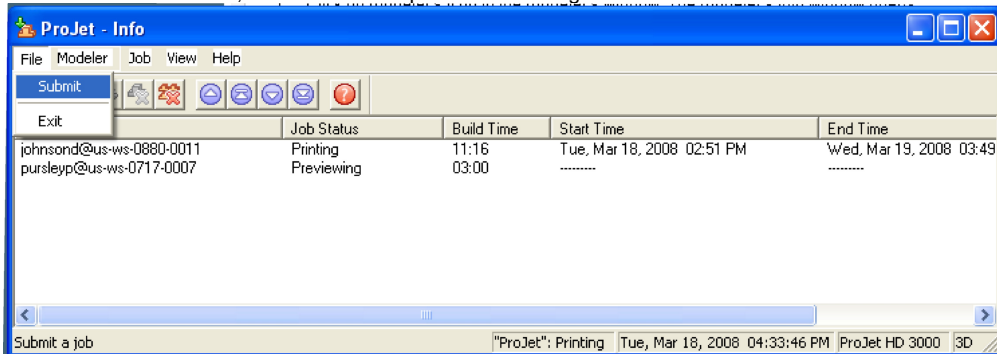
NOTE: Jobs to modelers' queue cannot be saved unless Save Job was selected. When a build job with the Save Job option enabled reaches Pending status, another job (with the suffix "\_s") is added to the queue. For more information see [Saving, Repeat, and Confirming Build Jobs](#) in your ProJet Client online Help for more information.

## 8.3 Submit a Build Job

1. Click on modeler's icon in the modeler's window. The modeler's Info window opens.

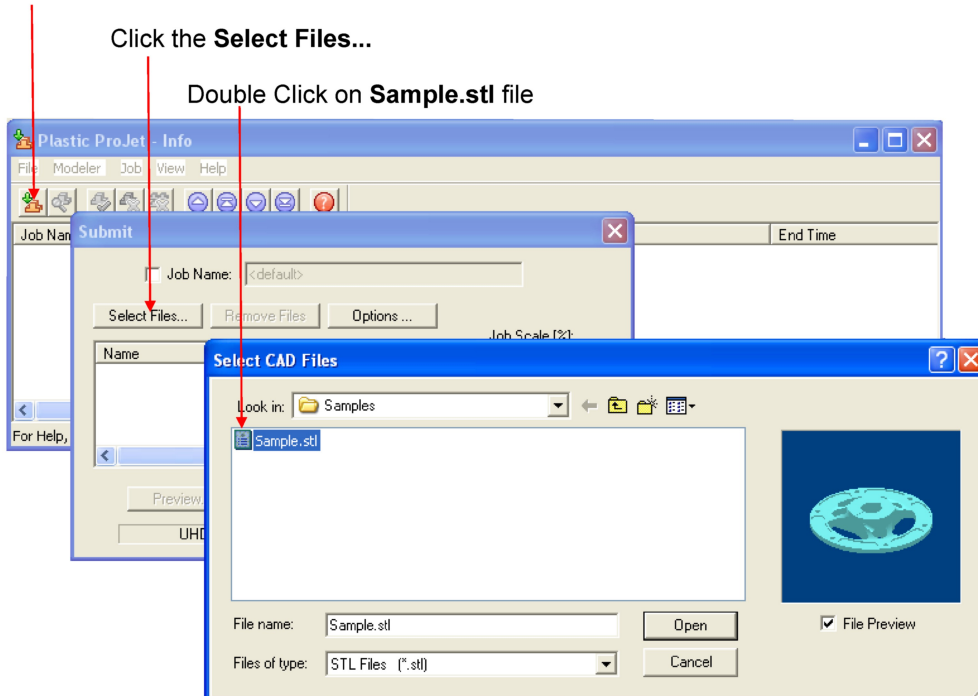


2. In modeler's Info window, click **Submit** to open Submit dialog box.

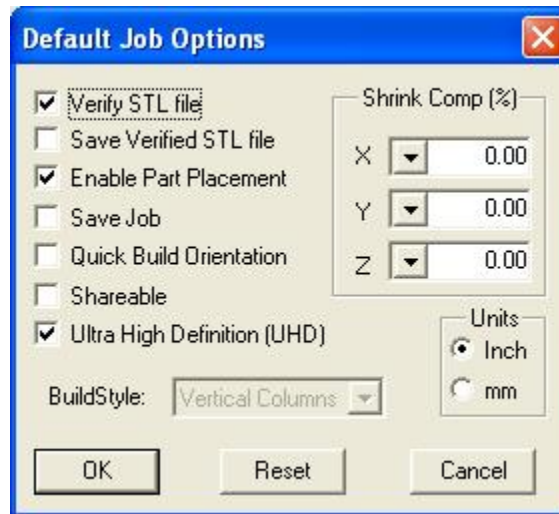


3. Click **Select Files** on the Submit dialog box to add one or more parts to the build job. **NOTE: More than one STL file can be selected at a time.** In Select CAD Files dialog box, hold down the Ctrl key and click on several STL files. Add parts in Preview window. After you have added at least one STL file, use Preview window to view build jobs in three dimensions, and to add more STL files if desired.

Sample STL files are in the \3-D Modeling Client\Samplesfolder.  
Click the **Submit** icon



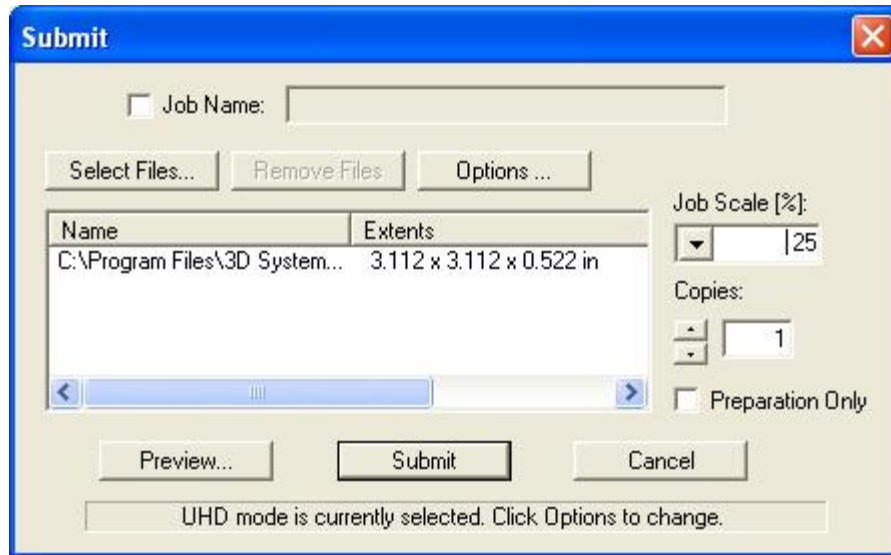
4. Browse files in Select CAD files window. When files are selected, file names appear in build job parts list of Submit dialog box.
5. Click **Options...** button on Submit dialog box. The Default Job Options dialog box appears.



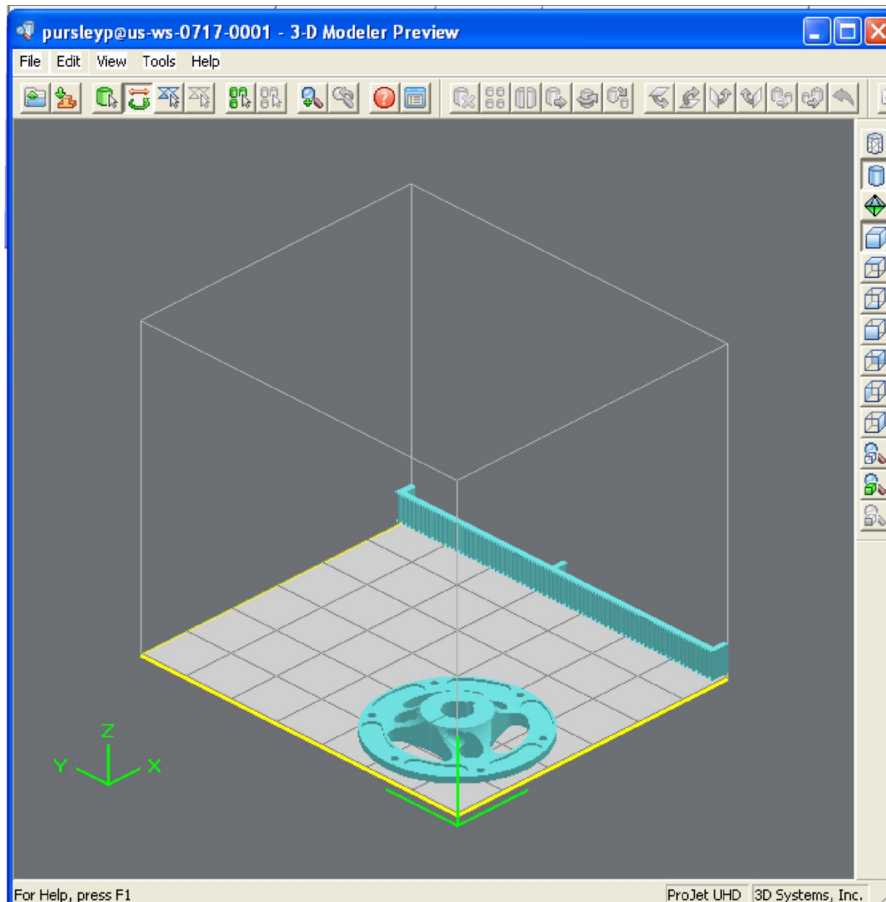
6. Change or reset values, such as Build Style, Shrink Comp (%), and Units. (See "Default Job Options Dialog Box" in the 3-D Modeling Client online Help for job options definitions.)

Parts shrink in X and Y. The degree of shrinkage depends on part geometry. To improve part accuracy, apply the X, Y, and Z Shrink Comp (%) values then measure your parts and refine these values. Refer to 8.10 Shrink Compensation for ProJet VisiJet® Materials.

7. Click **Preview** on Submit dialog box. If the file you are trying to preview is beyond the threshold of a certain file size, the system will automatically access the **Bounding Box Display** feature. See Section 8.1 Preview Build Job for details.



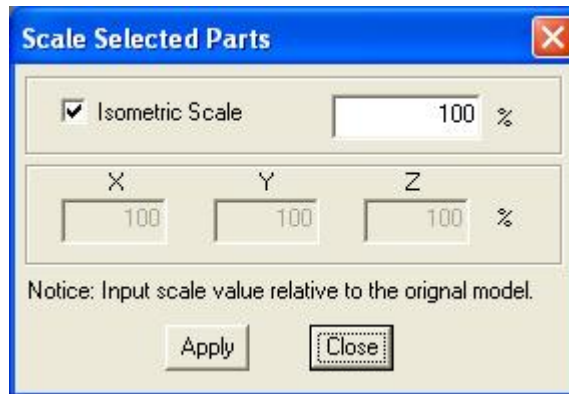
8. Manipulate parts interactively in the Preview window's virtual modeler 3-D build workspace.



9. If required, resize all parts in build job by the same scale factor, enter a Job Scale % in the Submit dialog box before clicking **Submit**. To resize some of the parts of your job, use **Edit > Scale** in Preview. (See the topic "**Previewing Print Jobs > Scaling Parts**" in your ProJet Client online Help for instructions.)

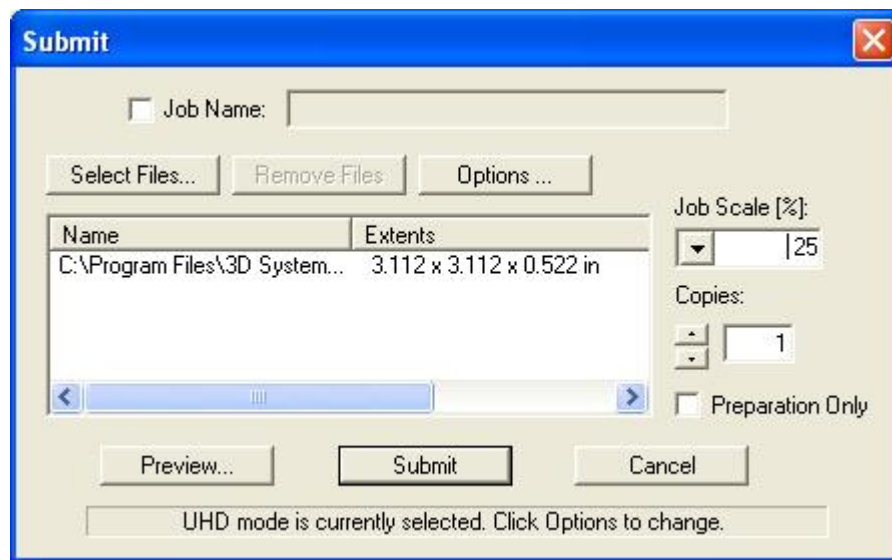


NOTE Applying Job Scale % (or scale percentage(s) using **Edit > Scale** in Preview)) is different than applying Shrink Comp % values in the Default Job Options dialog box. Applying scale percentages changes "nominal" part dimensions in the STL file(s). Applying Shrink Comp percentages does not change nominal part dimensions in the STL file(s). Rather, Shrink Comp adjusts for expected shrinkage during the build so the actual final part dimensions more closely match the nominal dimensions.

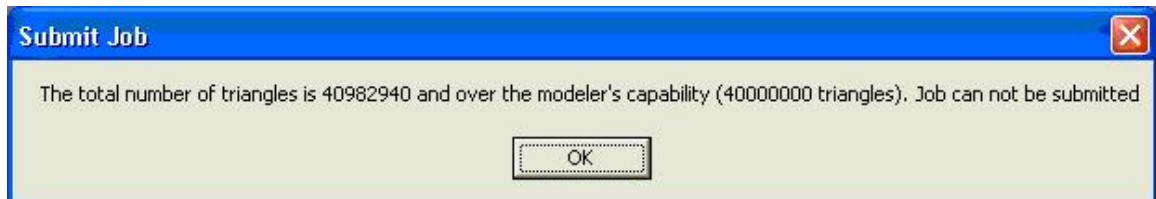


10. See Section 8.1 Preview Build Job.

11. Click **Submit** on Submit dialog box if you did not preview the job, or click **Submit** toolbar button in the Preview window if you did preview the job.

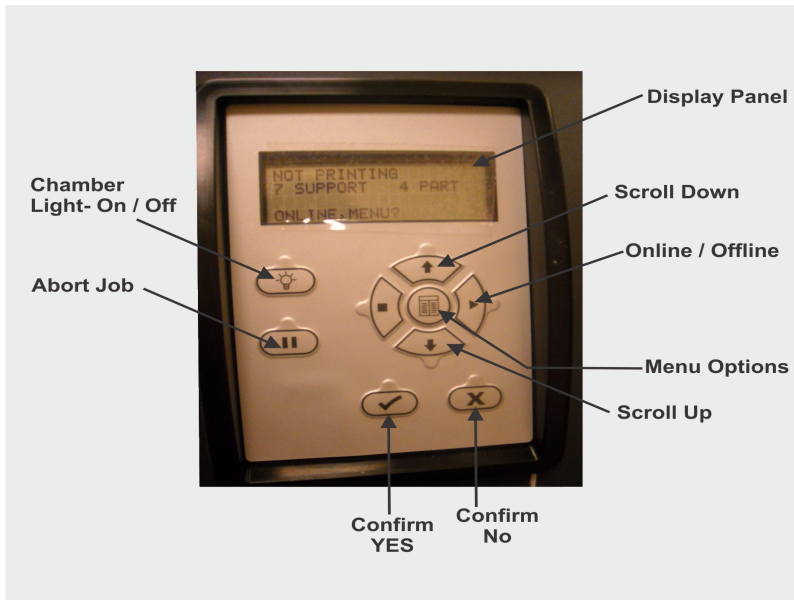


Both the 3-D Modeling Client and Print Preview now check to make sure that the maximum allowable accumulated build file size on the machine is not exceeded during job submission. The maximum threshold for job submission is roughly two gigabytes or 40,000,000 triangles. If a User attempts to submit a job to the build queue that exceeds this threshold, the following message will be displayed.



12. The build job submitted will be built when modeler is ready unless:

- It is **OFFLINE**, in which case press the **ONLINE** button on the modeler's panel.



- It does not have a clean build platform installed; install clean one and press **ONLINE**.
- The Preparation Only option in the Submit dialog box was checked. This causes the modeler to wait until the build job was confirmed before building --- enabling you to change the job in the Preview window again before confirming.

NOTE	See "Checking modeler Status" and "Confirming Build Jobs" in the online Help for more information.
------	--

- When the Operator panel LCD shows **PLATFORM EMPTY? Y/N**, verify platform is clean and free of debris. If required, press **NO** and remove build platform from the modeler to replace.

NOTE:	Prior to installing a build platform verify both sides of platform and x-carriage mating surface are free and clear of debris.
-------	--

- Open chamber door and carefully position rear of clean platform onto X-carriage under tab on back of X-carriage.
- Lower platform onto X-carriage. While holding onto platform tabs close latch. Ensure latch clicks.



- Close chamber door and press **ONLINE**. When the Operator panel LCD shows **PLATFORM EMPTY? Y/N**, press **YES**. If the display shows please **empty** waste or next build will exceed waste capacity, open the waste drawer and dispose of waste material.

- Close waste drawer. The job starts automatically.



NOTE	If the display shows <b>WAITING FOR JOB</b> , no jobs are in the modeler's queue. Go back to Step 2 and submit a build job to the queue. Once in the queue, the job starts automatically.
------	---

18. Refer to [Manage](#) build jobs for additional information.

### 8.3.1 Remove Build Platform

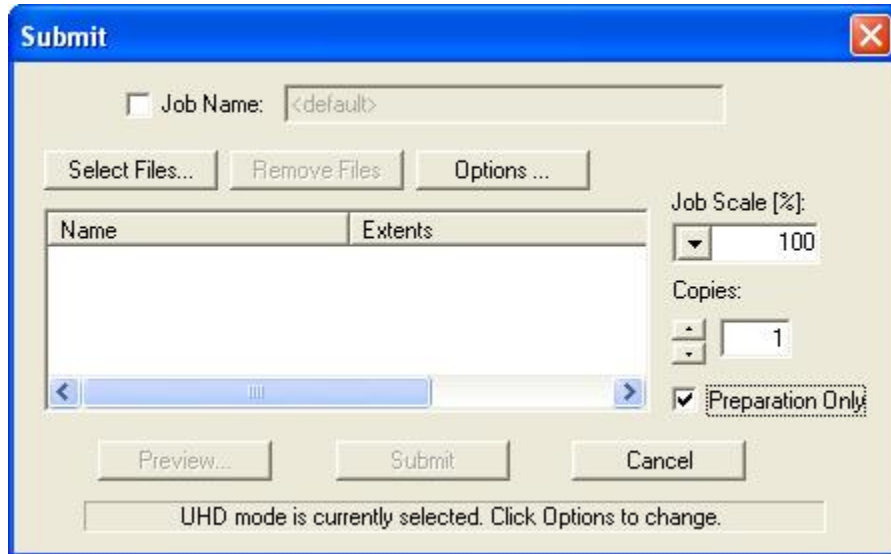
When operator panel display shows \*DONE: <job\_name> remove build. Hold X-carriage when removing platform from modeler to prevent damage of sensors.

1. Open chamber door.
2. Open latch securing build platform by pressing inward and releasing.
3. Lift up build platform and pull out, then [install](#) a clean platform or close chamber door.

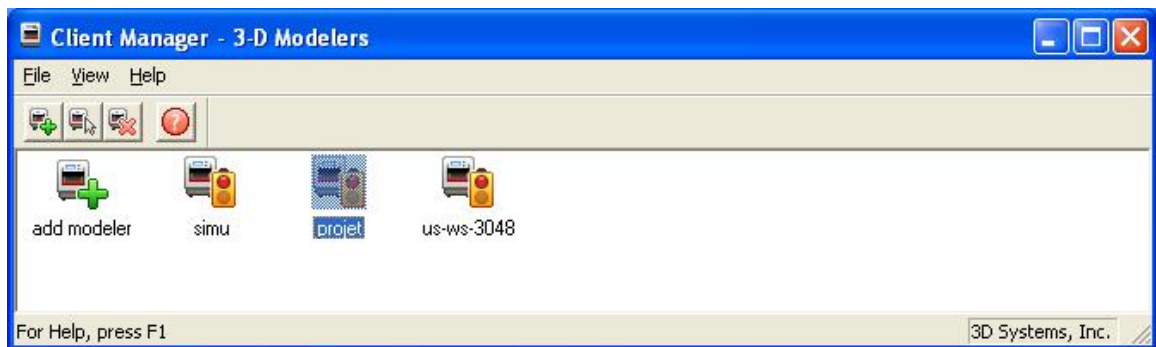


## 8.4 Manage Build Jobs

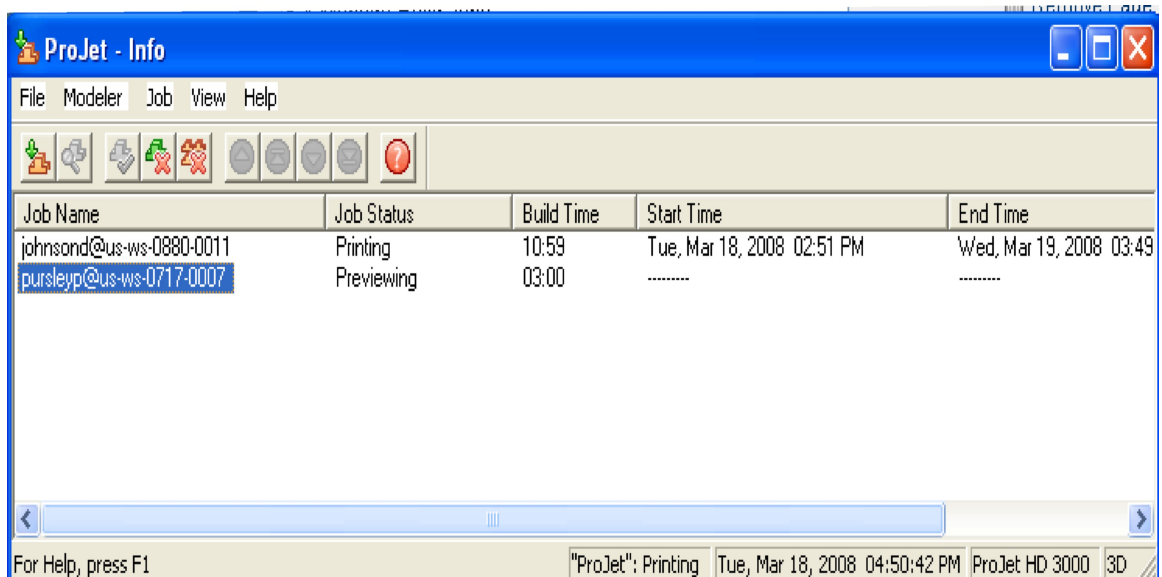
The client software will not send build jobs to the modeler until job confirmed by selecting **Preparation Only** checkbox on Submit dialog box or resubmit a saved build job.



1. Click modeler's icon in client software to open modeler's Info window.



2. Select build job with **Job Status** of **Needs Confirm** or **Saved**.
3. Click **Confirm** button or choose **Job > Confirm** located on the tool bar of the modeler window.



- Click **Yes**. Job is sent to modeler as soon as it's available.



A **Needs Confirm** build job status immediately changes to **Pending** when confirmed.

**NOTE** Confirming saved jobs generates a Pending build job whose name lacks the "\_s" suffix. However, saved jobs remain in the queue.

#### 8.4.1 Delete Build Jobs

#### 8.4.2 Pause Build Job

#### 8.4.3 Abort Build Job

#### 8.4.4 Repeat Build Job

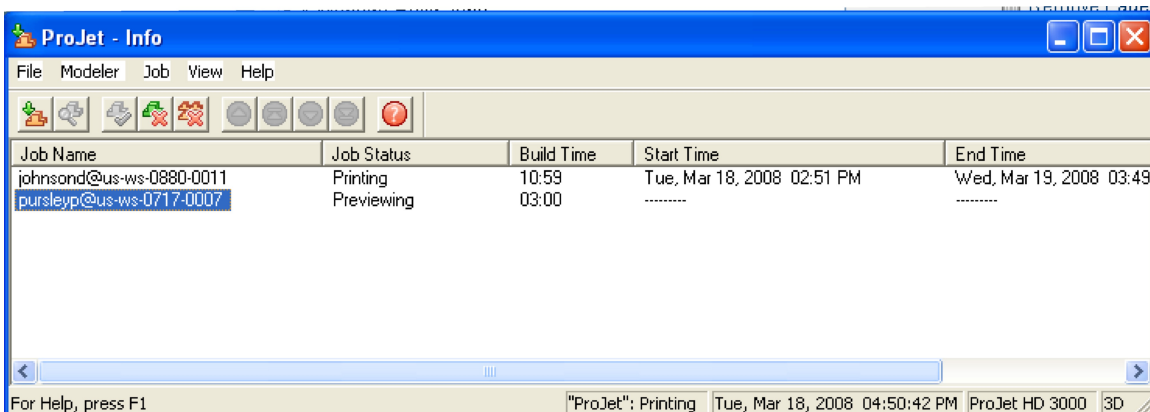
### 8.4.1 Delete Build Jobs

Follow the instructions below to delete one or more jobs from the queue after you submitted.

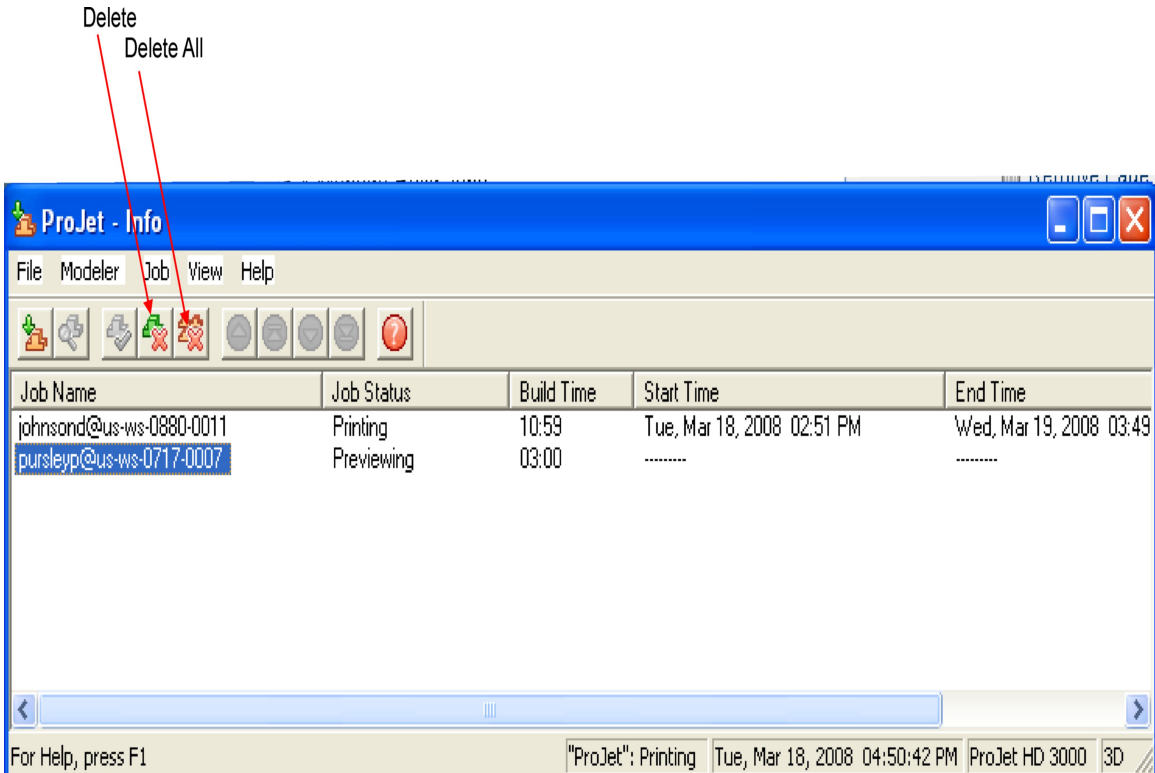
- Click on modeler's icon in modelers window to open Info window.



- Select build job(s) to delete. (Ctrl-click to select several jobs.)



- Click **Delete** or **Delete All** button or choose **Job > Delete** or **> Delete All**.



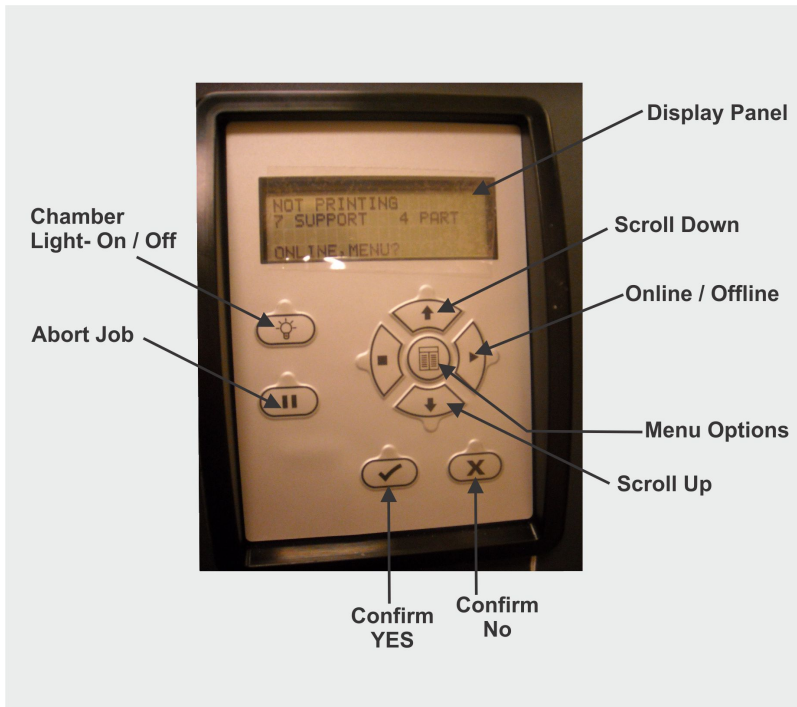
- To delete all jobs, click the **Delete All** button or choose **Job > Delete All**. If you use **Delete All**, and there are saved jobs, the ProJet Client will ask you if you want to delete saved jobs as well as other ones.



If you delete a job that is currently building; this aborts the operation. However, the job status will continue to show as "Building" at the PC until deletion is confirmed at the modeler.

## 8.4.2 Pause Build Job

- Press **PAUSE**. When display shows **PAUSE JOB? Y/N**, press **YES** to pause building or **NO** to keep building.



- The modeler keeps building after pressing **PAUSE** while it displays **PAUSE JOB? Y/N**. If **YES** was pressed in response to **PAUSE JOB? Y/N**, the modeler completes current layer or its current task. Then moves the platform forward while chamber door and waste drawer remain locked. Press **PAUSE** again to resume paused job. If you don't press **PAUSE** again, the paused job resumes automatically after 5 minutes.
- If you press **NO** in response to **PAUSE JOB? Y/N**, the job does not pause and the confirmation prompt disappears.

### 8.4.3 Abort Build Job

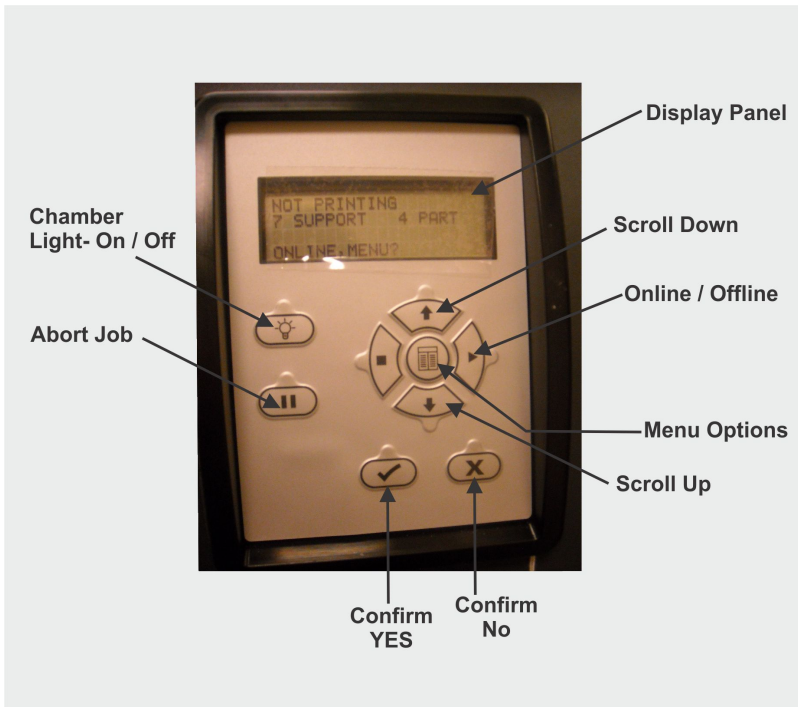
Press **ABORT**.

When display shows **ABORT JOB? - Y/N**, press **YES** to abort the build job or **NO** to continue. The modeler keeps building after you press **ABORT** while it displays **ABORT JOB? - Y/N**. If you press **YES** in response to **ABORT JOB? - Y/N**, the modeler does the following:

- Stops building immediately.
- Displays waiting for DSP (Digital Signal Processor) done.

NOTE:	Abort does not finish the current layer or current task.
-------	--

- Displays **Finishing Build** while it cures any uncured material on the platform.
- Displays **Raising Printhead** as it raises the printhead.
- Moves the platform forward and unlocks the chamber door.
- Displays:  
**abort: <job\_name>**  
**remove print**



If you press **NO** in response to **ABORT JOB? - Y/N**, the job does not abort and the confirmation prompt disappears.

You can now [remove](#) the platform.

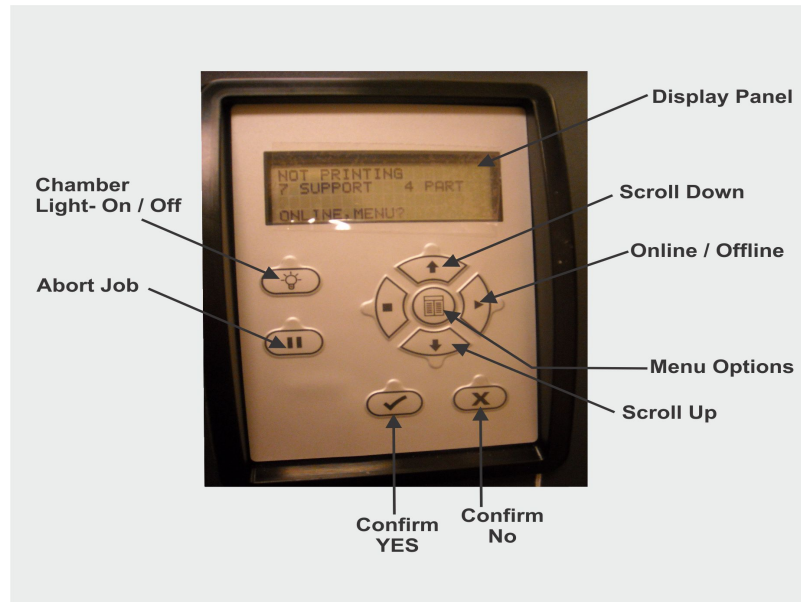


#### 8.4.4 Repeat Build Job

**NOTE:** Do not select Repeat from the Operators Panel after a test print.

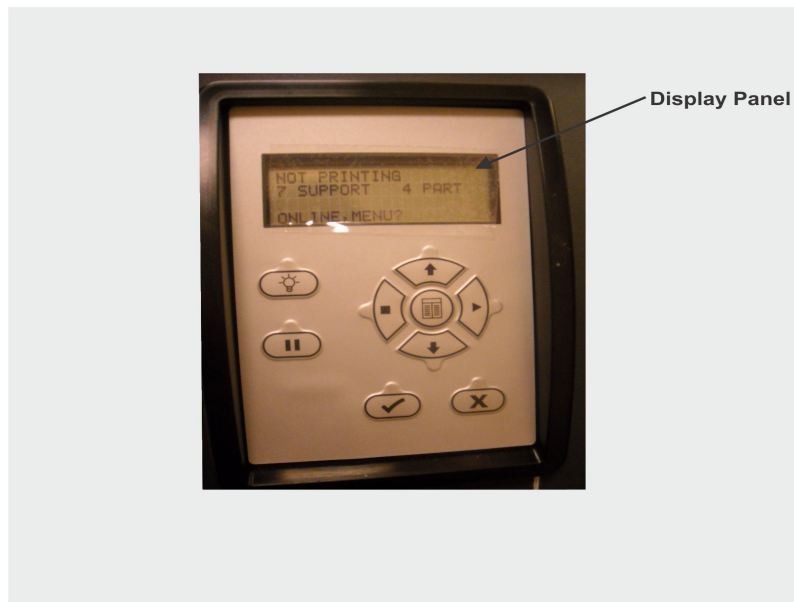
1. Press **MENU**, scroll to highlight **REPEAT BUILD**. # Press **YES**; the system displays **PLATFORM CLEAR? Y/N**.
2. When platform is clear, press **YES**. The modeler repeats the previous build job.





## 8.5 Modeler Status

To view the status of the modeler, observe the Liquid Crystal Display (LCD) Panel located on the user interface for elapsed build time, Build time remaining, material information, job status, name, time remaining on build, error messages, and System Statistics.



## 8.6 Empty Waste Drawer

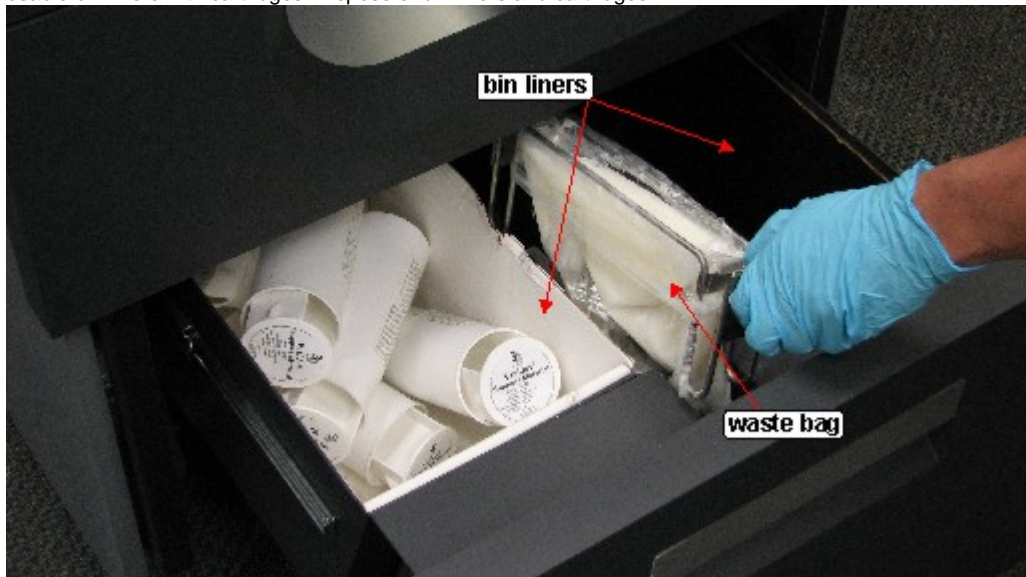


Personal protection equipment is required before opening waste drawer. Follow all material handling and disposal guidelines. Always follow MSDS guidelines and local regulations regarding handling and disposal of regulated materials. Keep disposal records if local law requires.

1. Open waste drawer.



Remove disposable bin liners with cartridges. Dispose of bin liners and cartridges.



2. If full, remove, close, and properly dispose of waste bag.
3. Install new waste bag onto bracket. Tilt bracket with waste bag and install flag into slot in back of waste drawer. Ensure bracket is properly seated on mounting bracket. Install new bin liners.
4. Close waste drawer and press **ONLINE** to resume.

## 8.7 Shutdown Modeler



**WARNING:** Switching off or disconnecting the modeler's power without going through a shutdown process can severely damage the modeler. Always perform shutdown procedures before switching off modeler's power unless power must be disconnected immediately for safety reasons.

The modeler can take several hours to warm up after being shutdown and switched off. Before shutdown and switching off, verify no need to build parts again soon.

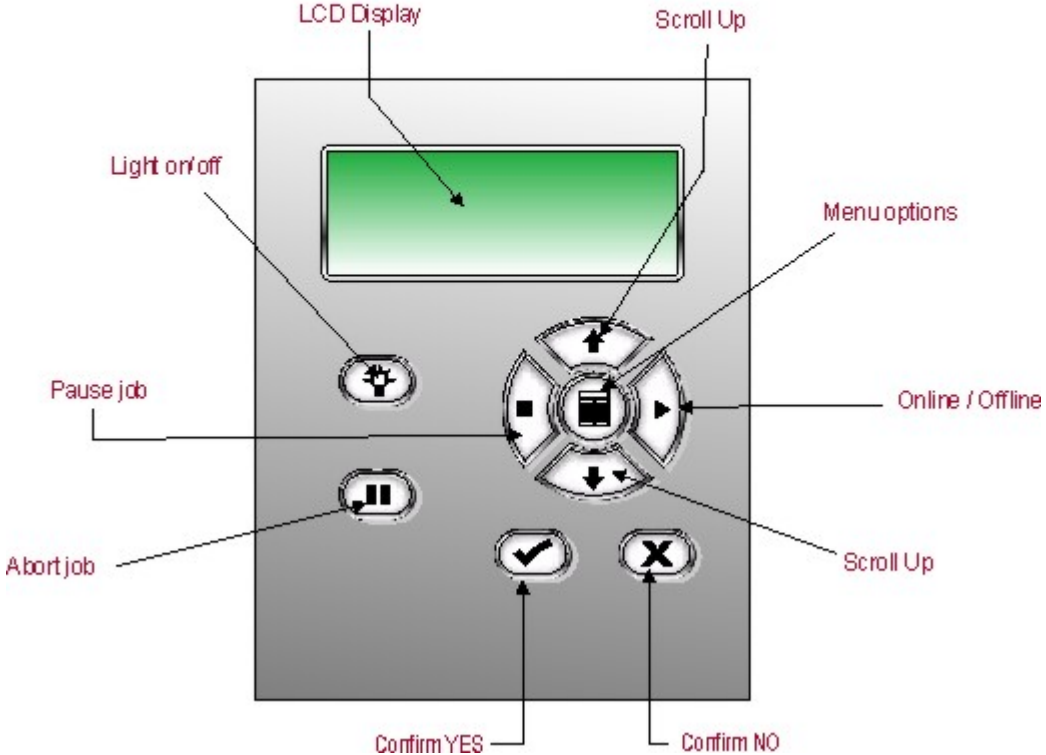
Mode	Clamp Feed
Standby	15 Min.
Conserve	25 Min.
Initial Pwr Up	90 Min.

NOTE:	It is recommended to leave your modeler in either standby or conserve mode instead of shutting down if the modeler is to be used within 7 to 10 days of last build.
-------	---

After modeler is idle 2 hours or 72 hours, it enters Standby or Conserve mode, respectively. In these energy-saving states, the modeler's heaters are partially cooled and many other components are disabled. The heaters are cooler in Conserve mode more than Standby mode. It takes much less time for the modeler to warm up from Standby or Conserve mode than it does from full shutdown/power off. Warming up from Conserve mode takes more time than from Standby.

NOTE	To increase or decrease wait time before the modeler enters Standby mode or Conserve mode, contact 3D Systems <a href="#">Technical Support</a> .
------	---

1. Verify modeler is not building.
2. **Abort** current build job.
3. Press **MENU**, scroll to highlight **SHUTDOWN**.



4. Press **YES** twice.
5. When the display shows **OK TO POWER OFF XXX**, press the power switch on the rear panel.



NOTE: To halt shutdown, press **ONLINE** before you press the power switch.

## 8.8 Remove Part from Build Platform

Remove build platform from modeler. Refer to [Manage build Jobs](#).

- Place warm platform of parts in a freezer for a few minutes. As the parts and platform cool, they contract at different rates and separate.
- Alternatively, the parts can be mechanically separated from the build platform by force using a tool such as a thin blade.

## 8.9 3D Modeling Batch Submission for Production Environment

The Modeler Batch Processor allows users to prepare/send jobs and inquire job status for multiple 3D modelers across networks without using 3D Modeling Accelerator Client software, which requires human interactions. It is compatible with various 3D Systems' supported 3D Printers, including ProJet, InVision, and ThermoJet.

The ModelerBatch.exe application reads the job parameters from the given parameter file (.ini file), then prepares, packs and sends the jobs to a designated printer. The ModelerStatus.exe application allows the user to inquire the job status on a designated printer for both current and previous jobs including "printing", "pending", "completed", and "aborted".

### Modeler Batch Processing

#### Setting Job Parameters via INI File

Before running the ModelerBatch.exe, a text file must be created that specifies the desired parameters for the pending job. See example below:

```

sample.ini - Notepad
File Edit Format View Help
[JOB PROPERTIES]
IP Address = 000.000.000.000
Number of Parts = 4
Part1 =C:\StlModel\Part1.stl
Part2 =C:\StlModel\Part2.stl
Part3 =C:\StlModel\Part3.stl
Part4 =C:\StlModel\Part4.stl
Auto Part Placement = NO
Max Extent X = 70.00
Sharable = Yes
Quick Build = No
Dual Mode UHD=Yes
Verify = No
Shrink Factor X = 0
Shrink Factor Y = 0
Shrink Factor Z = 0
Support Style = Standard
Units = mm
Job Scale %= 100.00
Number of Copies = 1
Save Job = NO
Save verified STL = NO

[JOB PREPARE]
Wait Timeout=3600
Display Error Msg = Yes
Ln 1, Col 1

```

All the job parameters are categorized into two sections:

- Job Properties
- Job Prepare

The table below provides a description of the ModelerBatch INI parameters.

Parameter Name	Default Value	Description	Section Name
IP Address	N/A	IP address of the designated modeler, e.g., 192.168.0.2 or 192.168.000.002	Job Properties
Number of Parts	0	Total number of parts in the job	Job Properties
Part#	N/A	Full path and name of the STL/CTL file. # must be replaced with numbers which start from 1, e.g., Part1, Part2, and Part3 ... The total number of parts must be consistent with the total number of parts. If a file name is one of: Modeler_Verification_Strip.STL Modeler_Verification_Strip_InVision.STL Modeler_Verification_Strip_ProJet.STL Modeler_Verification_Strip_ProJetCPX.STL ...then the file is the verification strip.	Job Properties
Auto Part Placement	No	Valid values are "Yes" or "No". If Yes, the Batch Processor performs auto part placement. If No, the parts will not be auto placed. However, the users should ensure the part sizes and positions are appropriate.	Job Properties
Max Extent X	dPlatExtX	Max job volume X extent, which is used to position the verification strip for optimal build speed. The default value is the max platform X extent, which is 6 inches for ProJet 3000 in high resolution mode.	Job Properties

Sharable	No	Valid values are "Yes" or "No", which specify if the print job will be shared with other jobs in the printer. The print job will not be shared if this field is absent.	Job Properties
Quick Build	No	Valid values are "Yes" or "No", which denote whether the parts should be oriented in the printer to save print time. Quick build part placement will not be performed if this field is absent.	Job Properties
Dual Mode UHD	Yes	Valid values are "Yes" or "No", which specify if ultra high resolution (UHD) mode is used to build the parts. UHD will be used if this field is absent. This option is only valid for the modelers with dual-mode capability.	Job Properties
Verify	No	Valid values are "Yes" or "No", which specify if verify needs to be performed on the parts. Verify will not be performed if this field is absent.	Job Properties
Shrink Factor X Shrink Factor Y Shrink Factor Z	0.0	The corresponding shrinkage compensation factors desired in percentage. These fields will default to 0 if absent, which means no shrinkage compensation is added.	Job Properties
Supports Style	Standard	This key defines the type of supports desired. The Standard supports type will be used if this field is absent. Valid values are Standard, Vertical Columns, Universal Std, or Universal HiRes.	Job Properties
Units	Inch	This key defines the units for the job. The units will default to Inch if this field is absent. Valid values are Inch or mm.	Job Properties
Job Scale %	100.0	The key indicates the scaling desired for the print job. The scale will default to 100% if this field is absent.	Job Properties
Number of Copies	1	This key defines the number of copies of the specified parts in the list. The default is to create one copy for each part in the job.	Job Properties
Save Job	No	The key is used to specify whether the job is to be saved in addition to printing. The job will not be saved if this field is absent. Valid values are Yes or No.	Job Properties
Save Verified STL	No	The key is used to specify whether the verified STL is to be saved in the same folder of the STL file using the name STLFileName_v.stl. The verified STL will not be saved if this field is absent. Valid values are Yes or No.	Job Properties
Wait Timeout	3600	The key denotes the allowed wait time to send jobs from the client to the modeler. The wait time depends on the client computer and network speeds. If the wait is more than the allowed wait timeout, the ModelerBatch.exe will be aborted. The default allowed wait timeout is 3600 seconds (or 60 minutes).	Job Prepare
Display Error Message	Yes	The key denotes whether to display an error message dialog (i.e. - Pop-up message) if any error happens.	Job Prepare

### Running the application

The ModelerBatch.exe application can be invoked from command line or program. The command line format is as follows:

**RootDir**\bin\ModelerBatch.exe IniFile **ReportFile**

Descriptions:

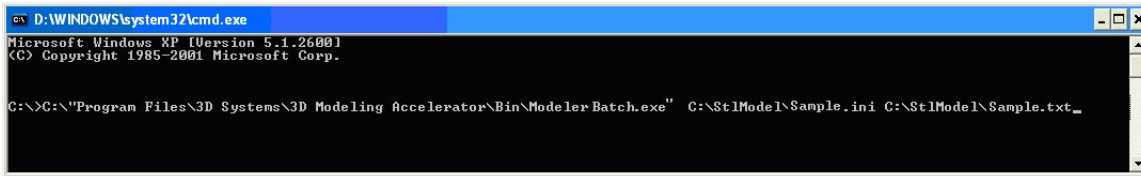
**RootDir** - the installation folder of the ProJet client, which can be obtained from the registry by using:

Key = "HKEY\_LOCAL\_MACHINE\SOFTWARE\3D Systems\3D Modeling Accelerator"  
Name= "RootDir"

**ReportFile** - returns a report to a specified file on the job submission

Note: If a filename is not specified for the report file, the data will be written to a default file named ReportFile.txt. This file will be overwritten every time the modelerbatch.exe or modelerstatus.exe applications are run without a report file specified

The DOS window show below is an example of running the ModelerBatch.exe via command window.



```
D:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

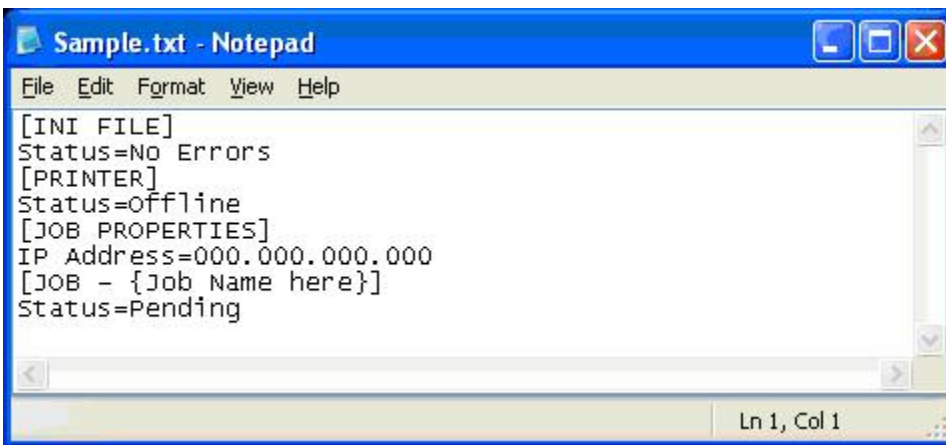
C:\>C:\Program Files\3D Systems\3D Modeling Accelerator\Bin\ModelerBatch.exe C:\StlMode1\Sample.ini C:\StlMode1\Sample.txt_
```

Note: If any of the directories specified in the command script have folders with spaces in the folder name quotes will be required around the directory structure for the script to work. If no spaces are present, the quotes are unnecessary.

Example: "C:\Program Files\3D Modeling Accelerator\Bin\ModelerBatch.exe"

### Output Report

After a successful run of the modelerbatch.exe application, the job will be submitted to the designated modeler's build queue and the application will output a report (ReportFile or IniFile) to the location designated in the command script. The figure below is an example of the report output after the ModelerBatch.exe completion.

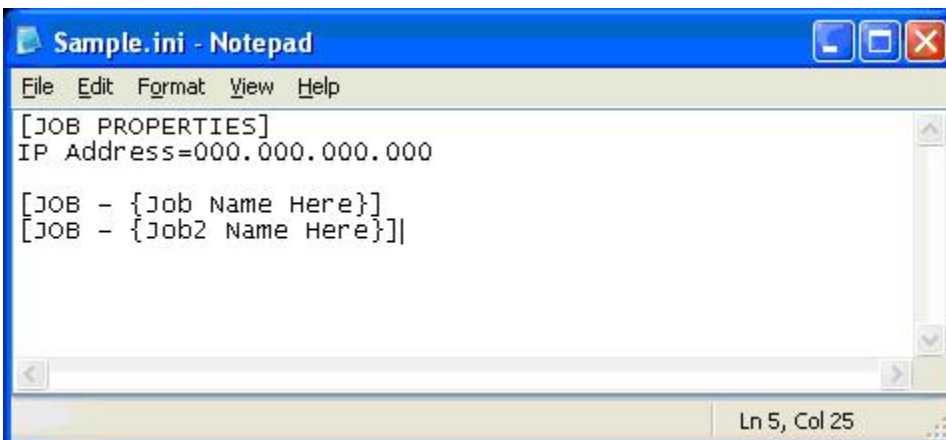


```
Sample.txt - Notepad
File Edit Format View Help
[INI FILE]
Status=No Errors
[PRINTER]
Status=Offline
[JOB PROPERTIES]
IP Address=000.000.000.000
[JOB - {Job Name here}]
Status=Pending
Ln 1, Col 1
```

### Modeler Status Reporting

#### Setting up Status INI File

Before running the ModelerStatus.exe, a text file must be created that specifies the desired machine. See example below.



```
Sample.ini - Notepad
File Edit Format View Help
[JOB PROPERTIES]
IP Address=000.000.000.000

[JOB - {Job Name Here}]
[JOB - {Job2 Name Here}]
Ln 5, Col 25
```

The table below provides a description of the ModelerStatus INI parameters.

Section Name	Parameter Name	Default Value	Description
JOB PROPERTIES	IP Address	N/A	IP address of the designated modeler, e.g., 192.168.0.2 or 192.168.000.002
JOB - JobName	N/A	N/A	The job names are not necessary to request current modeler status. However, individual job status will only be returned to the output ReportFile if the job names are specified in the INI file. The job name is formatted as "JOB - username@ComputerName-####", where #### represents the 4-digit job number.

### Running the application

The ModelerStatus.exe application can be invoked from command line or program. The command line format is as follows:

**RootDir**\bin\ModelerStatus.exe IniFile **ReportFile**

Descriptions:

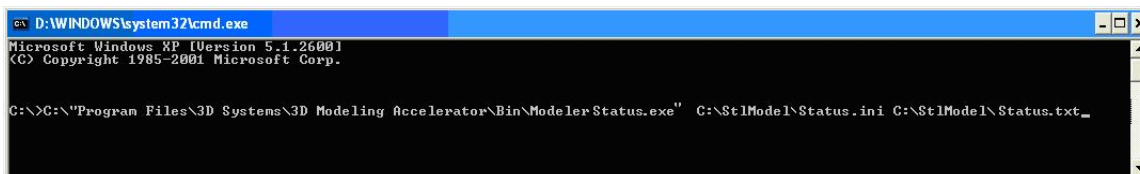
**RootDir** - the installation folder of the ProJet client, which can be obtained from the registry by using:

Key = "HKEY\_LOCAL\_MACHINE\SOFTWARE\3D Systems\3D Modeling Accelerator"  
Name="RootDir"

**ReportFile** - returns a report to a specified file on the job submission

Note: If a filename is not specified for the report file, the data will be written to a default file named ReportFile.txt. This file will be overwritten every time the modelerbatch.exe or modelerstatus.exe applications are run without a report file specified.

The DOS window show below is an example of running the Modelerstatus.exe via command window.



```
D:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\>C:\Program Files\3D Systems\3D Modeling Accelerator\Bin\ModelerStatus.exe C:\StlModel\Status.ini C:\StlModel\Status.txt
```

### Output Report

After a successful run of the modelerstatus.exe application, the application will output a report (ReportFile or IniFile) to the location designated in the command script. See example below.



```

status.txt - Notepad
File Edit Format View Help
[PRINTER]
Status=Printing
Current Job={Job Name Here}
[JOB - {Job Name Here}]
Status=Printing
Start Time=Mon, Oct 26, 2009 09:15 AM
End Time=Mon, Oct 26, 2009 04:30 PM
Total Build Time=00:15
Remaining Build Time=07:00
Complete %=2
Number of Parts=5
Ln 8, Col 23

```

If building in UHD Mode, "Number of Parts" includes the Verification Strip in the part total.

After a machine is put "Online", there is a period of time that a job takes to initialize. During that time, the Status returned will be "Not Printing" and the End Time, Total Build Time and Remaining Build Time will all report "Not Estimated". Once the state changes to "Printing", these values will be reported accurately.

### Exit Error Codes

The Modeler Batch Processing applications including ModelerBatch.exe and ModelerStatus.exe will return exit error codes if there are any issues while the application is running. The following table gives a description of each possible error code that may be reported while running either application.

Exit Error Code	Error Description	Suggested Solution
0	No Error	
500	The iniFile is not specified for batch processing	Specify the parameter IniFile as the argument
501	The specified iniFile does not exist or cannot be opened	Please make sure the IniFile exist
502	IP Address field not present	Add the IP address
503	IP address cannot be validated	Check the IP address
504	Number of Parts field does not present	The number of parts must be specified and larger than 0.
505	STL file for Part# can not be found	Missing the STL file. Make sure it exists and accessible.
506	Communication error. Unknown modeler type or unconnectable modeler.	Please check IP address.
507	Verification Strip file cannot be found.	Reinstall the client or restore the verification strip files.
508	Wait timeout.	Please verify the network and increase the wait timeout in the IniFile.
509	Cannot connect to the modeler.	Please check IP address.
510	Part outside platform or exceed platform size	Check the size and position of all parts to ensure that they will fit inside the platform
511	Too much part data for Auto Part Placement or Quick Build Placement	Please not use Auto Part Placement or Quick Build. For example, use Print Preview and manually position the geometries.

## 8.10 Shrink Compensation for ProJet VisiJet® Materials

Material shrinkage occurs in thermoplastics as they transition from liquid state to solid state during the curing process.

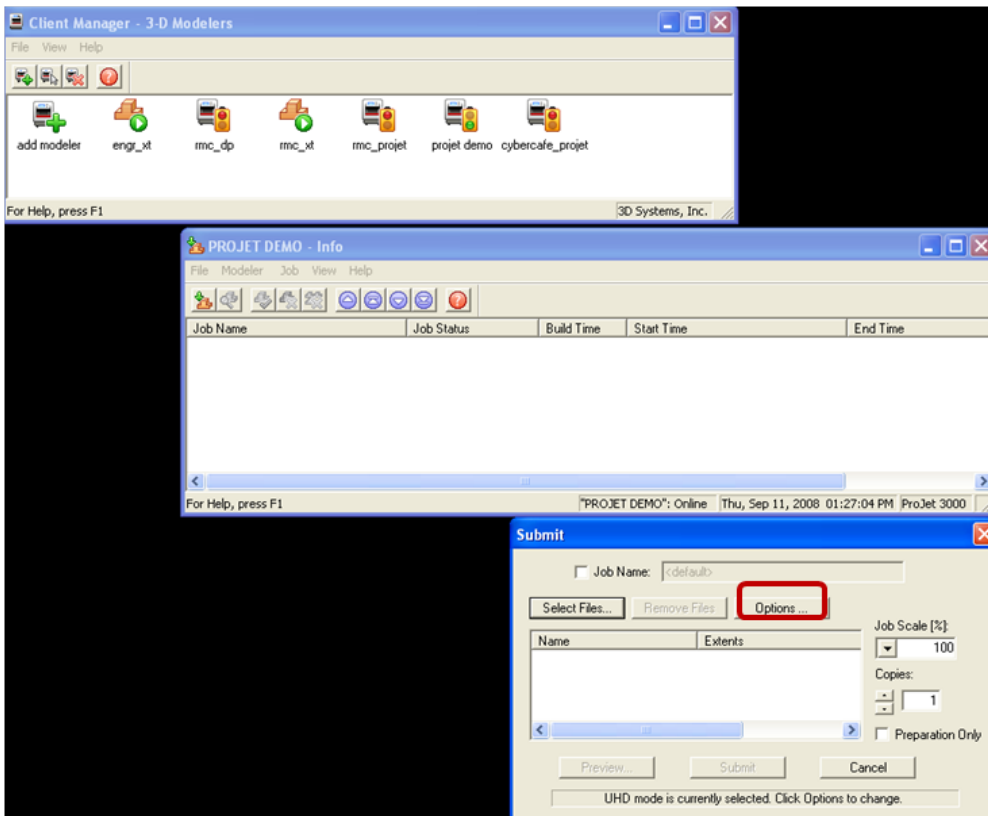
The ProJet Accelerator Client Software has features that allow the user to compensate for the natural shrinkage of the material in order to fine tune the accuracy of a part.

These shrink compensation values serve as general guidelines to setting shrink compensation. Part building and cleaning in a controlled process will best determine the optimal shrink compensation values for a particular geometry.

### SHRINK COMPENSATION VALUES FOR VISIJET® PART MATERIALS

Material	X value	Y value	Z value
SR200 (Configuration A)	1.01%	1.01%	0.00%
HR200 (Configuration A)	1.01%	1.01%	0.00%
EX200 (Configuration A)	1.01	0.75	0.00
EX200 (Configuration B)	0.50	0.25	0.00
DP200	1.01%	1.01%	0.00%
MP200	1.01	0.75	0.00

1. Enter Standard Shrink Compensation Values for the material.
  - a. Open ProJet Accelerator Client software and select the desired modeler.
  - b. Select the model to build.
  - c. Select the "Options" button.



- d. Within the Options panel, enter shrink compensations values for X or Y. Z compensation is rarely necessary (see table above for the values).\*

!Shrinkage 3.png|width=300,depth=300|align=right!|

2. Identify the exact X and Y dimensions of the part using a CAD program.
  - a. Most CAD programs and simple stl file viewers will provide a way to view a part with its dimensions.
  - b. Make note of the actual X and Y dimensions as XCAD and YCAD.

3. Build and clean the part and take measurements of the finished part.
  - a. It is recommended to measure along the critical dimensions of the geometry, take measurements in multiple areas and take an average of the values.
  - b. Measurements can be made using calipers or more advanced metrology methods.
  - c. Make note of the X and Y dimensions of the printed part and mark them as XPART and YPART

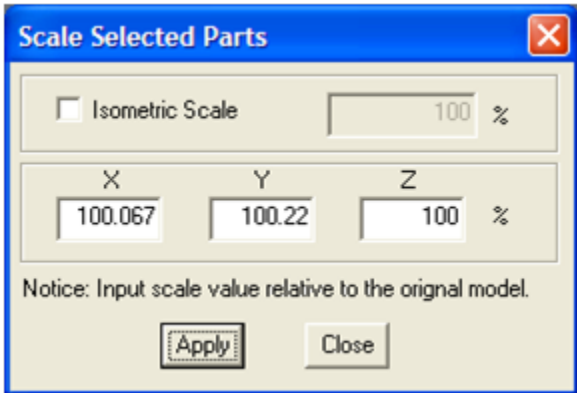
**NOTE: If the measurement of the finished part is different from the measurements of the CAD model, fine tune the accuracy using scaling factors.**

4. Determine "Scaling Factor" to use for the next build
  - a. Use the following formula calculate the scaling percentage to be used on the "fine tuning" build:

$X \text{ Scaling Factor} = (XCAD - XPART) / XCAD * 100$ (answer will be as a percentage)
$Y \text{ Scaling Factor} = (YCAD - YPART) / YCAD * 100$ (answer will be as a percentage)

<b>EXAMPLE:</b>
X measurement of CAD model = 3.000"
Y measurement of CAD model = 5.000"
X measurement of printed part = 2.998"
Y measurement of printed part = 4.989"
X Scaling Factor = $(3.000 - 2.998) / 3.000 * 100 = 0.067\%$
Y Scaling Factor = $(5.000 - 4.989) / 5.000 * 100 = 0.22\%$

5. Enter "Scaling Factor" for adjustment build
  - a. Open ProJet Accelerator Client software and select the desired printer.
  - b. Select the model to print
  - c. Open Print Preview to view the model. Select the model (color should be yellow)
  - d. Select the "Scale" Icon and enter the dialog box to enter the above scaling factors.
  - e. Uncheck the "Isometric Scale" button. This allows user to make individual x and y adjustments.
  - f. In the example above the x scaling factor should be  $100\% + 0.067\% = 100.067\%$
  - d. The y scaling factor should be  $100\% + 0.22\% = 100.22\%$
  - e. Enter these two numbers in the corresponding scaling boxes for x and y.



6. Build Part with Scaling Factors and measure
  - a. Additional iterations of adjusting scaling factors and taking measurements may be necessary with certain geometries.

## 09.0 Maintenance

The following general maintenance procedures provided must be accomplished to help maintain high part yield and low modeler down time.

- 9.1 Cleaning Surfaces
- 9.2 Cleaning the Waste Drawer
- 9.3 Preventive Maintenance
- 9.4 Return Modeler for Repair

## 9.1 Cleaning Surfaces

- Do not remove any outer panels when cleaning the modeler. Panels must only be removed by qualified 3D Systems Technical Support Representatives.
1. Remove dust from outer surfaces of modeler(s) wiping with a clean, dry, lint-free cloth.

**NOTE** Dust and clean outside surfaces only. Do not dust inside build chamber or feed slots.

2. Remove dirt and grease from modeler(s) outer surface by spraying all-purpose cleaner on a clean cloth and gently wiping.



**Caution: Use only non-abrasive, alcohol-free cleaners to clean surfaces. Do not use all-purpose cleaners containing petroleum-based polishing agents such as liquid wax. Spray cleaner on cloth, not on surface. Do not use cleaning solvents on build chamber window do to damage of protective UV coating.**

3. Remove dirt, grease, and build material residue from operator panel buttons, display window, and feed slot door windows using a ammonia-based glass cleaner on a clean, lint-free cloth gently wiping the buttons and windows.
- Remove build platform before cleaning the operator panel buttons. This will prevent the modeler from initiating any actions when buttons are pressed.

## 9.2 Cleaning the Waste Drawer

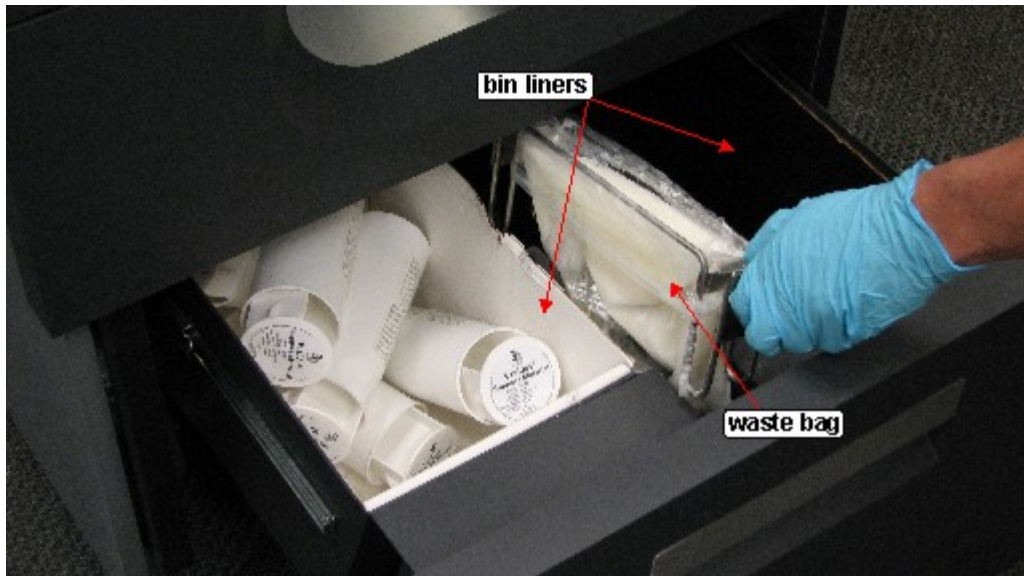
Review VisiJet material handling and disposal safety guidelines in [Build Material Safety](#) section of this guide before cleaning the waste drawer.

Clean modeler's waste drawer as follows:

1. Verify modeler is **OFFLINE**.
2. Put on protective gloves. Refer to [Personal Protection Equipment](#).



3. Open waste drawer. Remove white bin liner, black bin liner, and waste bag.



4. Dispose of bin liners and waste bag if required. Refer to [Disposal](#).

**NOTE** Insure to reinstall waste bag bracket in correct orientation; with flag in slot at rear of waste drawer.

5. Gently scrape any material stuck onto interior surface of waste drawer bins. Use a flexible plastic scraper to avoid damaging the paint.



6. Vacuum inside waste drawer material bins to remove scrapings.
7. Wipe inside surfaces of waste drawer bins using a clean cloth and all-purpose spray cleaner.

## 9.3 Preventive Maintenance

Preventive maintenance must be performed by qualified 3D Systems Technical Support Representatives after either one year of total build time, or consuming 208 lb (94 kg) of build and support materials combined.

The modeler automatically tracks total build time and combined weight of material consumed to date. When either the time or weight limit mentioned above is reached, its LCD panel will prompt you to contact 3D Systems [Technical Support](#) to schedule a PM visit. When prompted, schedule PM as soon as possible in keeping with the terms of your 3-D modeler warranty.

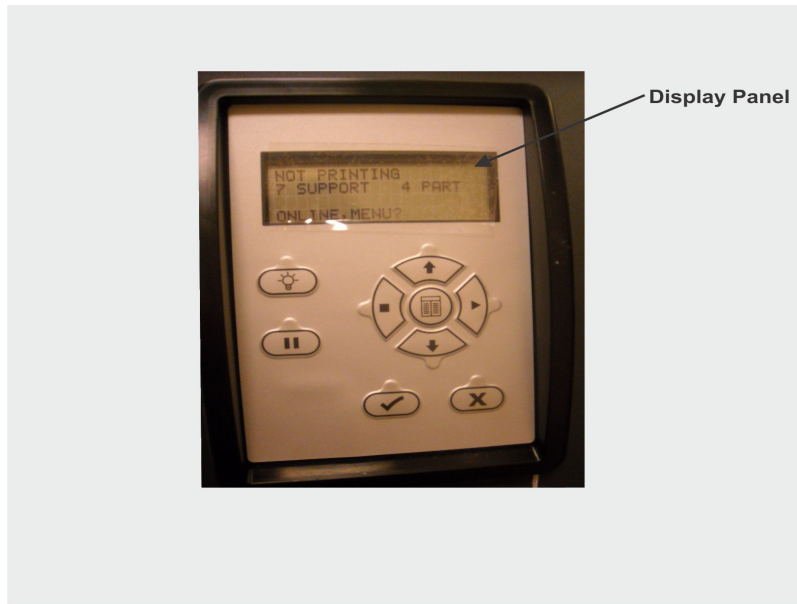
## 9.4 Return Modeler for Repair

### Guidelines for repacking the modeler

When shipping the modeler for service or repair, use the original shipping carton and packing material. Shipping damage as a result of inadequate packing is your responsibility. If you have already disposed of the packing material, contact 3D Systems [Customer Support](#) for information on repacking the modeler.

## 10.0 Error Messages

There are three primary types of error messages which could appear on the operator display panel of your modeler. The primary types of error messages found will be [Build](#), [Material](#), and [10.3 Status and Message Lines](#).



- [10.1 Build Messages](#)
- [10.2 Material Messages](#)
- [10.3 Status and Message Lines](#)

## 10.1 Build Messages

Use these messages to help you manage print jobs before, during, and after printing. The causes of and actions to take in response to various messages are described in the following table:

MESSAGE	CAUSE	ACTION
<b>XX:XX.....XX:XX 7 SUPPORT.....7 PART PRINTING</b>	The modeler is currently building. The display shows the elapsed and remaining build time on the top line and the number of cartridges in the each feed slot on the second line.  <b>NOTE</b> Add material when the number of cartridges in a slot is 3 or less.	None
<b>NOT BUILDING</b>	The modeler is ready to build.	Press <b>ONLINE</b> to build or <b>MENU</b> to list menu options.
<b>ProJet™ [X.X] month dd yyyyTIME XX:XX:XX</b>	When modeler is initially powered-up the latest version of software is briefly displayed.  <b>NOTE</b> This is the ProJet modeler's control code version; not the ProJet Client software version.	None

## 10.2 Material Messages

Use the following messages to help manage build jobs before, during, and after building. The causes and actions to take to various messages are described below:


MESSAGE	CAUSE	ACTION
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<b>#X PART</b>	The current number of black model ("part") material cartridges in the right feed slot.	None
<b>#X SUPPORT</b>	The current number of white support material cartridges in the left feed slot.	None
<b>ADD PART</b>	The maximum number of model material cartridges in the right feed slot is 9.	Add model material cartridges. The feed slot is full when five cartridges are visible in the window (maximum number of cartridges per slot is 9). <a href="#">Add cartridges</a> as required.
<b>ADD SUPPORT</b>	The maximum number of support material cartridges in the left feed slot is 9.	Add support material cartridges. The feed slot is full when five cartridges are visible in the window. <a href="#">Add cartridges</a> as required.

## 10.3 Status and Message Lines

Messages appear either on the Status line or the Message line. Read both lines together to determine the exact state of the modeler. The Status line generally indicates current state of the modeler. The Message line shows the action to take to complete a function and move to the next step.

MESSAGE	CAUSE	ACTION
<b>ABORT</b>	<b>ABORT</b> button pressed. Refer to <a href="#">abort build job</a> .	Press <b>YES</b> to abort or <b>NO</b> to cancel the command.
<b>ABORT ACKNOWLEDGED</b>	You confirmed an abort command. The modeler is aborting the current job.	None. Refer to <a href="#">abort build job</a> .
<b>BUILD PAUSED</b>	<b>PAUSE</b> button pressed during the build. The build platform moves forward and the chamber door and waste drawer remain locked. When you press the <b>PAUSE</b> button during a build, the modeler completes its current task before stopping.	Press <b>PAUSE</b> to continue. Refer to <a href="#">pause build job</a> .
<b>CLEANING PRINTHEAD</b>	The modeler is cleaning the build jets.	None. (This occurs automatically before every build.)
<b>CLOSE DOORS</b>	The chamber door is open.	Close the chamber door.
<b>CONFIRM PLATFORM CLEAR OR CANCEL</b>	The modeler is prompting you to verify the platform is clean and clear of obstructions. Refer to <a href="#">installation</a> of build platform.	Verify the platform is clean and clear, then press <b>YES</b> to continue or press <b>ABORT</b> to cancel.
<b>PRESS PAUSE TO CONTINUE</b>	The modeler is paused.	Press <b>PAUSE</b> to continue or <b>ABORT</b> to cancel.
<b>CYCLE POWER TO CONTINUE</b>	A severe error occurred. The modeler cannot recover from it and must be switched off.	Cycle power to the modeler. If the error message occurs again, contact your <a href="#">Technical Support Hotline</a> .
<b>DONE REMOVE BUILD</b>	The modeler completed building the current job.	Remove the platform. Refer to <a href="#">removal</a> of build platform.
<b>HOMING PRINTHEAD</b>	The modeler is initializing the Z-axis prior to building.	None.
<b>HOMING X - Y</b>	The modeler is initializing the X-axis and Y-axis prior to building.	None.

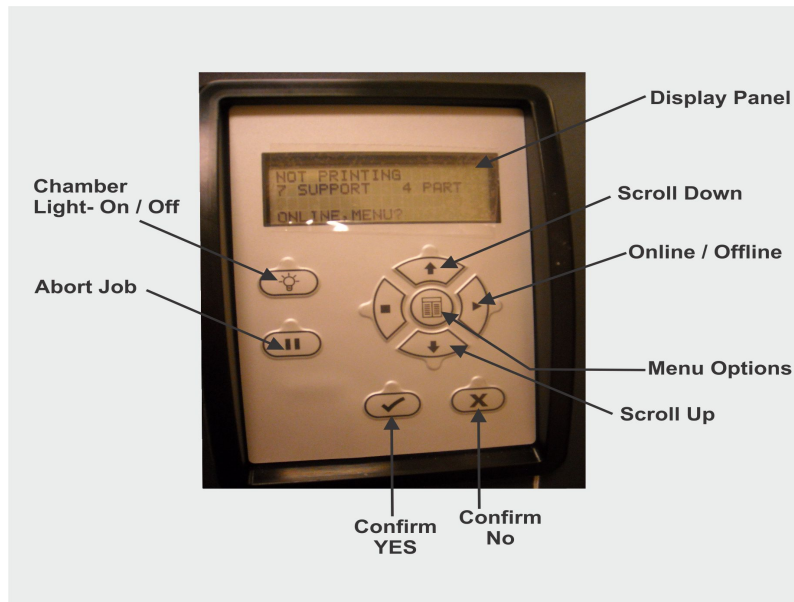
<b>INSTALL PLATFORM</b>	The modeler cannot detect a platform.	Install a clean platform. Refer to <a href="#">installation</a> of build platform.		
<b>NOT BUILDING</b>	The modeler is ready to build.	Press <b>ONLINE</b> to build or <b>MENU</b> to list menu options.		
<b>OK TO POWER OFF</b>	The modeler completed its internal shutdown procedure and is ready to be shutdown. Refer to modeler <a href="#">shutdown</a> .	Toggle power switch on modeler rear panel to the OFF position.	NOTE	Before you switch power off, verify you will not need to build parts again soon. It can take several hours for the modeler to warm up after you switch power back on.
<b>ONLINE/MENU?</b>	The modeler is ready to build.	Press <b>ONLINE</b> to build, <b>MENU</b> to list menu selections.		
<b>PAUSE ACKNOWLEDGE</b>	The <b>PAUSE</b> button was pressed. The modeler is acknowledging and complying with the command.	None.	NOTE	If you press <b>PAUSE</b> during a print job, the current layer or process is completed before the pause takes effect.
<b>PLEASE WAIT</b>	The modeler is cooling to shutdown temperature.	Wait for the modeler to complete its shutdown procedures. Refer to modeler <a href="#">shutdown</a> .		
<b>PRE-JOB CHECKS</b>	Briefly displayed during modeler build preparation.	None.		
<b>BUILDING</b>	The modeler is currently building.	Allow the build job to continue or press <b>PAUSE</b> or <b>ABORT</b> to stop building.		
<b>RAISING PRINthead</b>	The modeler is raising the printhead so you can remove the platform.	None.		
<b>REMOVE BUILD</b>	The modeler completed a build job and unlocked the chamber door so you can remove the platform.	Remove the platform and replace it with a clean platform. Refer to <a href="#">removal</a> of build platform.		
<b>SHUTDOWN IN PROGRESS</b>	You selected the <b>SHUTDOWN</b> menu option, then pressed <b>YES</b> twice. The modeler is cooling down so power can be switched off. Refer to modeler <a href="#">shutdown</a> .	None. <b>DO NOT switch off the modeler while shutdown is in progress.</b>		
<b>SHUTDOWN COMPLETE</b>	Modeler cooldown is complete; modeler is ready for power off.	Wait for <b>OK TO POWER OFF</b> message, then switch power off at the modeler's rear panel.	NOTE:	Before you switch power off, verify you will not need to build parts again soon. It can take several hours for the modeler to warm up after you switch power back on. Refer to modeler <a href="#">shutdown</a> . 
<b>STANDBY</b>	The modeler is in energy-saver mode. All internal subsystems are partially cooled and the modeler is inactive.	None. The modeler will warm to operating temperature when you press any button or submit a build job.		



<b>WAITING FOR JOB</b>	The modeler is online, but there is no build job in its queue. The modeler is ready to build as soon as it receives a job.	Submit a build job to the modeler. Refer to <a href="#">submit</a> a build job.
<b>WARMING STAGE [4,3,2,1]</b>	The material heaters and printhead jet heaters gradually warm up to either standby or build temperature.	None. The numbers on the LCD panel count down as the modeler warms up. At <b>Warming Stage 1</b> , all heaters and material are at build temperature.

## 11.0 Troubleshooting

If problems occur with the modeler, error messages appear on the LCD of the Operator's panel. Refer to appropriate troubleshooting table for assistance. There may be times when an unrecoverable error message will appear and will require a call to [Technical Support Hotline](#). Prior to contacting Technical Support Hotline ensure you have serial number of the modeler, a brief description of the problem including exact error message displayed on the LCD panel, and when the problem occurred (while submitting a job, during the beginning or end of the build, after power off recovery, etc.).



- 11.1 Communication Errors
- 11.2 Head Maintenance Station Errors
- 11.3 Material Feed and Waste System Errors
- 11.4 Material Quality Guarantee Errors
- 11.5 Material Waste Errors
- 11.6 Motion System Errors
- 11.7 UV Subsystem Errors
- 11.8 Vacuum Regulator Errors
- 11.9 Power Outage

### 11.1 Communication Errors

MESSAGE	CAUSE	ACTION
<b>RT_ERROR: No machine Identification (ID)</b>	No network connection.	Ensure you have a valid network connection. Cycle power to the modeler. If error message occurs again, contact your <a href="#">Technical Support Hotline</a> .
<b>evm6x_hpi_open()</b>	A communication error occurred.	Cycle power to the modeler. If this does not restore communication, contact your <a href="#">Technical Support Hotline</a> .
<b>evm6x_init_emif()</b>	A communication error occurred.	Cycle power to the modeler. If this does not restore communication, contact your <a href="#">Technical Support Hotline</a> .

## 11.2 Head Maintenance Station Errors

MESSAGE	CAUSE	ACTION
<b>HMS ERROR Recovery</b>	An error occurred during printhead maintenance (cleaning the printhead before beginning a build).	Cycle power to the modeler. If error message occurs again, contact your <a href="#">Technical Support Hotline</a> .

## 11.3 Material Feed and Waste System Errors

A just loaded cartridge did not engage correctly during the material feed cycle or the printhead sensors did not detect the required material level.

MESSAGE	CAUSE	ACTION
<b>RT_ERROR: AirPurge 1 (or 2) Not Responding</b>	Fault detected in control circuitry.	Cycle power to the modeler. If error message occurs again, contact your <a href="#">Technical Support Hotline</a> .
<b>RT_ERROR: AirPurge 1 (or 2) Position Error</b>	Fault detected in control circuitry.	Cycle power to the modeler. If error message occurs again, contact your <a href="#">Technical Support Hotline</a> .
<b>RT_ERROR: AirPurge 1 (or 2) Position Error</b>	Fault detected in control circuitry.	Cycle power to the modeler. If error message occurs again, contact your <a href="#">Technical Support Hotline</a> .
<b>Material 1 (or 2) Index Dump Error</b>	Feedback did not indicate whether the indexer reached the specified position.	Contact your <a href="#">Technical Support Hotline</a> .
<b>Material 1 (or 2) Index Load Error</b>	Feedback did not indicate whether the indexer reached the specified position.	Contact your <a href="#">Technical Support Hotline</a> .
<b>Material 1 (or 2) Index feed Error</b>	Feedback did not indicate whether the indexer reached the specified position.	Contact your <a href="#">Technical Support Hotline</a> .
<b>Material 1 (or 2) Index Timeout Error</b>	Communication failed to report the indexing operation was completed	Contact your <a href="#">Technical Support Hotline</a> .
<b>RT_ERROR: Index Drum 1 (or 2) Temp Out of Range</b>	Possible faulty heaters.	Cycle power to the modeler. If error message occurs again, contact your <a href="#">Technical Support Hotline</a> .
<b>RT_ERROR: material feed 1 (or 2) can't fill head</b>	A just loaded cartridge did not engage correctly during the material feed cycle or the printhead sensors did not detect the required material level.	Cycle power to the modeler. If error message occurs again, contact your <a href="#">Technical Support Hotline</a> .
<b>Material 1 (or 2) Pump Retract Error</b>	The retracting plunger was not detected.	Contact your <a href="#">Technical Support Hotline</a> .
<b>Material 1 (or 2) Pump Engage Error</b>	A new cartridge has been indexed but did not satisfy the sensors.	Contact your <a href="#">Technical Support Hotline</a> .

## 11.4 Material Quality Guarantee Errors

MESSAGE	CAUSE	ACTION
<b>Support (or build) material cartridge not detected</b>	Modeler is out of material cartridges, a cartridge misfed, or the material identification system is faulty.	<p>The build will abort if it needs to use the questionable cartridge to finish the build.</p> <ul style="list-style-type: none"> <li>• Add the specified material cartridge, install a clean build platform and repeat the build job.</li> <li>• If error message occurs again, contact your <a href="#">Technical Support Hotline</a>.</li> </ul>

<b>Support (or build) material cartridge not melted</b>	A cold cartridge was added to the material feed slot and it did not have enough time to melt before the modeler requested material.	The build will abort if it needs to use the questionable cartridge to finish the build. <ul style="list-style-type: none"> <li>• <a href="#">Install</a> a clean build platform and <a href="#">repeat</a> the build job after the modeler has reached build temperature.</li> <li>• If error message occurs again, contact your <a href="#">Technical Support Hotline</a>.</li> </ul>
<b>Support (or build) material cartridge expired</b>	The material identification system detected expired material.	Follow the discard instructions posted to the LCD panel.
<b>Support (or build) material cartridge incorrect type</b>	A material cartridge was inserted into the wrong feed slot.	The build will abort if it needs to use the questionable cartridge to finish the build. <ul style="list-style-type: none"> <li>• Follow the discard instructions posted to the LCD panel.</li> <li>• If error message occurs again and you have inserted the correct material cartridge into the correct feed slot, contact your <a href="#">Technical Support Hotline</a>.</li> </ul>

## 11.5 Material Waste Errors


MESSAGE	CAUSE	ACTION
<b>RT_ERROR: draintank not responding</b>	Fault detected in control circuitry.	Cycle power to the modeler. If error message occurs again, contact your <a href="#">Technical Support Hotline</a> .
<b>RT_ERROR: Draintank Position error</b>	Fault detected in control circuitry.	Cycle power to the modeler. If error message occurs again, contact your <a href="#">Technical Support Hotline</a> .
<b>RT_ERROR: Draintank timeout error</b>	Fault detected in control circuitry.	Cycle power to the modeler. If error message occurs again, contact your <a href="#">Technical Support Hotline</a> .
<b>RT_ERROR: can't empty draintank</b>	Sensor or valve malfunctioned.	Cycle power to the modeler. If error message occurs again, contact your <a href="#">Technical Support Hotline</a> .

## 11.6 Motion System Errors

MESSAGE	CAUSE	ACTION
<b>X-Following ERROR</b>	An attempt to open the build chamber door was made, or position sensor errors occurred.	Ensure the build chamber door is secured, then cycle power to the modeler. If error message occurs again, contact your <a href="#">Technical Support Hotline</a> .
<b>Negative Firing Delay</b>	Variations in scanning axis velocity.	Cycle power to the modeler. If error message occurs again, contact your <a href="#">Technical Support Hotline</a> .
<b>Pause Timeout ERROR</b>	Position sensor contamination.	Cycle power to the modeler. If error message occurs again, contact your <a href="#">Technical Support Hotline</a> .

## 11.7 UV Subsystem Errors

MESSAGE	CAUSE	ACTION
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<b>RT_ERROR: UV Lamp Power Too Low</b>	UV sensor detected a possible fault.	Cycle power to the modeler. If error message occurs again, contact your <a href="#">Technical Support Hotline</a> . <div style="border: 1px solid black; background-color: #ffffcc; padding: 10px; margin-top: 10px;"> <p><b>CAUTION</b></p> <p> To prevent skin exposure to uncured model material, do not handle parts in a build without wearing gloves if a UV lamp problem occurred during the build.</p> </div>
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## 11.8 Vacuum Regulator Errors

MESSAGE	CAUSE	ACTION
<b>RT_ERROR: Printhead Vacuum Low</b>	Indicates a fault within the vacuum system.	Cycle power to the modeler. If error message occurs again, contact your <a href="#">Technical Support Hotline</a> .
<b>RT_ERROR: Printhead Vacuum High</b>	Indicates a fault within the vacuum system.	Cycle power to the modeler. If error message occurs again, contact your <a href="#">Technical Support Hotline</a> .

## 11.9 Power Outage

If you are present during a power outage, or discover the main power OFF, complete the following steps:

1. Switch power OFF on modeler's rear panel so it does not automatically start when power is restored. This prevents modeler damage due to power flickers and surges.



2. When power is restored and stable, switch modeler power ON on the rear panel.

If power outage occurs and is restored before anyone can take action, the modeler will recover as follows:

The modeler advances through warming stages until reaching the required build temperatures. If modeler was not building when power outage occurred, the top line on the LCD panel will display **"Not Building"** and bottom line will display **"Online/Menu?"**. The modeler is ready to accept a build job.

If modeler was building when the power outage occurred, the LCD panel will display "**Power Off Recovery**" after power is restored and modeler has reached build temperature. This safety feature prevents accessing incomplete build until all build conditions are satisfied. Once occurred, the job will end, the LCD panel will display "**Done Remove Build**" and the build platform will move forward, and can be [removed](#) and [repeat](#) build job if desired.

NOTE	If the modeler is in Power Off Recovery, the build chamber will not be able to open until modeler completes recovery.
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## 12.0 Finishing

When the build is complete, refer to the [VisiJet® Material Handling and Post-Processing Guide](#) for information on how to detach parts from build platform, remove support material from parts, and clean parts to a smooth finish. Basic part coating and equipment maintenance recommendations are also included.

## 13.0 ProJet™ Spare Parts List

- [13.1 Consumables and Replacement Modules](#)

### 13.1 Consumables and Replacement Modules

To view the parts and modules that are available, click on the [ProJet™ Spare Parts Locator](#).

## 14.0 Other Documents

- [14.1 Parts Finisher User Guide](#)
- [14.2 Material Safety Data Sheets \(MSDS\)](#)
- [14.3 ProJet™ Quick Reference Guide](#)
- [14.4 Facility Requirements Guide](#)
- [14.5 VisiJet® Material Handling and Post-Processing Guide](#)

### 14.1 Parts Finisher User Guide

When the build is complete, refer to the Parts Finisher Guide for information to detach parts from build platform, remove support material from parts, and clean parts to a smooth finish. Basic part coating and equipment maintenance recommendations are also included.

### 14.2 Material Safety Data Sheets (MSDS)

To obtain a copy of the Material Safety Data Sheet (MSDS) or a Safety Data Sheet (SDS), go to 3D Systems website. . . [3D Systems MSDS](#)

### 14.3 ProJet™ Quick Reference Guide

[PROJET 3-D Modelers Quick\\_Reference Guide.pdf](#)

### 14.4 Facility Requirements Guide

[ProJet™ 3-D Modelers Facility Requirements Guide](#)

# 14.5 VisiJet® Material Handling and Post-Processing Guide

VisiJet® Material Handling and Post-Processing Guide

## 15.0 Service and Support

- [15.1 Contacts](#)
- [15.2 How to Order Parts](#)

### 15.1 Contacts

For information, questions, or comments about ProJet™ 3-D modeler system(s), VisiJet® materials, or request service, please contact a 3D Systems Customer Service or Sales Representative nearest you.

#### 3D Systems

333 Three D Systems Circle  
Rock Hill, SC 29730 USA  
**tel:** 803.326.4080  
**fax:** 803.324.8810  
**toll free:** 800.889.2964  
**email:** [moreinfo@3dsystems.com](mailto:moreinfo@3dsystems.com)  
[www.3dsystems.com](http://www.3dsystems.com)  
Nasdaq: TDSC

#### Customer Support Hotline

U.S.A. 800.889.2964

Asia-Pacific (+852) 29 23 50 77

Europe (+49) 6151 357-0

#### Sales and Service

FRANCE tel (+33) 1 69 35 17 17	ITALY tel (+39) 039 68904 00
GERMANY tel (+49) 6151 357-0	JAPAN tel (+81) 3 5451-1690
HONG KONG tel (+852) 29 23 50 77	UK tel (+44) 1442 282 600
SWITZERLAND tel (+41) 26 439 95 90	

### 15.2 How to Order Parts

New and refurbished parts made by 3D System's manufacturer are used when performing warranty repairs and in building replacement parts and systems. Refurbished parts and systems, are parts or systems that have been returned to 3D Systems, some of which were never used by a customer. All parts and systems are inspected and tested for quality. Replacement parts and systems are covered for the remaining period of the limited warranty for the product you bought. 3D Systems owns all parts removed from repaired products.

To order replacement parts, contact [3D Systems Customer Service Support](#) or contact your local reseller.

When contacting 3D Systems Customer Service Support, have your modeler serial number available to give to customer support.

## 16.0 Online Help

- Find Help topics on the Content Pages of each section.
  - [16.1 Frequently Asked Questions \(FAQ\)](#)
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# 16.1 Frequently Asked Questions (FAQ)

## General

### What is rapid prototyping?

Rapid prototyping (RP) is the process of building a part from a 3D CAD drawing and converting the drawing format into an .STL file. When the modeling event takes place in the modeler, it is constructed layer by layer using Accura VisiJet® materials.

### What is 3D Modeling?

A type of rapid prototyping, typically defined by faster, more affordable, and easier-to-use technologies.

### How does 3D Modeling fit into the design process?

For a growing segment of designers using 3D CAD drawing, the ProJet Modeler is quickly becoming an essential extension of overall CAD systems and a critical part of the entire design process by:

- Accelerating Time to Market - through shortening design and development cycles and ultimately get products to market more quickly enabling users to easily fine tune design and explore multiple design configurations.
- Generating Savings - by helping companies significantly lower production costs and reducing expensive revisions late in the development cycle.
- Enhancing Communication and Collaboration - through bringing ideas off flat screens and producing functional 3D models that can be easily shared, critiqued, and improved upon.
- Creating Better Designs - designers are no longer limited to the number of models they can produce and test, resulting in more creative designs and better final products.
- Ensuring Confidentiality - eliminating the need to exchange confidential design files with service providers, allowing companies to maintain product confidentiality and control.

### How does the 3D modeling process work?

The modeler builds functional 3D models from the bottom up, one layer at a time. STL files are imported into the modeler that automatically slices and orients the parts and creates any necessary support structures. The materials are fed into the modeler in a heated semi-liquid state and accurately deposited in layers upon the build platform. After completion of the build, support structures are simply removed through a post curing process.

### How durable are the build material?

VisiJet® materials create accurate, detailed, and durable models from your 3-D CAD designs. Popular applications include concept models, casting forms, prototype parts, and specialty tools. All the specific physical and process characteristics of VisiJet materials are detailed in

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VisiJet® Material Specifications

### Is post-processing required?

Yes, upon removing the part from the modeler you will need to remove the support material from VisiJet® parts. The parts finisher makes removing bulk support material from VisiJet parts efficient and easy. Forced airflow and precision temperature control deliver faster, shorter, and more predictable VisiJet part finishing times.

### Are there any special facility requirements or operating systems necessary to install and operate the modeler?

Refer to the ProJet™ 3-D Modelers Facility Requirements Guide.

### Can more than one user process files and build parts?

Multiple users can send files to the modeler build queue, move, delete, and set build priorities in the build queue. Depending on the size of the model, multiple files can be added onto the build platform in one build application.

### Can models be sanded, painted, dyed, and glued?

The parts can be sanded to remove imperfections or layer lines from the surface. After priming, the parts can be painted using any oil- or water-based paint that is compatible with the primer, or you can dye VisiJet parts with candle-craft dyes. You can also use super glue to join parts together.

### **What is Computer-aided design (CAD)?**

Computer-aided design (CAD) is use of a wide range of computerbased tools that assist engineers, architects and other design professions in their design activities. It is the main geometry authoring tool within the Product Lifecycle Management process and involves both software and sometimes special-purpose hardware.

### **What is a .STL file?**

A .stl file is a format used by Stereolithography software to generate information needed to produce 3D models on Stereolithography machines. It is a triangular representation of a 3-D object. The surface of the object is broken into a logical series of triangles. These triangles represent the surface of the object.

### **How do I export an STL file from my 3-D CAD program?**

Most CAD software offers STL conversion add-ins.

### **Are the build platforms reusable?**

Yes the build platforms are reusable.

### **How many builds can one material cartridge produce?**

This depends on the size and the complexity of the part being built.

### **If material runs out before the model has completed the build process, does the build abort?**

Yes the build will be aborted. Ensure that there is sufficient amount of materials to complete the build.

### **When submitting a build, will the 3-d modeling client software inform me if the amount of material is sufficient for completing a build?**

The client software will tell you how many cartridges it will take to complete the build.

### **How do I order parts?**

To order replacement parts you will need to contact [3D Systems' Customer Support](#).

## **16.2 Getting Help**

This section provides quick access to operating, maintenance, troubleshooting, spare parts locator and contact information to 3D Systems Customer Support Centers.

- [Project Spare Parts Locator](#)
- [Material Safety Documentation, 3D Systems MSDS](#)
- [Contact 3D Systems Corporation](#)

## **16.3 Build Material**

### **Build Material Safety Guidelines**

- [Material Disposal](#)
- [Material Handling](#)
- [Material Safety](#)
- [Material Usage](#)
- [Spilled VisiJet Material](#)
- [Waste Removal](#)

## **16.4 Modeler Hardware and Installation**

This section describes the modeler setup applications and functions.



Client Hardware & Network Interface  
Electrical

- Electrical Safety
- General Safety Guidelines

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Installing & Removing Build Platform  
Build Process & Previewing Build  
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Abort Build  
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Shutting Down System  
Notification Messages  
Return Modeler for Repair

## 16.5 Facility Requirements

The requirements for electrical and room preparation are specified in the [ProJet™ 3000 Facility Requirements Guide](#).

## 17.0 Glossary of Terms

**Build Platform** - this part is used by the modeler to build parts. Support structures link the model to the build platform and must be removed from the modeler once complete.

**.stl File** -- is a 3-dimensional solid Computer-aided design (CAD) software system used to produce models.

**Material Quality Guarantee** - the modeler reads an encrypted RFID tag on the cartridge to communicate parameters and ensure optimum build quality.

**Chamber Door** - the chamber door prevents harmful UV radiation from escaping the build chamber during the build process. The chamber door must be closed prior to starting or resuming a build job and is locked when a build is in progress.

**Modeling** - the modeler uses cartridges and a build platform to create 3-dimensional plastic prototype models.

**Operator Panel** - is used to display build job status, menu options, and command prompts for the modeler.

**Support Material** - is a wax based material that provides adhesion to the build platform and support for down facing surfaces and open volumes within the model.

**Build Material** - is a paste-like acrylic compound that is an ultraviolet (UV) curable material.

**ProJet Client Software** - is used to setup, run, and manage build jobs.

**Shrink Comparison Percentage** (Shrink Comp %) - is used to adjust for expected shrinkage during the build so actual part dimensions more closely match actual dimensions.

**Job Scale Percentage** (Job Scale %) - is used to resize parts during the build process.

**Material Feed Slots** - stores and feeds the cartridges to the modeler during the build process. The material feed slots hold eight each support and build material cartridges.

**Waste Material** - is any uncured support and/or build material generated during a build process.

**Debug Log** - is a text file used for obtaining information for resolving potential problems that may occur with the modeler.

**X-Axis** - is the orientation of the part from front to rear on the build platform.

**Y-Axis** - is the orientation of the part from left to right on the build platform.

**Z-Axis** - is the orientation of the part height on the build platform.

**Post Curing** (Finishing) - is the final process to remove support material from parts and clean the parts to a smooth finish prior to surface finishing and coating.

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