



# **PTR307 and PTR307B Manual Fiber Recoater with Rotary Proof Tester**

## **User Guide**



Mold Assembly Sold Separately



# Table of Contents

Chapter 1	Warning Symbol Definitions.....	1
Chapter 2	Safety .....	2
Chapter 3	Description .....	3
	3.1. <i>Introduction</i> .....	3
	3.2. <i>Parts Checklist</i> .....	3
Chapter 4	Part Selection.....	5
Chapter 5	Setup .....	6
	5.1. <i>Installing the Inserts</i> .....	7
	5.2. <i>Connecting the Wires</i> .....	7
	5.3. <i>Priming the Mold</i> .....	9
Chapter 6	Controlling the Unit.....	10
	6.1. <i>Unit Control Buttons</i> .....	10
	6.2. <i>Power Up</i> .....	11
	6.3. <i>A Quick Start Guide to using the Tablet Controller</i> .....	11
	6.4. <i>PTR307 / PTR307B Parameters</i> .....	13
	6.4.1. Inject Parameters (PTR307 Only) .....	13
	6.4.2. Cure Parameters .....	13
	6.4.3. Proof Test Parameters .....	13
	6.4.4. Advanced Parameters (PTR307 Only) .....	14
	6.5. <i>Injecting, Curing and Proof Testing</i> .....	15
	6.6. <i>Tablet Controller Reference</i> .....	16
	6.6.1. PTR307 / PTR307B Main Screen .....	17
	6.6.2. Settings .....	19
	6.6.3. Password.....	19
	6.6.4. Access Permissions .....	20
	6.6.5. Voice Notifications.....	21
	6.6.6. Language .....	22
	6.6.7. Open File.....	24
	6.6.8. Save File As .....	25
	6.6.9. Save File .....	25
	6.7. <i>Tools</i> .....	26
	6.7.1. Fill (PTR307 Only).....	27
	6.7.2. Purge (PTR307 Only).....	27
	6.7.3. Test Calibration .....	28
	6.7.4. Advanced Parameters (PTR307 Only) .....	28
	6.7.5. Proof Test History .....	29
	6.7.6. Inject Quantity Calculator .....	29
	6.7.7. Terminal .....	30
	6.7.8. Material Usage (PTR307 Only) .....	30
	6.8. <i>Log Out</i> .....	31
	6.9. <i>Exit / Close</i> .....	31

















---

<b>Chapter 7</b>	<b>Priming the PTR307 and PTR307B .....</b>	<b>32</b>
<b>Chapter 8</b>	<b>Recoat Process.....</b>	<b>36</b>
	<b>8.1. Position the Fiber for Recoat .....</b>	<b>36</b>
	<b>8.2. Recoating .....</b>	<b>37</b>
<b>Chapter 9</b>	<b>Proof Test Process.....</b>	<b>39</b>
<b>Chapter 10</b>	<b>Maintenance .....</b>	<b>41</b>
	<b>10.1. Planned Maintenance.....</b>	<b>41</b>
	<b>10.2. Cleaning .....</b>	<b>41</b>
	<b>10.3. Recoat System Maintenance.....</b>	<b>42</b>
	<b>10.4. Proof Test System Maintenance .....</b>	<b>44</b>
	<b>10.5. Replacement.....</b>	<b>44</b>
<b>Chapter 11</b>	<b>Trouble Shooting.....</b>	<b>46</b>
<b>Chapter 12</b>	<b>Material Data Safety Sheet.....</b>	<b>47</b>
<b>Chapter 13</b>	<b>Compliance .....</b>	<b>50</b>
<b>Chapter 14</b>	<b>Regulatory .....</b>	<b>51</b>
<b>Chapter 15</b>	<b>Thorlabs Worldwide Contacts .....</b>	<b>52</b>

---

## Chapter 1 Warning Symbol Definitions

Below is a list of warning symbols you may encounter in this manual or on your device.

Symbol	Description
	Direct Current
	Alternating Current
	Both Direct and Alternating Current
	Earth Ground Terminal
	Protective Conductor Terminal
	Frame or Chassis Terminal
	Equipotentiality
	On (Supply)
	Off (Supply)
	In Position of a Bi-Stable Push Control
	Out Position of a Bi-Stable Push Control
	Caution: Risk of Electric Shock
	Caution: Hot Surface
	Caution: Risk of Danger
	Warning: Laser Radiation
	Caution: Spinning Blades May Cause Harm

## Chapter 2 Safety

All statements regarding safety of operation and technical data in this instruction manual will only apply when the unit is operated correctly.



### SHOCK WARNING



**Unplug the power cord before servicing the unit. Do not operate the unit without all covers and items properly installed.**



### CAUTION



**Before connecting the AC power cord, make sure the source voltage is between 85 and 265 VAC, 47-63 Hz. Input voltages outside these ranges may result in damage to the unit.**



### CAUTION



**The recoat material is a flammable, toxic, acrylate compound. Avoid contact with the skin and eyes.**



### WARNING



**Argon is a chemically inert gas. It is colorless, odorless, tasteless, non-flammable, non-corrosive and non-toxic. However, the work area should be well ventilated so as to ensure that the correct oxygen level is maintained.**



### WARNING



**Ensure that the operator is properly trained for the handling of compressed gases and regulators.**

**Small transparent fiber shards may be present in and around the work area, and as such, the necessary measures should be taken to ensure the safety of the employee(s).**



### WARNING



**This unit must not be operated in explosive environments. The equipment should be used in a standard laboratory environment with temperature and humidity control.**



### WARNING



**All materials (such as wipes and gloves) that have acrylate material on them should be disposed with solid chemical waste.**

Fuses can be replaced by twisting it to release, and then pulling it out of the housing; it is replaced by pushing the fuse into the housing and then twisting it to lock in place. The fuse is 6.4 A, 250 V.

## Chapter 3 Description

### 3.1. Introduction

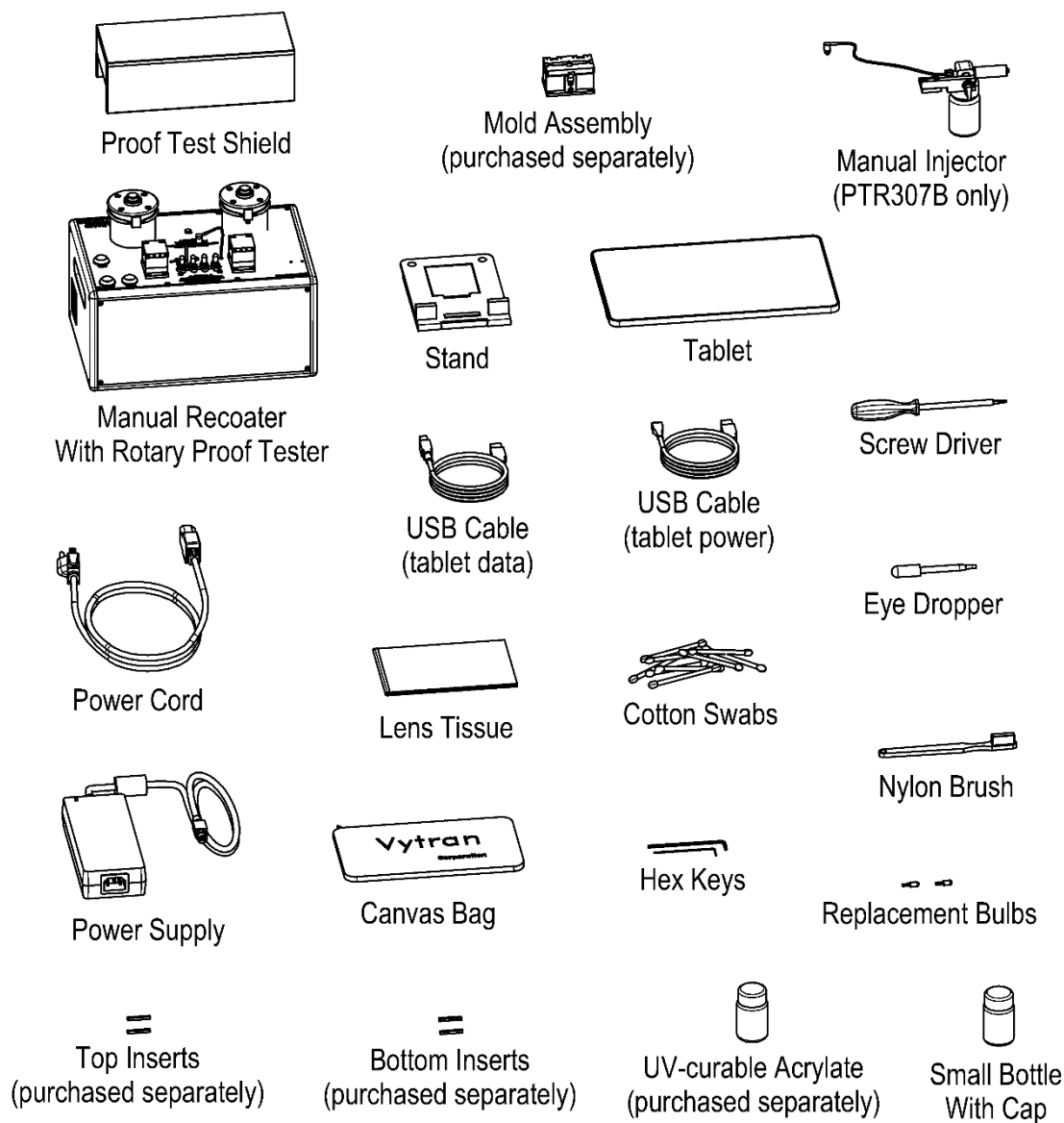
The PTR307 and PTR307B are optical fiber recoaters which have an integrated rotary proof tester. The recoat station applies a flexible UV acrylate coating to a fusion-spliced section of fiber, while the proof-test/tension test station determines the breaking strength of a fiber or ensures that a fiber or fusion splice meets a minimum strength requirement.

### 3.2. Parts Checklist

When unpacking the PTR307 or PTR307B for the first time, check to make sure that you have the following:

- PTR307 or PTR307B Fiber Recoater with Rotary Proof Tester
- Proof Test Shield
- 12 V Power Supply
- AC Power Cord
- Tablet Controller
- Stand for Tablet Controller
- Canvas Zipper Bag Containing:
  - Two (2) USB Cables
  - Lens Tissue
  - Eye Dropper
  - Flat Head Screw Driver
  - Cotton Swabs
  - 3/32" Hex Key
  - 0.035" Hex Key
  - Quartz Mold Cleaning Brush
  - Replacement Bulbs
  - Small Bottle with Cap
- Mold Assembly (Purchased Separately)
- Bottom Inserts for Fiber Holding Block (Purchased Separately)
- Top Inserts for Fiber Holding Blocks (Purchased Separately)
- UV-Curable Acrylate Recoat Material (Purchased Separately)
- For PTR307B Only: Manual Injector
- If Ordered Separately: Injection Syringes and Cap

If you are missing any of the above or need replacements, please contact Thorlabs.



**Figure 1**      **System Components**

## Chapter 4 Part Selection

When purchasing a PTR307 or PTR307B, it is necessary to select a mold assembly and fiber holding block inserts that best match the desired coating diameters of your fiber.

### Injection System Selection

The PTR307 and PTR307B are both manual fiber recoaters featuring an integrated rotary proof tester. The difference between the two is the type of injection system utilized by the device. The PTR307 comes with an automatic recoat injection pump fitted inside the unit. This pump system can be activated either by the “Inject” button on top of the unit, or with the tablet controller. An automatic injection system will inject a predetermined volume of recoat material into the mold assembly. It is compatible with high-index recoat material only.

The PTR307B comes with a manual injection system. This pump system provides a method of manually dispensing recoat material directly from the recoat bottle into the injection port. This system consists of a syringe with a knurled dispensing screw, which is fitted to a distribution valve with a two-position selection lever. It is compatible with both high- and low-index recoat material.

### Mold Assembly Selection

The Mold Assemblies are composed of split quartz mold plates which, when closed, form the cylindrical mold cavity around the exposed section of the fiber being recoated. When purchasing the recoater for the first time, it is necessary to choose a mold assembly that is appropriate for the desired fiber coating diameter. They are available for Ø280 µm, Ø430 µm, or Ø600 µm fiber coatings. Custom mold sizes up to Ø900 µm are available; please contact Thorlabs for more information. Additional mold assemblies may also be purchased and swapped out by the user. The assembly simply screws to the top of the device, making the removal and install simple and easy.

Item #	Coating Diameter
RM280	280 µm
RM430	430 µm
RM600	600 µm

### Insert Selection

When purchasing a PTR307 or PTR307B, the proper set of fiber holding block inserts need to be selected. A total of four inserts (two top and two bottom) are required for a full unit. The inserts are seated in and secured to the fiber holding blocks. They can easily be swapped out for different sizes, allowing the unit to be changed quickly should different fiber coating sizes be desired. The VHH Series inserts are compatible with fiber coating sizes ranging from Ø90 µm to Ø990 µm.

Item #	Top or Bottom	Nominal Diameter	Min Diameter	Max Diameter
VHH000	Top	-	90 µm	660 µm
VHH900	Top	900 µm	700 µm	1000 µm
VHH100	Bottom	100 µm	90 µm	110 µm
VHH125	Bottom	125 µm	113 µm	137 µm
VHH160	Bottom	160 µm	144 µm	176 µm
VHH250	Bottom	250 µm	225 µm	275 µm
VHH300	Bottom	300 µm	250 µm	350 µm
VHH400	Bottom	400 µm	350 µm	450 µm
VHH500	Bottom	500 µm	450 µm	550 µm
VHH600	Bottom	600 µm	540 µm	660 µm
VHH900S	Bottom	900 µm	810 µm	990 µm



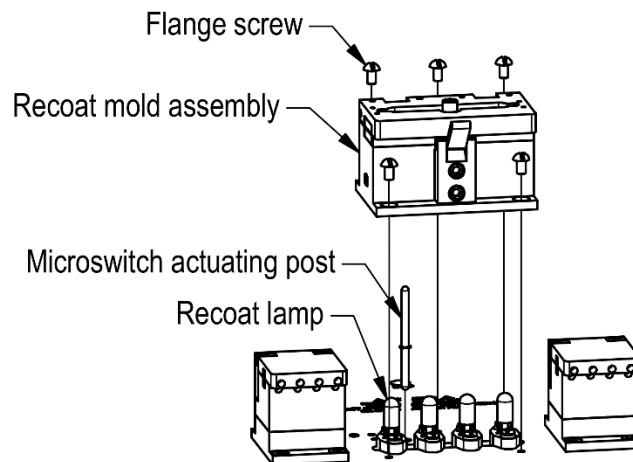
## Chapter 5 Setup

### Attaching the Manual Recoat Injector

If your unit is a PTR307B, you will need to attach the manual recoat injector to the side of the unit. Place the injector on the side of the unit, and attach it to the unit using the two cap screws from the attached bag. Use the 3/32" hex key to tighten the screws.

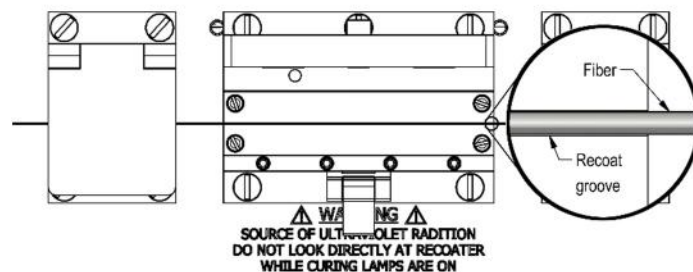
### Attaching the Recoat Mold Assembly

Make sure that the base plate, bottom of the mold assembly and microswitch actuating post are cleaned of any dirt particles. Insert the microswitch actuating post by inserting the long end into the recoat assembly. Verify that the post moves up and down freely.



**Figure 2 Place Recoat Mold**

Lower the assembly straight down over the recoat lamps and attach the recoat mold assembly using the five flange screws from the attached bag. Lightly tighten two diagonal screws. Keep them somewhat loose to allow for adjustment of the recoat assembly. Open the recoat station top and the tops of the fiber holding blocks. Clamp a length of coated fiber between the holding blocks so that the fiber is under slight tension. (A fiber nominally smaller than that of the diameter of the recoat mold should be used). Using a 10X magnifying loupe, view the fiber straight down at the right-hand edge of recoat station, shown in Figure 3. Adjust the recoat assembly such that the fiber is centered in the bottom recoat groove. Repeat this procedure while viewing the fiber at the left edge of the recoat station. Tighten the recoat flange screws and re-check the fiber alignment.

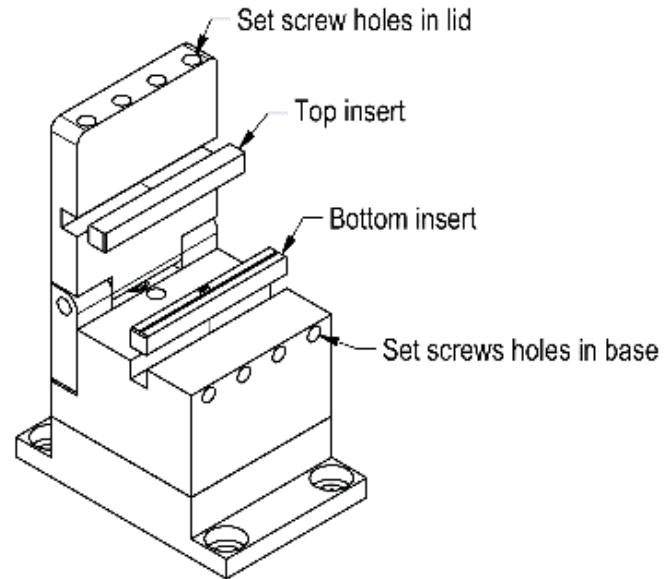


**Figure 3 Align Recoat Mold**

Connect the green recoat material tube to the inject port on the top of the lid.

### 5.1. Installing the Inserts

Put the top inserts in place and capture them using the set screws in the lid. Use the 0.035" hex key to tighten the set screws. Put the bottom inserts in place and capture them using the set screws in the base of the fiber holding block, using the same hex key. As you install the inserts, make sure they are fully seated as you tighten the set screws.



**Figure 4**      **Installing the Inserts**

### 5.2. Connecting the Wires

1. Plug in the AC power cord. The power supply accepts an AC input of 100 - 240 VAC; 47 - 63 Hz.
2. Connect the AC power cord to the external power supply.



3. Connect the DC power cable to the unit.



4. Locate the USB cable that has a microUSB Type B plug. Plug it into the power socket of the tablet.



5. The other USB cable has one end that is USB Type A. Plug that end of that cable into the USB socket of the tablet.



6. Plug the USB Type B plug into its socket on the back of the unit.



7. Plug the USB Type A plug (on the first USB cable) into its socket on the back of the unit.



### **5.3. Priming the Mold**

Before dispensing recoat material, it is necessary to prime the recoat mold. This will make it easier to dispense the exact right amount of acrylate material when recoating a fiber, and it will eliminate air bubbles that may be trapped in the recoat material. Refer to Chapter 7 for instructions on priming the system.

## Chapter 6 Controlling the Unit

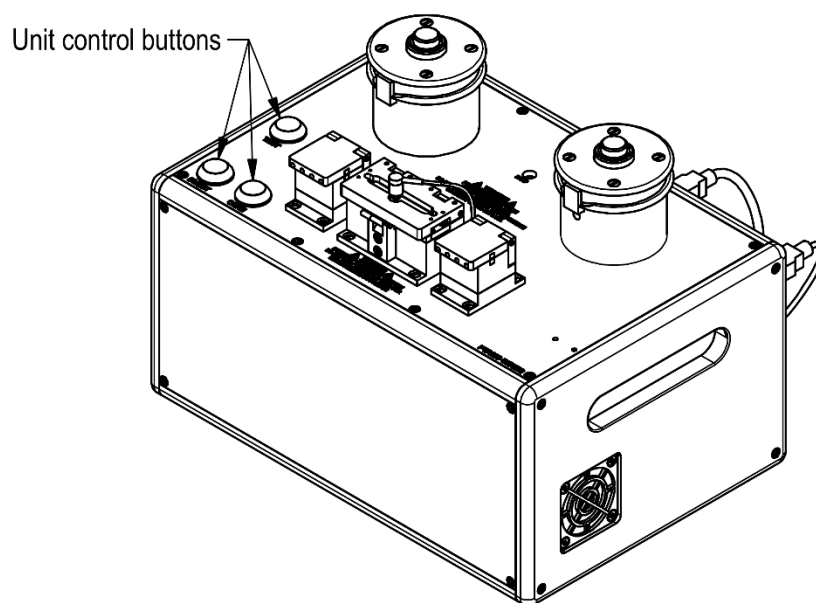
The PTR307 and PTR307B can be operated using either the three buttons on the top of the unit, or via the Tablet Controller, which is used to control the unit or to reprogram process parameters. The Tablet Controller is the primary controlling option for controlling the device, for service, or for parameter changes.



**Figure 5**      **Tablet Controller**

### 6.1. Unit Control Buttons

The PTR307 and PTR307B has three Unit Control Buttons that enable the user to inject and cure recoat material as well as test the strength of a fusion splice. The inject button is only enabled for the PTR307. All parameters are preset and cannot be changed without an optional controller in conjunction with the Unit Control Buttons (see below for control options). The Tablet Controller is also necessary for readout of the proof test values.



**Figure 6**      **Unit Control Buttons**

- Inject Button:** Inject a preset amount of recoat material into the mold (for the PTR307 only). The Inject Button is configured to inject recoat material while it is pressed (Momentary Injection).
- Cure Button:** If the recoat mold is closed, pressing the Cure Button turns on full power to the UV lamps for the preset cure time. If the recoat mold is open, holding down the Cure Button will illuminate the UV lamps at low power (no UV output). This allows for a visual inspection of the lamps.
- Test Button:** Activates a Proof Test with the current parameter settings stored within the main unit. The right-hand mandrel will rotate anti-clockwise to apply the set tension to the fiber. The load will be held for a set "hold time" after which the right mandrel will return to its starting position.

## 6.2. Power Up

With the Tablet Controller properly connected to the unit, turn on the PTR307 or PTR307B using the switch located at the back of the unit.

The system will go through an initialization process that takes from 15 to 90 seconds, during which time it will home and fill the internal recoat pump (if so equipped) and lock the right mandrel. During initialization the Tablet Controller will auto-detect the PTR307 and PTR307B and display the main screen. From here the User can start injecting, curing, testing, view / edit Parameters and select items on the toolbar

The Tablet Controller provides a simple, easy to use interface for configuring, controlling and monitoring PTR and LDC series machines. The following sections contain a quick start guide followed by a more detailed view of the features and capabilities of the Tablet Controller.

## 6.3. A Quick Start Guide to using the Tablet Controller

Once the Tablet Controller has recognized a PTR307 / PTR307B, the Main Screen is displayed.



**Figure 7 PTR307 Main Screen**

(Note that the main screen differs slightly when the Tablet Controller detects PTR307B, Inject functionality is disabled.)

To start Injecting, press 'Inject' (C). This performs the same action as pressing the blue 'Inject' button on the PTR307.

To start Curing, press 'Cure' (E). This performs the same action as pressing the blue 'Cure' button on the PTR307 / PTR307B.

To start Testing, press 'Test' (G). This performs the same action as pressing the blue 'Test' button on the PTR307 / PTR307B.



To view and/or edit Inject, Cure or Test Parameters, touch the respective view/edit button (D, F or H)



view/edit button

If the User has insufficient access permission to edit Parameters, a view only icon is displayed.

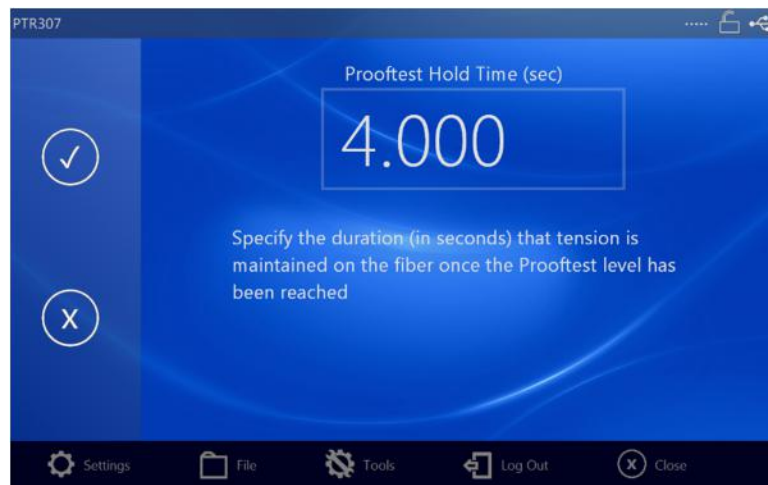
After pressing a view/edit button, the relevant parameters (along with the current value) will be shown on the Parameter Select screen. Swipe the list to scroll up / down, touch a parameter to select it for editing.

Note:  Yes, OK, Apply .  No, Cancel, Close



**Figure 8** **Parameter Select Screen (Test)**

In the edit / viewing screen, touch the value to enable the On-Screen-Keyboard and edit the value. Touch ✓ or X to return to the Parameter Select Screen.



**Figure 9** **Parameter Edit Screen**

The parameter list indicates that an item has been changed by displaying a different icon

 Prooftest Hold Time 4.000 sec

The User must select ✓ when leaving the Parameter Select Screen in order for all changes to be committed to the PTR307 / PTR307B.



## 6.4. PTR307 / PTR307B Parameters

The following sections describe the parameters that control PTR307 and PTR307B.

### 6.4.1. Inject Parameters (PTR307 Only)

The Inject parameters are defined as follows:

<b>Quantity:</b>	The volume of recoat material in microliters ( $\mu\text{l}$ ) injected into the mold.
<b>Rate:</b>	The speed at which recoat material is injected into the mold in microliters per second ( $\mu\text{l}/\text{sec}$ ). The maximum inject rate is 1.8 $\mu\text{l}/\text{sec}$ .
<b>Add Quantity:</b>	The percentage of Inject Quantity that can be manually injected to the mold after the Inject sequence is complete. The Tablet Controller displays the Add Button in the Inject Screen once the Inject sequence is complete. The Add feature is especially useful in situations where there is variability in the position of strip shoulders / length of recoat required.

### 6.4.2. Cure Parameters

The Cure parameters are defined as follows:

<b>Cure Time:</b>	The duration of the recoat material cure (1 to 480 seconds)
<b>Lamp Operation:</b>	Can be set to Sequenced or PWM. Sequenced mode turns on the lamps in the specified sequence determined by the Lamp Set parameters accessed from Tools-Advanced Parameters. In this mode, the Lamp Power value is ignored. PWM mode lights all lamps simultaneously and turns them on at the specified power level. In this mode, Lamp Set parameters are ignored.
<b>Lamp Power:</b>	The cure lamp power level expressed as a percentage of maximum power (PWM mode only).
<b>Cooldown Time:</b>	The cure lamp can be continuously on for up to 2 minutes, after this time the lamp is switched off for the Cooldown Time (in seconds). If the total Cure Time is greater than 2 minutes, the cycle of Lamp On / Cooldown is repeated until the lamp has been on for the total Cure Time.



#### Warning



**Do not look directly at the recoat assembly while the recoat lamps are on. The recoat lamps emit ultra-violet radiation which can cause damage to the eyes. The mold must be closed during recoat lamp operation.**

### 6.4.3. Proof Test Parameters

The proof test parameters are defined as follows:

<b>Fiber Diameter:</b>	The diameter of the fiber in microns ( $\mu\text{m}$ ). This diameter is required to calculate units of tension (kpsi & GPa). Note: Make sure to enter the diameter of the fiber, not the diameter of the coating.
<b>Tension Units:</b>	The unit of measurement, this can be either grams (g), gigapascals (GPa), Kilo-pounds per square inch (kpsi), pounds (lb) or Newtons (N).



<b>Peak Tension:</b>	The load or tension to which the fiber is to be proof tested in either grams, GPa, kpsi, lb, or N.
<b>Proof Test Timeout:</b>	Time limit to abort the proof test process if the Peak Tension is not reached.
<b>Hold Time:</b>	Also referred to as 'Dwell Time', the amount of time in seconds that the Peak Tension is held for.

#### 6.4.4. Advanced Parameters (PTR307 Only)

Advanced parameters are accessed from the toolbar since they are rarely modified. The PTR307 advanced parameters are defined as follows:

<b>Shrink Factor:</b>	The Shrink Factor is the amount of material injected into the recoat mold during the early stages of curing. This is entered as a percentage of the initial Inject volume, and is intended to compensate for material shrinkage during cure. Typical values for Shrink Factor are 3 to 6%.
<b>Shrink Time:</b>	Shrink Time specifies the time period over which any additional material is injected into the mold during cure. It is expressed as a percentage (%) of Cure Time.
<b>Lamp Set 1 Start:</b>	Specifies the switch-on time of Lamp Set 1 as a percentage (%) of Cure Time (Sequenced mode only).
<b>Lamp Set 1 Stop:</b>	Specifies the switch-off time of Lamp Set 1 as a percentage (%) of Cure Time (Sequenced mode only).
<b>Lamp Set 2 Start:</b>	Specifies the switch-on time of Lamp Set 1 as a percentage (%) of Cure Time (Sequenced mode only).
<b>Lamp Set 2 Stop:</b>	Specifies the switch-off time of Lamp Set 1 as a percentage (%) of Cure Time (Sequenced mode only).
<b>Momentary Injection:</b>	This can be enabled or disabled. When enabled, pressing the Inject button on the PTR307 causes the machine to inject recoat material for as long as the Inject button is down. When disabled, pressing the Inject button causes the predefined Inject Quantity to be injected. Note that pressing the Inject button on Tablet Controller will always deliver the predetermined Inject Quantity.

## 6.5. Injecting, Curing and Proof Testing

The tablet will display an appropriate screen whenever one of these operations is invoked. The Cure screen will close itself at the end of the Cure sequence, Inject (PTR307 only) and Proof Test Screen remain open for user input (add material, acknowledge test result). These screens are common to all PTR class Recoaters & Proof Testers.

### Inject Screen (PTR307 Only)

Once the Inject sequence has started (by pressing 'Inject' on either the Tablet or on the PTR307) the Inject Screen is displayed.



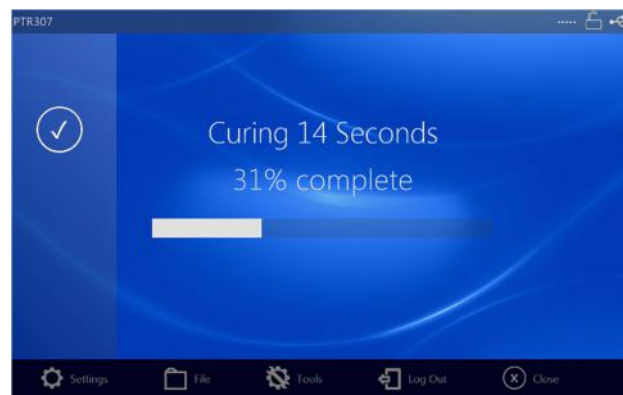
**Figure 10**      **Inject Screen**

If the PTR307 is configured for 'Momentary Injecting' (material is injected while the Inject button on PTR307 is held down) the Inject screen displays the amount of material injected so far. Note that pressing Inject on the Tablet Controller will always inject the quantity specified by the 'Inject quantity' parameter.

When configured for 'Auto-Injecting', the Inject screen displays the target Inject Quantity and a progress indicator.

### Cure Screen

Once the Cure sequence has started (either by pressing 'Cure' on the Tablet or on the PTR307 / PTR307B the Cure Screen is displayed.



**Figure 11**      **Cure Screen**

The cure screen displays the target Cure Time and a progress indicator (% complete). Once the Cure is complete, the Tablet Controller returns to the PTR307 / PTR307B main page.

## Test Screen

Once the Test sequence has started (either by pressing 'Test' on either the Tablet or on the PTR307 / PTR307B) the Test Screen is displayed.



**Figure 12     Test Screen**

The Test screen displays the current tension reading as well as the status of the test (started, tension OK, failed to reach tension). The Test Screen remains visible after the test to allow the user to see the result.

### 6.6.     Tablet Controller Reference

The Tablet Controller is a fully featured Windows 8 Tablet. The controller application (VytranCX.exe) is launched automatically on Windows startup. After a few seconds of displaying a master Home Screen, a discovery process is launched which detects any Vytran LDC / PTR modules connected. If a module is found and recognized, the controller configures itself for that module, in this case the PTR307 / PTR307B.

It is recommended that the Tablet Controller remains connected to a single machine in order to benefit from machine status monitoring built into the controller. The PTR307 / PTR307B can, however, operate without the Tablet Controller attached, and through use of the blue buttons will carry out Inject, Cure and Test using the last set of parameters that were uploaded to it.

At startup, Tablet Controller will always read parameters from the PTR307 / PTR307B meaning that the parameters that appear on the screen will always be the parameters that have been uploaded to the unit connected.

The Tablet Controller provides an 'offline' mode in which files can be modified and uploaded later.

### 6.6.1. PTR307 / PTR307B Main Screen

The PTR307 / PTR307B Main Screen has a status bar, one or more control (action) buttons, a view / edit button to access parameters related to that control or action, a Widget (for displaying the most relevant current parameters) and a toolbar. During operation, runtime messages are displayed.

From left to right, the status bar indicates the type of module detected (in this case PTR307 Manual Recoater – Rotary Proof Tester), the file currently open (blank if none) and three icons to indicate file status (unprotected or read-only), current user access status and USB connection.



**Figure 13** PTR307 / PTR307B Main Screen – Status Bar

The control buttons on the PTR307 / PTR307B Main Screen will perform the same function as the respective buttons on the PTR307 / PTR307B, invoking either Inject, Cure or Test. Each view / edit button will bring up the Parameter Select list that's relevant to the button.



**Figure 14** PTR307 / PTR307B Main Screen – Action & Parameter View / Edit

PTR307: The Widget provides an instant overview of the most relevant current parameters. From left to right it shows:

- Inject Quantity / Mold Size
- Material in Syringe ( $\mu\text{l}$ )
- Recoat Material remaining in bottle / Expiration Date.
- Cure Time
- Recoat Length
- Proof Test Level.



**Figure 15** PTR307 Main Screen – Widget

PTR307B: The Widget displays different parameters to PTR307. From left to right it shows:

- Manual Injection mode / Mold Size
- Recoat Material Expiration Date.
- Cure Time
- Recoat Length
- Proof Test Level
- Proof Test Timeout



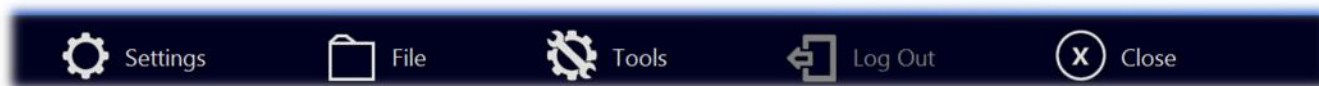
**Figure 16** PTR307B Main Screen – Widget

Runtime messages are displayed on the PTR Home screen when something important is happening such as reading parameters from the PTR and uploading new parameters to the machine.



**Figure 17** PTR Main Screen – Runtime Messages

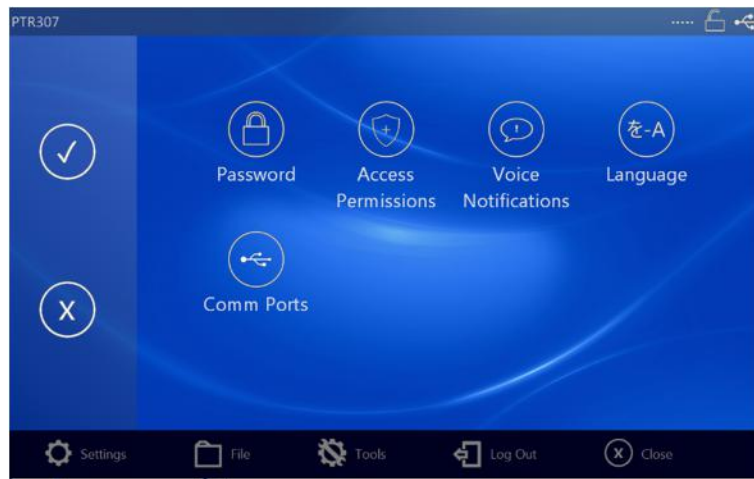
The toolbar provides access to Tablet Controller settings, the file system, PTR307 / PTR307B specific tools, a fast Log-Out feature and a close button to allow the user to exit the PTR307 Main Screen.



**Figure 18** PTR307 / PTR307B Main Screen – Toolbar

### 6.6.2. Settings

Touch the toolbar Settings button to bring up the Settings Screen. These options are for configuring the Tablet Controller and are generally not device dependent.

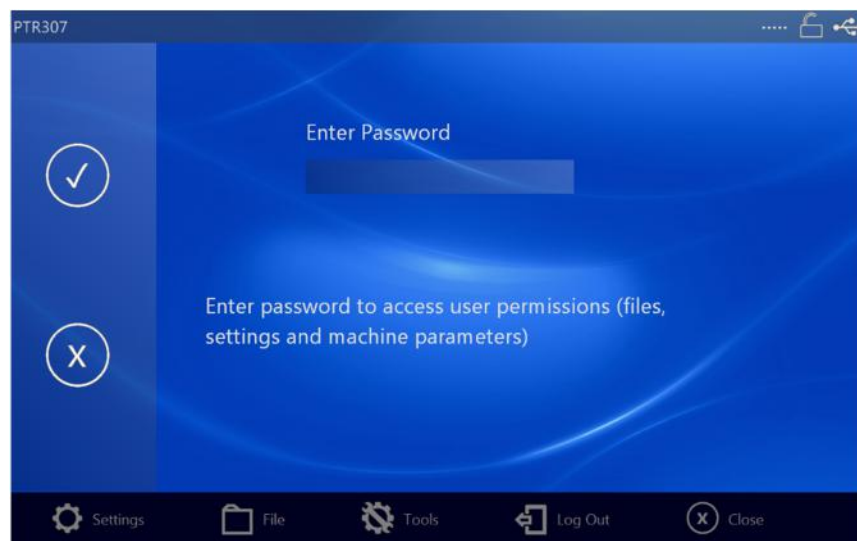


**Figure 19**      **Toolbar – Settings Screen**

From this screen the user can setup or enter a password, control user access permissions, enable or disable voice notifications, select the user interface language, view and manage communication ports.

### 6.6.3. Password

With a password, users can protect the controller and its files from unauthorized access / modification. Passwords are recoverable from a configuration xml file so can be retrieved if lost or forgotten. The controller defaults to No Password, Full Permission enabled. If a password has been setup and entered, the user can quickly log out using Log-Out from the toolbar. A password is required (only if one has been set) to change Access Permissions. These permissions are the actual mechanism for protecting files and parameters.

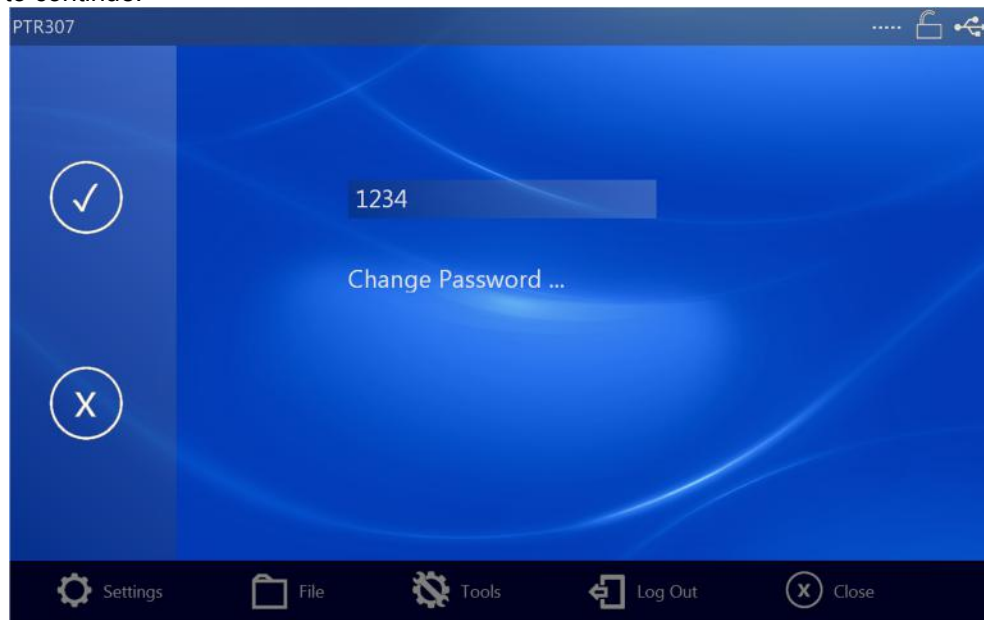


**Figure 20**      **Toolbar – Password Screen**

If no password has been setup yet, the password is effectively an empty string. Touch the password box and press the enter key to continue. If a password has been setup, enter the password. Passwords can be any characters, any length and are case sensitive. Whenever an incorrect password is entered, a message appears to inform the user. The Password is in effect until the user touches Toolbar-Log-Out.

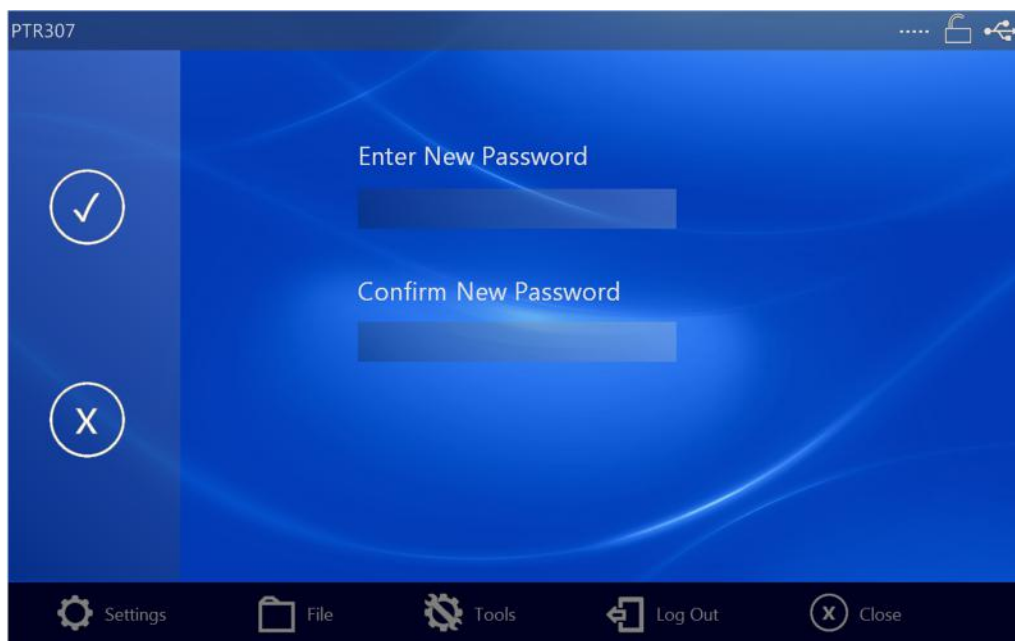


Once the correct password has been entered (in this case 1234), it can be changed by touching the Change Password text to continue.



**Figure 21**      **Toolbar – Change Password Option**

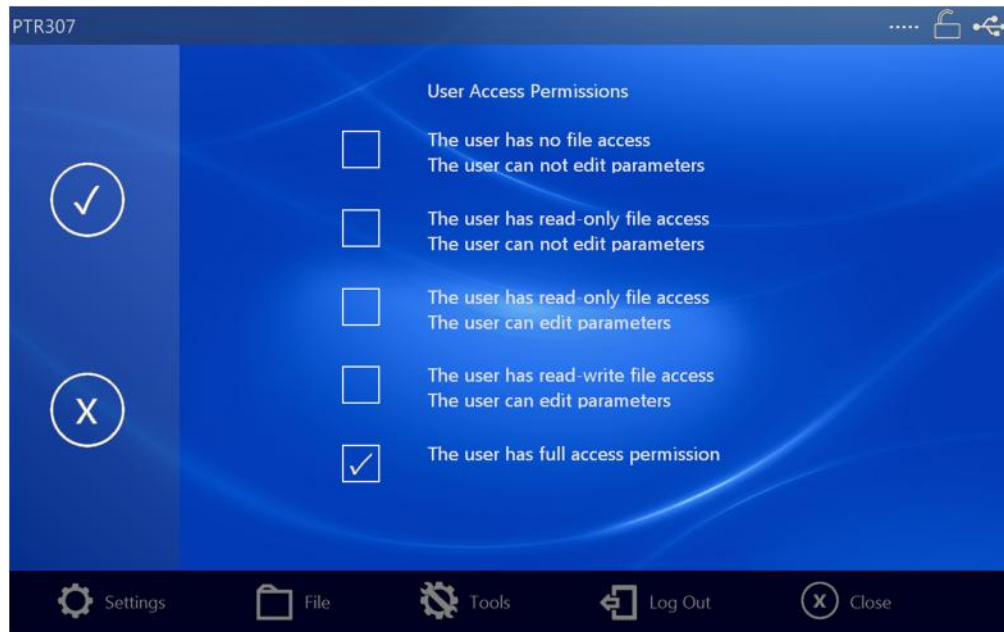
Touch the Enter New Password box and enter the new password, repeat in the confirmation box. The password is in effect until the user touches Toolbar-Log-Out.



**Figure 22**      **Toolbar – New Password Screen**

#### 6.6.4. Access Permissions

Tablet Controller can be setup to prevent unauthorized access of files and parameters which can be read-only or read-write in any combination. In addition, files can be saved as read-only and can only be overwritten by a user with Full Access Permission. Tablet Controller will warn the user when attempting to overwrite a read-only file. Tablet Controller defaults to No Password, Full Permission enabled. A password is required (if one has been set) to change Access Permissions.

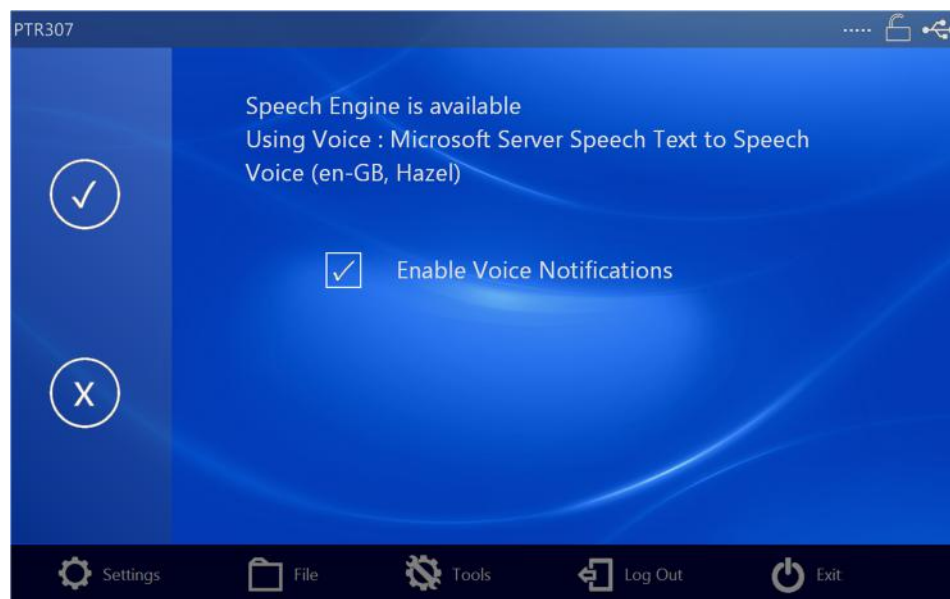


**Figure 23**      **Toolbar – User Access Permissions Screen**

The Access Permissions are self-explanatory except for Full Access Permission. Full Access Permission allows full read-write access of parameters and files, the ability to change User Access Permissions and the ability to overwrite a file that has been saved as read-only. If a read-only file contains an error, it's possible to correct it. If a password has been setup, the user must enter it before being allowed to change User Access Permissions.

### 6.6.5. Voice Notifications

Enable audible notifications in spoken language when a process has begun and whether it completed successfully or failed. Voice notifications will attempt to load an appropriate Text-To-Speech (TTS) voice for the current language selection. This requires a suitable (TTS) Voice has been installed. Contact Thorlabs / Vytran for more details.



**Figure 24**      **Toolbar – Voice Notifications (current language – English)**



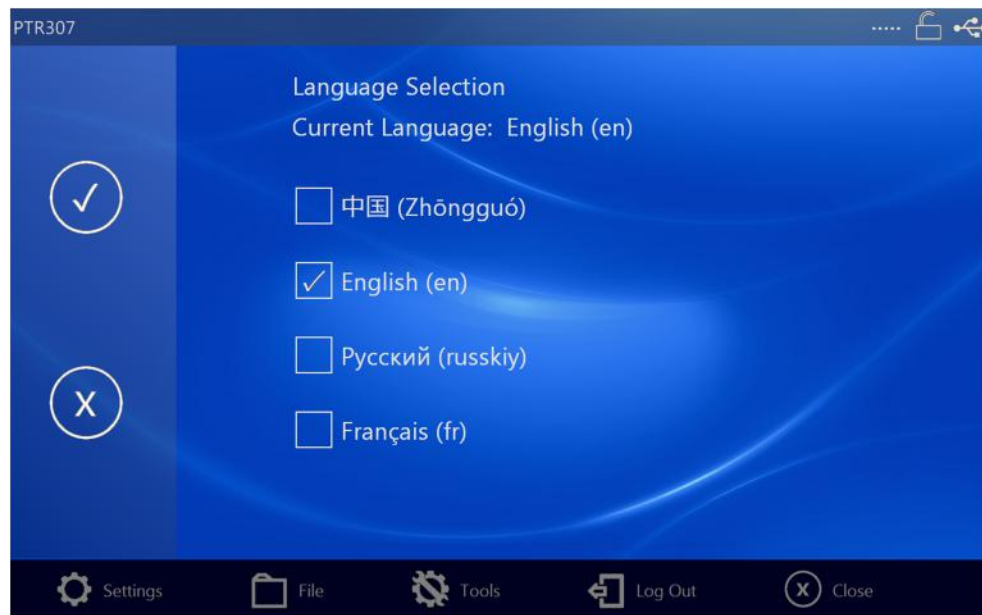


**Figure 25**      **Toolbar – Voice Notifications (current language – Chinese)**

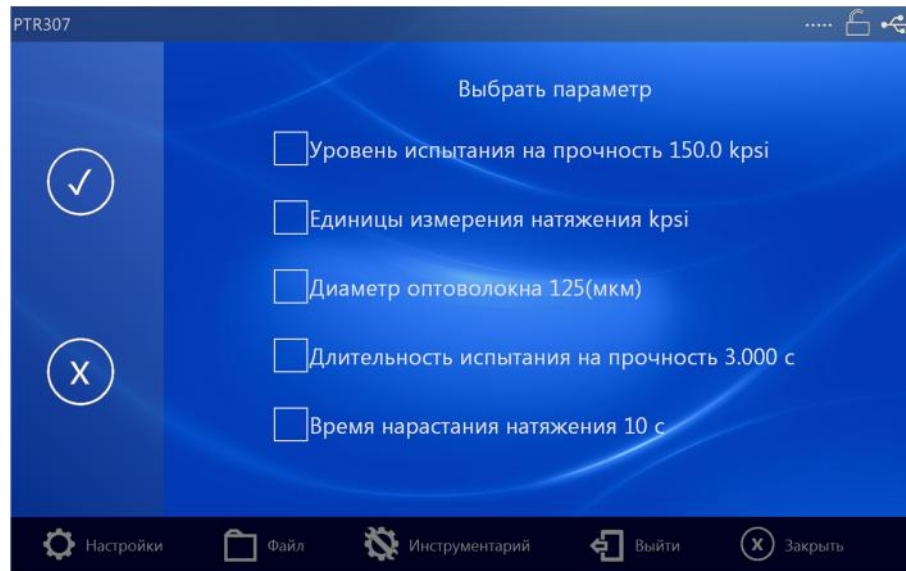
### 6.6.6. Language

The user can select the preferred user-interface language. Language selection is independent of computer locale or computer language packs installed.

Complete translations are available in English, French and Russian and Chinese, more will be available in the future. In the event that a piece of translated text is missing, the controller will default to English for that text. Future translations are installed by simply copying a resource-only dll file into a sub-folder of VytranCX controller.



**Figure 26**      **Toolbar – Language Selection**



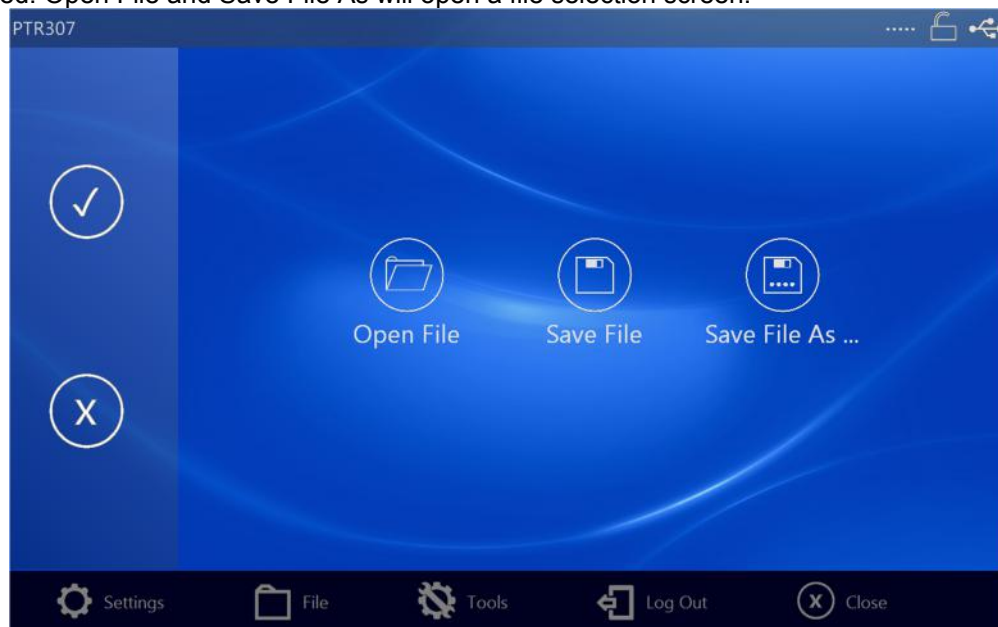
**Figure 27** PTR Parameter Select in Russian

### Comm Ports

The Comm Ports screen lists all communications ports detected by Tablet Controller which can be useful when fault-finding a missing connection. Tablet Controller will normally auto-detect the correct USB serial Comm Port to communicate with the module.

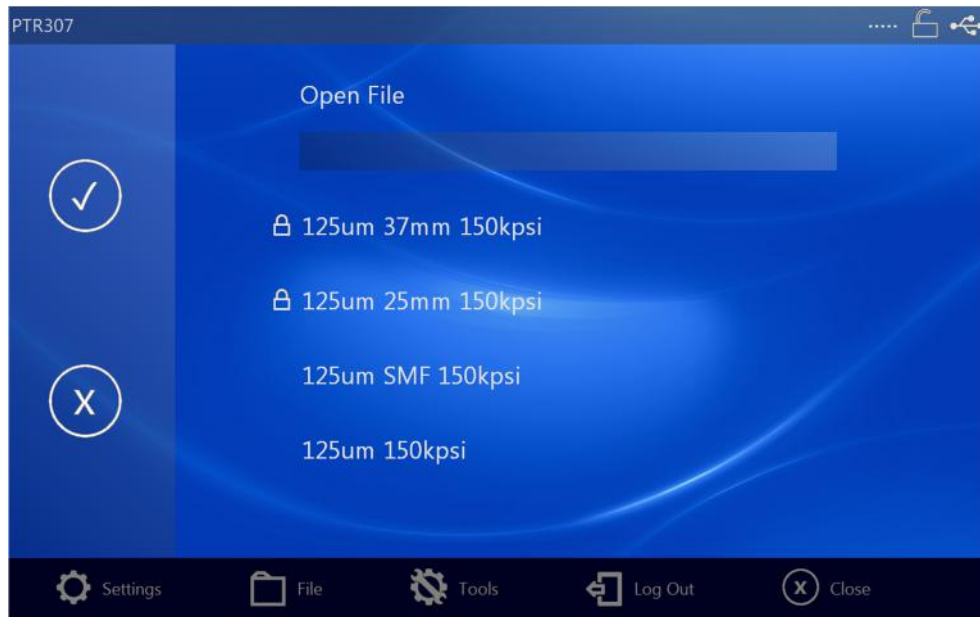
### Files

Files are opened, saved or saved-as from Toolbar-File. The user is presented with those options. Note that if no file is open, selecting Save File will open the Save File As screen and the current machine parameters will be saved to the file specified. Open File and Save File As will open a file selection screen.



**Figure 28** Toolbar – File Options Screen

### 6.6.7. Open File



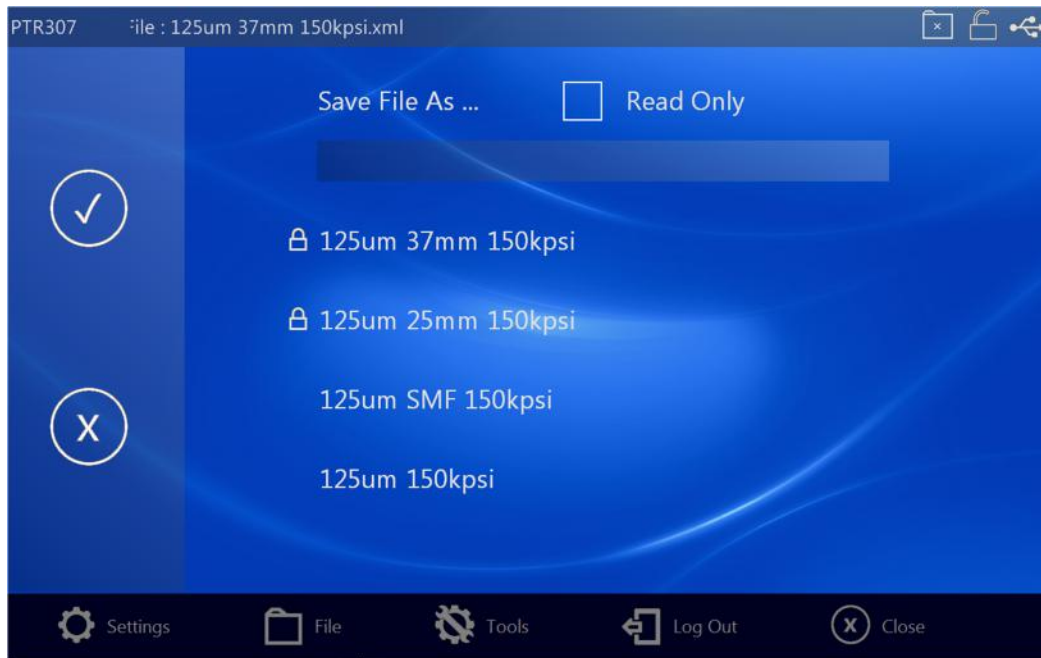
**Figure 29**      **Toolbar – File Open Screen**

In both File Open and Save File As screens, the existing files are listed in order of Most Recently. Any file that has been saved as a read-only file will display the small lock symbol next to the file name.

Only files specific to a particular type of Vytran equipment are displayed in the list. e.g., if the User is working with a PTRMRL/206/306, only files suitable for that machine are accessible. Each machine type has its own dedicated folder and files can only be saved in that folder.

Touch the file in the list to select to it for opening. Swipe the list to scroll up or down.

### 6.6.8. Save File As



**Figure 30**      **Toolbar – Save File As ... Screen**

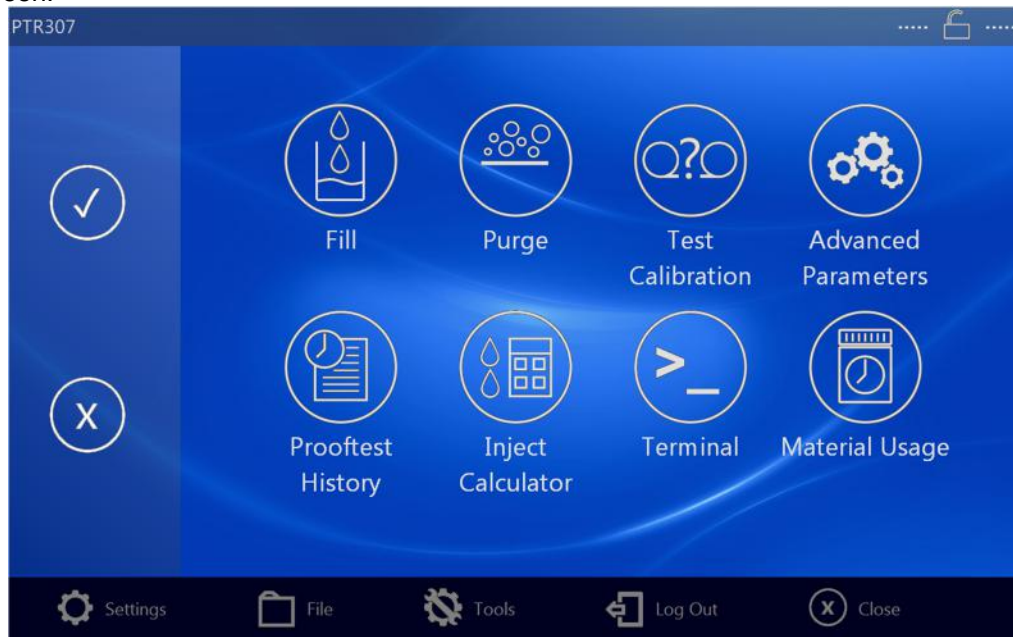
To select an existing file to overwrite, select it by touching it in the list. Alternatively, type in a filename to create a new file. Files can be saved as read-only. A read-only file can be overwritten but only if the user has Full Access Permission. It might at first seem strange to be able to overwrite a read-only file, consider how frustrating it would be if files contained errors that were impossible to correct. The current machine parameters can always be saved to file using Save File As.

### 6.6.9. Save File

Save File instantly saves the current open file to disk. There is no Save File screen.

## 6.7. Tools

Each Vytran machine type has its own suite of tools, designed to simplify certain tasks. Some of the tools are common to multiple machine types, others are unique to just one. Touching Toolbar – Tools brings up the Tool Selection Screen.



**Figure 31**      **Toolbar – Tool Selection Screen**

The set of tools currently available for PTR307 / PTR307B include:

- Syringe Fill Tool (PTR307 Only)
- Syringe Purge Tool (PTR307 Only)
- Test Calibration Tool
- Advanced Parameters (PTR307 Only)
- Proof Test History
- Inject Calculator Tool
- Terminal Client (direct command language communication with PTR307 / PTR307B)
- Material Usage Monitor (PTR307 Only)

### 6.7.1. Fill (PTR307 Only)

Allows the user to perform a fill operation. If an Inject sequence is initiated and the pump syringe has insufficient material to perform the inject operation, the machine will automatically fill the syringe from the material bottle. In many situations, the user may prefer to initiate the fill sequence while working away from the machine. Note that the machine cannot be used for any operation while performing a fill operation.



**Figure 32** Tools – Fill Screen

### 6.7.2. Purge (PTR307 Only)

Allows the user to initiate a Purge sequence. Purging is a method of removing air bubbles or voids from the inject mechanism. The system should be purged whenever a new bottle of material is installed.



**Figure 33** Tools – Purge Screen



### 6.7.3. Test Calibration

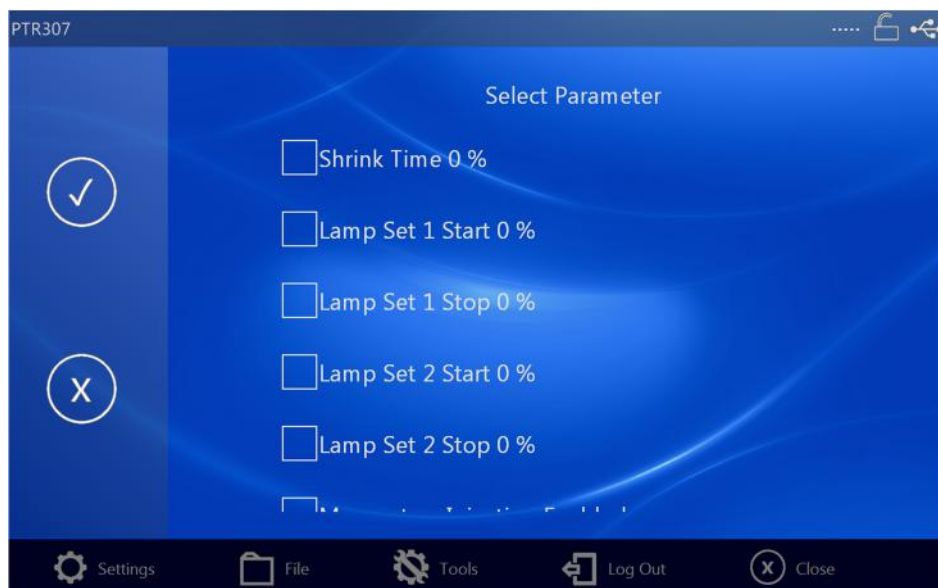
Test Calibration is a sequence that allows the user to hang a calibration weight from the PTR (via a suitable low friction pulley) and check the measured tension against the calibration weight.



**Figure 34** Tools – Test Calibration Screen

### 6.7.4. Advanced Parameters (PTR307 Only)

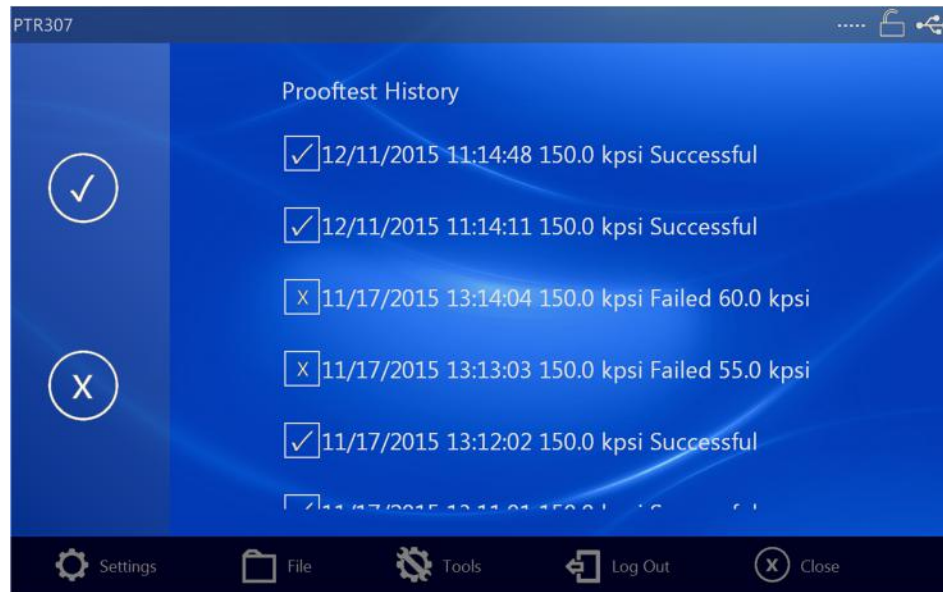
The Advanced Parameters Screen gives the user access to parameters that would not be modified except under fairly unusual conditions. On PTR307, these parameters are Shrink Time and Cure Lamp Sequence.



**Figure 35** Tools – Advanced Parameters Screen

### 6.7.5. Proof Test History

Whenever the PTR307 / PTR307B carries out a proof test, the Tablet Controller records when the test was carried out, the target tension and, if unsuccessful, the tension at which the fiber broke. Note that the tablet must be connected to the device for the proof test data to be recorded.



**Figure 36** Tools – Proof Test History Screen

### 6.7.6. Inject Quantity Calculator

The Inject Quantity Calculator provides a useful approximation of the recoat material required for a given mold size, fiber diameter and recoat length. Note that the volume is calculated on the assumption of no overlap with the fibers outer jacket. Touching a parameter on the right will bring up the Parameter Edit screen (provided the user has sufficient access rights).

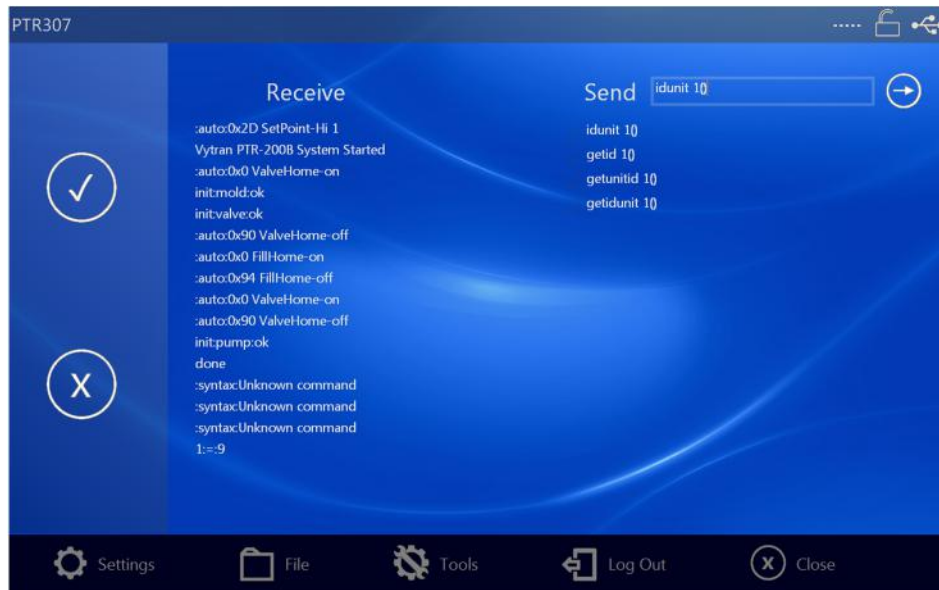


**Figure 37** Tools – Inject Calculator Screen



### 6.7.7. Terminal

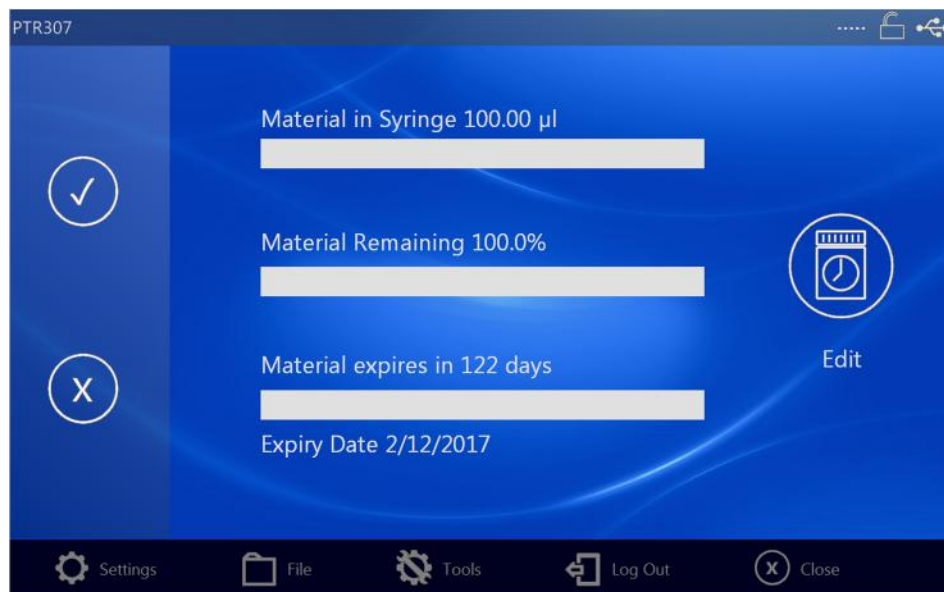
The Terminal Screen provides a box (top left) where a command can be entered for transmission. Below that is a list of the most recent commands sent. Touch a command in the list to select it for re-transmission. On the right is the received communications traffic.



**Figure 38** Tools – Terminal Screen

### 6.7.8. Material Usage (PTR307 Only)

The Material Usage Tool allows the user to enter the material bottle volume and expiration date. Click on the Edit button edit the bottle volume and expiration date. The Tablet Controller will then monitor material usage as it is injected into the mold and provide feedback in the Widget after each inject sequence. The Tablet Controller must be connected to the device for the material usage monitor to keep track of usage.



**Figure 39** Tools – Material Usage Screen

## **6.8. Log Out**

When the user enters a password, the user is considered 'logged in' with full access permission. The Log Out button provides a quick method of returning to the normal access permission level. If no password has been setup, the Toolbar-Log Out button is permanently greyed. If a password has been setup, the Toolbar-Log Out button is enabled whenever the user has 'logged in' by entering the password.

## **6.9. Exit / Close**

In the default Home Screen, the final toolbar button displays Exit. This will close the Application. When the Tablet is connected to a Vytran module, the button displays Close, this allows the user to return to the default Main Screen so the Tablet can be connected to a different Vytran module.

## Chapter 7 Priming the PTR307 and PTR307B

### Cleaning the Recoat Mold

The recoat mold assembly contains two very flat quartz plates, each with a semi-circular channel running longitudinally down the center of their mating surfaces. One plate is mounted in the hinged top which, when closed, forms a circular mold cavity with the bottom plate. In order for the top and bottom plates to mate flush together, they must be cleaned of all dirt and/or coating particles.

The quartz mold plates can be cleaned with a cotton swab wetted with isopropyl alcohol or acetone. Acetone cleans more thoroughly than alcohol and will also soften and lift away any cured recoat material. Do not use excessive scrubbing or scraping action to clean the mold plates. Typically a single wipe from left to right across both top and bottom mold plate is sufficient to clean the plates

If the recoat mold does have an accumulation of cured recoat material stuck to the plates, allow the cleaning solution (preferably acetone) time (60 - 90 seconds) to soften and lift any cured material. The soft brush provided can be used occasionally to clean the mold channels of any cured coating particles.

**Note:** The top surface of the bottom mold plate has an optical coating that blocks the UV light. Great care must be taken not to scratch or abrade this coating. Do not rub any hard objects across the surface of the plates as this could scratch the optical coating or chip the edges of the mold channel and degrade the quality of the recoat.

### Priming the Injection System

The PTR307 and PTR307B can both be manually injected if necessary. The PTR307 comes with the Automatic Injector System and the PTR307B comes with the Remote Manual Injector System as standard.

- Manual Injector
- Remote Manual Injector
- Automatic Injector

For priming the injection system go to the appropriate chapter below.

### Manual Injection System (PTR307 / PTR307B)

The top quartz plate contains an injection port, which must be filled with UV acrylate material prior to placing the fiber in the recoat mold. The injection port can be filled by using a syringe to dispense the UV material. Be careful to prevent the formation of bubbles in UV material when loading both syringe and injection port.



#### Warning



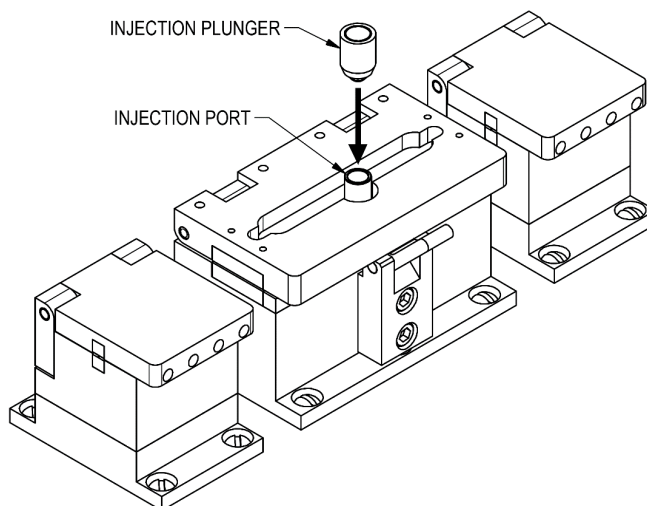
**Prior to handling the UV acrylate material, be sure to read the Material Safety Data Sheet provided in Chapter 12 Material Data Safety Sheet.**

To load the injection port, use the following procedures (see Figure 40):

1. Fill the syringe by inserting the tip into the bottle of UV material. Make sure that the tip is immersed in the material and slowly draw out the plunger.
2. If an air bubble gets trapped within the syringe, turn the syringe upside down for several minutes to allow the bubble to rise to the tip. Gently push in on the plunger to force out the air bubble.
3. Remove the threaded plunger from the injection port.
4. Slowly dispense material from syringe into the injection port. Make sure not to trap or inject air bubbles in the port. A good procedure is to dispense a small drop of recoat material at the tip of the syringe and then touch the drop to the inside back surface of the injection port. Give the material time to flow down into the

inject port – repeating with additional drops until material almost reaches the top. Some room should be left at the top in order to insert the O-ring plunger. If too much material is dispensed into the port such that it protrudes above the top, insert a small scrap piece of fiber into the port to remove some material.

5. Raise the recoat top slightly and press the O-ring of the injection plunger into the port.
6. Rotate the plunger clockwise until the threads just catch.
7. Raise the recoat top and wipe away any excess UV material that may have injected out through the top. Once the recoat port has been filled, it should contain enough UV material for several recoats.
8. Clean the mold plates of all excess recoat material.

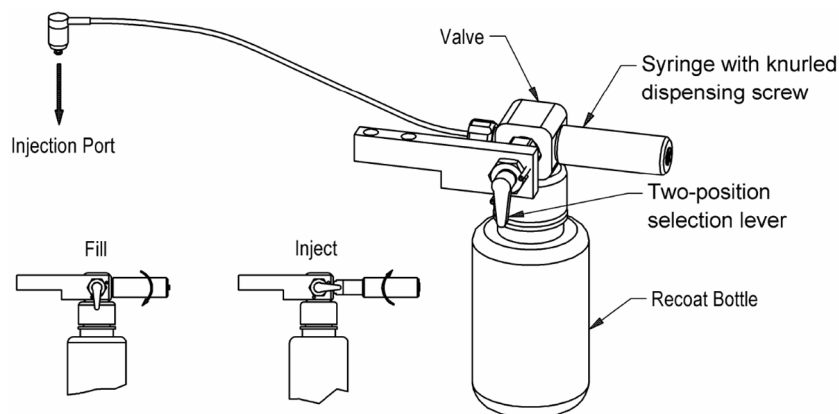


**Figure 40 Loading the Manual Injection Port**

### Remote Manual Injection (PTR307B)

The PTR307B comes with the remote manual recoat injector, which is fitted on the right side of the unit. This injector provides a method of manually dispensing recoat material directly from the recoat bottle into the injection port. It consists of a syringe with a knurled dispensing screw, which is fitted to a distribution valve with a two-position selection lever. The lever can be positioned downward (toward the recoat bottle) to draw up material from the recoat bottle, or horizontally (toward the syringe) to inject material into the mold. The knurled syringe screw is unscrewed (turned counterclockwise) to fill the syringe, and screwed in (turned clockwise) to inject material. The selection lever must always be in the correct position for the desired operation (see table below).

Operation	Lever Position	Turn Syringe Screw
Fill Syringe with Recoat Material	Down (Toward Recoat Bottle)	Counter-Clockwise (Unscrew)
Inject Recoat Material into Mold	Horizontal (Toward Syringe)	Clockwise (Screw In)



**Figure 41 Remote Manual Injector**

Prior to first use, the following steps must be followed to load the system with recoat material and purge all air from lines.



**Warning**



**Prior to handling the UV acrylate material, be sure to read the Material Safety Data Sheet provided in Chapter 12 Material Data Safety Sheet. Also review the MSDS provided with your chosen cleaning solution.**

1. Make sure to have lens tissue and cleaning solution (acetone or alcohol) available prior to proceeding.
2. Raise the recoater top.
3. Position the selection lever to the Inject position (lever horizontal) and screw in (turn clockwise) the knurled syringe screw until a slight resistance is felt at the end of travel. Do not use excessive force when turning in the screw once the end of travel is reached. The end of travel point is reached when the leading edge of the syringe screw is approximately level with the step in the syringe body.
4. Fit a recoat bottle with fresh recoat material to the system. The red inject tube should be long enough to just reach the bottom of the recoat bottle. If using a short (30 ml) recoat bottle the red tube may need to be trimmed to length.
5. Turn the selection lever to the Fill position (lever down). Unscrew (turn counter-clockwise) the knurled syringe screw to draw recoat material from the bottle into the syringe. Continue unscrewing the syringe screw approximately 3/4" or until it is felt to spin freely. Do not pull on the syringe screw once the end of travel is reached; this will pull the plunger out from the syringe body.
6. Turn the selection lever to the Inject position (lever horizontal) and screw in (turn clockwise) the syringe screw until the inject end of travel point is reached. **Note:** If the syringe screw was fully unscrewed until it spun freely, a slight forward pressure may initially be required to re-engage the threads.
7. Watch the injection port for signs of recoat material. Make sure to collect the recoat material as it comes out of the mold injection port. Do not allow recoat material to run down the face of the mold and under the mold plate.
8. The above steps of filling and injecting the syringe must be repeated several times to fully displace air from the system. Recoat material should run freely from the mold without bubbles. If bubbles are still present, run additional fill-inject sequences. It may help to turn the recoat plunger back and forth several times during the inject sequence in order to remove air trapped at the O-ring seal. It is also sometimes helpful to fill the syringe and then lift the left side of the unit such as to angle the syringe approximately 45 degrees. Leave the unit angled in this position for approximately 15 minutes. This will allow any air trapped in the syringe to rise up towards the distribution valve such that it can then be injected out.
9. Once the system runs free of air bubbles, clean the mold plates of any excess recoat material.

## Automatic Injection System (PTR307)

The PTR307 comes with the automatic recoat injection pump fitted inside the unit. This system must first be filled and purged with recoat material prior to operation. Follow the below steps to initialize this system.

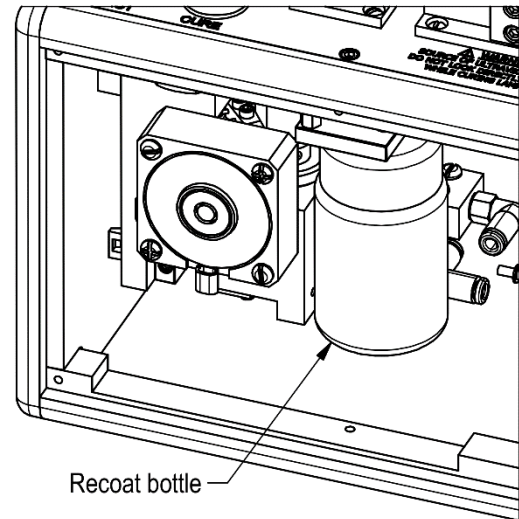


### Warning

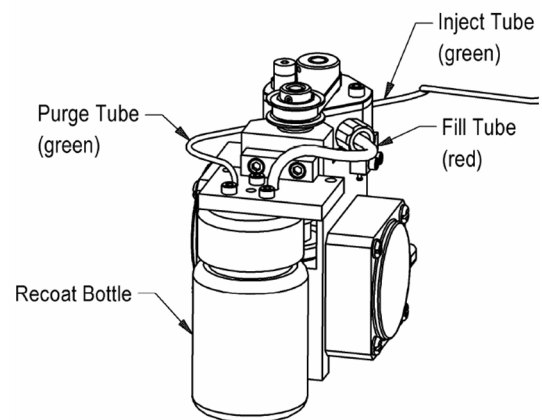


**Prior to handling the UV acrylate material, be sure to read the Material Safety Data Sheet provided in Chapter 12 Material Data Safety Sheet. Also review the MSDS provided with your chosen cleaning solution.**

1. Remove the front panel by removing four (4) socket head cap screws. A 3/32" hex key is provided in the tool kit
2. Unscrew the recoat reservoir (brown bottle) shown in Figure 8 and fill 3/4 full with recoat material (ANGSTRÖMBOND® 950-200), being careful not to generate air bubbles.
3. Screw the reservoir bottle back into place and replace the front panel.
4. Before turning on the unit, connect a Tablet Controller to the back panel of the unit.
5. Switch the device on and wait for the system to initialize.
6. Execute 5 purge cycles, which will take approximately 30 minutes. Each purge cycle will draw recoat material from the bottom of the bottle through the red fill tube and inject material back into the top of the bottle through the green purge tube.
7. After completion of the pump purge cycle, the green inject tube that runs from the pump to the inject port of the mold must also be purged. Raise the recoat mold top and make sure to have cotton swabs and cleaning solution (alcohol or acetone) available prior to proceeding.
8. Set the inject rate to 1.8 µl/sec.
9. Inject 50 µl of recoat material. **Note:** Make sure to collect the recoat material as it comes out of the mold injection port. Do not allow recoat material to run down the face of the mold and under the mold plate.
10. If the system was "dry" prior to proceeding, it will take 4 "inject 50" sequences to purge air completely from the inject tube. **Note:** Because the injection pump holds 100 µl of recoat material, there will be a delay of approximately one minute between the second and third inject sequence while the pump refills.
11. Once the pump and the inject tube are purged, clean the mold plates of all excess recoat material.
12. Reset the inject rate to the appropriate setting.



**Figure 42 PTR307 Recoat Bottle Access**



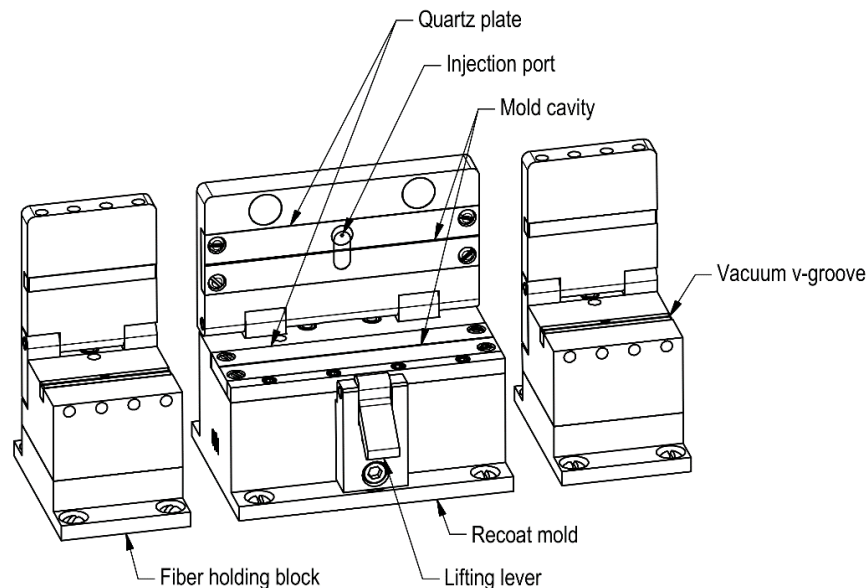
**Figure 43 Recoat Material Flow**

## Chapter 8 Recoat Process

The purpose of the recoat is to maintain the strength and flexibility of the fiber or fusion splice by protecting the glass surface from damage. It should be noted that recoating a splice does not make the splice stronger.

To recoat a fusion splice, the section of exposed fiber is placed in a quartz recoat mold assembly. External fiber holding blocks secure the fiber, centering it within the recoat assembly. To allow for tolerance variations from fiber manufacturers, the diameter of the recoat mold cavity is generally specified to be slightly larger than the nominal outside coating diameter (e.g. 280  $\mu\text{m}$  for a nominal 250  $\mu\text{m}$  coating).

The recoat process maintains a near original fiber diameter and delivers a flexible fusion splice that can be handled or tightly coiled as if no splice were present. The integral fiber holding blocks ensure that the fiber strength is not degraded by the recoat process.



**Figure 44** Recoat and Proof Test Components

### 8.1. Position the Fiber for Recoat

A vacuum V-groove fiber holding block is mounted on each side of the recoat mold assembly to position the fiber in the mold channel. Vacuum to the fiber holding blocks is automatically turned on when one of the fiber holding block tops is raised. To position a fiber for recoating, use the following procedures:

1. Raise the recoat top and both holding block tops.
2. Make sure both quartz plates are clean and that the injection port has enough UV material for the recoat (Manual Injection) or that the injection system is purged (PTR307 or PTR307B).
3. Hold the section of fiber to be recoated taut and lower it down over the fiber holding block such that the exposed section (fusion splice) is centered in the recoat mold. The fiber will be drawn by the vacuum into the V-grooves of the holding blocks. **Note:** Vacuum to the V-groove holding blocks will automatically shut off if left on for more than 30 seconds. To restart the vacuum, close both fiber holding block tops and then raise one of the tops. It is good practice to keep both fiber holding block tops closed when not in use.
4. Double check that the exposed section of fiber is centered in the mold. Lower one of the fiber holding block tops to clamp the fiber.
5. Make sure that the fiber is taut between the fiber holding blocks and lower the second holding top. The fiber should be held in line with the recoat mold channel.
6. Lower the recoat top gently, then lift the lifting lever to capture the fiber within the mold cavity.



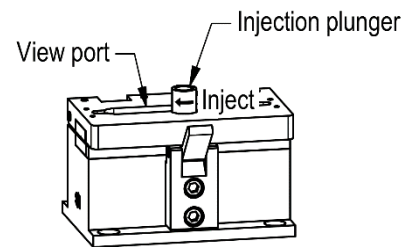
It is important to keep the fiber taut between the holding fixtures to prevent the fiber from bowing at the recoat. It is also important to avoid touching the exposed glass surface as this could significantly lower the strength of the fiber. Care should therefore be taken when positioning the fiber in the holding blocks to avoid rubbing the exposed section of fiber against the mold assembly. If proper care is taken when positioning the fiber, the recoat process will not degrade the strength of the fiber.

## 8.2. Recoating

### Manual Injection System (PTR307 / PTR307B)

Once the fiber has been captured in the recoat mold assembly, the injection plunger should be turned clockwise to inject the UV acrylate material into the mold cavity. The material will flow from the injection port, down a shallow channel, into the recoat cavity. The plunger should be turned slowly to give the material time to flow smoothly along the injection path.

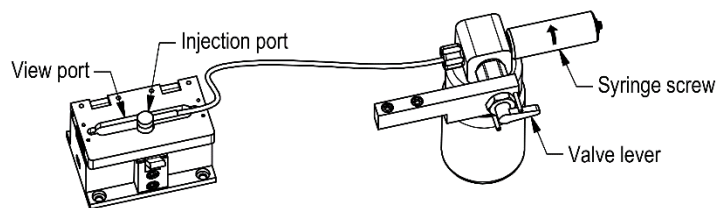
Use the viewport in the recoat top to watch the material flow into the mold. Continue turning the plunger until the acrylate material reaches both coating interfaces of the exposed section of fiber. A slight migration of the acrylate material outside of the injection path between the two mold plates can be expected. The bottom mold plate has an optical coating that prevents this material from curing and forming mold flashing. Excessive flashing flow indicates that the plates did not mate flush together. This is generally caused by dirt particles on the mold plates and/or by trying to recoat a fiber that has a larger coating diameter than the recoat mold.



**Figure 45** Manual Recoat Injection

### Manual Remote Injection System (PTR307B)

Make sure that the selection lever is in the inject position (lever up). Once the fiber has been captured in the recoat mold assembly, the injection syringe should be screwed in (turned clockwise) to inject the UV acrylate material into the mold cavity. The material will flow from the injection port, down a shallow channel, into the recoat cavity. The syringe should be turned slowly to give the material time to flow smoothly along the injection path.



**Figure 46** PTR307B Remote Manual Recoat Injection

Use the viewport in the recoat top to watch the material flow into the mold. Continue turning the injection syringe until the acrylate material reaches both coating interfaces of the exposed section of fiber. A slight migration of the acrylate material outside of the injection path between the two mold plates can be expected. The bottom mold plate has an optical coating that prevents this material from curing and forming mold flashing. Excessive flashing flow indicates that the plates did not mate together perfectly. This is generally caused by dirt particles on the mold plates and/or by trying to recoat a fiber that has a larger coating diameter than the recoat mold.

**Note:** If the syringe end-of-travel is reached during the injection process, the syringe can be re-filled mid-process by positioning the selection lever to the fill position (lever down) and un-screwing (turn counterclockwise) the syringe screw. Once filled, re-position the selection lever to the inject position (lever horizontal) and continue injecting material into the mold

### Automatic Injection System (PTR307)

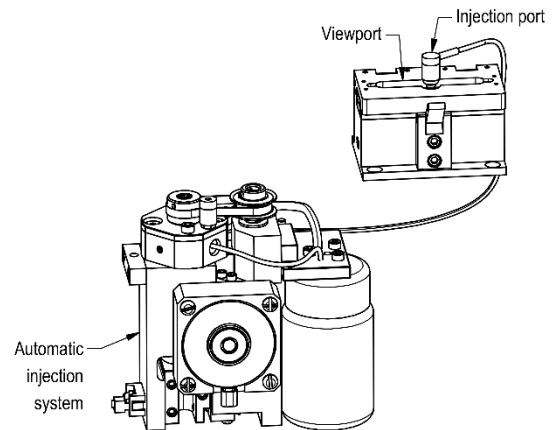
Once the fiber has been captured in the recoat mold assembly, press and hold the inject button on the top plate of the unit. This will activate the injection pump and begin dispensing recoat material.

Use the viewport in the recoat top to watch the material flow into the mold. Release the button to stop dispensing material once it has reached the coating interface.

A slight migration of the acrylate material outside of the injection path between the two mold plates can be expected. The bottom mold plate has an optical coating that prevents this material from curing and forming a characteristic mold flashing. Excessive flashing flow indicates that the plates did not mate flush together. This is generally caused by dirt particles on the mold plates and/or by trying to recoat a fiber that has a larger coating diameter than the recoat mold.

## Curing the Coating

The liquid UV acrylate material cures to a solid state when exposed to ultra-violet light. The necessary UV radiation is provided by four tungsten-halogen lamps located below the bottom mold plate. The optical coating on the bottom plate ensures that any material which flows between the two plates will not cure and form a flashing on the recoated section of the fiber. To cure the fiber coating, use the following procedures:



**Figure 47** PTR307 Automatic Recoat Injection



### Warning



**Do not look directly at the recoat assembly while the recoat lamps are on. The recoat lamps emit ultraviolet radiation which can cause damage to the eyes. The mold top must be closed during recoat lamp operation.**

1. Make sure recoat material has been injected up to or beyond the coating interfaces.
2. Activate cure process to turn on the UV lamps. The recoat lamps will shut off automatically after set cure time.
3. Raise both fiber holding block tops.
4. Raise the recoat mold top by pressing down on the lifting lever. Then open the recoat mold top all the way.  
**Note:** Do not lift by or exert any force on the injection port.
5. The fiber may remain tacked to either the top or bottom mold plate. In this case, it may be necessary to gently pull on the fiber to release it. Try to avoid inducing any sharp bend to the fiber.
6. Visually inspect the recoated fiber to make sure the recoat reached both interfaces and that there are no voids or air bubbles in the recoat. The recoat can be gently wiped with a dry lens tissue to remove any uncured recoat material or light flashing. Do not wipe the recoat with acetone.
7. Clean both top and bottom mold plates with a soft lint-free lens tissue and/or cotton swab soaked in cleaning solution. **Note:** Acetone is the preferred solution for cleaning the mold plates. Acetone cleans more thoroughly than alcohol and will also soften and remove cured recoat material. The mold plates can typically be cleaned of excess uncured recoat material with a single wipe from left to right across both top and bottom plates. Take care to avoid contact with the uncured recoat material (read "0 Material Data Safety Sheet" before working with recoat material).

**Note:** The top surface of the bottom mold plate has an optical coating that blocks the UV light. Great care must be taken not to scratch or abrade this coating. Do not rub any hard objects across the surface of the plates as this could scratch the optical coating or chip the edges of the mold channel and degrade the quality of the recoat.

## Chapter 9 Proof Test Process

The proof test station of the PTR307 / PTR307B can be used to determine the breaking strength of an optical fiber or to ensure that a fiber or fusion splice meets a minimum strength requirement.

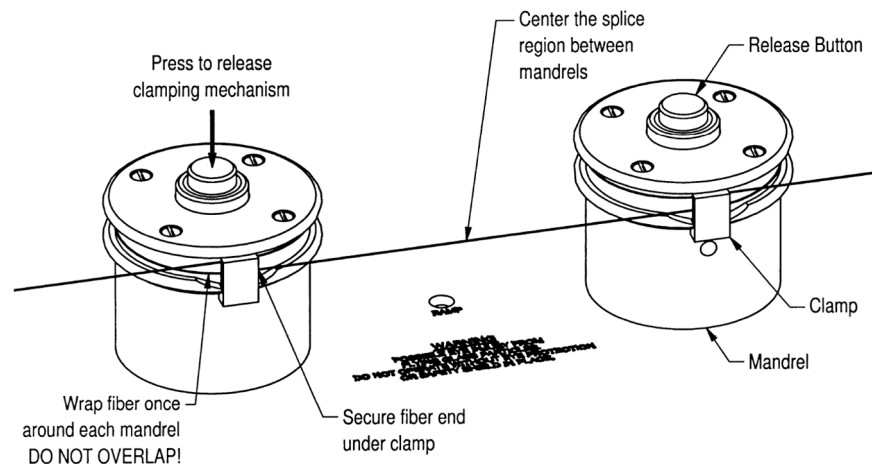
To proof or tension test a fiber, the section of fiber to be tested is located between two mandrels. The ends of the fibers are wrapped once around each mandrel and held in place by an integrated clamping mechanism. The test load is applied to the fiber by the rotation of the right hand mandrel. The load can be taken up to a predetermined level and released (proof test) or it can be taken up to the breaking strength of the fiber (tension test). The peak tension is recorded and can be displayed in units of load or tension.

### Position the Fiber for Proof Test

Before beginning the proof or tension test procedure, make sure that both recoat holding fixture tops are closed. Both tops must be closed for proper operation of the Proof Tester/Tension Tester.

**Note:** Do not use the Proof Tester/Tension Tester while curing a recoated splice.

Press and hold down the release buttons on top of the mandrels to open mandrel clamps. Position fiber under clamps such that the splice region or section of fiber to be tested is centered between the mandrels. Release the buttons to hold the fiber in position. Ensure that the splice is centered between the mandrels. Wrap the fiber once around each mandrel, ideally near the center of the rubber grip. Make sure not to overlap the fiber under the clamp as this could cause local stresses that may weaken or break the fiber during the proof test. When properly loaded the fiber should be taught with minimal slack between the mandrels. Note: The proof test reading will not be affected by any residual tension left in the fiber after loading.



**Figure 48 Load Fiber for Proof Testing**

### Proof Testing

Configure the unit to proof test to the desired level.



#### Warning



**Always use the safety shield or wear safety glasses when proof or tension testing fiber. The fiber under test can shatter and send glass particles flying.**

The procedures for the automatic proof test are as follows:

1. Set the Proof Test parameters.
2. Load the fiber to be tested.
3. Make sure the safety shield is in place and that you are wearing safety glasses. **Note:** Anyone observing the test should also take precautions against flying glass particles.
4. Press the **Test** button to initiate the proof test cycle.

The maximum tension applied to the fiber will be recorded and displayed. If the fiber breaks prior to reaching the Automatic Proof Test level, the breaking strength will be displayed.

## Adjusting Ramp Rate

The Ramp Rate is the rate at which tension to the fiber is applied during a Proof Test / Tension Test. This rate can be adjusted through the Ramp Screw as shown in Figure 15. To decrease the Ramp Rate turn the Ramp Screw clockwise; to increase the Ramp Rate turn it counterclockwise.



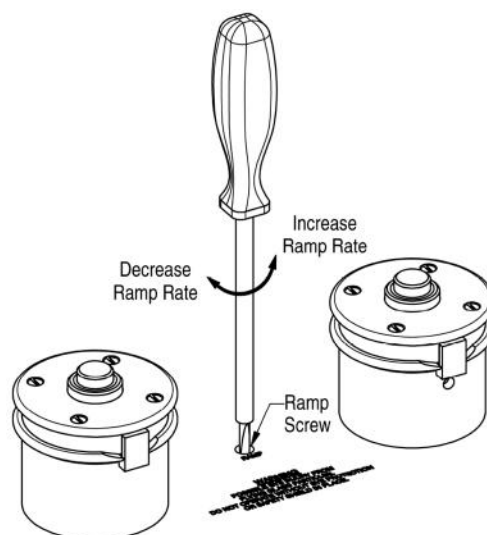
**Warning**



**Always use the safety shield or wear safety glasses when proof or tension testing fiber. The fiber under test can shatter and send glass particles flying.**

The procedures for adjusting the Ramp Rate are as follows:

1. Set the desired proof test level Peak Tension (see Chapter 6.3).
2. Make sure the proof test timeout is set for 10 seconds or greater.
3. Load a piece of test fiber onto the proof test mandrels.
4. Make sure the safety shield is in place or wear safety glasses.
5. Initiate the Proof Test by pressing the Test button.
6. Note the time it takes for the desired proof test Peak Tension level will be reached, starting from when the right hand mandrel just starts to rotate. The Peak Tension should be reached in approximately 5 seconds. Adjust as necessary.



**Figure 49**      **Adjusting the Ramp Rate**

## Chapter 10 Maintenance

The purpose of the maintenance section is to define the planned maintenance requirements of the PTR307 / PTR307B. Where appropriate maintenance procedures are included.

### 10.1. Planned Maintenance

These fiber recoaters are designed for a production environment to give trouble free operation provided normal planned maintenance is adhered to. Maintenance and repair procedures should only be performed by trained personnel. Improper service and/or repair could result in the safety features being disabled and can also lead to damage that will not be covered under warranty.

#### Planned Maintenance Schedule

Maintenance	Every Cycle	Every Shift	Daily	Monthly	3 Months	6 Months	12 Months
Check Mold <sup>1</sup>	✓	✓	✓	✓	✓	✓	✓
Check Fiber Holding Block Inserts for Debris/Damage <sup>1</sup>		✓	✓	✓	✓	✓	✓
Check UV Lamps <sup>1</sup>			✓	✓	✓	✓	✓
Run Purge (5 Cycles)				✓	✓	✓	✓
Replace UV Lamps <sup>2</sup>				✓	✓	✓	✓
Flush Recoat System						✓	✓
Replace Recoat Material						✓	✓
Check Proof Test Calibration/Recalibrate							✓

### 10.2. Cleaning

#### Clean Mold

Keeping the mold plates clean is vitally important for proper recoat performance and quality. The mold plates should be cleaned of dirt, dust or excessive recoat material before each use. Clean the mold plates only with a soft cotton swab soaked in cleaning solution. Acetone is the preferred solution for cleaning the mold plates. Acetone cleans more thoroughly than alcohol and will also soften and lift away any cured recoat material. Do not use excessive scrubbing or scraping action to clean the plates. Give the cleaning solution time (60 - 90 seconds) to soften and lift any cured material. Excessive cleaning can shorten the life of the mold through damage to the coatings on the mold plates or chipping of the mold channel.

#### Clean FHB Inserts

Turn OFF the unit and raise top of both fiber holding blocks. Inspect the vacuum V-groove inserts for debris or damage. If debris is present, clean V-grooves with a cotton swab wetted with acetone or alcohol



#### Warning



**Do NOT clean the V-groove insert with solvent when the PTR-200 is turned ON. The solvent will be drawn into the vacuum system and will cause internal damage. If the V-groove inserts appear to be damaged, replace the inserts.**

<sup>1</sup> Maintenance Operations can be Performed by the Operator

<sup>2</sup> Lamp Replacement Schedule Based on 2,000 recoats/month at 15 s/recoat

### 10.3. Recoat System Maintenance

#### Check Recoat Lamps

The PTR307 / PTR307B uses tungsten halogen lamps as the UV source for curing recoat material. These lamps have a useful lifetime of 500 minutes (30,000 seconds) and degrade linearly to 50% of their initial output over this period. For a standard cure time of 15 seconds on a 280 micron mold, this is a useful life of 2,000 recoats. If lamps collect dirt and/or recoat material due to improper use and/or cleaning, this lifetime can be even further reduced. For production environments, it is recommended that a fixed lamp replacement schedule of 1500 recoats be implemented (shorter if using longer recoat cure times for larger mold). Note: During this period the cure time will need to be increased to compensate for reduced lamp output.

To check the recoat lamps, open the top of the recoat mold assembly and press the CURE button on the unit. This applies low power to the UV lamps for visual inspection. This can also be done in the Options Menu from the Tablet. Look through the bottom recoat mold plates and check to make sure that all four recoat lamps are visibly illuminated. Because the lamps are powered in two series pairs, if one lamp burns out, only two will remain illuminated.



#### Warning



**Don't inspect the UV lamps while the top of the recoat mold assembly is closed, as the UV lamps will be powered for a cure process when pressing the CURE button.**

If a lamp is burned out, remove the recoat assembly and replace the burned out lamp. Replace the recoat assembly and re-align.

#### Empty the Manual Injection System (PTR307 / PTR307B)

If the recoat mold assembly is stored for any length of time, the acrylate injector port must be emptied, particularly if it is stored near a fluorescent light source. If it is stored when not empty, the material may cure (harden) in the port. To empty the injector, open the recoat mold top. Turn the injection plunger clockwise to force the UV acrylate material out of the injection port and onto the recoat mold plate. Wipe up the acrylate as it is ejected with a soft lint-free cloth. Acrylate should be disposed with solid chemical waste. Clean the mold thoroughly and store with several layers of soft lens tissue between the plates.

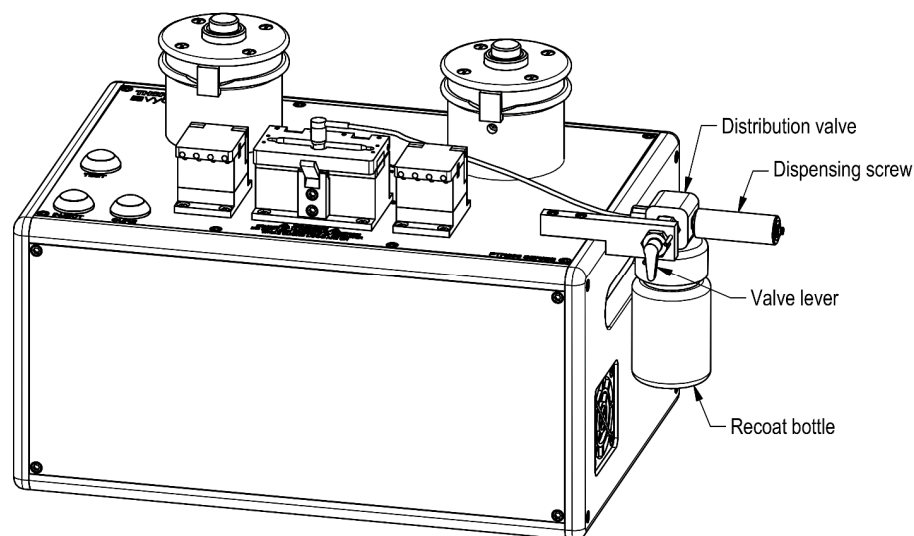
#### Flush the Manual Remote Injection System (PTR307B)

The recoat pumping system should be flushed clean every 6 months as part of recoat material replacement procedure. Before flushing the system, have lens tissue and cleaning solution (acetone or alcohol) available prior to proceeding. To flush system:

1. Raise the recoater top.
2. Position the selection lever to the Inject position (lever horizontal).
3. Screw in (turn clockwise) the knurled syringe screw until a slight resistance is felt at the end of travel. Do not use excessive force when turning in the screw once the end of travel is reached. The end of travel point is reached when the leading edge of the syringe screw is approximately level with the step in the syringe body. **Note:** Make sure to collect the recoat material as it comes out of the mold injection port. Do not allow recoat material to run down the face of the mold and under the mold plate.
4. Replace the recoat bottle with one containing clean solvent
5. Turn the selection lever to the Fill position (lever down).
6. Unscrew (turn counter-clockwise) the knurled syringe screw to draw the solvent from the bottle into the syringe. Continue unscrewing the syringe screw approximately 3/4 inches or until it is felt to spin freely. **Note:** Do not pull on the syringe screw once the end of travel is reached; this will pull the plunger out from the syringe body.



7. Turn the selection lever to the Inject position (lever horizontal) and screw in (turn clockwise) the syringe screw until the inject end of travel point is reached. **Note:** If the syringe screw was fully unscrewed until it spun freely, a slight forward pressure may initially be required to re-catch the threads.)
8. Watch the injection port for signs of solvent.
9. The above steps of filling and injecting the syringe must be repeated several times to fully displace recoat material from the system. Repeat until clean solvent flows from the injection port.
10. Clean the mold plates of all excess solvent and recoat material. Acrylate should be disposed of with solid chemical waste.
11. Remove the bottle containing the solvent and dispose of the solvent according to proper handling guidelines.
12. Repeat step 5-7 with no bottle present to purge any solvent from the injection system.
13. Prime the system by following the instructions in b) Remote Manual Injection System.



**Figure 50 Remote Injection System**

### Purge the Automatic Injection System (PTR307)

The purge cycle is a process of emptying the recoat material of the PTR307's Automatic Injector back into the recoat material bottle and refilling the pump with fresh recoat material drawn from the bottom of the bottle.

If the recoater is not used in a high volume application (less than 200 recoats per month), it is recommended that the system be purged monthly in order to circulate fresh recoat material into the pump. Running 5 purge cycles is sufficient to entirely fill the pump with fresh recoat material.

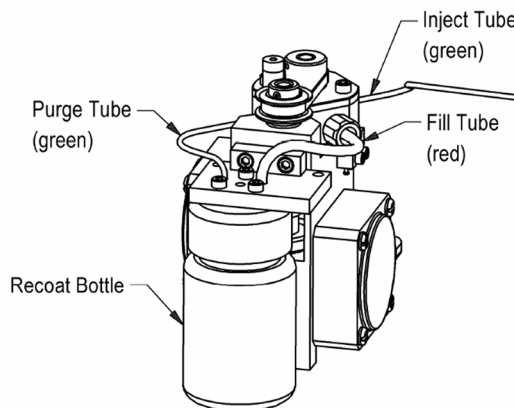
### Flush Automatic Injection System

The recoat pumping system should be flushed clean every 6 months as part of the recoat material replacement procedure. Before flushing the system, make sure to have lens tissue and cleaning solution (acetone or alcohol) available prior to proceeding. To flush the system:

1. Remove the internal recoat bottle and clean all exposed tubing and fittings with acetone.
2. Install a bottle filled 3/4 full with acetone on the pump.
3. Run 5 purge cycles.
4. Remove the bottle and fill with clean acetone.



5. Run 5 more purge cycles
6. Make sure the recoat mold is open.
7. Run several inject 50 sequences until acetone runs clear from the mold inject port. **Note:** Make sure to collect material as it comes out of the inject port. Do not allow any material to run under the mold plates.
8. Remove the bottle of Acetone from the pump.
9. Run several more inject 50 sequences until no more acetone exits the injection port.
10. Run one purge cycle. Make sure to collect any acetone that comes out of the green purge tube at the top of the bottle fitting using a Kimwipe; the Kimwipe can be disposed of with ordinary waste as the acetone evaporates quickly.
11. Clean all bottle tubing and fittings with acetone.
12. Prime the system by following the instructions in Automatic Injection System



**Figure 51 Recoat System**

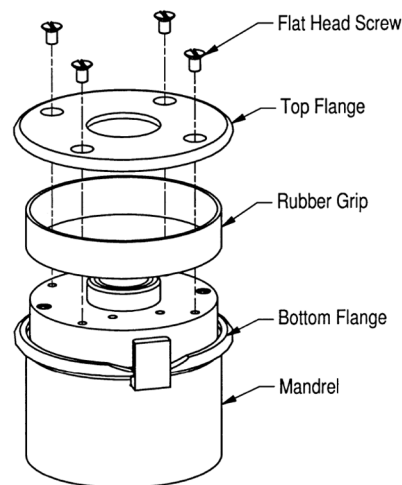
## 10.4. Proof Test System Maintenance

### Replace Proof Test Grips

Remove the 4 flat head screws on top of the proof test mandrel and lift off the flanged top. Depress the mandrel clamp button and remove the rubber grip. Install a new grip making sure that the grip is uniformly positioned around the mandrel and seated below the bottom flange. Replace the top flange and 4 flat head screws. Make sure that the mandrel clamp operates freely and that the rubber grip does not rub against the clamping arm. After replacing the proof test grips, a calibration check should be performed.

### Check Proof Test Calibration / Re-Cal

It is recommended that the recoater be returned to Thorlabs annually for calibration check and/or recalibration. A calibration fixture is available for customers who prefer to perform this function in-house.

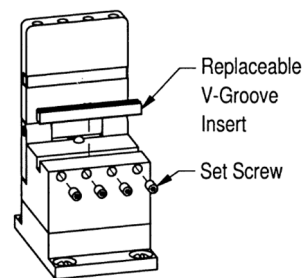


**Figure 52 Replace Proof Test Grip**

## 10.5. Replacement

### Replace Vacuum V-Groove Inserts

The fiber holding blocks contain replaceable V-groove inserts which are designed to hold a specific coating size. To change the inserts, loosen the four (4) set screws (using a 0.035" hex key) in the base of each holding fixture and remove the inserts. Install the new insert (V-groove side up) and gently tighten the four set screws. When clamping large diameter coatings, it may also be necessary to change the inserts located in the top of each holding fixture using the above procedure. Recheck the recoat assembly alignment after changing the inserts.



**Figure 53 Replace V-Groove Insert**

### Replace Recoat Material

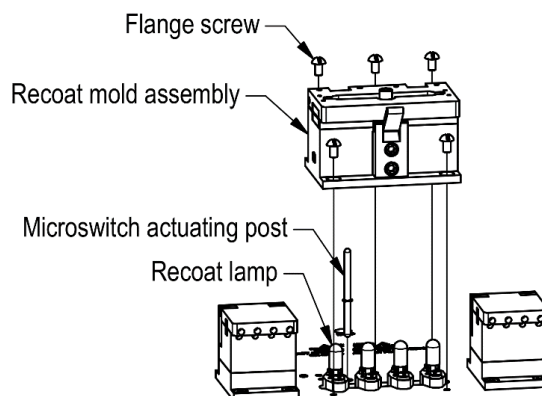
Recoat material has a finite shelf life and should be replaced every 6 months. To replace the recoat material first flush the system as outlined above. Once the system is flushed, fill a clean recoat bottle 3/4 full with fresh recoat material.

**Note:** The one-ounce internal recoat bottle holds approximately 30,000 micro-liters when 3/4 full. The number of recoats per fill and the approximate time before the material needs to be refilled can be determined based on the volume of material per recoat (typically 2.5  $\mu$ l for a 280  $\mu$ m mold) and the number of recoats per month. For most applications the material will need to be replaced before it runs out. Even if fresh material is added to the internal bottle prior to the 6-month Preventive Maintenance (PM) schedule, the material should still be replaced since mixing of the old and new materials occurs. Dispose of acrylate with solid chemical waste.

## Replace and Align Mold Assembly

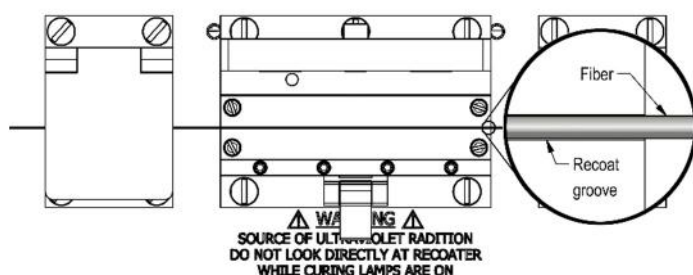
To remove the recoat assembly, remove the five flange screws at the base of the assembly. Lift the recoat assembly straight up until it clears the recoat lamps. Keep track of the micro switch actuating post which may slide free of the assembly.

Before replacing the recoat assembly, make sure that the base plate, bottom of the mold assembly and micro switch actuating post are cleaned of any dirt particles. Replace the micro switch actuating post by inserting the long end into the recoat assembly. Verify that the post moves up and down freely.



**Figure 54 Remove Recoat Assembly**

Lower the assembly straight down over the recoat lamps and replace the five flange screws. Lightly tighten two diagonal screws only to allow for adjustment of the recoat assembly. Open the recoat station top and the tops of the fiber holding blocks. Clamp a length of coated fiber between the holding blocks so that the fiber is under slight tension. (A fiber nominally smaller than that of the diameter of the recoat mold should be used). Using a 10X magnifying loupe, view the fiber straight down at the right-hand edge of recoat station, shown in Figure 55. Adjust the recoat assembly such that the fiber is centered in the bottom recoat groove. Repeat this procedure while viewing the fiber at the left edge of the recoat station. Tighten the recoat flange screws and re-check the fiber alignment.



**Figure 55 Align Recoat Mold**

## Replace Tungsten Halogen Lamps

In order to gain access to the lamps, first remove the recoat assembly. Remove the lamp by pulling it out of the lamp socket and replacing it with a new one. Avoid handling the glass envelope. Fingerprints left on the envelope could shorten the lamp life. If you do touch the lamp, be sure to clean it with a soft lens tissue wetted with alcohol or acetone. Make sure all of the bulbs are positioned in a straight line. Replace and align the recoat mold assembly.

## Chapter 11 Trouble Shooting

### Recoat Diagnostics

Problem	Possible Cause	Solution
<b>Fiber snaps when mold top lowered.</b>	Fiber not loaded properly.	See 8.1 Position the Fiber for Recoat.
	Recoat mold not properly aligned to fiber.	Refer to the "0 Replace and Align Mold Assembly" section for instructions on realigning the recoat mold assembly.
	Grooves on recoat mold plate and cap do not line up.	Contact Thorlabs for recoater servicing.
<b>Material flows excessively outside of mold cavity or does not flow down mold cavity ("puddling").</b>	Recoat mold plates are dirty.	Dirt between quartz mold plates will not allow them to lay flush, causing the acrylate to flow excessively outside the mold cavity. The recoat mold plates should be cleaned as described in the "0 Clean Mold" section.
	Grooves on recoat mold plate and cap do not line up.	Contact Thorlabs for recoater servicing.
<b>Plunger turns excessively when injecting acrylate.</b>	Bubbles in injector port.	Empty the recoat injector port (refer to the Maintenance section for instructions) and reload.
<b>Flashing forms along the length of the recoat.</b>	Cure time too long.	This will increase the modulus of the coating and make it stiffer. In the future, decrease the cure time. This flashing can generally be removed by wiping the recoated section with a dry lens tissue. Do not use a solvent! For very tough flashing, it may be necessary to use the gray abrasive square (provided) to gently rub off the flashing material.
<b>Recoat feels tacky or can be easily rubbed off by pulling the fiber between fingers.</b>	Cure time too short.	Increase the cure time.
	One of the recoat bulbs is burned out.	Replace recoat bulb (refer to "0 Replace Tungsten Halogen Lamps" section).
<b>Fiber sticks to recoat mold consistently.</b>	Recoat mold plates are dirty.	Clean recoat mold plates as described in the Cleaning "0 Clean Mold".
<b>Fiber snaps when lifting the recoat mold top.</b>	Failed to first release the holding fixture tops before lifting the recoat mold top.	If recoat mold top is lifted with the holding fixture tops closed, the fiber may stick to top and snap or degrade the strength of the fiber. Always open the holding fixtures before lifting recoat mold top.

### Proof Test Diagnostics

Problem	Possible Cause	Solution
<b>Fiber slips at very high tension levels.</b>	Proof test grips are dirty.	Clean proof test grips with a cotton swab dipped in alcohol.
	Proof test grips are worn out.	Call Thorlabs for replacement proof test grips and replace as described in "0 Replace Proof Test Grips".
<b>Tension levels appear unusually high or low for the particular fiber being tested.</b>	Wrong fiber diameter entered.	The fiber diameter is used in the tension level calculation. Check the setting for the current fiber diameter. (See Chapter 6 Usage)

# Chapter 12 Material Data Safety Sheet

950-200 from AngströmBond®  
Page 1 of 3

AdHESIVES

THE ONLY ADHESIVE LINE DEVELOPED EXCLUSIVELY FOR FIBER OPTICS

## 1. MATERIAL IDENTIFICATION

Product Name:

950-200 from ANGSTRÖMBOND®

Emergency Phone:

For product emergencies involving spill, leak, fire, exposure, or accident call CHEMTREC at (800) 424-9300. For all other inquiries call **Fiber Optic Center™, Inc.** at (800) 473-4237.

## 2. COMPOSITION

Hazardous Components	CAS No.	Percent	Exposure Limits	
			ACGIH TLV-TWA	OSHA PEL
Multifunctional acrylate(s)		20-80	NE	NE
Monomers		20-80	NE	NE
Photoinitiator(s)		1-10	NE	NE
Additive(s)		0.01-10	ne	NE
Glycol Ether acrylate		28.5	NE	NE
Abbreviations: N.E. = Not Established				

## 3. HEALTH HAZARDS IDENTIFICATION

Primary Routes of Exposure:

Eyes: yes

Skin: Yes

Inhalation: Yes

**Eye Contact:** Contact may cause irritation. Inflammation of the eye is characterized by redness, watering, and itching.

**Skin Contact:** Avoid prolonged or repeated contact with skin. May cause skin irritation or sensitization.

**Inhalation:** Irritating to respiratory tract, coughing shortness of breath. Vapors and aerosol can produce mucous membrane, nose and throat irritation.

**Ingestion:** May cause mild gastric irritation, abdominal spasms, nausea and faintness.

## 4. FIRST AID MEASURES

**Eyes:** Flush eyes thoroughly with water for 15 minutes while holding eyelids open. Seek medical attention.

**Skin:** Wipe excess from skin, and flush the affected area with water. Follow by washing with soap and water. Wash contaminated clothing thoroughly before reuse. If irritation persists obtain medical attention.

**Inhalation:** Remove to fresh air, and provide oxygen or artificial respiration if needed. Obtain medical attention.

**Ingestion:** Do Not Induce Vomiting. Obtain immediate medical attention.

## 5. FIRE FIGHTING MEASURES

### FLAMMABLE PROPERTIES

Flash Point:	higher than 93.3°C
Explosive Limits:	Not determined
Auto – Ignition Temperature:	Not determined
Hazardous Decomposition Products:	Carbon oxides, nitrogen oxides

### EXTINGUISHING MEDIA and FIRE FIGHTING INSTRUCTIONS

When sufficiently large quantities are present, firefighters should be equipped with full bunker gear, including a positive pressure, NIOSH approved, self-contained breathing apparatus. Fire-exposed containers may be cooled with water.

**Extinguishing Media:** Use water spray, fog, dry chemical powder, or an appropriate foam.

ANGSTRÖMBOND® is a REGISTERED TRADEMARK of Fiber Optic Center, Inc., New Bedford MA, USA

**Fiber Optic Center™, Inc.** MAKES NO EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS OR OTHERWISE, with respect to its products. In addition, while the information herein is believed to be reliable, no warranty is expressed or implied regarding the accuracy of the data or the results to be obtained from the use thereof. All recommendations or suggestion for use are made without guarantee -- inasmuch as conditions of use are beyond our control. The properties given are typical values, and are not intended for use in preparing specifications. Users should make their own test to determine the suitability of this product for their own purposes.

Rev. A 10/2002

**Fiber Optic Center™, Inc.**, 23 Centre Street, New Bedford, MA, 02740-6322, USA

E-mail: sales@focenter.com

Toll Free: (800) IS-FIBER or (800) 473-4237 • Phone: (508) 992-6464 • Fax: (508) 991-8876 • Website: www.focenter.com



900-200 from ÅngströmBond®  
Page 2 of 3

## Adhesives

The only adhesive line developed exclusively for fiber optics

### 6. ACCIDENTAL RELEASE MEASURES

Ventilate the spill area, and evacuate if necessary. Shut off the source of the leak if it is safe to do so. Remove all ignition sources. Dike and contain large spills. Absorb with clay, sand, or another suitable material, and dispose of properly.

Clean-up personnel should use adequate protective equipment.

### 7. HANDLING AND STORAGE

Store between 16-27°C, away from ignition sources and high temperatures. Avoid contact with incompatible materials. Wear protective eyewear, chemical-resistant gloves, and other protective clothing as appropriate. Do not breathe fumes. Avoid contact with eyes skin, and clothing. After handling always wash hands thoroughly with soap and water.

### 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

**Engineering / Ventilation Controls:** General ventilation may be acceptable under most conditions, although local ventilation is required to control exposure whenever vapors, mists, or dusts are generated.

**Respiratory Protection:** When local ventilation is unavailable and airborne limits are exceeded, a NIOSH-approved respirator for organic vapors, a supplied-air respirator, or a self-contained breathing apparatus is required.

**Skin Protection:** Chemical resistant (nitrile) gloves. Lab coat

**Eye Protection:** Chemical splash goggles or safety glasses with side shields should be worn as appropriate.

### 9. STABILITY AND REACTIVITY

**Chemical Stability:** Stable under normal conditions and use.

**Conditions and Materials to Avoid:** Keep away from direct sunlight or strong incandescent light. Keep away from heat. Incompatible With peroxides, and oxidizing agents.

**Hazardous Decomposition Products:** Carbon oxides, nitrogen oxides

**Hazardous Polymerization:** Not likely under normal conditions.

### 10. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance / State:** Clear viscous liquid

**Odor:** not determined

**pH:** Not determined

**Vap. Pressure (mmHG):** Not determined

**Vap. Density (air = 1):** > 1

**Boiling Point:** Not determined

**Freezing Point:** Not determined

**Specific Gravity:** Not determined

**Solubility in Water:** Not determined

**Evaporation Rate:** <.1 compared to Butyl acetate

### 11. DISPOSAL CONSIDERATIONS

Keep out of surface waters, sewers, and waterways entering or leading to surface waters. Notify authorities if any exposure to the environment occurs or is likely to occur. Utilize an appropriate disposal facility, in compliance with applicable federal, state, and local environmental control regulations.

ÅNGSTRÖMBOND® is a REGISTERED TRADEMARK of Fiber Optic Center, Inc., New Bedford MA, USA

**Fiber Optic Center™, Inc.** MAKES NO EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS OR OTHERWISE, with respect to its products. In addition, while the information herein is believed to be reliable, no warranty is expressed or implied regarding the accuracy of the data or the results to be obtained from the use thereof. All recommendations or suggestion for use are made without guarantee -- inasmuch as conditions of use are beyond our control. The properties given are typical values, and are not intended for use in preparing specifications. Users should make their own test to determine the suitability of this product for their own purposes.

Rev. A 10/2002

**Fiber Optic Center™, Inc.**, 23 Centre Street, New Bedford, MA, 02740-6322, USA

Toll Free: (800) IS-FIBER or (800) 473-4237 • Phone: (508) 992-6464 • Fax: (508) 991-8876 • E-mail: sales@focenter.com

Website: www.focenter.com





950-200 from ÅngströmBond®  
Page 3 of 3

**Adhesives**

THE ONLY ADHESIVE LINE DEVELOPED EXCLUSIVELY FOR FIBER OPTICS

## 12. TOXICOLOGICAL INFORMATION

### Toxicity to Animals:

Acute Oral toxicity (LD50): >5000mg/kg[rat] (Multifunctional acrylate)

Acute Dermal toxicity(LD50): >5000mg/kg[Rabbit] (Multifunctional acrylate)

Multifunctional acrylate: chronic health effects information:

This component has been reported to be mutagenic in the mouse lymphoma (in vitro) assay, but negative in the Ames test.. A dermal carcinogenicity study was also negative.

WEEL =1mg/m<sup>3</sup>,skin 8hours

Based upon physical and chemical properties and the manner in which this product will be used, considering foreseeable emergencies, airborne exposure at or approaching the WEEL is unlikely to occur. Skin contact is possible. Users should take appropriate precautions to prevent skin contact.

Chronic exposure:

### Chronic effects to humans:

None classified by IARC, none by NTP, None by OSHA

### Acute Effects on humans:

May cause irritation to skin, eyes, and respiratory tract.

## 13. TRANSPORTATION INFORMATION

DOT/IATA Proper Shipping Name: Not regulated.

## 14. REGULATORY INFORMATION

### TSCA

The chemical components of this product are included in the TSCA Chemical Substance Inventory, as required.

### SARA TITLE III

#### Section 313 – Toxic Chemicals

Pursuant to Section 313, this product contains Glycol Ether 28.5%

HMIS Hazards: Health: 2

Flammability: 1

Reactivity: 1

**Fiber Optic Center™, Inc.** urges each customer or recipient of this MSDS to study it carefully in order to become aware of and understand the hazards associated with the product. The reader should consider consulting reference works or individuals who are experts in ventilation, toxicology, and/or fire prevention, as necessary to use and understand the data contained in this MSDS.

To promote safe handling, customers and recipients should: 1 – notify their employees, agents, contractors, and others whom they know or suspect will use this material or the information in this MSDS and any other information regarding hazards or safety; 2 – furnish this same information to each of their customers for the product; and 3 – request their customers to notify their employees, customers and other users of the product of this information.

The information contained herein is based on the data available to **Fiber Optic Center™, Inc.**, and is believed to be correct. However, **Fiber Optic Center™, Inc.** makes no warranty, expressed or implied, regarding the accuracy of this data or the results to be obtained from the use thereof. **Fiber Optic Center™, Inc.** assumes no responsibility for injury from the use of the product described herein.

ANGSTRÖMBOND® IS A REGISTERED TRADEMARK OF FIBER OPTIC CENTER, INC., NEW BEDFORD MA, USA

**Fiber Optic Center™, Inc.** MAKES NO EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS OR OTHERWISE, with respect to its products. In addition, while the information herein is believed to be reliable, no warranty is expressed or implied regarding the accuracy of the data or the results to be obtained from the use thereof. All recommendations or suggestion for use are made without guarantee -- inasmuch as conditions of use are beyond our control. The properties given are typical values, and are not intended for use in preparing specifications. Users should make their own test to determine the suitability of this product for their own purposes.

Rev. A 10/2002

**Fiber Optic Center™, Inc.**, 23 Centre Street, New Bedford, MA, 02740-6322, USA

E-mail: sales@focenter.com

Toll Free: (800) IS-FIBER or (800) 473-4237 • Phone: (508) 992-6464 • Fax: (508) 991-8876 • Website: www.focenter.com

## Chapter 13 Compliance



### EU Declaration of Conformity

in accordance with EN ISO 17050-1:2010

We: Thorlabs Inc.

Of: 56 Sparta Avenue, Newton, New Jersey, 07860, USA

in accordance with the following Directive(s):

2006/42/EC	Machinery Directive (MD)
2014/30/EU	Electromagnetic Compatibility (EMC) Directive
2011/65/EU	Restriction of Use of Certain Hazardous Substances (RoHS)

hereby declare that:

Model: **PTR201, PTR203, PTR203B, PTR204, PTR204B, PTR206, PTR206B**

Equipment: **Recoater (w/ Halogen lamps), Linear Proof tester and combinations**

is in conformity with the applicable requirements of the following documents:

EN ISO 12100	Safety of Machinery. General Principles for Design. Risk Assessment and Risk Reduction	2010
EN 61326-1	Electrical Equipment for Measurement, Control and Laboratory Use - EMC Requirements	2013
EN 62471-1	Photobiological Safety of Lamps and Lamp Systems	2008

and which, issued under the sole responsibility of Thorlabs, is in conformity with Directive 2011/65/EU of the European Parliament and of the Council of 8th June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment, for the reason stated below:

does not contain substances in excess of the maximum concentration values tolerated by weight in homogenous materials as listed in Annex II of the Directive

I hereby declare that the equipment named has been designed to comply with the relevant sections of the above referenced specifications, and complies with all applicable Essential Requirements of the Directives.

Signed:

On: 01 August 2016

Name: Ann Strachan

Position: Compliance Manager

EDC - PTR201, PTR203, PTR203B, PTR204,...





## Chapter 14 Regulatory

As required by the WEEE (Waste Electrical and Electronic Equipment Directive) of the European Community and the corresponding national laws, Thorlabs offers all end users in the EC the possibility to return “end of life” units without incurring disposal charges.

- This offer is valid for Thorlabs electrical and electronic equipment:
- Sold after August 13, 2005
- Marked correspondingly with the crossed out “wheelie bin” logo (see right)
- Sold to a company or institute within the EC
- Currently owned by a company or institute within the EC
- Still complete, not disassembled and not contaminated



**Wheelie Bin Logo**

As the WEEE directive applies to self-contained operational electrical and electronic products, this end of life take back service does not refer to other Thorlabs products, such as:

- Pure OEM products, that means assemblies to be built into a unit by the user (e. g. OEM laser driver cards)
- Components
- Mechanics and optics
- Left over parts of units disassembled by the user (PCB's, housings etc.).

If you wish to return a Thorlabs unit for waste recovery, please contact Thorlabs or your nearest dealer for further information.

### Waste Treatment is Your Own Responsibility

If you do not return an “end of life” unit to Thorlabs, you must hand it to a company specialized in waste recovery. Do not dispose of the unit in a litter bin or at a public waste disposal site.

### Ecological Background

It is well known that WEEE pollutes the environment by releasing toxic products during decomposition. The aim of the European RoHS directive is to reduce the content of toxic substances in electronic products in the future.

The intent of the WEEE directive is to enforce the recycling of WEEE. A controlled recycling of end of life products will thereby avoid negative impacts on the environment.

## Chapter 15 Thorlabs Worldwide Contacts

### USA, Canada, and South America

Thorlabs, Inc.  
56 Sparta Avenue  
Newton, NJ 07860  
USA  
Tel: 973-300-3000  
Fax: 973-300-3600  
www.thorlabs.com  
www.thorlabs.us (West Coast)  
Email: sales@thorlabs.com  
Support: techsupport@thorlabs.com

### Europe

Thorlabs GmbH  
Hans-Böckler-Str. 6  
85221 Dachau  
Germany  
Tel: +49-(0)8131-5956-0  
Fax: +49-(0)8131-5956-99  
www.thorlabs.de  
Email: europe@thorlabs.com

### France

Thorlabs SAS  
109, rue des Côtes  
78600 Maisons-Laffitte  
France  
Tel: +33 (0) 970 444 844  
Fax: +33 (0) 825 744 800  
www.thorlabs.com  
Email: sales.fr@thorlabs.com

### Japan

Thorlabs Japan, Inc.  
Higashi-Ikebukuro Q Building, 2F  
2-23-2, Higashi-Ikebukuro,  
Toshima-ku, Tokyo 170-0013  
Japan  
Tel: +81-3-5979-8889  
Fax: +81-3-5979-7285  
www.thorlabs.jp  
Email: sales@thorlabs.jp

### UK and Ireland

Thorlabs Ltd.  
1 Saint Thomas Place, Ely  
Cambridgeshire CB7 4EX  
Great Britain  
Tel: +44 (0)1353-654440  
Fax: +44 (0)1353-654444  
www.thorlabs.com  
Email: sales.uk@thorlabs.com  
Support: techsupport.uk@thorlabs.com

### Scandinavia

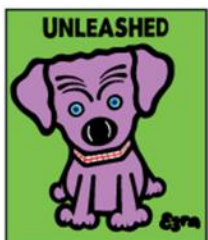
Thorlabs Sweden AB  
Bergfotsgatan 7  
431 35 Mölndal  
Sweden  
Tel: +46-31-733-30-00  
Fax: +46-31-703-40-45  
www.thorlabs.com  
Email: scandinavia@thorlabs.com

### Brazil

Thorlabs Vendas de Fotônicos Ltda.  
Rua Riachuelo, 171  
São Carlos, SP 13560-110  
Brazil  
Tel: +55-16-3413 7062  
Fax: +55-16-3413 7064  
www.thorlabs.com  
Email: brasil@thorlabs.com

### China

Thorlabs China  
Room A101, No. 100  
Lane 2891, South Qilianshan Road  
Putuo District  
Shanghai  
China  
Tel: +86 (0) 21-60561122  
Fax: +86 (0)21-32513480  
www.thorlabschina.cn  
Email: chinasales@thorlabs.com



**THORLABS**  
[www.thorlabs.com](http://www.thorlabs.com)

---