Thorlabs offers recoating and proof testing solutions for R&D and manufacturing applications. Our fiber recoaters apply a protective coating to fusion-spliced optical fiber, offering more flexibility than a splice sleeve. Proof testers are designed to apply a set load to a fusion-spliced optical fiber in order to test the strength of the spliced fiber. We also offer combination workstations that combine recoaters and proof testers in order to minimize transport of fiber across multiple stations.

These workstations are available from stock with a variety of options such as automatic or manual mold assemblies and rotary or linear proof testers. The recoaters and proof testers can be used with single mode, multimode, polarization-maintaining, or other specialty fibers.
Product Line at a Glance

Recoaters

Fiber Recoaters restore the coating of a fusion-spliced fiber by UV curing an acrylate coating over the spliced region. Compared to using a splice sleeve, recoating the fiber offers increased flexibility and durability that nearly matches the performance of the original fiber. Because of this, fiber recoaters are ideal for manufacturing high-stress or sensitive fibers such as undersea optical fiber cables, submarine communication cabling, fiber lasers or distributed Bragg reflector (DBR) lasers. Five models of recoaters are available as seen in the table below.

Recoater Selection Guide

<table>
<thead>
<tr>
<th>Item #</th>
<th>Mold Assembly</th>
<th>Recoat Injector</th>
<th>Recoat Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTR303</td>
<td>Manual</td>
<td>Automatic</td>
<td>50 mm</td>
</tr>
<tr>
<td>PTR303B</td>
<td>Manual</td>
<td>Manual</td>
<td>50 mm</td>
</tr>
<tr>
<td>PTR304</td>
<td>Automatic</td>
<td>Automatic</td>
<td>100 mm</td>
</tr>
<tr>
<td>PTR304B</td>
<td>Automatic</td>
<td>Manual</td>
<td>100 mm</td>
</tr>
<tr>
<td>PTR305</td>
<td>Automatic</td>
<td>Automatic</td>
<td>50 mm</td>
</tr>
</tbody>
</table>

Proof Testers

Proof Testers apply a set load to a fusion-spliced fiber at a controlled rate in order to test the spliced fiber’s strength. During proof or tension testing, the load is taken up to a predetermined level and released. The PTR301 Linear Proof Tester can perform simple proof tests for loads up to 20 N (4.5 lbs). The PTR302 Rotary Tester can perform both proof testing and tension testing for loads up to 89 N (20 lbs), making it ideal for process qualifications that require very high proof test or tension test levels.
Integrated Recoater and Proof Testers

Features

- Combine Recoater and Proof Tester in a Single Unit
- Minimize Transport of Fiber Between Multiple Stations
- 50 mm Recoat Length
- Available Recoater and Proof Tester Combinations Shown in Table Below
- Fully Programmable with Push-Button Operation and Tablet Controller

These integrated recoating and proof testing platforms provide a compact solution combining the function of both into a single unit. This offers several advantages such as minimizing the transport of a fusion-spliced fiber between multiple workstations, optimizing process flow in manufacturing, and reducing the space required for fiber manufacturing. As seen in the photo above, workstations with an integrated linear proof tester share the same fiber holding blocks between recoater and proof tester; therefore, the fiber does not need to be moved at all between recoating and proof testing.

Integrated Recoater and Proof Tester Selection Guide

<table>
<thead>
<tr>
<th>Item #</th>
<th>Mold Assembly</th>
<th>Recoater Injector</th>
<th>Proof Tester</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTR306</td>
<td>Manual (Acrylate Coating)</td>
<td>Automatic</td>
<td>Linear (20 N)</td>
</tr>
<tr>
<td>PTR306B</td>
<td>Manual</td>
<td>Manual</td>
<td>Linear (20 N)</td>
</tr>
<tr>
<td>PTR307</td>
<td>Automatic</td>
<td>Automatic</td>
<td>Rotary (89 N)</td>
</tr>
<tr>
<td>PTR307B</td>
<td>Manual</td>
<td>Manual</td>
<td>Linear (20 N)</td>
</tr>
<tr>
<td>PTR308</td>
<td>Automatic (Acrylate Coating)</td>
<td>Automatic</td>
<td>Linear (20 N)</td>
</tr>
</tbody>
</table>

Recoater with Integrated Linear Proof Tester

Recoating a splice with an acrylate coating material enables restoration of a fiber to nearly original condition. Unlike splices that are protected in a rigid splice protector, recoated fibers retain high flexibility and can be easily coiled or spooled. Because the recoat diameter accurately matches the original coating diameter, these fibers can be used in situations with tight packaging requirements.

As a result, recoating is ideal for applications where fibers that are spliced require high reliability and a high splice strength. Example applications include undersea fiber optic cabling and optical networks within submarines.

Recoater with Integrated Linear Proof Tester

Image of Ø125 µm cladding / Ø250 µm coating fiber after recoat with a seamless interface between the original coating and the recoated splice region.

Image of Ø450 µm fiber after recoat with the core illuminated.

Applications
Features

Mold Assembly

*Automatic Mold Assembly (PTR305 and PTR308 Only)*
- Pneumatic Mechanism Controls Mold Plates
- Direct Injection of Recoat Material into Mold Cavity
- Optimized for Ø430 µm Cladding Fiber
- Designed for High-Volume Manufacturing Applications
- Reduced Cleaning Requirements Compared to a Manual Mold Assembly

An automatic mold assembly greatly reduces the time needed for each recoat operation.

Manual Mold Assemblies (All Other Recoat-Capable Workstations)
- Split Quartz Mold Plates with Hinge
- Multiple Mold Sizes Offer Process Flexibility Ideal for R&D Applications
- Mold Assemblies for Ø280 µm, Ø430 µm, and Ø600 µm
  Available from Stock; Custom Mold Sizes Up to Ø900 µm Possible
- 50 mm or 100 mm Recoat Length

When purchasing a manual fiber recoater for the first time, it is necessary to choose a mold assembly that is appropriate for the desired fiber coating diameter. 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 installation simple and easy. Because of this, our manual recoaters are adaptable and flexible in the field and can be quickly modified for a variety of fiber diameters.

Recoat Injector

Two recoat injector configurations are available. For systems with automatic injectors, the amount of material dispensed by the automatic injector is controlled by hand via the top-mounted ‘Inject’ button or programmed into the machine using the tablet controller.

Systems with a manual injector come with a reservoir to hold recoat material and a two-position distribution valve to direct the flow (see image to the right). A knurled dispensing screw with an internal plunger acts as a syringe for the recoat material.

<table>
<thead>
<tr>
<th>Injector Type</th>
<th>Automatic</th>
<th>Manual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recoat Volume Control</td>
<td>Programmable via Tablet Controller</td>
<td>Manual Control</td>
</tr>
<tr>
<td>Recoat Injection Rate</td>
<td>≤1.8 µL/s (Programmable)</td>
<td>Manual Control</td>
</tr>
<tr>
<td>Compatible Recoat Material</td>
<td>AB9050200 High-Index Acrylate</td>
<td>AB9050200 High-Index Acrylate or PC373 Low-Index Acrylate</td>
</tr>
</tbody>
</table>
Proof Tester Features

- Linear and Rotary Testing Methods Available
- Linear Testing Uses Fiber Holding Blocks to Pull Fiber
- Rotary Towers Offer Higher Loads and Tension Testing
- Fully Programmable with Included Tablet Controller

During proof or tension testing, the load is taken up to a predetermined level and released. Proof testing is employed in manufacturing applications to ensure the fiber can support the necessary service load. To ensure the long-term reliability of the spliced fiber, the proof test level should be about three times higher than the intended service load.

For tension testing using a rotary tower, the load is typically increased to the breaking point of the fiber and is best suited for engineering and development applications. Both testing processes are fully programmable, allowing the user to select parameters such as the load, the rate at which the load is applied, and the hold time.

### Specifications

<table>
<thead>
<tr>
<th>Proof Tester Type</th>
<th>Linear</th>
<th>Rotary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load Mechanism</td>
<td>1.5&quot; (38 mm) Linear Fiber Clamp</td>
<td>Ø2&quot; (50.8 mm) Rotating Mandrel</td>
</tr>
<tr>
<td>Fiber Length (Min)</td>
<td>6&quot; (150 mm)</td>
<td>17&quot; (432 mm)</td>
</tr>
<tr>
<td>Load (Max)</td>
<td>20 N (4.5 lbs)</td>
<td>89 N (20 lbs)</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±2%</td>
<td></td>
</tr>
<tr>
<td>Ramp Rate</td>
<td>Programmable, ≤22.2 N/s (5 lbs/s)</td>
<td>Manual, ≤22.2 N/s (5 lbs/s)</td>
</tr>
</tbody>
</table>

### Tablet Controller

All workstations include a tablet controller running Windows® 10 (shown to the right) that allows the user to program and control process parameters. Adjustable settings include the inject rate, inject amount, cure time, lamp power, and proof test level. The tablet is shipped preloaded with files for common recoat and proof test parameters, but can store a virtually unlimited number of files.

The injection calculator assists in determining the appropriate amount of recoat material needed for any process.
Build Your System

Our Vytran® Recoaters and Proof Testers are fully customizable with modular components such as manual mold assemblies and fiber holding block inserts for a wide range of fiber sizes. Use the guide below to determine the right set of components for the intended application.

Step 1: Choose a Recoater or Proof Tester Workstation
Choose among the many configurations available below. Workstations with item #s that end with a B (e.g., PTR303B or PTR306B) use a manual recoat injector while others use an automatic recoat injection system.

Recoater Workstation
- PTR305: Automatic Mold Assembly
- PTR303 or PTR303B: Manual Mold Assembly, 50 mm Recoat Length
- PTR304 or PTR304B: Manual Mold Assembly, 100 mm Recoat Length

Proof Tester Workstation
- PTR301: Linear Proof Tester
- PTR302: Rotary Proof Tester

Step 1a: Choose a Mold Assembly (For Manual Recoaters Only)
If a recoater configured for a manual mold assembly was chosen in Step 1, the mold needs to be purchased separately. The table below outlines the recoat lengths and diameters available from stock. Custom molds with recoat diameters up to Ø900 µm are available upon request by contacting techsupport@thorlabs.com

<table>
<thead>
<tr>
<th>Manual Mold Assembly Item #</th>
<th>RM280A</th>
<th>RM430A</th>
<th>RM600A</th>
<th>RM280L</th>
<th>RM430L</th>
<th>RM600L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recoat Diameter</td>
<td>280 µm</td>
<td>430 µm</td>
<td>600 µm</td>
<td>280 µm</td>
<td>430 µm</td>
<td>600 µm</td>
</tr>
<tr>
<td>Recoat Length</td>
<td>50 mm</td>
<td></td>
<td></td>
<td>100 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compatible Workstations</td>
<td>PTR303, PTR303B, PTR306, PTR306B, PTR307, PTR307B</td>
<td>PTR304 and PTR304B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Step 2: Choose Fiber Holding Block Inserts (All Workstations Except PTR302)

Fiber holding block inserts are placed within the fiber holding blocks of recoaters and linear proof testers. For every workstation except the PTR302, two top and two bottom inserts should be selected. These support a wide range of fiber outer diameters (from Ø80 µm to Ø1000 µm). For a full list of options, please visit the website.

If purchasing a workstation with a linear proof tester (e.g., PTR301, PTR306, PTR306B, or PTR308)
- Choose 2 VHJxxx Top Inserts
- Choose 2 VHJxxx Bottom Inserts

If purchasing a workstation with a recoater, but no linear proof tester (e.g., PTR303, PTR303B, PTR304, PTR304B, PTR305, PTR307, or PTR307B)
- Choose 2 VHHxxx Top Inserts (Item #s VHH000 or VHH900)
- Choose 2 VHHxxx Bottom Inserts (Item #s VHH100 through VHH900S)

Consumables and Replacement Items

Regular consumables such as recoat material and replacement items for worn and used components of a recoater or proof tester workstation are described below.

**Recoat Material**
- UV-Curable Acrylate Recoat Material (1 oz Bottle)
  - AB950200 High-Index Material Compatible with All Standard Recoaters
  - PC373 Low-Index Material Compatible with Recoaters Using Manual Injectors

**Replacement Bulb**
- Replacement Bulb for Recoaters with Manual Mold Assembly
- Four Bulbs Needed for 50 mm Recoat Length; Eight Bulbs for 100 mm Recoat Length
- Bulb Replacement Recommended After 2000 Recoats (15 s per Recoat)

**Replacement Proof Tester Grips**
- Replacement Grips for Rotary Proof Testers
- Pack of 10

**Replacement Manual Injector**
- Replacement Manual Injector for Dispensing Recoat Material into the Mold
- Compatible with 50 mm Length Manual Recoaters

**Contact Us**

Contact Vytran for assistance in selecting components for your specific application.

1-732-972-2880 or techsupport@thorlabs.com

Robert Walz
Vytran General Manager