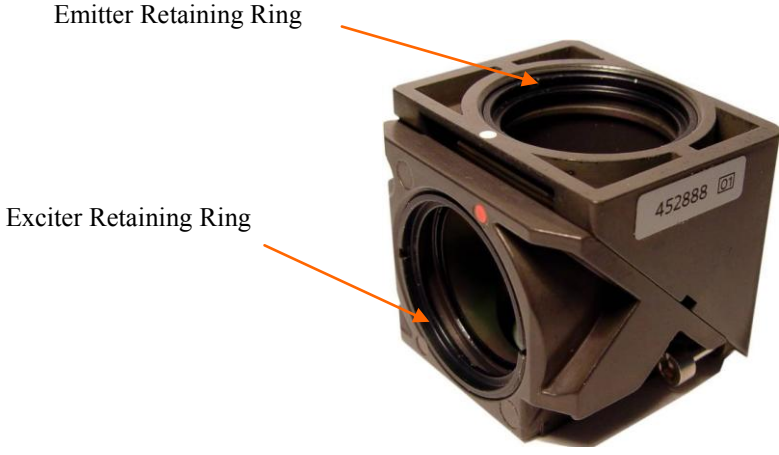
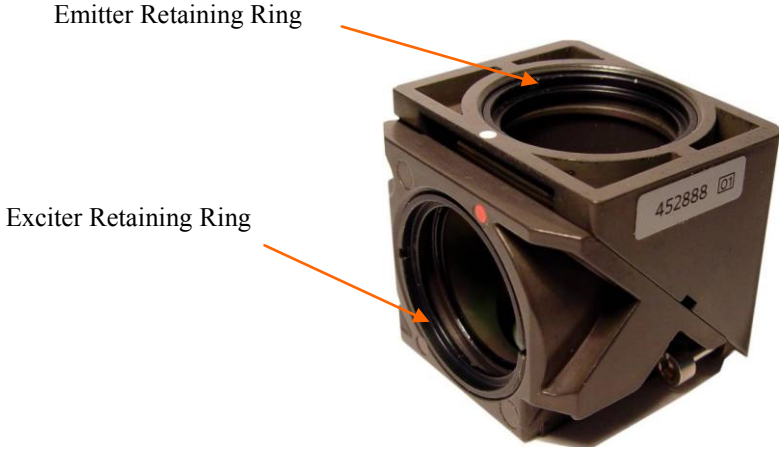
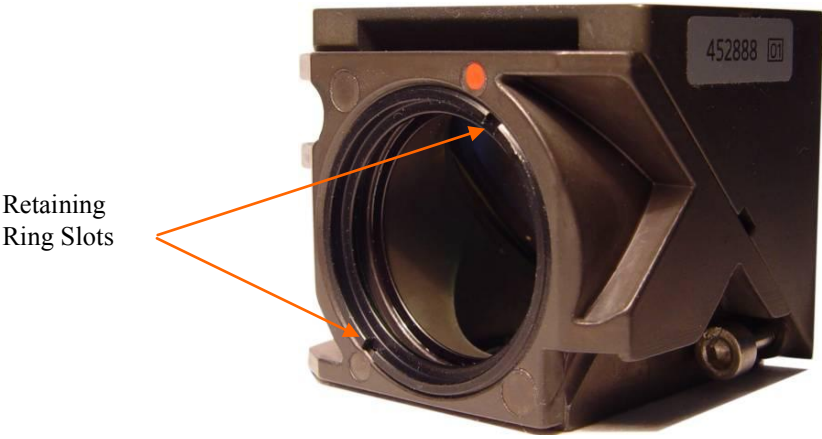


# Assembling the Zeiss Cube

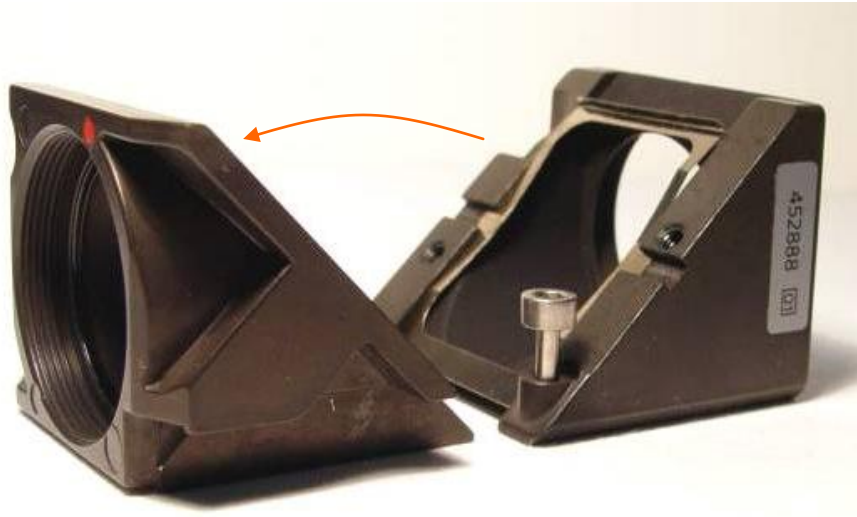
A Quick How-to Guide for the Zeiss  
Threaded Filter Cube



**Semrock** a Unit of IDEX  
The Standard in Optical Filters for Biotech & Analytical Instrumentation

Step	Action
1.1.1	<p>The ZAT cube assembly has two filter retainer rings; one is located on the Exciter side and one is on the Emitter side as shown below. Note that the Exciter housing is marked with a red dot and the Emitter /Dichroic housing is marked with a white dot.</p> <div style="display: flex; justify-content: center; align-items: center;"> <div style="margin-right: 20px;">Emitter Retaining Ring</div>  </div> <div style="display: flex; justify-content: center; align-items: center; margin-top: 20px;"> <div style="margin-right: 20px;">Exciter Retaining Ring</div>  </div>
1.1.2	Remove both filter retainer rings from the cube assembly.
1.1.2.1	<p>The ZAT cube retaining rings are installed shoulder side inward. Remove the rings by gently grasping the retaining ring slots with your finger tips. Applying even pressure to the retaining ring slots, turn the ring counterclockwise to remove from the cube assembly.</p> <div style="display: flex; justify-content: center; align-items: center;"> <div style="margin-right: 20px;">Retaining Ring Slots</div>  </div>

Step	Action
<p>1.1.2.2</p>	<p>Note that there are two distinctly different sides to the retainer rings. One is the “flat” Shoulder Side and one is the Open Side.</p> <p>The Open Side <b>ALWAYS</b> faces into the cube assembly and is tightened <i>against</i> the installed filter. The Shoulder Side faces outward. The two sides are shown below for reference.</p> <div style="display: flex; justify-content: space-around; text-align: center;"> <div data-bbox="370 478 727 892"> <p><b>Open Side</b></p>  </div> <div data-bbox="836 478 1193 892"> <p><b>Shoulder Side</b></p>  </div> </div>
<p>1.1.2.3</p>	<p>Loosen two (T-10) Torx head screws to separate the cube halves.</p> 

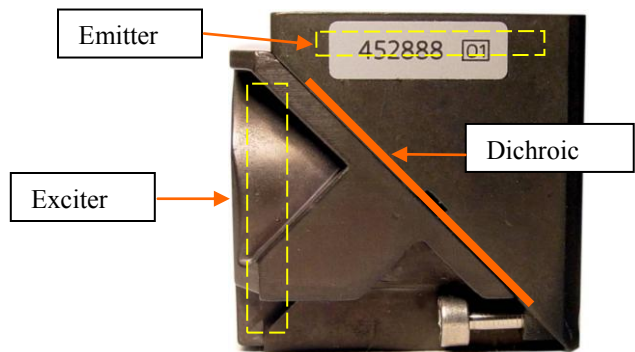
Step	Action
1.1.2.4	<p>Separate the cube halves to prepare for installation of the Semrock filter set.</p> 

Step	Action
<b>1.2</b>	<b>Install the Semrock Filter Set</b>
1.2.1	The diagram below illustrates a cross section of the Zeiss ZAT cube for use in orienting and installing the Exciter, Dichroic and Emitter filters into the cube assembly. The cross section is for reference only to illustrate filter position and orientation.

**Filter Positions**

The Emitter is located at the top of the cube assembly.

The Exciter is located at the left side and the Dichroic is mounted diagonally at the center of the cube and shares the Emitter half of the assembly.



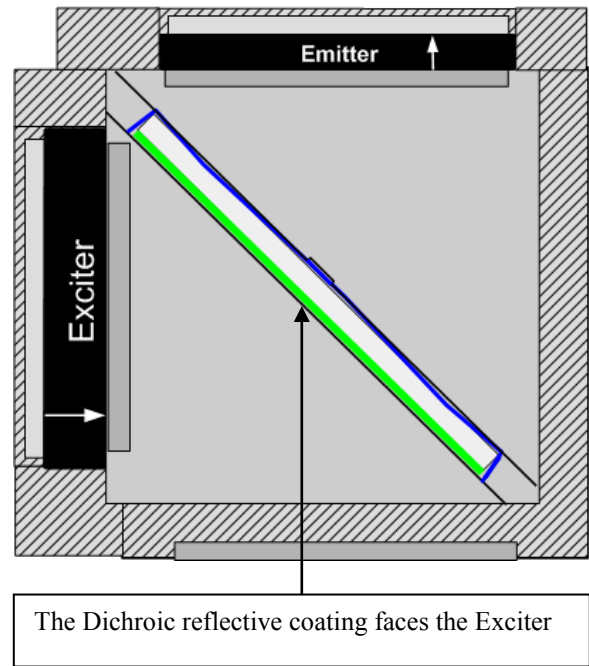
**Filter Orientation**

The filters are *oriented* in the assembly as follows:

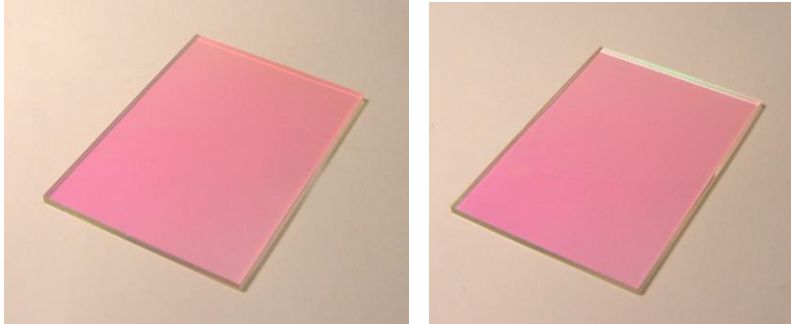
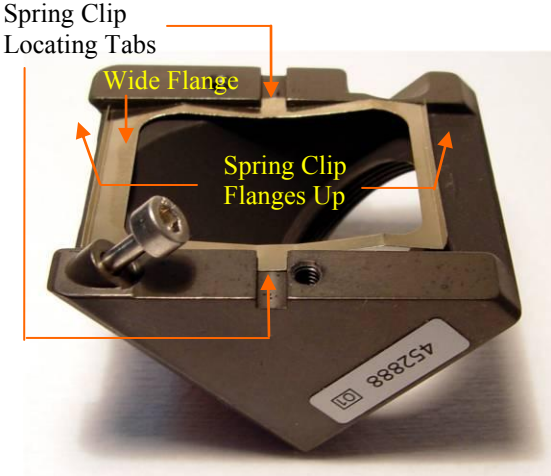
- The Exciter is mounted with its arrow pointing **inward**.
- The Dichroic reflective side is mounted facing the Exciter
- The Emitter is mounted with its arrow pointing **outward**.

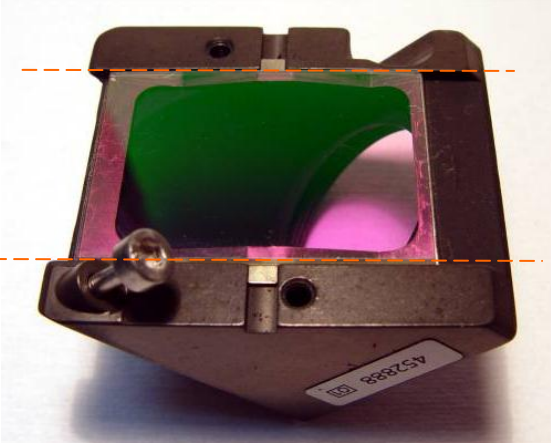
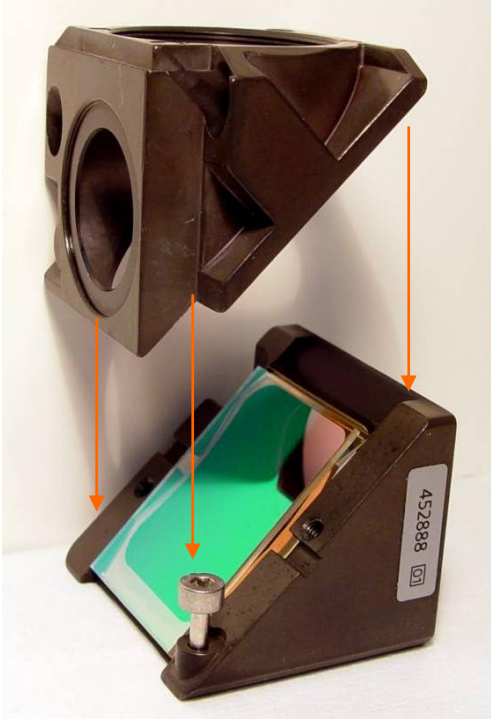
Light passes through the cube in the direction of the arrows.



**Note:** The Dichroic Reflective coating must face the Exciter as shown in the cross section diagram.



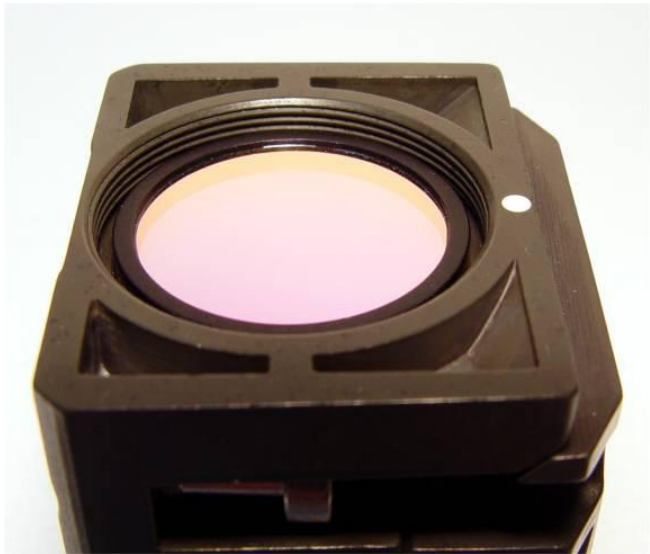
Step	Action
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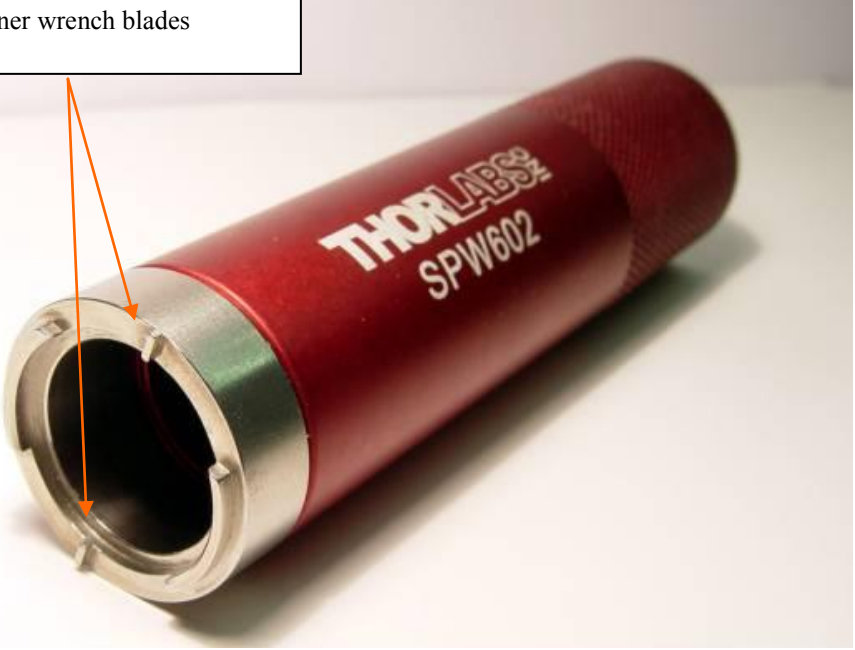
Step	Action
<p>1.2.2</p>	<p>Reflective “Coated Side”: The filter edge is concealed by the reflective coating and appears colored all the way to the edge.</p> <p>Anti-Reflective “Uncoated Side”: The filter edge appears uncolored.</p> <p style="text-align: center;"><b>Reflective Side</b>                      <b>Anti-Reflective Side</b></p> 
<p>1.2.3</p>	<p>Assemble the Emitter /Dichroic half of the cube first. Place the Spring Clip onto the Dichroic mounting surface with the locating tabs flat against the cube housing and the spring clip flanges pointing up. Locate the wide flange adjacent to the mounting screw as shown.</p> 

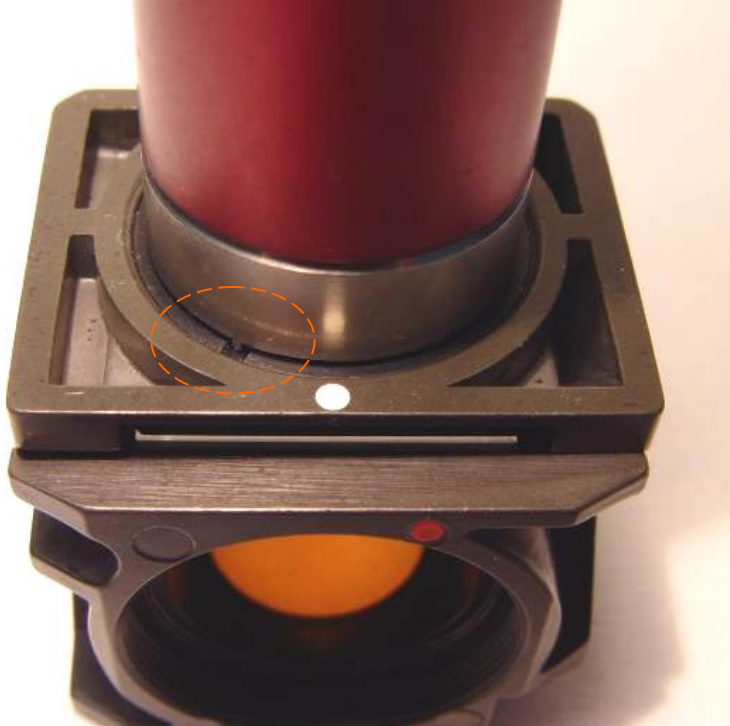
Step	Action
1.2.4	<p>With the reflective coating facing UP, place the Dichroic between the upright flanges of the spring clip</p> <p><b>Note:</b> Ensure the Dichroic is centered and does not overlap onto the housing outside the spring clip area.</p> 
1.2.5	<p>Carefully assemble the cube halves while keeping the Dichroic centered within the flanges of the spring clip. <b>Note:</b> Ensure the Dichroic locating tabs are positioned within their slots in the cube housing. The cube halves should fit together flush and without interference at either mounting surface.</p> 

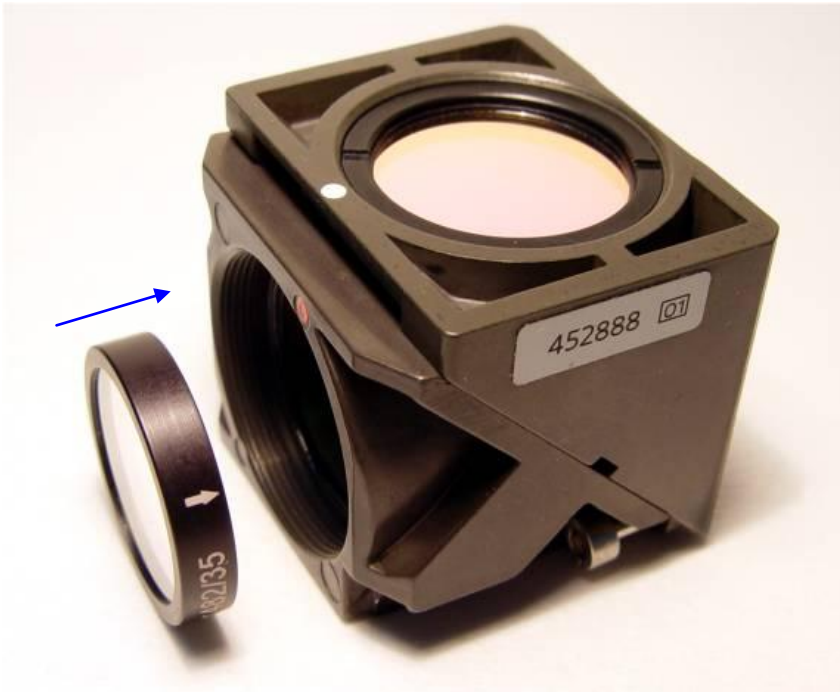

Step	Action
<p>1.2.6</p>	<p>Check the alignment of the Dichroic and spring clip through the slots on the cube side. Ensure the spring clip locating tab is flush within the slotted opening and the Dichroic is aligned within the spring clip flanges.</p> 
<p>1.2.7</p>	<p>Fasten the cube halves together using the two T-10 Torx screws removed previously. Alternately tighten the screws until they are snug. Once snug, further tighten 1/8 turn.</p> 



Step	Action
1.2.8	<p data-bbox="331 264 1182 296">Orient the Emitter with the arrow pointing away from the cube as shown below.</p> 
1.2.9	<p data-bbox="331 978 1138 1010">Place the filter inside the Emitter mounting area with the arrow pointing up.</p> 

Step	Action
1.2.10	<p data-bbox="332 262 1307 357">Insert the filter retaining ring open side into the Emitter mounting area of the cube. Turn the ring inward until it starts to resist finger tightening. Do not force thread the ring as it will turn freely if oriented correctly.</p> 
1.2.11	<p data-bbox="332 955 1307 1018">Locate the THORLABS <b>SPW602</b> Spanner Wrench. The spanner wrench blades are shown below.</p> <div data-bbox="332 1045 695 1123" style="border: 1px solid black; padding: 2px; display: inline-block;">Spanner wrench blades</div> 

Step	Action
1.2.12	<p>Insert the spanner wrench blades into the slots of the Emitter retaining ring. Support the wrench and cube housing to prevent the blades from slipping out of the retaining ring slots while turning.</p> <p>Applying even pressure across the spanner wrench blades, tighten the retaining ring snug against the Emitter filter. Once snug, tighten slightly further to secure.</p> 

Step	Action
<p>1.2.13</p>	<p>Orient the Exciter with the arrow pointing into the cube as shown below.</p> 
<p>1.2.14</p>	<p>Position the cube with the Exciter mounting area facing upward as shown below. Place the Exciter filter inside the mounting area with the arrow pointing IN.</p> 

Step	Action
<p>1.2.15</p>	<p>Insert the retaining ring open side over the Exciter filter. Using your finger tips, carefully rotate the retaining inward and against the filter. Do not force thread the ring as it will turn freely if oriented correctly. If the ring will not turn, it is not threaded properly – slowly turn the ring out and try again.</p> <p>Using the Spanner Wrench, tighten the ring snug against the Exciter filter. Once snug, tighten slightly further to secure. In the photo below, note the retaining ring shoulder side faces outward.</p> 
<p>1.2.16</p>	<p>Completed Zeiss ZAT Cube Assembly.</p> 