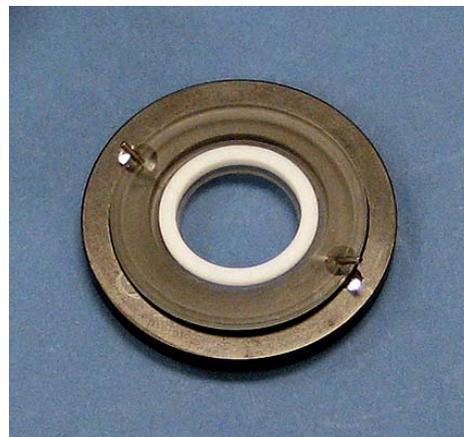


The family of **Series 40** Quick Change Imaging Chambers have several features in common. These include the use of a #1.5 coverslip to form the floor of the chamber. In most cases, this same coverslip contains the imaging sample. When viewed with inverted microscopes, images are visualized through a single thickness of glass, usually 0.13-0.17 mm.

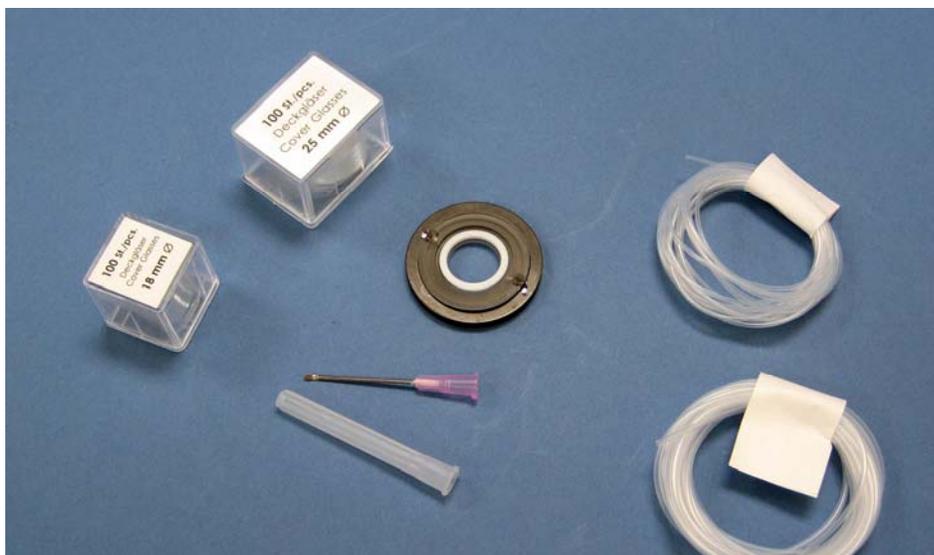
Other features include quick and easy disassembly and assembly for replacement of coverslips. Since bath volumes are generally small, exchange times are measured in seconds even when flow rates are less than 1 ml/min. **Series 40** Chambers are optimized to be used with Warner's **QE-1** Quick Exchange platform.



THE RC-43CLP

The RC-43CLP is a medium volume imaging chamber featuring rapid solution exchange, short working distances, and a closed bath. This chamber is designed to be inserted into Warner's QE-1 allowing a variety of assays to be quickly performed on cultured cells. The RC-43CLP features a 213 μ l working volume with a 15.8 mm aperture on the chamber bottom. The chamber bottom accommodates a 25 mm #1.5 coverslip. The top of the chamber also has a 15.8 mm aperture and accepts a 18 mm coverslip. The working distance between the top and bottom coverslips is 1 mm.

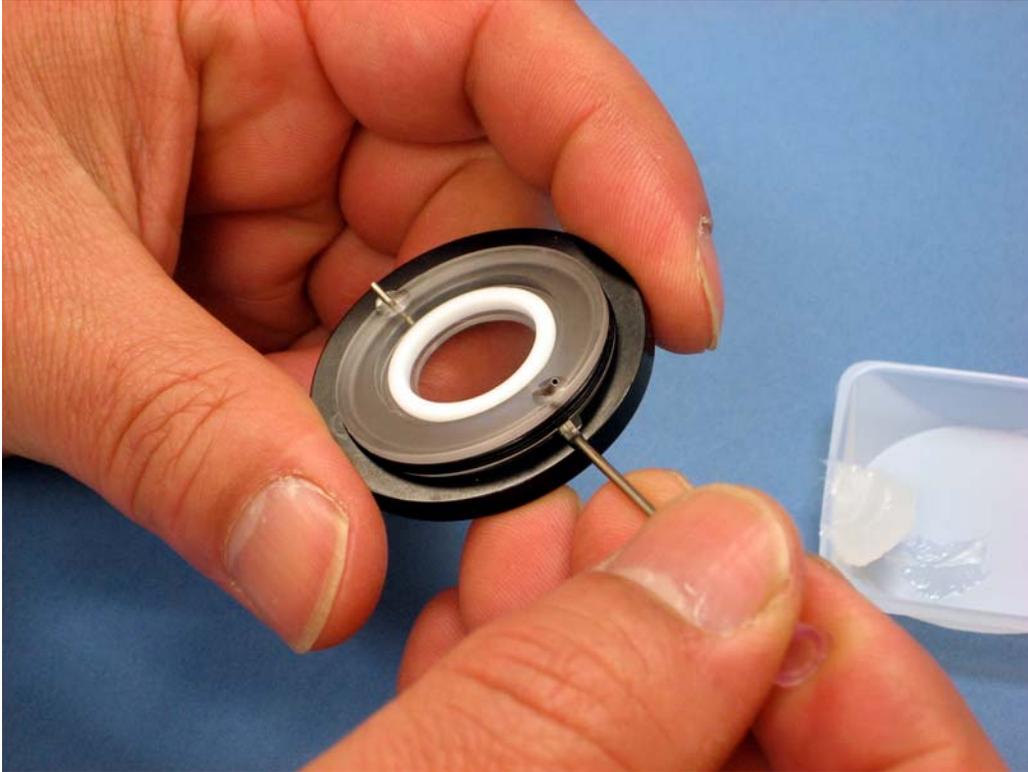
The RC-43CLP is shipped with an anodized base, the chamber body, and a retaining ring to hold the top coverslip in place. Also included is a removal tool, 10 ft of PE-160 tubing, 10 ft of PE-90 tubing, and 100 each of 25 and 18 mm round #1 coverslips.



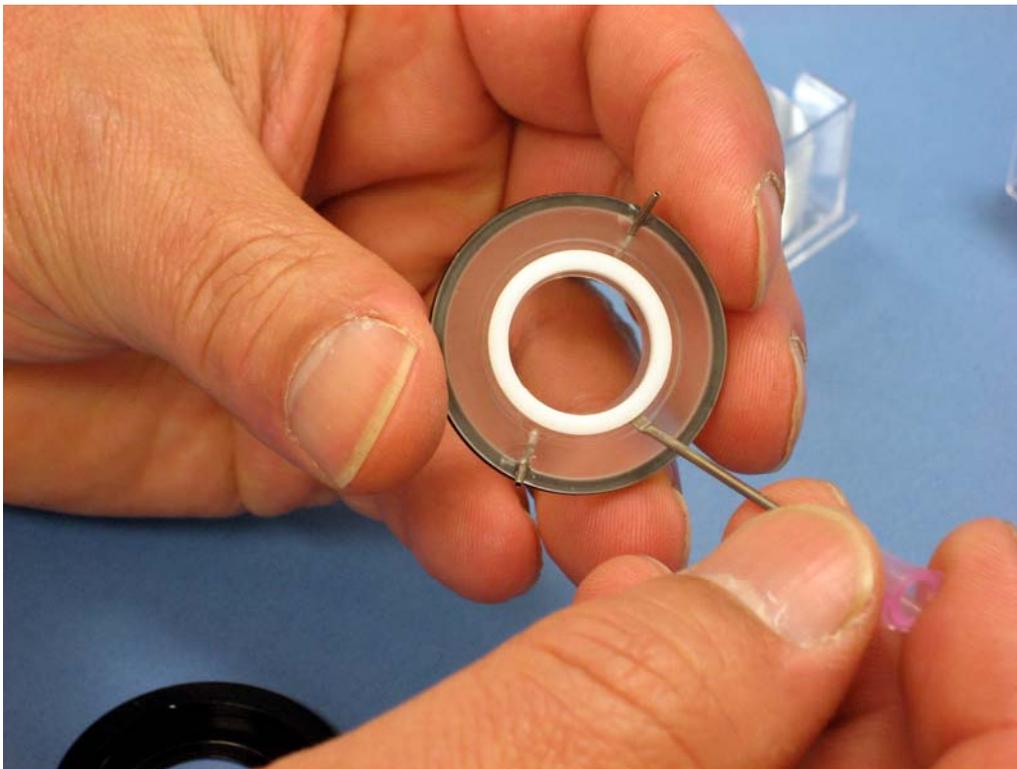
ASSEMBLY

The general procedure for the assembly of the RC-43CLP is to first prepare the base to accept a sample containing coverslip, then to mount the bottom coverslip, and then the chamber body, in that order. The top coverslip is then inserted and the retaining ring is secured into place. The assembled chamber can be placed into the QE-1 platform and mounted onto your microscope in the usual manner. Prior to beginning assembly make sure all required components are available and thoroughly cleaned.

1. Begin by separating the chamber from the anodized base by using the removal tool.



2. Separate the retaining ring from the chamber by using the removal tool.



3. Apply a small layer of vacuum grease around the recess in the bottom of the base.

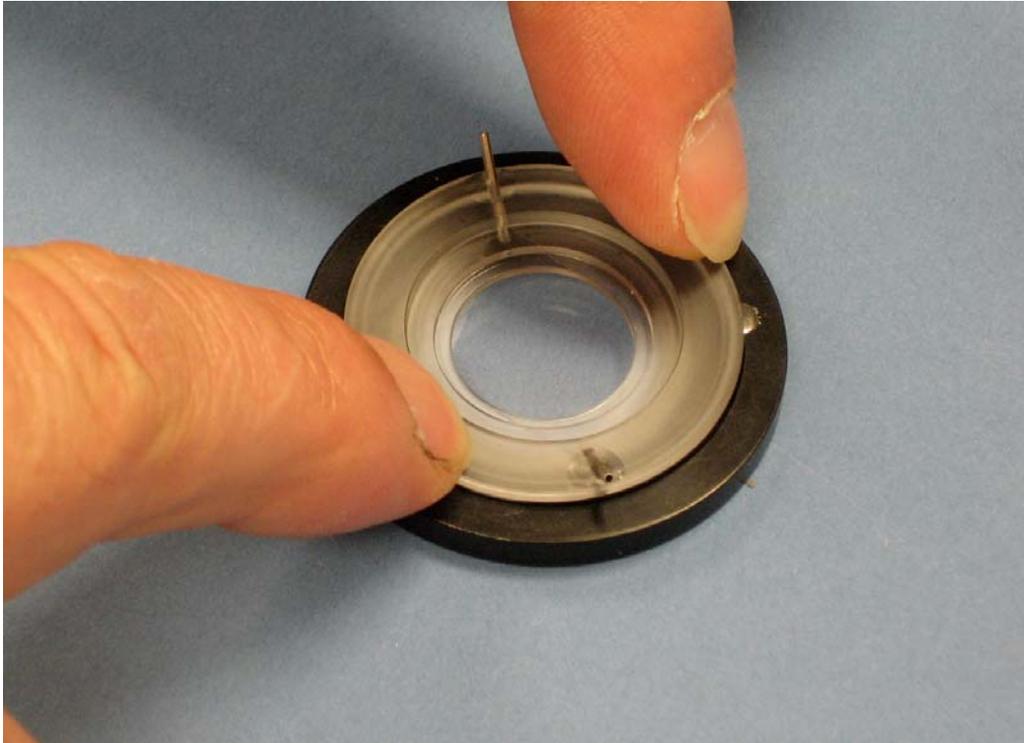
NOTE: Vacuum grease can be most simply applied by use of a small, #1 or #2 artist's dotting brush. Brushes can be found in your local art shop, university bookstore, or can be purchased from Warner. A silicone grease kit is also available. (Catalog # 64-0378.)



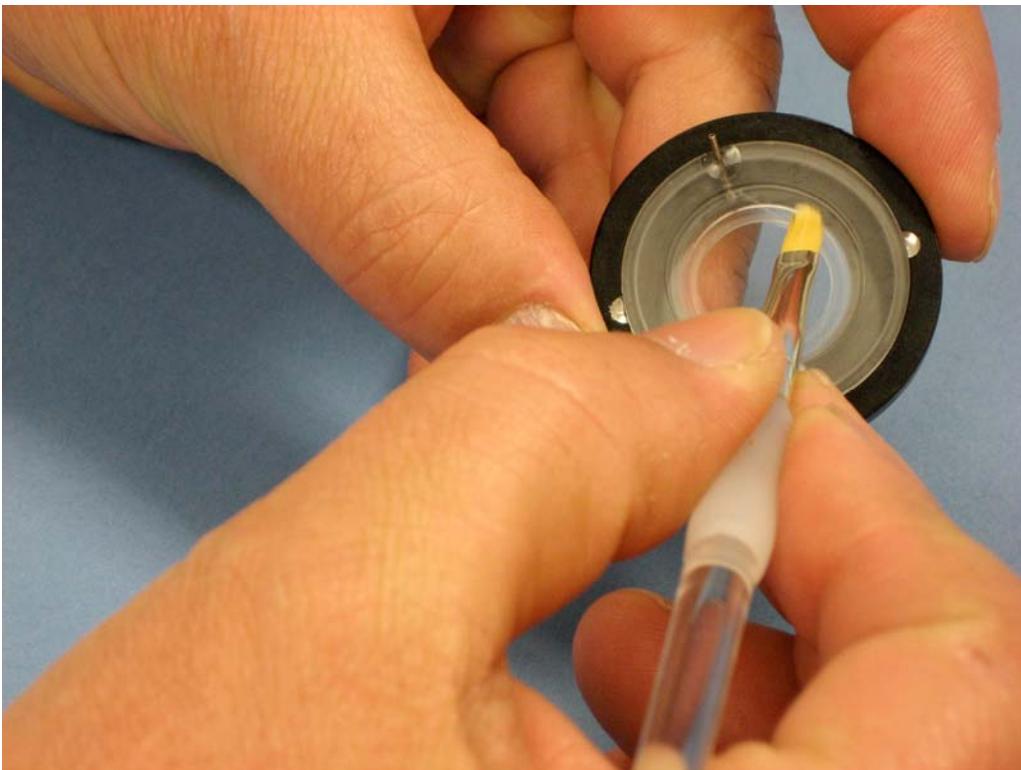
4. Place the bottom coverslip, sample side up (if this coverslip contains the sample), into the recess in the base.



5. Press the greased chamber into the base.



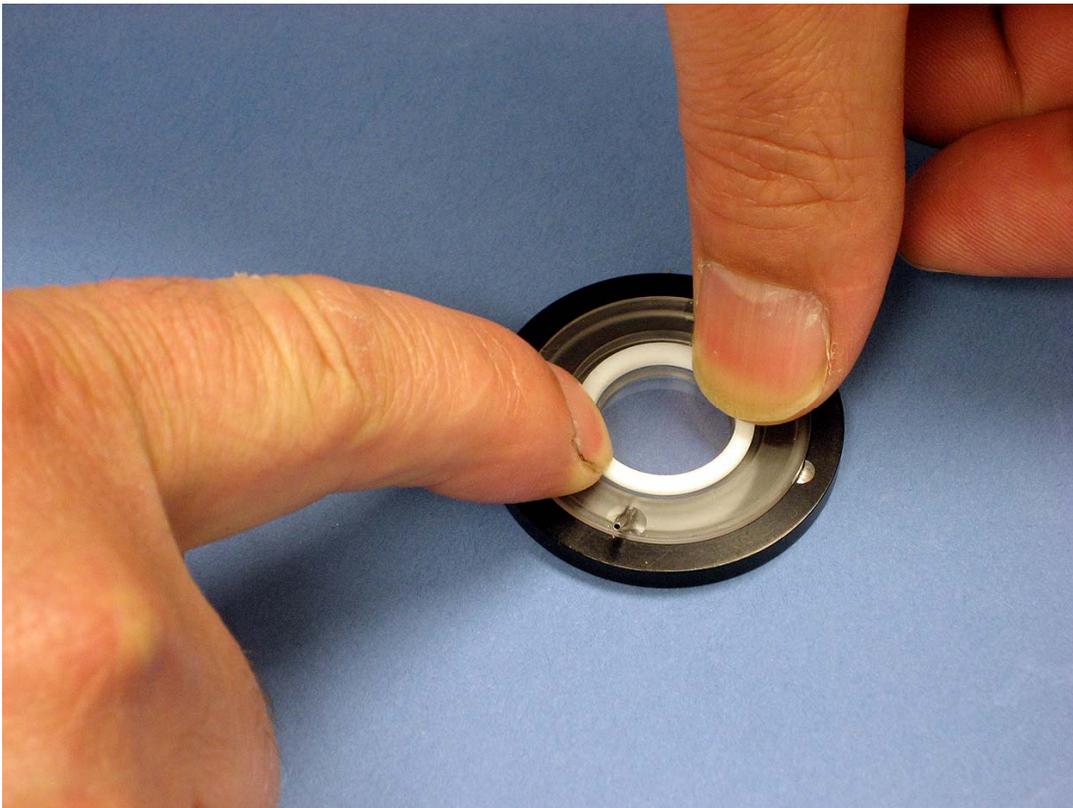
6. Carefully grease the inner lip of the opening in the chamber top where the top coverslip will be inserted.



7. Place the top coverslip, sample side down (if this coverslip contains the sample), into the grease opening.

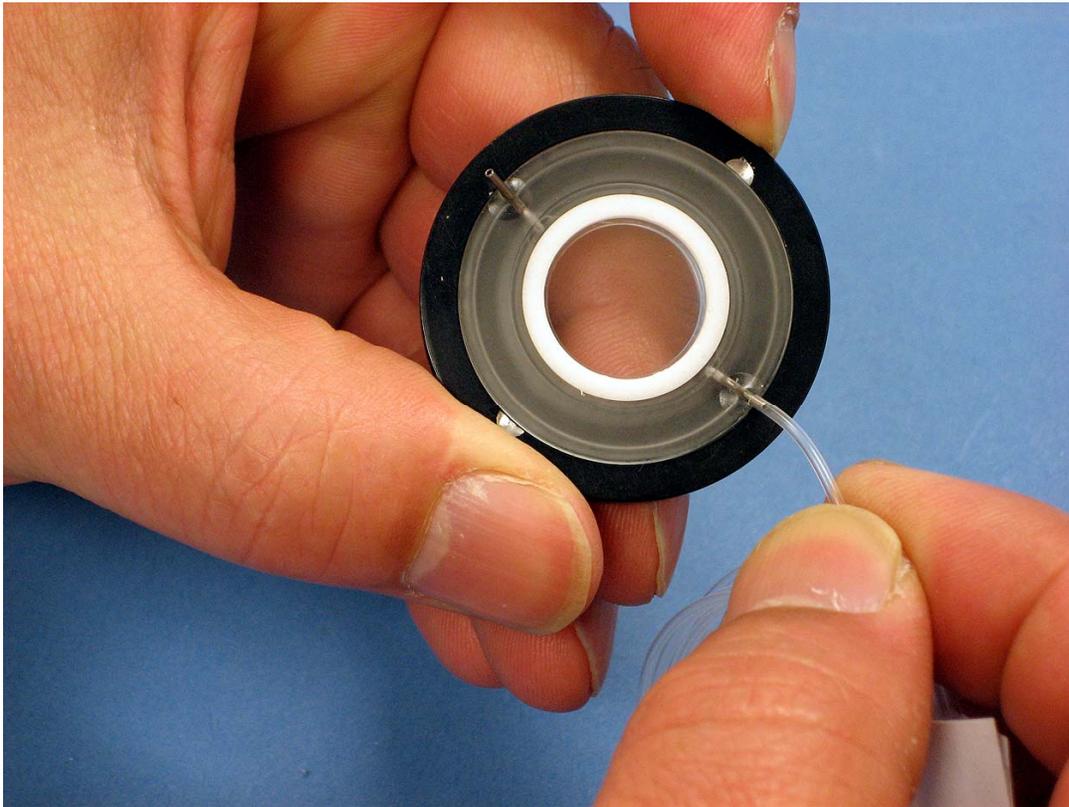


8. Press the white retaining ring into place to secure the top coverslip.



9. Attach the perfusion lines.

NOTE: We recommend pre-filling all perfusion lines before connection to reduce the occurrence of bubbles in the bath.



PERFUSION

Attachment of fluid lines

Input and output perfusion lines are attached to the **RC-43CLP** via 20 gauge stainless steel perfusion ports.

A short length of **PE-90** tubing is supplied to facilitate coupling of the **PE-160** perfusion tubing to the chamber. Cut a short length of **PE-90** (approximately $\frac{3}{4}$ of an inch is sufficient) and attach to the stainless steel ports. The OD of the **PE-90** conveniently matches the ID of the **PE-160** to make a leak-free seal.

Fluid control

The selection of solution source and rate of delivery can be of either manual or automatic design and is left to the user. However, Warner Instruments manufactures several perfusion control systems (such as the valve-driven **VC-8** and **VC-8M Control Systems**) all of which can be used with this application.

The rate of solution delivery can be established either by pump or gravity feed. While these approaches allow good control of the flow rate, Warner Instruments also offers a dedicated solution flow regulator (**FR-50 Flow Regulator**). A reference by Trese Leinders-Zufall describing the advantages of different perfusion control systems is available for download from the Support section of our website (<http://www.warneronline.com/techref.html>).

Multiple perfusion solutions

Warner Instruments multi-port manifolds (**MM** or **ML Series**) can be used to connect up to 8 solution lines to the **Series 40** chamber. Connect the manifold output tube to the input port feeding the chamber. Air should be removed

from each feed line by pre-filling with its appropriate solution. We recommend making the connection between the manifold and chamber as short as possible to minimize exchange times.

MAINTENANCE

Cleaning of the **Series 40** chamber should be performed using a dilute detergent solution. Alternatively, Warner instruments has developed a trisodium phosphate (TSP) wash protocol which is effective in cleaning plastic parts. Contact our Technical Support staff or download the protocol in PDF format from our website. (<http://www.warneronline.com>)

NOTE: Do not use alcohol, ether or other solvents on plastic parts.