

SUPERPRESSURE

OPTICAL ABSORPTION CELLS

41-11542

5K PSI

41-11546

50K PSI

41-11552

100K PSI

This Manual is for:

Optical Cell Part No. : _____
Sales Order No. : _____
Serial No. : _____
Date Manufactured : _____

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I DESCRIPTION

The Optical Absorption Cells are designed and developed to provide a dependable means of investigating high-pressure chemical and physical phenomena by optical methods.

High Pressure Cell, 100,000psi, 41-11552.

Maximum working pressure is 100,000psi at 250F. Cell is tested to 110,000psi at ambient temperature. Optical path length (between the faces of clear windows) is 1 Centimeter. Clear aperture is 1/4 inch diameter. The faces of each window are parallel within 5 minutes of arc and flat within 1/4 wavelength of yellow light. The body and window retainer are made of heat-treated 400-series stainless steel. Overall diameter of the cell is 4-3/8 inches and the length is 6-3/8 inches. The two 1/4 inch Aminco Superpressure openings are 120° apart.

Medium Pressure Cell, 50,000 PSI, 41-11546.

Maximum working pressure is 50,000psi at 250°F. Cell is tested to 75,000psi at ambient temperature. The body is made of 17-4PH. The cell meets the same general construction specifications as the 100,00psi cell. Overall diameter of the cell is 3-7/8 inches and the length is 5-1/32 inches.

Low Pressure Cell, 5,000 PSI, 41-11542.

These cells are designed to fit most of the commercially available Spectrophotometers. Maximum working pressure is 5,000psi at 250°F. Optical path length is 1 centimeter. Clear aperture is 11/16 inch. Cell is tested to 7,500psi at ambient temperature. Cell meets the same general construction specifications as the cell above, except that the windows are made of the finest grade of optical fused quartz. The faces of each window are parallel within 5 minutes of arc and flat to within 1 wavelength of yellow light. Body material is 316-series stainless steel. Overall diameter of the cell is 2-9/16 inches and the length is 3-25/64 inches.

II PROCEDURE FOR REMOVING, CLEANING, AND REASSEMBLING CELL WINDOWS

High and Medium Pressure Cells

1. Plug one of the 1/4 inch tubing openings.
2. Back out both window support nuts approximately 1/4 inch with the spanner wrench.
3. Apply pneumatic or hydraulic pressure (25-35psi) to cell through the other tube opening. this will overcome the O-ring friction and move windows and supports back to support nuts. If window is damaged so that pressure does not work, see note on page 3.

4. Back out window support nuts an additional 1/4 inch and repeat procedure described in step 3. This will free one of the window assemblies.
5. Completely remove window support nuts.
6. Lift out free window support assembly.
7. Using a soft-faced rod, push remaining window assembly out of cell body.
8. The window holders have a light friction-fit on the window supports and may be separated with a slight effort.
9. Clean parts with any compatible solvent. Be careful not to nick or scratch the window, its mating surface, or the window support sealing surfaces.
10. To reassemble, reverse the procedure above. To aid in installing the window supports and overcoming the O-ring friction, use the window support nuts as a means of forcing the window supports in place. See Section III on lubrication before proceeding.

CAUTION

It is not necessary or desirable to tighten the window support nuts more than finger tight once the supports are in position. Tightening will not effect a seal but merely makes a subsequent removal difficult.

NOTE

If because of damage the Cell will not hold pressure follow this procedure for removing the window. The seal plugs have a short internal screw thread to facilitate their removal. For the 100,000psi Cell the thread is 5/16-24 and for the 50,000psi Cell the thread is 1/8 NPT. A pipe nipple or machine bolt can be used to remove the assembly.

Low Pressure Cell

1. To remove windows, remove nuts with spanner wrench provided.
2. Place hand over opening and shake cell; window will drop out.
3. Repeat for other side.
4. Clean with compatible solvent.
5. Reassemble as follows:
 - a. Place cell on end.
 - b. Place Teflon O-ring in its groove.
 - c. Drop window into position

- d. Install washer. Make sure it is in the cavity with the window.
- e. Install nut and apply torque of 1 to 2 ft. seal. See section on lubrication before proceeding.
- f. Repeat for other window.

III LUBRICATION

High and Medium Pressure Cells

1. The window support nut threads should always be lubricated with any good thread lubricant.
2. Where it can be done, the O-rings should be lubricated to facilitate assembly and avoid having the O-ring roll upon installation, with subsequent leakage.
3. The window support may be coated with a light film of heavy bodied compatible lubricant and the window wrung into place. This will aid in obtaining an initial seal.

Low Pressure Cell

1. Lubricate threads of nut with any compatible lubricant.

IV OPERATION at TEMPERATURES other than AMBIENT

High and Medium Pressure Cells

1. If temperature changes are necessary, bring cell to required temperature before applying pressure; however, a pressure of approximately 10 atmospheres can be applied during heating in order to suppress boiling of the media.

CAUTION

Make sure the cell is designed to accommodate the anticipated temperature range before heating.

Low Pressure Cell

2. This cell is suitable for work only at temperatures $\pm 100^{\circ}\text{F}$ of ambient.

V STORING

Remove windows, clean, and dry cell thoroughly after use and before storing.