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Instructions **μSample Plan™**
Sample Compression Cell
with Diamond Windows
0042-444/0042-448

The μSample Plan™ with diamond windows is a device used to flatten samples for analysis via FT-IR microspectroscopy. The cell consists of an aluminum base, two diamond windows, a single o-ring and a screw cap assembly.

Instructions:

1. Unscrew the top cap from the base of the μSample Plan.

2. Place the first diamond window on the base unit (the windows are equivalent) with its diamond surface pointing up. Position the window so that the two holes on the window are in line with the red dot on the base unit. Place the o-ring in the circular groove of the diamond window in the base unit.

3. Place the sample on the diamond window as close to the center as is possible. Generally, a sample that occupies 5% or less of the diamond surface is suitable.

4. Place the second window with its diamond surface pointing down directly on top of the first window - make certain that the slots in the top and bottom windows are in line.

5. Place the screw cap back on the base of the cell - do this by first lining up the red dot on the top cap with the red dot on the base unit and then turning the cap clockwise.

6. Hand tighten the cap firmly. Do not use tools of any sort to tighten the diamond cell.

If the sample is too thick for analysis after following the above procedure, too much sample may have been placed between the diamond windows initially. Removing 50 to 75% of the initial sample from the diamond surfaces and reflattening will often correct this problem.

Interference fringes can be avoided by removing the top window after crushing the sample and analyzing the sample on the single lower diamond window.

**Note - Some Reflachromat™ reflecting objectives have a cone shaped baffle at the bottom of the optic - when using the compression cell it must be removed - this to allow for clearence for the cell. It is removed by loosening the three screws in the bottom plate (0.035 inch hex. head with red handle is included in the tool kit).

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INSTRUCTIONS FOR MINIATURE DIAMOND ANVIL OPTICAL CELL

FOR SOFT MATERIALS

The miniature diamond anvil optical cell (Type IIA diamonds) for infrared studies was designed for examining soft materials, using finger pressure.

Place the sample on the lower diamond anvil in the plate containing the spindles and then position the top plate, bringing the two halves together. Insert the three screws with springs into the top plate and slowly tighten them with your fingers until firm. The screws are necessary to keep the two halves of the instrument from rocking. Flatten the sample by moderately squeezing the instrument with finger pressure. Finger pressure is sufficient to flatten the sample.

WARNING - Tightening the three screws beyond finger-snug can quickly create too much pressure on the anvils leading to breakage.

Cell construction consists of two triangular plates with one plate featuring a ball and socket arrangement. This plate is the top of the instrument. The diamond bonded to it is in fixed orientation and parallel to the opposite diamond which is bonded to a steel disc. The diamond anvil windows are aligned by adjusting the set screws and moving the steel disc horizontally. When tightening the set screws, care must be taken so that the disc is not "pushed up."

Adjusting the anvils and checking the parallelism is accomplished by using a low power binocular microscope with transmitted white light. Parallelism is checked by using the light fringe technique. Multi-colored bands of light spread evenly across the working surface of the anvil indicate the anvils are parallel.

The anvils can be cleaned by wiping acetone or alcohol across the working surfaces with a pointed tissue. Do not let the solvent come in contact with the epoxy as it will eventually loosen the bond holding the diamond to its mount. The working surfaces can also be cleaned by scraping with a razor blade or with a needle. The undersides of the diamond anvils are cleaned by placing a drop of clean acetone into the aperture using a fine pointed tweezer. A round toothpick placed into the opening is used to clean the base of the diamond and absorb the solvent. A needle, such as a beading needle held in a pin vise, is then used to pick up remaining debris.

CAUTION - Diamond will easily scratch diamond. After removing the sample, place a piece of paper between the anvils.

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