APPENDIX I

CYCLONE ASSEMBLY AND CLEANING INSTRUCTIONS

A. Cyclone Assembly

Inspect the cyclone parts for signs of wear or damage such as scoring, rifling, or a loose coupler. Replace the units or parts if they appear damaged. Figures I-1 and I-2 show the parts for MSA and Sensidyne cyclones, respectively.

FIGURE I-1 MSA CYCLONE ASSEMBLY PARTS

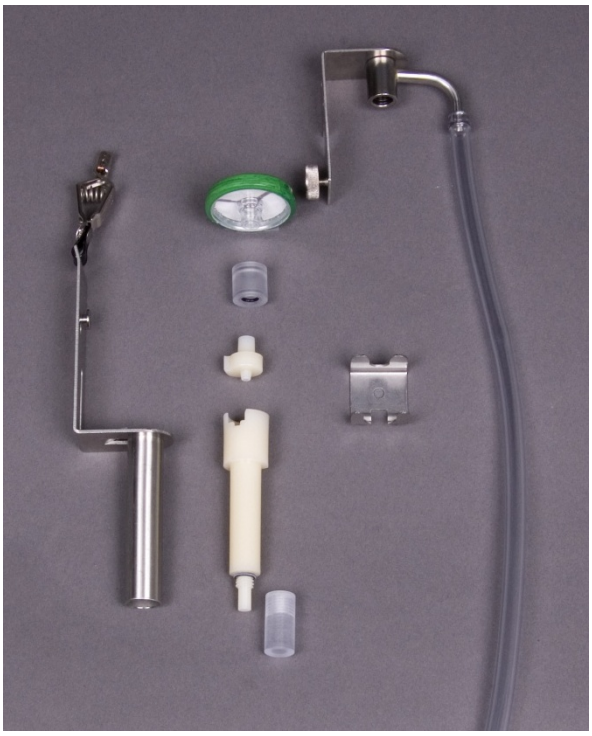
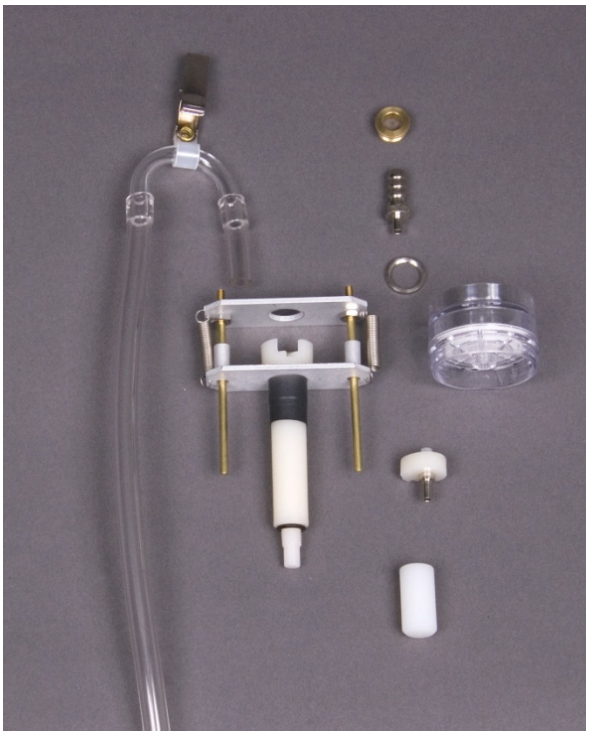


FIGURE I-2 SENSIDYNE CYCLONE ASSEMBLY PARTS



B. Cyclone Leak Test Procedure

Leak test the cyclone before use unless it has been leak tested within the past month. A cyclone leak test kit and cyclone leak test procedure are provided in each Area Office for this purpose.

This section summarizes procedures for leak testing of the Dorr-Oliver cyclone samplers used for collecting respirable dust. Further details on this procedure are contained in the Cyclone Leak Test Procedure (CLTP). CSHOs should review the entire leak test procedure before conducting the leak test as summarized below. See the CLTP for more specific procedures regarding leak tests.

Nylon Part Inspection

- Disassemble the cyclone assembly, clean it, and inspect it for cracks and worn fit between parts. Take care not to scratch the inside surface of the cyclone chamber.

- Replace any worn or cracked units or parts.

O-Ring, Tubing, and Filter Leak Test

- Connect the entire cyclone assembly (minus the cyclone body) to the pressure gauge and aspirator, maintaining the normal spacing between the plastic filter adaptor (coupler) and the vortex finder.

- Seal the cyclone vortex finder opening by placing an airtight cap or your fingertip over the hole.

- Hold the cyclone assembly together with one hand.

- With your other hand, squeeze and gently release the aspirator bulb until the pressure gauge reads between 4 inches and 10 inches of water pressure, then fold the tubing halfway between the "Tee" fitting and the aspirator. If the pressure reading is beyond full scale, release the vacuum and try again.

- Observe the pressure gauge reading for 30 seconds. If the pressure drops less than 25%, the leakage is acceptable and the unit passes the leak test. If the pressure drops more than 25%, corrective action is necessary. Sources of leaks include worn or damaged O-rings, cracked or ill-fitting tubing, and leaky pre-weighed filter cassettes.

Note: Leaks between the filter input and the air sampling pump are more disruptive than leaks at the plastic filter adaptor O-rings.

Final Pump-Fault Leak Test

- Connect the cyclone assembly to the pump in the normal sampling configuration with the air sampling pump running at 1.7 L/min.

- Close the inlet to the cyclone with tape or a finger. If the pump bears down and goes into a fault mode, the assembly passes this final, but crude, pump-fault leak test.

C. Cyclone Cleaning

Unscrew the grit pot from the cyclone. Empty the grit pot by turning it upside down and tapping it gently on a solid surface. Clean the cyclone thoroughly and gently after each use in warm soapy water or, preferably, wash it in an ultrasonic bath. Rinse it thoroughly in clean water, shake off excess water, and set aside to dry before reassembly. Never insert anything into the cyclone during cleaning.