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Made in the USA



## Model FC47 & FC47P 47mm Filter Cassette Instructions

### Cassette Operation

Our model FC47 filter cassettes are designed to meet all EPA specs for PM<sub>2.5</sub> Reference Method sampling, and may also be used for other particulate or gravimetric dust sampling applications where standard 47mm cassettes are used. The cassette has precision machined upper and lower plastic sections that fit together tightly to prevent leakage. A stainless steel screen supports the filter disc during sampling.

To open the cassette, the upper and lower plastic halves must be carefully pried apart. **Our cassettes use a tight fit, and it may be difficult or impossible to separate the two parts by hand.** We recommend the use of our model **FCT** lab-grade filter cassette opening tool. In any case, be careful not to allow the cassette assembly to pop apart violently when opening. The cassettes should not be disassembled in the field.

**⚠ Warning! Do not pry the cassette apart with a screwdriver or any other tool that could gouge the plastic surfaces. The resulting damage is not covered by warranty.**

The deep side of the cassette assembly is the top. A laboratory technician loads a clean, pre-weighed filter disc on top of the steel support screen, then closes the cassette and places it into a protective transport container. The cassette is transported to the field site and placed into the air sampler by a technician. Air is drawn through the filter for a period of time (often 23 or 24 hours), after which the cassette is removed, placed back into the transport container, and returned to the laboratory for re-weighing.

In most cases, there are specific requirements for how the cassettes are to be packed, transported, and shipped. More detailed procedures for cassette operation and filter handling can be found in *EPA Quality Assurance Document 2.12: Monitoring PM<sub>2.5</sub> in Ambient Air Using Designated Reference or Class I Equivalent Methods*.

If our special cassette transport cans are used, the filter disc serial number may be written in the "Filter ID" field on the can lid. The "Cassette ID" field may be marked with the Alaric serial number as etched on the bottom of the cassette screen. We now recommend using a fine point wet-erase type pen to mark the can lid, because some brands or colors of permanent ink seem to be difficult to completely remove from the tin plated steel surface with isopropyl alcohol. Test the ink that you plan to use, and verify that it can be removed adequately. The lid may be marked and reused indefinitely. Alternatively, small adhesive labels may be used in the can lid fields.

### Compatible Filter Types

The EPA PM<sub>2.5</sub> reference method requires the use of a specific type of 46.2 mm diameter PTFE filter with a plastic support ring around the perimeter. Alaric recommends GE Healthcare Biosciences Whatman<sup>®</sup> PM<sub>2.5</sub> filters, which are available from lab or filter suppliers.

Filter discs of glass fiber, quartz fiber, Nylon, cellulose, or other materials are also available for different sampling applications. In some cases, the filter discs may be supplied directly by the laboratory that performs the gravimetric analysis on the samples.

**Note:** If the cassette is to be used for speciation or an XRF/chemical dust analysis application, make sure that the planned analysis method will not be adversely affected by the Delrin<sup>®</sup> Acetal plastic of the cassette.

### Sampler Compatibility

Our standard **model FC47** cassettes follow strict EPA dimensions, and thus cannot be used in the Thermo/R&P Partisol<sup>®</sup> 2000/2025 series samplers. These samplers have a protrusion on the upper filter holder which extends into a chamfer in the top of the filter cassette. Our **Model FC47P** cassettes have the chamfer to accommodate this. Be sure to follow the sampler manufacturer's instructions for proper installation of the cassette in the sampler.

### Maintenance & Cleaning

The 47mm filter cassette assembly should be cleaned after each use in order to prevent dust contamination from affecting subsequent lab results. The white Delrin parts and the stainless steel screen should be hand washed with warm soapy water, rinsed, and dried. It may be preferable to final rinse with distilled or deionized water. The Delrin parts should not be autoclaved or steam cleaned, because this exceeds the temperature specification of the plastic.

**Use caution when handling the steel screen discs, because they are delicate and the edges may be sharp.** If a screen disc becomes creased or bent it should be replaced.

The transport can lid should be cleaned with water or isopropyl alcohol in order to remove any ink used to mark the ID numbers. The can assembly may be washed with warm soapy water. The lid should be dried immediately after washing in order to prevent the possibility of rust formation in the etched lid artwork.

**Note:** Attempt to keep the two original cassette halves together with their serialized screen when possible. These parts were factory assembled and tested together as a unit. Mixing parts from other cassettes is not recommended, as the cassettes have a precision interference fit, and very small dimension variations from lot to lot can affect the fit.

### Warranty

Alaric ElectroMechanics Inc. filter cassettes are warranted against defects in materials and workmanship for a period of 90 days from shipment from the factory, when used per these instructions. This warranty does not apply to products that have been subjected to misuse, negligence, accidents, acts of nature, or to products that have been modified, altered, or used for an application other than intended. Any product found to be defective will be repaired or replaced at our option. The liability of Alaric Electromechanics Inc. shall not exceed the purchase price of the product.