

# Instruction Manual

## FB-R Series Fluid Seal Bag-In/ Bag-Out Round Filtration Housing



**FARR GOLD SERIES®**

Customer: \_\_\_\_\_  
Location: \_\_\_\_\_  
Purchase Order: \_\_\_\_\_  
Local rep: \_\_\_\_\_  
Rep. phone: \_\_\_\_\_  
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## DISCLAIMER

**Before proceeding with any Bag-In/Bag-Out undertaking, review this Installation, Operation, and Maintenance Manual and all safety procedures with your company's safety personnel.**

Camfil APC is committed to providing air filtration products, which meet or exceed our customer's expectations. We are dedicated to a corporate-wide policy of continual improvements as a means of insuring our leadership position in the air filtration marketplace.

The Camfil APC's housings and filters are designed to protect personnel and the general public by filtering dangerous materials. The filters you change can be contaminated with these dangerous materials. In order for your complete protection and the protection of the general public, it is imperative you follow these instructions as amended by your safety personnel. The bagging method of changing a filter is not fail-safe, but it is the safest, pragmatic method available for changing a contaminated filter. Since all types of housing designs and configurations cannot be addressed by a single manual or set of safety procedures, we propose a proven method of replacing contaminated filters with clean filters. Once this method is understood by both maintenance personnel and safety personnel, they can adapt the most suitable method to use, based on the housing, location, type of filter/ adsorber, and any other mitigating factor that can affect safety.

Carefully study this manual and your safety personnel's amendments so that you have the entire procedure in mind before initiating the change-out procedure. Before initiating this procedure, verify you have all the necessary tools on hand.

Camfil APC describes the "twist and tape" method and banding method of sealing the bag in the manual, but any method approved by your safety personnel is acceptable, including, but not limited to, thermal sealing of the bag.

Please note: In order to prevent the operator or immediate environment from contamination, use common sense, adhere to the instructions in this manual and consult your company's safety manual.

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## INTRODUCTION TO BAG-IN / BAG-OUT HOUSINGS

Camfil APC's line of Bag-In/Bag-Out housings are "containment" design, filter housings used for critical applications. These filter housings have been designed to meet the air filtration needs of industries and research facilities that handle dangerous or toxic, biological, radiological or carcinogenic materials. To minimize exposure to these harmful contaminants, while replacing and handling contaminated filters, the housing incorporates a heavy duty plastic bag covered access port. Once the initial filters are installed and the bag attached and secured, all filters, both new and contaminated are handled through the bag, using procedures described throughout this manual, hence the name "Bag-In/Bag-Out".

The filter-to-housing seal is accomplished with filter locking mechanisms which forces the integral gasket of the filter to compress against the housing sealing surface, creating a positive airtight seal.

When the initial filters are installed or the contaminated filters are changed out, the system must be in-place leak tested to assure the filters are sealed properly and all contaminants will be filtered from the air stream.

Camfil APC's Bag-In/Bag-Out housing can be designed in an assortment of arrangements, depending on the user's requirements and the types of filters or adsorbers installed inside the housings. Camfil APC's Bag-In/Bag-Out housings come in various sizes. The housings can be supplied individually as small filtration systems or as several housing modules. These modules can be factory welded and stacked together to create a variety of larger filtration systems to meet the customer's needs. Regardless of the filter housing size you may have, the filter change-out procedure described in the manual will remain the same.

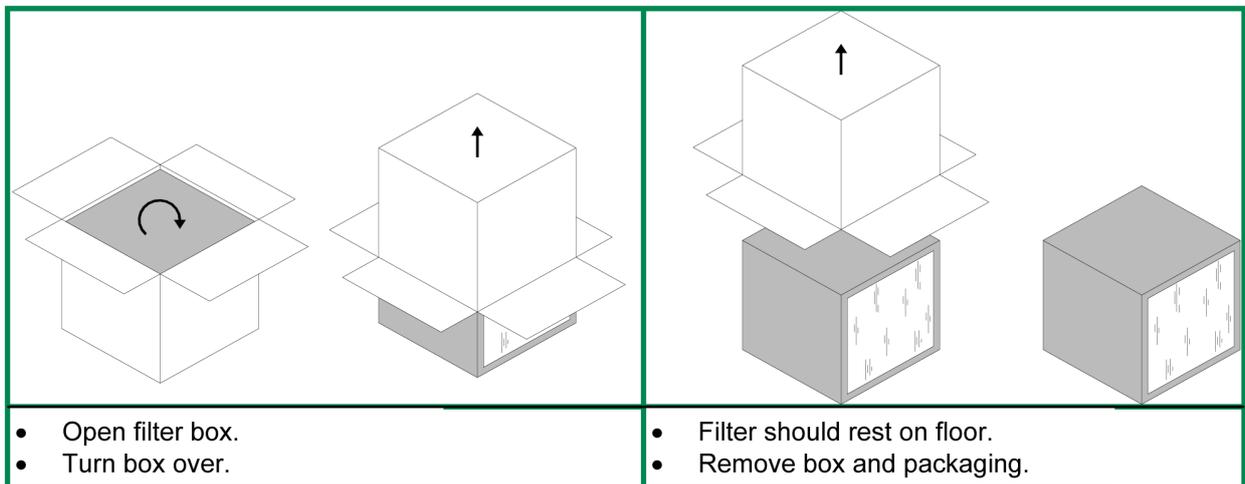


## INSTALLATION OF FILTRATION HOUSING

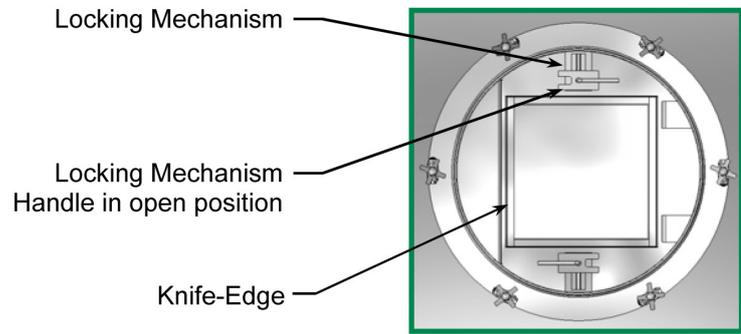
1. Check the filtration housing for loose items that may have been stored inside during shipment. Remove any loose items which are present. All loose items should be inventoried and stored in a controlled environment along with the filters. These items should remain in the controlled environment, in their original boxes until installed.
2. To allow for filter installation and change-out, a minimum of four (4) feet of clearance in front or above the access door is recommended.
3. The filtration housing must be installed in the correct orientation. Be sure the direction of airflow and the position of the housing access door is correct prior to installation of ductwork to the filtration housing.
4. The ductwork should be permanently installed to the filtration housing and sealed to prevent leakage between the ductwork and filtration housing. All sections of the filtration system, including fans, dampers, etc. should be complete and ready for operation. The overall filtration system should be securely mounted to a curb, base, or structural support.
5. Following installation of the ductwork and filtration housing, the system should be cleaned to remove dust or debris before installing new filter into the system.

## INSTALLATION OF NEW FILTER PRIOR TO NEW SYSTEM START-UP

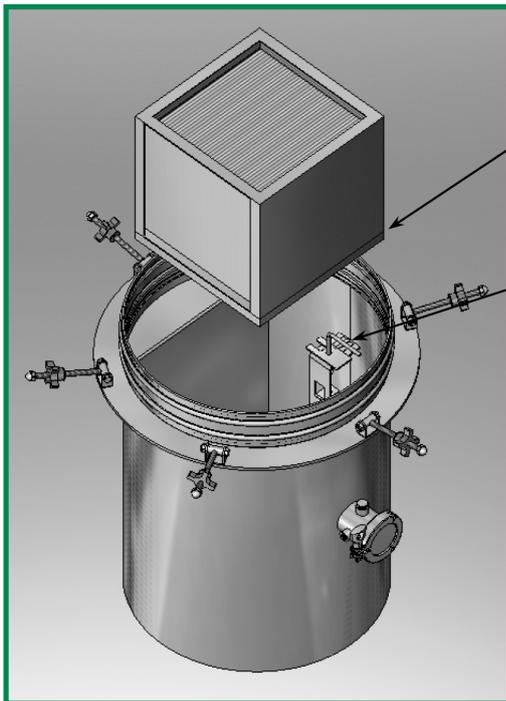
1. Check for correct model number, quantity, type, and size of media.
2. Unpack the filter in accordance with Camfil APC's recommended instructions. Rest filter on the floor and cut open taped seam with a utility blade (set blade to 1/8" max.). Open box and bag(s) protecting filter, pull excess bag(s) over the edge of the box. Turn box over carefully holding flaps away from filter, so the filter rest on floor. Lift box and bag(s) from filter.
3. Take extreme caution when removing HEPA filters from their boxes. Handle only the exterior frame of the filter. Touching the filter face can damage the media, adversely affecting the filter's performance and efficiency.
4. Visually inspect the filter frame and media for damage prior to installation.



5. To gain access to the inside of the filtration housing, remove the housing access doorknobs by turning counter-clockwise (for housings equipped with swivel latches: do not remove doorknobs; loosen and swivel door bolt out from door corner retainer). Pull the access door straight towards you to remove.

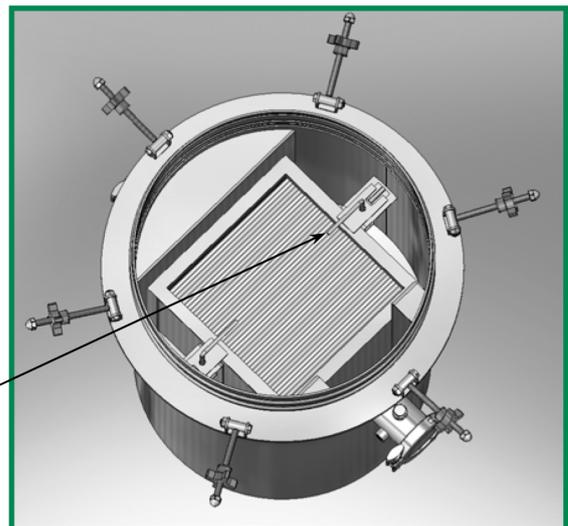


6. To install filter, make sure both locking mechanism handles are turned to the open position so that they will not interfere with the filter when installing. Load the filter into the housing with the gel towards the housing knife-edge using the filter guides inside the housing, and push the filter into the housing as far as possible. Grab each locking mechanism handle, pull the handle above the filter and turn the handle so that the locking mechanism will set across the filter in the closed position when released. Release the locking mechanism handle.



Load the filter with the gel towards the housing knife-edge. Handle only the exterior frame of the filter.

Make sure both Locking Mechanisms Handles are turned open before installing filter.

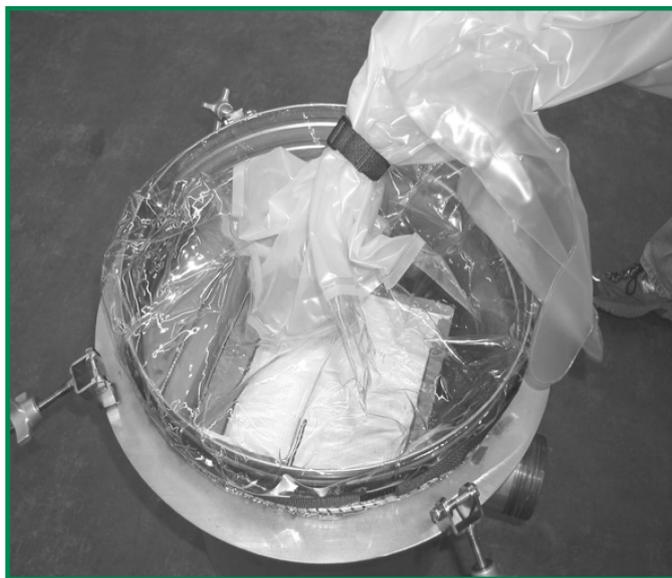
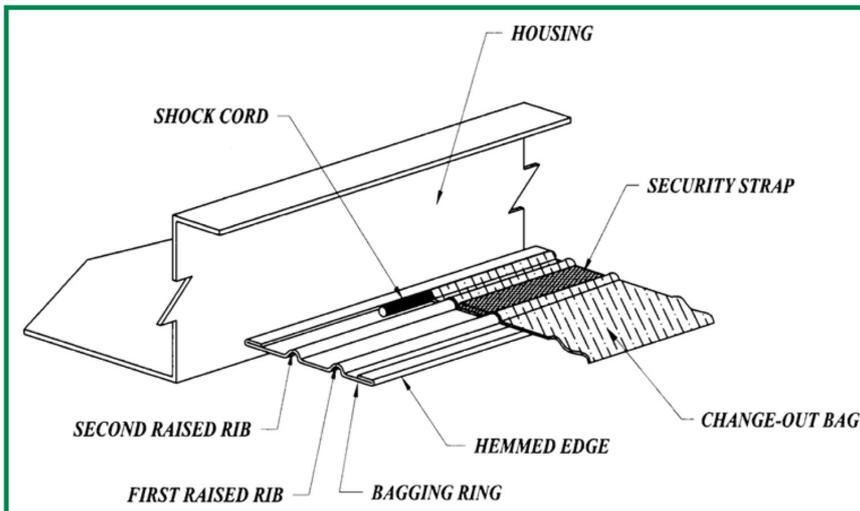


Turn the handle so that the locking mechanism will set across the filter in the closed position when released.

7. Install the plastic change-out bag over the bagging ring. Check the door label to insure the correct changeout bag size is installed (see Spare Parts and Accessories page 13), each change-out bag has a tag with the bag size located on the shock cord, hemmed into the bag opening. The shock cord is to be located between the second raised rib of the bagging ring and the housing. Once the change-out bag has been installed on the bagging ring, install the security strap around the change-out bag with the Velcro side out.

The security strap is to be located between the first and second raised ribs of the bagging ring. Tighten the security strap and secure any excess strap so that it does not interfere with the door seal when the door is installed. After the change-out bag has been secured with the security strap, attach the cinching strap around the remainder of the bag as close to the bottom of the bag as possible, this will prevent the bag from being pulled into the filter when the airflow is on.

Extend the remaining bag out completely and fold and roll the bag towards the housing, squeezing trapped air out of the folded/rolled portion of the bag until the bag is tucked neatly between the bagging ring and the filter access port. While holding the change-out bag in this position, replace the housing access door carefully. Reinstall the access door and tighten the housing access doorknobs by turning clockwise. The filtration system is now ready for operation.

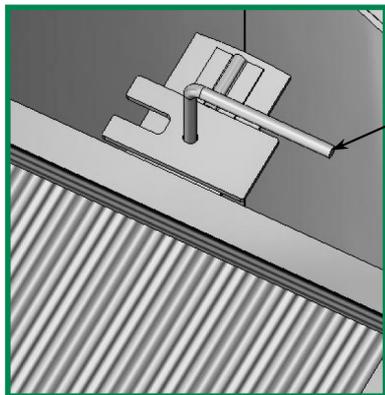


## FILTER CHANGE-OUT (Replacing Contaminated Filters Or Adsorbers)

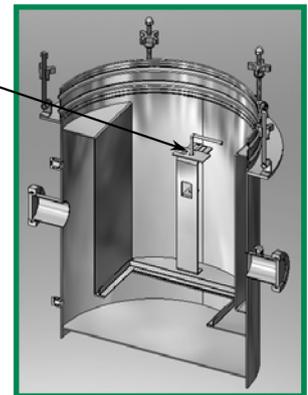
**Consult your safety officer before beginning filter change-out, to assure all proper procedures are followed for your application.**

Note: The pictures shown are with standard housings (not round housing). These pictures will help visualize the change-out procedure, which is the same for either housing type.

1. Before replacing a contaminated filter, the airflow through the filtration system must be stopped. This can be performed by shutting-down the system, or by-passing the airflow through the system to another system, when applicable. To minimize possible contamination, close upstream and downstream dampers (if equipped). It is recommended that protective clothing, gloves, and respirators be worn when changing filters with dangerous contaminants. Consult your safety officer before beginning filter change-out to assure all proper procedures are followed for your application.
2. To gain access to the inside of the filtration housing, remove the housing access doorknobs by turning counter-clockwise (for housings equipped with swivel latches: do not remove doorknobs; loosen and swivel door bolt out from door corner retainer). Pull the access door straight towards you to remove.
3. To remove the filter sealed with the locking mechanism, extend the change-out bag and grab each locking mechanism handle and pull the handle away from the filter while turning the handle to the open position. Make sure both locking mechanism handles are turned to the open position so that they will not interfere with the filter being removed and the new filter being installed.



Turn the handle so that the locking mechanism is in the open position.



4. Carefully remove the filter from inside the filtration housing by inserting your arms into the change-out bag gloves and pulling the filter into the change-out bag. Use a table to place filter after removing from housing. Inspect the sealing surface of the filtration housing to insure no foreign matter will interfere with the new filter to be installed. Remove arms from the change-out bag gloves, leaving gloves inside bag.

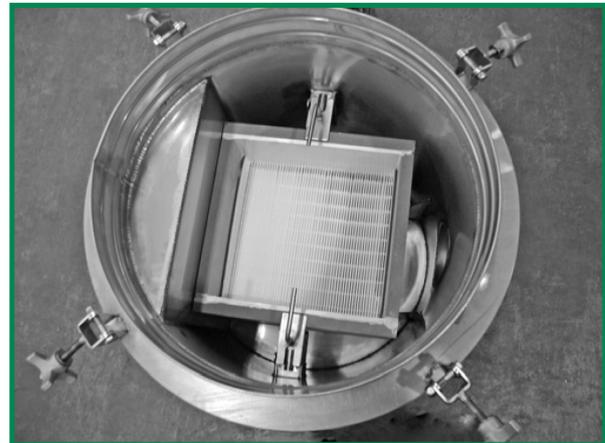
5. Once the filter is removed from the housing into the change-out bag, tightly twist the change-out bag together between the filter access port and the contaminated filter. Tape or tie strap approximately 8" of the twisted bag to secure and cut in the middle of section. Tape over exposed edges where bag was cut. Remove the contaminated filter for disposal. A banding kit can also be used (as shown in picture, see Spare Parts and Accessories, page 14). Remove the change-out bag security strap and gently position the bag's shock cord between the two raised ribs of the bagging ring.



6. Place a new change-out bag over a new filter to be installed (see Installation of New Filter for proper unpackaging and preparations). Position the new filter so that the gel will be facing the housing knifeedge once installed in the housing. Carefully pull shock cord of change-out bag to bottom of filter then pull remainder of bag down until filter is at back of the change-out bag. Turn the filter/adsorber over and pull the bag up. Install the new change-out bag with filter around the bagging ring (over top of the "stub" bag), locating the shock cord between the second raised rib and the housing. Insert arm into changeout bag glove closest to housing and remove the "stub" bag from the bagging ring. Pull as much of the "stub" bag as possible into the glove while turning the glove "inside-out", use one of the other gloves to help push all the "stub" bag into the glove turned "insideout". Reinstall the security strap.

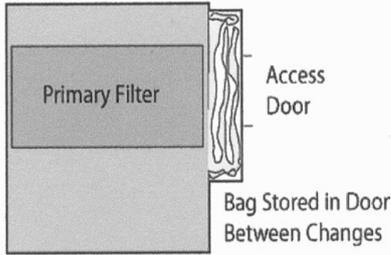


7. Slide the new filter into the housing using the filter guides inside the housing, and push the filter into the housing as far as possible. Grab each locking mechanism handle, pull the handle above the filter and turn the handle so that the locking mechanism will set across the filter in the closed position when released. Release the locking mechanism handle.

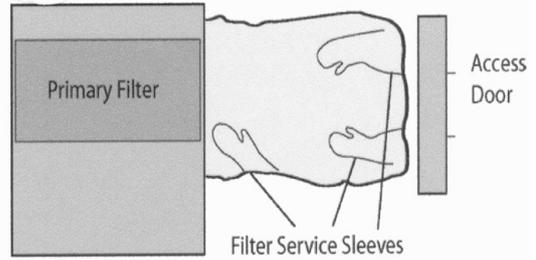


Bag not shown for clarity.

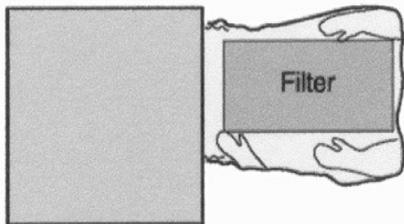
8. The "stub" bag inside the glove closest to the housing can be removed by twisting tightly together and taping or tie strapping, and cutting off (remember to tape over exposed portion). If the "stub bag" will not interfere with the access door seal, the "stub" bag can remain inside the new bag until the next filter change-out. After the change-out bag has been secured with the security strap, attach the cinching strap around the remainder of the bag as close to the bottom of the bag as possible, this will prevent the bag from being pulled into the filter when the airflow is on. Extend the remaining bag out completely and fold and roll the bag towards the housing, squeezing trapped air out of the folded/rolled portion of the bag until the bag is tucked neatly between the bagging ring and the filter access port. Reinstall the access door and tighten the housing access doorknobs by turning clockwise. The filtration system is now ready for operation.



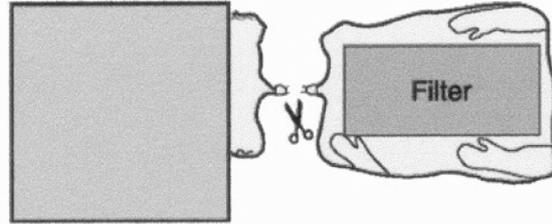
During operation the filter (s) are in place and the bag is stored in the door



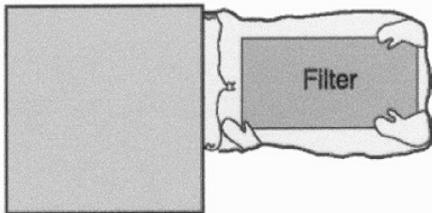
After removing the access door, extend the bag, and use the bag gloves to carefully move the contaminated filter into the bag.



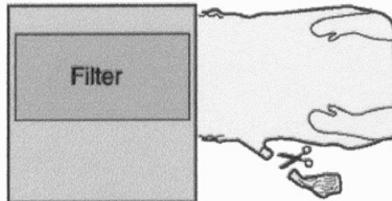
Remove the contaminated filter from the housing, supporting the filter on a table, or optional change-out tray.



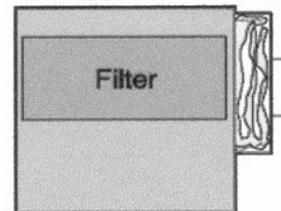
Seal the bag with banding ties between the filter and the door opening. Cut the bag with shears to contain the used filter.



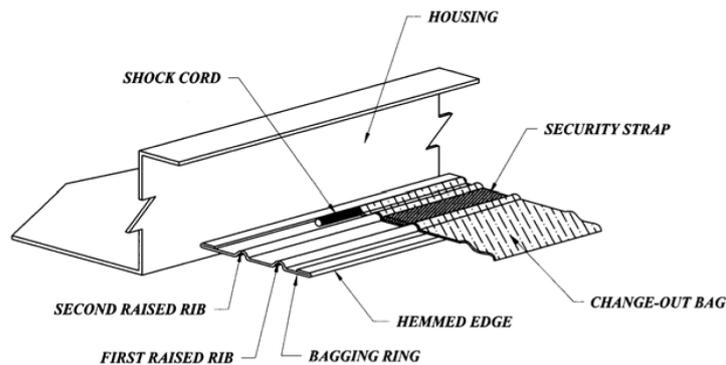
Place a new filter in a new bag and secure the new bag opening to the housing door opening. Move the old bag stub into the new bag cavity and install the filter.



Move the old bag stub into the third service glove sleeve and seal the sleeve with banding ties between the bag body and the glove sleeve.



Carefully fold the bag and place in the door cavity. Replace door.



## MAINTENANCE

### Important note!

Proper maintenance of the filtration housing is vital for proper operation. To maintain the desired level of filtration, it is necessary to perform filter change-out when they are no longer functioning properly. To determine when media change-out is required, the following guidelines must be considered:

#### 1. Components

##### For Particulate filters (prefilters, HEPA filters):

- The pressure drop across the filter exceeds the recommended change-out pressure drop or system design pressure.
- The HEPA filter in-place leak test shows an unacceptable penetration of challenge aerosol.

##### For Carbon adsorbers (HEGA):

- The in-place leak test shows an unacceptable penetration of challenge agent.

#### 2. Filtration System

The filtration system is the containment structure built by Camfil Farr. This structure may be a single housing, or a complete filter train (consisting of multiple, adjoining housings), depending on the scope of the contract. The filtration system is no longer functioning properly when any of the following occurs:

- A periodic site inspection, routine maintenance checks, or other planned surveillance testing reveals torn gaskets, broken welds, stripped threads on door bolts, or any other indication that the system's ability to contain the process airstream has been compromised.

To assure that the filtration system is maintained at peak performance, the owner must commit to periodic component maintenance, inspections/repairs, and test performed by qualified In-Place Testing personnel.

These safe guards will insure containment has not been compromised, as well as a prompt and sufficient program outlining needed repairs.

Access door gasket of the filtration system can be replaced and new gasket installed, if damaged in service (see following page for instructions).

Please call Camfil APC with any comments or question regarding any equipment or procedures in this manual. Camfil APC will answer any questions regarding the systems and components we design and build.

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## DOOR GASKET REPLACEMENT

If the gasket on the access door becomes damaged, it can be replaced with new gasket by the user. You may purchase replacement gasket from Camfil APC (see Spare Parts and Accessories). The following steps should be taken to replace a door gasket:

1. Remove the door with the damaged gasket from the filtration housing. The filtration system will have to be shut down for removal, consult you safety personnel first.

2. Warning: This step may require the use of sharp objects. Take extreme caution when performing this step. With the door moved to a suitable work area, remove the damaged gasket from the door by cutting, tearing or pulling until all gasket is removed from the door. Scrape or cut off the remaining adhesive caulking from the door. Wipe clean with a cleaning solvent to remove any remaining adhesive caulking, dirt, grease, etc.

3. Position door so the edge is up and dry fit new gasket to door just like previous gasket was installed, and cut gasket to length. Allow for 3/4" overlap when cutting, this is to compress the gasket edges back together when performing the final installation. It is important to cut gasket as straight as possible.

4. Locate adhesive caulking (DC 732 or equal) and caulking gun. Cut tip off adhesive tube so that a bead of caulking approximately 1/8" to 3/16" diameter will be produced. Deposit a continuous bead of caulking (1/8" to 3/16" diameter) inside the bottom of the extruded gasket channel.

5. Start placing gasket on door so that the edge of the door will lay inside the bottom of the extruded gasket channel (see diagram). With one hand, use your thumb and index finger to gently pinch the extruded gasket together while placing the gasket with the other hand until the entire door is covered. Apply an even layer of caulking over the face area of the cut ends (do not apply to thick). Install ends together over door while compressing gasket. Apply a very thin layer of caulking around the outside edge of the joint.

6. Check the alignment of the gasket and reposition gasket if needed while caulking in pliable. Gently lift and turn door over on table with the gasket face down. Apply caulking around the outside perimeter where the top edge of the gasket meets the door. The adhesive caulking generally takes 24 hours to fully cure.

7. After the adhesive caulking fully cures, the door can be reinstalled on the housing.

## SPARES REQUIREMENTS

Contact Camfil APC Aftersales Department.

