



**CONTAMINATION
TECHNOLOGY**
C O R P O R A T I O N

Operating and Maintenance Manual

B1 Series Housings

B2 Series Housings

C1 Series Housings



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About this Manual

Notice to Operator:

This guide should be used for reference within on-site safety procedures.

This manual should be used by the operator as a reference guide when installing and changing filters in the Bag-In/Bag-Out Housings: Models B1, B2, and C1. Since system designs and environments vary, procedures in this manual must be adapted for appropriate on-site needs.

Maximum protection from contaminants can be achieved through proper procedure; however, no bag-out method can insure complete protection from contaminants.

To achieve maximum protection, the operator must be completely familiar with the bag-out methods and review procedures with on-site safety personnel before performing any filter changes. Depending upon the nature of the contaminants, the operator may need to wear protective clothing or utilize other personal protective devices when changing filters. The operator must be familiar with all safety policy and on-site procedure established at the site. Change-out methods require study and practice.

This manual does not address system installation, nor does it address the suitability of a product for particular usage. If you have any questions concerning any of the guidelines in this operating manual, please contact Contamination Technology Corporation at the location listed on the front and back cover.



Manufacturers of High Efficiency Air Filtration Systems
For
Science and Industry

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Chapter 1:

General Instruction and Overview



Contamination Technology Bag-In/Bag-Out Housings

Bag-In/Bag-Out series housings are used to filter particulate that is dangerous to the environment and generally unsafe around humans. They have a side access port with a bagging collar to allow removal of filters or adsorbers contaminated while in service. The bagging process allows for safe removal of this media by keeping it separated from the environment and service personnel performing the procedure. Numerous system configurations are available. Basic housings are available in terms of one filter high, and up to three filters deep. Each access door is designed to accommodate a maximum of three (3) filters. Housings containing more than one filter per door will include a retrieval rod to assist in filter removal.

Quality Assurance Program

Contamination Technology Corporation (CTC) institutes a strict quality assurance program to address the criteria structure outlined by ASME NQA-1 and also in accordance with ASME N510 standards. ASME NQA-1 is defined as “Quality Assurance Requirements for Nuclear Facility Applications.” It establishes 18 criteria covering all aspects of quality from design through testing. Quality Assurance comprises “all those planned and systematic actions necessary to provide adequate confidence that a structure, system, or component will perform satisfactorily in service.” It includes Quality Control, “which comprises those Quality Assurance actions related to the physical characteristics of a material, structure, component, or system which provide a means to control the quality of the material, structure, component, or system to predetermined requirements.” ASME NQA-1 was developed for the Nuclear Industry and due to the strict requirements is generally deemed as a form of checks and balances.

Air filtration containment was initiated as a critical requirement to protect workers, the public, and the environment for the Nuclear Industry. Modern day containment is now required in numerous industries such as pharmaceuticals, health care, military, as well as the original nuclear applications. ASME N-510 is the recognized standard of design and testing of containment filtration systems currently utilized by Contamination Technology Corporation.

Leakage Testing Standard

CTC tests the filter seal area as well as the complete system assembly in accordance with the Pressure Decay Method, in accordance with ASME N510-1995 Reaffirmed, Testing of Air Cleaning Systems. Systems are monitored closely over a period not less than fifteen (15) minutes, as well as soap bubble tested in all seams and gaskets. CTC strives to manufacture zero leakage systems, however, we guarantee our product to meet industry standard of 0.0005 CFM

per cubic foot of the system. This rate is guaranteed for both the seal face as well as the full system.

Design Consideration

Standard filters are 12” or 24” deep, so a minimum clearance of 3 feet in front of the door is recommended. Carbon Adsorbers are extremely heavy, so special considerations for weight will need to be taken. For some change-outs, a change-out tray, stand, or table is recommended

General Equipment Storage

Contamination Technology Corporation (CTC) recommends installation of the equipment immediately. Storing the equipment may permit particulate into the system such as gravel or sand that may prevent gaskets from obtaining a proper seal. If you must store the equipment, leave it wrapped in the shrink wrap applied at the factory. If this has already been removed, we recommend reapplying wrap or wrapping in a painter’s tarp and taping it closed tightly. Ensure no particulate can enter under the wrap or through the seams. After storing, lightly wipe out the interior of the system with a rag . Wipe clean all inner surfaces paying close attention to the areas where gaskets seal for any debris. Outdoor storage is not permitted. All equipment must be stored in a clean dry place.

For loose dampers and systems with dampers already installed, it is imperative to keep these securely wrapped. The gaskets have a light coating of silicone grease applied and any particulate will stick to it. Thoroughly inspect these gaskets prior to installation. Wipe down and reapply silicone grease to any gaskets with visible debris.

Filter media supplied with equipment must be carefully handled and stored. Moisture can damage or destroy the filter media. All filters should be stored in their oriented positions, as they will be installed in the housing. For HEPA filters, the filter pleats will be vertical when installed. For carbon adsorbers, the bed will be in the horizontal position.

Required Equipment for Filter Installation/Removal

The following list of equipment is required for all filter change-out procedures.

1. Filters
2. Silicone Grease
3. Change out bag
4. Security Strap
5. Utility knife or scissors
6. Cable ties or heat sealing device and duct tape
7. Ratchet with extension and 3/8" socket

Standard Feature Locations

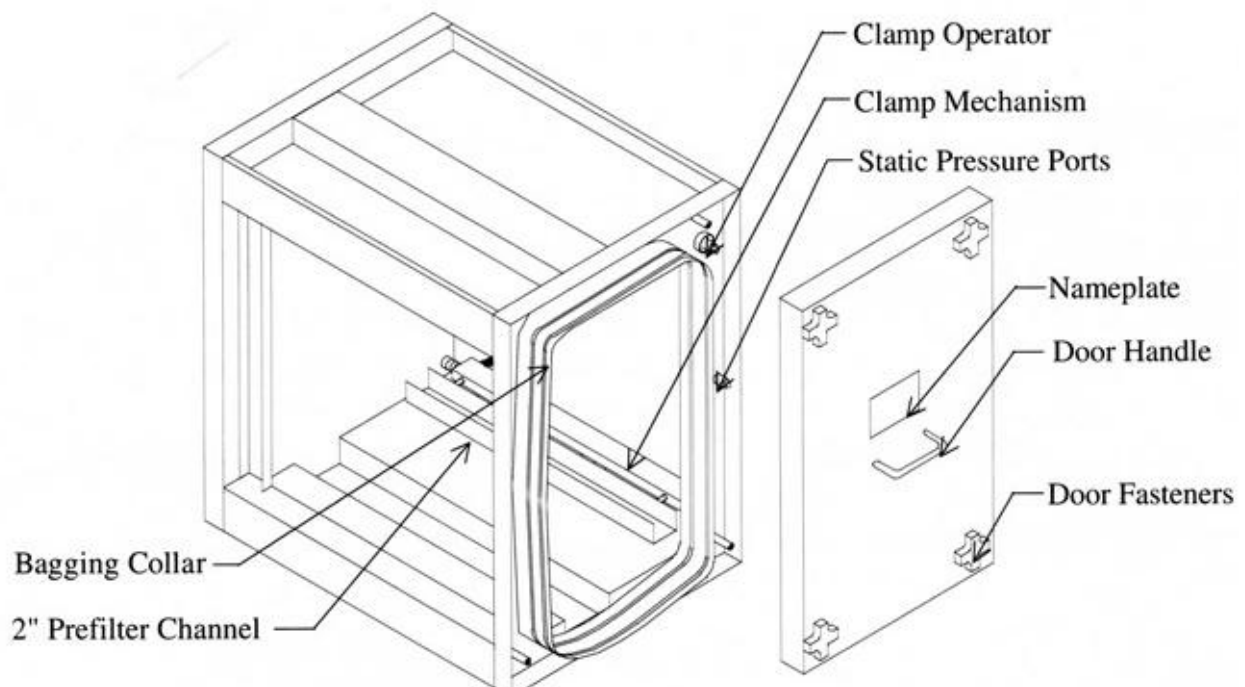
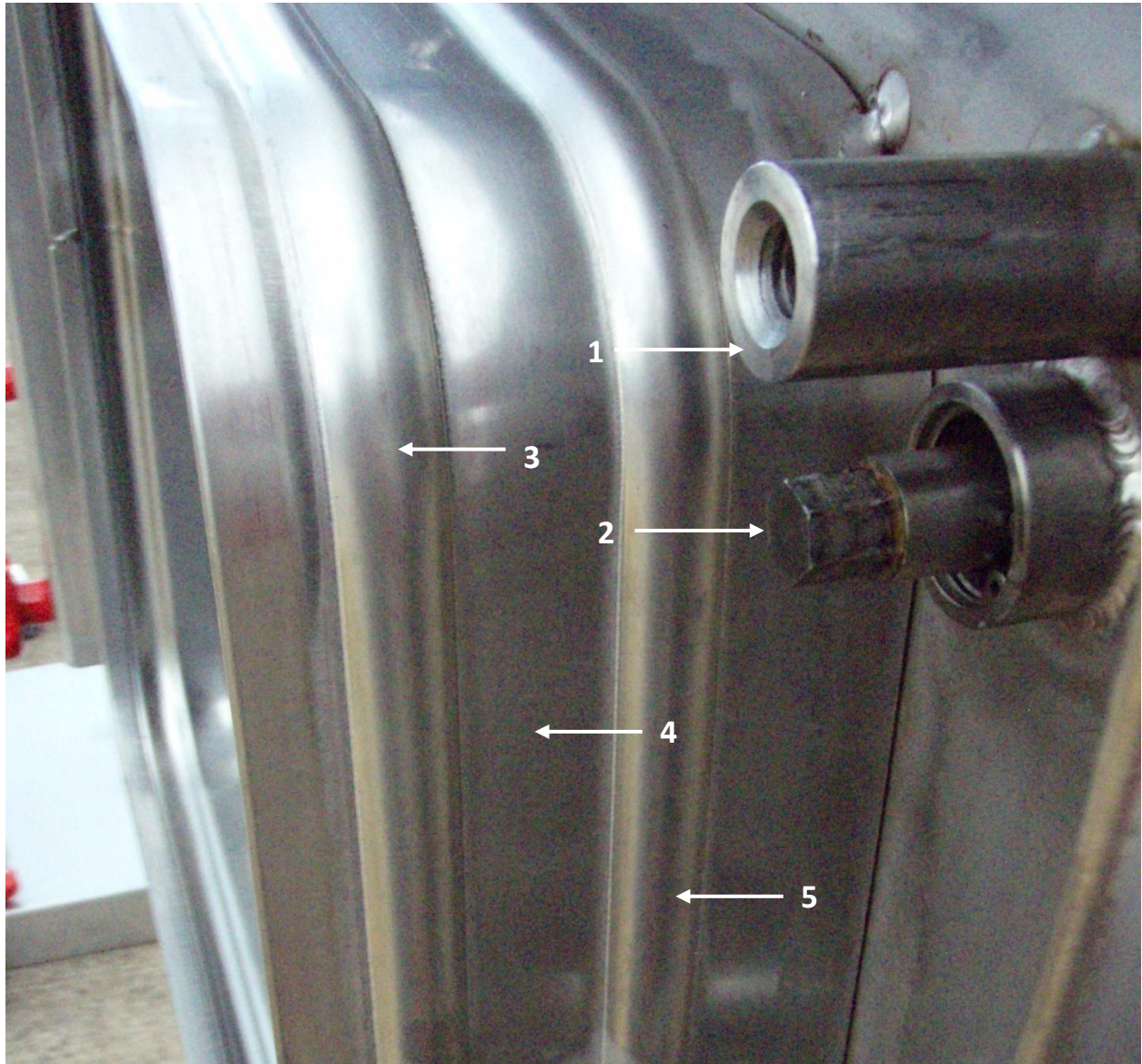


Illustration Diagrams

Illustration 1: Close-up view of the bagging collar



1. Door Post
2. Clamping Mechanism Operator
3. First bagging rib
4. Safety Strapping Ring
5. Second Bagging Rib

CTC Parts List

Product Description		Part Number
B1 Series Filter Housing Consumables		
Model B1 Change-out bags		CTC-50-C
Filter Elements for B1 Series:	HEPA 24"x24"x12" (nominal)	Standard HEPA
	OR Adsorber 24"x24"x12" (nominal)	CTC-A-12
	Pre-filter 24"x24"x2"	Standard Pre-filter
B2 Series Filter Housing Consumables		
Model B2 Change-out bags (HEPA Door)		CTC-50-C
Change-out bags (Pre-Filter Door)		CTC-40-C
Filter Elements for B2 Series:	HEPA 24"x24"x12" (nominal)	Standard HEPA
	OR Adsorber 24"x24"x12" (nominal)	CTC-A-12
	Pre-filter 24"x24"x2"	Standard Pre-filter
C1 Series Filter Housing Consumables		
Model C1 Change-out bags		CTC-60-C
Filter Elements for C1 Series:	Adsorber 24"x24"x16"	CTC-A-16
	OR Adsorber 24"x24"x18"	CTC-A-18
	Pre-filter 24"x24"x2"	Standard Pre-filter
General Parts List		
Safety Strap		SS-101
Banding Set		BN-105
Silicone Grease		TL-108
Door Knob Assembly		DA-402
Clamping Shaft Seal Assembly		OS-202
Clamping Mechanism Push Assembly		CM-010



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Chapter 2:

Start-Up Installation



Start-Up Installation

As outlined in Chapter 1, this start-up installation will generally hold true for all models of housings. Special considerations may need to be taken for custom housings, carbon adsorbers, and specific configurations. Particulate filters include a vast range of size, type and performance capabilities. Consult with the Engineering and Safety groups in charge of your building to verify filtration requirements. Take special care when removing any filtration media from its packaging. Prior to installation, thoroughly inspect all filter media to be placed in service for damage.

The following list outlines equipment required to install the filter, as defined in Chapter 1. Verify all equipment necessary is available prior to starting the installation process.

1. Filters
2. Silicone Grease
3. Change out bag
4. Security Strap
5. Utility knife or scissors
6. Cable ties or heat sealing device and duct tape
7. Ratchet with extension and 3/8" socket

NOTE: This start-up procedure is general information and may not meet all site requirements. Verify all required processes are adhered to prior to starting the system.

WARNING: The filter installation portion of this section is for initial start-up only. This procedure is incorrect for any system currently in use.

1. Remove the equipment from the pallet or crating.
2. Remove the access doors and check for any items shipped loose inside the housing (i.e. gauges, bags, manuals, etc.) Inventory these items and store in a controlled environment. Care must be taken to prevent any damage.
3. Fully operate both clamping mechanisms to ensure no damage occurred in shipping.
4. Install the housing into the correct service position.

WARNING: This step is vitally important. The system must be in its final service position prior to initial startup. All ducting and any dampers must be in place. CTC highly recommends running the system with a disposable set of pre-filter, HEPA filter, or combination of both, to remove any dust or construction debris from the airway. Replace the door into service position prior to starting the fan. Allow the fan to run approximately 1 hour to permit any particulate to dislodge.

5. Thoroughly inspect and wipe down the interior surface. Pay close attention to any substance or object that may prevent the filter from sealing. The following image illustrates a clean view of the sealing surface.



6. CTC recommends all filter gaskets be coated with a silicone grease or equivalent. This will ease filter installation as well as promote gasket resiliency and prevent the gasket from sticking to the seal face.
7. Install the start up filters without using a change out bag. Clamp the filters into place by turning the clamping mechanism operator clockwise. There is a built in stop, so you will feel a strong resistance when the clamping mechanisms are fully extended.



8. After the filters are installed and visually inspected, place a change out bag over the second rib of the bagging collar and secure the bag with a safety strap.



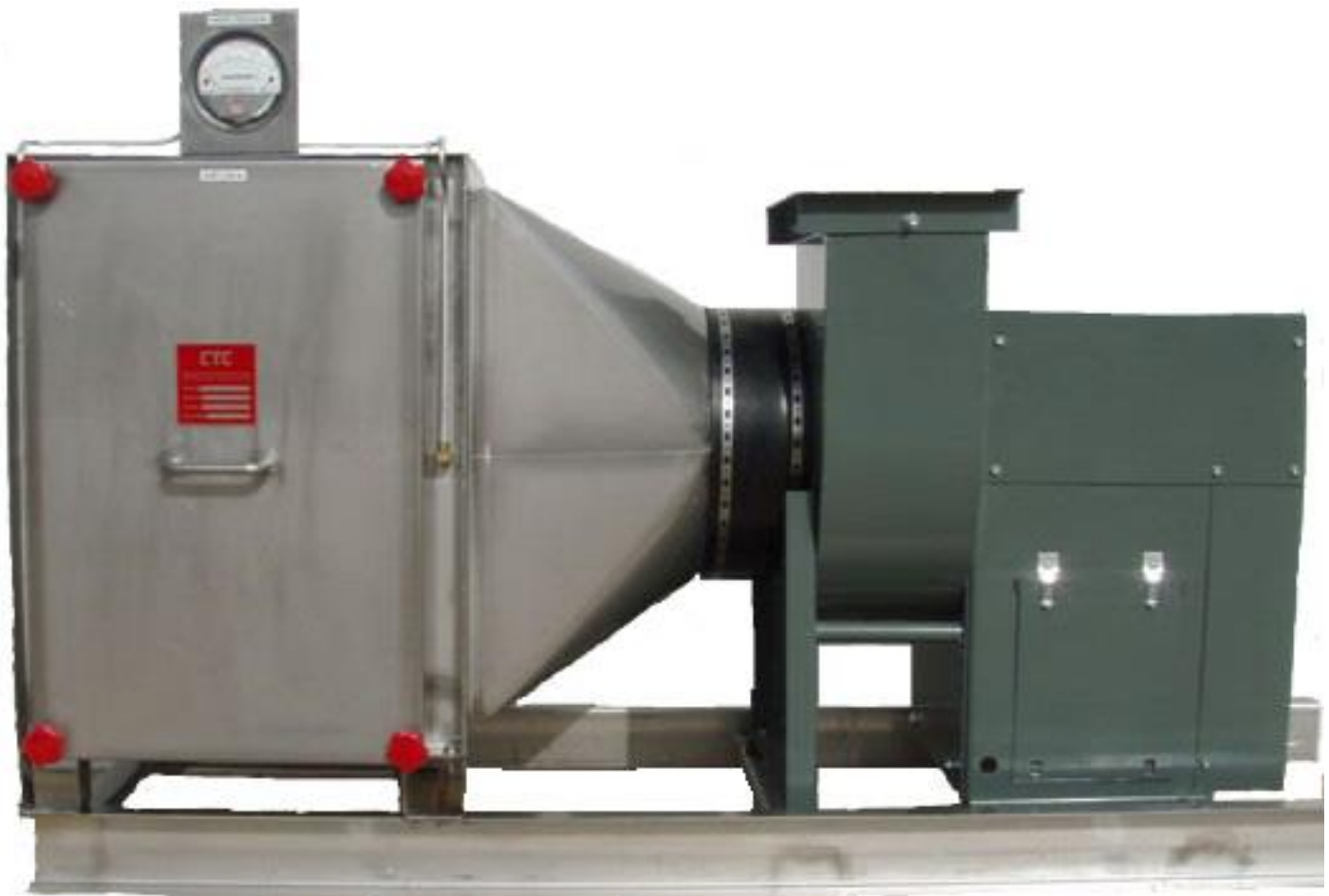
9. Roll or collapse the bag into the bagging collar and place the access door back into its service position.





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Filter Change-Out Procedure



Filter Change-out Procedure

As outlined in Chapter 1, this change-out procedure will generally hold true for all models of housings. Special considerations may need to be taken for custom housings, carbon adsorbers, and specific configurations. Particulate filters include a vast range of size, type and performance capabilities. Consult with the Engineering and Safety groups in charge of your building to verify filtration requirements. Take special care when removing any filtration media from its packaging. Prior to installation, thoroughly inspect all filter media to be placed in service for damage.

The following list outlines equipment required to install the filter, as defined in Chapter 1. Verify all equipment necessary is available prior to starting the installation process.

1. Filters
2. Silicone Grease
3. Change out bag
4. Security Strap
5. Utility knife or scissors
6. Cable ties or heat sealing device and duct tape
7. Ratchet with extension and 3/8" socket

NOTE: This procedure is necessary to protect workers or maintenance personnel from potential contamination when changing filters.

WARNING: This filter change out procedure is provided as a safe method for changing out contaminated filter and replacing it with a new one. Onsite safety and maintenance personnel should thoroughly review this procedure and make necessary modifications to suit specific applications. Prior to beginning work, personnel should review and understand the modified procedure.

1. Shut down the fan operating the system to eliminate any airflow. Also verify any dampers that may be installed are closed, isolating the contaminated area.
2. After you have verified the system is shut down and all airflow has ceased, remove the access door by turning the knobs counterclockwise. Lift the door off the housing and set the door aside.

3. Using the 3/8" socket, release the clamping mechanisms by turning them counter clockwise. There is a built in stop so you will feel a firm tension when they are fully released. Repeat this process for both the top and bottom mechanisms.
4. Extend the change-out bag to its full length. Don't be overly forceful extending the bag. Verify the arms built into the bag are right-side in.



5. Remove the contaminated filter from the housing into the back of the change out bag.
 - **Tip:** With the filter extracted approximately half way, bunch the bag up around the filter so the back of the bag is contacting the back of the filter. This will ease the suction created during the extraction process.

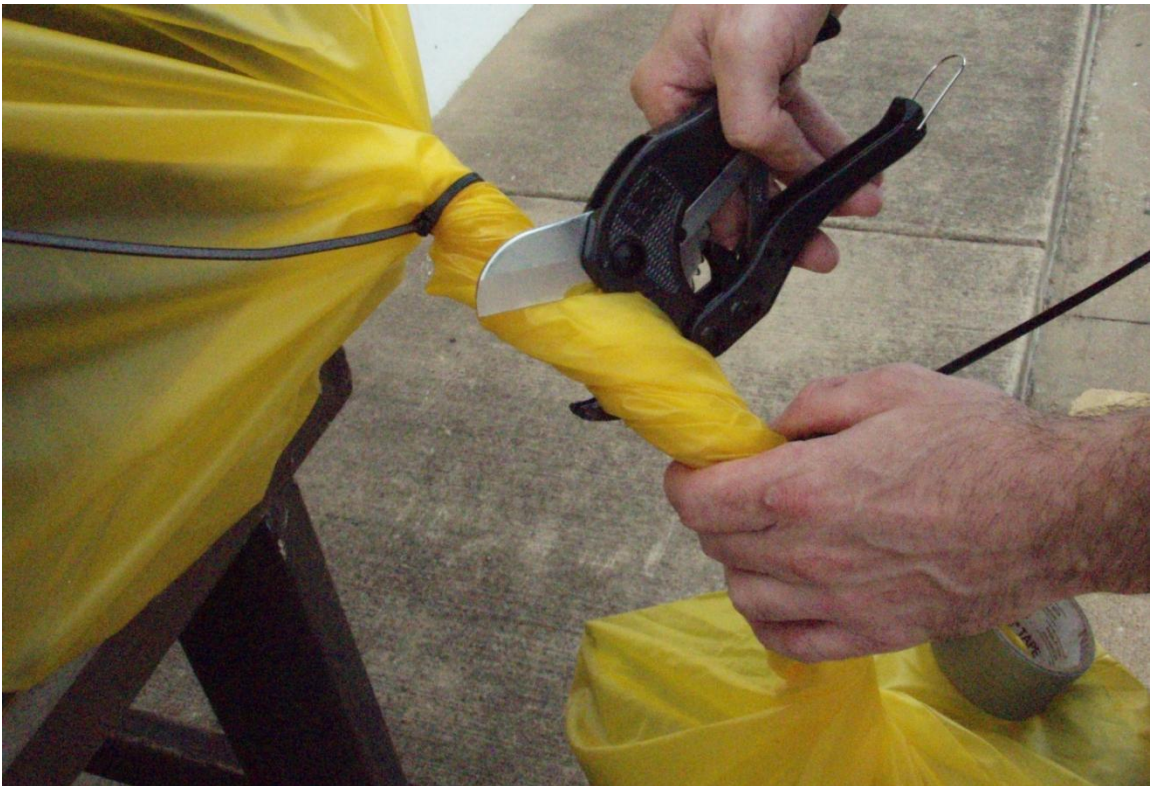


6. If using a cable tie, tightly twist a 10"-12" section, tie off each end, and cut in the middle. Use duct tape to securely tape each cut end. After isolating the contaminated filter, remove the safety strap and move the left over bag stub to the first rib of the bagging collar. This allows the new bag to cover the old bag stub while keeping the contaminated area secure.

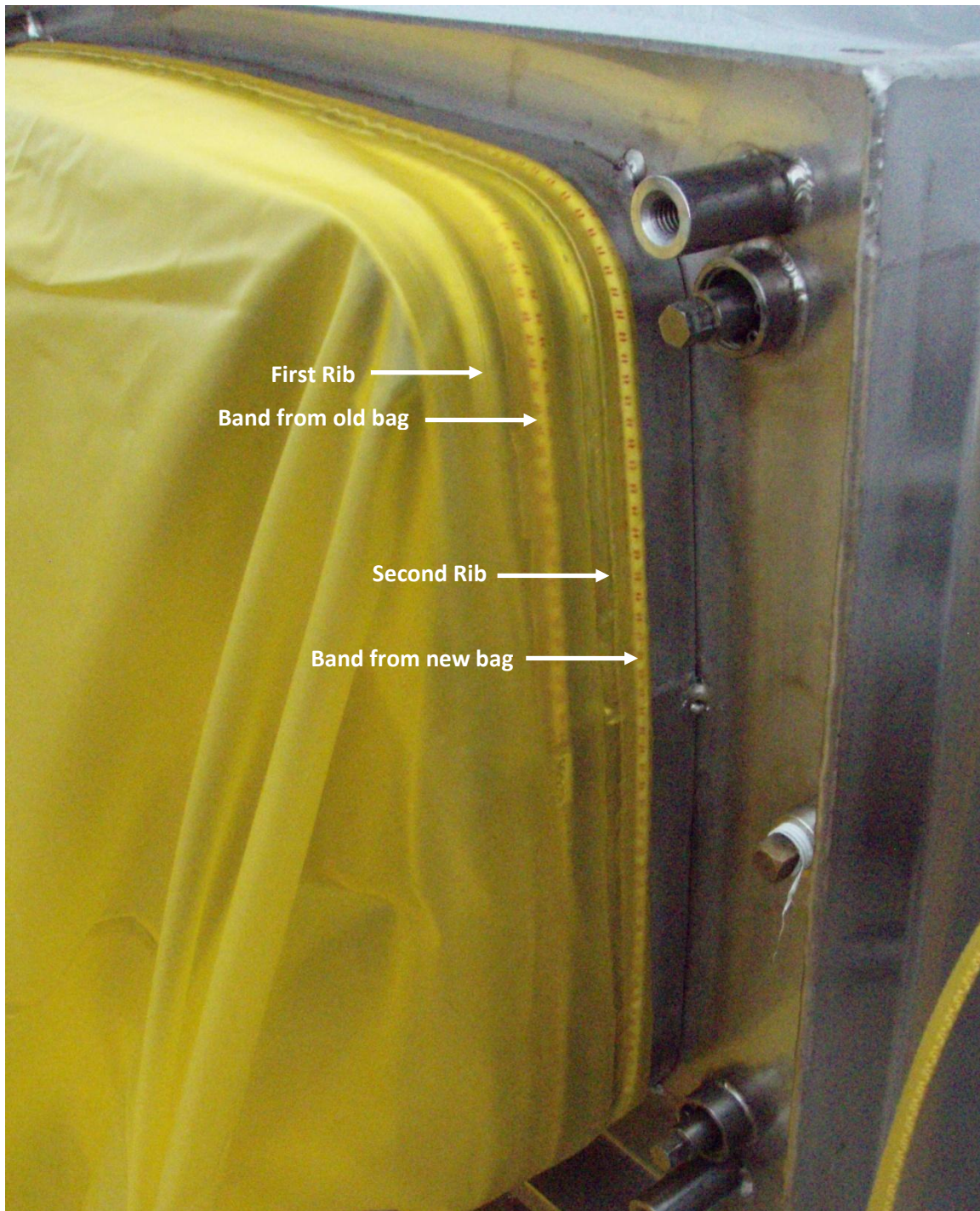
Alternate: If using a heat seal, make two (2) parallel passes between the filter and the housing. (The heat seal passes should be approximately 3 inches apart.)

Alternate: Many facilities use a twist and tape method which requires tightly twisting a 10"-12" section of the bag between the contaminated filter and the housing. After tightly taping this entire section, cut it in the middle. The exposed ends are then securely taped and sealed.

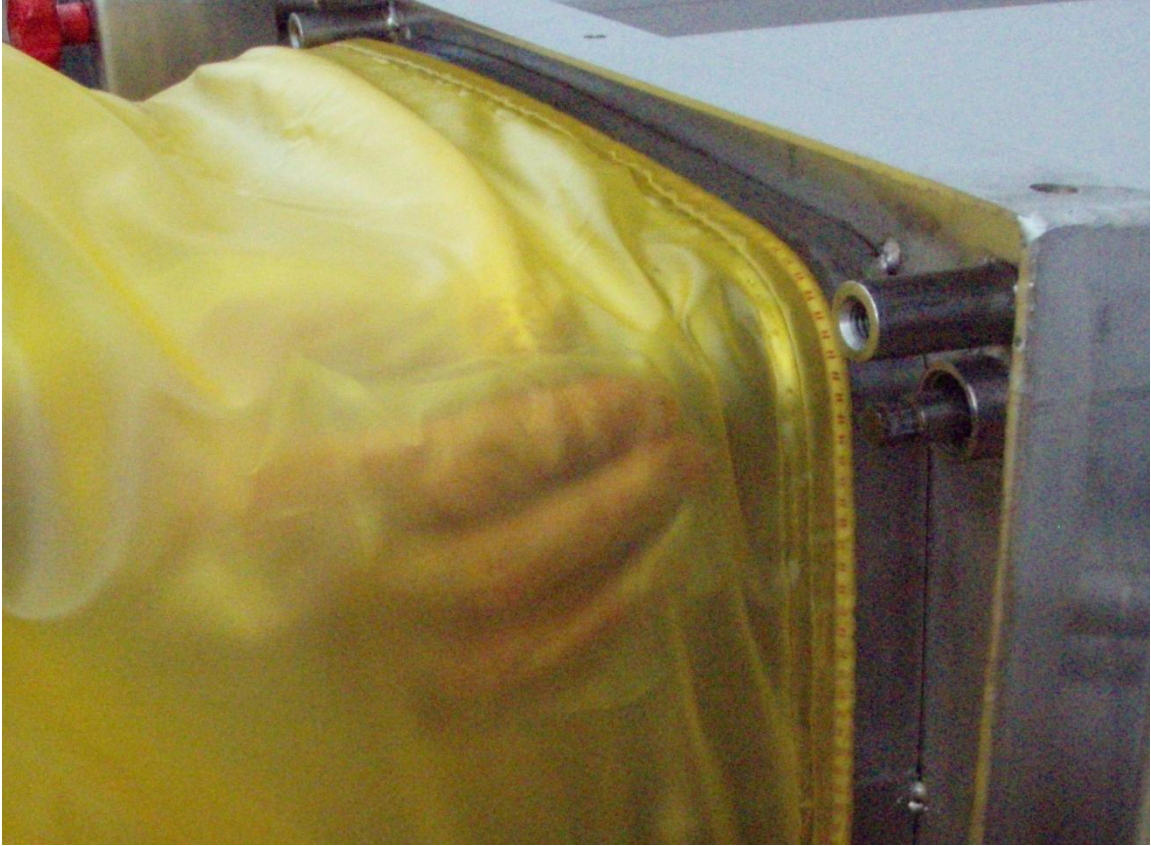
The pictures on the following page illustrate this procedure using the cable tie method.



7. Put a film of silicone grease (CTC supplied) or equal on the gasket of the new filter and place the filter into a new change out bag.
 - Tip: When placing the filter in the bag, insure the gasket side of the filter is facing the seal face section of the housing.
8. With the safety strap off and the old bag stub on the first rib of the bagging collar, place the new change out bag containing the new filter over the second rib of the bagging collar.



9. Pull the old bag stub off and move to the back of the new change out bag. Place the safety strap around the bagging collar between the two ribs and tighten fully.



10. With the safety strap in place, work the new filter to the front of the bag and slide completely into the housing.



11. Clamp the new filter securely in place by rotating both the top and bottom clamping mechanism operators clockwise until they are fully extended.
12. CTC recommends the old bag stub be left in place in the new bag, as it will be disposed of at the time of the next filter change out. This will help insure that the bag currently in service is free of leaks due to cutting. If it is required to remove the old bag stub, isolate the stub to the back of the bag and repeat step 6.
13. Collapse the change out bag into the bagging collar.



14. Place the access door back on the housing using the alignment supports, and tighten the knobs clockwise until fully tightened.
15. Bring the system back online for normal operation.
16. Check the system pressure drop to insure the installed filters meet the expected pressure drop.

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