

CLAY VESSEL MANUAL (VC Series Vessels)



Velcon Filters, Inc. • 4525 Centennial Blvd. • Colorado Springs, CO 80919
Phone: 719-531-5855 • Facsimile: 719-531-5690 • E-mail: vfsales@velcon.com
www.velcon.com



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DISCLAIMER: This generic vessel manual is provided on the web for your information, with the understanding that each vessel manual sent out from Velcon is customized for the particular vessel, and contains accessory information not included in this document. This document makes reference to other pieces of literature, such as schematics and drawings that are added to the manual as needed depending on the vessel parameters.

GENERAL DESCRIPTION

The Velcon Clay Vessel that you have received consists of the vessel, clay elements and accessory equipment to meet your specific requirements. Descriptive literature covering the accessories can be found at the end of this manual.

The Velcon Clay Vessel is specifically designed to remove surfactant material from the product being treated. The product enters from the inlet nozzle, rising vertically behind a baffle until it reaches the region above the top of the highest elements. The elements are arranged in vertical stacks rising up from a flat division plate. The fluid enters the outside of each element and flows through the packed clay media toward the center of the elements. The flow then goes downward to the outlet nozzle.

The system must be correctly installed and operated to function properly. Please read the instructions in the manual and follow them carefully.

Clay Canister Elements

Attapulugus clay canisters are used for the removal of surfactants from jet fuel and other petroleum products.

INSTALLATION OF VESSEL

1. Identify the Clay Vessel inlet and outlet by the markings provided on the vessel piping. The Clay Vessel must be installed in the correct direction of flow to perform and to avoid damage to the system.
2. INLET AND OUTLET PIPING should be carefully aligned to avoid stressing the Vessel connections during installation. Installation of shut-off valves on either side of the Clay Vessel is recommended so that it can be independently drained for cartridge change or inspection.

CAUTION: STEPS 3 AND 4 SHOULD BE PERFORMED BEFORE REMOVING HINGE OR PIVOT MOUNTED COVER TO INSURE STABILITY OF THE CLAY HOUSING.

3. Bolt the Clay Vessel to a stable base.
4. Carefully install correct gaskets on the inlet and outlet connections and connect to the inlet and outlet piping.
5. Connect any accessories that are not already installed. See Accessories Parts List and literature as required.
6. Element and Mounting Hardware are packed separately. Open cover and install elements as directed in the installation instructions below
7. Be sure the cover gasket is in place and properly aligned. Replace cover and secure tightly.
8. NOTE: CLAY VESSELS MUST BE PROVIDED WITH PRESSURE RELIEF VALVES TO INSURE THAT PRESSURE THAT DEVELOPS FROM THERMAL EXPANSION OF THE FUEL, DUE TO TEMPERATURE INCREASES, WILL NOT DAMAGE THE VESSEL WHEN THE SYSTEM IS NOT OPERATING.

ELEMENT INSTALLATION

Your Clay Vessel was ordered with rigid canister elements. The installation instructions are outlined below. (See Internal Assembly Drawing):

1. Place gaskets and mounting adapters over holes in bulkhead.
2. Place tie rods through mounting adapters and screw into the crossbars across the bottom of the bulkhead.
3. Secure mounting adapters in place using lock washers and hex nuts.
4. Install first tier of elements, handle up. Do not drop elements. Lower carefully into place.
5. Place center plates over elements.
6. Repeat steps 4 and 5 for additional tiers of elements.
7. Install final tier of elements.
8. Place end-sealing caps over final tier of elements.
9. Secure in place using gaskets, flat washers, lock washers and hex nuts. Tighten hex nut until gasket curls up slightly.
10. Place lid gasket into groove provided, close vessel lid and bolt in place.

START-UP PROCEDURE

Prior to start-up, the valve handles should be placed in the following positions:

1. Manual drain valves closed.
2. Manual air eliminator valve open.
3. The valves in the inlet and outlet piping should be closed.
4. The pressure gauge valve to OFF position. For Clay Vessels equipped with selector valves, this is done by turning the handle outward so that the arrow points toward the vessel.

For information on operation of accessories, turn to Accessory Instruction in the back of the manual.

After the valves have been positioned as outlined, the unit is ready to be filled.

The following operating instructions can be used for initial start-up and for subsequent start-ups after installation of replacement elements or servicing of the unit.

1. Start the system pump.
2. Open the inlet valve slightly, allowing the clay housing to **SLOWLY** fill with fluid.
3. If the unit is equipped with a manual air eliminator valve, leave the valve cracked open until the fluid flows from the opening; then close quickly. If equipped with an automatic air eliminator, the unit is filled when the eliminator stops flowing air.
4. When the Clay Vessel is filled with fluid, **SLOWLY** open the valve on the outlet line. Then open the inlet valve fully.
5. When the unit is in operation, take a differential pressure reading and record the reading. The differential pressure should be between 1 and 3 psid depending on the purchase specification. If there is no differential pressure, the system should be shut down and the Clay Vessel inspected for broken seals or possibly elements left out. See Differential Pressure Reading, Page 7.

OPERATING INFORMATION

Below are the Velcon recommendations for operating procedures. Your Company Maintenance and/or Quality Control procedures may provide alternate instructions on these matters.

1. **DIFFERENTIAL PRESSURE READINGS.** Differential pressure is the difference between the pressure upstream and downstream of the Clay Vessel. Differential pressure increases when contaminant is filtered by the elements and causes flow restriction.

(NOTE: A high differential pressure is a sign of the clay vessel becoming an expansive pre-filter vessel, and the clay cartridges are probably not removing much surfactant.)

Readings should be taken when the system is flowing at maximum capacity. If the Clay Vessel is equipped with a direct reading differential pressure gauge, the reading shown on the gauge is the differential pressure across the Clay Vessel.

If the Vessel is equipped with a pressure gauge and a selector valve, use the following procedure for determining differential pressure:

- A. Turn the handle to the outlet side so that the arrow points toward the inlet. Record gauge reading as "Inlet Pressure."
- B. Turn the handle toward the inlet side so that arrow points toward the outlet. Record gauge reading as "Outlet Pressure."
- C. Subtract outlet pressure from inlet pressure to determine differential pressure.
- D. Turn handle outward so that arrow points toward vessel, which is the "OFF" position. **TO AVOID DAMAGE TO THE PRESSURE GAUGE, LEAVE THE HANDLE IN THE "OFF" POSITION WHEN READINGS ARE NOT BEING TAKEN.**

Differential pressure readings should be taken at least once during each operating week and more frequently in high throughput installations or when the differential pressure is increasing rapidly. Records of the differential pressure and throughput should be maintained to determine when cartridges should be changed.

A sudden drop in pressure differential is an indication of a possible problem. Check first to be sure that readings were taken at equivalent flow rates. If so, shut the system down and open the Clay Vessel and inspect for damaged elements or seals.

2. **ELEMENT CHANGE REQUIREMENTS.** Clay Elements should be changed whenever one of the following events occur:
 - A. Differential pressure exceeds 15 psid.
 - B. Effluent quality checks indicate the clay is spent and is no longer removing surfactant materials. (e.g. Unsatisfactory filter membrane color, MSEP, or IFT Readings)
 - C. After one year of operation.

3. **ELEMENT CHANGE OR INSPECTION PROCEDURE.**

- A. Shut off the pump.
- B. Close the inlet and outlet pipe valves.
- C. Open drain valves and remove product from the Clay Vessel.
- D. Open the manual air eliminator valve. This will permit the unit to drain faster.
- E. Open cover and inspect cover gasket. Replace gasket if it is damaged.
- F. Remove spent elements.
- G. Wipe off or wash down any foreign matter from the vessel interior.
- H. Install elements in accordance with instructions on Page 5.

Check cover gasket for alignment, replace cover and secure tightly. The Clay Vessel is now ready for the start-up procedure.

USE ONLY VELCON FILTERS INC. ELEMENTS IN THIS CLAY VESSEL. VELCON CANNOT WARRANT PERFORMANCE IF ANY OTHER MANUFACTURER'S ELEMENTS ARE USED.

To reorder elements and replacement parts or to obtain further information contact your Velcon Filters, Inc. representative

Or

VELCON FILTERS, INC.
4525 Centennial Blvd.
Colorado Springs, CO 80919-3350
Phone: 719-531-5855
Fax: 719-531-5690

E-mail: vfsales@velcon.com

Web site: www.velcon.com



4525 Centennial Blvd., Colorado Springs, CO 80919
Phone: (719) 531-5855 FAX: (719) 531-5690
e-mail: vfsales@velcon.com

INSTALLATION Instructions

CO-718CE – CLAY CANISTER ELEMENTS

The CO-718CE is a canister type element which is equipped with a gasket at each end. To insure proper sealing at each end it is necessary to use a sealing plate between stacked elements. Installation procedures are as follows:

1. Stop product flow, close inlet and outlet valves, open the air eliminator, and drain vessel completely down.
2. Remove head bolts from head cover.
3. Raise cover by raising hydraulic jack cover and swing back to one side of the vessel.
4. Remove tie rod nuts, washers and top sealing caps.
5. Remove old elements.
6. Remove center plates and store with the sealing caps, the tie rod nuts, and washers.
7. Remove next layer(s) of old elements.
8. Clean vessel interior after all elements are removed.
9. Remove new CO-718CE from plastic bag.

NOTE: CO-718CE ELEMENTS CAN BE DAMAGED BY WATER. NEW ELEMENTS SHOULD BE PROTECTED FROM ANY WASHING DOWN OPERATION OR RAIN.

10. Lower CO-718CE elements over the center rods to bottom of vessel. Bail handles for assisting in installing and removing the canisters should be on the upper end of the canisters. **DO NOT DROP ELEMENTS. LOWER CAREFULLY.**
11. Place center plates over first tier of elements.
12. Place CO-718CE elements on top of center plates.
13. Install center plates on top of these elements if the vessel is a 3 high stack, otherwise go to Step 15.
14. Install third tier of elements.
15. Place sealing caps on top of final tier of elements.
16. Place a rubber gasket, flat washer, lock washer and nut over each tie rod and securely fasten down. When rubber gasket starts to curl out from under flat washer, enough torque has been applied.
17. Replace vessel cover and tighten down securely.
18. Close drain valve, open air eliminator, crack open the inlet valve and fill the vessel **SLOWLY**.
19. When vessel is full, fully open the inlet and outlet valves.

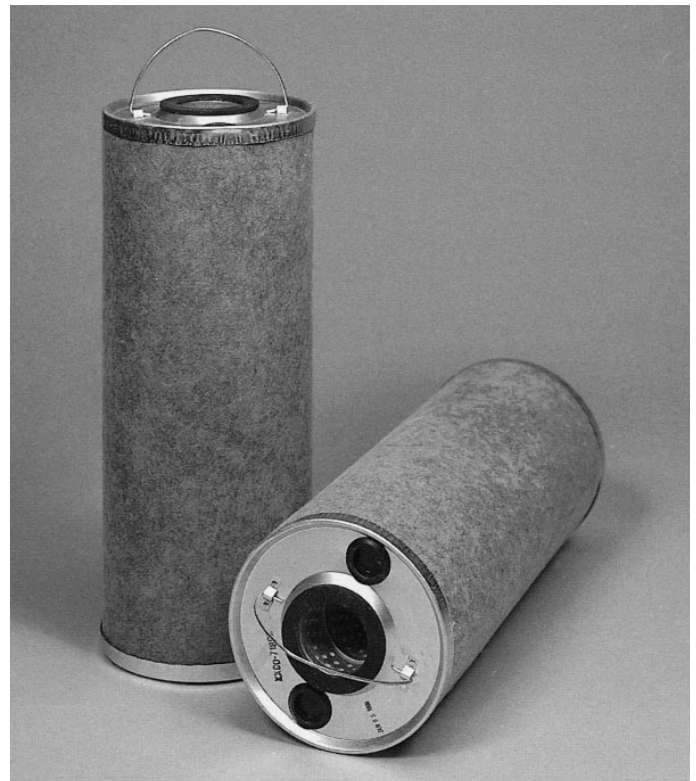


CO-718 Series Cartridges for Fuel and Oil Treatment

The Velcon CO-718 Series elements are intended for use in all clay treatment vessels designed for nominal 7" x 18" cartridges. The treatment/purification medium is a special blend of low volatile materials (LVM) fuller's earth compounded to provide the optimum balance between adsorptive capacity and water resistance. With their ability to prevent channeling and their high particle structure stability, the elements assure reliable performance and long life in the most exacting process applications.

Jet Fuel Treatment – One of the most common uses for clay elements is to remove surfactants from jet fuels. Surfactants can carry over from the refinery process or be picked up when the jet fuel travels through multi-product pipelines (corrosion inhibitors, gasoline additives, etc.). Surfactants will eventually disarm filter/separators, which are primarily designed to remove water from the jet fuel. By removing surfactants from the fuel, the clay elements protect the downstream filter/separators. Since clay removes the surfactants by an adsorbent (adhering) action, the fuel residence time, or time in contact with the clay, is very important for proper fuel treatment. Normally, a flow rate of about 6.5 gpm per 7" x 18" element is ideal for jet fuel.

NOTE: For further information on clay, see data sheet #1223 in the Technical Information Section of the Velcon catalog. See data sheet #1759, *SWIFTKit*®, for information on how to determine when the clay elements should be changed.



CO-718CE Canister

CONSTRUCTION

CO-718CE is a rugged canister element featuring aluminized steel endcaps and center-tube, polyester felt outerwrap and both interior and exterior media migration barriers. A wire bail provides for easy installation and removal. Buna-N gaskets at each end assure tight sealing. The improved construction offers high resistance to transit or handling damage and to differential pressures up to 100 psi.

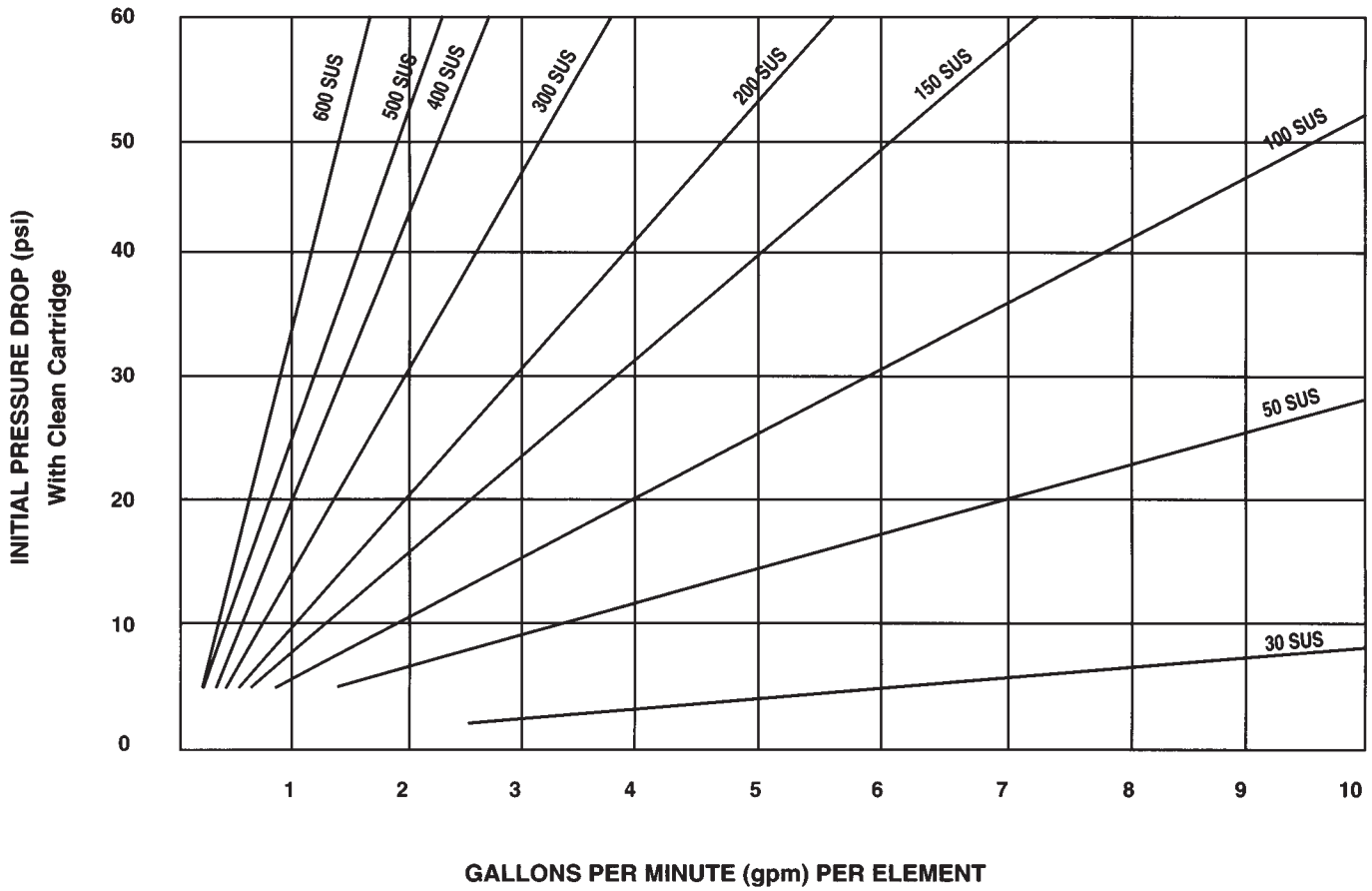
SPECIFICATIONS

Length 18"
 Outer Diameter 7"
 Center Diameter 2 1/4"
 Collapse Strength 100 psi
 Interchange:
 Facet/Fram C-766-3
 Keene-LE-718

APPLICATIONS

Lubricating Oils
 Vacuum Pump Oils
 Jet Fuels
 Aluminum and Stainless Steel Rolling Oils
 Quench Oils
 Hydraulic Fluids
 Insulation Oils

Flow Rate Per Element



Velcon products are sold and serviced by a world-wide representative network. To order, contact Headquarters or your **LOCAL REPRESENTATIVE**:

COMPANY HEADQUARTERS:
 Velcon Filters, Inc. 4525 Centennial Blvd.
 Colorado Springs, CO 80919-3350
 Phone: 1.800.531.0180
 Fax: 719.531.5690
 e-mail: vfsales@velcon.com
 www.velcon.com

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