FLOWSORB®

Liquid Phase Adsorption Canister

Description

Designed for low-flow water treatment applications, prefabricated 55-gallon FLOWSORB canisters contain all the operating elements found in a full-scale adsorption system. These small, economical treatment systems hold 180 pounds of granular activated carbon for applications including:

- Small wastewater streams
- Groundwater remediation
- Underground storage tank leaks
- Well pump tests
- Product purification or de-colorization
- Tank cleaning water treatment
- Batch water or product treatment
- Carbon adsorption pilot testing
- Emergency spill treatment
- Monitoring well water treatment

Features / Benefits

FLOWSORB offers several features and benefits to industrial, commercial, and municipal users including:

- Low cost per unit makes carbon treatment economical
- Simple installation and operation
- Space above carbon bed facilitates flow distribution or back-flushing
- Flexibility to be used in series or parallel operation
- Supplied with virgin or reactivated carbon
- Practical disposal option: pre-approved spent carbon canisters may be returned to Calgon Carbon Corporation for safe carbon reactivation
- Continuous treatment at various flow rates and concentrations

System Specifications	FLOWSORB
Vessel	Open head steel canister
Cover	Removable steel cover, 12 gauge bolt ring
Internal Coating	Heat-cured phenolic epoxy
External Coating	Baked enamel (white)
Temperature Limit	120°F (max)
Inlet	2" FNPT
Outlet	2" FNPT
Carbon	180 lbs. granular activated carbon: Specify FILTRASORB 300 or reactivated grade
Ship Weight	219 lbs. (99.4 kg)
Identification	Sequentially numbered for traceability

Typical Operating Parameters	FLOWSORB
Flow Rate	10 gpm (37.8 l/m)
Contact Time	4.5 minutes
Pressure Drop	< 1 psi (clean water and carbon)
Operating Pressures	3 psig maximum no vacuum

Pressure Drop

Safety Message

Wet activated carbon can deplete oxygen from air in enclosed spaces. If use in an enclosed space is required, procedures for work in an oxygen deficient environment should be followed.

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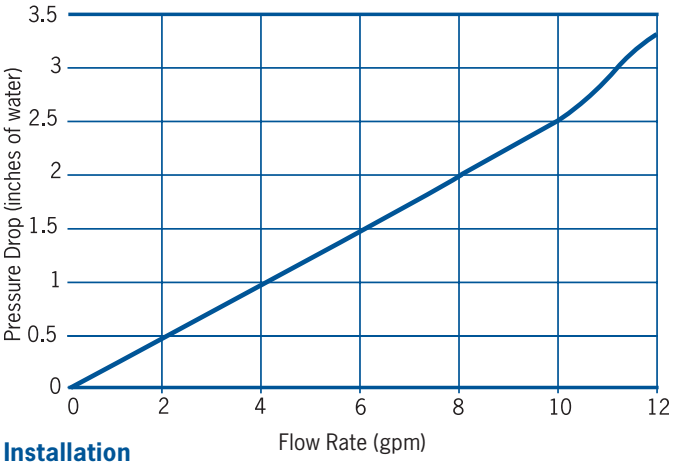
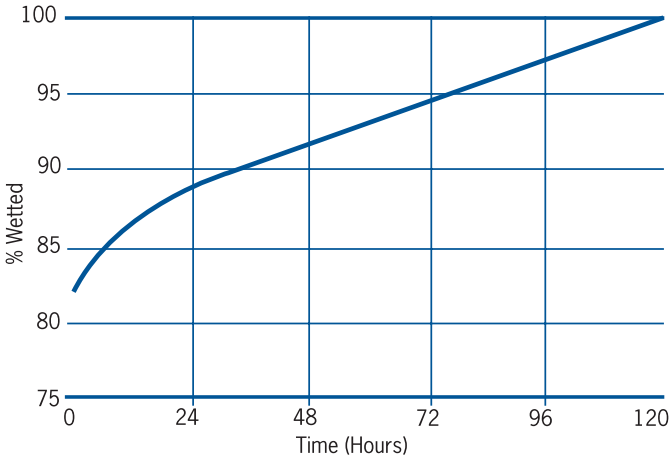


Typical Installation



Installation

FLOWSORB canisters should be set on a flat, level surface and piped as recommended in the installation illustration. The influent pipe connection should be attached to the unit by using a flexible connection. Some minor deflection of the lid may occur if pressure builds due to filtration or other flow blockage downstream.

FLOWSORB discharge piping should include a piping loop elevated above the top of the canister to ensure that the canister remains flooded with water at all times. In addition to the piping loop, a drain connection is recommended on the discharge piping; this allows drainage of the unit prior to disconnection or temporary shutdown.

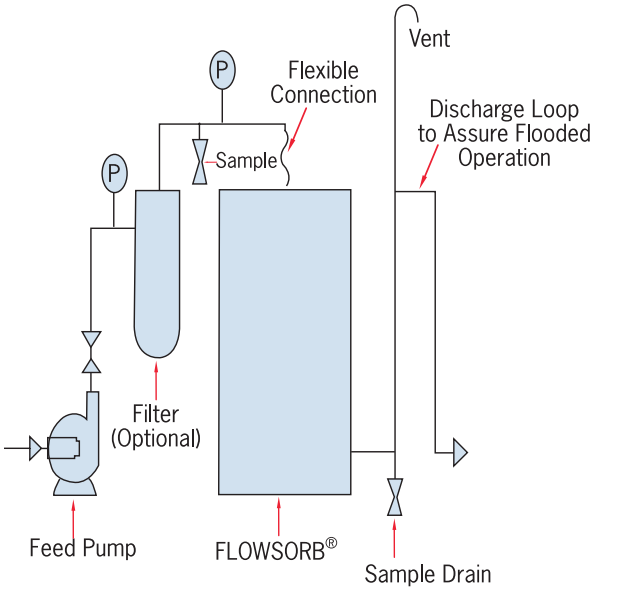
Pipe connections to the canister are the responsibility of the customer. It is recommended that influent and discharge pipe connections be made using fittings that are of good quality and have un-damaged threads. Application of sealant tape to the pipe thread ensures better contact with the limited depth of the fittings on the canister. Over tightening of the pipe fitting will damage the canister fittings and cause leaks.

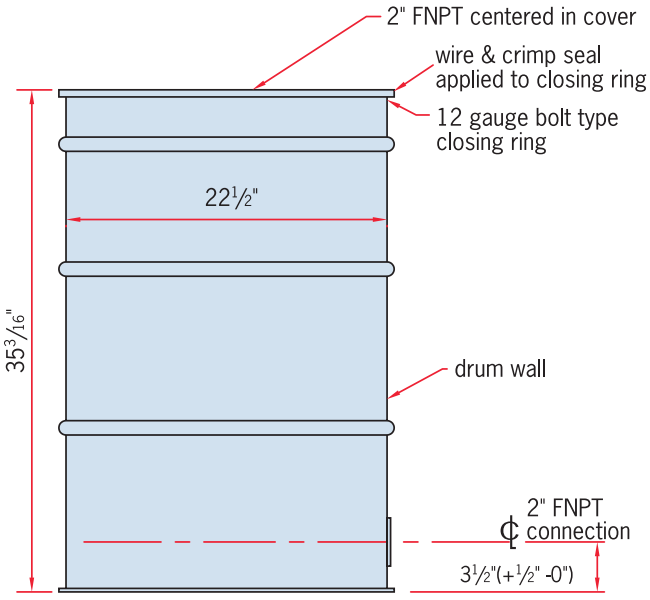
FLOWSORB canisters are shipped with dry activated carbon; the carbon must be wetted and de-aerated prior to use. This procedure displaces air from the internal structure of the carbon granule, thus assuring that the liquid to be treated is in contact with the carbon surface.

Prior to operation each canister must be filled with clean water; the water should be introduced into the bottom outlet connection. The unit should sit for approximately 48 hours to allow most of the carbon's internal surface to become wetted as shown on the wetting curve. After wetting, the carbon bed can be de-aerated by draining the canister and refilling the canister upflow with clean water. This procedure will eliminate any air pockets which may have formed between the carbon granules. The FLOWSORB is now ready for operation. A filter should be installed if the liquid to be treated contains substantial amounts of suspended solids. A simple cartridge or screen filter helps prevent pressure buildup in the carbon bed.

Wetting Curve for GAC (77°F/25°C)

Operation





Safety Message

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FLOWSORB canisters should be full of clean water before treatment begins. Flow rate to the canister should be determined based on required contact time between the liquid and the carbon media. In groundwater treatment applications, the recommended contact time is typically 8-10 minutes with a resultant flow of approximately 5 gpm. Consult your Calgon Carbon Corporation Technical Sales Representative for advice about proper contact time for your application.

FLOWSORBS can be manifolded in parallel operation for higher flow rates. For series operation, two FLOWSORBS can be piped together sequentially, as normal pressure drop will not exceed the recommended operating pressure.

These canisters have space for bed expansion and can be back flushed by introducing clean water or liquid at approximately 20-25 gpm to the outlet and taking backflush water from the inlet.

How to Estimate FLOWSORB Life

The treatment table on this page lists the volume of water that can be purified by the FLOWSORB for typical contamination situations. Most applications, however, involve a unique mixture of organic chemical contaminants including some chemicals that adsorb at different capacities or strengths. Please consult with your Calgon Carbon Technical Sales Representative for more information about carbon usage rates.

Calgon Carbon Liquid Purification System

FLOWSORB is a unit specifically designed for a variety of small flow applications. Calgon Carbon Corporation offers a wide range of carbon adsorption systems and services for a greater range of flow rates and carbon usages to meet specific applications.

Return of FLOWSORB

Arrangements should be made at the time of purchase to return canisters containing spent carbon. Calgon Carbon will provide instructions on how to sample the spent carbon and arrange for carbon acceptance testing. The spent carbon is reactivated by Calgon Carbon and all of the contaminants are thermally destroyed. The company will not accept FLOWSORB for landfill, incineration, or other means of disposal.

FLOWSORB cannot be returned to Calgon Carbon unless the carbon acceptance procedure has been completed, an acceptance number provided, and the return labels (included with the unit at the time of purchase) are attached. FLOWSORB must be drained and inlet/outlet connections must be plugged prior to return to Calgon Carbon.

Theoretical Treatment Capacity for Typical Cases

	Case 1 1,600,000 gal	**Case 2 400,000 gal**	**Case 3 85,000 gal**
Benzene	20 ppb	200 ppb	2 ppm
Toluene	40 ppb	400 ppb	4 ppm
Xylene	40 ppb	400 ppb	4 ppm
	Case 4 1,900,000 gal	**Case 5 550,000 gal**	**Case 6 125,000 gal**
TCE	50 ppb	500 ppb	5 ppm
PCE	50 ppb	500 ppb	4 ppm
	Case 7 230,000 gal	**Case 8 50,000 gal**	**Case 9 10,000 gal**
Phenol	1 ppm	10 ppm	100 ppm
Total SOC	10 ppm	100 ppm	1,000 ppm

Each case represents a groundwater or wastewater stream that contains the combination of contaminants listed. The treatment capacity indicates the total gallons of that particular water that may be treated before any of the specific contaminants are present in the treated water as noted. Theoretical capacity based on 5 gpm water at 70°F or less and 180 lbs. of FILTRASORB 300. Background TOC is < 1 ppm except phenol cases as noted. Contaminants reduced to < 5 ppb except phenol case which is for 95% phenol reduction.

Safety Message

It is unlikely that a worker would be able to physically enter a FLOWSORB canister; however, the following information and precautions apply to partially closed canisters or situations where carbon is to be removed from the canister and stored elsewhere. Wet activated carbon preferentially removes oxygen from air. In closed or partially closed containers and vessels, oxygen depletion may reach hazardous levels. If workers are to enter a vessel containing carbon, appropriate sampling and work procedures for potentially low oxygen spaces should be followed including all applicable federal and state requirements. Please refer to the SDS for all up to date product safety information.

Should the canister need to be opened, first vent the drum by slowly opening the inlet or outlet connection before removing the drum ring.