



CALGON CARBON CORPORATION

Making Water and Air Safer and Cleaner



Air Purification
Systems

Calgon Carbon Corporation produces a wide variety of powdered, granular, and pelleted activated carbons made of wood, coal and coconut char. These carbons are designed to meet specific air purification objectives. Applications typically include the removal of organic chemical contaminants from industrial air emissions, gas process streams, storage tank vents, internal work air environments, and soil remediation vents. Having the right carbon product is just one component of a complete air purification program. To ensure optimal performance of the carbon, Calgon Carbon has developed a complete line of standardized, pre-engineered adsorption systems, capable of treating air flows ranging from one standard cubic foot per minute (scfm) to thousands of scfm, which can be quickly delivered and easily installed at any treatment site.



The adsorption systems described in this brochure are all designed for the convenient and effective use of activated carbon products. Calgon Carbon can provide standard carbon products for air purification and special grades for specific process requirements. In addition, economical carbon adsorption services are available which include safe handling, transport, storage, and the ultimate destruction of the adsorbed organic compounds through thermal reactivation. Such adsorption services may also include return or exchange of some of the adsorbers described. A Calgon Carbon Technical Sales Representative can provide assistance in selecting the proper activated carbon product, system, and/or service required for a total solution to meet your treatment requirements.

VENTSORB® Systems

VENTSORB® units are modular, prefabricated steel canisters with an internal phenolic coating which contain 180 pounds of Calgon Carbon granular activated carbon. These units are ideal for low flow air purification applications treating up to 100 scfm. These 55-gallon canisters contain all the elements found in a full-scale adsorption system: vessel, activated carbon, inlet connection and distributor, and an outlet connection for the purified air stream. Air is introduced at the bottom of the carbon bed with a corrosion-resistant distributor. Most VENTSORB® units can be returned to Calgon Carbon after use, and adsorbed contaminants are destroyed in the carbon reactivation process. Return of VENTSORB® units is subject to Calgon Carbon's acceptance criteria. These economical adsorption systems control small volume organic contaminant and/or odorous gas emissions from:

- Storage tank vents
- API separator vents
- Sludge thickener tanks at waste treatment plants
- Sewer gas vents, wet stations and weir boxes at chemical and municipal waste treatment plants
- Chemical plant wastewater holding tanks
- Air-stripper and scrubber off-gases



VENTSORB®-PE

VENTSORB®-PE canisters, each containing 170 pounds of activated carbon, are ideal for low-flow air purification applications at industrial and municipal facilities. Ventsorb®-PE units are polyethylene canisters with polyethylene intervals for corrosion resistance and can treat up to 250 cfm with low pressure drop. These economical adsorption systems control small volume organic contaminant and/or odorous gas emissions.

The 55-gallon VENTSORB®-PE canisters contain all the elements found in a full-scale adsorption system: activated carbon, inlet connection and distributor, and an outlet connection for the purified air stream. The unique inlet air distributor for this product provides even flow distribution resulting in effective carbon utilization.

PROTECT™ VW Series

The PROTECT™ VW series vessels are low cost, portable adsorbers that can be easily installed for service. This series of vessels operates at a maximum pressure of 3 psi and temperatures up to 150° F. There are two sizes available containing either 1,000 or 1,800 lbs. of selected granular activated carbon to treat up to 850 cfm.

Important features of the Protect™ VW Series adsorbers are:

- Carbon steel construction with a rust-prohibitive epoxy urethane exterior coating
- Lower air plenum areas for effective air distribution and carbon utilization
- 16" manway in top head for carbon fill and discharge
- 4" threaded air connections in side shell and top head
- Lifting lugs and forklift guides

High Flow VENTSORB®

Calgon Carbon Corporation's High Flow VENTSORB® (HFVS) emission control units were developed to use granular activated carbon to treat air/vapor containing VOC emissions from a variety of applications at industrial, commercial, or remedial sites.

These units are designed to allow selection of the optimum size to economically solve air treatment needs. The units are constructed with features that allow for ease of installation and operation.

The HFVS units are available in four sizes: 500 cfm, 1,000 cfm, 2,000 cfm, and 3,000 cfm. The units are constructed of carbon steel with an internal epoxy lining and external epoxy coating.

High Flow VENTSORB® Unit



VAPOR-PAC®

The VAPOR-PAC® adsorption unit is designed to remove organic contaminants from air or vapor streams. It is especially useful for short-term projects with low volume flows.

The unit is provided under a service agreement and contains 1,800 pounds of activated carbon capable of treating flows up to 1,000 cfm. These units are available either in polyethylene or stainless steel construction and can be arranged in parallel or series modes for specific site requirements. The VAPOR-PAC® unit is portable, can be moved by fork lift, and can be conveniently transported.

The VAPOR-PAC® units are provided on a comprehensive service basis, thus eliminating the need for capital investment. Under terms of the service agreement, Calgon Carbon ships the selected VAPOR-PAC® to the treatment site ready for quick and easy installation. Carbon handling is eliminated because the adsorption system serves both as a shipping container and as an adsorber which is easily transported and installed. This approach eliminates spent carbon disposal problems and handling of contaminated carbon, protecting employees from exposure to the spent material.

When the carbon's capacity becomes exhausted or spent, the unit is disconnected and returned to Calgon Carbon's reactivation facility (providing that the spent carbon meets reactivation acceptance criteria). At the reactivation site, the carbon is thermally reactivated and the organic chemical contaminants are destroyed. The units can be refilled with either virgin or reactivated carbon. This service is provided for a monthly fee agreed upon in advance by the user and Calgon Carbon. Agreements can be made for short-term or ongoing treatment requirements.

VAPOR-PAC® 10

VAPOR-PAC® 10 removes VOCs from high volume air emissions while minimizing capital expenditures and eliminating on-site spent carbon transfer and regeneration. VAPOR-PAC® 10 uses a transportable adsorber containing 12,500 lbs. of granular activated carbon that can treat air flows up to 10,000 scfm. Typical applications include industrial plant emissions, soil remediation vents, and air stripper off-gases. VAPOR-PAC® 10 units can be configured as two separate adsorber beds operating in parallel or in series.

Calgon Carbon provides the entire service for the adsorption process which includes spent carbon removal, transport, and reactivation or disposal. No major capital investment is required and on-site carbon handling is eliminated. When an exchange is required, Calgon Carbon delivers a replacement unit. The spent unit is removed and returned to our facility for processing.

VAPOR-PAC® 10 Unit



VAPOR-PAC® Units



Industrial Air Purification Systems

Calgon Carbon Corporation's industrial air purification systems are pre-engineered granular activated carbon adsorption systems designed for higher air rates. Typical applications are found in many industries where there is a need to control volatile organic compound emissions, remove toxic compounds, control odors, protect personnel, or minimize equipment corrosion. These units are designed to provide maximum economy with ease of installation and operation, and are designed to be used in situations where the granular activated carbon is replaced rather than regenerated in place. Industrial air purification systems are available in a variety of sizes and materials of construction to meet a wide range of applications.

Reactivation Service

Calgon Carbon operates two granular activated carbon reactivation sites in the U.S.: one at Neville Island, Pennsylvania, and the other at Catlettsburg, Kentucky. These plants operate closed loop systems designed for maximum environmental safety and are the largest, most sophisticated facilities in the world dedicated to the reactivation of carbon. Regular reviews by Calgon Carbon's Carbon Acceptance Committee assure that its facilities are always operating in full compliance with laws and regulations applying to the transport and reactivation of spent carbon. Both reactivation facilities are fully permitted under RCRA Part B to accept manifested spent activated carbon, and each plant carries sudden and accidental pollution insurance as required by Federal and State laws. In addition, the Company owns and operates a trailer fleet specifically designed for the transport of reactivated and spent carbon. Every driver in the private fleet is fully trained in changeout procedures. Transport trailers are licensed and insured up to \$1 million dollars in case of an accident.

About Calgon Carbon Corporation

Calgon Carbon Corporation (NYSE: CCC) has been a global leader in services and solutions for making water and air safer and cleaner and for purifying food, beverage, and industrial process streams.

Headquartered in Pittsburgh, Pennsylvania, Calgon Carbon maintains 15 carbon manufacturing, reactivation, and equipment fabrication facilities and 20 sales and service centers. Calgon Carbon is known as Chemviron Carbon in Europe, the Middle East, and Africa. Calgon Carbon serves thousands of customers around the world. In 2006, the company's sales totaled \$316 million.

Calgon Carbon's expertise spans many fields, including activated carbon, UV technology, continuous ion exchange, and chromatography. For any application, from drinking water purification to pharmaceutical manufacturing, Calgon Carbon technologies are designed to enhance production efficiencies, minimize waste, and remove pollutants – in short, making the world a cleaner, safer place.



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