

Calgon Carbon Corporation

Making Water and Air Safer and Cleaner

Protecting our health and our environment from harmful contaminants in water, air and industrial processes is the primary business of Calgon Carbon Corporation, a global leader in cutting-edge solutions for water and air purification, and a pioneer in the ongoing development of activated carbon products, innovative treatment systems and value-added services.

Calgon Carbon is the world's largest producer of granular activated carbon for both environmental and industrial markets. The company supplies more than 100 types of activated carbon products—in granular, powdered, pelletized and cloth form—for more than 700 distinct applications. These include purification systems for drinking water, wastewater, odor control, pollution abatement, and a variety of manufacturing processes in the food and beverage industry, chemicals and pharmaceuticals, refining and environmental compliance.

Diamonds in the rough

Carbon is the sixth most abundant element in the universe, existing in its purest form as diamonds. In less pure forms, it's found in all organic matter and is a major constituent of coal, wood and coconut shell. When these abundant raw materials are treated at high temperature, they are transformed into activated carbon.

In the activation process, a combination of low- and high-temperature heat treatment creates an intricate network of



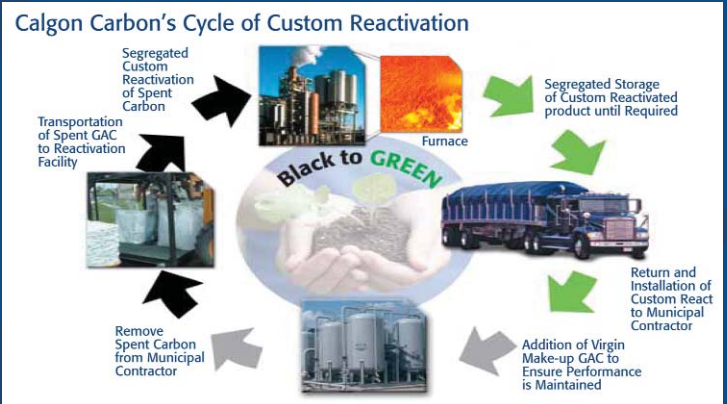
microscopic pores. Organic molecules in liquids or gases subsequently passing through this porous material are attracted and retained within the internal structure, physically bonding to the pore

surface. This process is called "adsorption," and activated carbon creates the strongest physical adsorption forces of any known material.

Of all types of activated carbon, bituminous coal-based products—powerful, flexible, and cost effective—have the broadest application in both environmental and industrial sectors. While coconut-based products have very specific uses in narrow segments like gold recovery and cigarette filters, bituminous coal-based products are effective in a wide range of applications. And, as opposed to lignite- or wood-based products, they're eminently suitable for reactivation.

Reactivation and recycling

When activated carbon becomes saturated with impurities and its adsorptive capacity exhausted, it can be returned to Calgon Carbon for thermal reactivation. Adsorbed organic chemicals are completely



destroyed and reactivated carbon can be recycled for continued use, a cost benefit for the customer and a boon for the environment.

The reactivation process generates only about 20 percent of the carbon dioxide generated in the production of virgin activated carbon, so the CO₂ footprint is significantly reduced, even when transportation is taken into account. And because hazardous organic compounds are destroyed rather than sent to a landfill, there is no future risk of a landfill leak or other environmental mishap.

Calgon Carbon has long been established as the global leader in reactivation capacity, and is significantly expanding that capability over the next year. A \$25-million expansion will double existing

capacity at the company's reactivation facility in Belgium, already the largest in the world; and a multi-million dollar reactivation service center being constructed in China is expected to come on stream in 2011.

The water we drink

Although water covers about 70 percent of the earth's surface, only a scant 1 percent is fresh, accessible and suitable for drinking, and that tiny percentage has become increasingly threatened by man-made contaminants.

Since Calgon Carbon pioneered the use of granular activated carbon (GAC) for the treatment of drinking water more than 40 years ago, hundreds of millions of pounds have been installed throughout the world to improve water quality. GAC is a proven technology not only in removing the types of contaminants typically found in industrial solvents, pesticides and herbicides, but also in removing disinfection byproducts (DBPs) or preventing their formation. These potentially harmful compounds are a byproduct of chlorination, and maximum levels have been set by the U.S. Environmental Protection Agency, with compliance dates ranging between 2012 and 2014.



Calgon Carbon's traditional leadership in GAC applications for municipal drinking water treatment is enhanced by a deep expertise in ultraviolet (UV) disinfection and oxidation systems. Calgon Carbon scientists were the first to discover that low doses of UV light could be used to inactivate potentially harmful pathogens like *Cryptosporidium*. This microscopic intestinal parasite, found in most surface water, can cause severe illness, and even be fatal for people with suppressed immune systems.

The air we breathe

Continued industrialization around the globe means increased levels of air contaminants and new environmental and public health concerns. Government regulations, like recently established standards for mercury emission, are designed to meet these challenges. More than a dozen states have adopted regulations requiring substantial levels of mercury reduction from coal-fired power plant flue gas from 2009 through 2014, and the EPA is scheduled to promulgate a regulation next year that will require

similar reductions in every state. Mercury emission standards for U.S. cement manufacturers will take effect in 2012, and it is expected that the gold mining industry will be next.

Powdered activated carbon (PAC) injection is recognized by the EPA as the leading abatement technology for mercury removal from flue gas, and Calgon Carbon is emerging as a market leader. The company has added 70 million pounds of PAC capacity at its Big Sandy plant in Kentucky, and continually expanded its PAC product portfolio, most recently with a revolutionary new carbon enabling power generators to solve the very significant problem of mercury removal when elevated levels of sulfur trioxide are present.

Making water and air safer and cleaner

In industrialized and developing nations around the world, as contamination challenges proliferate and new ones emerge, Calgon Carbon will continue provide innovative solutions for water treatment, emissions and odor control, and environmental remediation—all designed to protect our health and the environment we all share.



Company profile

Headquartered in Pittsburgh, Calgon Carbon Corporation employs approximately 1,050 people worldwide and operates production facilities in Asia, Europe and North America, sales and service centers on four continents, and the industry's largest and most advanced R&D organization. Net sales in 2009 were \$411.9 million, a 2.9 percent increase over 2008, despite the challenges of a worldwide recession. Calgon Carbon has been listed on the New York Stock Exchange since 1991 and trades under the symbol CCC. ◆