

Respirators and Human Protection

Technologies for Purification, Separation, Recovery and Synthesis

Proven Experience for Human Protection

Calgon Carbon Corporation, the world's leading manufacturer of granular activated carbon, has worked with the United States government since 1942 to develop and supply the most technologically advanced activated carbon for personal and collective protection filters. Today, U.S. and NATO armed forces turn to Calgon Carbon's environmentally-friendly impregnated carbon for use in gas masks and collective protection filters.

Carbon: Nature's Filter

Carbon is a non-metallic element, present in every organic compound. It can be chemically and physically treated to perform a variety of purification and filtration functions. Activated carbon is a type of treated carbon, and impregnated carbon is a type of activated carbon. Depending upon the requirements of the application, carbon can be impregnated with a variety of different metals to neutralize different contaminants.

In the simplest terms, impregnated carbon does double duty: first it grabs the contaminants, and then it either holds them or turns them into something harmless. Accordingly, it is ideal for respirator or collective protection filter applications because impregnated carbon attracts and holds contaminants both physically and chemically, making the carbon more effective than other carbon products.

Offering Application Specific Specialty Carbons

Calgon Carbon custom manufactures specialty carbons to meet end-user requirements. We select the base stock source, manufacturing process variables, final product mesh size, and pore size distribution to ensure the carbon performs to your specifications. Most of our carbons are entirely safe for the environment, disposable, portable, and cost-effective.

Carbons for Industrial/Civilian Applications

Non-military applications for impregnated carbon include:

- Manufacturing of personal protection and first responder masks
- Individual gas mask filters
- Collective protection filters
- Sulfur compounds removal
- Automotive cabin air purification systems
- Mercury abatement
- Odor control

Calgon Carbon manufactures carbons to provide protection against most industrial air contaminants, such as NIOSH gases, sulfur dioxide, hydrogen sulfide, and chlorine. The chart on page 3 can help you choose the right carbon for your application. A brief explanation of each carbon type is described below:

URC (Universal Respirator Carbon) – Widely used for individual protection, URC protects against contaminants used in industrial environments. URC removes organic vapors (CCl_4 , toluene, most hydrocarbons), acid gases (SO_2 , H_2S), and basic gases (NH_3). URC is often the best choice in industrial settings because it protects against the widest range of probable irritants.

AGR, or Acid Gas Removal – This carbon is another industrial variety of impregnated carbon. AGR is designed to remove acid gases (SO_2 , H_2S , Cl_2 , etc.).

RVG-C (Respirator Vapor Grade, Coconut-Based) – RVG-C provides protection based on physical adsorption principles only. A non-impregnated activated carbon, RVG-G is suitable for processes involving compounds that can be rendered harmless by physical adsorption such as organic vapors (CCl_4 , toluene, and most hydrocarbons).

ASZM-TEDA – Calgon Carbon's military and CBRN-use impregnated carbon is also used in the industrial environment for first responder masks designed to protect against cyanide, cyanogen chloride (CK), and a variety of other harmful gases.

FCA, Fortified Carbon A – For the European market, Calgon Carbon supplies FCA which is designed to combat acid gases (SO_2 , H_2S) and inorganic gases (HCN, Cl₂).

UFR (Universal First Responder) – UFR is designed for industrial and CBRN-use. It has the capability to remove cyanogen chloride.

Product	Acid Gases				Blood Agents				Nerve Agents				Tear Agents			
	Sulfur Dioxide (SO_2)	Hydrogen Sulfide (H_2S)	Hydrogen Chloride (HCl)	Hydrogen Cyanide (HCN)		Arsine (AsH_3)	Cyanogen Chloride	Tabun	Sarin	Soman	Agent VX	Chloroacetophenone	Chloropicrin	Ammonia (NH_3)	Methylamine (CH_3NH_2)	Formaldehyde (CH_2O)
URC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AGR	•	• (Organic Vapors (ex CCl_4))	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RVG-C	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
FCA*	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ASZM-TEDA	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ASC*	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
LC-HA*	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
UFR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

This chart is intended only to provide guidance for carbon selection. The applicability of a given product for a specific respiration application will depend on the specific requirements and design parameters.

*Product sold in Europe.

Protection Against Respiratory Threats

Charcoal Cloth International (CCI), a division of Calgon Carbon Corporation, is the world leader in the development, manufacture and supply of activated charcoal cloth products for a broad range of industrial and medical markets.

Activated charcoal cloth was first developed for nuclear, biological and chemical protection (NBC) clothing and masks for the armed forces. Additional applications include odor-adsorbing wound dressings and ostomy bag filters, as well as anti-tarnish use and odor prevention for museum artifacts.

Carbon for Military Use and CBRN

Military applications for impregnated carbon include:

- Manufacturing of personal protection and first responder masks
- Individual gas mask filters
- Collective protection filters

A brief explanation of each type of military use carbon is described below:

ASZM-TEDA – Calgon Carbon's standard impregnated carbon is for U.S. and NATO military use. This versatile carbon is designed to protect against the traditional CWAs that governments list as potential homeland threats.

ASC – Calgon Carbon still manufactures a chromium impregnated product as originated in 1942 for military services. ASC is a carbon designed to remove the nerve agent Sarin, blood agents including arsine and hydrogen cyanide, and the tear agent chloropicrin.

UFR – Calgon Carbon developed this product for first responder applications and CBRN needs. This product is designed to remove industrial vapors and gases and the traditional CWAs, which include cyanogen chloride.

Helping the World Breathe Easier

Calgon Carbon provides the best activated carbon for the products that protect people against dangerous conditions. As new needs emerge, Calgon Carbon Corporation continues to develop new products and find innovative uses for existing ones. By supplying high-quality impregnated carbon to NATO, industrial customers, and laboratories, Calgon Carbon Corporation helps the world breathe easier. To find out more, contact Calgon Carbon at 1 800 422-7266.

Your #1 Source for Impregnated Carbon Applications

Impregnated carbon cleans the air and protects against toxic gases and vapors in:

- Laboratories
- Chemical and industrial facilities
- Hospitals
- Airports
- Government buildings and vehicles
- Other places where people gather and work

We are always looking for technological advancements to improve human protection. Calgon Carbon is willing to explore potential partnerships from toll manufacturing unique media or media blends to jointly developing new and innovative solutions for the most difficult nuclear, biological, and chemical protection challenges. If you have an application that you would like to discuss, please contact us at 1-800-422-7266.

Customer and Technical Service

Customers at thousands of installations across the globe trust Calgon Carbon's extensive network of skilled service technicians to provide the support they need every day. If you have service needs related to any Calgon Carbon system, technology or type of equipment, we'll handle them for you.

All Calgon Carbon products, systems and technologies are available on a laboratory, pilot plant or full-scale production basis. Each customer is provided with customized process engineering design to ensure that the manufacturing process meets their specific requirements. Full analytical laboratory support is also available which includes computer modeling to demonstrate product quality.

The Calgon Carbon Difference

What makes Calgon Carbon a trusted and consistently reliable partner?

- More than 100 types of granular, powdered, pelletized and activated carbon cloth products
- Small and large pre-engineered adsorption systems inventoried across the U.S.
- Customized equipment to meet your needs
- Turnkey reactivation and recycling programs
- Quick response emergency deployment and installation programs
- Permanent or temporary system installations
- Field installation and operator training services
- Complete testing and analytical support, feasibility studies and cost evaluations

www.calgoncarbon.com



Making Water and Air Safer and Cleaner



Corporate Headquarters
Calgon Carbon Corporation
500 Calgon Carbon Drive
Pittsburgh, PA USA 15205
800.422.7266
412.787.6700
412.787.6713 Fax

www.calgoncarbon.com

European Operations
Chevron Carbon Corporation
Zoning Industriel C de Feluy
B-7181 Feluy, Belgium
+ 32 (0) 64 51 18 11
+ 32 (0) 64 54 15 91 Fax

Asia Operations
Calgon Carbon Asia Pte Ltd.
9 Temasek Boulevard
#26-02 Suntec Tower Two
Singapore 038989
+65 6221 3500
+65 6221 3554 Fax

Your local representative