



PROTECTING AND DEFENDING

THE POWER OF  
activated  
**carbon**

**CalgonCarbon**

**Your job is tough.** It is our job to ensure that you return home — safe and unharmed. While we cannot control every circumstance, we can help to protect you from hazards that threaten your well-being such as chemical contaminants.



The risk of exposure to toxic gases increases every day whether it is from industrial manufacturing or from chemical, biological, and nuclear warfare.

*From safeguarding the workplace to defending soldiers against chemical warfare, Calgon Carbon Corporation is committed to the mission of protecting and defending by offering a wide variety of activated carbon products for respiratory and collective protection.*

Throughout its history, Calgon Carbon has been a pioneer in creating new products, systems, and services from the infancy stages to global commercialization. The company's industry leading technologies help to ensure that tens of millions of people breathe clean, odor-free air and drink clean, safe water. Calgon Carbon's specialty carbons for personal and collective protection are no exception.

We offer activated carbon technologies used in over 700 distinct market applications from purifying air, drinking water, foods, and pharmaceuticals, to separating gases and removing mercury emissions from coal-powered electrical facilities.



# HISTORY



When the United States entered World War II, coconut shells were the raw material used to produce granular activated carbon, the filtering agent in military gas masks. Faced with a shortage of this crucial war material, the government asked Pittsburgh Coke and Chemical to develop a substitute from a native material. In 1942, the company produced an activated carbon product using bituminous coal, which was the beginning of the company now known as Calgon Carbon Corporation.

Today, innovation is still the cornerstone of Calgon Carbon. Our advanced research and development capabilities continue to provide value-added solutions to the challenging problems and applications that are faced by customers around the world. Our exhaustive carbon database and predictive modeling tools allow Calgon Carbon to quickly identify the most cost-effective solution to meet customers' specific needs.

In addition to Calgon Carbon's technical capabilities, our laboratories are fully equipped to perform a variety of carbon characterization tests and in-house performance tests against a wide range of challenge gases. With our extensive knowledge and technical expertise developed over half a century, Calgon Carbon is uniquely positioned to assist in all aspects of your respiratory protection needs.



For over 60 years, Calgon Carbon's products have been used to protect and defend against a wide range of chemical contaminants.

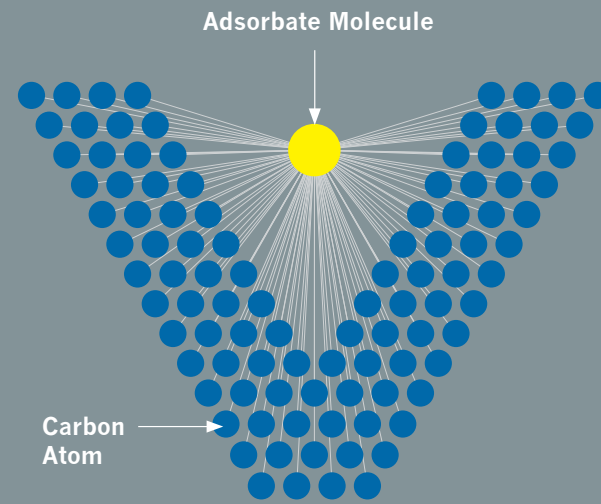
# ACTIVATED CARBON

Activated carbon is a highly porous, organic material used to remove impurities and hazardous contaminants from liquids and gases. In pure form, activated carbon “adsorbs” or removes contaminants by attracting and binding the undesirable molecules to the carbon surface. This phenomenon is the result of intermolecular attractions or forces inherent to the carbon pores.

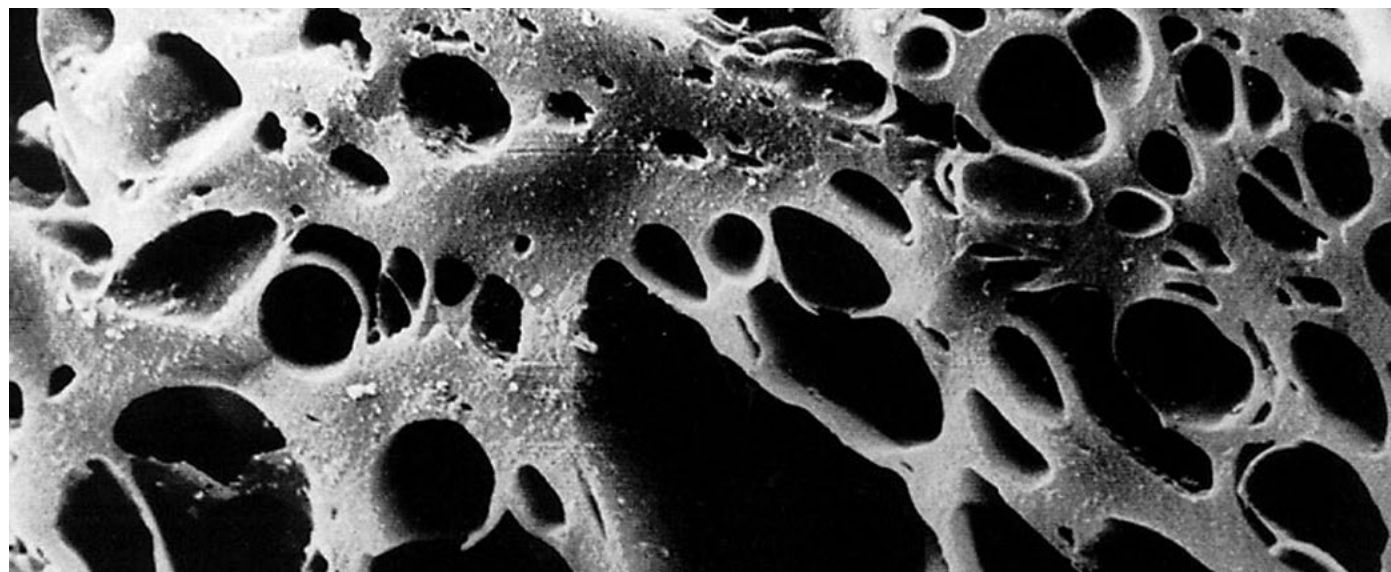
To enhance the performance of activated carbon, the material can be “impregnated” with a variety of chemical compounds or metals. These impregnates will chemically neutralize hazardous contaminants creating a safe, non-toxic environment. The individual and combined benefits of activated carbon and impregnates result in a material with unmatched performance characteristics critical for respiratory and collective protection.

Our high-quality activated carbon products for use in personal and collective protection equipment are custom manufactured to meet end-user requirements and are tailored for respiratory protection to meet the world’s most challenging conditions.

## How Activated Carbon Works



In physical adsorption, contaminants are adsorbed and held on the internal surface of activated carbon due to Van der Waals Forces of attraction between the carbon atom and the molecule. The force of attraction diminishes as the distance between the pore wall and the adsorbate molecule increases.



One handful of activated carbon has a surface area equivalent to that of a football field. The massive surface area of activated carbon makes the material an ideal adsorbent.

# PRODUCTS

Calgon Carbon Corporation supplies more than 100 types of activated carbon for a range of applications. For respiratory protection, Calgon Carbon is a global leader in the production of activated carbon for both personal and collective protection. Industrial workers, military personnel, and others in potentially dangerous situations rely on our products to ensure that they return home — safe and unharmed.

Calgon Carbon has an extensive portfolio of activated carbon products to protect and defend against a variety of contaminants, including NIOSH gases, chemical warfare agents, and other toxic industrial chemicals. The table below provides an overview of the performance capabilities of some of the activated carbon products commercially available.

		INDUSTRIAL					MILITARY		CBRN
		URC	AGR	RVG	CK	BGR	ASZM-TEDA	FCF	UFR
<b>Industrial Chemicals</b>	Organic Vapors	•	•	•		•	•		•
	Carbon Tetrachloride	•	•	•		•	•		•
	Cyclohexane	•	•	•		•	•		•
	Ammonia (NH <sub>3</sub> )	•				•		•	•
	Methylamine (CH <sub>3</sub> NH <sub>2</sub> )	•				•			•
	Formaldehyde (CH <sub>2</sub> O)	•							•
	Dimethyl methylphosphonate (DMMP)	•	•				•		•
	Chlorine (Cl <sub>2</sub> )	•	•				•	•	•
	Mercury (Hg)				•				
	Phosphine (PH <sub>3</sub> )	•					•		•
Phosgene (CG)	•					•		•	
<b>Acid Gas</b>	Nitrogen Dioxide (NO <sub>2</sub> )	•					•		•
	Sulfur Dioxide (SO <sub>2</sub> )	•	•				•	•	•
	Hydrogen Sulfide (H <sub>2</sub> S)	•	•				•	•	•
	Hydrogen Chloride (HCl)	•	•				•		•
<b>Blood Agents</b>	Hydrogen Cyanide (AC)	•					•		•
	Arsine (SA)						•		•
	Cyanogen Chloride (CK)						•	•	•
<b>Nerve Agents</b>	Tabun (GA), Sarin (GB), etc.	•	•	•			•		•
<b>Tear Agents</b>	Chloroacetophenone	•	•	•			•	•	•
	Chloropicrin	•	•	•			•	•	•
<b>Nuclear</b>	Radioactive Methyl Iodide						•	•	•

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

For more information or if you have a specific application that you would like to discuss, please contact us at **1-800-422-7266** or [info@calgoncarbon-us.com](mailto:info@calgoncarbon-us.com).

# INDUSTRIAL



Every day, we use manufactured products and never think about how these items were made. Industry is critical for manufacturing items that we depend upon, ranging from fuel to food to automobiles. While industry provides these essential needs to our society, the individuals working to provide these critical goods may be exposed to toxic gases and chemicals that can be life threatening on a daily basis.

Fortunately, Calgon Carbon's activated carbon products for personal protection are tailored to remove harmful industrial contaminants and are widely used in respiratory protective equipment to safeguard millions of industrial workers.

Our commercially available products are appropriate for a range of industrial chemicals:

INDUSTRIAL						
Product	<b>RVG</b> (Respirator Vapor Grade)	<b>AGR</b> (Acid Gas Removal)	<b>CK</b>	<b>BGR</b> (Base Gas Removal)	<b>URC</b> (Universal Respirator Carbon)	<b>UFR</b> (Universal First Responder)
<b>NIOSH Filter Classes</b>	Organic Vapors	Acid Gases and Organic Vapors	Mercury	Ammonia Gas	Multi-Contaminant	Multi-Contaminant and CBRN Agents
<b>EN14387 (EU) Filter Types</b>	A	A, E	Hg	K	A, B, E, K	A, B, E, K
<b>Benefits</b>	Excellent physical adsorption capacity  Available in coconut and coal grades	Highly efficient for acid gases such as SO <sub>2</sub> , H <sub>2</sub> S, Cl <sub>2</sub> , etc.  Provides both physical and chemical adsorption	Provides excellent protection against mercury  Provides both physical and chemical adsorption	Excellent ammonia and amine adsorption capacity	Protection against a wide range of contaminants  High capacity and efficiency  Provides both physical and chemical adsorption  Chromium free	Excellent protection against a wide range of industrial gases and CBRN agents  Provides both physical and chemical adsorption capacity  Great product choice for first responders applications  Chromium free



With our decades of experience and knowledgeable technical staff, Calgon Carbon can design and supply the most effective product for your application.

# MILITARY AND CBRN



Calgon Carbon Corporation has a long history of protecting and defending troops with our activated carbon products, and we remain committed to providing adsorbents to combat chemical warfare agents. In an environment where there is no room for failure, why wouldn't you rely on products that have been used and trusted for over half a century?

MILITARY AND CBRN			
Product	UFR	FCF	ASZM-TEDA
<b>Benefits</b>	<p>Excellent protection against a wide range of industrial gases and CBRN agents</p> <p>Provides both physical and chemical adsorption capacity</p> <p>Great product choice for first responders applications</p> <p>Chromium free</p>	<p>Excellent protection across a range of CBRN, industrial and military agents</p> <p>Designed for collective protection</p> <p>Provides both physical and chemical adsorption capacity</p> <p>Chromium free</p>	<p>Premier product for military applications</p> <p>Protection against a wide range of toxic industrial chemicals and CBRN agents</p> <p>Unmatched chemical adsorption efficiency</p> <p>Chromium free</p>

As the threat of weapons of mass destruction (WMD) continues to increase, Calgon Carbon products can protect both military personnel and civilians against chemical, biological, radiological, or nuclear attacks.

# GLOBAL LOCATIONS

■ FACILITY ■ SERVICE ■ SALES ■ REACTIVATION ■ HEADQUARTERS



[www.calgoncarbon.com](http://www.calgoncarbon.com)

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