

Activated Carbons  
*for* Industrial,  
Military *and* Nuclear  
Protection

# The Proactive Company



**SAFEGUARDING HEALTH AND PROTECTING** people from hazards caused by airborne chemical contaminants is a significant consideration in modern society. Prevention and control of disease and workplace related illnesses are a challenge for any responsible company or organization.

It is becoming increasingly difficult to comply with a growing number of stringent respiratory protection regulations from government authorities enforced by testing standards like NIOSH and CEN, and complex workplace regulation required by HSE or OSHA to mitigate exposure of workers to Toxic Industrial Chemicals (TIC's). These standards outline the necessary requirements for maintaining a safe workplace, as well as protecting the environment. As an industry partner, Jacobi Carbons accepts these challenges and finds suitable production methods to help our customers comply with increasing demands.

Jacobi has extensive knowledge of regulation standards in the Personal Protection sector and deep insight into the complex markets in which our customers operate. No matter the sector – industrial, military or nuclear – we are equipped with the activated carbons to support our customer's needs. Our highly specialized products are often tailor-made for unique applications and designed to meet the most challenging conditions. In fact Jacobi has developed and maintains a portfolio of over 100 impregnated carbon products used in personal protection. We have developed high performance products that are chromium-free and able to combat non-standard gases such as formaldehyde, while offering optimal cost benefit performance. Our R&D lab strives to find a solution for any particular application. Jacobi's consistent quality and availability is vital, and our focus on our customer's success is second to none.

Our tailor-made products, know-how and reliable deliveries are added values that provide our customers with effective solutions while meeting their corporate and environmental responsibilities.



With over 100 impregnated carbon product grades tailored for use in personal protection we have a solution to fit your application needs.



**IT IS IMPORTANT FOR US** to be more than just a supplier of high quality activated carbon products. We also strive to be a close partner providing unique solutions for our customers. Our R&D department, as well as our technical experts, have extensive knowledge of all applicable procedures and can provide assistance, performance testing and product handling advice to assist in production of protective devices.

Jacobi's laboratories are equipped to perform a range of performance and characterization tests. These include nitrogen and argon adsorption surface area determinations; challenge gas testing, e.g. NH<sub>3</sub>, H<sub>2</sub>S etc. and thermogravimetric analytical (TGA) testing among others. These facilities are also used to support our QA teams of the physical properties of our activated carbons, allowing us to provide detail and customer specific reporting on all aspects of product quality and performance. We also provide our customers with detailed reports and application recommendations.

Jacobi Carbons has mastered the complex process of manufacturing specialized activated carbons of superior quality derived from a careful selection of high quality coconut shell raw material. This provides harder products of high density (higher volume activity) that is less liable to dusting during handling, ensuring significant benefits to both the manufacturer and user of respiratory and collective protection products.

Our production base is the most diverse in the industry. Manufacturing plants are located in France, Germany, USA, Sri Lanka, India, Vietnam and the Philippines. Products are stocked at our own warehouses or with our distribution partners, which ensures first rate supply worldwide.



Coconut shells are harder, more microporous and better suited to vapour phase applications than any other raw material. Other benefits include lower attrition, less dust and a more sustainable product, from a carbon neutral source.



Our team of application experts provides assistance on all aspects of personal protection including reports and recommendations.

# The Inventive Company



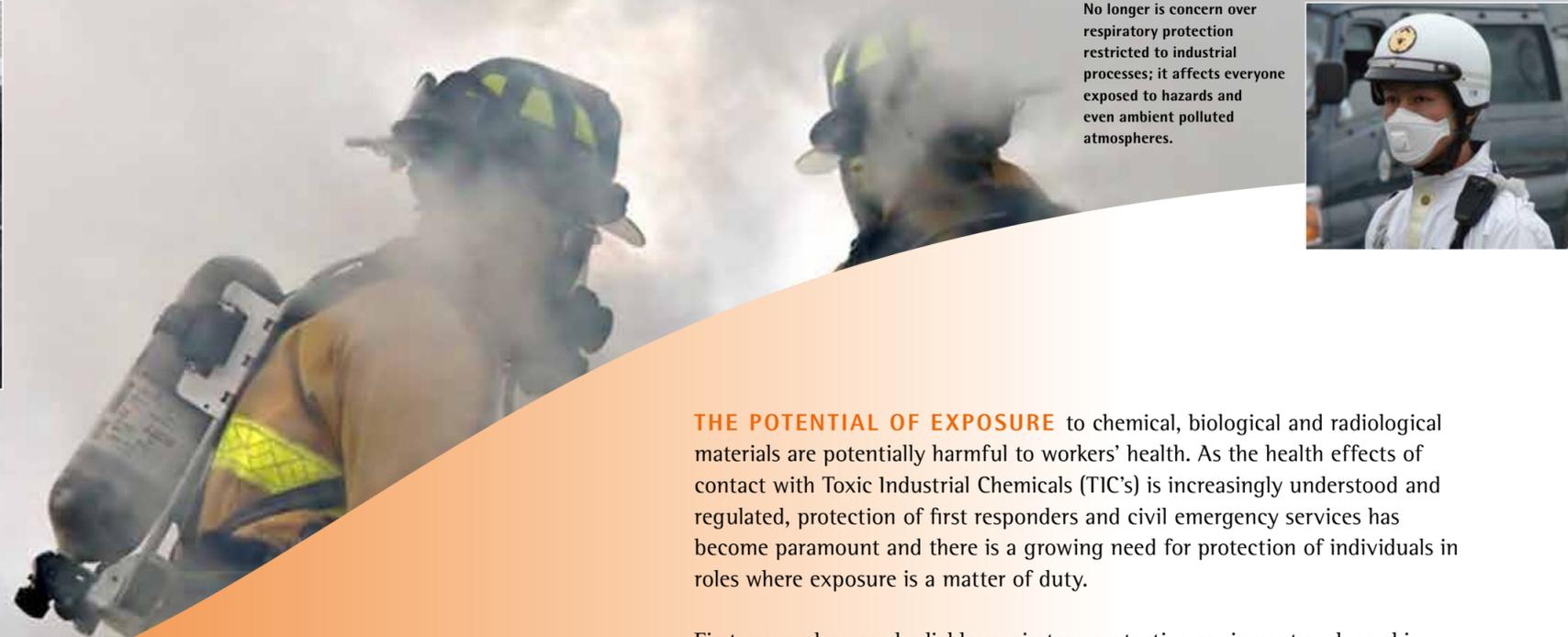


Throughout all tiers of industry, the use of activated carbon in protection of individuals from contact with potential harmful chemicals is accepted as the easiest, most flexible method available.

The use of high activity adsorptive carbons in group protection filtration systems is increasingly important in the workplace.



# The Protection Company



No longer is concern over respiratory protection restricted to industrial processes; it affects everyone exposed to hazards and even ambient polluted atmospheres.



**THE POTENTIAL OF EXPOSURE** to chemical, biological and radiological materials are potentially harmful to workers' health. As the health effects of contact with Toxic Industrial Chemicals (TIC's) is increasingly understood and regulated, protection of first responders and civil emergency services has become paramount and there is a growing need for protection of individuals in roles where exposure is a matter of duty.

First responders need reliable respiratory protective equipment such as chin masks, APR's, PAPR's and CBRN clothing that contain activated carbon as first line of defence against airborne contaminants. Due to their chemical properties inorganic gases and vapours are difficult to adsorb onto activated carbon alone. Jacobi's ample range of impregnated activated carbons are designed specifically to remove these compounds providing equipment manufacturers with the required choice of fill materials for respiratory protective equipment.

These products are equally effective in larger filters for collective protection and filtration systems used on ships, vehicles, aircraft and civilian shelters in municipal, as well as industrial workplaces. We provide high quality and cost effective activated carbon for a wide array of applications. The portfolio also includes a range of chromium-free products to comply with existing and future legislation in certain markets. Our R&D laboratories constantly work on finding new and more effective solutions to deal with the ever-changing challenges facing our customers.

## STANDARD PRODUCT RANGE EN14387 - INDUSTRIAL

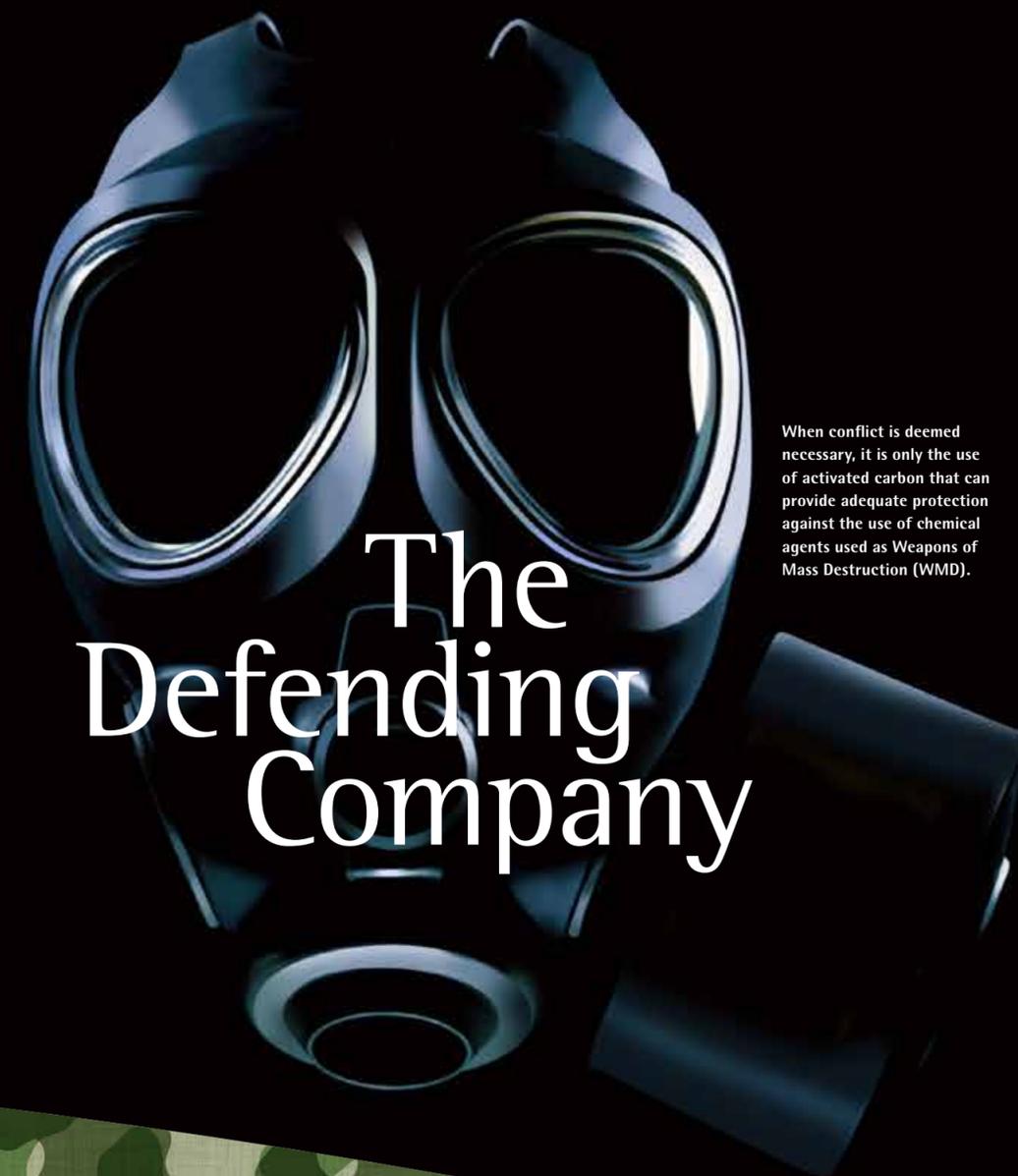
Protection Against	Filter Type EN14387 (EU)	Recommended Carbon Grades	Main Benefits
Organic Vapours >65°C (Test Gas: C <sub>6</sub> H <sub>12</sub> )	A	AddSorb™ GA	Very high activity
		AddSorb™ GA1	High activity
		AddSorb™ GA2	Standard activity
Organic Vapours <65°C (Test Gases: C <sub>2</sub> H <sub>10</sub> , CH <sub>3</sub> OCH <sub>3</sub> )	AX	AddSorb™ G-AX	Effective against low boiling point OV's
Inorganic Vapours (Test Gases: Cl <sub>2</sub> , H <sub>2</sub> S, HCN)	B	AddSorb™ 14MFA	Removal of Inorganic Vapours
		PICATOX™ BCC	Removal of Inorganic Vapours, Cr-free
Acid Gases (Test Gas: SO <sub>2</sub> )	E	AddSorb™ GE	Enhanced acid gas performance
		PICATOX™ TAGA	Cost effective grade for acid gas removal
Ammonia & Amines (Test Gas: NH <sub>3</sub> )	K	AddSorb™ GK	Minimal corrosion on Al canisters
		AddSorb™ AM80	High performance, plastic canisters
General Protection	A, B, E	PICATOX™ BCC	Cr-free
		AddSorb™ 14MFA	High performance
General Protection	A, B, E, K	AddSorb™ MGR	Cr-free with Formaldehyde performance
		AddSorb™ MGCFz	Cost effective Cr-free, Hg removal
		AddSorb™ EU-MG	High performance, economy product

## STANDARD PRODUCT RANGE NIOSH - INDUSTRIAL

NIOSH Filter Classes (USA)	Recommended Carbon Grades	Properties
Organic Vapour (OV) (C <sub>6</sub> H <sub>12</sub> or CCl <sub>4</sub> )	AddSorb™ NFC	Very high activity, granular coconut base
	AddSorb™ NFB	High activity, granular coconut base
	AddSorb™ GA	High activity, coconut based
	AddSorb™ GA1	Standard activity, coconut based
Acid Gas (AG) (SO <sub>2</sub> , H <sub>2</sub> S, HF, ClO <sub>2</sub> , HCl, Cl <sub>2</sub> )	PICATOX™ AG	Standard acid gas adsorbent
	PICATOX™ AG-F	Acid gas removal with added formaldehyde capability
Ammonia & Amines (Test Gas: NH <sub>3</sub> , NH <sub>3</sub> CH <sub>3</sub> )	AddSorb™ GK	Minimal corrosion effect on Al canisters
	AddSorb™ AM80	High performance, plastic canisters
Mercury (Test Gas: Hg)	PICATOX™ PM10	Respirator grade with mercury removal capability
Multigas (Organic Vapour, Acid Gas, Ammonia & Amines)	AddSorb™ MGR20	Multi-gas adsorbent with sufficient OV performance as classified by NIOSH for multigas cartridges

STANDARD PRODUCT RANGE MILITARY

Application	Protection Against	Recommended Carbon Grades	Properties	
Respirators	Chemical Warfare Agents, CWA - e.g. AC (HCN), CK (Cyanogen Chloride), PS (Chloropicrin)	AddSorb™ 14MFAT	Very high efficiency UK-def.stan.68/133 iss.3	
		AddSorb™ M	High efficiency, (Cr-free)	
		AddSorb™ 14S	Good cost performance ratio, French standard SA 6121/6122	
		AddSorb™ 14MFA-S	French standard 6122	
Collective Protection	CK (Cyanogen Chloride) DMMP	AddSorb™ 14Z-LS	Israeli standard SI 4570	
		AddSorb™ 14Z-MC	Israeli standard SI 4570	
	CWA	AddSorb™ 14S	Standard chemical defence grade	
		AddSorb™ 14M	French standard SA6121	
		AddSorb™ 14MFA-S	French standard 6122	
		AddSorb™ 14MFAT	Stanag 4447 Shipboard Filters	
	CK (Cyanogen Chloride), PS (Chloropicrin) Chlorine Sulphur Dioxide Ammonia	PICATOX™ MT		Finish Civil Defence Shelters



# The Defending Company

When conflict is deemed necessary, it is only the use of activated carbon that can provide adequate protection against the use of chemical agents used as Weapons of Mass Destruction (WMD).

**ACTIVATED CARBON IS** the principal means of providing protection against the gases and vapours used as chemical warfare agents (CWA's). Impregnating activated carbon with specialized chemicals further enhances this capability. Jacobi's impregnation technology, utilizing various organic and inorganic salts, has resulted in products that have years of proven performance and are in full compliance with current military regulations.

Carbons that are applied to collective protection filtration systems for warships, fighter aircraft, armoured and other ground vehicles as well as military shelters are also part of our portfolio. Jacobi Carbons manufactures chromium-free products for the adsorption of chemical warfare agents (CWA) as well as toxic industrial chemicals (TIC's). Our R&D department is proud of its unique ability to provide tailor made solutions for a wide variety of challenge agents.

In theatre, combat troops must be afforded optimum protection by highly efficient, high capacity adsorption devices. Such devices use premium activated carbons from Jacobi, allowing soldiers to perform their duty with minimal restriction or impairment.



NUCLEAR PRODUCT RANGE

Protection Against	Carbon Type	Property
Radio active isotopes (Capture of Radioactive Methyl Iodide and Iodine by chemisorption and isotopic exchange and delay of rare gas emissions)	PICATOM™ TA5T	High capacity in low CO <sub>2</sub> environment
	PICATOM™ TA3IK	High capacity in high CO <sub>2</sub> environment
	PICATOM™ RI32	For use in CO <sub>2</sub> unknown environment
	PICATOM™ RI	For passive capture filters
	EcoSorb™ CH	Noble gas removal
	PICATOX™ PM5	Respirator grade
	PICATOX™ PM10	Respirator grade with mercury removal capability

Application

- Containment zones of nuclear power stations.
- Impregnated with non-radioactive iodine and/or other organic substances promoting an isotopic exchange.
- The extensive pore volume also adsorbs other contaminated gases.
- The impregnation is adapted to various levels of relative humidity.

# The Containment Company

**NUCLEAR POWER GENERATION** is considered among the most efficient ways to generate energy. However, the extreme toxicity of the process means that should an accident occur, there is a high risk of effect on significant population numbers, including decontamination personnel and operators at the power station. Since the inception of nuclear power, activated carbon has been the most accepted way to provide respiratory protection against radioactive iodine compounds or other toxic gases thanks to its ability to effectively adsorb these agents.

Today there is a need for new and more sophisticated activated carbons that can absorb and neutralize an array of contaminants. The high porosity of our coconut shell based activated carbons also adsorbs other contaminated gases. When impregnated with nonradioactive iodine and/or other organic substances it results in a radioactive isotopic exchange that is adapted to various levels of relative humidity.

Jacobi's high quality, cost effective, and reliable activated carbons offer a proven safety record regarding radioactive gas containment. These inherent properties of our carbons provide customers with the performance they need.

At our laboratories, we are constantly researching the present and future requirements of the nuclear industry. Our R&D technicians are focused on the advancement of nuclear emission control and comprehensive testing and evaluation of activated carbons for the nuclear industry.



Throughout the nuclear industry, whether in research or production, activated carbons from Jacobi provide protection in everyday and emergency situations.



# The Global Company

Jacobi Carbons has developed the most diverse production base in the industry with manufacturing plants, reactivation plants and sales offices located in 19 countries around the world.



## MANUFACTURING PLANTS

China	Sri Lanka
France	The Philippines
Germany	United Kingdom
India	United States
Italy	Vietnam
Japan	

## SALES OFFICES

Australia	Malaysia
China	Poland
Finland	Singapore
France	Spain
Germany	Sweden
India	Switzerland
Italy	United Kingdom
Japan	United States

## TECHNOLOGY CENTERS

France
Germany
Japan
United Kingdom
United States

## SELECTED DISTRIBUTION PARTNERS

Algeria	Ecuador	Guinea
Argentina	Indonesia	Peru
Australia	Kazakhstan	Saudi Arabia
Brazil	Mexico	Russia
Canada	Myanmar	South Africa
Colombia	New Zealand	Turkey
Ghana	Norway	United States
Chile	Papua New	Uzbekistan

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**Jacobi**  
CARBONS



OSAKA GAS CHEMICALS GROUP

JACOBI CARBONS IS  
A PROUD MEMBER OF THE  
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