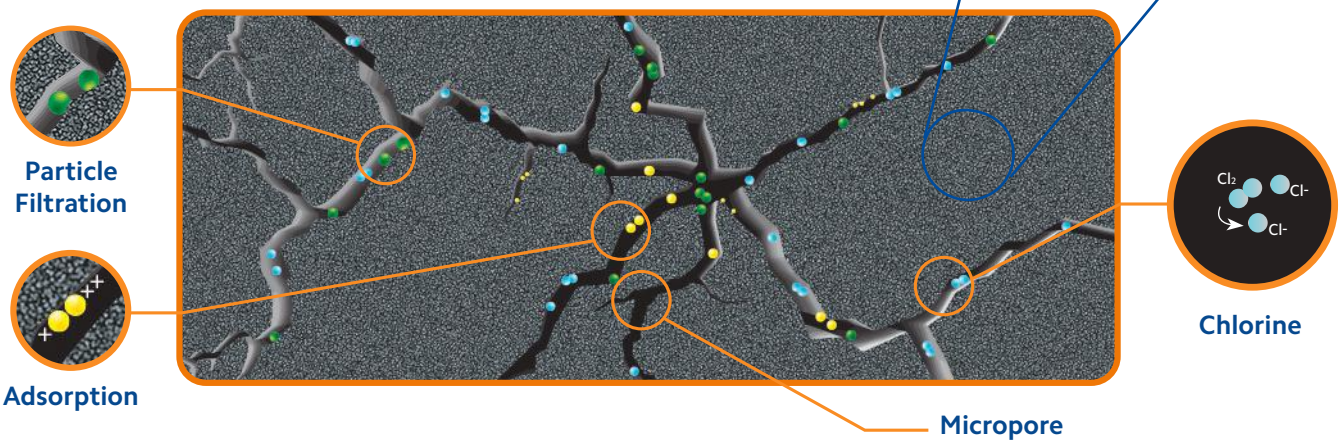
Carbon Technology

Utilised for several hundred years, carbon is considered one of the oldest means of water purification. Although impossible to trace the exact date and time, there is evidence of its usage and importance throughout history, from the ancient world to the modern era.

How Carbon Works

The cross-section below exposes the huge network of cracks and micropores that determines carbon's effectiveness at removing a wide range of contaminants.



Particle Filtration
Sediment and Suspended Solids

Every carbon block cartridge has a given micron rating to indicate the physical size of suspended particulate that can be removed by the cartridge. To prevent premature sediment blockage before the chlorine capacity of the carbon has been exhausted, pre-filtration, such as the SPECTRUM SSP or PSP, is recommended to prolong the life of the cartridge.

Adsorption
Organics and Heavy Metals

Carbon is a naturally adsorptive media, removing dissolved contaminants from a solution. When heated to 870°C, during the activation process, millions of tiny micropores are created throughout the structure of the cartridge, attracting large organic molecules and heavy metals to the surface.

Chemical Reaction
Chlorine and Chloramine

Through chemical interactions with the activated carbon, reactive chlorine molecules are converted to less reactive chloride ions. Chloramine can also be removed through this process although the reaction occurs at a much slower rate. Speciality cartridges such as the SPECTRUM PCB have been specifically designed to effectively target chloramine.

Carbon Flow Rate

The longer water comes into contact with carbon, generally the more effective the treatment process will be, whether removing organics, heavy metals, chlorine or chloramine. Even a small increase over the recommended flow rate can cause dramatic decreases in carbon treatment's effectiveness. Therefore it is imperative to size a carbon treatment system properly, ensuring that the flow rate allows enough contact time to remove the undesired contaminants. The recommended flow rate for each cartridge is shown on the product page (as illustrated, right).

Carbon's Effectiveness at Removing...

Excellent

Chloramine
Chlorine
Dyes
Glycols
Herbicides
Hydrogen Peroxide
Insecticides
Iodine
Odours
Oil-dissolved
PCBs
Pesticides
Sodium Hypochlorite
Taste
THMs

Good

Organic Acids
Organic Salts
Potassium Permanganate
Solvents
Sulphonated Oils
Tannins

Fair

Acetic Acid
Detergents
Heavy Metals
Hydrogen Sulfide
Plating Wastes
Soap

Carbon Cartridge Construction

From raw material, through to activation and end product.

Coal and coconut carbon are the base materials used in cartridge construction. Coconut promotes the highest porosity and is the cleanest form oriented more towards drinking water use. Coal-based carbon, having a higher ash content, is better suited to industrial or batch process usage.

Coal and coconut are individually heated to 870°C in a carbon activation furnace.

Properties, such as mesh size and adsorption capacity, are confirmed with quality testing. Ash content is checked and can be controlled with acid washing to reduce ash and soluble impurities resulting in a cleaner end product that rinses up quickly.

Activated media is combined with binders and compressed through an extrusion machine, or manufactured using specialised techniques i.e. modified or catalytic carbon.

To complete construction, the product is encased in applicable wraps and end-caps.

Modified
Carbon Block
e.g. CFB-Plus

An advanced technology, Fibredyne combines dissolved contaminant removal with excellent sediment reduction. Uses powdered carbon for effective chlorine reduction.

Powder
Carbon Block
e.g. SCB & PCB

Finer carbon mesh size increases surface area, ensuring highly effective removal of small contaminants such as chlorine. Perfect for drinking water applications.

Granular
Carbon Block
e.g. CB & ECB

Traditional carbon technology, more effective at removing large molecules such as odours. Suitable for commercial and industrial applications.

Chlorine, Taste and Odour Reduction for Drinking Water

FDA Compliant Materials

SPECTRUM

Chlorine Reduction Start - End of Life (%)
99-75

Total Chlorine Capacity (mg)
14,000

Typical Life in UK Water (L)*
70,000

870 Granular Carbon - Economic

20 micron

Suited to commercial, residential and small scale industrial applications, the ECG provides a cost effective solution for chlorine, taste and odour treatment. Considered a greener solution when compared with mined bituminous carbon, the 100% virgin coconut shell activated carbon provides exceptional treatment with minimal effect on the pH of the water, thus providing water with a bottle quality taste.

Key Features

- Manufactured using 100% pure virgin coconut shell activated carbon
- All parts are sealed using advanced friction welding, eliminating the need for adhesives
- Thermosplastic top mounted gasket eliminating risk of dioxin release and bacterial growth associated with natural rubber.
- Bacteria-resistant PET pads

Typical Applications

- Ideally suited for chlorine, taste and odor reduction
- Can be used as a standalone water filter or as prefilter for water purifiers and other water filtration systems

Specification

Max. Operating Temperature
40°C

Carbon Type
Acid washed pure coconut shell

End-cap
Polypropylene

Max. Operating Pressure Differential
2.5 bar

Shell
Polypropylene

Gasket
Thermoplastic

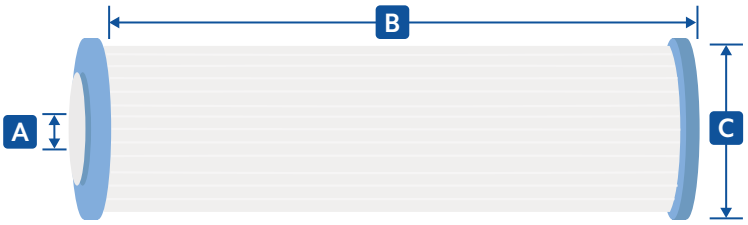
ECG Properties				
Length (")	Chlorine Reduction (L) @ 2mg/l *	Chlorine Reduction (L) @ 0.2mg/l **	Pressure Drop (Bar) @	Flow Rate (LPM)
9¾	8,000	70,000	0.3	3.8

*Chlorine capacity using 2mg/l free available chlorine at 0.5mg/l breakthrough
**Calculated chlorine capacity using 0.2mg/l free available chlorine at 0.05mg/l breakthrough

Configurations

Micron (µm)	Length (")	Diameter
20	9¾	Standard

Dimensions & Packaging



Dimensions (mm)			
Length (")	A	B	C
9¾	28	248	74

Part Number

Code		Micron		Length
ECG	–	20	–	9¾

e.g. ECG-20-9¾