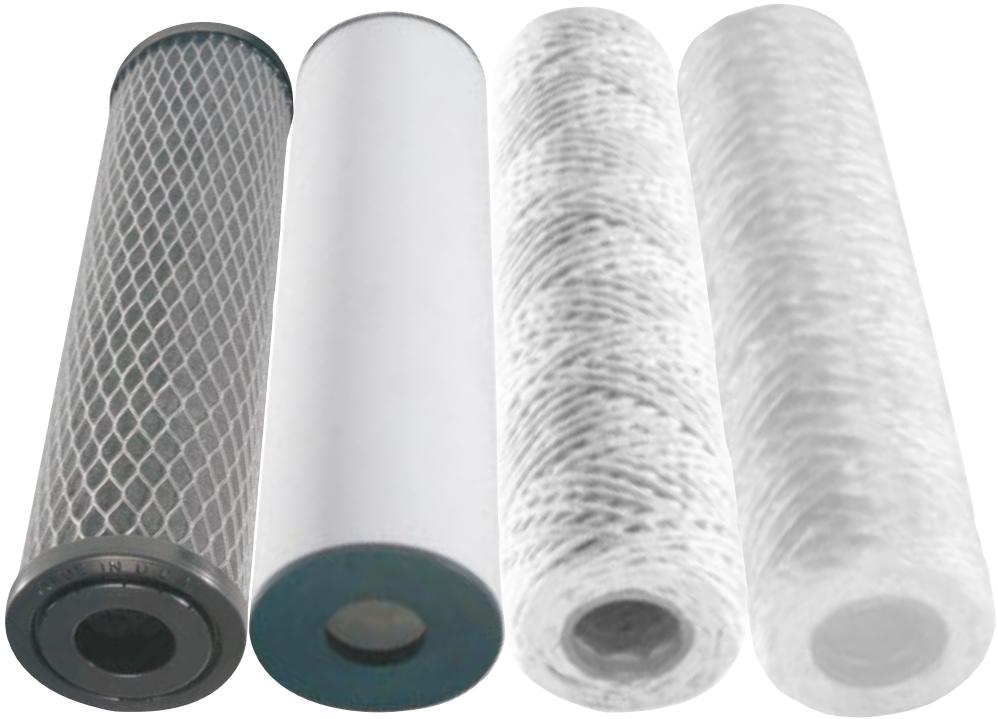
Series PC

Penguin Carbon
Filter Cartridges



Style M *Style C* *Style GC* *Style CP*

Features:

Organic Impurity Removal
Non-Contaminating
Choice of Packed Granular or Impregnated Powder Carbon Cartridges
High Grade Activated Carbon
Standard Filter Cartridge Replacement

Recommended Applications:

Amines, Glycols, Sulfanols
Water Purification
Vending Machines
Photographic
Dechlorinating
Plating Solutions
Oil Removal
Aromatic Compounds
High Molecule Weight Alcohols
Color Removal
Drinking Water
Waste Water
Benzene/Toluene
PCB's
Clarity Improvement
Cooling Tower Treatment
Beverages
Decolorizing
Deodorizing

Penguin carbon cartridges are a one-step carbon and filtration treatment. These cartridges eliminate the problems associated with loose carbon treatment and the need for a separate filtration system. The standard cartridge measures 2 3/4" OD with lengths varying from 4" to 40" and flow rates up to 2 1/2 gpm. These cartridges are designed to be used in either single or multi-tubed vessels.

Penguin carbon cartridges are available in 4 different styles. Style GC is an outer wound cartridge which utilizes a special high grade activated granular carbon with a very low sulfur content. Style CP is also an outer wound cartridge which features layers of paper impregnated with activated powdered carbon. Style C is a porous polyethylene shell containing high grade activated granular carbon. Style M features an outer layer of polyolefin webbing with an impregnated carbon powder interior.

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ADSORPTION DEFINITION: Adsorption may be defined as a process in which fluid molecules are concentrated on a surface by chemical or physical forces, or in both. In physical adsorption, the contaminants are held on the surface of the adsorbent by weak van der waal and electrostatic forces, where as in chemical adsorption, these forces are relatively strong and occur at active sites on the surface.

Potable Water, Food and Beverages
Removal of Free Chlorine
Removal of Foul Tastes, Odors, Colors
Removal of Trace Dissolved Organics
Sediment Removal
Purification of Plating and
Photo Processing Solutions
Waste Water Treatment
Process Water Recycling
Removal of Organic Matter and Color
Molecules

Style GC
This outer wound carbon cartridge removes undesirable tastes, odors, sediments, discoloration, and chemicals from water, hydrocarbon gases, and other industrial fluids. It also provides organic removal from plating, acid, and alkaline solutions. This economical carbon cartridge is actually three filters in one. It first provides filtration through an outer winding, then through a layer of activated granular carbon, and finally through a 5 micron polishing inner winding. Choices of core materials and wound materials make Penguin's Style GC cartridges a versatile and economical choice for all carbon filtration needs.

Potable Water, Food and Beverages
Removal of Free Chlorine
Removal of Foul Tastes, Odors, Colors
Removal of Trace Dissolved Organics
Sediment Removal
Photo Processing Solutions
Graphic Arts
Plating Solution Clarification

Style CP
This outer wound carbon cartridge features layers of paper impregnated with activated powdered carbon with a very low sulfur content. Having the same characteristics as the Style GC, it also provides three filters in one. The outer winding acts as a pre-filter, the carbon impregnated paper removes the organic contaminants as well as undesirable tastes, odors, sediments, and discoloration, and the 5 micron polishing inner winding completes the process. There is a choice of polypropylene, FDA polypropylene, or bleached cotton for the wound material with the core material being either polypropylene or stainless steel.

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Purification of Potable Water, Beverage Water, Water for Kidney Dialysis and Aquarium Water.
Removal of Free Chlorine
Removal of Foul Tastes, Odors, Colors
Volatile Organic Chemical Removal (VOC's)
Sediment Removal
Purification of Plating and Photo Processing Solutions
Waste Water Treatment
Process Water Recycling
Remediation of Contaminated Groundwater
Recover of Gold ***Sulfur Dioxide***
Hydrocarbon Vapors ***Hydrogen Sulfide***

Style C

The porous shell carbon cartridge has been designed primarily for use in removing organics and particulate contaminates from plating, acid, alkaline, and hydrocarbon solutions. The pre-filtering outer shell is a strong non-corroding polyethylene with ethylene-propylene end caps. There are 9 oz. of activated granular coconut carbon per 10" length, providing an extended life of up to 50% over the cartridges. The liquid flows from the outside of the cartridge through the carbon granules, removing organics, and finally through a 3 micron inner wound layer of polypropylene media for a polishing depth filtration.

For gases, this carbon cartridge can be used in removing organics such as oil mist, water vapor, fine dust, and scale particles. The polyethylene outer wrap possesses excellent filtering/coalescing properties. Most of the oil/water contaminant will be trapped and collected in the shell. The activated carbon is very effective for adsorption of very finely dispersed oil, smoke, odors, and aqueous mist that might penetrate the outer wrap. The inner wound layers then provide an excellent air polishing media.

Purification of Potable Water
Removal of Free Chlorine
Removal of Foul Tastes, Odors, Colors
Sediment Removal
Purification of Plating and Photo Processing Solutions
Decolorizing ***Deodorizing***

Style M

This impregnated carbon cartridge is constructed with an outer layer of polyolefin and synthetic fibers which removes solid particles and protects the inner carbon powder layer from premature clogging. The sulfur-free carbon powders form a fixed bed which provide increased carbon treatment capacity. The polypropylene core is surrounded by fine microfibers which again filters the solution and assures no carbon bleed-off. Economical cartridges are available when cellulose-free cartridges are not required.

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Introduction: Carbon belongs to a family of elements, which in their highest state of oxidation, are tetravalent; the other members of the family are silicon, germanium, tin, and lead. Carbon and silicon are non-metallic elements, while the others are metals. Carbon occurs in nature in two distinct allotropic crystalline modifications, which are known as diamond and graphite. Coconut shell carbons have very large surfaces per unit weight, owing to the fineness of the pores of the materials from which they were made. The higher the molecular weight and boiling point of the gas or liquid and the lower the temperature, the greater the adsorption. Charcoal is a catalyst for many reactions, particularly between gases when cooled to the temperature of liquid air. Coconut shell charcoal will adsorb very completely all gases except hydrogen, helium, and neon. High density contributes to the structural strength of the carbon so that it can withstand excessive particle abrasion during use.

Carbon Cartridge Selection and Sizing

A. Several factors affecting life and efficiency are:
1. Particulate load in fluid
2. Type and amount of contaminant to be adsorbed
3. Flow rate, temperature, and pH of fluid
4. Single pass or recirculation system
5. Contact time with carbon. Steady or intermittent use.

Activated carbon is used to purify, deodorize, decolorize, and up grade quality of liquids.

B. Early in the system, it removes contaminants or it is used as a final step to improve product quality. Activated carbon prefers chemicals with low solubility, low polarity, and a low degree of ionization.

C. Single pass applications should employ molded activated powder, impregnated carbon, or paper impregnated activated powder carbon cartridges.

D. Recirculating systems should employ granular carbon cartridges.

E. Series filtration, utilizing a string wound particulate filter upstream of the carbon cartridge, will increase the life of the carbon cartridge immensely.

F. Sizing is based on contact time. Longer contact time will result in higher adsorption.

G. Higher than recommended flow rates can be employed, but removal efficiency may be sacrificed. The lower the gpm flow rate, the greater the efficiency of the carbon cartridge. We recommend a maximum of 1.0 gpm per 10" cartridge length.

H. Carbon treatment usually begins to be cost effective when adsorbable organic levels are below 20 ppm. With sufficient contact time, GAC can effectively remove contaminants to below detectable levels.

Packaging

	Number of Cartridges per case			
Length	Style C	Style GC	Style CP	Style M
4"	NA	30	30	NA
6"	NA	30	30	NA
9 3/4"	20	20	20	20
10"	20	20	20	20
20"	8	10	10	12
30"	8	10	10	12
40"	NA	10	10	NA

Dimensions

PC	GC	1 0	P	P
Penguin Carbon Cartridge	Carbon Style	Length	Core Material	Fiber Material/Shell
	GC = granular carbon/ outer wound	4 = 4"	P = polypropylene	P = porous polyethylene or standard polypropylene outer wound
	CP = carbon paper/ outer wound	6 = 6"	S = 304SS	PX = fibrillated FDA outer wound
	C = granular carbon/ porous shell	93 = 9 3/4"		PFDA = polypropylene FDA outer wound
	M = impregnated carbon/ outer wound	97 = 9 7/8"		C = bleached cotton FDA outer wound
		10 = 10"		
		20 = 20"		
		30 = 30"		
		40 = 40"		

Not all combinations available. Consult factory.