MatrixCarbon

MatrixCarbon™ is a totally unique activated carbon that is shaped as a spherical bead of about 2 mm in diameter with a very uniform particle size distribution. The spherical shape is ideal for hydrodynamics that provide for maximum water flow and contact without the compacting and channeling characteristic of granular activated carbon. Water channeling is likewise characteristic of carbon pelletized as cylindrical pellets. Such cylindrical pellets were originally engineered for air filtration and have poor water hydrodynamics. A size of 2 mm diameter is an ideal compromise between handling ease and particle penetration by adsorbates and water. Particles beyond 2 mm are inefficient, because, as particle size increases, penetration into the particle diminishes exponentially.

MatrixCarbon™ has a very low ash content, as indicated by its minimal impact on pH. Even when added to distilled water, it does not raise pH above 7.0. Ash refers to the soluble and insoluble oxide and hydroxide content of the carbon. Oxides are produced when carbon is exposed to temperatures over 900° C. The more oxygen present during this process, the more oxides are produced. Ash content is reduced by limiting the oxygen content or by post production washing. Sodium oxide or hydroxide is an example of soluble ash; magnesium oxide, an example of insoluble ash. The higher the soluble ash content, the greater the immediate upward effect on pH (pH shock!). The higher the insoluble ash content, the greater the long term pH influence. For aquarium use, low ash content is very important.

Activated carbon is produced from matter that was once living, and, since all living matter is rich in phosphates, and, since heating to 900° C does not destroy phosphates but converts them to soluble orthophosphate, all carbons contain phosphate, regardless of false claims to the contrary. MatrixCarbon™, however, has the lowest leachable phosphate content of all major carbon brands tested.

Porosity and surface area are key to the performance of any activated carbon. Carbon pores run the gamut from micropores that admit only water to macropores that admit near visible particles. A sponge is a good analogy for carbon. Macropores lead progressively with multiple branching to smaller and smaller pores until micropores are reached. Most aquarium organic molecules are retained in the intermediate or transitional macropores. While surface area increases as porosity increases, the relation is not straightforward. Microporosity increases surface area more than macroporosity, but most of this type of surface is not accessible to water impurities. Macroporosity produces available surface. Adsorbtion of aquarium impurities takes place on the internal surface of macropores. Macroporosity, more than microporosity, increases Pore Volume, a measure of the open space within the carbon. Pore Volume, therefore, is a good indicator of the carbon's capacity. If the Pore Volume is too great, however, the carbon is fragile and disintegrates easily. The most practical laboratory indicator of macroporosity is the Molasses Number. The often cited Iodine Number is much less important for aquarium filtration, since it reflects primarily the micropore content. Carbons produced from coconut shell have a disproportionately high ratio of micropores, making such carbons more suitable for gas filtration than water filtration. Wood and lignite coal based carbons, on the other hand, have disproportionately high macroporous content with low intermediate pores and micropores, giving such carbons a large Pore Volume, but low capacity and increased fragility. Bituminous coal based carbons are more likely to have a good compromise between macropores, intermediate pores, and micropores. Sulfur is a common component of coal and carbons produced from sulfur rich coals can produce hydrogen sulfide when adsorbing acidic components from the water.

MatrixCarbon™ outperforms the other best grade carbons by at least two-fold when compared for total capacity to remove aquarium organic matter, rate of adsorbtion, and duration of use.

1000 Seachem Drive • Madison, GA 30650 • 706.343.6060 • FAX 706.343.6070 • 888-SEACHEM • www.seachem.com

Carbon	shape	size (mm)	pH	PO_4	MN	PV	Other
MatrixCarbon	bead	2	6.1	<0.01	600	0.55	
Magnum Carbon	gm	7	9.0	<0.01	375	0.40	H_2S
Activated Carbon	gm	2	8.2	<0.02	525	0.45	H_2S
Reef Carbon	cylindrical pellet	3x5	9.4	<0.04	90	0.35	dusty
Super Activated	gm	3	6.9	<0.01	450	0.80	wet/fragile
Pelletized Carbon	cylindrical pellet	4x7	10.0	<0.02	30	0.30	H_2S
Dupla Carbon	cylindrical pellet	1x3	10.1	<0.03	50	0.35	H_2S
Carbolit Freshwater	cylindrical pellet	1x3	8.2	<0.05	50	0.35	H_2S
Carbolit Saltwater	cylindrical pellet	4x7	9.2	<0.16	15	0.30	H_2S
Coconut Carbon	gm	4	6.7	<0.01	15	0.30	

SPECIFiCATIONS: Shape: spherical; Size: 1–1.8 mm; Density: 0.38–0.42 g/cc; Pore Volume (PV): 0.55–0.65 mL/cc; Total Surface Area (TSA): 500–600 m2/cc; TSA/PV: 770–1,100; Iodine#: >1,000; Molasses#: >600; pH in distilled water: < 7.2; Leachable Phosphate: <0.01 mg/cc. Some values may vary from lot to lot. Marine or fresh water use.