

HYDRODARCO® 4000 AND NORIT® GAC 400 ACTIVATED CARBONS DEMONSTRATE SUPERIOR ADSORPTION OF PFOA AND PFOS IN WATER

Benefits

- ◆ Enables the removal of PFOA and PFOS from ground and surface water to non-detectable levels and well below the 70 PPT advisory level set by the EPA
- ◆ Resists interference from Total Organic Carbon (TOC) for enhanced performance
- ◆ Demonstrates performance superior to coconut-based carbons
- ◆ Lowers operating costs made possible by enabling the treatment of more bed volumes of water before change-out due to higher performance

Challenge and solution

PFOA (perfluorooctanoic acid) and PFOS (perfluorooctane sulfonate), also known as Poly- and perfluoroalkyl substances or PFASs, are manmade substances used in products such as non-stick cookware, waxy food package coatings, water resistant clothing, stain resistant carpets and fabrics, and aqueous fire-fighting foams (AFFF). Once in the environment, these chemicals are persistent, toxic, bioaccumulative and biotransformative, and pose risks to human health. In May 2016, the United States Environmental Protection Agency (EPA) established a human Health Advisory Limit (HAL) of 70 ppt for the combined exposure concentration of PFOA and PFOS in drinking water.

When compared to coconut-based carbons in surface and ground waters, actual third party case studies¹ and our R&D studies found that HYDRODARCO 4000 and NORIT GAC 400 activated carbons demonstrated superior performance in the removal of PFAS molecules. Unlike other types of granulated activated carbon (GAC), both our activated carbons resisted interference from Total Organic Carbon (TOC) that reduce the carbon's adsorptive capacity for contaminants like PFOA and PFOS. In other studies involving groundwater with low TOC, the performance of our activated carbons was also superior to other coal-based and coconut based carbons.

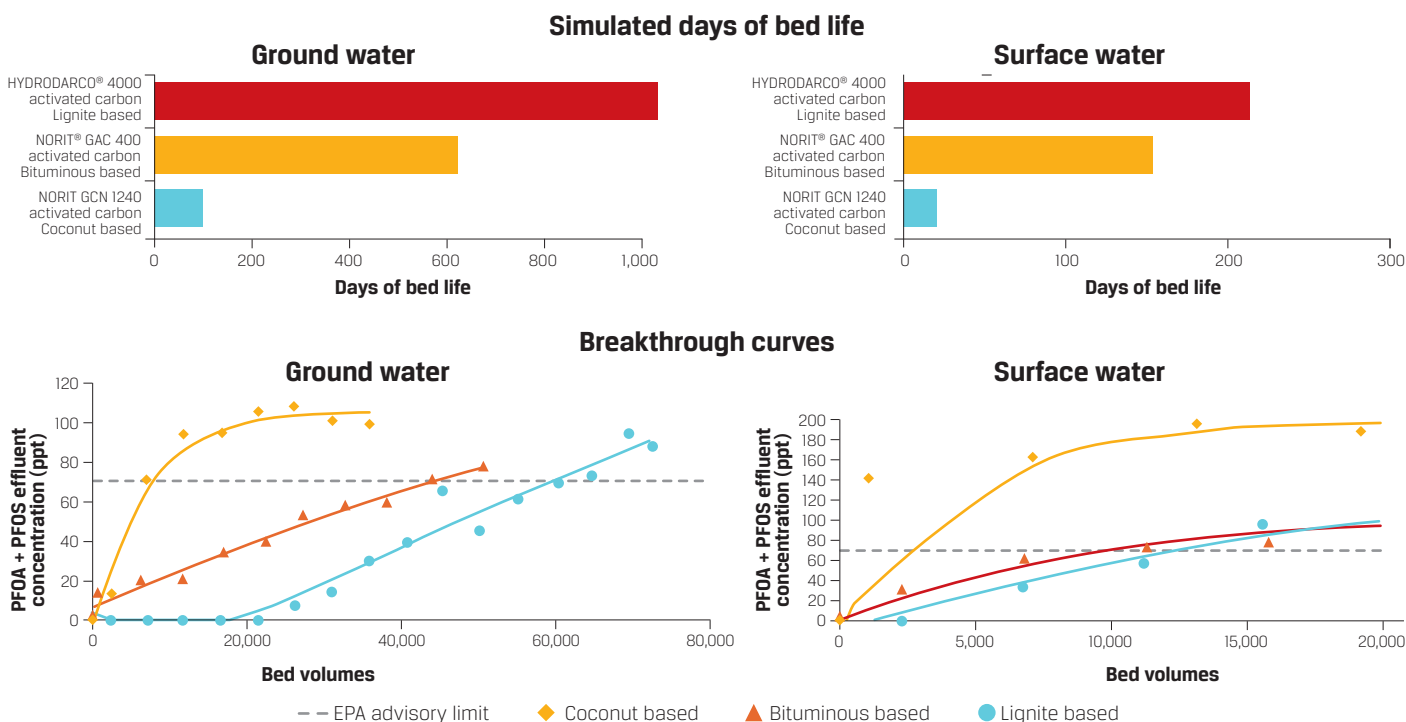
Small scale column tests for surface and ground water were conducted with different activated carbons. Test water samples contained the following TOC concentrations and PFOA/PFOS influent concentration:

- ◆ Ground water – TOC Concentration of 0.8 ppm
- ◆ Surface water – TOC Concentration of 7.4 ppm
- ◆ PFOA + PFOS Influent Concentration of 209 ppt

¹ Dr. Detlef Knappe, Department of Civil, Construction, and Environmental Engineering, North Carolina State University, 2017



Test results are provided in the following tables.



Our NORIT activated carbon selection guide

Our technical experts will consider your unique water source to help you choose the right activated carbon for your application. In most cases, HYDRODARCO 4000, NORIT GAC 400 PLUS (acid washed) and NORIT GAC 400 (unwashed) activated carbons offer an excellent combination of high porosity and a large quantity of adsorption sites for the PFASs with resiliency to background organics. These products are NSF certified and used in many drinking water applications worldwide.

Performance	HYDRODARCO 4000 activated carbon	NORIT GAC 400 activated carbon	NORIT GAC 400 PLUS activated carbon	NORIT GCN 1240 activated carbon
High PFAS concentration	●	●	●	●
Performance in high organics >1 ppm	●	●	●	○
Performance in low organics <1 ppm	●	●	●	●
Characteristics				
Raw material	Lignite coal	Bituminous coal	Bituminous coal	Coconut
Mesh size	12 x 40	12 x 40	12 x 40	12 x 40
Washing	Acid washed	Unwashed	Acid washed	Unwashed

Best
 Better
 Good
 Fair
 Poor

We manufacture activated carbon in seven plants and reactivate carbon in four plants. Our sales, technical service and customer service teams are prepared to serve customers around the world. And when water treatment vessels are involved, we work with the best system providers to meet all your requirements. So whether you have one operation or many facilities around the globe, we've got you covered. Contact us at cabotcorp.com/activatedcarboncontact



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