

Improving Health – Protecting the Environment

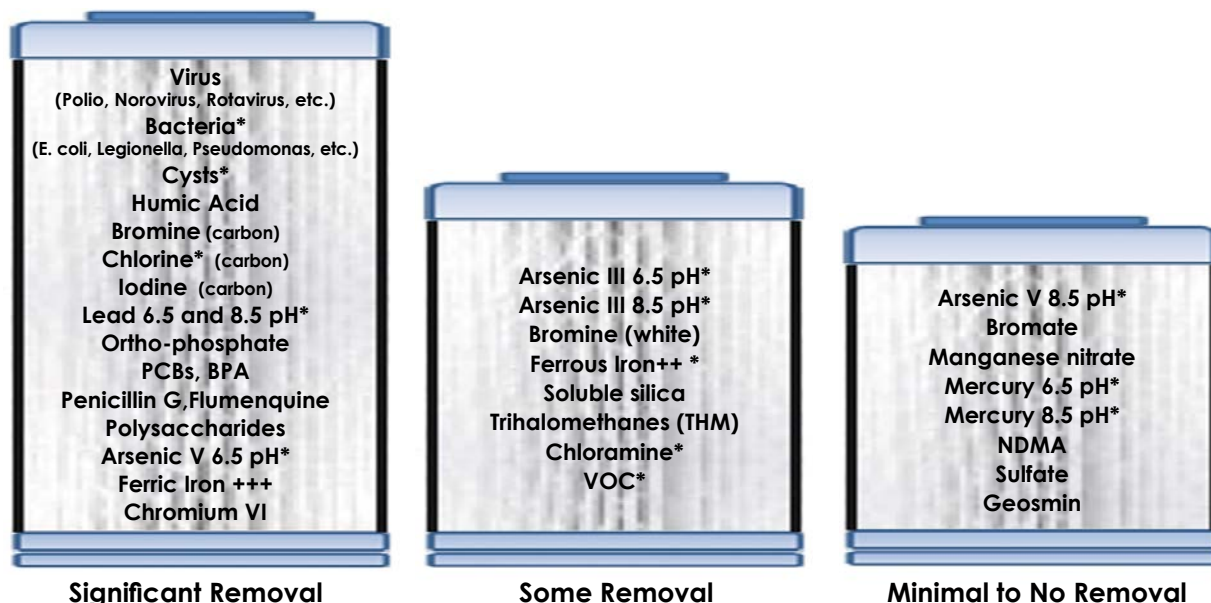
## Ahlstrom Disruptor® Nonwoven filter media



### Ahlstrom Disruptor®: Contaminant Removal Capability.

Disruptor® filter media removes a wide range of submicron particulates, organic acids, virus, bacteria, cysts, cell debris and trace pharmaceuticals with its naturally occurring electropositive charge. By accomplishing submicron "filtration" with a charge field rather than with mechanical pores, Disruptor® has a small fraction of the pressure drop and many times the flow rate when compared to ultrafiltration membranes having similar efficiency.

### Summary of Disruptor® Removal Capability.



All marked with\*:  
NSF concentration  
standard followed

## Disruptor® PAC

Ahlstrom Disruptor® PAC contains powdered activated carbon (PAC) with an average particle size of only 8 microns. Activated carbon at this particle size has a very high pore size to weight ratio which produces remarkably high dynamic adsorption.

## Health Safety and the Environment

Disruptor® is based on the naturally occurring element boehmite which has no known HSE issues. Boehmite has long been used as an additive to food products, digestive analgesics, industrial applications and as an adjuvant for human vaccines. Disruptor® media has passed testing to NSF/ANSI standard 61 for potable water contact, USP Class VI testing and endotoxin testing.

## Antimicrobial Statement Regarding Ahlstrom Disruptor® Products

Ahlstrom Disruptor® products can be treated with antimicrobial product protection. Materials utilizing naturally occurring silver are frequently used to protect products from bacterial and fungal growth. Such treatments are recognized in a broad range of regulatory requirements including EPA, FDA, NSF, USDA, European BPD and FSA. Such a use of silver is an environmentally intelligent treatment, allowing used filters to be disposed of in standard waste facilities. While antimicrobial product protection can prevent the growth of odor-causing microbes, protection is limited to the treated article. It does not further enhance the Ahlstrom Disruptor® filter's ability to protect against disease.

## Contact Ahlstrom sales

### North America

☎ +1 770 650 21 00

✉ [filtration@ahlstrom.com](mailto:filtration@ahlstrom.com)

Learn more: [www.ahlstrom.com](http://www.ahlstrom.com)

**DISCLAIMER:** The information supplied in this document is for guidance only and should not be construed as a warranty. All implied warranties are expressly disclaimed, including without limitation any warranty of merchantability of fitness for use. All users of the material are responsible for ensuring that it is suitable for their needs, environment and end use. All data is subject to change as Ahlstrom deems appropriate.

Improving Health – Protecting the Environment

## Ahlstrom Disruptor® Nonwoven filter media



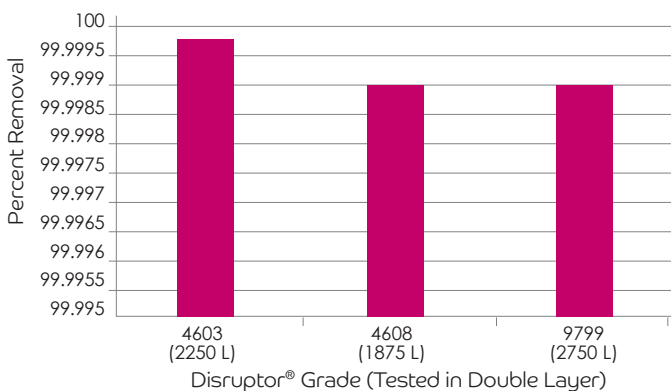
### Ahlstrom Disruptor®: *Legionella* Removal Capability

The electroabsorbent properties of Disruptor® allow it to remove a variety of contaminants from water including biological contaminants like *Legionella pneumophila*. *Legionella pneumophila* is a pathogenic bacterium commonly present in many residential, commercial and industrial systems such as cooling towers and hot water systems. It is transmitted as an aerosol and when aspirated by people having compromised immune systems can cause Legionnaires' disease, a respiratory infection that causes pneumonia. Transmission of the *Legionella pneumophila* bacterium can be of great concern in hospitals and nursing homes where patients are more susceptible to infections.

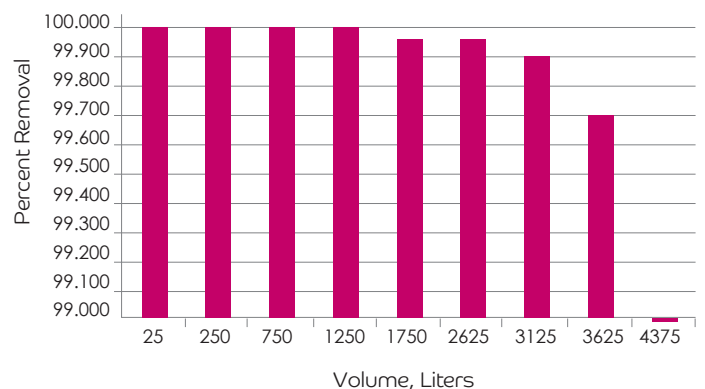
### Applications

Disruptor® could be used as Point of Entry (POE) filters to reduce the amount of *Legionella pneumophila* entering a building. Point of Use (POU) filters could be designed and certified for use on showers or other water outlets. Such filters would be of particular interest in locations with immunocompromised people such as hospitals and nursing homes. *Legionella* outbreaks are also associated with cooling towers, car washes and public fountains. Disruptor® filters that remove *Legionella pneumophila* could be used in conjunction with other sanitization treatments to inhibit growth of the bacterium in all such water systems.

Percent Removal of *Legionella* at Disruptor® Filter Capacity



Average *Legionella* Removal and Capacity for Disruptor® Media with Prefilter



## Health Safety and the Environment

Disruptor® is based on the naturally occurring element boehmite which has no known HSE issues. Boehmite has long been used as an additive to food products, digestive analgesics, industrial applications and as an adjuvant for human vaccines. Disruptor® media has passed testing to NSF/ANSI standard 61 for potable water contact, USP Class VI testing and endotoxin testing.

## Antimicrobial Statement Regarding Ahlstrom Disruptor® Products

Ahlstrom Disruptor® products can be treated with antimicrobial product protection. Materials utilizing naturally occurring silver are frequently used to protect products from bacterial and fungal growth. Such treatments are recognized in a broad range of regulatory requirements including EPA, FDA, NSF, USDA, European BPD and FSA. Such a use of silver is an environmentally intelligent treatment, allowing used filters to be disposed of in standard waste facilities. While antimicrobial product protection can prevent the growth of odor-causing microbes, protection is limited to the treated article. It does not further enhance the Ahlstrom Disruptor® filter's ability to protect against disease.

## Contact Ahlstrom sales

### North America

☎ +1 770 650 21 00

✉ [filtration@ahlstrom.com](mailto:filtration@ahlstrom.com)

Learn more: [www.ahlstrom.com](http://www.ahlstrom.com)

**DISCLAIMER:** The information supplied in this document is for guidance only and should not be construed as a warranty. All implied warranties are expressly disclaimed, including without limitation any warranty of merchantability of fitness for use. All users of the material are responsible for ensuring that it is suitable for their needs, environment and end use. All data is subject to change as Ahlstrom deems appropriate.

Improving Health – Protecting the Environment

## Ahlstrom Disruptor® Nonwoven filter media



### Ahlstrom Disruptor®: Electroadsorptive technology for water purification and filtration.

Disruptor® filter media removes a wide range of submicron particulates, pathogens, trace pharmaceuticals and cellular debris with its naturally occurring electropositive charge. Disruptor® is specifically engineered to have this charge field cover the entire depth and void volume of the media. By accomplishing submicron "filtration" with a charge field rather than with mechanical pores, Disruptor® has a small fraction of the pressure drop and many times the flow rate as compared to ultrafiltration membranes having similar efficiency.

### Performance

Independent testing has shown Disruptor® to reduce MS2 virus at greater than 99.99%. It can remove a wide range of bacteria at greater than 99.9999% including; E. coli, Pseudomonas and Legionella. Removal of 3 micron spheres (as a surrogate for cryptosporidium) is greater than 99.95% efficiency. Disruptor® has been proven to remove certain species of colloidal metals, hazardous compounds such as PCB's and trace pharmaceuticals including BPA, a known hormone inhibitor.

University testing has shown Disruptor's® combination of electroadsorption and depth filtration to effectively reduce low molecular weight organic acids and polysaccharides from fresh, brackish and salt water. These organic materials are now considered the main cause of fouling for hollow fiber and reverse osmosis membranes.

### Applications

Ahlstrom's unique Disruptor® technology is creating many new application opportunities across the entire spectrum of water filtration. With the filtration efficiency of ultrafiltration membranes and the pressure drop of a 2 micron nonwoven media, Disruptor® can be considered as an alternative for membranes in many residential and commercial applications. These include point-of-entry and point-of-use-devices such as: whole house filters; countertop, tap and under counter filters; water dispenser ice machines, food and beverage preparation.

With the ability to remove membrane biofoulants such as organic acids, bacteria and cellular debris Disruptor® is an effective pre-filter to protect reverse osmosis membranes from biofouling. By reducing membrane biofouling, Disruptor® extends the performance and life of RO membranes by increasing the time between clean-in-place treatment and reduces the volume of reject water. Energy savings are also gained because clean membranes operate at reduced pressure drop, saving energy. Opportunities for improving RO membrane performance include industrial and municipal waste water, water reuse, municipal drinking water and desalination.

## Disruptor® PAC

Ahlstrom Disruptor® PAC also contains powdered activated carbon (PAC) with an average particle size of only 8 microns. Activated carbon at this particle size has a very high pore size to weight ratio which produces remarkably high dynamic adsorption. Disruptor® uses no adhesives or binders to retain the carbon, therefore significantly more active sites remain available for adsorption of chlorine, iodine, volatile organic compounds (VOCs), disinfection by-products (DPBs) and organic acids from water.

## Disruptor® with Silver

Since it is naturally non-toxic, Disruptor® is effective in removing bacteria from water but does not inactivate the retained bacteria. For applications that require growth inhibition of bacteria retained by the media, all Disruptor® grades are available with a silver treatment registered to be safe for use in potable water.

## Disruptor® High Flow

High Flow is an exciting addition to our Disruptor® family of filter media. High Flow was commercialized in 2013 and is designed with a large pore volume that is not totally covered by the boehmite charge field. This feature reduces the efficiency of the media but increases its capacity for colloid, particulate and organic acid loading. When High Flow is used as a prefilter to our standard Disruptor® grades in more turbid waters the life and efficiency of the two-layers significantly outperforms a single layer of Disruptor®. High Flow can also be used as a stand-alone filter when high levels of organic contaminants must be removed, such as to protect reverse osmosis membranes from biofouling.

## Health Safety and the Environment

Disruptor® is based on the naturally occurring element boehmite which has no known HSE issues. Boehmite has long been used as an additive to food products, digestive analgesics, industrial applications and as an adjuvant for human vaccines. Disruptor® media has passed testing to NSF/ANSI standard 61 for potable water contact, USP Class VI testing and endotoxin testing.

## Filtration Technology Comparison Table

Water Remediation Technologies - Residential, Commercial, Industrial, Municipal, Desal								
	Disruptor® PAC Technology	RO	NF	UF	MF	Particulate Cartridges	Carbon Block	Ultra Violet
<b>Contaminants</b>								
Dissolved Salts		X						
Endotoxin	X	X	X	X	X	X		
Virus	X	X	X					X
Bacteria	X	X	X	X	X	X	X	X
Cysts	X	X	X	X	X	X	X	X
Polysaccharides (TEP)	X	X	X	X	X			
Colloids	X	X	X	X				
Particulates	X	X	X	X	X	X	X	
Chemical Reduction	X	X					X	X
Trace Pharmaceuticals	X	X					X	X

Membrane definition: Reverse Osmosis=RO; Nanofiltration=NF; Ultrafiltration=UF; Microfiltration=MF.

## Antimicrobial Statement Regarding Ahlstrom Disruptor® Products

Ahlstrom Disruptor® products can be treated with antimicrobial product protection. Materials utilizing naturally occurring silver are frequently used to protect products from bacterial and fungal growth. Such treatments are recognized in a broad range of regulatory requirements including EPA, FDA, NSF, USDA, European BPD and FSA. Such a use of silver is an environmentally intelligent treatment, allowing used filters to be disposed of in standard waste facilities. While antimicrobial product protection can prevent the growth of odor-causing microbes, protection is limited to the treated article. It does not further enhance the Ahlstrom Disruptor® filter's ability to protect against disease.

## Contact Ahlstrom sales

### North America

+1 770 650 21 00

filtration@ahlstrom.com

Learn more: [www.ahlstrom.com](http://www.ahlstrom.com)

**DISCLAIMER:** The information supplied in this document is for guidance only and should not be construed as a warranty. All implied warranties are expressly disclaimed, including without limitation any warranty of merchantability of fitness for use. All users of the material are responsible for ensuring that it is suitable for their needs, environment and end use. All data is subject to change as Ahlstrom deems appropriate.