Product Data Sheet

DuPont™ AmberLite™ MAC-3 H Ion Exchange Resin

Food Processing, Macroporous, Acrylic, Weak Acid Cation Exchange Resin

Description

DuPont™ AmberLite™ MAC-3 H Ion Exchange Resin is an acrylic, macroporous weak acid cation exchange resin that offers high exchange capacity, excellent regeneration efficiency, very good resistance to osmotic shock, and good chemical and physical stability.

AmberLite™ MAC-3 H is effective in removing temporary hardness (hardness associated with alkalinity) and dealkalization. It can also be used for recovery of metals. AmberLite™ MAC-3 H can be supplied in accordance to the TOC (Total Organic Carbon) requirements of the major European legislations for use in food and potable water applications. In such cases, a recommendation is given for resin conditioning before use.

Applications

- Softening
- Dealkalization
- Demineralization

Properties

Physical Properties	
Copolymer	Crosslinked acrylic
Matrix	Macroporous
Type	Weak acid cation
Functional Group	Carboxylic acid
Physical Form	White to off-white, opaque, spherical beads
Chemical Properties	
Ionic Form as Shipped	H^+
Total Exchange Capacity	≥ 3.8 eq/L
Water Retention Capacity	44 – 52%
Particle Size [§]	
300 - 1180 µm	≥ 90%
Stability	
Whole Beads	≥ 90%
Swelling	$H^+ \rightarrow Na^+$: ~70%
Density	
Particle Density	1.18 g/mL
Shipping Weight	750 g/L

[§] For additional particle size information, please refer to the Particle Size Distribution Cross Reference Chart (Form No. 45-D00954-en).

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Suggested Operating Conditions

Maximum Operating Temperature (H^+ form)	120°C (248°F)	
pH Range	5 – 14	
Bed Depth, min.	800 mm (2.6 ft)	
Flowrates		
Service	5 – 50 m/h (2 – 20 gpm/ft^2)	
Backwash	See Figure 1	
Regeneration		
HCl	1 – 10 m/h (0.4 – 4 gpm/ft^2)	
H_2SO_4	5 – 20 m/h (2 – 8 gpm/ft^2)	
Displacement Rinse	Same flowrate as the regenerant	
Fast Rinse (if applicable)	5 – 50 m/h (2 – 20 gpm/ft^2)	
Total Rinse Requirement	3 – 6 BV*	
Regenerant	HCl	H_2SO_4
Concentration	1 – 5%	0.5 – 0.8%

* 1 BV (Bed Volume) = 1 m^3 solution per m^3 resin or 7.5 gal per ft^3 resin

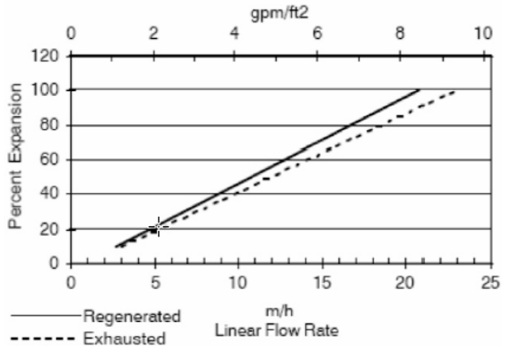
Hydraulic Characteristics

Estimated bed expansion of DuPont™ AmberLite™ MAC-3 H Ion Exchange Resin as a function of backwash flowrate and ionic form at 25°C (77°F) is shown in Figure 1. The flowrate necessary to achieve a desired bed expansion for other water temperatures can be calculated with the provided equations.

Estimated pressure drop for AmberLite™ MAC-3 H as a function of service flowrate at 20°C (68°F) is shown in Figure 2. These pressure drop expectations are valid at the start of the service run with clean water and a well-classified bed. Estimated pressure drop at other water temperatures can be calculated with the provided equations.

Figure 1: Backwash Expansion

Temperature = 25°C (77°F)



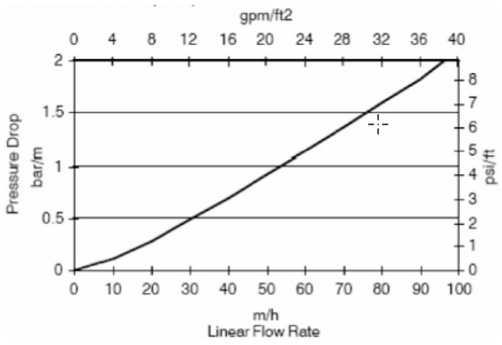
For other temperatures use:

$F_T = F_{25°C} [1 + 0.008 (1.8T_{°C} - 45)]$, where F ≡ m/h

$F_T = F_{77°F} [1 + 0.008 (T_{°F} - 77)]$, where F ≡ gpm/ft^2

Figure 2: Pressure Drop

Viscosity = 2 – 12 cP



For other temperatures use:

$P_T = P_{20°C} / (0.026T_{°C} + 0.48)]$, where P ≡ bar/m

$P_T = P_{68°F} / (0.014T_{°F} + 0.05)]$, where P ≡ psi/ft

Product Stewardship

DuPont has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with DuPont products—from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

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Customer Notice

DuPont strongly encourages its customers to review both their manufacturing processes and their applications of DuPont products from the standpoint of human health and environmental quality to ensure that DuPont products are not used in ways for which they are not intended or tested. DuPont personnel are available to answer your questions and to provide reasonable technical support. DuPont product literature, including safety data sheets, should be consulted prior to use of DuPont products. Current safety data sheets are available from DuPont.

Please be aware of the following:

- **WARNING:** Oxidizing agents such as nitric acid attack organic ion exchange resins under certain conditions. This could lead to anything from slight resin degradation to a violent exothermic reaction (explosion). Before using strong oxidizing agents, consult sources knowledgeable in handling such materials.

Regulatory Note

This product may be used in applications that need to comply with relevant regulations. In support of these applications, a Regulatory Information Package is available upon request. Please address your request to your sales team or the contact details provided in this Product Data Sheet.

Have a question? Contact us at:

www.dupont.com/water/contact-us

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