AMBERJET™ 1600 H Resin

Industrial Cation Exchange Resin for Power Generation Applications

Description

AMBERJET™ 1600 H Resin is a uniform particle size, gel type, strong acid cation exchange resin with a combination of very high capacity and stability that offers an advanced level of performance in ion exchange applications. It is designed for use in separable mixed bed systems which demand the ultimate in effluent purity, operating capacity, and resin life.

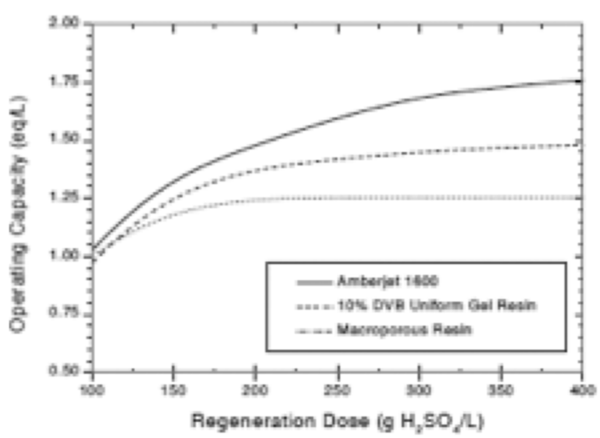
With a total capacity near 2.5 eq/L in the H+ form, AMBERJET 1600 Resin H is especially well suited for condensate polishing in PWR nuclear or high pressure fossil electric generating plants. In this application, cation resin capacity controls the cycle throughput of the beds, and therefore the regeneration frequency. AMBERJET 1600 H Resin can extend the hydrogen cycle run length by as much as 20% beyond any currently available resin, and this proportionally reduces the number of regenerations and effort needed to operate the condensate polishing plant. The exceptionally good backwash separation characteristics of AMBERJET 1600 H Resin further simplify the regeneration process.

Due to its very high level of DVB crosslinker, AMBERJET 1600 H Resin possesses exceptional physical stability and oxidative stability of any commercially available cation resin, either gel or macroporous. This allows for maximum useful life of the cation resin, while at the same time minimising the release of organic sulfonate leachables. This helps to preserve the kinetic response of the anion exchange resin in the mixed bed, thus allowing for reduced levels of sulphate in the steam generator or boiler, which is especially critical in PWR plants where organic amines are used.

High Operating Capacity

Figure 1 shows the expected hydrogen cycle operating capacity for AMBERJET 1600 H Resin compared to other cation resins which have been widely used in condensate polishing applications. Due to its exceptionally high available capacity, the operating capacity of AMBERJET 1600 H Resin increases dramatically compared to conventional cation resins, when more regenerant acid is applied.

Figure 1.



Packaging

25 liter bags or 7 cubic foot drums

Form No. 177-02216-0411, Rev. 0

Typical Physical and Chemical Properties

Physical form		Chart data inset
Matrix		text
Functional group		text
Ionic form as shipped		Na^+ form
Total exchange capacity, min.	eq/L kgr/ft^3 as $CaCO_3$	
Bead size distribution range 300–1,200 µm, min. < 300 µm, max.	 % %	
Moisture retention capacity	%	
Whole uncracked beads	%	
Color throw, as packaged, max.	APHA	
Acidity range	pH	
Total swelling ($Ca^{++} \rightarrow Na^+$)	%	
Particle density	g/mL	
Shipping weight**	g/L lbs/ft^3	

Suggested Operating Conditions

Maximum operating temperature	135ºC / 275ºF
Minimum bed depth	800 mm (2.6 ft)
Service flow rate (Linear Velocity)	10–120 BV*/h (1.2–15.0 gpm/ft^3)
Regeneration	
Regenerant	H_2SO_4 or HCl
Level (100% basis)	120–320 g/L (7.5–20 lbs/ft^3)
Concentration	4–8%
Minimum contact time	30 minutes
Slow rinse volume	1–2 BV at regeneration flow rate
Fast rinse	4–8 BV

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

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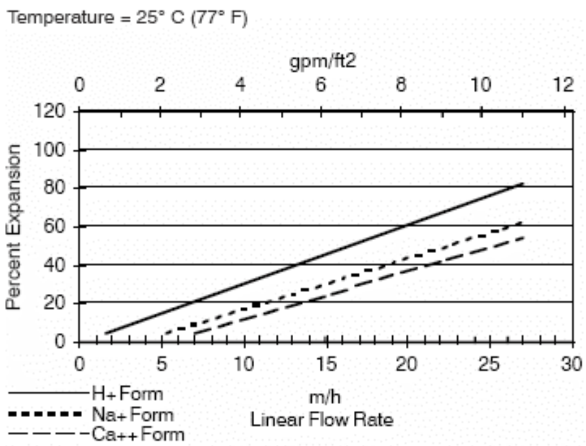
Hydraulic Characteristics

Figure 1 shows the bed expansion of AMBERJET™ 1600 H Resin as a function of backwash flow rate and water temperature. Figure 2 shows the pressure drop data as a function of service flow rate and water temperature. Pressure drop data are for clean, classified beds that have not accumulated solids during the service run. The pressure drop of a mixed bed can be approximated by summing the component pressure drops.

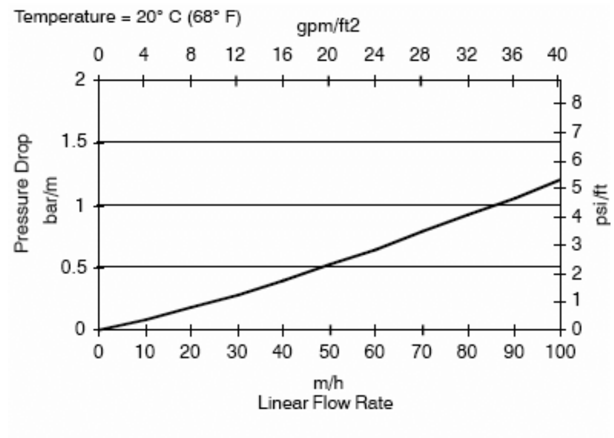
Figure 1. Backwash Expansion Data



For other temperatures use:

$F_T = F_{77°F} [1+ 0.008 (T_{°F} -77)]$, where $F \equiv gpm/ft^2$
$F_T = F_{25°C} [1+ 0.008 (1.8T_{°C} - 45)]$, where $F \equiv m/h$

Figure 2. Pressure Drop Data



For other temperatures use:

$P_T = P_{20°C} / (0.026\, T_{°C} + 0.48)$, where $P \equiv bar/m$
$P_T = P_{68°F} / (0.014\, T_{°F} + 0.05)$, where $P \equiv psi/ft$

Product Stewardship

Dow 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 Dow products - from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Customer Notice

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

DOW™ Ion Exchange Resins
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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.

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