



## 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.

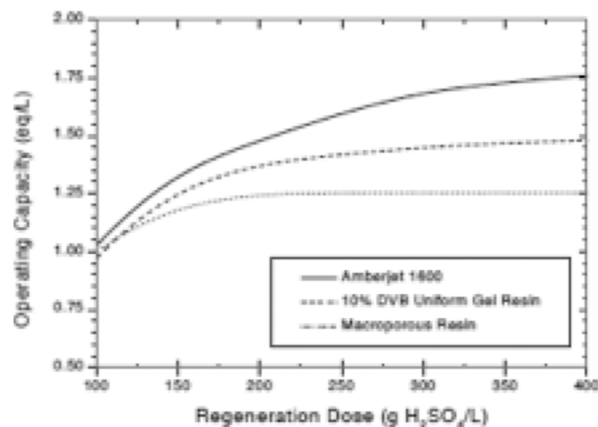
With a total capacity near 2.5 eq/L in the H<sup>+</sup> form, AMBERJET 1600 Resin H is especially well suited for condensate polishing in PWR nuclear or high pressure fossil electric generating plants. In this application, cation resin capacity controls the cycle throughput of the beds, and therefore 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

## Typical Physical and Chemical Properties

Physical form		Chart data inset
Matrix		text
Functional group		text
Ionic form as shipped		Na <sup>+</sup> form
Total exchange capacity, min.	eq/L kgr/ft <sup>3</sup> as CaCO <sub>3</sub>	
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 <sup>++</sup> → Na <sup>+</sup> )	%	
Particle density	g/mL	
Shipping weight**	g/L lbs/ft <sup>3</sup>	

## Suggested Operating Conditions

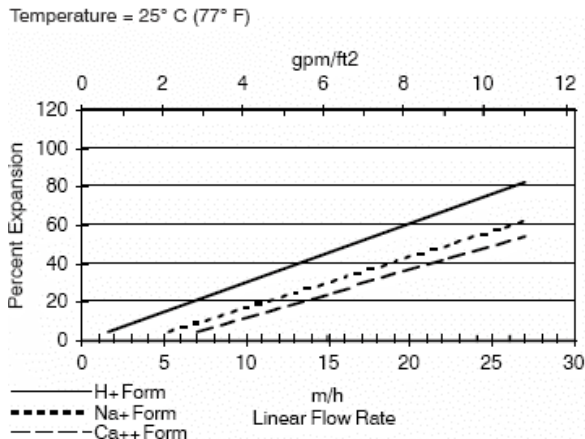
Maximum operating temperature	135°C / 275°F
Minimum bed depth	800 mm (2.6 ft)
Service flow rate (Linear Velocity)	10–120 BV*/h (1.2–15.0 gpm/ft <sup>3</sup> )
Regeneration	
Regenerant	H <sub>2</sub> SO <sub>4</sub> or HCl
Level (100% basis)	120–320 g/L (7.5–20 lbs/ft <sup>3</sup> )
Concentration	4–8%
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<sup>3</sup> solution per m<sup>3</sup> resin or 7.5 gals per ft<sup>3</sup> resin

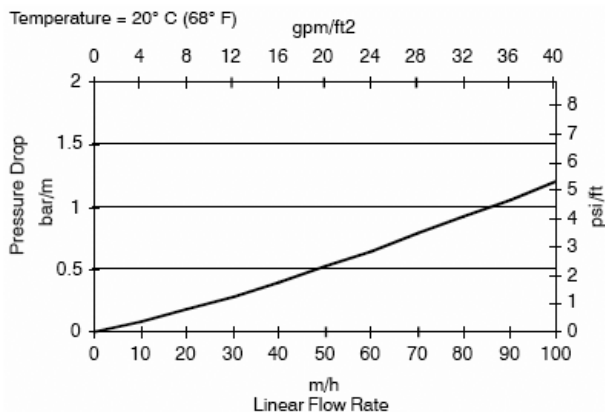
## Hydraulic Characteristics

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**



**Figure 2. Pressure Drop Data**



**For other temperatures use:**

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

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

**For other temperatures use:**

$$P_T = P_{20°C} / (0.026 T_C + 0.48), \text{ where } P \equiv \text{bar/m}$$

$$P_T = P_{68°F} / (0.014 T_F + 0.05), \text{ where } P \equiv \text{psi/ft}$$

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### DOW™ Ion Exchange Resins

For more information about DOW™ resins, call the Dow Water & Process Solutions business:

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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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