AMBERLITE™ IRN160

Nuclear Grade Mixed Bed Resin

Introduction

AMBERLITE IRN160 resin is a mixture of uniform particle size, gelular polystyrene cation and anion exchange resins. It is supplied in the H+/OH- form and contains a stoichiometric equivalent of the strong acid cation and the strong base anion resins. . AMBERLITE IRN160 resin is a nuclear grade mixed bed designed for use in PWR primary coolant, radwaste, Candu moderator, and BWR deep bed condensate polishing applications. The resin combines the properties of high capacity with excellent resistance to bead fracture from attrition and osmotic shock. The less separating properties of this resin make it easily transferable from one location to another, helping to eliminate the formation of a cation layer at the bottom of the service vessel.

Properties

Physical form	Uniform particle size spherical beads	
Matrix	Styrene divinylbenzene copolymer	
Shipping weight	690 g/L	
	Cation resin	**Anion resin**
Functional group	Sulphonic acid	Trimethylammonium
Ionic form as shipped	H^+	OH^-
Total exchange capacity	≥ 2.0 eq/L (H^+ form)	≥ 1.1 eq/L (OH^- form)
Moisture holding capacity	45 to 51 % (H^+ form)	54 to 60 % (OH^- form)
Particle size		
Uniformity coefficient	≤ 1.2 (for each component)	
Harmonic mean size	0.525 ± 0.05 mm < 0.300 mm ≤ 0.2 %	0.630 ± 0.05 mm
Whole beads	≥ 95 %	
Breaking weight Average > 200 g/bead	 ≥ 350 g/bead ≥ 95 %	
Ionic conversion	≥ 99 % H^+	≥ 95 % OH^-[1]
CO_3^-	≤ 5 %	
Cl^-	≤ 0.1 %	
SO_4^-	≤ 0.1 %	

[1] Contractual value

Test methods and SQC charts are available on request.

Suggested Operating Conditions

Maximum operating temperature	60 °C (140°F)
Minimum bed depth	900 mm (36 inches)
Service flow rate	8 to 80 BV*/h
Maximum Service velocity	120 m/h (50 gpm/ft^2)

* 1 BV (Bed Volume) = 1 m^3 solution per m^3 resin

Purity

AMBERLITE IRN160 resin is manufactured as a nuclear grade resin using specific procedures throughout the manufacturing process. These procedures, combined with a Dow process to reduce the chloride content of the anion component, produce material of the ultimate purity and yield a product that meets the rigorous demands of the nuclear industry. AMBERLITE IRN160 resin is recommended in any non regenerable mixed bed application where reliable production of the highest quality water is required and where the "as supplied" resin must have an absolute minimum of ionic and non ionic contamination.

Purity	Cation	Anion
	mg/kg dry resin	
Al	≤ 50	≤ 50
Ca		≤ 50
Cu	≤ 10	≤ 10
Fe	≤ 50	≤ 50
Mg		≤ 50
Na	≤ 50	≤ 20
Pb	≤ 10	≤ 10

Applications

The purity and physical stability of AMBERLITE IRN160 resin provides exceptional performance in nuclear applications. The non separating feature of AMBERLITE IRN160 makes it an excellent choice for :

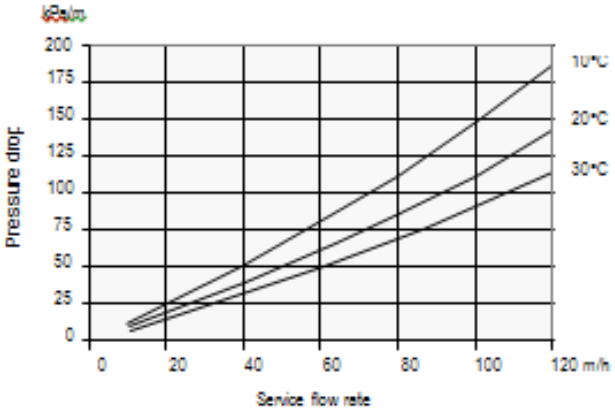
- BWR deep bed condensate polishing
- PWR primary coolant treatment
- Candu moderator
- Mixed bed deionisation

Hydraulic Characteristics

Pressure drop

The approximate pressure drop for each meter of bed depth of AMBERLITE IRN160 resin in normal downflow operation at various temperatures and flow rates is shown in the graph below. Pressure drop data are valid at the start of the service run with clean water.

Figure 1 : Pressure drop



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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.

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