



## AMBERLITE™ IRN160 Resin

Nuclear Grade Mixed Bed Resin for the Power Industry

### Description

AMBERLITE™ IRN160 Resin is a stoichiometric equivalent mixture of uniform particle size gel polystyrenic cation and anion exchange resins, supplied in the fully regenerated H<sup>+</sup>/OH<sup>-</sup> forms. The resin combines the properties of high capacity and excellent resistance to bead fracture from attrition and osmotic shock.

AMBERLITE IRN160 Resin is designated as a nuclear grade resin and is manufactured using special processing procedures, combined with a Dow process to reduce the chloride content of the anion component. This results in material of the ultimate purity to meet the exacting demands of the nuclear industry. AMBERLITE IRN160 Resin is recommended for use 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. The non-separating properties of this resin make it easily transferable, leaving no cation layer that has separated from anion resin. It is therefore an excellent choice for radwaste applications and deep bed condensate polishing in BWR nuclear power plants.

### Typical Physical and Chemical Properties

Physical form		Uniform translucent spherical beads	
Matrix		Styrene divinylbenzene copolymer	
Functional group		Sulphonic acid	Trimethylammonium
Ionic form as shipped		Cation (H <sup>+</sup> form)	Anion (OH <sup>-</sup> form)
Total volume capacity, min.	eq/L	2.0	1.1
	kg/ft <sup>3</sup> as CaCO <sub>3</sub>	47.0	26.2
Moisture retention capacity	%	45–51	54–60
Particle size			
Harmonic mean diameter	mm	0.525 ± 0.05	0.63 ± 0.05
Uniformity coefficient		1.2	1.2
< 0.300 mm, max.	%	0.2	
Whole beads, min.	%	95	
Friability		350 g/bead average, 95% > 200 g/bead	
Ionic conversion, min.	%	99	95
CO <sub>3</sub> <sup>2-</sup> max.	%	—	5
Cl <sup>-</sup> max.	%	—	0.1
SO <sub>4</sub> <sup>2-</sup> max.	%	—	0.1
Na, dry resin basis, max.	ppm	50	
Metals, dry resin cation, max.	ppm	Fe: 50, Al: 50, Cu: 10	
Metals, dry resin anion, ppm, max.	Mg / Fe / Ca / Al: 50, CO: 30, Cu: 10, Pb: 10		
Other anion impurities, dry basis, max.	ppm	Total Cl: 500, SiO <sub>2</sub> : 100, Total SO <sub>4</sub> : 600	
Shipping basis**		690 g/L (43 lbs/ft <sup>3</sup> )	

For additional particle size information, please refer to Particle Size Distribution Cross Reference Chart (Form No. 177-01775).

## Suggested Operating Conditions

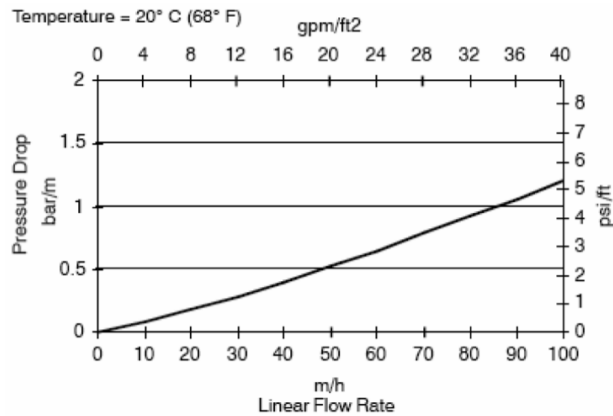
Maximum operating temperature	60°C / 140°F
Bed depth, min.	800 mm (2.6 ft)
Service flow rate	8–50 BV*/h (1.0–6.3 gpm/ft <sup>3</sup> )
Maximum Service Velocity	60 m/h (25 gpm/ft <sup>2</sup> ) max.

\*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

The approximate pressure drop of AMBERLITE™ IRN150 Resin in normal downflow operation at various temperatures and flow rates is shown in Figure 1. Pressure drop data are valid at the start of the service run with a clear water.

**Figure 1. Pressure Drop Data**



**For other temperatures use:**

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

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

## Packaging

25 liter bags or 7 cubic foot drums

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

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China: +86 21 2301 1000  
<http://www.dowwaterandprocess.com>

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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