



# AMBERLITE® IRN77

Nuclear Grade Gel Cation Exchange Resin

## PRODUCT DATA SHEET

AMBERLITE IRN77 is a strongly acidic gelular polystyrene cation exchange resin supplied in the hydrogen form. This resin is nuclear grade and processed to the highest purity standards required for treating water in the nuclear

power industry such as primary reactor cooling water and radwaste treatment. AMBERLITE IRN77 contains a minimum of 99% of its exchange sites in the hydrogen form.

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### PHYSICAL CHARACTERISTICS

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Physical Form _____	Uniform particle size spherical beads
Shipping Weight _____	50 lb/ft <sup>3</sup> (800 g/L)
Particle Size (U.S. Std. Screen) _____	< 50 mesh (0.300 mm) : 0.2 % maximum
	> 16 mesh (1.180 mm) : 2.0 % maximum
Whole Beads _____	95 % minimum
Friability Average _____	350 g/bead minimum
Friability > 200 g/bead _____	95% minimum

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### CHEMICAL CHARACTERISTICS

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Matrix _____	Polystyrene DVB gel
Functional Groups _____	Sulfonic acid
Ionic Form as Shipped _____	H <sup>+</sup>
Total Exchange Capacity _____	1.8 meq/ml minimum (H <sup>+</sup> form)
Moisture Holding Capacity _____	49 to 55 % (H <sup>+</sup> form)
Ionic Conversion _____	99 % minimum (H <sup>+</sup> form)

### PURITY

The manufacturing process for this resin is controlled to keep inorganic impurities at the lowest possible level.

These high standards of resin purity will help keep nuclear systems free of contaminants and deposits, and prevent increases in radioactivity levels due to activation of impurities in the reactor core.

Purity	mg/kg dry resin
Al	≤ 50
Ca	≤ 50
Cu	≤ 10
Fe	≤ 50
Mg	≤ 50
Na	≤ 20
Heavy metals, as PB	≤ 10

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## RECOMMENDED OPERATING CONDITIONS

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Minimum Bed Depth _____	36 inches	(800 mm)
Maximum Operating Temperature _____	140 °F	(60°C)
Service flow rate _____	1 to 6 gpm/ft <sup>3</sup>	(8 to 50 BV/h)

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### APPLICATIONS

AMBERLITE IRN77 has proved highly effective in the following applications :

#### Primary reactor cooling water treatment :

Removal of fission products, activated corrosion products and suspended matter. It is also used to control the pH of the reactor coolant stream by removing the excess Li<sup>7</sup>.

#### Radwaste treatment :

Removal of radioactive cations such as cesium 137 from waste streams.

#### Decontamination :

Removal of cationic radioactive material from spent decontaminating solutions.

### LIMITS OF USE

AMBERLITE IRN77 is suitable for industrial uses.

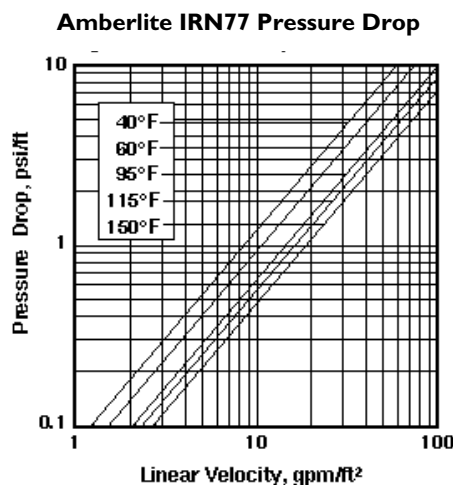
For other specific applications such as pharmaceutical, food processing or potable water applications, it is recommended that all potential users seek advice from Rohm and Haas in order to determine the best resin choice and optimum operating conditions.

### HYDRAULIC CHARACTERISTICS

#### Resin Handling

To retain the high purity standards of nuclear grade resins, deionized water should be used for all resin handling.

The figure below shows the approximate pressure drop for each meter of bed depth of AMBERLITE IRN77 in normal downflow operation at various temperatures and flow rates. Pressure drop data are valid at the start of the service run with a clear water.



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Ion exchange resins and polymeric adsorbents, as produced, contain by-products resulting from the manufacturing process. The user must determine the extent to which organic by-products must be removed for any particular use and establish techniques to assure that the appropriate level of purity is achieved for that use. The user must ensure compliance with all prudent safety standards and regulatory requirements governing the application. Except where specifically otherwise stated, Rohm and Haas Company does not recommend its ion exchange resins or polymeric adsorbents, as supplied, as being suitable or appropriately pure for any particular use. Consult your Rohm and Haas technical representative for further information. Acidic and basic regenerant solutions are corrosive and should be handled in a manner that will prevent eye and skin contact. Nitric acid and other strong oxidising agents can cause explosive type reactions when mixed with Ion Exchange resins. Proper design of process equipment to prevent rapid buildup of pressure is necessary if use of an oxidising agent such as nitric acid is contemplated. Before using strong oxidising agents in contact with Ion Exchange Resins, consult sources knowledgeable in the handling of these materials.

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