

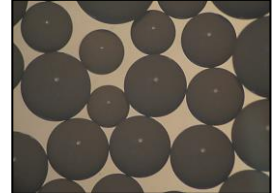


## **AMBERLITE™ IRN9652 H Ion Exchange Resin**

Nuclear-grade, Macroporous, Strong Acid Cation Exchange Resin for Water Treatment  
Applications in the Nuclear Power Industry

### **Description**

AMBERLITE™ IRN9652 H Ion Exchange Resin is designed specifically for use in nuclear loops where highest resin purity and stability are required, and where the "as supplied" resin must have a minimum of ionic and non-ionic contamination. These high standards of resin purity enable plants to achieve reliable and safe production whilst reducing the need for equipment maintenance and minimizing the impact of unscheduled outages.



AMBERLITE IRN9652 H has a high capacity to remove cationic contaminants, especially <sup>137</sup>Cs in the primary loop and sodium traces in the secondary loop steam generator blowdown conditioned with organic amines such as morpholine. It can operate in short beds at high linear velocity due to the fast kinetics enabled by its macroporous pore structure. It can also be used in a layered bed below the macroporous anion resin.

### **Applications**

- Primary water treatment:
  - Primary coolant purification
  - Treatment of primary coolant blowdown
- Fuel pool purification in single bed systems
- Rad waste treatment and decontamination:
  - Removal of radioactive cations such as <sup>137</sup>Cs and cobalt isotopes
  - Removal of silver
- PWR steam generation blowdown (APG)

### **Purity**

AMBERLITE™ IRN Ion Exchange Resins are manufactured as nuclear-grade using specific procedures throughout the manufacturing process to keep the inorganic impurities at the lowest possible level. Special treatment procedures are also utilized to remove traces of soluble organic compounds to meet the rigorous demands of the nuclear industry. 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. IRN resins are recommended in both non-regenerable and regenerable single bed or mixed bed applications 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.

### **Historical Reference**

AMBERLITE™ IRN9652 H Ion Exchange Resin has previously been sold as AMBERLITE™ IRN9652 Ion Exchange Resin.

## Typical Physical and Chemical Properties\*\*

| <b>Physical Properties</b> |                                    |
|----------------------------|------------------------------------|
| Copolymer                  | Styrene-divinylbenzene             |
| Matrix                     | Macroporous                        |
| Type                       | Strong acid cation                 |
| Functional Group           | Sulfonic acid                      |
| Physical Form              | Brown, opaque, spherical beads     |
| <b>Chemical Properties</b> |                                    |
| Ionic Form as Shipped      | H <sup>+</sup>                     |
| Total Exchange Capacity    | ≥ 1.95 eq/L (H <sup>+</sup> form)  |
| Water Retention Capacity   | 51.0 – 57.0% (H <sup>+</sup> form) |
| Ionic Conversion           |                                    |
| H <sup>+</sup>             | ≥ 99.0%                            |
| <b>Particle Size</b>       |                                    |
| Particle Diameter §        | 650 – 900 µm                       |
| Uniformity Coefficient     | ≤ 1.60                             |
| < 300 µm                   | ≤ 0.2%                             |
| > 1180 µm                  | ≤ 3.0%                             |
| <b>Purity</b>              |                                    |
| Metals, dry basis:         |                                    |
| Na                         | ≤ 60 mg/kg                         |
| K                          | ≤ 20 mg/kg                         |
| Fe                         | ≤ 100 mg/kg                        |
| Cu                         | ≤ 5 mg/kg                          |
| Co                         | ≤ 5 mg/kg                          |
| Ca                         | ≤ 10 mg/kg                         |
| Mg                         | ≤ 10 mg/kg                         |
| Al                         | ≤ 50 mg/kg                         |
| Hg                         | ≤ 20 mg/kg                         |
| Heavy Metals (as Pb)       | ≤ 10 mg/kg                         |
| <b>Stability</b>           |                                    |
| Whole Uncracked Beads      | ≥ 97%                              |
| <b>Density</b>             |                                    |
| Shipping Weight            | 800 g/L                            |

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

## Suggested Operating Conditions\*\*

|   |                        |
|---|------------------------|
| Temperature Range (H <sup>+</sup> form) | 5 – 150°C (41 – 302°F) |
| pH Range (Stable)                       | 0 – 14                 |

For additional information regarding recommended minimum bed depth, operating conditions, and regeneration conditions for [mixed beds](#) (Form No. 177-03705) or [separate beds](#) (Form No. 177-03729) in water treatment, please refer to our Tech Facts.

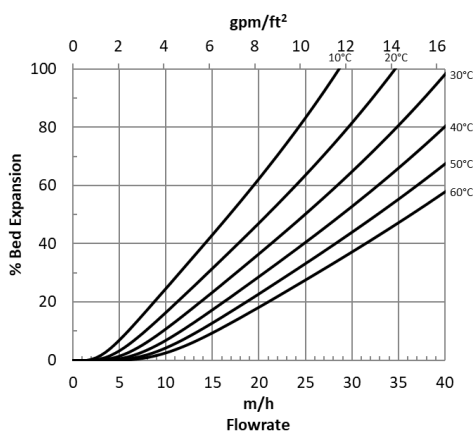
## Hydraulic Characteristics

Estimated bed expansion of AMBERLITE™ IRN9652 H Ion Exchange Resin as a function of backwash flowrate and temperature is shown in Figure 1.

Estimated pressure drop for AMBERLITE IRN9652 H as a function of service flowrate and temperature is shown in Figure 2. These pressure drop expectations are valid at the start of the service run with clean water and a well-classified bed.

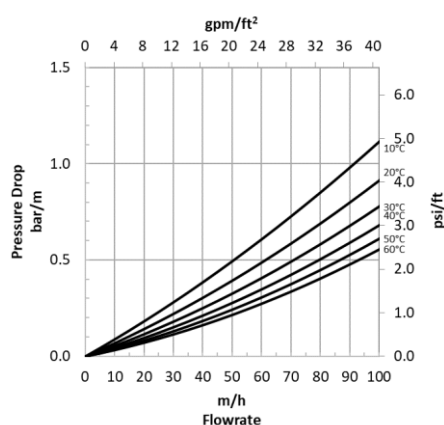
**Figure 1: Backwash Expansion**

Temperature = 10 – 60°C (50 – 140°F)



**Figure 2: Pressure Drop**

Temperature = 10 – 60°C (50 – 140°F)



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|                             |                  |
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| Asia Pacific                | +86 21 3851 4988 |
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| Latin America               | +55 11 5184 8722 |
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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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