AMBERLITE™ IRN160
Nuclear Grade Mixed Bed Resin

AMBERLITE IRN160 resin is a mixture of uniform particle size gelular polystyrene cation and anion exchange resins. AMBERLITE IRN160 resin as supplied contains a stoichiometric equivalent of the strongly acidic cation and the strongly basic anion exchange resins. It is supplied in the H⁺/OH⁻ form. AMBERLITE IRN160 resin is designed for use in radwaste applications and deep bed condensate polishing in BWR nuclear power plants. The resin combines the properties of high capacity and excellent resistance to bead fracture from attrition and osmotic shock. The non separating properties of this resin make it easily transferable from one location to another, leaving no cation layer that has separated from anion resin.

PROPERTIES

| Physical form | Uniform particle size spherical beads |
| Matrix | Styrene divinylbenzene copolymer |
| Shipping weight | 690 g/L |

**Functional group**

- Cation resin: Sulphonic acid
- Anion resin: Trimethylammonium

**Ionic form as shipped**

- H⁺
- OH⁻

**Total exchange capacity**

- ≥ 2.15 eq/L (H⁺ form)
- ≥ 1.2 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 (H⁺ form)
  - 0.630 ± 0.05 mm (OH⁻ form)
- Whole beads ≥ 95 %
- Breaking weight (average) ≥ 350 g/bead ≥ 95 %

**Ionic conversion**

- ≥ 99 % H⁺
- ≥ 95 % OH⁻
- ≤ 5 % Cl⁻
- ≤ 0.1 % CO₃⁻
- ≤ 0.1 % SO₄⁻

**SUGGESTED OPERATING CONDITIONS**

- Maximum operating temperature 60 °C
- Minimum bed depth 800 mm
- Service flow rate 80 BV*/h
- Maximum Service velocity 120 m/h at 35-50 °C

* 1 BV (Bed Volume) = 1 m³ solution per m³ resin
PURITY

AMBERLITE IRN160 resin is designated as a nuclear grade resin and is manufactured using special processing procedures. These procedures, combined with a Rohm and Haas process to reduce the chloride content of the anion component, produce material of the ultimate purity and yield a product meeting the exacting 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.

<table>
<thead>
<tr>
<th>Purity</th>
<th>Cation</th>
<th>Anion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mg/kg dry resin</td>
<td></td>
</tr>
<tr>
<td>Al</td>
<td>≤ 50</td>
<td>≤ 50</td>
</tr>
<tr>
<td>Ca</td>
<td>≤ 50</td>
<td></td>
</tr>
<tr>
<td>Co</td>
<td>≤ 30</td>
<td></td>
</tr>
<tr>
<td>Cu</td>
<td>≤ 10</td>
<td>≤ 10</td>
</tr>
<tr>
<td>Fe</td>
<td>≤ 50</td>
<td>≤ 50</td>
</tr>
<tr>
<td>Hg</td>
<td>≤ 20</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>≤ 40</td>
<td></td>
</tr>
<tr>
<td>Mg</td>
<td>≤ 50</td>
<td></td>
</tr>
<tr>
<td>Na</td>
<td>≤ 50</td>
<td>≤ 20</td>
</tr>
<tr>
<td>Pb</td>
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<td></td>
</tr>
<tr>
<td>Total Cl</td>
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<td></td>
</tr>
<tr>
<td>SiO₂</td>
<td>≤ 100</td>
<td></td>
</tr>
<tr>
<td>Total SO₄</td>
<td>≤ 600</td>
<td></td>
</tr>
</tbody>
</table>

APPLICATIONS

The purity and physical stability of AMBERLITE IRN160 resin provides unsurpassed performance in nuclear applications. The non separating feature of AMBERLITE IRN160 makes it an excellent choice for:
- BWR deep bed condensate polishing
- Radwaste deionisation
- 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 a clear water.

LIMITS OF USE

AMBERLITE IRN160 resin 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.

All our products are manufactured in ISO 9001 certified facilities.