



## Product Data Sheet

### AmberSep™ IRA743 Chelating Resin

Industrial-grade Chelating Resin for Selective Boron Removal

#### Description

AmberSep™ IRA743 Chelating Resin is a unique ion exchange resin specifically designed and used to remove boric acid and borate from water, magnesium brine, or other solutions under a variety of conditions.

The presence of boron compounds, even in very small concentration, is frequently a concern in drinking and irrigation water, in ultrapure water (as used in the semiconductor industry), and in other chemical processes.

Boric acid can be removed from water with conventional ion exchange resins, but the exchange is not selective and, therefore, impractical. The selectivity of AmberSep™ IRA743 for boric acid is high, even in saline backgrounds.

The high selectivity of AmberSep™ IRA743 for boric acid is due to a unique, sugar-like active group. The borate ion makes a very stable complex with the glucamine group, while other anions do not react at all.

#### Applications

- Irrigation water
- Ultrapure water
- Wastewater for fossil power plants
- Purification of magnesium brine
- Purification of lithium brines
- Produced water

#### Typical Properties

|                            |                                    |
|----------------------------|------------------------------------|
| <b>Physical Properties</b> |                                    |
| Copolymer                  | Styrene-divinylbenzene             |
| Matrix                     | Macroporous                        |
| Type                       | Chelant                            |
| Functional Group           | N-methylglucamine                  |
| Physical Form              | Off-white, opaque, spherical beads |
| <b>Chemical Properties</b> |                                    |
| Ionic Form as Shipped      | Free base (FB)                     |
| Total Exchange Capacity    | ≥ 0.6 eq/L                         |
| Water Retention Capacity   | 48 – 54%                           |
| <b>Particle Size</b> §     |                                    |
| Particle Diameter          | 500 – 700 µm                       |
| Uniformity Coefficient     | ≤ 1.6                              |
| < 300 µm                   | ≤ 1%                               |
| > 1180 µm                  | ≤ 5%                               |
| <b>Density</b>             |                                    |
| Shipping Weight            | 700 g/L                            |

§ For additional particle size information, please refer to the [Particle Size Distribution Cross Reference Chart](#) (Form No. 45-D00954-en).

## Suggested Operating Conditions

|                               |                                                                             |
|-------------------------------|-----------------------------------------------------------------------------|
| Maximum Operating Temperature | 75°C (167°F)                                                                |
| Service Flowrate              | 4 – 30 BV*/h                                                                |
| Regeneration                  | Several regeneration procedures are available, depending on the application |

\* 1 BV (Bed Volume) = 1 m<sup>3</sup> solution per m<sup>3</sup> resin or 7.5 gal per ft<sup>3</sup> resin

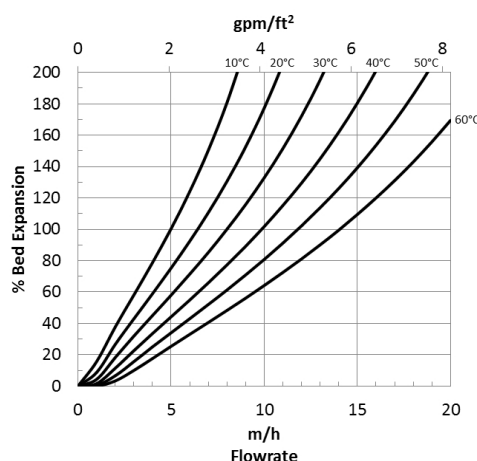
## Hydraulic Characteristics

Bed expansion of AmberSep™ IRA743 Chelating Resin as a function of backwash flowrate and water temperature is shown in Figure 1.

Pressure drop data for AmberSep™ IRA743 in water as a function of service flowrate and water temperature is shown in Figure 2. Pressure drop data are valid for clean, classified beds which have not been contaminated with suspended solids during the service run; if the bed accumulates solids, the pressure drop will increase.

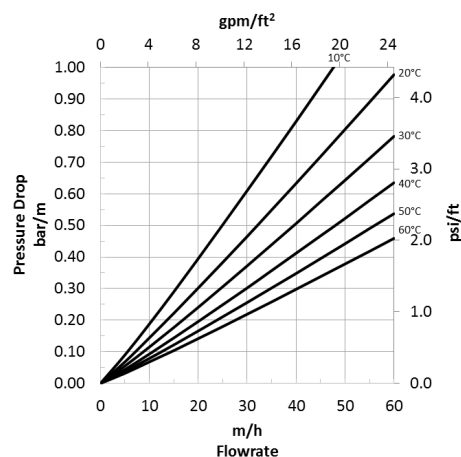
**Figure 1: Backwash Expansion**

Temperature = 10 – 60°C (50 – 140°F)



**Figure 2: Pressure Drop**

Temperature = 10 – 60°C (50 – 140°F)



## Application Information

### Irrigation Water

Boron is known to improve plant growth, but within tight limits—excess boron has a very detrimental effect on agriculture. The boron limit is usually considered to be 1 mg/L.

### Ultrapure Water

Boron is used as a doping agent in the production of semiconductors. Therefore, wastewater in this industry contains variable amounts of boron. However, boron must be totally absent from the water used in certain production steps. AmberSep™ IRA743 Chelating Resin can reduce boron concentrations to ng/L (parts per trillion) levels.

### Wastewater

Boron is present in ceramic tiles and enamels used to decorate them. These boron compounds can be selectively removed from the waste streams using AmberSep™ IRA743 Chelating Resin.

### Magnesium Brine

Magnesium is produced by electrolysis. The presence of boron prevents the coalescence of magnesium during the electrolysis of fused Mg salts. The brines must be purified, bringing the B concentration from about 100 mg/L to less than 10 mg/L, which can be accomplished with AmberSep™ IRA743 Chelating Resin, even in a solution with extremely high salt background.

## **Application Information (Cont.)**

### **Produced Water**

When treating produced water for reuse for gel fracking operations, boron removal is typically required. Boron can lead to premature crosslink of the polymers in fracking fluids, upsetting the delayed rheology desired in the gel formulation. For this reason, a boron selective ion exchange resin like AmberSep™ IRA743 Chelating Resin can be used to efficiently reduce boron concentrations without impairing gel fracking formulations.

### **Drinking Water**

AmberSep™ IRA743 Chelating Resin is intended only for industrial purposes. For boron removal from drinking water, the use of AmberLite™ PWA10 Ion Exchange Resin is recommended.

The above applications are examples, and each of them requires a specific regeneration procedure. Potential users should contact a technical service representative for more details.

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Please be aware of the following:

- **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.

## **Regulatory Note**

These products may be subject to irrigation water / drinking water application restrictions in some countries; please check the application status before use and sale.

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