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

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

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February 2023

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^3 solution per m^3 resin or 7.5 gal per ft^3 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)

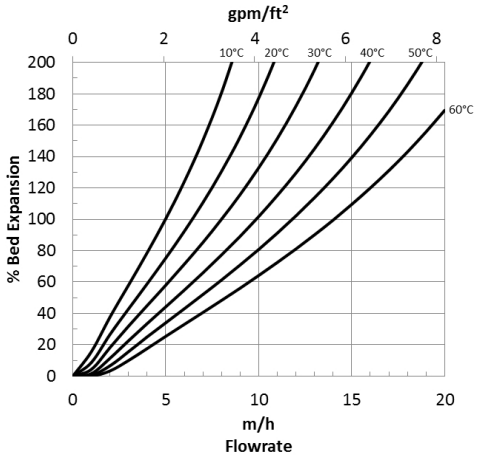
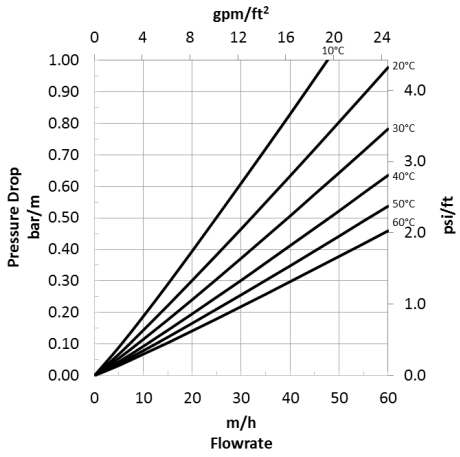


Figure 2: Pressure Drop
Temperature = 10 – 60°C (50 – 140°F)



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.

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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.

Product Stewardship

DuPont 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 DuPont products—from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Customer Notice

DuPont strongly encourages its customers to review both their manufacturing processes and their applications of DuPont products from the standpoint of human health and environmental quality to ensure that DuPont products are not used in ways for which they are not intended or tested. DuPont personnel are available to answer your questions and to provide reasonable technical support. DuPont product literature, including safety data sheets, should be consulted prior to use of DuPont products. Current safety data sheets are available from DuPont.

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.

Have a question? Contact us at:

www.dupont.com/water/contact-us

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