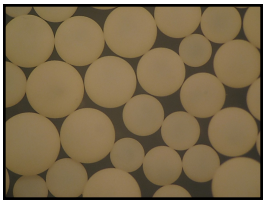
Product Data Sheet

AmberLite™ IRC83 H Ion Exchange Resin

Gaussian, Acrylic, Macroporous, Weak Acid Cation Exchange Resin for Industrial Demineralization, Softening, and Dealkalization Applications

Description



AmberLite™ IRC83 H Ion Exchange Resin is a general-purpose dealkalization and softening resin with a long-established track record of reliable performance in the industry. This industry-staple resin is designed for co-flow regenerated systems in variety of industrial water treatment applications.

When AmberLite™ IRC83 H is operated in the Na^+ form, it will remove total hardness even in high salinity waters such as those in oilfield SAGD systems. When operated in the H^+ form, it will remove only the hardness associated with alkalinity—a weak acid cation resin operated in the H^+ form is well-suited for use with strong acid cation resins to improve overall efficiency and throughput of a demineralization system by reducing the hardness exposure on the strong acid cation resin.

In Na^- form softening operation, AmberLite™ IRC83 H enables improved operating capacity for total hardness versus other weak acid cation resins currently available, which allows more competitive vessel design or extended production capacity when installed in existing systems.

In dealkalization, AmberLite™ IRC83 H has demonstrated improved operating capacity versus other weak acid cation resins currently available, which allows users to simultaneously minimize operating costs and environmental impacts while also preserving precious raw water resources under the right conditions.

In reverse osmosis pretreatment, AmberLite™ IRC83 H can protect the membrane from hardness scaling, which can improve system recovery and operational reliability and can eliminate the use of chemicals such as antiscalants or acids for RO feedwater pH control. The resin's ability to soften high-salinity feedwaters enables the RO to reliably operate under extremely variable and/or harsh conditions, such as with wastewater reuse or minimal liquid discharge.

Applications

- Demineralization, ideally when treating water with:
  - High oxidant level (among WAC resins)
  - Total hardness to alkalinity ratio > 0.8
- Industrial softening
- High-salinity softening (operated in the Na^+ form)
- Dealkalization
- Reverse osmosis pretreatment
- Steam-assisted gravity drainage (SAGD)

System Designs

- Co-current

Form No. 45-D01248-en, Rev. 2
July 2020

Historical Reference

AmberLite™ IRC83 H Ion Exchange Resin has previously been sold as AmberLite™ IRC83 Ion Exchange Resin.

Typical Properties

Physical Properties	
Copolymer	Crosslinked acrylic
Matrix	Macroporous
Type	Weak acid cation
Functional Group	Carboxylic acid
Physical Form	Off-white, opaque, spherical beads
Chemical Properties	
Ionic Form as Shipped	H^+
Total Exchange Capacity	≥ 4.7 eq/L (H^+ form)
Water Retention Capacity	40.0 – 50.0% (H^+ form)
Particle Size [§]	
Particle Diameter	500 – 750 µm
Uniformity Coefficient	≤ 1.6
< 300 µm	≤ 1.0%
> 1180 µm	≤ 1.0%
Stability	
Whole Uncracked Beads	≥ 95%
Swelling	$H^+ \rightarrow Na^+$ ≤ 60%
Density	
Particle Density	1.21 g/mL
Shipping Weight	760 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

Temperature Range	
H^+ form	5 – 120°C (41 – 248°F)
Na^+ form	5 – 120°C (41 – 248°F)
pH Range	
Service Cycle	6 – 14
Stable	0 – 14

For additional information regarding recommended minimum bed depth, operating conditions, and regeneration conditions for separate beds (Form No. 45-D01131-en) in water treatment, please refer to our Tech Fact.

Hydraulic Characteristics

Estimated bed expansion of AmberLite™ IRC83 H Ion Exchange Resin as a function of backwash flowrate and temperature is shown in Figure 1.

Estimated pressure drop for AmberLite™ IRC83 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)

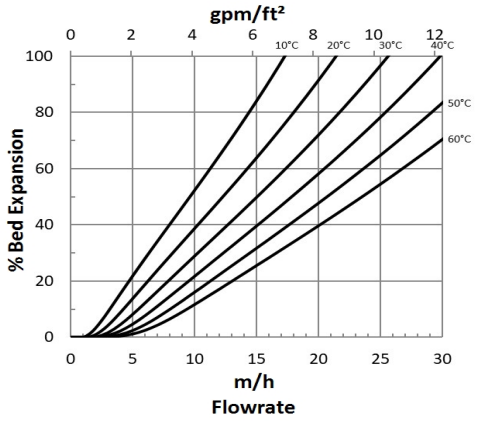
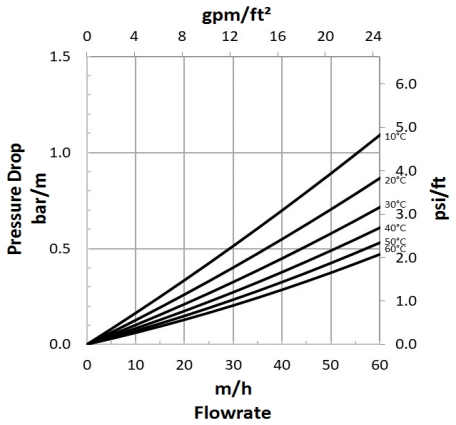


Figure 2: Pressure Drop

Temperature = 10 – 60°C (50 – 140°F)



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.

Have a question? Contact us at:

www.dupont.com/water/contact-us

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