

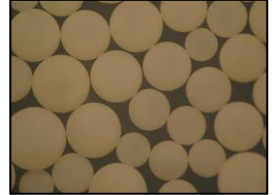


## AMBERLITE™ IRC83 H Ion Exchange Resin

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

## Historical Reference

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

## Typical Physical and Chemical Properties\*\*

<b>Physical Properties</b>	
Copolymer	Crosslinked acrylic
Matrix	Macroporous
Type	Weak acid cation
Functional Group	Carboxylic acid
Physical Form	Off-white, opaque, spherical beads
<b>Chemical Properties</b>	
Ionic Form as Shipped	H <sup>+</sup>
Total Exchange Capacity	≥ 4.7 eq/L (H <sup>+</sup> form)
Water Retention Capacity	40.0 – 50.0% (H <sup>+</sup> form)
<b>Particle Size</b>	
Particle Diameter §	500 – 750 µm
Uniformity Coefficient	≤ 1.6
< 300 µm	≤ 1.0%
> 1180 µm	≤ 1.0%
<b>Stability</b>	
Whole Uncracked Beads	≥ 95%
Swelling	H <sup>+</sup> → Na <sup>+</sup> ≤ 60%
<b>Density</b>	
Particle Density	1.21 g/mL
Shipping Weight	785 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 – 120°C (41 – 248°F)
Na <sup>+</sup> 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. 177-03729) in water treatment, please refer to our Tech Fact.

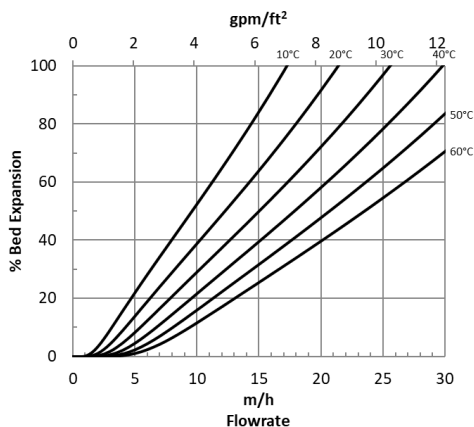
## Hydraulic Characteristics

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.

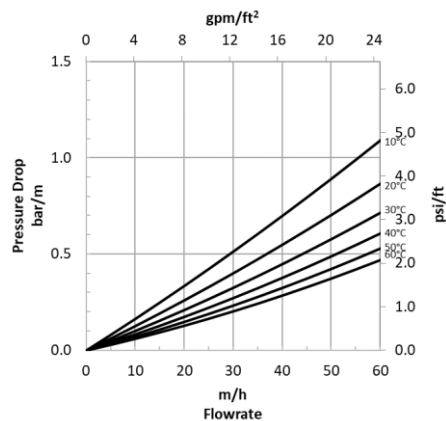
**Figure 1: Backwash Expansion**

Temperature = 10 – 60°C (50 – 140°F)



**Figure 2: Pressure Drop**

Temperature = 10 – 60°C (50 – 140°F)



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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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