

PRODUCT DATA SHEET

AMBERLITE™ IRN78

Nuclear Grade Strong Base Anion Resin

AMBERLITE IRN78 resin is a uniform particle size strongly basic gel type polystyrene anion exchange resin supplied in the hydroxide form. This resin is nuclear grade and processed to the highest purity standards required for treating water in the nuclear power industry.

AMBERLITE IRN78 resin contains a minimum of 95% of the exchange sites in the hydroxide form and a maximum of 0.1 % in the chloride form. The uniform particle size and the absence of fine resin beads results in a lower pressure drop compared to conventional resins.

PROPERTIES

Physical form _____	Yellow spherical beads
Matrix _____	Styrene divinylbenzene copolymer
Functional group _____	Trimethylammonium
Ionic form as shipped _____	OH ⁻
Total exchange capacity ^[2] _____	≥ 1.20 eq/L (OH ⁻ form)
Moisture holding capacity ^[1] _____	54 to 60 % (OH ⁻ form)
Shipping weight _____	690 g/L
Particle size	
Uniformity coefficient ^[1] _____	≤ 1.2
Harmonic mean size ^[1] _____	0.580 to 0.680 mm
< 0.300 mm ^[1] _____	0.2 % max
Whole beads _____	≥ 95 %
Breaking weight (average) _____	≥ 350 g/bead
> 200 g/bead _____	≥ 95 %
Ionic conversion ^[1] _____	≥ 95 % OH ⁻
	≤ 5 % CO ₃ ⁼
	≤ 0.1 % Cl ⁻
	≤ 0.1 % SO ₄ ⁼

^[1] Contractual value

^[2] Average value calculated from statistical quality control

Test methods and SQC charts are available on request.

SUGGESTED OPERATING CONDITIONS

Maximum operating temperature _____	60 °C
Minimum bed depth _____	800 mm
Service flow rate _____	8 to 50 BV*/h
Service velocity _____	60 m/h maximum

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

PURITY

The manufacturing process for this resin is controlled to keep inorganic impurities at the lowest possible level. Special treatment procedures are also used to remove traces of soluble organic compounds. These high standards of resin purity will help keep nuclear systems free of contaminants and deposits, and prevent increases in radioactivity levels due to activation of impurities in the reactor core.

Purity	mg/kg dry resin
Al	≤ 50
Ca	≤ 50
Co	≤ 30
Cu	≤ 10
Fe	≤ 50
Hg	≤ 20
K	≤ 40
Mg	≤ 50
Na	≤ 50
Pb	≤ 10
Total Cl	≤ 500
SiO ₂	≤ 100
Total SO ₄	≤ 600

APPLICATIONS

AMBERLITE IRN78 resin has proved highly effective in the following applications:

Primary water treatment:

AMBERLITE IRN78 resin is very effective in removing ¹³¹Iodine and ¹³³Iodine as well as traces of chloride contamination from reactor coolant systems. It is also useful to control the boron level in the primary system.

Radwaste treatment:

AMBERLITE IRN78 resin is very effective in removing radioactive anions such as ¹³¹Iodine and ¹³³Iodine from waste systems.

Decontamination:

AMBERLITE IRN78 resin removes anionic radioactive material from spent decontaminating solutions.

Steam generator blow down purification:

AMBERLITE IRN78 resin is effective in removing anionic impurities from secondary streams in the presence of ammonia, morpholine or other amines at elevated pH.

HYDRAULIC CHARACTERISTICS

Resin handling

To maintain the high purity of nuclear grade resins, deionized water should be used for all resin handling. If the resin requires backwashing, the bed should be expanded a minimum of 50 %. See figure 1.

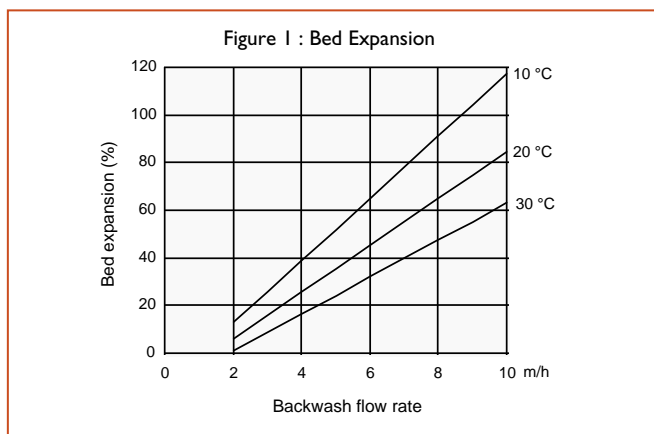
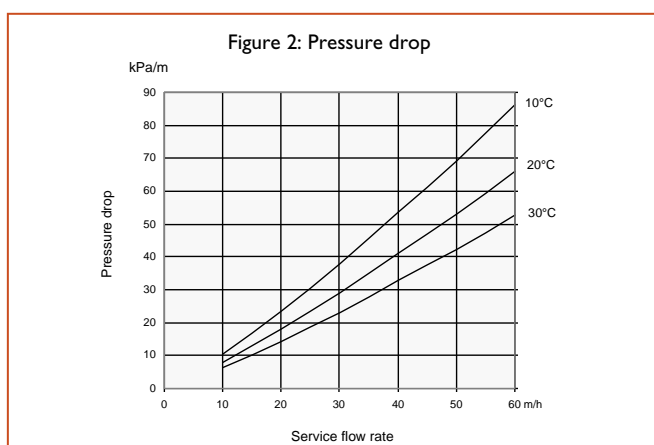


Figure 2 shows the approximate pressure drop for each meter of bed depth of AMBERLITE IRN78 resin in normal downflow operation at various temperatures and flow rates. Pressure drop data are valid at the start of the service run with clear water.



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Ion exchange resins and polymeric adsorbents, as produced, contain by-products resulting from the manufacturing process. The user must determine the extent to which organic by-products must be removed for any particular use and establish techniques to assure that the appropriate level of purity is achieved for that use. The user must ensure compliance with all prudent safety standards and regulatory requirements governing the application. Except where specifically otherwise stated, Rohm and Haas Company does not recommend its ion exchange resins or polymeric adsorbents, as supplied, as being suitable or appropriately pure for any particular use. Consult your Rohm and Haas technical representative for further information. Acidic and basic regenerant solutions are corrosive and should be handled in a manner that will prevent eye and skin contact. Nitric acid and other strong oxidising agents can cause explosive type reactions when mixed with Ion Exchange resins. Proper design of process equipment to prevent rapid buildup of pressure is necessary if use of an oxidising agent such as nitric acid is contemplated. Before using strong oxidising agents in contact with Ion Exchange Resins, consult sources knowledgeable in the handling of these materials.

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