



AMBERLITE® IRN78

Industrial Nuclear Grade Strong Base Anion Resin

PRODUCT DATA SHEET

AMBERLITE IRN78 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 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.

PHYSICAL CHARACTERISTICS

Physical form _____	Uniform particle size spherical beads
Shipping weight _____	690 g/L
Harmonic mean size _____	630 ± 50µm
Uniformity coefficient _____	≤ 1.2
Particle size ^[1] _____	< 0.300 mm : 0.2 % max
	> 1.180 mm : 2.0 % max
Whole beads _____	95 % minimum
Breaking weight (average) _____	≥ 350 g/bead
> 200 g/bead _____	≥ 95 %

CHEMICAL CHARACTERISTICS

Matrix _____	Polystyrene DVB gel
Functional groups _____	Trimethylammonium
Ionic form as shipped _____	OH ⁻
Total exchange capacity ^[2] _____	≥ 1.2 eq/L (OH ⁻ form)
Strong base capacity ^[1] _____	≥ 90 %
Moisture holding capacity ^[1] _____	54 to 60 % (OH ⁻ form)
Ionic conversion ^[1] _____	95 % min OH ⁻
	5 % max CO ₃ ⁼
	0.1 % max Cl ⁻
	0.1 % max SO ₄ ⁼

^[1] Contractual value

^[2] Average value calculated from statistical quality control
Test methods and SQC charts are available on request.

RECOMMENDED OPERATING CONDITIONS

Minimum bed depth _____	800 mm
Maximum operating temperature _____	60 °C
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 has proved highly effective in the following applications :

Primary water treatment :

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

Decontamination :

AMBERLITE IRN78 removes anionic radioactive material from spent decontaminating solutions.

Steam generator blow down purification :

AMBERLITE IRN78 is very 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 retain the high purity standards of nuclear grade resins, deionised 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 1 : Bed Expansion

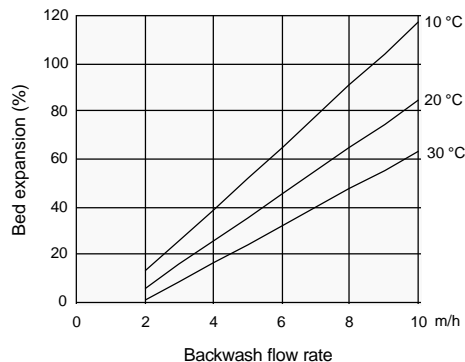
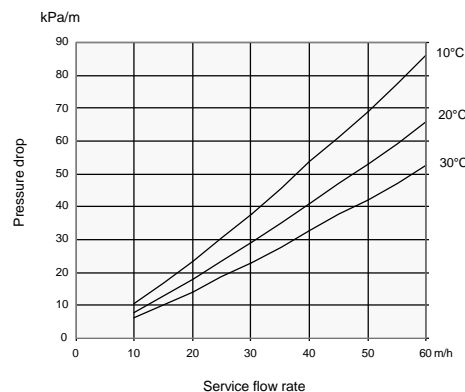


Figure 2 shows the approximate pressure drop for each meter of bed depth of AMBERLITE IRN78 in normal downflow operation at various temperatures and flow rates. Pressure drop data are valid at the start of the service run with a clear water.



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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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