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**AMBERLITE™ IRN78**

Nuclear Grade Strong Base Anion Resin

**Introduction**

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 <sup>-</sup>
Total exchange capacity	≥ 1.20 eq/L (OH <sup>-</sup> form)
Moisture holding capacity	54 to 60 % (OH <sup>-</sup> form)
Shipping weight	690 g/L
Particle size	
Uniformity coefficient	≤ 1.2
Harmonic mean size	0.580 to 0.680 mm < 0.300 mm 0.2 % max
Whole beads	≥ 95 % ≥ 350 g/bead
Breaking weight (average)	≥ 95 % > 200 g/bead ≥ 95 % OH <sup>-</sup>
Ionic conversion	≤ 0.1 % Cl <sup>-</sup> ≤ 0.1 % SO <sub>4</sub> <sup>=</sup>

**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

**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 <sub>2</sub>	≤ 100
Total SO <sub>4</sub>	≤ 600

## Applications

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

### Primary water treatment:

AMBERLITE IRN78 resin is very effective in removing <sup>131</sup>Iodine and <sup>133</sup>Iodine 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 <sup>131</sup>Iodine and <sup>133</sup>Iodine 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.

Figure 1: Bed Expansion

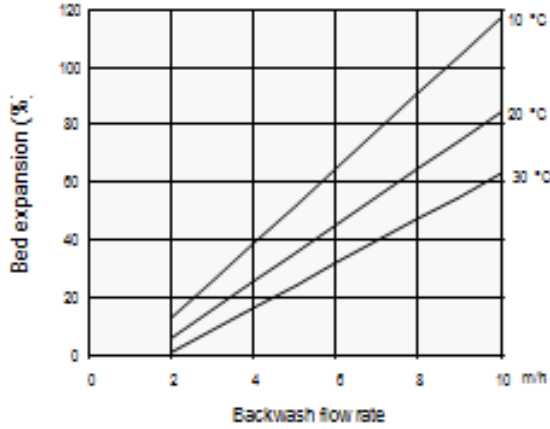
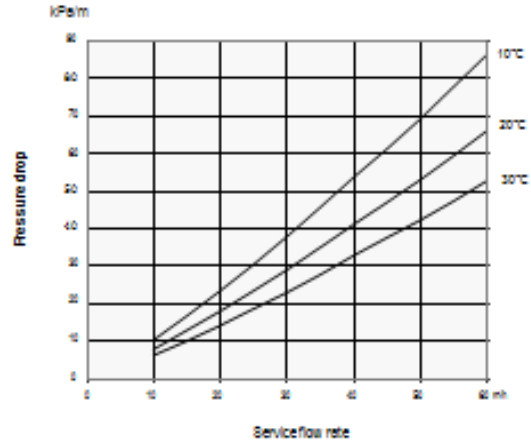


Figure 2: Pressure drop



**For more information about DOW™ resins, call the Dow Water & Process Solutions business:**

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