Product Data Sheet

DuPont™ AmberSep™ IRC747 UPS Chelating Resin

Industrial-grade, Uniform Particle Size, Chelant for Chemical Processing

Description

DuPont™ AmberSep™ IRC747 UPS Chelating Resin is a uniform particle size resin of macroporous structure. Its polystyrenic matrix, crosslinked with divinylbenzene, contains amino-phosphonic groups. The chemical nature of these groups is such that they form complexes with metal ions. The narrow particle size distribution affords an exceptional pressure drop profile.

AmberSep™ IRC747 UPS features very high operating capacity for calcium and is especially useful when treating brines that do not have a very high strontium content. Under these conditions, the resin offers an improved cycle time, displaying also very good removal efficiency for barium and strontium.

AmberSep™ IRC747 UPS is also used for metal recovery in hydrometallurgical applications.

Applications

- Chlor-alkali (brine purification)
- Zinc separation
- Lead separation

Typical Properties

Physical Properties	
Copolymer	Styrene-divinylbenzene
Matrix	Macroporous
Type	Chelant
Functional Group	$–CH_2–NH–CH_2–PO_3–Na_2$
Physical Form	Beige, hard, opaque, spherical beads
Chemical Properties	
Ionic Form as Shipped	Na^+
Total Exchange Capacity	≥ 1.75 eq/L
Water Retention Capacity	64 – 69%
Particle Size [§]	
Particle Diameter	550 ± 50 µm
Uniformity Coefficient	≤ 1.2%
Stability	
Swelling	$H^+ \rightarrow Na^+$: 45%
Density	
Particle Density	1.10 – 1.14 g/mL
Shipping Weight	755 g/L

[§] For additional particle size information, please refer to the Particle Size Distribution Cross Reference Chart (Form No. 45-D00954-en).

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Suggested Operating Conditions

Maximum Operating Temperature	80°C (180°F) in non-aqueous media
Operating pH Range	Depends on the application
Bed Depth, min.	700 mm (2.3 ft)
Operating Flowrate	Up to 40 BV*/h (5 gpm/ft^3)
Regeneration	1 – 2N HCl
Conversion to Na^+ form	1 – 4% NaOH at flowrate of 2 – 4 BV/h

* 1 BV (Bed Volume) = 1 m^3 solution per m^3 resin or 7.5 gal per ft^3 resin

Hydraulic Characteristics

Estimated bed expansion of DuPont™ AmberSep™ IRC747 UPS Chelating Resin as a function of backwash flowrate and fluid specific gravity is shown in Figure 1.

Estimated pressure drop for AmberSep™ IRC747 UPS a function of service flowrate at 40°C (104°F) in brine is shown in Figure 2.

Figure 1: Backwash Expansion

Temperature = 5 – 60°C (41 – 140°F)

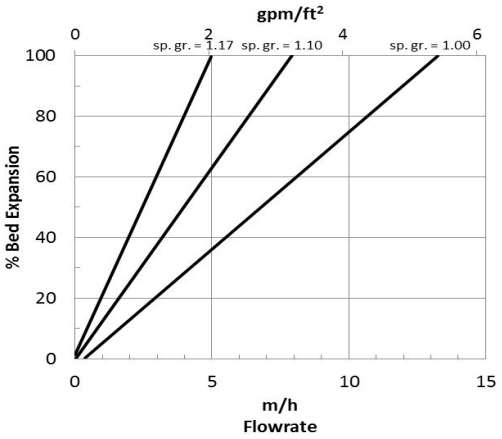
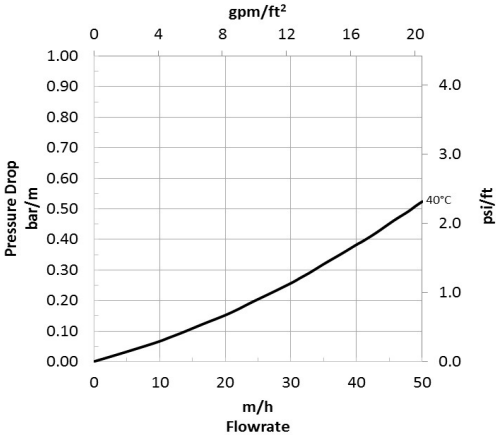


Figure 2: Pressure Drop

Viscosity = 1 – 10 cP



The characteristic reaction of AmberSep™ IRC747 UPS Chelating Resin is:

$$R–CH_2–NH–CH_2–PO_3Na_2 + M^{2+} \rightarrow R–CH_2–NH–CH_2–PO_3M + 2\ Na^+$$

The relative affinity of this resin for the various cations decreases in the order shown below:

$$Pb^{2+} > Cu^{2+} > Zn^{2+} > Mg^{2+} > Ca^{2+} > Cd^{2+} > Ni^{2+} > Co^{2+} > Sr^{2+} > Ba^{2+}$$

The resin can operate in a neutral, acidic, or alkaline medium, but since its capacity depends on the pH, the following minimum pH values are recommended for various cations:

Minimum pH	**2**	**2.5**	**3**	**4.5**
Cations	Cu^{2+}	Zn^{2+}	Cd^{2+}	Mg^{2+}
	Pb^{2+}		Ca^{2+}	Ni^{2+}
				Co^{2+}

Form No. 45-D00806-en, Rev. 2
February 2023

Hydraulic Characteristics (Cont.)

DuPont™ AmberSep™ IRC747 UPS Chelating Resin is a very efficient resin for:

Brine Purification
Removal of Ca, Mg, and other metals present in trace quantities (a few ppm) in concentrated brine, e.g., chlor-alkali electrolysis

Zinc Separation
Separation of zinc from media; for example, in corrosion preventive products in cooling towers

Lead Separation
Separation of lead from industrial effluents, such as waste from oil refineries and battery factories, or solvents and wastes from the manufacture of paints and printing inks

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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