Product Data Sheet

# AMBERSEP™ IRC747 UPS Chelating Resin

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

## Description

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

- Chloralkali (brine purification)
- Zinc separation
- Lead separation

## Typical Physical and Chemical Properties**

| | |
|---|---|
| Matrix | Styrene-divinylbenzene, macroporous |
| Type | Chelant |
| Functional Group | $–CH_2–NH–CH_2–PO_3–Na_2$ |
| Physical Form | Hard, opaque, beige, spherical beads |
| 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 |
| Swelling, maximum reversible | $H^+ \rightarrow Na^+$ : 45% |
| Particle Density | 1.10 – 1.14 g/mL |
| Bulk Density, as Shipped | 755 g/L |

§ For additional particle size information, please refer to the Particle Size Distribution Cross Reference Chart (Form No. 177-01775).



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## Suggested Operating Conditions**

| | |
|---|---|
| Maximum Operating Temperature | 80°C (180°F) in non-aqueous media |
| Operating pH | Depends on the application |
| Bed Depth, min. | 70 cm (28 inches) |
| 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

Bed expansion of AMBERSEP™ IRC747 UPS Chelating Resin as a function of backwash flowrate and fluid specific gravity is shown in Figure 1.

Pressure drop data for AMBERSEP IRC747 UPS as a function of service flowrate at 40°C (104°F) in brine is shown in Figure 2.

**Figure 1: Backwash Expansion**

Specific gravity = 1.00, 1.10, 1.17

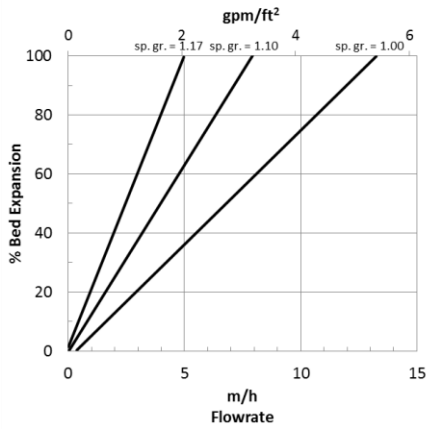
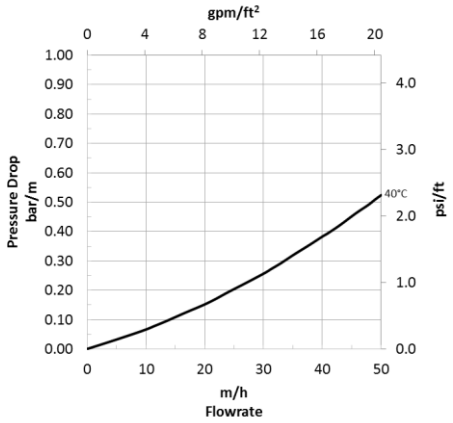



**Figure 2: Pressure Drop**

Brine temperature = 40°C (104°F)



## Application Information

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 | $Cu^{2+}$ | $Zn^{2+}$ | $Cd^{2+}$ | $Mg^{2+}$ |
| | $Pb^{2+}$ | | $Ca^{2+}$ | $Ni^{2+}$ |
| | | | | $Co^{2+}$ |

AMBERLITE™ 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., chloralkali 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



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**For more information, contact our Customer Information Group:**

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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.



**All information set forth herein is for informational purposes only. This information is general information and may differ from that based on actual conditions. Please note that physical properties may vary depending on certain conditions and while operating conditions stated in this document are intended to lengthen product lifespan and/or improve product performance, it will ultimately depend on actual circumstances and is in no event a guarantee of achieving any specific results. Nothing in this document should be treated as a warranty by Dow.





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