



Product Data Sheet

AmberSep™ 43600 Chelating Resin

Industrial-grade Selective Chelant for Platinum Group Metals

Description

AmberSep™ 43600 Chelating Resin is thiuronium-functionalized to be highly selective for platinum group metals (PGMs). It is made using a DuPont-patented process which produces beads with remarkable size uniformity, which provides improved exchange kinetics. The bead size makes this resin well-suited for clarified solutions in fixed bed or fluidized bed applications.

Due to its selectivity for PGMs, AmberSep™ 43600 can be used in hydrometallurgical mining, metal scavenging, and chemical processing. Metal loading up to 10 – 12 g/L of resin (10 – 12 oz/ft³ of resin) has been reported.

The resin can be regenerated with 7 – 15% thiourea in 7 – 15% HCl. Or, due to the high loading capacity of AmberSep™ 43600, it can be economical to recover the metal by pyrolytic destruction of the resin. For more details on this process, contact a technical service representative.

Note that the thiuronium group is subject to base hydrolysis so the product should be used under acidic to neutral pH conditions.

Applications

- Hydrometallurgical extraction of platinum group metals
- Catalyst recovery
- Electroplating

Typical Properties

Physical Properties	
Copolymer	Styrene-divinylbenzene
Matrix	Macroporous
Type	Chelant
Functional Group	Thiuronium
Physical Form	White to tan, opaque, spherical beads
Chemical Properties	
Total Exchange Capacity	≥ 0.7 eq/L
Water Retention Capacity	42 – 54%
Particle Size §	
Particle Diameter	550 ± 50 µm
Uniformity Coefficient	≤ 1.1
Density	
Particle Density	1.06 g/mL
Shipping Weight	675 g/L

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

Suggested Operating Conditions

Maximum Operating Temperature	
OH ⁻ Form	60°C (140°F)
Cl ⁻ Form	100°C (212°F)
pH Range	
	0 – 7 (optimal)
Bed Depth, min.	
	910 mm (3.0 ft)
Flowrates	
Service	2 – 12 BV*/h
Backwash	See Figure 1
Regenerant	
	7 – 15% thiourea in 7 – 15% HCl or pyrolytic destruction to recover the metal

* 1 BV (Bed Volume) = 1 m³ solution per m³ resin or 7.5 gal per ft³ resin

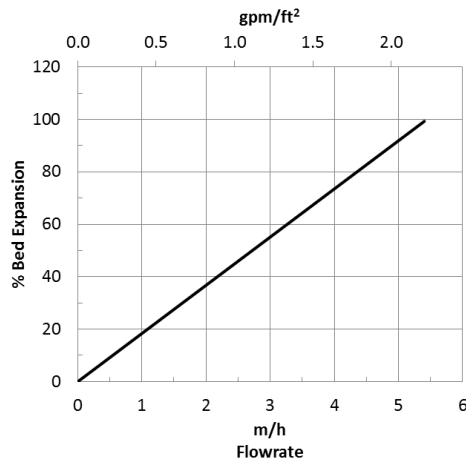
Hydraulic Characteristics

Bed expansion of AmberSep™ 43600 Chelating Resin as a function of backwash flowrate at 25°C (77°F) is shown in Figure 1. The flowrate necessary to achieve a desired bed expansion for other water temperatures can be calculated with the provided equations.

Pressure drop data for AmberSep™ 43600 as a function of service flowrate at 20°C (68°F) is shown in Figure 2. The pressure drop for other water temperatures can be calculated with the provided equations.

Figure 1: Backwash Expansion

Temperature = 25°C (77°F)



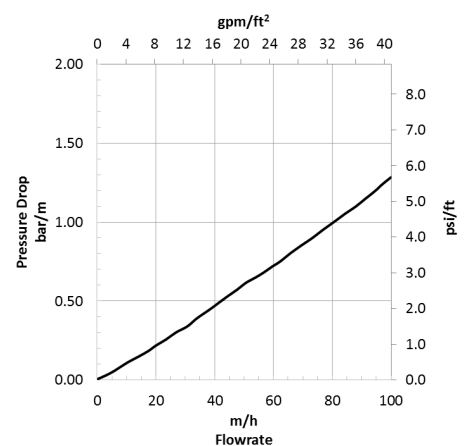
For other temperatures use:

$$F_T = F_{25^\circ\text{C}} [1 + 0.008 (1.8T_{\circ\text{C}} - 45)], \text{ where } F \equiv \text{m/h}$$

$$F_T = F_{77^\circ\text{F}} [1 + 0.008 (T_{\circ\text{F}} - 77)], \text{ where } F \equiv \text{gpm/ft}^2$$

Figure 2: Pressure Drop

Temperature = 20°C (68°F)



For other temperatures use:

$$P_T = P_{20^\circ\text{C}} / (0.026 T_{\circ\text{C}} + 0.48), \text{ where } P \equiv \text{bar/m}$$

$$P_T = P_{68^\circ\text{F}} / (0.014 T_{\circ\text{F}} + 0.05), \text{ where } P \equiv \text{psi/ft}$$

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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:

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