



## Product Data Sheet

### AmberSep™ 43600 Chelating Resin

Industrial-grade Selective Chelant for Platinum Group Metals

#### Description

AmberSep™ 43600 Chelating Resin is thiouronium-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/ft<sup>3</sup> 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 thiouronium 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

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##### Physical Properties

Copolymer	Styrene-divinylbenzene
Matrix	Macroporous
Type	Chelant
Functional Group	Thiouronium
Physical Form	White to tan, opaque, spherical beads

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##### Chemical Properties

Total Exchange Capacity	≥ 0.7 eq/L
Water Retention Capacity	42 – 54%

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##### Particle Size §

Particle Diameter	550 ± 50 µm
Uniformity Coefficient	≤ 1.1

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##### Density

Particle Density	1.06 g/mL
Shipping Weight	675 g/L

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§ 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 <sup>-</sup> Form	60°C (140°F)
Cl <sup>-</sup> 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 m<sup>3</sup> solution per m<sup>3</sup> resin or 7.5 gal per ft<sup>3</sup> resin

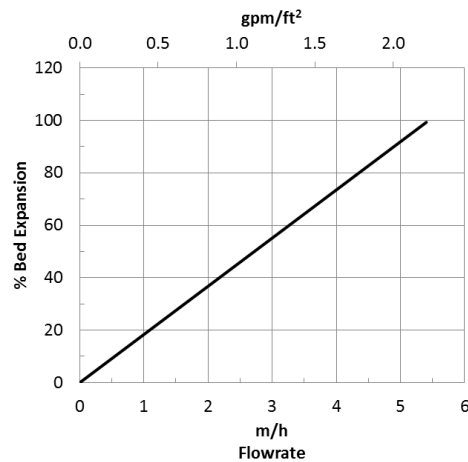
## Hydraulic Characteristics

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)



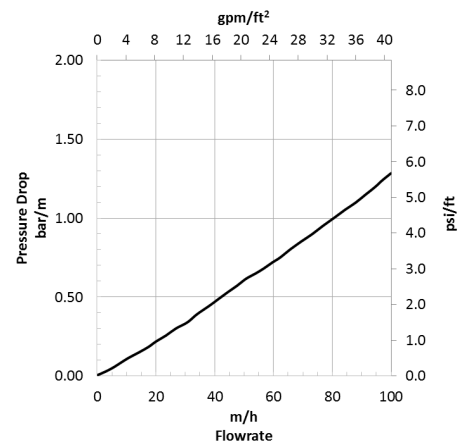
**For other temperatures use:**

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

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

**Figure 2: Pressure Drop**

Temperature = 20°C (68°F)



**For other temperatures use:**

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

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

## 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.

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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:

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