Product Data Sheet

DuPont™ AmberLyst™ 19 Polymeric Catalyst

Industrial-grade, Strongly Acidic Catalyst

Description

DuPont™ AmberLyst™ 19 Polymeric Catalyst is a bead-form, gel, sulfonic acid ion exchange resin developed particularly for heterogeneous catalysis. It is a highly active esterification catalyst for the reaction of acrylic acid with methanol and ethanol to form the corresponding acrylates.

Applications

- Esterification

Typical Properties

Physical Properties	
Copolymer	Styrene-divinylbenzene
Matrix	Gel
Type	Strong acid cation
Functional Group	Sulfonic acid
Physical Form	White to amber, translucent, spherical beads
Chemical Properties	
Ionic Form as Shipped	H^+
Concentration of Acid Sites ‡	≥ 1.80 eq/L
Water Retention Capacity	48 – 54%
Particle Size §	
< 400 µm	≤ 1%
> 1180 µm	≤ 2%
Stability	
Friability:	
Average	≥ 350 g/bead
> 200 g/bead	≥ 95%
Swelling	$Na^+ \rightarrow H^+$: 8%
Density	
Shipping Weight	785 g/L

‡ Total Exchange Capacity (on a water-wet basis) ≥ 1.80 eq/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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February 2023

Suggested Operating Conditions

Maximum Operating Temperature	120°C (248°F)	
Bed Depth, min.	600 mm (2.0 ft)	
Flowrates		
Operating	5 – 50 m/h (2 – 20 gpm/ft^2)	
Linear Hourly Space Velocity (LHSV)	0.5 – 5 h^{-1}	
Backwash	See Figure 1	
Regeneration	1 – 10 m/h (0.4 – 4 gpm/ft^2)	
Displacement Rinse	1 – 10 m/h (0.4 – 4 gpm/ft^2)	
Fast Rinse	5 – 50 m/h (2 – 20 gpm/ft^2)	
Total Rinse Requirement	3 – 6 BV*	
Regenerant	H_2SO_4	HCl
Concentration	1 – 10%	4 – 8%

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

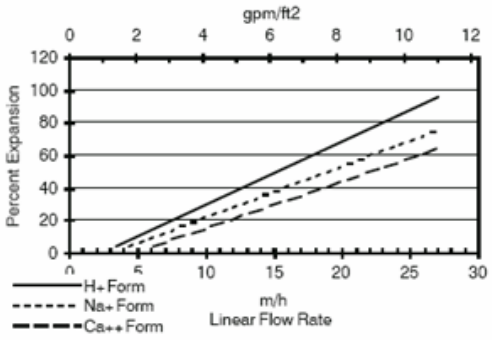
Hydraulic Characteristics

Estimated bed expansion of DuPont™ AmberLyst™ 19 Polymeric Catalyst as a function of backwash flowrate and ionic form 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.

Estimated pressure drop for AmberLyst™ 19 as a function of service flowrate at 20°C (68°F) is shown in Figure 2. These pressure drop expectations are valid at the start of the service run with clean water and a well-classified bed. Estimated pressure drop at other water temperatures can be calculated with the provided equations.

Figure 1: Backwash Expansion

Temperature = 25°C (77°F)



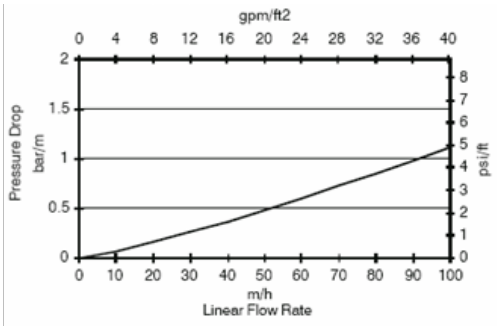
For other temperatures use:

$F_T = F_{25°C} [1 + 0.008 (1.8T_{°C} - 45)]$, where F ≡ m/h

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

Figure 2: Pressure Drop

Temperature = 20°C (68°F)



For other temperatures use:

$P_T = P_{20°C} / (0.026T_{°C} + 0.48)]$, where P ≡ bar/m

$P_T = P_{68°F} / (0.014T_{°F} + 0.05)]$, where P ≡ 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:

www.dupont.com/water/contact-us

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Form No. 45-D00786-en, Rev. 3
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