Product Data Sheet

AMBERLYST™ 15WET Polymeric Catalyst

Industrial-grade Strongly Acidic Catalyst

Description

AMBERLYST™ 15WET Polymeric Catalyst is a strongly acidic, sulfonic acid, macroreticular polymeric resin based on crosslinked styrene-divinylbenzene copolymers. Its continuous open pore structure and excellent physical, thermal, and chemical stability makes it the resin of choice in many applications. It also possesses a greater resistance to oxidants such as chlorine, oxygen, and chromates than most other polymeric resins.

AMBERLYST 15WET is used in a wide variety of organic reactions. It has the optimal balance of surface area, acid capacity, activity, and pore diameter to make it the catalyst of choice for etherification (MTBE, ETBE, TAME), esterification, and hydration reactions. Its optimized pore size distribution makes it an excellent catalyst when fouling is anticipated.

AMBERLYST 15WET can be used for processes where ionic or organic impurities have to be removed or recovered from a process liquor. Both cationic and anionic impurities can be removed through both ionic and adsorptive interactions of the polymer and its acidic groups. Its excellent resistance against oxidation makes it a superior resin in many applications.

AMBERLYST 15WET can be used directly in aqueous systems or in organic media after conditioning with a water-miscible solvent.

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Typical Physical and Chemical Properties**

Matrix	Styrene-divinylbenzene, macroporous
Type	Strong acid cation
Functional Group	Sulfonic acid
Physical Form	Amber, spherical beads
Ionic Form as Shipped	H^+ Form
Concentration of Acid Sites [d]	≥ 4.95 eq/kg ≥ 1.8 eq/kg
Water Retention Capacity	52 – 57%
Particle Size	
Particle Diameter [b]	650 – 800 µm
Uniformity Coefficient	≤ 1.5
< 355 µm	≤ 0.5%
> 1180 µm	≤ 1.0%
Whole Uncracked Beads	≥ 98.5%
Nitrogen BET	
Surface Area	53 m^2/g
Pore Volume	0.40 cc/g
Pore Size, average	300 Å
Shrinkage	Water → Methanol : 5% Water → MTBE : 9% Water → Hexane : 22% Water → Dry : 37%
Bulk Density, as Shipped [c]	780 g/L

[b] For additional particle size information, please refer to the Particle Size Distribution Cross Reference Chart (Form No. 177-01775).
[c] As per the backwashed and settled density of the resin, determined by ASTM D-2187.
[d] Total Exchange Capacity (on a water-wet basis) ≥ 1.8 eq/L; Dry Weight Capacity ≥ 4.95 eq/kg.

Suggested Operating Conditions**

Maximum Operating Temperature	120°C (250°F)	
pH Range	0 – 14	
Bed Depth, min.	100 cm (39 inches)	
Pressure Drop, max.	1 bar (15 psig) across the bed	
Flowrates		
Service	1 – 40 BV*/h (0.125 – 5 gpm/ft^3)	
Backwash	See Figure 1	
Regeneration	4 – 8 BV/h (0.5 – 1.0 gpm/ft^3)	
Slow Rinse	2 BV (15 gal/ft^3) at regeneration flowrate	
Fast Rinse	2 – 4 BV (15 – 30 gal/ft^3) at service flowrate	
Total Rinse Requirement	3 – 5 BV	
Regenerant	HCl	H_2SO_4
Concentration	4 – 10%	1 – 5%
Level (100% basis) ‡	40 – 100 kg/m^3	40 – 200 kg/m^3
	(2.5 – 6 lb/ft^3)	(2.5 – 12 lb/ft^3)
Contact Time, min.	30 minutes	30 minutes

* 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 AMBERLYST™ 15WET Polymeric Catalyst as a function of backwash flowrate and water temperature is shown in Figure 1.

Pressure drop data for AMBERLYST 15WET as a function of service flowrate and water temperature is shown in Figure 2.

Figure 1: Backwash Expansion

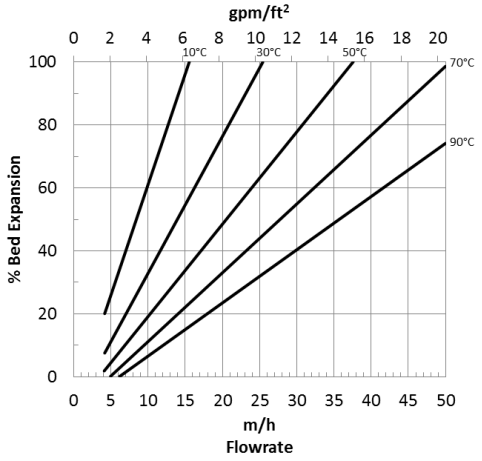
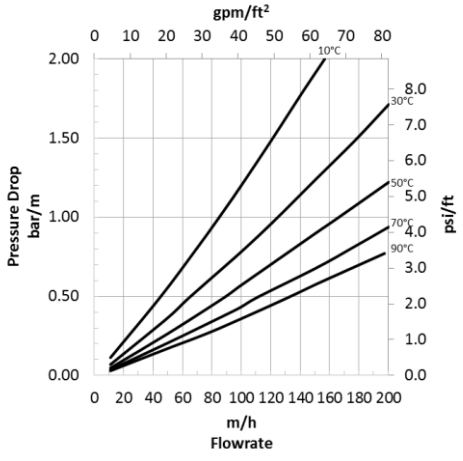


Figure 2: Pressure Drop



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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.

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