



## AMBERLYST<sup>®</sup> A23

Industrial Grade Weakly Basic Polymeric Resin

### Introduction

AMBERLYST A23 is a highly porous granular weak base anion exchange resin, based on crosslinked phenol-formaldehyde polycondensate. Its ion exchange activity is due almost entirely to tertiary amine groups. Consequently, it exhibits a minimum of strong base capacity. Regeneration with little more than stoichiometric amounts of alkali is rapid and complete. It has proven more efficient than conventional polystyrene resins in a variety of applications. The combination of the unique porous matrix and the hydrophilic phenolic structure of AMBERLYST A23 permits the reversible adsorption of high molecular weight color bodies frequently found in solutions of natural products. The main features of AMBERLYST A23 are: low swelling, high capacity, excellent physical and osmotic stability, good resistance to organic fouling.

AMBERLYST A23 can be used to remove mineral and color bodies in organic synthesis such as the production of phenol from cumene hydroperoxide and after cation exchangers like AMBERLYST 40Wet to remove acids in aqueous and non aqueous solutions.

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### Properties

Matrix	Crosslinked phenol-formaldehyde polycondensate
Functional groups	Tertiary amine
Physical form	Green to gray colored granules
Ionic form as shipped	Free Base (FB)
Total exchange capacity	≥ 1.8 eq/L (FB form)
Moisture holding capacity	60 to 65 % (FB form)
Shipping weight	650 g/L (40.6 lbs/ft <sup>3</sup> )
Particle size	
Harmonic mean size	0.470 to 0.740 mm
Uniformity coefficient	≤ 1.9
Fine content	< 0.300 mm : 2.0 % max
Coarse beads	> 1.180 mm : 1.0 % max
Nitrogen BET	
Surface area	128 m <sup>2</sup> /g
Average pore diameter	280 Å
Total pore volume	0.90 ml/g
Swelling	Water to acetone : 1.9 % Water to phenol : 18 %

### Suggested Operating Conditions

Maximum operating temperature	50°C (120 °F)		
Minimum bed depth	700 mm (28 inches)		
Service flow rate	up to 15 BV*/h (1.9 gpm/ft <sup>3</sup> )		
Regenerants	NaOH	Na <sub>2</sub> CO <sub>3</sub>	NH <sub>3</sub>
Level (g/L)	40 to 80	65 to 110	20 to 40
Level (lb/ft <sup>3</sup> )	2.5 to 5	4 to 7	1.25 to 2.5
Concentration (%)	2 to 6	5 to 8	1 to 4

Flow rate (BV/h)	2 to 8 (0.25 to 1 gpm/ft <sup>3</sup> )
Minimum contact time	30 minutes
Slow rinse	4 BV (30 gal/ft <sup>3</sup> ) at regeneration flow rate
Fastrinse	8 to 12 BV (60 to 90 gal/ft <sup>3</sup> ) at 10 BV/h

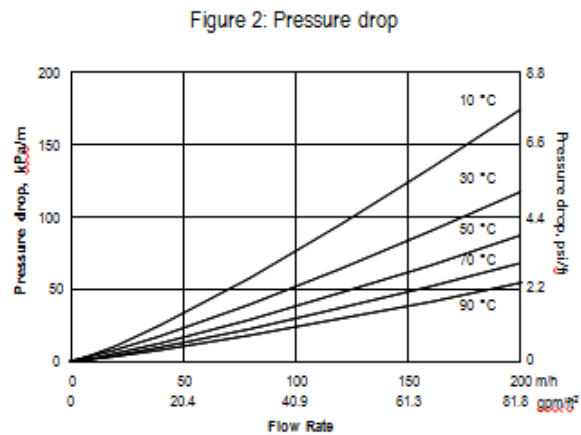
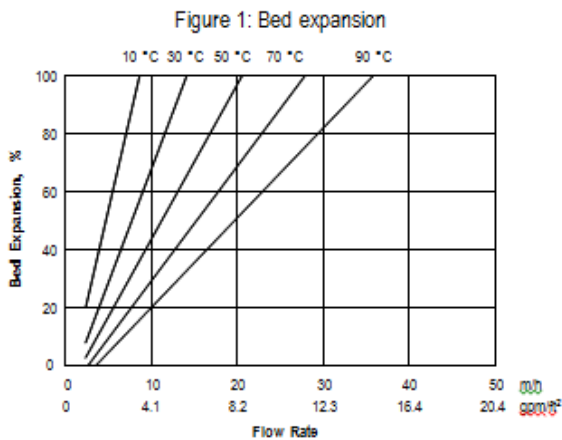
1 BV = 1 m<sup>3</sup> solution per m<sup>3</sup> resin

Remark : AMBERLYST A23 is supplied in the partially dried form. Volume delivered is measured in the fully hydrated form, after being exhausted with dilute HCl, regenerated (see above), backwashed extensively, settled and drained.

## Hydraulic Characteristics

Figure 1 shows the bed expansion of AMBERLYST A23 as a function of backwash flow rate and water temperature.

Figure 2 shows the pressure drop data for AMBERLYST A23 as a function of service flow rate and water temperature.



### For more information about DOW™ resins, call the Dow Water & Process Solutions business:

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