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DOWEX™ UPCORE™ MAC-3
 A Weak Acid Cation Exchange Resin Specifically Designed for the UPCORE System

Product	Type	Matrix	Functional group
DOWEX™ UPCORE™ MAC-3	Weak acid cation	Polyacrylic, macroporous	Carboxylic acid

Guaranteed Sales Specifications			H ⁺ form
Total exchange capacity, min.	eq/L		3.8
	kgr/ft ³ as CaCO ₃		83.0
Water content	%		42 - 52
Bead size distribution [†]			
Range, 400 - 1,200 µm, min.	%		90
> 1,200 µm, max. (16 mesh)	%		1
< 350 µm, max. (45 mesh)	%		1
Whole beads, min.	%		95

Typical Physical and Chemical Properties			H ⁺ form
Total swelling (H ⁺ → Na ⁺)	%		~70
Particle density	g/mL		1.18
Shipping weight**	g/L		750
	lbs/ft ³		47

Recommended Operating Conditions	• Maximum operating temperature	120°C (250°F)
	• pH range	5 - 14
	• Bed depth, min.	1,000 mm (3.3 ft)
	• Pressure drop, design max.	1.5 bar (22 psi)
	• Pressure drop, max.	2.5 bar (37 psi)
	• Flow rates:	
	Service/fast rinse	5 - 50 m/h (2 - 20 gpm/ft ²)
	Regeneration/displacement rinse	5 - 50 m/h (2 - 20 gpm/ft ²) for H ₂ SO ₄ 6 - 12 m/h (2.4 - 4.8 gpm/ft ²) for HCl
	• Total rinse requirement	3 - 6 Bed volumes
	• Regenerant	1 - 5% HCl, 0.5 - 0.8% H ₂ SO ₄

[†] For additional particle size information, please refer to Particle Size Distribution Cross Reference Chart (Form No. 177-01775).

** As per the backwashed and settled density of the resin, determined by ASTM D-2187.

Typical Properties and Applications

DOWEX™ UPCORE™ MAC-3 macroporous weak acid cation exchange resins contain carboxylic acid functional groups attached to a polyacrylic-divinylbenzene matrix. The particle size is specially chosen for use in the UPCORE packed bed counter-current regeneration system.

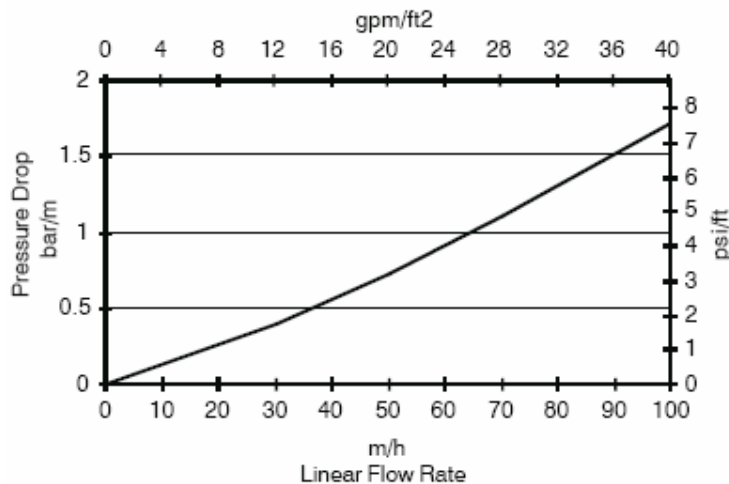
DOWEX UPCORE MAC-3 resin efficiently removes hardness associated with alkalinity. When used in combination with DOWEX UPCORE Mono C-600 resin, DOWEX UPCORE MAC-3 resin can be regenerated with effluent acid from the strong acid cation regeneration. This results in highly efficient regeneration of the cation resin pair.

Packaging

25 liter bags or 5 cubic feet fiber drums

Figure 1. Pressure Drop Data

Temperature = 20° C (68° F)



For other temperatures use:

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

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

DOWEX™ Ion Exchange Resins

For more information about DOWEX resins, call the Dow Water Solutions business:

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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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