



DOWEX MAC-3

A Macroporous Weak Acid Cation Exchange Resin used for Water Softening, Dealkalization & Demineralization Applications

Product	Type	Matrix	Functional group
DOWEX* 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
Bead size distribution range† 0.3 mm - 1.2 mm, min. (50 mesh - 16 mesh)	%	90

Typical Physical and Chemical Properties	H ⁺ form	
Water content	%	44 - 50
Whole Beads	%	95 - 100
Total swelling (H ⁺ → Ca ⁺)	%	15
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.	800 mm (2.6 ft)
Flow rates:	
Service/fast rinse	5-50 m/h (2-20 gpm/ft ²)
Backwash	See figure 1
Regeneration/displacement rinse	1-10 m/h HCl (0.4-4 gpm/ft ²), 5-20 m/h H ₂ SO ₄ (2-8 gpm/ft ²)
Rinse	5-20 m/h (2-8 gpm/ft ²)
Total rinse requirement	3-6 Bed volumes
Regenerant	1-5% HCl or 0.5-0.8% H ₂ SO ₄

†For additional particle size information, please refer to the Particle Size Distribution Cross Reference Chart (Form No. 177-01775/CH 171-476-E).

DOWEX Ion Exchange Resins

For more information about DOWEX resins, call Dow Liquid Separations business:

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<http://www.dow.com/liquidseps>

Typical properties and applications:

DOWEX* MAC-3 weak acid cation resin has high exchange capacity, excellent regeneration efficiency, very good resistance to osmotic shock, plus good chemical and physical stability. DOWEX MAC-3 resin is effective in removal of temporary hardness (hardness associated with alkalinity) and dealkalization. It is also used for

recovery of metals. DOWEX MAC-3 resin can be supplied on request for use in food and potable water applications in accordance to the TOC (Total Organic Carbon) requirements of the major European legislations. In such cases, a recommendation is given for resin conditioning before use.

Packaging

25 liter bags or 5 cubic feet fiber drums.

Figure 1. Backwash Expansion Data

Temperature = 25° C (77° F)

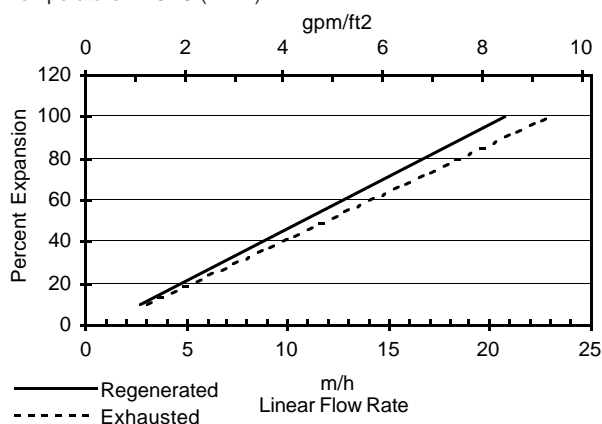
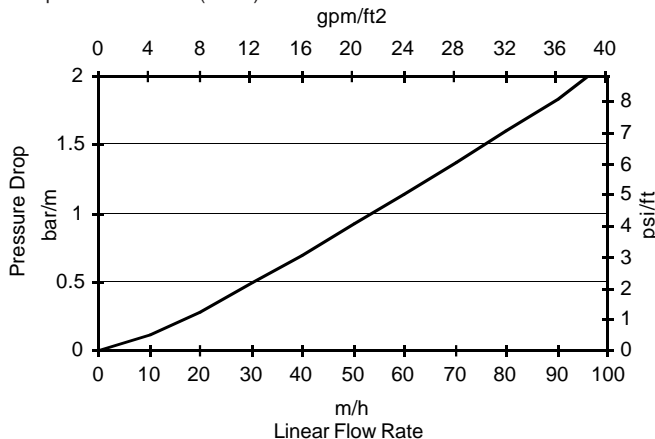


Figure 2. Pressure Drop Data

Temperature = 20° C (68° F)



For other temperatures use:

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

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

For other temperatures use:

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

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

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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