



## DOWEX™ MAC-3 Resin Macroporous Weak Acid Cation Exchange Resin

For Water Softening, Dealkalization and Demineralization Applications

### Description

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

### Typical Physical and Chemical Properties

Physical Form		White to amber opaque beads
Matrix		Polyacrylic, macroporous
Functional group		Carboxylic acid
Ionic form as shipped		H <sup>+</sup> form
Total volume capacity, min.	eq/L kgr/ft <sup>3</sup> as CaCO <sub>3</sub>	3.8 83.0
Particle size† 300–1,200 μm, min. (50 mesh–16 mesh)	%	90
Moisture retention capacity	%	44–52
Whole beads	%	90–100
Total swelling (H <sup>+</sup> → Na <sup>+</sup> )	%	~70
Particle density	g/mL	1.18
Shipping density**	g/L lbs/ft <sup>3</sup>	750 47

† 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

### Suggested 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 Backwash Regeneration/displacement rinse	5–50 m/h (2–20 gpm/ft <sup>2</sup> ) See figure 1 1–10 m/h HCl (0.4–4 gpm/ft <sup>2</sup> ) 5–20 m/h H <sub>2</sub> SO <sub>4</sub> (2–8 gpm/ft <sup>2</sup> ) 5–20 m/h (2–8 gpm/ft <sup>2</sup> )
Total rinse requirement	3–6 BV*
Regenerant	1–5% HCl or 0.5–0.8% H <sub>2</sub> SO <sub>4</sub>

\*1 BV (Bed Volume) = 1 m<sup>3</sup> solution per m<sup>3</sup> resin or 7.5 gals per ft<sup>3</sup> resin

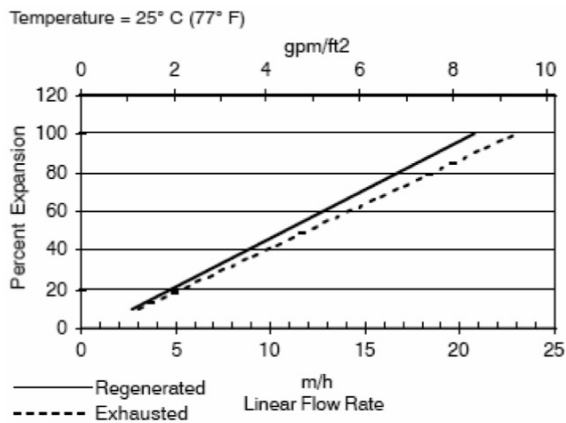
## Packaging

25 liter bags or 5 cubic feet fiber drums

## Hydraulic Characteristics

Figure 1 shows the bed expansion of DOWEX™ MAC-3 resin as a function of backwash flow rate and water temperature. Figure 2 shows the pressure drop data for DOWEX MAC-3 as a function of service flow rate and water temperature. Pressure drop data are valid at the start of the service run with clear water and a correctly classified bed.

### Figure 1. Backwash Expansion Data

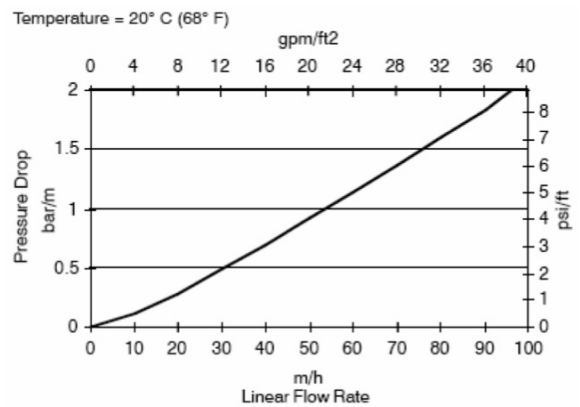


#### For other temperatures use:

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

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

### Figure 2. Pressure Drop Data



#### For other temperatures use:

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

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

## **Product Stewardship**

Dow 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 Dow products - from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

## **Customer Notice**

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products. Current safety data sheets are available from Dow.

### **DOW™ Ion Exchange Resins** For more information about DOW™ resins, call the Dow Water & Process 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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