

**DOWEX™ FPC16UPS Na Ion Exchange Resin**

Uniform Particle Size, High Capacity Strong Acid Cation Exchange Resin

Description

DOWEX™ FPC16UPS Na Strong Acid Cation Exchange Resin is a uniform particle size resin designed for beet sugar thin juice softening and can also be used in other specialty applications such as demineralization in dairy applications (after conversion to the H⁺ form) or amino acid recovery and purification. The small uniform beads exhibit faster kinetics than conventionally sized resins. The improved kinetics can result in improved regeneration efficiency, higher operating capacity, reduced regenerant usage and less wastewater. DOWEX FPC16UPS Na resin also shows outstanding stability to compressive and osmotic stress.

Applications

- Beet sugar thin juice softening
 - Gryllus process
- Quentin process for sugar recovery
- Dairy demineralization
- Amino acid recovery and purification (i.e., L-lysine, etc.)

Typical Physical and Chemical Properties**

Physical Properties	
Copolymer	Styrene-divinylbenzene
Matrix	Gel
Type	Strong acid cation
Functional Group	Sulfonic acid
Physical Form	Amber, translucent, spherical beads
Chemical Properties	
Ionic Form as Shipped	Na ⁺
Total Exchange Capacity	≥ 2.0 eq/L
Water Retention Capacity	42 – 48%
Particle Size §	
Particle Diameter	600 ± 50 µm
Uniformity Coefficient	≤ 1.1
Stability	
Whole Uncracked Beads	≥ 95%
Swelling	Na ⁺ → H ⁺ : 8%
Friability:	
Average	≥ 350 g/bead
> 200 g/bead	≥ 95%
Density	
Particle Density	1.28 g/mL
Bulk Density as Shipped	820 g/L

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

Suggested Operating Conditions**

Maximum Operating Temperature	93°C (200°F)	
pH Range	0 – 14	
Bed Depth, min.	1000 mm (3.3 ft)	
Flowrates		
Service	2 – 8 BV*/h	
Backwash	See Figure 1	
Fast Rinse	2 – 8 BV/h	
Contact Time		
Regeneration	30 – 45 minutes	
Displacement Rinse	30 – 45 minutes	
Total Rinse Requirement	2 – 5 BV	
Regenerant	NaCl	HCl
Concentration	10%	7%
Level	90 – 240 kg/m ³ (5.6 – 15 lb/ft ³)	80 – 96 kg/m ³ (5 – 6 lb/ft ³)
Temperature, max.	93°C (200°F)	93°C (200°F)

* 1 BV (Bed Volume) = 1 m³ solution per m³ resin or 7.5 gal solution per ft³ resin

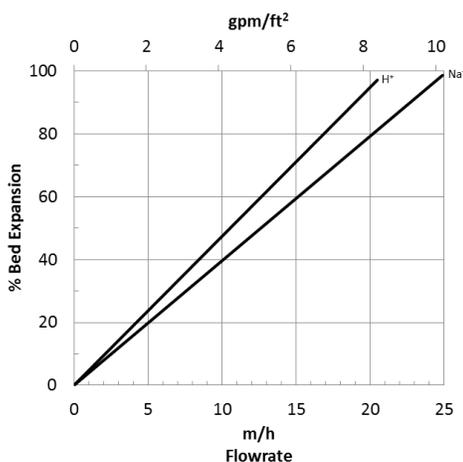
Hydraulic Characteristics

Bed expansion of DOWEX™ FPC16UPS Na Ion Exchange Resin as a function of backwash flowrate at 25°C (77°F) is shown in Figure 1. The flowrate necessary to achieve a desired bed expansion for other water temperatures can be calculated with the provided equations.

Pressure drop for DOWEX FPC16UPS Na as a function of service flowrate at 20°C (68°F) is shown in Figure 2. These pressure drop expectations are valid at the start of the service run with clean water.

Figure 1: Backwash Expansion

Temperature = 25°C (77°F)



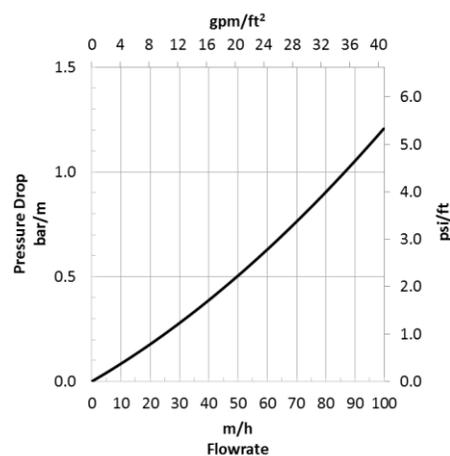
For other temperatures use:

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

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

Figure 2: Pressure Drop

Temperature = 20°C (68°F)



For other temperatures use:

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

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

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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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