

GENERAL TECHNOLOGIES, SPC

- High-Quality Services & Products

Tel: 913-766-5566, Fax: 253-663-9333

Web: <http://gtspc.com>, Email: info@gtspc.com

Engineering Datasheet – D890

Anion Exchange Resin - Nitrate Selective

DESCRIPTION

GENERAL TECHNOLOGIES' D890 is a strong base anion exchange resin supplied in the chloride form as moist, tough, uniform spherical beads. It is especially useful in nitrate removal applications due to its ability to remove nitrates preferentially in the presence of sulfates and other divalent ions. The use of General Technologies D890 eliminates nitrate dumping and retains a greater degree of its operating capacity in the presence of high levels of sulfates where standard anion resins such as A307, A351 and A302, would suffer loss in operating efficiencies and exhibit nitrate dumping in the presence of sulfates.

FEATURES & BENEFITS

- **HIGHEST OPERATING CAPACITY OF ANY NITRATE SELECTIVE RESIN**

The unique amine functional group has been optimized to retain the highest operating capacity for a selective resin.

- **COMPLIES WITH FDA REGULATIONS**

Conforms to paragraph 21CFR 173.125 of the Food Additives Regulations of the US Federal Food & Drug Administration (FDA)



- **NSF STANDARD**

- **HIGHLY UNIFORM PARTICLE SIZE, LOW PRESSURE DROP**

0.315 mm to 1.25mm size range, giving a LOWER PRESSURE DROP while maintaining SUPERIOR KINETICS.

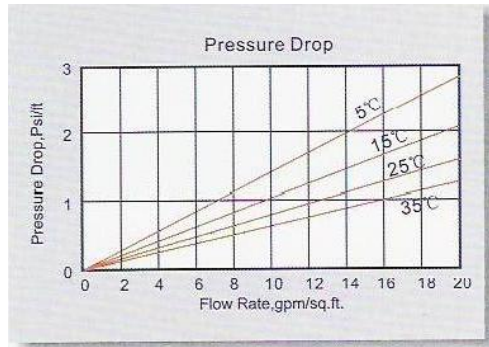
- **SUPERIOR PHYSICAL STABILITY**

95% plus sphericity and high crush strengths together with a very uniform size provide greater resistance to bead breakage.

- **LOW COLOR THROW**

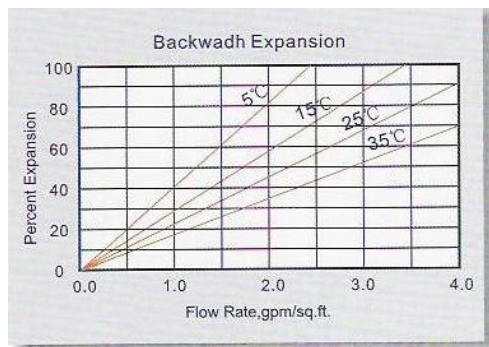
For potable water applications, the resin must be properly pre-treated, usually by multiple exhaustion and regeneration cycles, to insure compliance with extractable levels.

HYDRAULIC PROPERTIES



PRESSURE DROP

The graph shows the expected pressure loss per foot of bed depth as a function of flow rate at various water temperatures.



BACKWASH

After each cycle the resin bed should be backwashed at a rate that expands the bed 50 to 75 percent. This will remove any foreign matter and reclassify the bed. in the sodium form.

PHYSICAL PROPERTIES

Polymer Structure	Styrene with DVB
Functional Group	R-N-(R) ₃ ⁺ Cl ⁻
Ionic Form, as shipped	Chloride
Physical Form	Tough, Spherical Beads
Screen Size Distribution	0.315mm to 1.25mm
>1.25mm	<5percent
<0.42mm	<2percent
<0.315mm	<1percent
pH Range	0-14
Sphericity	>95 percent
Uniformity Coefficient	Approx. 1.6
Water Retention	
Chloride Form	50 to 60 percent
Solubility	Insoluble
Approximate Shipping Weight	
Chloride Form	0.66~0.72g/ml
Swelling Cl ⁻ to OH ⁻	Approx. 15 percent
Total Capacity	
Chlorid Form	0.85 mmol/ml min.

SUGGESTED OPERATING CONDITIONS

Maximum Temperature	
Salt Form	60 °C
Minimum Bed Depth	600mm
Backwash Rate	50 to 75% Bed Expansion
Regenerant Concentration	5-8 percent
Regenerant Flow Rate	3 to 5 m/h
Regenerant Contact Time	At least 30 Minutes
Displacement Rinse Rate	Same as Regenerant Flow Rate
Displacement Rinse Volume	Approx. 2 BV*.
Fast Rinse Rate	Same as Service Flow Rate
Fast Rinse Time	5 to 8 BV
Service Flow Rate	30 to 60 BV

*1 BV (Bed Volume) = 1m³ solution per m³ resin.

OPERATING CAPACITY

The operating capacity of General Technologies D890 for nitrate removal at various regeneration levels when treating an influent with a concentration of 500 ppm as CaCO₃ is shown in the following table:

Pounds NaCl/cu.ft.	Capacity Kilograins/cu.ft. As Ca CO ₃			
	Water Analyses: Cl/HCO ₃ = 1:1; NO ₃ =100ppm as C _a CO ₃			
	Percent Sulfate			
	0	25	50	75
5	8.2	7.0	6.6	6.5
10	10.0	8.5	8.1	7.9
15	10.8	9.2	8.7	8.6
120	11.3	9.6	9.1	8.9

APPLICATIONS

The unique functional group gives General Technologies D890 over 35 times greater affinity for absorbing monovalent ions against multivalent ions than standard Type 1 or Type 2 strong base anion resins at 500 ppm TDS.

Nitrate Removal from Potable Waters

General Technologies D890 removes nitrates efficiently with low leakage. Its unique amine functional group eliminates the possibility of nitrate dumping, which can occur with other standard types of resins. Also, D890 meets potable water requirements for all major European agencies.

Perchlorate in ground waters has been identified as a nuisance and potential health hazard. The perchlorate ion is so strongly attracted to anion exchange resins that in some cases it makes regeneration impractical. However, perchlorate concentration is usually so low that multivalent ions such as sulfate can dramatically reduce the loading for perchlorate by normal resins. General Technologies D890 can be used in these applications to maintain

high loading and favorable economics. When used in conjunction with other exchangers it can become part of a superior process offering a high kinetic rate to make otherwise slow processes operate at a faster rate.

Chemical Processing and Resource Recovery

General Technologies D890 can be used to remove certain monovalent ions like nitrates, bromides, iodides, etc. from streams containing multivalent ions. Consult our technical representative for recommendations for specific applications.

***CAUTION: DO NOT MIX ION EXCHANGE RESIN WITH STRONG OXIDIZING AGENTS.** Nitric acid and other strong oxidizing agents can cause explosive reactions when mixed with organic materials, such as ion exchange resins.

Material Safety Data Sheets (MSDS) are available for GENERAL TECHNOLOGIES products. To obtain a copy, contact our office. They contain important health and safety information, which may be needed to protect your employees and customers from any known health and safety hazards associated with our products. We recommend that you secure and study the pertinent MSDS for our products and any other products being used. These suggestions and data are based on information we believe to be reliable. They are offered in good faith. However, we do not make any guarantee or warranty. Our caution against using these products in an unsafe manner or in violation of any patents; further, we assume no liability for the consequences of any such actions.