Resin Glossary

Acid
A substance which releases hydrogen ions when dissolved in water. Most acids will dissolve the common metals and will react with a base to form a neutral salt and water.

Acrylic Resin
Resin that is made with an acrylic polymer instead of a styrene polymer. Acrylic resins can be activated with weakly acidic, weakly basic, or strongly basic exchange groups.

Anion Resin
A positively charged resin bead that exchanges negatively charged ions in the water. *(See ProSelect™)*

Bed Expansion
The increase in volume of a bed of ion exchange resin or filter media during upflow operations such as backwashing, due to lifting and separation of bed materials.

Capacity
The amount of an element that resin will pick up before it needs to be regenerated. With softening resin, this usually applies to hardness measured in kilograms per cubic foot of resin. Standard cation resins, once in service, will generally remove 30,000 kilograms of hardness after it is regenerated with salt (sodium chloride). With nitrate removal, resin calculations can be done to estimate the ppm (parts per million) of nitrate removal before the resin bed is exhausted and another regeneration of salt is needed. Capacity is measured in many different ways and other elements can run interference on a resin's capacity.

Cation Resin
A negatively charged resin bead that exchanges positively charged ions in the water. Cation resin is most often used for removing calcium and magnesium (hardness) from water. *(See ProSoft™)*

Contact Time
The time that brine or other regenerant, at the proper strength, is moving through the resin bed.

Crosslink
A chemical bridge that connects the polymer chains of a resin bead; the glue that holds the resin beads together. Generally, the higher the crosslink, the tougher the resin. For cation resins, higher crosslinking also means more resistance to chlorinated water.

Dyed Resin
Resin that is colored with a dye that is pH sensitive and changes color as the pH of the resin changes.

DVB
Abbreviation for "Divinylbenzene." Divinylbenzene is the chemical most commonly used to crosslink polymers that are used to make ion exchange resins.

Effective Size
A measure of the size of particles of an ion exchange resin or filter media, defined as the diameter of a specific particle in a bed, batch, or lot which has 10 percent smaller, and 90 percent larger, particles.

Elution
The stripping of ions from an ion exchange material by other ions, either because of greater affinity or because of much higher concentration.

Fouling
The process in which undesirable foreign matter accumulates in a bed of filter media, ion exchange resin, or membrane process, clogging pores and coating surfaces, thus inhibiting the proper operation of the system. This can be due to the presence of suspended solids, precipitated salts, or biological growth, and can cause a decrease in both the amount of water produced and the quality of water.

Freeboard
The vertical distance between the top of a resin bed or filter media and the overflow or collector for backwash water. This may be expressed either as a linear distance or a percentage of bed depth.

SAFE WATER TECHNOLOGIES, INC.
996 BLUFF CITY BOULEVARD, ELGIN, IL 60120 USA
TELEPHONE 847 888 6900 • FACSIMILE 847 888 6924
E MAIL: info@swtwater.com • WEB SITE: www.swtwater.com

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Gel Resin
Resins that do not have discrete pores and are translucent in appearance. Gel resins generally have higher capacity than macroporous resins.

Ionic Form
Refers to the particular type of ion that is exchanged onto an ion exchange resin. (e.g., The ionic form of ProSelect™ Tannin is Cl (chloride) and the regenerant used is salt (sodium chloride). This means that the chloride side of the salt is the exchanged ion.)

Leakage
The presence of a consistent concentration of ions in the effluent of an ion exchange system, due to incomplete removal of the ions.

Macroporous Resins
Resins that have discrete pores and are opaque in appearance. Macroporous resins are generally stronger than gel resins.

Mixed Bed
The blending of cation and anion resins into a single bed. These resins are mostly used in D.I. or specialty applications. By mixing and matching different resins and ratios, different results can be accomplished.

Operating Capacity
The quantity of ions that can be exchanged by a resin before leakage bleed through of ions occurs. This term also refers to resin in service, rather than resin fresh out of the bag.

ProSelect™
At SWT, we believe it is the best anion resin you can buy.

ProSoft™
At SWT, we believe it is the best cation resin you can buy.

Regeneration
This process includes the backwash, brine, and fresh water rinse steps necessary to prepare a water softener ion exchange bed for service after exhaustion.

Selectivity (Relative Affinity)
A quantitative measure of a resin's preference for various ions at equilibrium between the resin and water. In general, an ion with greater selectivity will be removed preferentially to an ion with lower selectivity (e.g., as in the case of "nitrate selective" resins).

Strong Base
Anion resins that are capable of splitting salts and can therefore operate in an alkaline environment and can remove weakly ionized substances, such as carbon dioxide and silica.

Total Capacity
The maximum quantity of ions that a resin is capable of exchanging.

Total Dissolved Solids
The quantity of all the dissolved minerals in water.

Type 1
Strong base anion resins that are activated with trimethylamine. These resins are relatively more stable and produce higher water quantity, but have lower capacity and give off a "fishy" odor when used in the hydroxide form.

Type 2
Strong base anion resins that are activated with dimethylethanolamine. These resins have a higher capacity and are more easily regenerated, but do not produce as high of a water quality and generally have a shorter life.

Weak Base
Anion resins that can only function under acidic conditions, and can only exchange for strong acids and that can not remove weakly ionized substances.

Zeolite
A class of inorganic ion exchange materials that are based on aluminosilicate chemistry (e.g., clay based compounds). Zeolites have lower capacities than ion exchange resins, but are more selective for certain ions.

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