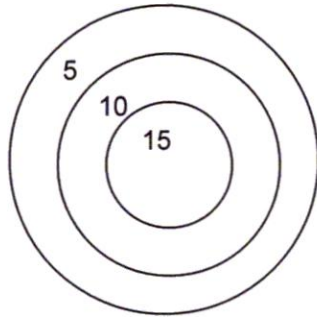


Softener Resin Capacity and General Info

Resin



5# Salt / ft ³	=	20,000 grain removal / ft ³ resin
10# Salt / ft ³	=	25,000 grain removal / ft ³ resin
15# Salt / ft ³	=	30,000 grain removal / ft ³ resin

10 grain TH feed water

Efficiency

5# =	2,000 gal	5# =	4,000 grain / # salt
10# =	2,500 gal	10# =	2,000 grain / # salt
15# =	3,000 gal	15# =	3,000 grain / # salt

Hardness Leakage

5# =	5-7 mg/l TH
10# =	3-5 mg/l TH
15# =	1.2 mg/l TH

Sodium Cycle Resin Regeneration

Summary

Regenerating resin to the sodium form is the most common application of all resin use. The process is relatively simple yet must be occur within specific ranges. Regenerating outside of the ranges causes numerous problems. These include:

- ✓ Unacceptable Hardness Leakage to Service
- ✓ Salty Water to Service
- ✓ High salt usage

Understanding and following the basic ranges will provide high unit performance and a satisfied user.

Regeneration Steps

The purpose of regeneration is to make resin reusable. During the service cycle the resin loses its ability to soften the water (becomes exhausted) and must be regenerated. Standard process steps for regeneration are:

1. Backwash, to expand the bed in a reverse flow, purge any debris to drain and reclassify resin beads. This cycle also prevents bed compaction and reduces the opportunity of channeling.
2. Brining uses dissolved salt usually NaCl or KCl. Dissolved salt is drawn or pumped from a brine tank. The salt is drawn at a high solution concentration and diluted within the operation of the water softener. The sodium portion of the salt is used to convert the resin from an exhausted state to a regenerated state. This occurs due to the resins ability to exchange one ion for another. In this case the exchange is hardness ions for sodium.
3. Slow Rinse is used to complete the displacement of the regenerate and once the necessary amount has been introduced it rinses traces amount to drain.
4. Fast Rinse is used to pack the bed down and prepare the resin for service flow.
5. Refill is used to provide water back to the brine tank for make-up salt solution for the next regeneration.

Regeneration Process

Regeneration steps provide standard cycle definition and purpose. The process differs as the steps are defined more closely with flows, regenerate solution concentration, amounts of regenerates, amount of regenerate rinse and contact times. The resin manufacturer specifies the process. Refer to the attached resin specification sheets.

This discussion is based on the following operating conditions:

- Back Wash Expansion
- Regenerant type
- Regenerate Strength
- Regenerant Levels
- Regenerant Flow Rate
- Regenerant Injection Time
- Slow Rinse Volume
- Slow Rinse Rate
- Fast Rinse Rate
- Fast Rinse Volume

end