Acid neutralizing water filter resin

Good write up on basics and water quality and what to do if iron etc.
http://www.bae.ncsu.edu/programs/extension/publicat/wqwm/he419.html

Acid-neutralizing Filters
Acid-neutralizing filters are used to reduce water acidity. They add crushed calcite or some other carbonate-based mineral at controlled rates to raise the water's pH and decrease corrosivity. The water to be treated must be low in tannins and free of oil. The filter media must be replaced periodically. Backwashing is recommended to remove trapped particles and oxidized metals unless a sediment filter is installed ahead of the unit.

Glossary for Water Treatment Systems, Equipment, Service and Supplies
http://www.reskem.com/pages/glossary.php

Calcium Carbonate	Calcite, GA Marble, Georgia Marble, Limestone	A chemical coumpound found in nature as calcite (in limestone, marble and chalk) and aragonite (in pearls) and in plant ashes, bones and many shells. Used to raise the pH reading (reduce the acidity) of low pH (acidic) water and to filter out sediment.
Cation Resin	SAC, Strong Acid Cation, Softener Resin, WAC, Weak Acid Cation, Zeolite, Softener Beads, Softner Beads, Softner Resin	An ion with a positive charge. Cation Exchange is an ion exchange process in which cations in solution are exchanged for other cations from an ion exchanger.
KDF	Redox Alloy	A trade name for a patented medium composed of high purity copper and zinc granules. KDF is capable of removing chlorine, soluble heavy metals, and other inorganic contaminants from water through the chemical reduction/oxidation (redox) process.
Manganese Greensand	Greensand	Greensand which has been processed to incorporate the higher oxides of manganese into its pores and onto its surface. Manganese greensand has a mild oxidizing power and is often used in the oxidation, precipitation and removal of iron, manganese, and/or hydrogen sulfide. It is regenerated by solutions of potassium permaganate (KmnO4).
Neutralizer	Neutralize	An alkaline sustance such as calcium carbonate (calcite) or mangnesium oxide (magnesia) used to neutralize acidic waters or an acidic substance such as acetic acid or dilute hydrochloric acid used to neutralize alkaline waters. The term "neutralizer" is commonly used to refer to calcite or magnesia acid-neutralizing filters used to neutralize acidity and/or reduce free carbon dioxide in water and thereby raise the pH of acidic water.

http://www.crystalquest.com/data%20sheet%20Ca.htm

http://www.bae.ncsu.edu/programs/extension/publicat/wqwm/he419.html

Neutralizing Filters and Chemical-Feed Pumps

Neutralizing filters and chemical-feed pumps adjust the pH of water. A pH of 7 is neutral, while a pH less than 7 is acidic, and a pH greater than 7 is alkaline. Water should be as close to pH 7 as possible. Very low or very high pH water is corrosive, which can cause leaching metals from plumbing systems or forming scale in pipes. Signs of very low or very high pH water are blue-green stains from copper plumbing or red stains from galvanized plumbing.

Tank-type neutralizing filters or chemical-feed pumps that inject a neutralizing solution into the well neutralize acid water. If iron treatment is needed, the chemical-feed pump system is required. Tank-type neutralizing filters pass the water through granular calcite (marble, calcium carbonate, or lime) or magnesia (magnesium oxide). They treat water as low as pH 6. They must be installed after the pressure tank. These systems make the water harder.

For water less than pH 6, chemical-feed pumps inject a neutralizing solution of soda ash (sodium carbonate) or caustic soda (sodium hydroxide) into the well. This raises the sodium content of the water. Potassium can be substituted for sodium, but potassium is more expensive. Keep the solution tank full and adjust the feeder to provide the correct rate to result in a pH of near 7. For water between pH 4 and pH 6, use soda ash mixed at one pound of soda ash per gallon of water. Feed this solution into the well at a rate to raise the pH to near 7 at the faucet farthest from the well. For water less than pH 4, use caustic soda. This material is extremely dangerous. Wear gloves and goggles. Slowly feed a solution of one pound of caustic soda per gallon of water into the well at a rate sufficient to result in pH 7 at the faucet farthest from the well.

Neutralize alkaline water (greater than pH 7) by feeding diluted sulfuric acid in the same manner as soda ash. Use caution in making solutions from strong acids. Always add acid to water slowly. Never add water to acid: Use gloves and goggles when preparing solutions.

backwashing will prevent packing, reclassify the bed and maintain high service rates. Depending on pH, water chemistry and service flow, the media bed will have to be periodically replenished as **CQ-Ca®** is depleted. As the **CQ-Ca**'s calcium carbonate neutralizes the water, it will increase hardness and a softener may become necessary after the neutralizing filter.

ADVANTAGES

- Naturally occurring material
- Low uniformity coefficient for maximum contact for controlled pH correction
- Slower reacting for controlled pH correction

PHYSICAL PROPERTIES

- Color: Near white
- Bulk Density: 90 lbs./cu. ft.
- Mesh Size: 16 x 40
- Specific Gravity: 2.7
- Effective Size: 0.4 mm
- Uniform Coefficient: 1.5
- Hardness: 3.0 (Mohs scale)
- Composition: CaCO3, 95% min. MgCO3, 3.0% max.

CONDITIONS FOR OPERATION

- A gravel support bed is recommended
- Water pH range: 5.0-7.0
- Bed depth: 24-30 in.
- Freeboard: 50% of bed depth (min.)
- Backwash rate: 8-12 gpm/sq. ft.
- Backwash Bed Expansion: 35% of bed depth
- Service flow rate: 3-6 gpm/sq. ft. but may be modified to adapt to local conditions
- Service flow rate: 6 gpm
- Backwash rate: 5 gpm

Service Flow Rate

Service flow rate is the **maximum** gallons per minute recommended for obtaining excellent water quality. Exceeding the service flow rate will cause a reduction in the product water quality.

Backwash Flow Rate

Backwash flow rate is the **minimum** gallons per minute recommended for proper reclassification of the media or resin. Insufficient backwash flow rate will cause inadequate media or resin reclassification and, over time, may reduce its effectiveness.

Calculating Your Flow Rate

You will need a watch with a second hand and a 1 or 5 gallon container to measure your flow rate with the instructions below.

- Using the bathtub as the measuring point, open BOTH the hot and cold water faucets completely (If you have a well water supply, wait until the pump kicks on before continuing.)
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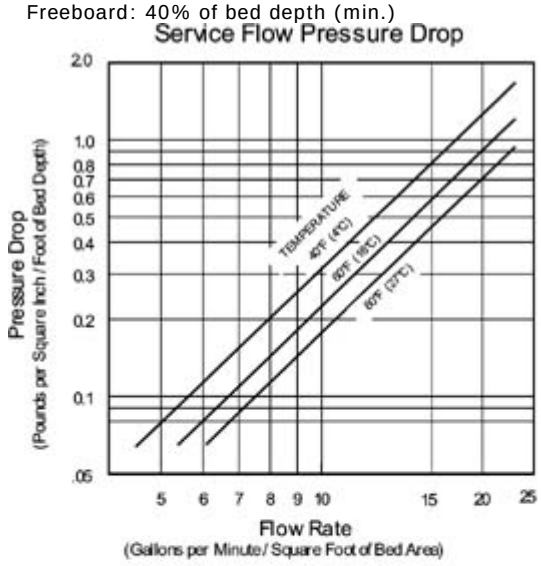
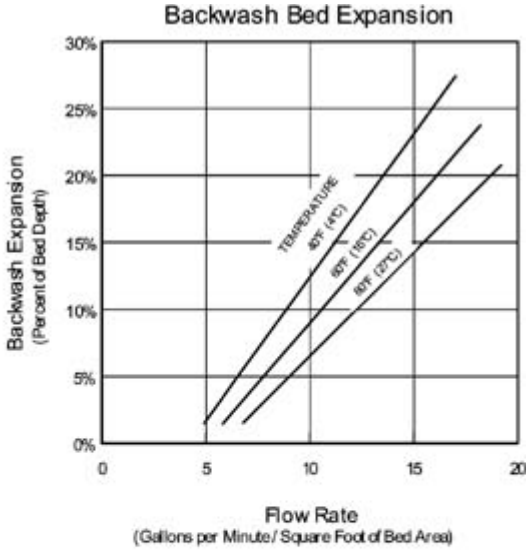
- Place either a 1 or 5 gallon container under the faucet and measure the amount of time it takes to fill the container in seconds.
- Refer to the chart below. Find the row on the left that contains the size of the container you used to fill with water, either 1 or 5 gallons.
- Then, find the column across the top that is closest to the number of seconds in took to fill the container.
- The value in the table at the intersection of the row and column you determined is your flow rate in gallons per minute.

	Seconds to Fill Container																	
Container Capacity (gal)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1	12.00	6.00	4.00	3.00	2.40	2.00	1.71	1.50	1.33	1.20	1.09	1.00	0.92	0.86	0.80	0.75	0.71	0.67
5	60.00	30.00	20.00	15.00	12.00	10.00	8.57	7.50	6.67	6.00	5.45	5.00	4.62	4.29	4.00	3.75	3.53	3.33

CONDITIONS FOR OPERATION

- pH: 6.5-9.0
- Bed depth: application dependent
- Backwash flow rate: 14gpm
- Backwash expansion: 15-30% of bed depth
- 7 gpm service flow rate
- Freeboard: 40% of bed depth (min.)





NSF

Tested and listed under ANSI/NSF Standard 60 for Health Effects.

carbon info

Carbon is extremely porous and provides a large surface area for contaminants to collect. Carbon-only filters must also use their capacity for chlorine removal, resulting in a shortened life. They also may use a bituminous coal carbon, which is good at removing chlorine, but not as effective at removing chemicals. We use a high-grade coconut shell carbon that is most effective at removing chemicals. Coconut shell carbon provides a significantly higher volume of micro-pores than either coal, wood or lignite based carbon. As a result, it is more effective than other carbon types in removing trihalomethanes (THM's) and other chemicals from municipally supplied water. Since our REDOX media removes the chlorine before it reaches the carbon, the carbon capacity is not wasted on chlorine and is free to concentrate more effectively on organic contaminants.

In stages 4 & 5 , Water flows through a bed of media made of a special high-purity alloy blend of two dissimilar metals - copper and zinc KDF-55D ®, and KDF-85D ® . KDF is a major advancement in water treatment technology that works on the electro-chemical and spontaneous-oxidation-reduction (REDOX) principles. Chlorine is instantaneously and almost inexhaustibly oxidized. Tests on KDF/GAC cartridge have shown 99+% chlorine removal past 20,000 gallons of water. In comparison, carbon cartridges of comparable volumes drop below 90% effectiveness after only 4,000 gallons.

Iron and hydrogen sulfide are oxidized into insoluble matter and attach to the surface of the media. Heavy metals such as lead, mercury, copper, nickel, chromium, cadmium, aluminum, and other dissolved metals are removed from the water by the electrochemical process. They are attracted to the surface of the media, much like a magnet. The media inhibits bacterial growth throughout the entire unit In fact, it has been shown to be reduced up to 90%, eliminating the need for silver, which is commonly used in carbon-only filters (silver is considered a pesticide by the EPA and, as such, must be registered with them).

Is copper or zinc added to the water

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http://www.sahra.arizona.edu/programs/akyw/altmethods.html

Other Treatment Methods

Bacteriostatic Filters

Bacteriostatic filters are activated carbon filters that also contain silver particles to help control bacterial growth inside the filter. However, their effectiveness is controversial. Silver may help contain but not necessarily reduce bacterial growth in activated carbon filters. The National Sanitation Foundation (NSF) lists and certifies some filter devices (and manufacturers) with "bacteriostatic effects." However, their efficiency at controlling bacteria in tap water is not stated.

KDF Filters

KDF (redox) filters are a new type of home water filtration device that may work as intended to reduce already low levels of bacteria, chlorine, some metals, and some types of organic pollutants from water. The effectiveness of this type of filter is also controversial. The NSF lists KDF filter media in its website. These filters should not be used for any other reason than to (possibly) improve water aesthetics (control taste, odors, or residual chlorine).

Oxidizing Filters

Also known as iron filters, oxidizing filters reduce both ferric (yellow cloudy) and ferrous (green clear) iron, manganese, and hydrogen sulfide gas from well waters by oxidizing ferrous iron witih manganese green sand, converting it to the suspended ferric state, so that it can be filtered out. These filters require periodic backwashing to flush particulates and restore flow and regeneration with potassium permanganate to restore oxidizing properties. They should not be used on water supplies that have a pH of 6.8 or less, sulphur in excess of 2.0 ppm, or iron exceeding 10 ppm.

Acid-neutralizing Filters

Acid-neutralizing filters are used to reduce water acidity. They add crushed calcite or some other carbonate-based mineral at controlled rates to raise the water's pH and decrease corrosivity. The water to be treated must be low in tannins and free of oil. The filter media must be replaced periodically. Backwashing is recommended to remove trapped particles and oxidized metals unless a sediment filter is installed ahead of the unit.

Ion Exchange Applied to the Removal of Other Ions

Organic resins can also be used to remove from water any type of ion besides calcium and magnesium (see also section on Ion Exchange). Ion exchange resins are commonly used as POU treatment devices to produce ultra-pure (near completely demineralized) water in commercial and industrial laboratories. Usually, a water source with a very low TDS (less than 5 mg/L) is used. This usually requires pretreatment of the water source using an RO system. Typically, a series of mixed bed [anionic (-) and cationic(+)] resins followed by activated carbon filtration (packed in cartridges) are used to “polish” the water to strict purity standards. However this approach is not practical, cost-effective, or even necessary for home water treatment.

Laboratory grade water deionizer system that uses four mix bed resins, and activated carbon and particle filters.

photo by: Janick Artiola

click to enlarge

Ion Exchange Considerations

• Mixed bed resins are quickly exhausted when tap water is used because ions like sodium, calcium, chloride, and sulfate (among others) quicky overwhelm and saturate the resin sites.

• Unlike water softening resins, mixed bed resins cannot be regenerated at home and must be purchased new when exhausted or regenerated commercially. The cost of each cartridge starts at over $100 and varies upward depending on size.

• The efficiency of removal of trace levels of pollutants like cadmium, chromium, lead and many other metal ions varies greatly and depends mostly on the TDS of the water source. The higher the TDS, the lower the efficiency of removal.

• To maintain strict water quality, commercial laboratories regularly test the purity of their water source with sophisticated instruments.

Aeration

A process (also known as air stripping) in which small bubbles of air are passed through a

solution. Air is injected, usually either through an open-ended tube or a diffuser, near the water intake. This process can be used to remove some substances from water that preferentially move into the air phase, such as volatile organics.

Flocculation and Sedimentation

Flocculation and sedimentation (also known as coagulation) are used globally in water treatment facilities to remove dirt and other large particles in water. This process adds alum, iron salts, or synthetic organic polymers (flocculants and coagulants) to the water in holding tanks to form sticky particles that attract the fine solids supsended in water so they can settle quickly or be filtered faster. The filtration process is complex and expensive, and is consequently mainly used to treat large volumes of surface water that is high in sediments and soil particles like silt and clay.

Go to other treatment methods:
Particle and Microfiltration Filters
Activated Carbon Filters
Reverse Osmosis
Distillation
Ion Exchange Water Softening
Disinfection of Drinking Water

Acid neutralizing water filter

http://www.purehealthresource.com/info/2007/07/crystal_quest_cqca.php

CQ-Ca® is a naturally occurring calcium carbonate media. One of the advantages of **CQ-Ca®** is its self-limiting property. When properly applied, it corrects pH only enough to reach a non-corrosive equilibrium. It does not overcorrect under normal conditions. Upon contact with **CQ-Ca®** , acidic waters slowly dissolve the calcium carbonate to raise the pH, which reduces the potential leaching of copper, lead and other metals found in typical plumbing systems. Periodic backwashing will prevent packing, reclassify the bed and maintain high service rates. Depending on pH, water chemistry and service flow, the media bed will have to be periodically replenished as **CQ-Ca®** is depleted. As the **CQ-Ca** 's calcium carbonate neutralizes the water, it will increase hardness and a softener may become necessary after the neutralizing filter.

ADVANTAGES

- Naturally occurring material
- Low uniformity coefficient for maximum contact for controlled pH correction
- Slower reacting for controlled pH correction

PHYSICAL PROPERTIES

- Color: Near white
- Bulk Density: 90 lbs./cu. ft.
- Mesh Size: 16 x 40
- Specific Gravity: 2.7
- Effective Size: 0.4 mm
- Uniform Coefficient: 1.5

- Hardness: 3.0 (Mohs scale)
- Composition: $CaCO_3$, 95% min. $MgCO_3$, 3.0% max.

CONDITIONS FOR OPERATION

- A gravel support bed is recommended
- Water pH range: 5.0-7.0
- Bed depth: 24-30 in.
- Freeboard: 50% of bed depth (min.)
- Backwash rate: 8-12 gpm/sq. ft.
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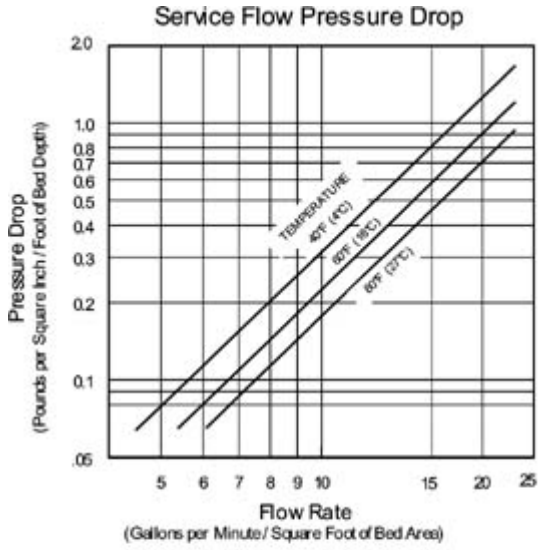

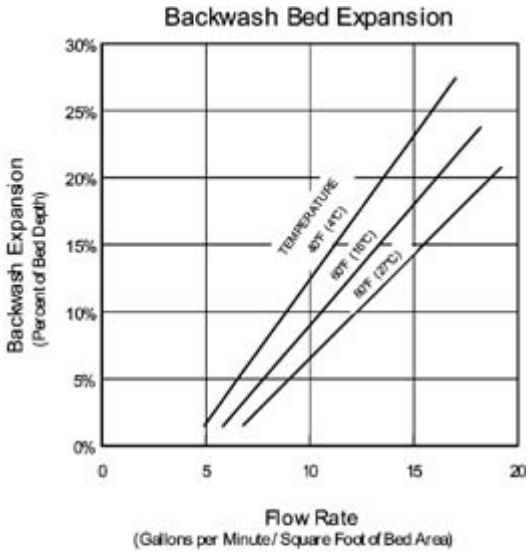

NSF

Tested and listed under ANSI/NSF Standard 60 for Health Effects.

http://www.anteromas.com/calciumcarbonate.html

Details of Calcium Carbonate (CaCo3) Granular, Powder and Pellet

Details of Calcium Carbonate (CaCo3) Granular, Powder and Pellet

1. **Product Name:**
   Calcium Carbonate (CaCo3)

2. **Available Quantity:**
   10,000 Tons

3. **Product Specifications:**
   Coated and Non-Coated
   1. Chemical Name: Calcium Carbonate
   2. Chemical Formula: CaCO3
   3. Molecule Content: 100
   4. Appearance: Powder
   5. Color: White
   6. Whiteness Degree:
   a) Super A grade: 90 Min.
   b) A+ grade: 85 Min.
   c) A grade: 80 Min.
   d) B grade: 75 Min.
   7. Melting Point: 1339 Celcius
   8. Specific Gravity: 2.7
   9. Odor: Odorless
   10. Loss of Ignation: 44.12%
   11. Bulk Density: 1.4
   12. Moisture Content: 0.20%
   13. pH: 9.8 to 10
   14. CaCO3: 97.75%
   15. CaO: 54.74%
   16. SiO2: 0.29%
   17. Fe2O3: 0.04%
   18. AI2O3: 0.03%
   19. MgO: 0.33%
   20. MgCO3: 1.38%
   21. K2O: Undetectable
   22. Na2O: Undetectable
   23. Non-coated CaCO3 available in: 60 mesh, 150 mesh, 200 mesh, 325 mesh, 400 mesh, 800 mesh, 1200 m
   1500 mesh
   24. Coated CaCO3 available in: 325 mesh, 400 mesh, 800 mesh, 1200 mesh, 1500 mesh

4. **Pricing in USD:**
   Please get the latets

5. **Term of Payments:**
   T/T

6. **Port of Departure:**
   Destination

7. **Delivery Time since PO:**
   14 - 21 days

8. **Additional Information:**

- Request Inquiry

9. 1. Delivery Lead Time: 2-3 weeks after received of purchase order.
   2. Minimum order: 1x20' FCL per item (20 MT)
   3. Sales Terms: CNF Destination Port
   4. Supply Capability: 1,000 MT per month for each product
   5. Branding & design: TEROLITE (zeolite) and TEROCAL (CaCO3) or your design is available
   6. Packaging:
   a) 800 pcs PP Bag (with 1 ply PE Inner Bag) @25kgs per 1x20' FCL
   b) 1,000 pcs PP Bag (with 1 ply PE Inner Bag) @20kgs per 1x20' FCL
   c) 20 pcs Jumbo Bag @800kgs and 80 pcs PP Bag (with 1 ply PE Inner Bag) @50kgs per 1x20' FCL
   d) Also available in white LLDPE bag (with 1 ply PE Inner Bag) per 20kgs and 25kgs