



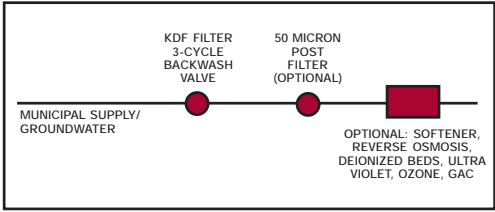
KDF® 55 and 85 Process Media in Point-of-Entry Water Treatment Systems – Chlorine, Iron and Hydrogen Sulfide Reduction

What is KDF Process Media?

KDF Process Media are high-purity copper-zinc granules that reduce contaminants in water using oxidation/reduction (redox) reaction. **KDF 55 process medium is an effective chlorine removal agent**

used in point-of-entry (POE) treatment of municipal water supplies. KDF 85 process medium is an effective iron (ferrous) and hydrogen sulfide (H₂S) removal agent that may be used alone or to protect existing water filtration/purification technologies in POE treatment of groundwater supplies.

These unique, innovative and environmentally responsible media consist of high purity copper-zinc granules that use redox (the exchange of electrons) in patented



products to effectively reduce/remove chlorine, iron, hydrogen sulfide, heavy metals, and control microorganisms in potable water without the use of chemicals. What's more, KDF 55 and 85 media are highly efficient and tank size requirements are modest for more economical system engineering and installation.

This bulletin describes the proper use of KDF media in residential (whole house), commercial, institutional, and light industrial buildings and facilities with potable water service flows in a range from 3 to 324 gallons per minute with maximum chlorine, iron, and H₂S concentrations of 5 ppm/mgl.

Medium Requirements and System Sizing

Easily the most critical aspect of pressure filter performance is the relationship of flow rate to surface of KDF media. Inaccurate sizing is the most common reason for trouble in filter systems. The nominal flow rate in the service cycle depends on surface area available. For most types of filter media, the service flow rate must not exceed five gallons per minute (gpm) per square foot of surface area, with at least a 30-inch filter bed depth.

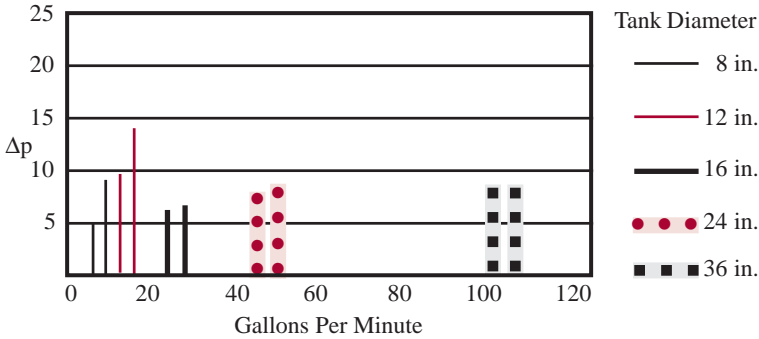
Service flow rates with KDF Process Media, however, may be calculated at 15 gpm per square foot of surface area (0.104 gpm per square inch). This is three times the effective flow rate of other filter media.

KDF Media POE Recommended Operating Conditions (use 3-cycle valve)

| | |
|-----------------------------------|----------------|
| Service flow | 15 gpm/sq. ft. |
| Backwash for 10 min. @ | 30 gpm/sq. ft. |
| Purge/rinse for 3 min. @ | maximum |
| Bed expansion, backwash | 10 to 15% |
| Free board | 20% |
| Minimum bed depth (6" dia.) | 10" |
| pH range: drinking water | 6.5 to 8.5 |
| Water temperature, influent | 35°F to 212°F |

(Always maintain wetness)

Pressure Drop, KDF® Media (Δp)



Back-washing KDF Process Media

In electrochemical reduction processes, surface products are formed when KDF® media are used in point-of-entry (POE) water treatment systems. These

byproducts, along with any calcium and magnesium precipitate, *must be* periodically backwashed. For backwash rates of 3 to 25 gpm, use a high quality 3-cycle backwash valve (service, backwash, purge). One with a high-flow backwash mode is best. For 36 to 324 gpm, use a diaphragm nest valve.

Remember to remove any backwash flow restrictors. Select a distributor based on backwash flow rate. For 3 to 11 gpm, use a fine slotted distributor and for 15 to 324 gpm, use a hub and lateral distributor (#8 garnet underbedding is recommended). Time the backwash cycle for ten minutes and purge for three minutes. Backwash at least three times

per week, more frequently if necessary, depending upon the quality of the water supply. If more backwashing is required, repeat the entire cycle. Backwash flow rates are a function of backwash water temperature; type, size and density of media; and the specific design of the pressure filter. KDF Process Media have a density of 171 pounds per cubic foot, which makes it a very high density medium requiring a backwash flow rate of twice the service flow.

KDF media require 30 gallons per minute per square foot of bed surface area. Very cold water requires somewhat lower backwash rates and warmer water requires higher rates. Do not restrict pipe size to the drain.

Note: If backwashing procedures are not properly followed, KDF Process Media may become fouled. For proper cleaning techniques, contact KDF's Technical Department.

Engineering Guidelines for KDF Media

| Maximum Service Flow (gpm) | Tank Size Diameter (inches) | Backwash Valve Required | Distributor | Minimum Backwash Rate (gpm) | Pipe Size Diameter (inches) | KDF Process Media | | | |
|----------------------------|-----------------------------|-------------------------|-----------------|-----------------------------|-----------------------------|--------------------|--------------|------------------|--------------|
| | | | | | | Bed Depth (inches) | Weight (lbs) | Volume (cu. ft.) | No. of Drums |
| 3 | 6x35 | 3-cycle | Fine slotted | 6 | 0.75 | 10 | 28.5 | 0.16 | 0.5 |
| 4 | 7x35 | | | 8 | 0.75 | 11 | 42.8 | 0.25 | 0.75 |
| 5.5 | 8x40 | | | 10 | 0.75 | 12 | 57.0 | 0.33 | 1.0 |
| 6 | 9x44 | | | 12 | 0.75 | 13 | 85.5 | 0.50 | 1.5 |
| 8 | 10x44 | | | 16 | 0.75 | 14 | 114.0 | 0.66 | 2.0 |
| 11 | 12x48 | | | 22 | 1 | 16 | 171.0 | 1.04 | 3.0 |
| 15 | 14x65 | | | 30 | 1 | 18 | 285.0 | 1.60 | 5.0 |
| 20 | 16x65 | Diaphragm nest | Hub and lateral | 40 | 1.5 | 20 | 399.0 | 2.33 | 7.0 |
| 25 | 18x65 | | | 50 | 1.75 | 22 | 627.0 | 3.50 | 11.0 |
| 36 | 21x62 | | | 72 | 2 | 24 | 855.0 | 5.00 | 15.0 |
| 45 | 24x72 | | | 90 | 2 | 25 | 1140.0 | 6.50 | 20.0 |
| 72 | 30x70 | | | 144 | 2.5 | 25 | 1767.0 | 10.25 | 31.0 |
| 100 | 36x70 | | | 200 | 2.5 | 25 | 2565.0 | 14.75 | 45.0 |
| 144 | 42x73 | | | 288 | 3 | 25 | 3420.0 | 20.00 | 60.0 |
| 188 | 48x78 | | | 376 | 4 | 25 | 4446.0 | 26.00 | 78.0 |
| 324 | 63x86 | | | 648 | 5 | 25 | 7695.0 | 45.00 | 135.0 |



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