



Troubleshooting Guide: Filtration

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Introduction

Filters are used to remove suspended and colloidal solids in the 5-50 ppm range. Suspended solids include fine sand, silt, clay, colloidal silica, microbiological growth, precipitated metals, and hardness. Typical applications are influent clarification, cooling water side-stream filtration, boiler makeup pretreatment, polishing and industrial processes, and waste treatment. Water is passed through a porous bed of sand or other granular material, such as anthracite (coal) or activated carbon. Properly operating filters are capable of reducing turbidity to <1 NTU (Nephelometric Turbidity Unit) while particle size removal depends on media type and size. Filters used after cold lime soda softening can have either anthracite or sand as the media, while filters used after hot lime softening use anthracite. Activated carbon is used for removal of organics, chlorine, odors, and tastes from water. Filters are classified by the type of media used: single media, dual media, or mixed bed (three or more media types). Flow designs are gravity, pressurized, and upflow.

Proper operation of pretreatment and online filtration equipment is important to the effectiveness of the treatment program. The following guide can be used for general troubleshooting purposes.

Filter Sizes and Media Requirements

Symptom	Possible Cause	Corrective Action
Short runs, poor quality effluent, or excessive pressure drop	Insufficient backwash	Check current flow vs. design.
	Poor backwash frequency	Establish a new backwash schedule based on pressure drop or time.
	Carryover from hot lime softener	Check media and chemically clean if severely fouled.
	High / low service flow	Check current flow vs. design.
	Blinding of filter bed	Check coagulant / flocculation process. Floc particle size may be too small. Optimize flocculation to increase particle size.
Poor organic removal	Loss of media	Inspect and replace. You may also need to reduce backwash flow rate.
High pressure drop	Damaged distribution system	Inspect and repair or replace.
Poor chlorine removal in carbon bed filters	Exhausted carbon bed	Re-bed.
	Water bypassing unit	Inspect and repair or replace valve.
	Improper carbon for application	Check with manufacturer and re-bed.
	High suspended solids in influent	Pre-filtration or clarification may be required.
	Channeling or water bypassing unit	Check backwash rate and inspect valve.