CONTRAFAST™ HIGH RATE SLUDGE THICKENING SOFTENER



The CONTRAFAST clarifier is a high rate sludge thickening softener. Utilizing a combination of internal and external sludge recirculation and tube clarification, settling the CONTRAFAST process is capable of running at rise rates of 6 gpm/sq.ft. and higher. This is over 4 times the rate typically used for conventional lime softening clarifiers. In addition, the CONTRAFAST unit produces sludge with more than 20% solids by weight, eliminating the need for a sludge thickener. Therefore the combination of the high rise rate, and the elimination of the separate thickener, reduces the total process footprint. The entire process takes place in a single vessel, greatly simplifying installation.

combined Raw water with recirculated sludge and treatment chemicals enter the center draft tube. There they are mixed and recirculated within the reactor by the variable speed impeller. The impeller aids in accelerating solids formation and densifying the sludge. A high-velocity upflow port prevents settling in the reactor and transfers the water to the settling chamber. The water passes under a baffle and continues upward through the settling tubes and into the effluent collection launder. The dense sludge settles to the basin floor where it is continually scraped and further thickened, until it is removed from the unit.

Single units are designed with nominal capacities of 175, 350, 700, and 1,400 gpm. Custom units can be designed to virtually any size or flow rate. USFilter scope of supply includes the internal mechanism, steel basin, spiral stairway, external sludge recirculation pump, and sludge blowdown valves and controls. Filters, chemical feed and sludge handling equipment are options easily added to the system.

APPLICATIONS

- Lime softening
- Silica reduction
- · Cooling tower make-up
- Cooling tower blowdown
- Heavy metals removal
- · Zero liquid discharge



MIDWESTERN USA, POWER PLANT - COOLING TOWER BLOWDOWN Objectives: High Rate Clarification, Silica Removal & Solids Densification

Parameter	Influent Quality	Effluent Quality (avg)	Percent Removal
pH	7.6 - 8.4	10.0 - 11.0	n/a
Temperature	74-101° F		n/a
Turbidity	78-154 NTU	< 10.0 NTU	> 90%
TSS	62-87 mg/L	10 mg/L	> 83%
Alkalinity (Total)	188-300 mg/L as CaCO ₃	60 mg/L as CaCO ₃	n/a
Hardness (Total)	1200-1700 mg/L as CaCO ₃	<50 mg/L as CaCO ₃	96%-99%
Calcium	760-1140 mg/L as CaCO ₃	<20 mg/L as CaCO ₃	97% - 99%
Magnesium	240-680 mg/L as CaCO ₃	<20 mg/L as CaCO ₃	92% - 99%
Silica (Total)	141-191 mg/L as SiO ₂	<30 mg/L as SiO ₂	79% - 91%

Table 1: Power Plant Performance Summary: Operating Rates: 5.5, 7.1 & 9.1 gpm/sq.ft.

Solids	TSS (% by wt)	5-min Settling Volume
Blowdown	29% (avg)	> 95%

AMES, IA WTP - GROUND WATER SOFTENING & IRON REMOVAL Objectives: High Rate Softening & Solids Densification

Table 2: Ames WTP Performance Summary: Operating Rates: 5.6 & 8.8 gpm/sq. ft.

Parameter	Influent Quality	Effluent Quality (avg)	Percent Removal
pH	7.4 - 7.9	9.5 - 10.0	n/a
Temperature	52° F		n/a
Iron	3.27 – 5.94 mg/L	< 0.2 mg/L	94% - 99%
Manganese	0.382 - 0.450 mg/L	< 0.03 mg/L	92% - 100%
Turbidity	38 – 56 NTU	< 5 NTU	> 90%
TSS		< 10 mg/L	n/a
Alkalinity (Total)	240 – 288 mg/L as CaCO ₃	60 mg/L as CaCO ₃	n/a
Hardness (Total)	340 – 380 mg/L as CaCO ₃	165 mg/L as CaCO ₃ *	50% - 60%
Calcium	240 – 288 mg/L as CaCO ₃	70 mg/L as CaCO ₃	70% - 80%
Magnesium	80 – 120 mg/L as CaCO ₃	90 mg/L as CaCO ₃	15% - 25%

*Targeted hardness

Solids	TSS (% by wt)	5-min Settling Volume
Blowdown	35% (avg)	> 95%



Memcor, Microfloc & General Filter Products 600 Arrasmith Trail Ames, IA 50010 515.232.4121 phone 515.232.2571 fax

For additional information, please contact Steve DuVall by phone at 515. 232.4121 ext. 8462 or by e-mail at duvalls@usfilter.com.

http://www.usfilter.com ©2002 United States Filter Corporation

GF-CN-DS-1002