

## Start-up procedure for sludge concentration system



Laholm in Sweden, salmon farm. Filtration & sludge concentration.

1. Start mixers in mixertank & the Beltfilter



Control panel for mixer tank

2. Start filling the mixertank with sludge from microscreen.



A mixer in small tank, receiving sludge from microscreen, will ensure an even concentration of suspended solids in sludge

A level controlled pump, will secure an even flow to mixertank.  
Coagulant  
(iron or aluminium salt is added in-line)

3. Start adding chemicals.



Polymore: Polymer dosing unit.  
Liquid polymer and water is mixed.  
See manual for adjustments.



Dosing of aluminium hydroxide.



4. Check that mixers are rotating.



5. Floc formation !



Floc formation.



Add some flocculated sludge on the belt.



6. Beltfilter can be operated by levelsticks or by timer !



Sludge pump on outlet hopper. "scraper" at the top for sludge removal

### **Operational schedule**

Daily:

Control of polymer mixer and refill of polymer if needed  
 Mixer tank, check on function  
 Microscreen, check on function  
 Beltfilter, control of function and check on "scraper"

Weekly:

Control of levels in tanks of coagulants  
 Drumfilter, check on nozzle tips  
 Beltfilter, check on nozzle tips

Monthly:

Drumfilter, check on filter panels  
 Beltfilter, check on belt cloth

2` monthly:

Beltfilter, check on tension of belt  
 Sludge storage, level ?, maybe empty the tank

3` monthly:

Dosing pumps, see manual

1/2 year:

Drumfilter, check of rubber lip seal against the inside of drum

Yearly:

Cleaning of all tanks  
 Oli check on drum and beltfilter (see manual)

### **Functional description**

Sludge from Microscreen collects in a small tank. A static mixer ensures an even concentration of SS in sludge to be pumped to mixertank by a submerged level controlled sludge pump.

Mixers in mixertank starts at the same time as the sludge pump. Mixers in mixertank will continue to rotate app 1 min after the sludge pump has stopped pumping.

Polymer and coagulant dosing, starts synchronized with the sludge pump. Beltfilter and ax-flow pump will operate at the same time, controlled by water level inside the tank of the beltfilter(sometimes it is preferred to have a timer control of the belt/ax-flow pump)

Flocculation will happen as very distinct "cakes" of sludge. There is a baffle wall as inlet to the beltfilter for gentle loading of flocculated sludge to the belt. Sludge will be drained on the belt and scraped off at the top of the belt. A Jet system will clean the belt by high pressure water, before it return as active filter surface.

Beltfilter is operated by a frequency converter to adjust speed of belt, this must be done manually for optimal draining of sludge. Adjustment of coagulants and polymer is also done manually(add some polymer to filtered water and see if there still is a coagulation reaction = overdosing!), but once adjusted, the system can operate at a minimum of daily inspection.