

## **Heterotrophic biofilm filter raw start conditioning or restart from dormant.**

For 1000L tank, K1 media. Difco or Beckton Dickson (BD) Nutrient Broth microbiological media. Comes in 500g containers, start up will require 290 g. Material is very hygroscopic, seal unused portion tightly

### **Day 0.**

Fill Tank with 1 Micron filtered seawater

Dose to achieve 100 mg/L:

Mix 100g (3.5 oz) Nutrient Broth in water, about a liter or 1 quart (can be reactor water, filtered seawater, or tap (fresh) water. Weight is somewhat critical, volume of water is not, enough to dissolve, make sure all is dissolved before pitching into tank.

### **Day 4**

Dose to achieve 100 mg/L: Mix 100g (4 oz) Nutrient Broth in water.

### **Day 6**

Dose to achieve 50 mg/L: Mix 50g (2 oz) Nutrient Broth in water.

### **Day 8**

Dose to achieve 25 mg/L: Mix 25g (1 oz) Nutrient Broth in water.

### **Day 10**

Dose to achieve 10 mg/L: Mix 10g (0.5 oz) Nutrient Broth in water.

### **Day 12**

Drain and refill with 1 micron seawater

Dose to achieve 5 mg/L: Mix 5g (0.25 oz) Nutrient Broth in water.

### **Day 14**

Drain and refill with 1 micron seawater

Online use in 24 hours (day 15).

If not used right away, give it a kick with a 5 mg/L (0.25 oz) dose every week and 3 days before use (go back to Day 12), drain and refill with 1 micron seawater 24 hours before bringing online.

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Results of bacteria and microflagellate counts from Congrove startup procedure 21 April 2021 through 5 May 2021. Initial fill and dose with 100 mg L<sup>-1</sup> organics resulted in a rise in bacterial numbers peaking in 24 hours, followed by increase in microflagellates grazing on bacteria at 48-54 hours (4-4.5 days). Second dose of 50 mg L<sup>-1</sup> organics resulted in another bacteria peak at 8 days followed by a decrease in bacteria and microflagellates in the planktonic phase, even with an additional 10 mg L<sup>-1</sup> organic dose. This indicated the microbial biomass in the system shifting to the biofilm phase from plankton phase as desired. Drain and refills at 12 and 14 days, completes the planktonic to biofilm shift and prepared the system for use.

If the protein skimmer was on during this conditioning protocol it may have delayed the shift to biofilm biomass. In the future, the protein skimmer should be activated after the drain, refill and final 5 mg L<sup>-1</sup> organic dose at 12 days.

