Haloklear NATURAL FLOCCULANTS **RESIDUAL** TESTINT INSTRUCTIONS



Convenient Economical



- Economical Reliable
- Dependable
- Added Safety Layer

Determines the presence of free residual flocculant in treated water.



RESIDUAL CHITOSAN TEST

This test determines the presence of free residual chitosan in treated stormwater. The test is designed as a "Pass/Fail," with the "Fail" criteria as values exceeding 0.1 mg/L free chitosan.

The test compares a field water sample with a blank and a standard solution of 0.1 mg/L chitosan. If there is greater than 0.1 ppm of free residual chitosan then a brown/pink-purple color will develop on the test filter. If the color is as dark as the standard, then the test is a fail and the treated water has more than 0.1 ppm of chitosan.

EQUIPMENT SUPPLIED IN KIT

- Two 1 liter bottles
- One filter holder
- One 140 mL syringe
- One 3 mL syringe
- Three plastic eyedroppers
- Sodium sulfate solution
- HaloKlear LiquiFloc[™] 1% chitosan acetate sample

- Three 1 liter open tubs
- · 200 glass fiber filters
- One 10 mL syringe
- One 1 mL syringe
- One forceps
- Iodine test solution

EQUIPMENT NOT SUPPLIED IN THE KIT

You will need clean water for making a blank solution, standard solution and general rinsing between stages. Use distilled water if in the lab or tap water if in the field, but not stormwater.

Part 1 MAKE UP THE STANDARD SOLUTION

- Step 1 Fill both the 1 liter jars with clean water up to the ring just below the neck (as shown to the right).
- Step 2 With the 10 mL syringe, draw out 10 mL of LiquiFloc 1% and transfer it into one of the 1 liter jars. Cap and mix well.



Step 3 With the 1 mL syringe, draw out 1 mL of the solution you created in step two and put it in the second 1 liter bottle. Cap and mix well. This is the 0.1 ppm or mg/L chitosan standard.

Part 2 TEST PROCEDURE

The following steps are the same for the blank (done on clean water), the standard solution, and the test sample:

- Step 1 Collect at least 200 mL of sample in one of the 1 liter tubs.
- Step 2 With the forceps, load a clean glass filter into the filter holder and secure.





Step 3 With the 140 mL syringe, filter a little over 200 mL of sample by following these directions:

- **Step 3a:** Fill the syringe with sample.
- **Step 3b:** Secure the filter holder on the end of the syringe.
- Step 3c: Expel the material through the filter into the second 1 liter tub

Note:

- This takes more than one draw, so remove the filter before refilling the syringe.
- Do not expel the sample out too forcefully as this "craters" the filter and can affect the results.
- · Do not draw the sample back up the filter as this will damage it.
- If the sample has high turbidity, more than one filter may have to be used. Turbidities above 100 NTU generally use too many filters to be practical.
- The filters are one time use only.
- Step 4 With the 3 mL syringe, draw out 2 mL of the sodium sulfate solution, add it to the filtered sample tub and mix. The syringe itself is a handy mixer in the field, but wash between uses.
- **Step 5** Load a clean glass filter into the filter holder and secure.
- Step 6 With the 140 mL syringe, filter 200 mL of sample, secure the filter holder on the end and then expel the material through the filter. Discard the filtrate.
- Step 7 Open the filter holder and with the forceps, transfer the wet pad to the worksheet.

Note:

- Do not place the wet pad on unprotected paper as the starch in the paper will turn the pad a bright blue and spoil the test.
- Step 8 With the eyedropper, place one drop of iodine into the center of the pad (as shown to the right). Filter (in the same manner as the test sample) the blank and standard 0.1 ppm solutions and collect the filters to compare with the test sample.
- Step 9 There should be some immediate color, but allow 5 to 60 minutes for more color to develop. Compare the test sample with the blank and the standard.

Note:

- The blank should be light yellow color.
- The standard should have a light brown/pink-purple color.
- If the sample has a lighter color than the standard, then it has less than 0.1 mg/L free chitosan and therefore it is deemed a "Pass." If it is as brown/pink-purple, or darker brown/black, then it is deemed a "Fail."
- For multiple samples, they can all be placed on the worksheet, then iodine treated at the same time so the colors develop concurrently.

Step 10 Rinse out tubs and syringes with clean water, such as tap or deionized water, between each sample.







HaloKlear is a registered trademark of Dober Chemical Corporation.

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HaloKlear's portfolio consists of 100% biodegradable chitosan-based, natural flocculants as well as iron-and sulfate-free hybrid flocculants. HaloKlear technologies address a wide variety of pollutants and contaminant types, including total suspended solids, algae, hydrocarbons, heavy metals, oils and organic compounds.

