

# 623-2050 (78-070) Fieldmaster® Transparency Tube (Turbidity Tube)

## Warranty and Parts:

We replace all missing or defective parts free of charge. For replacements, use part numbers above. All products guaranteed free from defect for 90 days. This guarantee does not include accident, misuse, or normal wear and tear.

## Description:

This device is commonly used to determine the clarity of running water. It functions very similarly to the Secchi disk, which relies on the reflected light of the sun from a disk lowered through the water column. A Secchi disk has two white quadrants and two black quadrants. (The Secchi disk is lowered until it disappears and, conversely, reappears when raised. This depth produces a reading which is called the index of transparency.)

The turbidity tube measures turbidity in streams where a Secchi disk is not practical. The clear polycarbonate tube is in two lengths (60 or 120 cm long) for different turbidity requirements. It features a centimeter scale on one side of the tube and a small Secchi disk on the bottom. The Secchi disk is screwed to a rubber stopper that removes for cleaning.

## Introduction to turbidity:

Turbidity, or cloudiness, in water is caused by a variety of suspended materials. The material can be organic (plankton, sewage) and/ or inorganic (silt, clay). This suspended material will scatter and absorb light passing through the water. The light scattered back to the observer can be affected so that the water will have a color dependent upon the type and amount of suspended matter. Cloudiness and color can also

be observed if a water sample in a transparent container is held between your eye and a light source.

**Turbidity** relates to the effect that suspended particles have on water clarity. High turbidity readings (low clarity) can indicate erosion and sedimentation problems. Rainfall and runoff can increase the suspended solid load in a river and make the river appear cloudy or muddy. High biological productivity related to increases in nutrients and temperature can result in increases of diatoms and other algae that contribute to turbidity. Turbidity meters can be used to estimate plankton density.

High turbidity can cause an increase in water temperature since suspended particles absorb heat. Since less light penetrates the water column when the water is turbid, the rate of photosynthesis can decrease. This, in turn, can lead to a decrease in the amount of dissolved oxygen in the water. As suspended particles settle, they can impair the habitat needed for fish spawning and aquatic macroinvertebrates. They can also clog the gills of fish and the breathing apparatus of invertebrates. Particles serve as places of attachment for harmful microorganisms and toxic materials.

Transparency is the ability of water to transmit light. Any beam of light that is attenuated, reflected, scattered or absorbed decreases the transparency of the water. Thus, water that is "dirty" lowers the transparency of the water.

## Maintenance:

The Secchi disk is fastened to a rubber stopper (#10) which can be removed for cleaning.

Rinse in fresh water after each day's use and allow to air dry completely. Store in a clean, dry place.

## How to use a turbidity tube:

*This device is commonly used in the field and is well suited to use by groups since a number of readings is valuable.*

1. Close the drain tube on the bottom of the turbidity tube by pinching the crimp.
2. Obtain a water sample from running water by means of a bucket or other container.
3. Fill the turbidity tube with water sample.
4. While looking down the entire length of the water column through the top of the tube, open the drain crimp part way and slowly draw off the sample. The flow can be controlled by squeezing the crimp. *You may need a partner to help drain the water.*

*Important note:* Do this right after you fill the tube because you will get the most accurate reading before the sample settles out.

5. When you see first see the black and white pattern of the secchi disk at the base of the tube emerge, immediately tighten the crimp to stop the flow of water.
6. Record this depth of water to the nearest 1 cm using the centimeter rule on the side of the tube.
7. Enter data for each observer. Calculate the average of all readings to determine a final average.
8. If you can still see the image on the bottom of the tube after filling it completely, simply record the depth as greater than the length of the tube.

**24-8070**

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The environmentalists of the future have to start out somewhere. And upon them may rest the future of the earth. What better way to begin than with real equipment, to sort you can use over and over, stretching the teacher's budget to the max? Taking advantage of the manufacturing capabilities of our sister company **Wildlife Supply®** - which manufactures water sampling equipment for use by professionals - we offer a set of ecology kits for schools Each contains enough equipment for your entire class to use without extensive training.

## Other Fieldmaster® products that may be of interest:

### **7623-7210 Lake Bottom Sampling Kit**

Contains student-sized benthic grab; wash bucket; thermometer; twelve (12) sample bottles; instructions

### **623-7211 Stream (Moving Water) Sampling Kit**

Contains six (6) student D-frame nets; turbidity tube; thermometer; twelve (12) sample bottles; six (6) wash bottles

### **623-7212 Plankton Sampling Kit**

Contains water sampling bottle; secchi disk; student plankton net; 24 sample bottles, 12 each of two different sizes; wash bottle for rinsing nets.

### **623-7213 Plankton Lab Kit**

Contains six (6) Bogorov chambers; twelve (12) gridded Petri dishes; 24 plastic vials; 100 disposable pipettes; twelve (12) insect forceps; twelve (12) probes; twelve (12) clear rulers

### **623-2010 Secchi Disk**

For determining turbidity in shallow waters. With 20 meters of polyester line on a winding float.

### **623-2310 Basic Water Bottle**

For obtaining water samples. Needs no messenger. Impact resistant PVC bottle body (1.75 L capacity) with soft rubber seals. Includes 20 m line on a winding float.