

Refractometer

Care and Use

Portable Salinity Refractometer with ATC
Model RF20
Made by: EXTECH Instruments

Physical Description

The refractometer is stored in a grey plastic box that says “Portable Refractometer” on the lid.

The refractometer is a tube with an eyepiece at one end and a wedge-shaped bit (the prism) where the sample goes on the other end.

The grey box also contains:

- A microfiber cleaning cloth
- A tiny screwdriver
- A small bottle of distilled water
- A small plastic pipette

Use of Refractometer

A refractometer is a sensor that measures the salinity (saltiness) of a water sample. Salinity is determined by measuring how much light refracts (bends) when it passes through the sample. The more salt there is in water, the more the light is bent.

This refractometer measures salinity in parts per million (ppm or ‰), or the grams of salt per grams of solution.

Calibrate the Refractometer

1. Lift the plastic cover plate from the prism, or wedge-shaped end, of the refractometer.
2. Use pipette to put 2 or 3 drops distilled water on the blue surface of the prism.
3. Close the cover plate.
4. The distilled water should almost completely fill the entire rectangular outline on the cover plate. Add another drop of distilled water as needed.
5. Hold the refractometer horizontally underneath a light so that light is shining straight down on the refractometer. (Alternative: hold refractometer horizontally and point towards a window.)
6. Turn the eyepiece until the scale is as clear as possible.

7. Check that the shadow-line (the light-dark boundary) lines up with 0 on the right-side scale.
8. If the shadow-line is not at zero, remove the black rubber cap from the knob next to the prism. Use the tiny screwdriver to turn the knob until the shadow-line is at 0. Replace the rubber cap and return the screwdriver to the case.
9. After calibration, clean the distilled water from the prism and cover plate with a soft cloth (e.g. microfiber) or lense paper.

Measure a Sample

1. Lift the cover plate and use pipette to put 2 or 3 drops of the liquid sample on the blue surface of the prism.
2. Close the cover plate and check that the liquid almost completely fills the rectangular outline on the cover plate with no air bubbles. Add another drop of liquid if needed.
3. Wait 30 seconds.
4. Hold the refractometer horizontally underneath a light so that light is shining straight down on the refractometer.
5. Look through the eyepiece.
6. Turn the eyepiece until the scale is as clear as possible.
7. To measure salinity, find where the shadow-line crosses the scale on the right. This scale is marked from 0 to 100 and has the ppm symbol (‰) next to it.
8. Record your salinity measurement.

Handling and Storage

When done measuring samples, please clean the refractometer and return it to the box. To clean the refractometer, wipe away any liquid with a clean microfiber cloth or 'delicate task wipe' (lense paper). Do not wash or rinse the refractometer.

Make sure all other components (see list under 'Physical Description') are back in the box.

Tips and Tricks

The display on the refractometer is *tiny*. To change the focus, turn the black ring surrounding the eyepiece. Make the scale as clear as possible - the goal is to confidently measure to the nearest tick mark, not the nearest tens place.

Facilitator should check calibration of the refractometer when they first try it out. Youth will not need to repeat this step.

When testing a sample, be sure to wait for 30 seconds. **We recommend using a stopwatch, e.g. on a phone**, to make sure that the sample has time to settle before taking the measurement.