

1.0 INTRODUCTION

The IFT 10HP Industrial Fluid Tester (refractometer) from Riechert offers a fast and easy-to-use method for determining total solubles in aqueous solutions, including cutting fluids and quenching solutions used in heat treating.

This unit utilizes Automatic Temperature Compensation. This allows accurate readings to be taken in most environments without having to calculate temperature effects.

The IFT 10HP is a precision optical instrument. As such, it is critical that the instrument is properly maintained. Please follow all directions for the proper use, cleaning, and maintenance of the instrument. Failure to do so may result in inaccurate results or possible damage to the instrument.

2.0 MEASUREMENT OF SAMPLE

Note: The scale is not visible until a sample is placed on the prism. If the concentration of the solution tested is greater than the limits of the scale, the shadow will not be visible.

The instrument is measuring the refractive index of the sample. The scale which is seen is simply a conversion from refractive index to Percent Solids as Sucrose.

To take a sample reading, simply place a few drops of sample onto the measuring prism at the end of the instrument. Lower the sample cover onto the sample and prism. Holding the instrument under a light source, look through the eye-piece. The concentration is determined by the intersection of the boundary of the light and dark fields (known as the shadowline) on the printed scale. If the scale appears out of focus, the focusable eyepiece may be adjusted by rotating the knurled portion. The instrument also features an extendable eyeguard to prevent stray light from entering the eyepiece and causing reflections. The eyeguard may be used by gently pulling the end portion of the eyepiece, the smooth finished section, towards the eye. To lock in place, rotate the eyeguard clockwise until snug.

It may be necessary to adjust the position of the light source to maximize the contrast of the shadowline. Under normal conditions, optimal contrast is obtained by holding the instrument underneath and perpendicular to a light source.

Once a reading has been taken, thoroughly rinse the prism and sample cover with water. (For some samples, it may be necessary to clean the prism with soap and water, followed by rinsing with water.) Wipe dry with a clean soft cloth or lens tissue. Place the instrument in the provided plastic case, and store in a safe, dry environment until further measurements are desired.

Readings are automatically temperature compensated. No temperature correction calculations are necessary for readings which are taken at temperatures within the range of this mechanism. The optimal operational range for automatic temperature compensation is from 60°F (15°C) to 90°F (32°C). Outside this range, readings will vary slightly from the specified accuracy of the instrument.

3.0 CALIBRATION

Always thoroughly clean the prism and sample cover with water, and wipe dry with a soft cloth or lens tissue prior to calibration testing. Calibration of the instrument will rarely be required.

To verify the calibration of the IFT 10HP, read a sample of distilled, deionized water between 60°F (15°C) and 77°F (25°C). If the reading varies from 0 by more than 1 scale division, recalibration may be necessary. If a standard calibration is necessary, locate the calibration adjustment access hole on the underside of the instrument. Remove the protective cap. With distilled, deionized water on the prism, adjust the allen head screw in the calibration adjustment access hole until the shadowline is centered on 0.0 on the scale. Dry off the prism and sample cover, replace the calibration access hole protective cap, and proceed with normal readings.

4.0 TROUBLESHOOTING

Should any difficulties arise with this instrument, please refer to the following helpful hints:

- Thoroughly clean and dry the prism and sample cover prior to attempting to read any sample or calibration standard.
- Ensure that enough sample is used to obtain optimum contrast of the shadowline intersect
- Hold the instrument underneath and perpendicular to a light source.
- Make any necessary adjustments to the focus-able eyepiece.

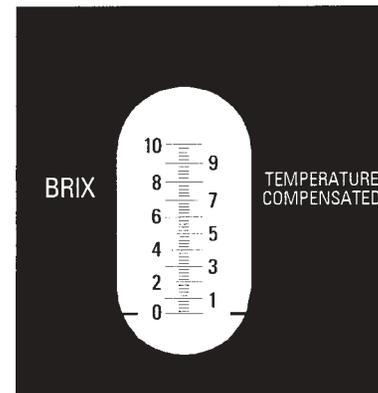
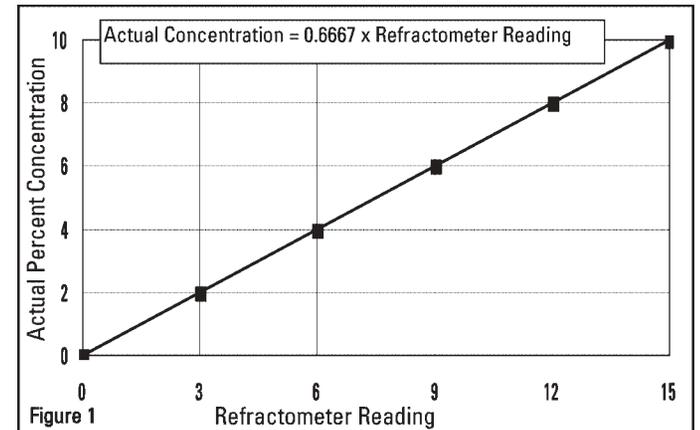
- Extend the eyeguard to prevent stray light from entering the system and causing reflections.
- Verify the calibration of the instrument using distilled, deionized water.
- Samples which are not within the reading range of the instrument will not produce a visible shadowline intersect.
- Samples which are opaque, contain undissolved matter, or cause high levels of dispersion will not produce a sharp shadowline intersect.

5.0 CLEANING THE INSTRUMENT

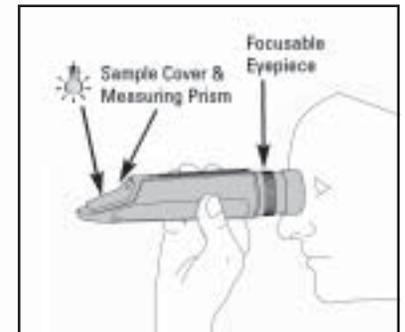
The instrument should be thoroughly cleaned after each use. Any residue left on the measuring prism could result in an inaccurate reading or damage to the instrument.

To clean, swing back the plastic sample cover located at the slanted end of the instrument to expose the measuring prism. Wipe clean both the prism and the bottom of the sample cover. Dry them with a tissue or a clean soft cloth. Close the sample cover.

The instrument's scale is divided into units reading 0 - 10. The scale can be used to determine unknown solution concentrations by plotting known values as shown in Figure 1, where the refractometer reading is plotted versus known concentrations of the solution. To determine the concentration of any solution whose refractive index falls within the range of the instrument, prepare three to five accurately measured known solutions (e.g.: 2, 4, 6, 6, 10%). Measure their values using the IFT 10HP. Plot a chart with readings on the horizontal x-axis and known values on the vertical y-axis. From this graph, the concentration of unknown samples can be accurately determined by two methods. The first method is to plot these points as a graph and then to plot a trend line as shown in Figure 1. The equation of this trend line will determine the % Concentration by entering the sample reading (as taken from the IFT 10HP) as the x variable. The second method is to simply take the reading of the sample from the instrument and refer back to the chart. Plot the point of the 'Refractometer Reading' on the X-axis, then draw a line straight up until it intersects the plot line developed from the known solutions. Drawing a straight line across from this point to the Y-axis will give the solution's actual concentration.



IFT 10HP Optical Scale





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IFT 10HP

Instruction Manual

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