

Technical Bulletin

ARIAS 500 Guidelines of Operation

NOTICE: This document is intended as a guide to attain the greatest degree of accuracy from the ARIAS 500 Refractometer. Reichert Analytical Technical Assistance is available by phone at 716-686-4500.

Overview

Reichert Inc's. ARIAS 500 is a semi automatic transmitted light refractometer with an extended 1.30000 to 1.70000 refractive index range. The advantage over manual refractometers is that our instrument interprets the shadow line that is projected onto the dual *OptiMatrix* electronic arrays. Therefore, the potential human error of shadow line interpretation between a set of cross hairs is eliminated. As a result of the semi automatic features of the ARIAS 500, Reichert can offer a greater degree of measurement capability than with a manual transmitted light instrument. The Arias 500 can read refractive index to the 5th decimal place and to the 2nd decimal place for % Brix.

To attain the greatest degree of accuracy and consistency from the ARIAS 500, the following steps and practice should be followed:

- 1. Water Bath Circulator:** It is recommended that the instrument be connected to a water bath circulator to insure temperature stability and consistent readings. While the instrument does have temperature correction, using the circulator protects against thermal shifts that can cause calibration drift. In addition, all refractometers are temperature sensitive and measuring out to 5 significant places in nD and 2 significant places % Brix places additional responsibility on the operator for good laboratory practice and technique.

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2. **Calibration Verification:** Full calibration verification should be performed on any refractometer upon initial setup and installation. Before verification or calibration is to be performed, allow the instrument sufficient time to reach operating temperature after it has been powered on. It is recommended that the instrument be allowed to warm up for at least one hour before performing actual calibration, calibration verification by reading standards, or sample measurements.

3. **Calibration:** If the temperature of the prism area is changed by 5 or more degrees C, re-calibration is essential at that new temperature. You should always verify or calibrate the refractometer at the same prism temperature that the measurements will be made.

4. **Calibration Standards:** The following is a list of the oils that are used to fully calibrate all points along the refractive index span of the Reichert Refractometer line of instruments:

| | | |
|---------|-----------------|------------------|
| Point 1 | Distilled Water | |
| Point 2 | 1. 402XX | cat no. 13K41340 |
| Point 3 | 1. 457XX | cat no. 13K41350 |
| Point 4 | 1. 489XX | cat no. 13K41360 |
| Point 5 | 1. 514XX | cat no. 13K41330 |
| Point 6 | 1. 572XX | cat no. 13K41370 |
| Point 7 | 1. 630XX | cat no. 13K41380 |

While it is possible to calibrate the ARIAS 500 using other calibration fluids, it is not recommended if they are not of an extremely tight tolerance and verified to at least 5 decimal places. Also the temperature coefficient and the stated



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temperature for that refractive index must be known. Reichert calibration oils provide all necessary data and are NIST certified.



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