

PROCEDURE FOR CALIBRATING REFRACTIVE INDEX LIQUID USING ABBE REFRACTOMETER

SHU-CHUN SU, PH.D.

NVLAP TECHNICAL EXPERT FOR BULK AND AIRBORNE ASBESTOS PROGRAMS

1. Open the top (illumination) prism.
2. Apply 2-3 drops of RI liquid to be calibrated to the surface of the bottom (measurement) prism and close and lock down the top prism. The amount of liquid should be just enough to fill the thin gap between the two prisms without overflowing.
3. Look through the eyepiece of the telescope, adjust the illumination mirror and rotate the prism knob until the boundary between a dark field and a light field is near the center of the field of view (Fig.1 Top window). The boundary may appear fuzzy and colored. Rotate the compensation knob to eliminate the dispersion, resulting in a sharp black-white border line between the dark and bright fields. Rotate the prism knob until the dark/light boundary is exactly at the intersection of the cross hairs as shown in the top window of Fig. 1.

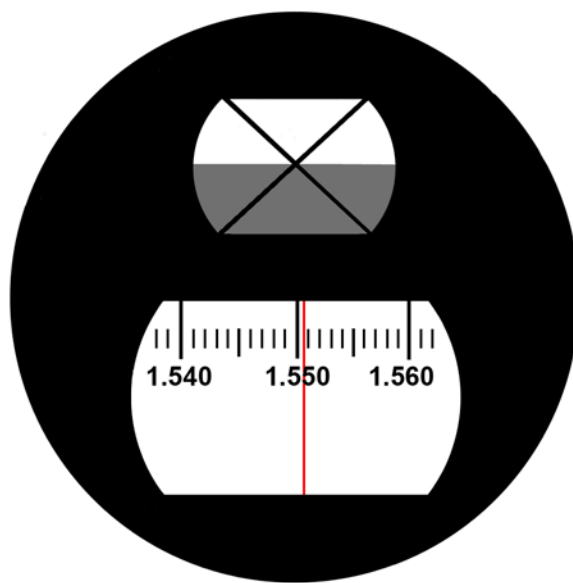


Fig. 1

4. In the lower reading window (Fig. 1), read the refractive index to the 4th decimal place. For example, the above measurement gives a reading 1.5507.
5. When finished, use high quality lens paper to clean off the liquid and then apply a few drops of xylene (dimethylbenzene) to thoroughly clean the prism surfaces. The prisms are made of glass with high lead concentration, which is very soft and can be easily scratched.