

## Refractive Index - RI Measurement of Solids & Films

### Refractometer Calibration, 2 point method, Rudolph Research J157 – Video Transcript

Refractometer Calibration resource – for laboratory refractometer users utilizing a Rudolph Research Automatic Refractometer.

Hi, I am John Ciccarella, Service manager of the most innovative line of refractometer instruments made today from Rudolph Research Analytical. John Ciccarella, Rudolph Research, Service Manager with a J157 Refractometer

Today the objective is cover effective calibration of your refractometer instrument. Shown: J157 Refractometer with needed materials, acetone, water fluid, towels Calibration Type: 2 point

There are a few simple steps to accomplishing a refractometer calibration successfully with a few needed materials

Shown in Video: acetone, water and a certified calibration fluid with the J157 Refractometer in the background

List of needed materials needed for a Refractometer Calibration:

- Acetone
- Water
- Paper towels
- Certified – high calibration fluid

The refractometer is designed to guide you through the 2 point – refractometer calibration process. However, to really make sure you have effectively eliminated any potential error, it's always good to "Zero" first. Here is how...

Step 1: Confirm the Refractometer Prism is clean and Press the zero key Shown Screen of the J157 Refractometer. Press Zero Button

Step 2: Now simply place Deionized Water on the prism. Verify the Prism is completely covered by the sample. Cover the sample with the presser or with the light exclusion cap that would be supplied with a J57 model refractometer. Press the continue key

Step 3: Once, it is noted that on the Refractometer screen that the water zero has performed successfully. The user can now clean the prism. The best way would be to use a paper towel and dry the prism thoroughly, the user can use acetone as a drying agent as needed.

Shown in Video: John cleaning the prism and also using amount of acetone. Note: All instruments in the Rudolph Research refractometer line use Scratch resistant Sapphire Prisms making paper towel a cost effective solution to cleaning as opposed to using more expensive drying materials.

After this has been completed, I will now show you how to perform a 2 point refractometer calibration. We will be using distilled water and an R.I. standard supplied with the Refractometer with a refractive index value of 1.42012 at 20.0c

Step 4: The way to this is by pressing a few keys on the Refractometer:

First, press the setup key and enter in the factory code of 1-2-3, Once in the main menu, press user calibration, then press two point calibration, select desired temperature in this case we will be using 20.0c, then select the desired scale and we will be using R.I. (Refractive Index), then press "Done." The system will now perform an air calibration. As always, confirm the prism is very clean and covered. This will take a few moments.

Shown in Video: Measurement bar on screen

Step 5: The refractometer will ask the user to load sample "One" on the prism dish, this simply means to add your low value fluid, and this is typically Deionized Water. Confirm the prism is completely covered by the sample, close the presser lid and press done, and then hit continue.

Shown: John loading the water on the prism

Step 6: When the Refractometer is finished scanning the sample. User will be asked to enter the sample's R.I. value and for Deionized Water at 20.0c this is known to be 1.33299. This can be entered into the field using the keypad on the refractometer and then hit the enter key.

Shown in Video: The J157 Refractometer screen as value is entered. The spec value for water theoretically is 1.33299 which is factored into the calibration

Step 7: Once, the refractometer screen has accepted the water's R.I. value, the instrument will ask you to load sample 2 on the prism, the user can now clean the prism and presser again, The best way would be to use paper towel and dry the prism thoroughly, the user can use acetone as a drying agent as needed. Sample 2 will be the high R.I. refractometer calibration liquid in this case, a fluid which is certified and included when the refractometer is shipped.

Shown in Video: User pouring sample 2 on prism. Refractometer calibration fluids come with certificates and are available in a wide range of values, suited to your refractometer.

Step 8: When the refractometer is done factoring in the R.I. value of the calibration fluid it will ask the user to enter the certified value which is printed on the label of the refractometer calibration fluid bottle. In this case the fluid value is.... and this again is entered using the keypad on the J157 refractometer and then press "Enter"

Step 9: Now the refractometer will factor in the entered value in the calibration and once a variation percentage is noted to be at 0%, you are alerted that the calibration was successful and the user can measure refractive index, assured that there will be accurate results output since the refractometer was fully calibrated.

Shown in Video: Screen of calibration completion. It is best to calibrate and achieve a 0% variation indication so all variation factors have been eliminated.

Watch this Video: Refractometer 1 and 2 Point Calibration

Additional Information is available on the Rudolph Research line of Refractometers