VEE GEE Temperature Correction

Model NDX-1 is factory-calibrated to conduct readings at 20°C. For the best accuracy, if ambient temperature falls above or below 20°C, temperature correction values should be applied to readings. When a reading is taken under these circumstances, note the temperature value from the thermometer mounted on the side of the refractometer and follow the procedure listed below.

Temperature coefficients are used to correct measured values conducted at temperatures other than the reference (calibration) temperature. For each °C higher than the reference temperature, a temperature coefficient is subtracted from the value; for each °C lower than the reference temperature, a temperature coefficient is added to the value. Model NDX-1 can be used for measuring both water-based solutions and oils. The coefficients used for temperature correction on oil-based solutions are slightly higher than those used for water-based solutions (see upper right corner). If there is a specific temperature coefficient known for the sample being tested, use this value. Otherwise use an average of the values shown in the upper right corner. Confirm the type of sample being tested and perform the following calculations:

Temperature Coefficients
Water-Based Solutions: (-0.0001 to -0.0002/+°C)
Oil-Based Solutions: (-0.0003 to -0.0004/+°C)

Sample Values

1.492	27°C	20°C	0.0003
Measurement Value	Measurement Temperature	Reference Temperature	Temperature Coefficient

1. Calculate Temperature Differential

20	27	-7
Reference Temperature -	Measurment Temperature =	Temperature Differential

2. Calculate Temperature Compensation Factor

-7	0.0003	-0.002
Temperature Differential x	Temperature Coefficient =	Temperature Compensation Factor

3. Calculate Temperature Corrected Value

1.492	-0.002	1.490
Measurement Value +	Temperature Compensation Factor =	Temperature Corrected Value

VEE GEE Specifications

Range:	1.3330-1.5170 nD (Refractive Index)
Resolution:	0.0005
Accuracy:	±0.0005
Dimensions:	35 x 35 x 200mm (1.4 x 1.4 x 7.9")
Weight:	650g (22.9 oz.)
Supplied With:	Vinyl Carrying Case (1), Plastic Transfer Pipet (1)

VEE GEE Common Oils

Sample	Temperature	nD Range
Almond Oil	20°C	1.470-1.472
Arachis Oil	20°C	1.460-1.472
Aromatic Oils	20°C	1.487-1.550
Beef Tallow	40°C	1.454-1.459
Beeswax	20°C	1.440-1.445
Butter	40°C	1.453-1.463
Cacao Oil	40°C	1.456-1.458
Camellia Oil	20°C	1.468-1.469
Castor Oil	20°C	1.477-1.479
Chrysalis Oil	40°C	1.471-1.476
Coconut Oil	40°C	1.448-1.450
Cod Liver Oil	40°C	1.477-1.483
Cod Oil	20°C	1.479-1.482
Corn Oil	20°C	1.474-1.476
Cottonseed Oil	20°C	1.472-1.477
Herring Oil	40°C	1.470-1.475
Hog Tallow	40°C	1.458-1.461
Kapok Oil	20°C	1.469-1.471
Lanolin	20°C	1.478-1.482
Lard	40°C	1.458-1.461
Linseed Oil	20°C	1.479-1.481
Mackerel Oil	20°C	1.478-1.481
Mutton Tallow	40°C	1.455-1.458
Naphthalene Oils	20°C	1.407-1.436
Neat's-Foot Oil	40°C	1.460-1.461
Olive Oil	20°C	1.467-1.471
Palm Oil	40°C	1.453-1.456
Paraffin Oils	20°C	1.332-1.412
Peanut Oil	20°C	1.460-1.472
Rapeseed Oil	20°C	1.472-1.476
Sardine Oil	40°C	1.479-1.481
Seal Oil	40°C	1.474-1.483
Sesame Oil	20°C	1.473-1.476
Shark Oil	20°C	1.492-1.493
Soy Sauce	20°C	1.463-1.465
Soybean Oil	20°C	1.470-1.478
Sugar Oil	20°C	1.471-1.474
Sunflower Oil	20°C	1.474-1.476
Tea Oil	20°C	1.468-1.471
Tuna Oil	20°C	1.478-1.484
Tung Oil	20°C	1.500-1.510
Unsaturated Oils	20°C	1.371-1.432

VEE GEE Refractometers

VEE GEE® Refractometers

Operation Manual
Model NDX-1

1.3330-1.5170 nD

Cat. No. 43053

VEE GEE Introduction

Thank you for purchasing this VEE GEE Refractometer. With the user in mind, VEE GEE Refractometers are built from modern designs and, with proper care, this instrument should provide many years of reliable performance. It's recommended this manual is read entirely before using the refratometer for the first time.

VEE GEE Refractometer Components

Eyepiece
The eyepiece is focusable to ensure sharp, accurate readings.

Secondary Prism
Covers the primary prism and sample during readings.

Dispersion Dial
Eliminates color/blurriness from the boundary line.

Range Selection Dial
Sets the optics to one of the 3 available scales.

Thermometer
Displays the current temperature of the sample/prism assembly.

Primary Prism
The primary prism and sample are covered by the secondary prism during readings.

NDX-1 1.333-1.520nD

VEE GEE Precautions

⚠ This refractometer is an optical instrument -- it can become damaged if dropped or handled in a rough manner.

⚠ The prism is made of optical glass and is susceptible to scratches -- do not apply any rough or abrasive material and take care when cleaning the prism.

⚠ After each use, clean the prism surface and daylight plate with a soft cloth or tissue soaked in water and wipe off with a dry cloth or tissue.

⚠ Do not hold the refractometer under a stream of water from a faucet. Do not splash it with or dip it in water.

⚠ If the surface of the prism becomes coated with an oily solution or similar, it will repel test samples and affect readings. If this occurs, the prism should be cleaned with a weakened detergent or similar solvent.

VEE GEE General Use

① Open the secondary prism and apply one or two drops of the sample solution to the surface of the primary prism. Hold the refractometer at an angle close to parallel with the floor so the sample will not run off of the prism.

② Gently close the secondary prism over the primary prism. The sample solution should spread as a thin, even layer in between the seconary prism and the primary prism. If there are bubbles and gaps or if the sample is only on one portion of the prism, the sample solution must be reapplied (Figure 1). Inaccurate readings will result if the prism is not covered correctly.

③ Before performing a reading, the range selection dial must be set to the range which covers the approximate value of the sample solution. Choose from the following:

RANGE No. 1:
1.3330-1.4050 nD
(RIGHT)

RANGE No. 2:
1.4050-1.4670 nD
(CENTER)
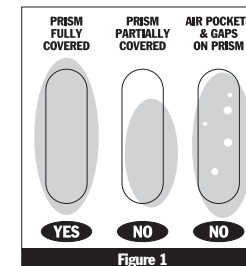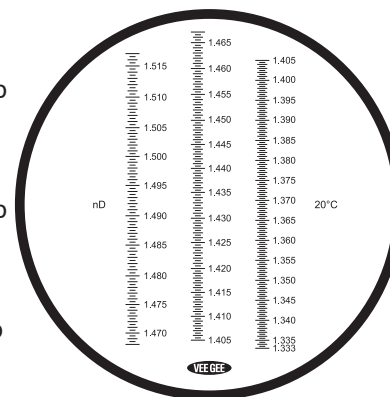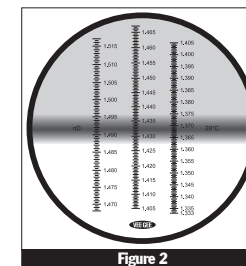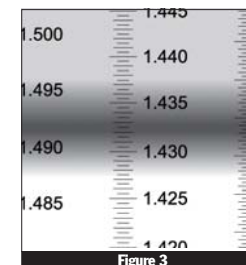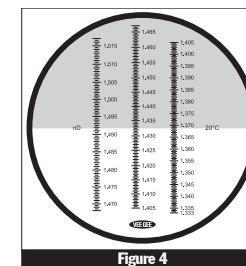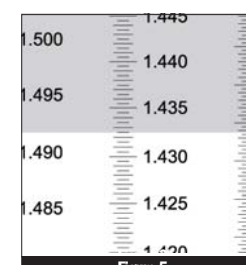
RANGE No. 3:
1.4680-1.5170 nD
(LEFT)

④ If an approximate value of the sample is unknown, cycle through the three ranges and select the range which provides the sharpest contrast at the boundary line.

⑤ Looking through the eyepiece, hold the refractometer (secondary prism facing up) and direct the prism assembly upwards towards light. If the scale is not in focus, adjust it by gently turning the eyepiece either clockwise or counterclockwise. Be careful not to overturn the focusing mechanism.

⑥ In the field of view, the boundary line may appear colored and/or blurry (Figures 2 & 3). If this is the case, turn the dispersion dial until the coloring and or blurriness is replaced by sharp contrast.

⑦ When the refractometer scale is viewed through the eyepiece (with the dispersion dial at the proper setting), the upper field of view will be seen as grey and the lower field will be seen as white (Figure 4). The reading is taken at the point where the boundary line of the grey and white fields crosses the scale (Figure 5). The value is the Refractive Index (nD) reading of the sample.

⑧ When each measurement is complete, the sample must be cleaned from the prism using tissue paper and water.

⑨ This refractometer is equipped with a thermometer indicating the temperature of the sample/prism assembly. These temperature readings are used to calculate temperature correction values when readings are conducted in ambient temperatures above or below 20°C. Please refer to the follwoing page for temperature correction procedures.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5