

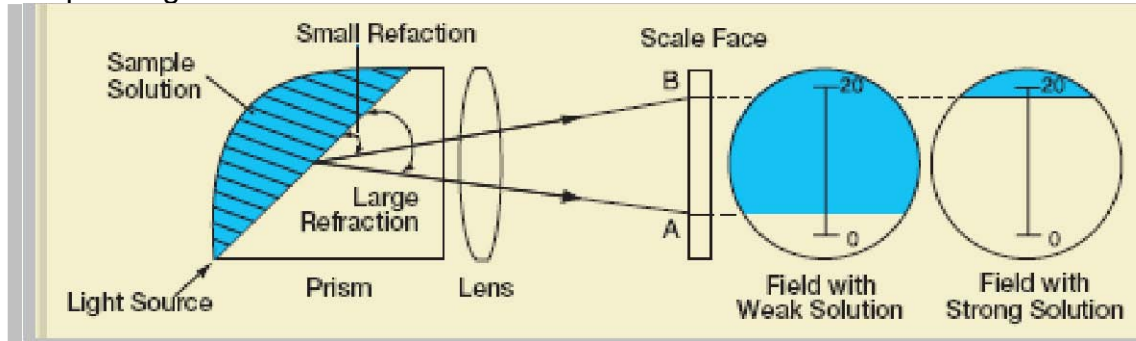
A refractometer is an instrument the concentration of aqueous solution by measuring its refractive index. All water-based solution can make light bend. The bending of light increases at a rate proportional to the increasing solution concentration.

The hand-held refractometer is a precise optical instrument. It's characterized by small volume, light weight, graceful in shape and easy to operate. Therefore it can be used by all sides.

How a Refractometer Works

When light enters a liquid it changes direction; this is called refraction. Refractometers measure the degree to which the light changes direction, called the angle of refraction. A refractometer takes the refraction angles and correlates them to

refractive index (nD) values that have been established. Using these values, you can determine the concentrations of solutions. For example, solutions have different refractive indexes depending on their concentration in water.



The prism in the refractometer has a greater refractive index than the solution. Measurements are read at the point where the prism and solution meet. With a low concentration solution, the refractive index of the prism is much greater than that of the sample, creating a large refraction angle and a low reading ("A" on diagram). The reverse would happen with a high concentration solution ("B" on diagram).

Refractometers

Refractometer Selection Guides

BEVERAGES	
Distilled Water	0% Brix
Acidophilus	12 - 20% Brix
Carbonated	5 - 15% Brix
Concentrated Fruit Juices	41 - 68% Brix
Fruit Juice	12 - 17% Brix
Grapes & Wines	14 - 19% Brix
Lactic Acid	12 - 22% Brix
Milk	6 - 17% Brix
Nectars	16 - 23% Brix
Tomato Juice	4 - 9% Brix

FRUITS	
Distilled Water	0% Brix
Apples	11 - 18% Brix
Grapes	7 - 24% Brix



Oranges & Pears	4 - 13% Brix
Strawberries	6 - 12% Brix
Tomatoes	3 - 6% Brix
Tomato Puree	14 - 17% Brix

FOODS	
Distilled Water	0% Brix
Can Fruits	14 - 29% Brix
Condensed Milk	52 - 68% Brix
Egg Yokes	45 - 50% Brix
Flour Paste, Jams, Jellies & Marmalade	60 - 70% Brix
Honey	58 - 92% Brix
Liquid Sugar	58 - 80% Brix
Mayonnaise	5 - 10% Brix
Olive Oil & Palm Oil	70 - 75% Brix
Paraffin Oil	55 - 60% Brix
Soybean Milk	4 - 13% Brix
Steak Sauce & Tomato Catsup	28 - 38% Brix
Yeast Culture Solutions	3 - 8% Brix

INDUSTRY	
Distilled Water	0% Brix
Cutting Oil, Quenching Oil	0 - 9% Brix
Emulsification Solutions	0 - 8% Brix
Soluble Tempering Oil	0 - 20% Brix

BRINE	
Seawater Density/Brine for Food/Pickling /Salt Rinsing Solutions /Canning /Aquaculture / Aquariums	

Refractive Index - Brix - Density Conversion Chart

The following tables show the conversion between refractive index respective to Density & Brix at 20°C. There is a direct relationship between Density and Brix. This conversion is based on table 109 of NBS Circular 440. Refractive Index and Brix reading are temperature-dependent.

Density (2)d20°C	Brix %20°C	Refractive Index (1)nD20°C
1.00000	0	1.33000
1.00965	5	1.34026
1.03998	10	1.34782
1.06104	15	1.35568
1.08287	20	1.36384
1.10551	25	1.37233
1.11898	30	1.38115
1.15331	35	1.39032
1.17853	40	1.39986
1.20467	45	1.40987
1.23174	50	1.42009
1.25976	55	1.43080
1.28873	60	1.44193
1.31866	65	1.45348
1.34956	70	1.46546
1.38141	75	1.47787
1.41421	80	1.49071
1.44794	85	1.50398
1.48259	90	
1.51814	95	
(2) According to 109 of NBS Circular 440		(1) According to 16th Session of ICUMSA 1974



Overviews

Handheld Optical Refractometers are specially designed to measure the concentration of many kinds of solution such as Juices, Beverages, Honey, Salt water, Alcohol, Wine, Brine, Cleaning fluid, Battery Acid fluid, Antifreeze and Industrial fluids, Gemmological etc. As well they can test the proportion of the water-soluble solution. They can be easily used and they are competitive in price. You only need to drop some water on the prism and then make it towards to the sunlight. Then the reading of the concentration will appear. They are equipped with a built-in automatic temperature compensation (ATC) of 10°C to 30°C for applications where the temperature of samples vary.