REFRACTIVE INDEX & °BRIX TEMPERATURE RELATIONSHIP

Calibration Oil Component Code: 90-231 **Type:** BSDC-B **Batch:** BSDC-B05

TEMPERATURE	REFRACTIVE INDEX	°BRIX	TEMPERATURE	REFRACTIVE INDEX	°BRIX
10.0°C	1.54063	98.10	45.0°C	1.52762	93.55
15.0°C	1.53877	97.46	50.0°C	1.52577	92.90
20.0°C	1.53690	96.81	55.0°C	1.52392	92.24
25.0°C	1.53504	96.16	60.0°C	1.52208	91.58
30.0°C	1.53319	95.51	65.0°C	1.52023	90.92
35.0°C	1.53133	94.86	70.0°C	1.51839	90.26
40.0°C	1.52947	94.21	75.0°C	1.51655	89.60
R.I. = (1.544366E+00) + (-3.738621E-04 x Temperature) + (3.911828E-08 x Temperature^2)					
°BRIX = (9.938788E+01) + (-1.283401E-01 x Temperature) + (-2.871527E-05 x Temperature^2)					

Refractive index values detailed in the table were calculated from a 2nd order polynomial fit of empirical data, as shown above, which is valid over the range 10 to 75°C. Values used to determine this relationship were produced from a statistical evaluation of averaged refractive index data.

Equivalent °Brix values are derived from ICUMSA SPS-3 (2000) Equation 2. When using these values to calibrate at the refractometer's operating temperature, sucrose temperature compensation should not be applied to °Brix readings.

The refractive index of the sample was measured on a high accuracy refractometer at 589.3nm in a temperature controlled room. Refractometer calibration was set prior to testing with high purity water. Refractive index values for water were obtained from "Revised Formulation for the Refractive Index of Water and Steam as a Function of Wavelength, Temperature and Density", adopted by the International Association for the Properties of Water and Steam (IAPWS) and available as part of NIST Standard Reference Database 10[1]. Refractive indices calculated from the formulation are absolute refractive indices; conversion to refractive index against air requires division by the respective absolute refractive index of air (NIST Engineering Metrology Toolbox[2]).

Maximum residual of polynomial data fit: ±0.00005 R.I.
Date of analysis: 5th June 2020

Authorised signatory

A.Darkins
Technical Services Manager

Calibration oils are guaranteed until the expiry date, provided they are stored as directed. However, B+S can only consider queries regarding a batch of samples if unopened bottles are returned before the expiry date. In no event will Bellingham + Stanley Ltd. be liable for direct, indirect, incidental or consequential damages resulting from the use of this product.

Material Safety Data Sheet for this product is available from the B+S website or on request.

Equivalent °Brix values and refractive indices at temperatures other than 20.0°C are not covered by the current UKAS Scope of Accreditation of Bellingham + Stanley Ltd. °Brix values greater than 85.00 are extrapolated from the relationship given in ICUMSA SPS-3 (2000) Equation 2.

[1]NIST Standard Reference Database 10, Version 2.21, A.H.Harvey, A.P.Peskin, S.A.Klein
[2]NIST Engineering Metrology Toolbox: Refractive Index of Air Calculator (http://emtoolbox.nist.gov/Wavelength/Abstract.asp)

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