REFRACTIVE INDEX & °BRIX TEMPERATURE RELATIONSHIP

Calibration Oil Component Code: 90-225 **Type:** BSLP **Batch:** BSLP31

TEMPERATURE	REFRACTIVE INDEX	°BRIX	TEMPERATURE	REFRACTIVE INDEX	°BRIX
10.0°C	1.46862	71.29	45.0°C	1.45563	65.91
15.0°C	1.46677	70.54	50.0°C	1.45377	65.13
20.0°C	1.46492	69.78	55.0°C	1.45191	64.33
25.0°C	1.46306	69.02	60.0°C	1.45005	63.54
30.0°C	1.46121	68.25	65.0°C	1.44819	62.73
35.0°C	1.45935	67.47	70.0°C	1.44633	61.93
40.0°C	1.45749	66.70	75.0°C	1.44447	61.12
R.I. = (1.472327E+00) + (-3.702303E-04 x Temperature) + (-1.636036E-08 x Temperature^2)					
°BRIX = (7.278755E+01) + (-1.484899E-01 x Temperature) + (-9.508242E-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: 15th November 2017

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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