

# REFRACTIVE INDEX / TEMPERATURE RELATIONSHIP

Calibration Oil Component Code: 90-225

Type: BSLP

Batch: BSLP22

TEMPERATURE	REFRACTIVE INDEX	TEMPERATURE	REFRACTIVE INDEX
20.0°C	1.46783	50.0°C	1.45670
25.0°C	1.46597	55.0°C	1.45485
30.0°C	1.46412	60.0°C	1.45301
35.0°C	1.46226	65.0°C	1.45116
40.0°C	1.46041	70.0°C	1.44932
45.0°C	1.45855	75.0°C	1.44748
$R.I. = (1.475293E+00) + (-3.737404E-04 \times \text{Temperature}) + (3.860644E-08 \times \text{Temperature}^2)$			

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 20 to 75°C. Values used to determine this relationship were produced from a statistical evaluation of averaged refractive index data.

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<sup>1</sup>. 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<sup>2</sup>).

*Maximum residual of polynomial data fit: ±0.00005 R.I.*

*Date of analysis: 10th January 2007*

Authorised signatory



A. Darks  
Laboratory 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.

Refractive indices at temperatures other than 20.0°C are not covered by the current UKAS Scope of Accreditation of Bellingham + Stanley Ltd.

<sup>1</sup>NIST Standard Reference Database 10, Version 2.21, A.H.Harvey, A.P.Peskin, S.A.Klein

<sup>2</sup>NIST Engineering Metrology Toolbox: Refractive Index of Air Calculator (<http://emtoolbox.nist.gov/Wavelength/Abstract.asp>)

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