



# Certified Reference Materials

FOR REFRACTOMETERS AND POLARIMETERS



Regular verification of laboratory instrumentation is of primary importance in a modern manufacturing facility, not only for reasons of quality control but also as an assurance of plant efficiency.

Depending on the instrument type, application and traceability requirement, a choice can be made from a number of Certified Reference Materials offered by Bellingham + Stanley that may be used to verify almost any make of refractometer or polarimeter. All CRMs are manufactured to the highest standards and are certified in accordance with ISO/IEC 17025:2017.

The United Kingdom Accreditation Service (UKAS) assess and accredits organisations that provide certification, testing, inspection and calibration services. UKAS is one of the signatories to the International Laboratory Accreditation Co-operation (ILAC) Arrangement for the mutual recognition of calibration certificates.

Please contact Bellingham + Stanley or your local distributor for advice on selecting the correct CRM for your particular application.

#### Features:

- Low Brix water based refractometer CRMs
- High value oil based refractometer CRMs
- Sucrose Solution supply contracts
- Quartz Control Plates for Polarimeters
- 12-months validity on most products



## A Range of Calibration Solutions

Bellingham + Stanley, a UKAS accredited calibration laboratory number 0834, offer a number of different calibration materials for verifying and calibrating refractometers, traceable to NIST and ICUMSA. The standards are made to the highest quality and are supplied with certificates in either single or multi-pack formats. Values at temperatures other than 20°C<sup>1</sup> are available in RI and °Brix from a table supplied with the fluid or via [www.bellinghamandstanley.com](http://www.bellinghamandstanley.com)



## AG Fluids

Ideal for use where verification/calibration at the lower end of the °Brix or refractive index scale is required. AG fluids are despatched with at least 12-months validity and when purchased as a single value 'multi-pack' offer excellent value for money as the 'per bottle shipping cost' is significantly reduced.



Code			Type	Specification	
Single 5ml Bottle	Multi-pack of 5 x 5ml Bottles	Multi-pack of 20 x 5ml Bottles		Refractive Index	°Brix <sup>3</sup>
90-401	90-501	90-601	AG2.5	1.33659	2.50
90-402	90-502	90-602	AG5	1.34026	5.00
90-403	90-503	90-603	AG7.5	1.34401	7.50
90-404	90-504	90-604	AG10	1.34782	10.00
90-405	90-505	90-605	AG11.2	1.34968	11.20
90-406	90-506	90-606	AG12	1.35093	12.00
90-407	90-507	90-607	AG12.5	1.35171	12.50
90-408	90-508	90-608	AG15	1.35568	15.00
90-418	90-518	90-618	AG40	1.39986	40.00

### Specification (AG Fluid)

Certificate:	UKAS (ISO 17025)
Uncertainty (k=2)	±0.000037RI ±0.019 °Brix
Shelf Life:	12-months (minimum)
Storage:	Room temperature Keep sealed
Traceability:	ICUMSA NIST

## Calibration Oils

Primarily used to verify instruments that operate over a wide refractive index range and for specific applications such as within the edible oil industry, careful consideration to temperature must be adopted when using calibration oils due to their high coefficient. For optimum performance, temperature control should be applied to the instrument being verified or alternatively, use of the RI/°C table/calculator should be made.

Code	Type	Specification	
Multi-pack of 5 x 5ml Bottles		Refractive Index <sup>2/4</sup>	°Brix <sup>3/4</sup>
90-525	BSLP	1.46607	70.25
90-531	BSDC-B	1.53402	95.81
90-535	BSDD	1.55900	n/a



AG and Calibration Oil calculators available on our website

### Specification (Calibration Oils)

Certificate:	UKAS (ISO 17025)
Uncertainty (k=2) (BSDD)	±0.000074RI ±0.030 °Brix (±0.000103RI)
Shelf Life:	12-months (minimum)
Storage:	Room temperature Keep sealed
Traceability:	ICUMSA NIST

## Industry Specific Multi-Packs

Mixed multi-packs are ideal for customers, sales persons and service engineers. They have an excellent shelf life and do not require any special storage during transit. They are ideal for verifying the performance of new installations as well as for validating refractometers across the typical measurement range in the harshest of controlled environments such as within the chemical and pharmaceutical industry.

CRMs can verify refractometers that are not temperature controlled by entering data in to our on-line calculator.

Multi-Pack of 5 x 5ml bottles (1 of each value below) incl. UKAS Certificates, SDS & 5 disposable pipettes.



Code	Type	Specification
Multi-pack of 5 x 5ml Bottles	Industry	Refractive Index <sup>2</sup> °Brix <sup>3</sup>
90-910	Soda	AG 2.5 1.33659 2.50
		AG 10.0 1.34401 10.0
		AG 15.0 1.35568 15.0
		AG 40.0 1.39986 40.0
		BSLP Oil 1.46607 70.25
90-911	Beverage	AG 7.5 1.34401 7.50
		AG 12.5 1.35093 12.5
		AG 15.0 1.35568 15.0
		AG 40.0 1.39986 40.0
		BSLP Oil 1.46607 70.25
90-912	Juice	AG 7.5 1.34401 7.50
		AG 11.2 1.34968 11.2
		AG 15.0 1.35568 15.0
		AG 40.0 1.39986 40.0
		BSLP Oil 1.46607 70.25
90-913	Pharma & Chemical	AG 10 1.34782 10.00
		AG 15.0 1.35568 15.0
		AG 40.0 1.39986 40.0
		BSDC-B Oil 1.53402 95.81
		BSDD Oil 1.55900 n/a
90-914	Petrochemical	AG 10.0 1.34968 10.0
		AG 40.0 1.39986 40.0
		BSLP Oil 1.46607 70.25
		BSDC-B Oil 1.53402 95.81
		BSDD Oil 1.55900 n/a

### Specification (General)

Certificate:	UKAS (ISO 17025)
Uncertainty (k=2)	±0.000037RI ±0.019 °Brix
Shelf Life:	12-months (minimum)
Storage:	Room temperature Keep sealed
Traceability:	ICUMSA NIST

### Specification (Uncertainty, k=2)

Type	Refractive Index	°Brix
AG	±0.000037RI	±0.019
BSLP	±0.000074RI	±0.030
BSDC-B	±0.000074RI	±0.030
BSDD	±0.000103RI	n/a



**AG and Calibration Oil calculators available on our website**

## Sucrose Solutions

Sucrose Solutions are an extremely easy to use medium for verifying and calibrating refractometers measuring in the °Brix scale, as no special consideration is required when testing instruments at ambient temperature fitted with ATC.

Sucrose Solutions are typically supplied in 15ml plastic dropper bottles complete with a UKAS certificate of calibration. Single value multi-packs are also available as 4 x 15ml bottles. We believe that smaller bottles, as opposed to a larger volume bottle, helps to reduce cross-contamination. Density Meter users operating in the °Brix scale may wish to consider these multi-packs. Density fluids are also available.

The UKAS certificate provides values for sucrose in %weight/weight, °Brix and refractive index as well as giving detail about traceability and uncertainty.



### Sucrose Solutions – Supply Contracts

As Sucrose Solutions have a limited shelf life of 6-weeks, they must be purchased at the time of requirement. If a frequent calibration regime is operated, the administration cost of issuing purchase orders every time can be relatively high. Many users therefore choose to take out a supply contract on a single order that ensures trouble free regular delivery over a twelve month period.

Code 15ml	Value (°Brix)	Value (RI)
SS00	0	1.33299
SS05	5	1.34026
SS075	7.5	1.34401
SS10	10	1.34782
SS112	11.2	1.34968
SS115	11.5	1.35015
SS12	12	1.35093
SS125	12.5	1.35171
SS15	15	1.35568
SS20	20	1.36384
SS25	25	1.37233
SS30	30	1.38115
SS35	35	1.39032
SS40	40	1.39986
SS45	45	1.40978
SS50	50	1.42009
SS55	55	1.43080
SS60	60	1.44193

### Specification (Sucrose)

Certificate:	UKAS (ISO 17025)
Uncertainty (k=2)	±0.011 °Brix
Shelf Life:	6-weeks <sup>5</sup>
Storage:	Refrigerated at approx 5°C Do not freeze
Traceability:	ICUMSA NIST

## “RI Equivalent” Aqueous Urea Solution

Users of refractometers for the testing of Diesel Exhaust Fluids require some specific calibration materials. Manufacturers need an extremely high accuracy CRM to comply with ISO 22241, whilst users in the field need longevity of product.

Bellingham + Stanley supplies two products that have an equivalent refractive index to 32.5% Urea. Supplied with UKAS certificate.

Code	Type	Value (RI)	Vessel	Volume	Uncertainty (RI: k=2)	Shelf Life
90-421	BS-AUS	1.38290	Glass	1 x 5ml	±0.000034	12-months
90-521	BS-AUS	1.38290	Glass	5 x 5ml	±0.000034	12-months

### Specification (AG Fluid)

Certificate:	UKAS (ISO 17025)
Uncertainty (k=2)	±0.000037
Shelf Life:	12-months (minimum)
Storage:	Room temperature Keep sealed
Traceability:	ICUMSA NIST

Note:

- UKAS Certification is valid at 20°C & 589.3nm only. For use at other temperatures, please refer to: [www.bellinghamandstanley.com/en/customer-support/calculators](http://www.bellinghamandstanley.com/en/customer-support/calculators)
- Typical refractive index @ 589.3nm & 20.0°C.
- Equivalent °Brix value @ 589.3nm & 20.0°C. °Brix values greater than 85 are extrapolated from the relationship given in ICUMSA SPS-3 (2000) Equation 2.
- All quoted values for calibration oils are subject to minor batch to batch variations.
- From date of manufacture. Please consider delivery and customs times when ordering.





## Quartz Control Plates

Bellingham + Stanley offer a choice of Quartz Control Plates (QCP) for verifying and calibrating polarimeters. QCPs are made to the highest standard and may be supplied with an optional Certificate of Calibration, showing traceability to PTB. When used with an ADP polarimeter manufactured by Bellingham + Stanley, an XPC block may be used to provide physical contact to the instrument's external temperature sensor, allowing the use of quartz temperature compensation for added accuracy.

As part of Good Laboratory Practice, it is recommended that Quartz Control Plates are sent to our UKAS laboratory at regular intervals determined by the user's own Standard Operating Procedure for inspection and recertification.



Code	Type	ISS (°Z)	Angular (°A)	Description
34-20	Single	100	34	Standard Quartz Control Plate and Certificate of Conformity at 589nm and 850nm. UKAS and/or manufacturers' certification over the range 300 to 900 nm is available on request and is subject to additional costs.
34-21	Single	15	5	
34-22	Single	-30	-10	
34-23	Single	50	17	
34-30	Set A	100 & 15	34 & 5	
34-31	Set B	100 & -30	34 & -10	
34-32	Set C	15 & -30	5 & -10	
34-39	Set Full	100, 15 & -30	34, 5 & -30	
34-33	Set D	50, 15, -30	17, 5, -10	For UV wavelengths.

### Specification (Quartz Control Plate)

Certificate:	UKAS (ISO 17025)
Best Measurement Uncertainty (k=2)	$\pm 0.017^\circ\text{Z}$ $\pm 0.006^\circ\text{A}$
Shelf Life:	Certify Regularly
Traceability:	ICUMSA PTB

Visit [www.bellinghamandstanley.com](http://www.bellinghamandstanley.com) for further information about Certified Reference Materials and up to date information about new products and services.

# Xylem |'zīləm|

- 1) The tissue in plants that brings water upward from the roots;
- 2) a leading global water technology company.

Bellingham + Stanley is part of Xylem Lab Solutions and is a leading provider of refractometers, polarimeters and density meters.

Xylem Lab Solutions' global brands have been leaders in the laboratory instrumentation market for decades, and are relied upon every day across more than 150 countries. Working in true partnership with our clients, we listen, learn and adapt to individual needs, offering deep application expertise built upon our long history of innovation in instruments and services. Our solutions for analysis, measurement and monitoring help enable many of today's modern laboratories and industrial processes, and provide our customers the trusted and high performing solutions they need to succeed.

Xylem Lab Solutions is part of Xylem Inc., a global company focused on solving the world's most challenging and fundamental water issues. As accurate analysis is crucial to the water industry, Xylem Lab Solutions taps its diverse product brands for leadership in that field and beyond, providing the best laboratory and field monitoring instrumentation across a wide variety of industries.

**For more information on how Xylem can help you, go to [www.xylem.com](http://www.xylem.com)**



Bellingham + Stanley, a Xylem brand, operates an Integrated Management System complying with ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018.



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