



# Certified Reference Materials

FOR REFRACTOMETERS AND POLARIMETERS



**Bellingham  
+ Stanley**

a xylem brand



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 EN ISO/ IEC 17025:2005.

**The United Kingdom Accreditation Service (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!

Bellingham + Stanley Ltd., 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 the Technical Centre at [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 'multi-pack' offer excellent value for money as the 'per bottle shipping cost' is significantly reduced.



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Code			Type	Specification	
Single 5ml Bottle	Multi-pack of 5 x 5ml Bottles	Multi-pack of 20 x 5ml Bottles	589nm	Refractive Index <sup>2</sup>	°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 Fluids)

Certificate: UKAS (ISO17025)

Uncertainty ±0.000037RI  
(k=2) ±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<sup>1</sup>.

Code	Type	Specification	
Multi-pack of 5 x 5ml Bottles		Refractive Index <sup>2/4</sup>	°Brix <sup>3/4</sup>
90-525	BSLP	1.46990	71.81
90-530	BSDC	1.52256	91.75
90-535	BSDD	1.56138	---



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

### Specification (Calibration Oils)

Certificate: UKAS (ISO17025)

Uncertainty ±0.000074RI  
(k=2) ±0.030 °Brix  
(BSDD) (±0.000103RI)

Shelf Life: 12-months (minimum)

Storage: Room temperature  
Keep sealed

Traceability: ICUMSA  
NIST

# 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 Certificate

of Calibration but may also be supplied in a larger quantity for high volume users or for customers wishing to verify the performance of density meters operating in the °Brix scale.

The Certificate of Calibration 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.

## "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 offer two product types based on existing fluids that have an equivalent refractive index to 32.5% Urea.

Code	Type	Value (RI)	Vessel	Volume	Uncertainty (RI: k=2)	Shelf Life
18-50 <sup>5</sup>	SS-AUS	1.38290	Plastic	15ml	±0.000011	6-weeks
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

### Note:

- UKAS Certification is valid at 20°C & 589.3nm only. For use at other temperatures, please refer to the calibration/technical sections of [www.bellinghamandstanley.com](http://www.bellinghamandstanley.com)
- 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.
- Due to its relatively short shelf life and limited application, SS-AUS is only available on a Supply Contract basis.

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:	Manufacturer
Uncertainty	±0.011 °Brix (k=2)
Shelf Life:	6-weeks
Storage:	Refrigerated at approx 5°C Do not freeze
Traceability:	ICUMSA NIST





## 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, a thermal block may be used to provide mechanical 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.

For details of QCP combination box sets, please visit our website.

Code	ISS (°Z) 589/850nm	°A 589nm	Type	Specification
34-20	+100 °Z	+34.6 °A		
34-21	+15 °Z	+5.2 °A		Standard Quartz Control Plate and Certificate of Conformity at 589nm and 850nm
34-22	-30 °Z	-10.4 °A		
90-803	UKAS Certificate of Calibration for Quartz Control Plate at 589.44nm			
90-805	UKAS Certificate of Calibration for Quartz Control Plate at additional specified wavelength between 546-900nm			
34-241	Thermal Block for use with ADP/S			



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### Specification (Quartz Control Plate)

Certificate:	UKAS (ISO17025)
Best Measurement Uncertainty (k=2)	±0.017 °Z ±0.006 °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.



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