

Reagecon

A CALIBRE SCIENTIFIC COMPANY



Physicochemical Standards

- Colour Standards
- Spectrophotometry Standards
- Melting Point Standards
- Density Standards
- Viscosity Standards
- Sucrose (Brix) Standards
- Refractive Index Standards
- Osmolality Standards
- Cryoscope Standards

About Reagecon

Reagecon, part of the Calibre Scientific Group of companies is one of the largest producers of Physical and Chemical Standards. The company is based in an 8,000 sq. metre facility that includes a large suite of manufacturing, quality control and research and development laboratories in Shannon, Ireland with sales offices in Shanghai and North America, Europe and the UK through our Calibre Scientific sister companies. Reagecon employs 100 people, 50% are chemistry or science graduates and most are involved in the development, production, testing, quality control and sales & marketing of over 10,000 product references that we currently produce. We have a very active R&D programme and develop and bring to market many hundreds of new standards, every year.

All Reagecon manufactured products are underpinned by and demonstrate our position as a centre of excellence in the science of Metrology. Product is manufactured, tested, and certified under the applicable ISO/IEC 17025 (A2LA Ref: 6739.03) or ISO/IEC 17034 (A2LA Ref: 6739.01) accreditation or ISO/IEC 17025 (A2LA Ref: 6739.02) for Calibration, in one of our 20 specially equipped laboratories.

The resulting product is classified within one of 54 product families, these families are then grouped and promoted under 7 main product headings, as listed below:-

- ✔ Electrochemistry Standards
- ✔ Cation and Anion Standards
- ✔ Pharmacopoeia Reagents and Standards
- ✔ Physicochemical Standards
- ✔ Total Organic and Inorganic Carbon Standards
- ✔ Volumetric Solutions for Titration
- ✔ Customised Standards and Reagents



Colour Standards



Summary of Features & Benefits

- Produced in accordance with ASTM (D1500, D6045, D1209) APHA, ACS, EP & USP methods
- Consistency of product - Independent, Traceable, Certified
- For use as Calibration and/or Quality Control Standards
- Presented in high quality tamper evident bottles
- Various pack sizes available
- Ready to Use
- Certificates of Analysis and Safety Data Sheets available online

Introduction

Reagecon manufactures the full range of ASTM, Saybolt, Platinum-Cobalt (Hazen), Gardner, European Pharmacopeia and United States Pharmacopeia Colour Standards for use with ASTM, APHA, ACS, European and United States Pharmacopeia standard methods. The ASTM standard methods include D1500, D6045 and D1209. The products can be used to calibrate, control, qualify and validate colour measurement instruments.

The products range from:

- ASTM Colour Standards Sample A05- A7
- Saybolt Colour Standards S+30 to S-15
- Platinum-Cobalt Scale No. 0 - No. 1000
- Gardner Colour Standards GARD02-GARD18
- European Pharmacopeia Standards (Opalescence, Primary and Standard Solutions)
- Chinese Pharmacopoeia Standards
- United States Pharmacopoeia Standards

These products are prepared gravimetrically on a weight/weight basis. Both solute and solvent are weighed on a balance calibrated by Reagecon engineers using OIML traceable weights. Reagecon holds ISO 17025 accreditation for calibration of laboratory balances. The concentration of each standard is verified using a high performance top of the range calibrated spectrophotometer.

Spectrophotometry Standards



Summary of Features & Benefits

- ✔ National Institute of Standards and Technology (NIST) Traceable
- ✔ Produced with salts sourced directly from NIST where applicable
- ✔ All standards certified at multiple slit widths
- ✔ Certified measurement uncertainties
- ✔ Can be used with all UV-VIS spectrophotometers
- ✔ Consistency of product - Independent, Traceable, Certified
- ✔ Supplied as permanently sealed cuvettes or in ready to use bottles
- ✔ Ready to Use
- ✔ Bi-Annual Recertification for all makes of permanently sealed spectrophotometer cuvettes
- ✔ Certificates of Analysis and Safety Data Sheets available online

The product range includes:

- ✔ Linearity Standards
- ✔ Wavelength Standards
- ✔ Stray Light Standards
- ✔ Bandwidth Standards

These products are prepared gravimetrically on a weight/weight basis. Both solute and solvent are weighed on a balance calibrated by Reagecon engineers using OIML traceable weights. Reagecon holds ISO 17025 accreditation for calibration of laboratory balances.

Melting Point Standards



Summary of Features & Benefits

- ✔ Uncertainty of measurement up to $\pm 0.3^{\circ}\text{C}$
- ✔ Extensive range
- ✔ Can be used with any melting point apparatus
- ✔ Consistency of product – Independent, Traceable, Certified
- ✔ Presented in high quality glass bottles
- ✔ Ready to Use
- ✔ Certificates of Analysis and Safety Data Sheets available online

Introduction

The product range (18 different products) starts at Benzophenone with a Melting Point $+47$ to $+49^{\circ}\text{C}$ up to Potassium Nitrate with a Melting Point of $+333$ to $+335^{\circ}\text{C}$.

These products are prepared using the highest purity raw materials. Products are tested and certified using a reference Melting Point apparatus that is calibrated using Certified Reference Materials to give traceability to the ITS-90 temperature scale. Both the meniscus formation and complete liquefaction temperatures are certified.



Density Standards

Premium Range

Summary of Features & Benefits

- ✔ Extensive range (0.6752 - 2.5964)
- ✔ High accuracy products (± 0.00077 g/ml)
- ✔ Test method accredited to ISO/IEC 17025 (0.65 – 1.034 g/mL)
- ✔ Tested using a fundamental measurement technique (Bingham Pycnometer)
- ✔ Products tested in accordance with ASTM D1480
- ✔ No toxic heavy metals used in any formulation
- ✔ Can be used with any brand or type of density measuring instrument
- ✔ Presented in a high quality tamper proof amber glass bottle
- ✔ Consistency of product - Independent, Traceable, Certified
- ✔ Certificates of Analysis and Safety Data Sheets available online

Reagecon manufactures an extensive range of **Density Standards** in accordance with ASTM D1480 for testing of Density or Relative Density (specific and API gravity) by Bingham Pycnometer. These materials covering values above 2.6 and below 1 g/mL at different temperatures can be used as calibration standards for density measurement by pycnometric techniques, vibrational techniques or hydrometer based techniques.

The product range includes:

- ✔ 0.6960 - 1.8366 g/mL @ 15°C
- ✔ 0.6919 - 2.0812 g/mL @ 20°C
- ✔ 0.6878 - 2.5964 g/mL @ 25°C
- ✔ 0.6752 - 1.1581 g/mL @ 40°C
- ✔ 0.7873 - 0.8868 g/mL @ 50°C
- ✔ 0.8027 - 0.8790 g/mL @ 60°C
- ✔ 0.7614 - 0.8629 g/mL @ 80°C

The Test Method used by Reagecon for testing **Density Standards** using Bingham Pycnometers is accredited to ISO 17025. The product is prepared gravimetrically on a weight/weight basis. Both solute and solvent are weighed on a balance calibrated by OIML traceable weights. Reagecon holds ISO 17025 Accreditation for calibration of laboratory balances. The density of the product is established and tested using high performance calibrated reference pycnometers.

Quality Range

Summary of Features & Benefits

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| <ul style="list-style-type: none">✔ Extensive range (0.6752 - 1.0302)✔ High accuracy products, uncertainty of measurement (assay procedure) $\pm 0.16\%$✔ Test method accredited to ISO/IEC 17025 (0.65 – 1.034 g/mL)✔ Tested using a fundamental measurement technique✔ Produced in accordance with ASTM D4052 | <ul style="list-style-type: none">✔ No toxic heavy metals used in any formulation✔ Can be used with any brand or type of vibrational density measuring instrument✔ Presented in a high quality tamper proof amber glass bottle✔ Consistency of product - Independent, Traceable, Certified✔ Certificates of Analysis and Safety Data Sheets available online |
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Reagecon manufactures an extensive range of **Density Standards** in accordance with ASTM D4052 for testing of Density, Relative Density and API Gravity of liquids by Digital Density Meter. These materials can be used as calibration standards for density measurement by vibrational techniques or hydrometer based techniques.

The product range includes:

- ✔ 0.6960 - 1.0040 g/mL @ 15°C
- ✔ 0.6919 - 1.0301 g/mL @ 20°C
- ✔ 0.6878 - 1.0265 g/mL @ 25°C
- ✔ 0.6752 - 0.9857 g/mL @ 40°C
- ✔ 0.7454 - 0.8868 g/mL @ 50°C
- ✔ 0.8027 - 0.8790 g/mL @ 60°C
- ✔ 0.7614 - 1.0302 g/mL @ 80°C

The Test Method used by Reagecon for testing **Density Standards** using vibrational densitometers is accredited to ISO 17025. The product is prepared gravimetrically on a weight/weight basis. Both solute and solvent are weighed on a balance calibrated by OIML traceable weights. Reagecon holds ISO 17025 accreditation for calibration of laboratory balances. The density of the product is established and tested using high performance calibrated vibrational densitometers.



Viscosity Standards

Summary of Features & Benefits

- ✔ Manufactured and certified according to ASTM D2162 using Ubbelohde Master Viscometers.
- ✔ This is the internationally recognised primary method for Viscosity standard certification.
- ✔ Each standard is certified for Kinematic Viscosity (mm²/s,cSt), Dynamic Viscosity (cP) and Density (g/ml) at a range of temperatures.
- ✔ All standards observe Newtonian Fluid behaviour
- ✔ Extended shelf life.
- ✔ Attractive secure packaging.
- ✔ Certificates of Analysis and Safety Data Sheets available on-line for every batch manufactured.
- ✔ Manufactured from high quality, stable base oils and additives.

Reagecon offers an exciting range of certified, accurate and traceable **Viscosity Standards**. These products can be used for calibration, control, verification, qualification or method validation of Kinematic and Dynamic Viscosity Measurement Instruments (both manual and automatic). Products are traceable to the ITS-90 Temperature Scale and the universally accepted Primary Standard value of the Viscosity of Water at 20°C, defined as 1.0034mm²/s (cSt) in accordance with ISO 3666.

Reagecon has an extensive Research and Development facility based in Shannon, Ireland. Several speciality and additional ranges of **Viscosity Standards** are currently under development.

ISO 17034 Sucrose in Water Standards (Brix)



Summary of Features & Benefits

- ✔ Extended shelf life - 20 weeks (Manufactured in accordance with ICUMSA guidelines)
- ✔ Manufactured and certified in accordance with the requirements of ISO 17034
- ✔ Can be used with any brand of refractometer
- ✔ Extensive range (1-60% mass/mass Sucrose in Water solutions)
- ✔ Product measurement uncertainty is computed on a batch to batch basis, guaranteed to never exceed ± 0.15 °Brix
- ✔ Presented in a convenient high quality dropper bottle
- ✔ Ready to Use
- ✔ Consistency of product – Independent, Traceable, Certified
- ✔ Certificates of Analysis and Safety Data Sheets available

Reagecon manufacture a range of **Sucrose in Water (Brix)** Certified Reference Materials (CRMs), which are manufactured and certified in accordance with the requirements of ISO 17034. Product measurement uncertainty is computed on a batch to batch basis, guaranteed to never exceed ± 0.15 °Brix

These products are used primarily either as a calibrant or analytical control solution in refractive index based methods of Brix value determinations, they can also be used to validate appropriate test methods or qualify a refractometer for use in a regulated industry.

Our **Sucrose in Water Standards** have a shelf life of 20 weeks and are produced in accordance with ICUMSA guidelines.



Brix Standards (Stabilised)

Summary of Features & Benefits

- ✔ Extensive range 0 - 67.5% Brix
- ✔ Test method accredited to ISO/IEC 17025 for values 5 - 60% Brix
- ✔ Uncertainty of measurement $\pm 0.11\%$ for all Brix values @ 20°C
- ✔ Extended shelf life of 1 year for our Stabilised Sucrose products (for users not required to follow ICUMSA Guidelines)
- ✔ Can be used with any brand of refractometer
- ✔ Consistency of product, Independent, Traceable Certified
- ✔ Presented in a convenient high quality dropper bottle
- ✔ Available as single bottles or a handy set of 6 bottles
- ✔ Ready to Use
- ✔ Certificates of Analysis and Safety Data Sheets available online
- ✔ Customised pack options available

Reagecon manufactures several ranges of Brix / Refractive Index (RI) Standards for ease of use when controlling all types of Refractometers, irrespective of brand.

- ✔ Non ICUMSA compliant **Stabilised Brix Standards (Sucrose)**
- ✔ **Sucrose in Water (Brix) ISO 17034** Certified Reference Materials (see previous page)

All of these standards are manufactured using high purity raw materials and are used primarily either as a calibrant or analytical quality control solution. Product No.'s BS00S to BS67S for single bottles and BS00S6 to BS67S6 for packs of six bottles, contain the same raw materials as the ICUMSA range, but are stabilised to have an extended shelf life of 1 year. Products represent excellent value for users that are not required to follow ICUMSA Guidelines.

Reagecon holds ISO 17025 accreditation for testing Refractive Index (Brix standards) using refractometry. These products have an uncertainty of measurement of $\pm 0.11\%$, are stable for one year, either opened or unopened and are presented in convenient 15ml dropper bottles. The product is prepared gravimetrically on a weight/weight basis. Both solute and solvent are weighed on a balance calibrated by OIML traceable weights. Reagecon holds ISO 17025 accreditation for calibration of laboratory balances.

Refractive Index Standards



Summary of Features & Benefits

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| <ul style="list-style-type: none">Both Sucrose and Solvent based standards availableExtensive range 1.33310 – 1.65812 nD Refractive IndexHigh accuracy ± 0.00014 nD units Refractive Index Stabilised SucroseTest method accredited to ISO/IEC 17025 for 1.3310 – 165812 nD Refractive IndexExtended Shelf Life of:
1 year stabilised sucrose products
2 years solvent based productsCan be used with any brand of refractometer | <ul style="list-style-type: none">Consistency of product - Independent, Traceable CertifiedPresented in a convenient high quality dropper bottleAvailable as single bottles or a handy set of 6 bottlesReady to UseCertificates of Analysis and Safety Data Sheets available onlineCustomised pack options available |
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Reagecon manufactures **Refractive Index (RI) Standards** for ease of use when controlling all types of Refractometers, irrespective of brand.

- RI Standards manufactured from Sucrose
- RI Standards manufactured from Solvents

Standards are manufactured using high purity raw materials and are used primarily either as a Calibrant or Analytical Quality Control Solution.

Product No.'s **RIBS07S** to **RIBS60S** have identical components and shelf life (1 Year) to the stabilised Brix Standards already described in the previous section. However, the certified values are expressed in Refractive Index (R.I) units n_D .

Product No.'s **RI0138** to **RI0165** our solvent based Refractive Index Standards have an extended shelf life of 2 years.

Products represent excellent value for users that are not required to follow ICUMSA Guidelines.

All products are prepared gravimetrically on a weight/weight basis. Both solute and solvent are weighed on a balance calibrated by OIML traceable weights. Reagecon holds ISO/IEC 17025 accreditation for calibration of laboratory balances. The R.I. of the standard is verified using a high performance calibrated, temperature controlled refractometer.

Osmolality Standards



Summary of Features & Benefits

- ✔ Extensive range 50 – 3000 mOsm/kg H₂O (including protein based and urine based standards)
- ✔ Test method accredited to ISO/IEC 17025 (50 – 3000 mOsm/kg H₂O)
- ✔ Low Uncertainty of Measurement
- ✔ Manufactured in accordance with European and United States Pharmacopoeia guidelines where appropriate
- ✔ Can be used with any brand of Osmometer
- ✔ Extended shelf life
- ✔ Presented in convenient ampoules
- ✔ Ready to Use
- ✔ Consistency of product - Independent, Traceable, Certified
- ✔ Certificates of Analysis and Safety Data Sheets available online

Reagecon manufactures a range of **Osmolality Standards** for use when calibrating all types of Osmometers irrespective of brand

Our range of **Osmolality Standards** for Osmometry determinations, start at 50 mOsm/Kg and go right up to 3000 mOsm/Kg. These standards are used for calibration, quality control, method validation and instrument calibration irrespective of brand and manufactured using high purity raw materials in accordance with European and United States Pharmacopoeia guidelines.

Because Osmolality Standards are used extensively in Clinical and Life Sciences Laboratories we also offer a range of **Protein Based Standards** and **Urine Based Standards** for Osmometry measurement which are certified and accredited.

Products are prepared gravimetrically and are on a weight/weight basis. Both solute and solvent are weighed on a balance calibrated by Reagecon engineers using OIML traceable weights. Reagecon holds ISO 17025 accreditation for calibration of laboratory balances. The Osmolality of the standard is verified using a high performance calibrated, temperature controlled Osmometer.

Cryoscope Standards



Summary of Features & Benefits

- ✔ Extensive range 000 (0.000°C) to -621 (-0.600°C) (621m°H)
- ✔ Products manufactured and certified for use on all Cryoscopes compliant to International Reference standard ISO5764/IDF108 for the determination of freezing point in milk
- ✔ NIST traceability
- ✔ Extremely high accuracy
- ✔ Extended shelf life
- ✔ High quality, easy to use, secure packaging
- ✔ Ready to Use
- ✔ Consistency of product - Independent, Traceable, Certified
- ✔ Certificates of Analysis and Safety Data Sheets available online

Reagecon manufactures a range of high quality **Cryoscope Standards**, the range is completed by the availability of **Heat Transfer Fluid** and **Bath Liquid**. Our Cryoscope Standards are used to calibrate, control, verify or validate Cryoscopes. These products are manufactured for use on all Cryoscopes compliant to International Reference Standard ISO5764/IDF108 for the determination of freezing point in milk.

Together with our Cryoscope offering Reagecon produces a wide range of Physical and Chemical Standards that are appropriate to the testing of dairy products. Several of these products, which are specific or unique to the dairy industry, can be viewed at www.reagecon.com

The concentration of solute in a liquid solvent, effects several colligative properties of the combined solution, one of which is its Freezing Point. The Freezing Point of milk depends on this phenomenon and milk in its unadulterated state has a freezing point below 0°C. As milk is diluted with water, the freezing point moves closer to that of pure water (0°C). This elevation of freezing temperature is due mainly to reduction in concentration of lactose and inorganic salts, due to the addition of water. The reduced concentration of biological materials such as fats, proteins or other solids are not thought to contribute to the freezing point elevation.

Historically, from a regulatory and practical perspective freezing point value is considered the optimum method for determining the presence of added water in either raw or treated milk. Economically, the addition of water to milk either accidentally or deliberately by producers, or at any other point in the process chain has a profound adverse effect on the milk or milk derivatives industry. The measurement has formed the basis of an official method that dates back to at least 1923 and has become established as a scientific discipline called Cryoscopy. Dating back to the 1950's several manufacturers of Cryoscopes have offered their products in the market place. Such instruments are usually very accurate and precise. Like all scientific instruments, Cryoscopes require calibration and control and in some situations method validation and instrument qualification. Due to our extensive knowledge of metrology and our unequalled number of accreditations, Reagecon range of **high quality Standards** facilitate these objectives.



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