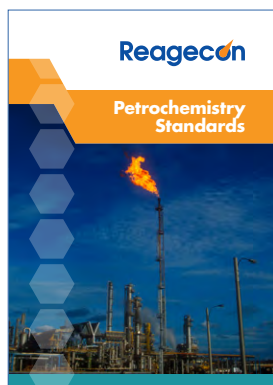


# The Metrologist



Volume 1 September 2015

**Reagecon**

[www.reagecon.com](http://www.reagecon.com)

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## Dear Customers, Readers and Business Partners

Welcome to the first edition of a new publication from Reagecon, which will be published three times every year (September, January and May). Reagecon is the largest producer in the world of Chemical and Physical Standards, Certified Reference Materials and Reagents. We produce in excess of 7000 different products, which are sold through distributors under the Reagecon brand, in 150 countries. We also sell an extensive portfolio of products through private label channels and through instrument manufacturer's.

### Our objectives in presenting this publication to you are as follows:

- To help you stay up to date on legal, scientific and technology issues relating to metrology in general, but more specifically on Standards, Reference Materials and Reagents.
- To introduce you to a significant pipeline of new products that are continually emerging from our very progressive R&D department in Reagecon.
- To provide you with technical notes on various exciting new product families focusing on applications, features and benefits of such products, which will assist you in your scientific work on a daily basis.
- Provide you with updates on innovations, promotions and service offerings from Reagecon that will enhance our overall value proposition to you. Contained in this publication are details of three such initiatives:
  - The Labcal™ Stability System, a new system designed to eliminate any possibility of contamination of Standards and Reagents.
  - The introduction of new outer packaging that will provide greater protection in terms of handling, storage and shipping of high value added products. All such packaging will contain Certificates of Analysis and information to help you source other Reagecon products.
  - A series of Industry Specific Catalogues that contain Standards, Reference Materials and Reagents listed and cross referenced to the compendium method relevant to each particular industry.
- Facilitate a two-way flow of information and dialogue between Reagecon and users of our products and enable us to help our channel partners to keep you up to date with developments in metrology and give you the best service possible.
- To present valuable case studies on various aspects of metrology.



Because all of the content of this and future publications relate to some aspect of the science of metrology, we will simply be calling the new publication "The Metrologist". We hope that you find "The Metrologist" of value, that it will provide a conduit between Reagecon and end users through our channel partners and facilitate a valuable two-way flow of information.

Enjoy this first edition of "The Metrologist".

A handwritten signature in black ink, which appears to read "John J. Barron".

Regards,  
John J Barron  
Managing Director

# Who are Reagecon?

Reagecon is based in Shannon, Ireland and has a sales office in Shanghai, China. The company operates from a 6000 sq. meter facility that includes a large suite of Manufacturing, Quality Control and Research and Development laboratories. We employ approximately 80 people, which includes 50 graduate or post-graduate chemists.

Traditionally, Reagecon's manufactured products were on the lower end of the value chain and fitted into the classification of working/secondary standards. The development and production of such standards was consistent with our main technical competence (method validation).

Since 2011, we have escalated dramatically the range of working and secondary standards developed and we have moved up the value chain to include some primary standards, because of our recently developed ability to perform some degree raw material characterisation.

## Applications of Physical & Chemical Standards

**Physical and Chemical Standards are products that may be used for 6 main applications:**

1. Calibrate scientific instrumentation in preparation for testing
2. Control the entire process during testing
3. Perform instrument qualification prior to testing
4. Assist in method validation
5. Proficiency Testing
6. Analyst Qualifications Sets

The uses of Chemical and Physical Standards for Calibration, Control, Qualification, Validation and Proficiency are well documented in several publications produced by Reagecon. The uses of Physical and Chemical Standards as Qualification Sets is an exciting and brand new innovation from Reagecon launched recently. The principle, application, features and benefits of the technique are covered later in this document and in detail in our latest publication.



# List of Products Produced

## Standards/Certified Reference Materials

- Total Organic Carbon's (TOC)
- Total Inorganic Carbon (TIC)
- Volatile Organic Carbon's (VOC)
- Semi Volatile Organic Carbon's (SVOC)
- Polycyclic Aromatic Hydrocarbons
- Phenolics
- Phthalates
- Azo Dyes
- Paraffins, Olefins, Naphthalates, Isoparaffins, Aromatics (PIANO's)
- Oxygenates
- Thiols
- Pesticides
- Fatty Acid Methyl Esters (FAME's)
- Fatty Acid Ethyl Esters (FAEE's)
- Refractive Index (RI)
- Brix
- Sucrose in water
- Density
- Viscosity
- Melting Point
- ICP-MS/ICP-OES
- Atomic Absorption
- Titrants/Indicators
- Total Acid Number (TAN)
- Total Base Number (TBN)
- Hydrocarbons
- Solvent Residues
- Ion Chromatography
- Cryoscope



- Osmolality
- Colour
  - Saybolt
  - Hazen
  - ASTM
  - Gardner
- Turbidity
- Spectrophotometry
  - Wavelength
  - Linearity
  - Stray light
  - Band width
- pH
- Conductivity
- Ion Selective Electrode
- Ionic Strength Adjusters
- Flame Photometry
- Ion Chromatography
- Redox
- Pharmacopoeia
  - European
  - Chinese
  - United States
  - Japanese
  - Indian
- Eluents/Mobile Phases
- Dissolution Solutions
- pH Electrode Care & Maintenance
- Reagents for DNA Synthesis and Sequencing



All these products can be viewed in detail at [www.reagecon.com](http://www.reagecon.com)

# Techniques & Instruments Employed

Reagecon has an extensive range of scientific instrumentation. We have at least one and in some cases several of the instruments listed.

- Gas Chromatography (GC)
  - Flame Ionisation Detection (GC-FID)
  - Mass Spectroscopy (GC-MS)
- Liquid Chromatography
  - Mass Spectroscopy (HPLC-MS)
  - Ultra Violet Detection
  - Preparative
  - Reverse Phase
- Ion Chromatography (IC)
- Flame Atomic Absorption Spectroscopy (FAAS)
- Induced Coupling Plasma-Mass Spectroscopy (ICP-MS)
- Bingham Pycnometry
- Vibrational Densitometer
- Refractometer
- Polarimeter
- Osmometer
- Total Organic Carbon Analysers
  - Membrane Exclusion
  - Carbon Oxidisation
- Rotational Viscometer
- Ubbelodhe Master Viscometer
- Cryoscope
- Coulometer
- Auto Titrator
- Spectrophotometer
- Fourier Transform Infrared Spectroscope (FTIR)
- Colourimeter
  - Hunter Solid/Liquid
  - Tintometer
- Volumetric Karl Fisher
- Turbidimeter
- Conductometer
- pH Meter
- Differential Scanning Calorimeter
- Chemical Oxygen Demand (COD)
- Biological Oxygen Demand Assay Unit
- Ex-rated Solvent Facility
- Radley Combinatorial Chemistry Synthesiser
- Buchi Rotary Evaporator
- Melting Point Apparatus
- TBN/TAN Titrator
- Class ISO7 (Class 10,000) Cleanroom
- Solvent Manufacturing Plant



# Accreditations

## Accreditation ISO 9001:2008

- Registration number 19.2769
  - Accreditation held since May 1988
  - Certificate of Registration of Quality Management System covering the manufacture and distribution of chemicals, reagents, consumables, apparatus, safety and scientific equipment. The provision of IQ/OQ, equipment maintenance and calibration services.
- The provision of Vendor Managed Inventory (VMI) services to allow customers to outsource the management and replenishment of their consumables and equipment.

## Accreditations ISO 17025:2005

- ISO 17025:2005 (264T Testing accreditation)
- Accredited since May 1988 for some products
- pH Buffers
- Conductivity
- Titration
- Brix 0% - 60%
- Refractive Index 1.3331 – 1.6581
- Density 0.65 – 1.03 g/l
- ICP-OES, ICP-MS
- VOC and VOC Internal Standards
- Phenols and Internal Phenol Standards
- PAHs and Internal PAH Standards
- Colour and Spectrophotometry
- TOC/TIC 500 µg/Kg – 50 mg/Kg
- Melting point
- Pesticides
- Viscosity
- Density 1.03 g/l – 3.1 g/l
- IC standards



## Physical Accreditations to ISO 17025:2005

- Density
- Viscosity
- Mass
- Temperature
- Volume



# Accreditations

## Accreditations ISO 17025:2005

- ISO 17025:2005 (265C Calibration accreditation)
- Accredited since July 2010
- Balance, Volumetric and Temperature Calibration Laboratory

## Accreditations ISO Guide 34

- ISO Guide 34 (001RM)
- Accredited since April 2014
- Accredited Producer of Reference Materials
- Only company in Ireland with this accreditation
- Production of materials used for the calibration of scientific instruments and the validation of test methods
- ISO Guide 34 accreditations demands a set of stringent requirements that ensures all aspects of the production of reference materials are carried out with measureable and traceable quality
- The Guide's comprehensive requirements includes production planning, raw material selection and characterization, assignment of certified values, uncertainty, traceability, homogeneity and stability, as well as packaging, documentation, supply chain and logistics.



# Extensions to Reagecon's Organic Product Ranges

We are delighted to announce several additions to Reagecon's single and multi component organic standards. These are supplied in methanol, or in another solvent when appropriate. They are supplied in methanol, or in another solvent when appropriate. Additional solvents include methylene chloride, acetone, benzene, hexane and acetonitrile, THF and water. Please inquire about the matrix for a particular item when ordering if the matrix is important to your application as substitutions may be possible. You can find these new standards presented in various locations with in this periodical.

## Commercial Benefits

- Ready to use (dilute for use as calibration and/or quality control standards)
- Extensive range of organic compound mixes and single compound standards available
- Can be used with a variety of instruments including GC, GC-MS, HPLC and LC-MS
- Designed specifically for use in EPA or EU analytical methods
- Presented in high quality amber ampoules
- Customised formulations available

## Technical Benefits

- Produced in accordance with EPA methods
- Consistency of product – Independent, Traceable, Certified
- Ideal for use in EPA or EU analytical methods
- Certificates of Analysis and Safety Data Sheets available online

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 (INAB ref: 265C). The resulting Balance Certificate of Calibration is issued in accordance with the requirements of ISO/IEC 17025. The concentration of each standard is verified using a high performance calibrated Gas Chromatograph - Mass Spectrometer (GC-MS Instrument). The calibration of the GC-MS instruments completed using high purity ISO Guide 34 accredited VOC standards similar in VOC concentration value to these products. The mass spectrum of each of the analytes is confirmed by comparison with the National Institute of Standards and Technology (NIST) mass spectral library.



# VOC Product Range Expanded

Reagecon already offer over 120 VOC standards. Details of these are available in our Physical and Chemical Standards catalogue or online at [www.reagecon.com](http://www.reagecon.com). These include single, multi, internal and surrogate standards. Reagecon's product portfolio is continually expanding so we are happy to add the following new products to our existing catalogue. Hopefully, these new standards will meet, or exceed your expectations.

Product No.	Analyte	Concentration & Matrix	Pack size
REVOC300	1,2,3,4-Diepoxybutane	1000µg/ml in Purge & Trap Methanol	1ml
REVOC301	1,2,3,4-Diepoxybutane	2000µg/ml in Purge & Trap Methanol	1ml
REVOC302	1,4-Dioxane	1000µg/ml in Purge & Trap Methanol	1ml
REVOC303	1,4-Dioxane	2000µg/ml in Purge & Trap Methanol	1ml
REVOC304	1-Propanol	1000µg/ml in Purge & Trap Methanol	1ml
REVOC305	1-Propanol	2000µg/ml in Purge & Trap Methanol	1ml
REVOC306	2-Butanone (MEK)	1000µg/ml in Purge & Trap Methanol	1ml
REVOC307	2-Butanone (MEK)	2000µg/ml in Purge & Trap Methanol	1ml
REVOC308	2-Chloroethanol	1000µg/ml in Purge & Trap Methanol	1ml
REVOC309	2-Chloroethanol	2000µg/ml in Purge & Trap Methanol	1ml
REVOC310	2-Chloroethyl vinyl ether	1000µg/ml in Purge & Trap Methanol	1ml
REVOC311	2-Chloroethyl vinyl ether	2000µg/ml in Purge & Trap Methanol	1ml
REVOC312	2-Hexanone	1000µg/ml in Purge & Trap Methanol	1ml
REVOC313	2-Hexanone	2000µg/ml in Purge & Trap Methanol	1ml
REVOC314	2-Hydroxypropionitrile	1000µg/ml in Purge & Trap Methanol	1ml
REVOC315	2-Hydroxypropionitrile	2000µg/ml in Purge & Trap Methanol	1ml
REVOC316	2-Nitropropane	1000µg/ml in Purge & Trap Methanol	1ml
REVOC317	2-Nitropropane	2000µg/ml in Purge & Trap Methanol	1ml
REVOC318	2-Pentanone	1000µg/ml in Purge & Trap Methanol	1ml
REVOC319	2-Pentanone	2000µg/ml in Purge & Trap Methanol	1ml
REVOC320	2-Picoline	1000µg/ml in Purge & Trap Methanol	1ml
REVOC321	2-Picoline	2000µg/ml in Purge & Trap Methanol	1ml
REVOC322	2-Propanol	1000µg/ml in Purge & Trap Methanol	1ml
REVOC323	2-Propanol	1000µg/ml in Purge & Trap Methanol	1ml
REVOC324	2-Propanol	2000µg/ml in Purge & Trap Methanol	1ml
REVOC325	2-Propanol	2000µg/ml in Purge & Trap Methanol	1ml
REVOC326	3-Chloropropionitrile	1000µg/ml in Purge & Trap Methanol	1ml
REVOC327	3-Chloropropionitrile	2000µg/ml in Purge & Trap Methanol	1ml
REVOC328	4-Methyl-2-pentanone (MIBK)	1000µg/ml in Purge & Trap Methanol	1ml
REVOC329	4-Methyl-2-pentanone (MIBK)	2000µg/ml in Purge & Trap Methanol	1ml
REVOC330	Acrolein (Propenal)	1000µg/ml in Distilled Water	1ml
REVOC331	Acrolein (Propenal)	1000µg/ml in Purge & Trap Methanol	1ml
REVOC332	Acrolein (Propenal)	2000µg/ml in Distilled Water	1ml
REVOC333	Acrolein (Propenal)	2000µg/ml in Purge & Trap Methanol	1ml
REVOC334	Acrylonitrile	1000µg/ml in Purge & Trap Methanol	1ml
REVOC335	Acrylonitrile	2000µg/ml in Purge & Trap Methanol	1ml
REVOC336	Allyl alcohol	1000µg/ml in Purge & Trap Methanol	1ml
REVOC337	Allyl alcohol	2000µg/ml in Purge & Trap Methanol	1ml
REVOC338	Allyl chloride	1000µg/ml in Purge & Trap Methanol	1ml
REVOC339	Allyl chloride	2000µg/ml in Purge & Trap Methanol	1ml
REVOC340	Benzyl chloride	1000µg/ml in Purge & Trap Methanol	1ml
REVOC341	Benzyl chloride	2000µg/ml in Purge & Trap Methanol	1ml
REVOC342	Bromoacetone	1000µg/ml in Purge & Trap Methanol	1ml
REVOC343	Bromoacetone	2000µg/ml in Purge & Trap Methanol	1ml
REVOC344	Bromomethane	1000µg/ml in Purge & Trap Methanol	1ml
REVOC345	Bromomethane	2000µg/ml in Purge & Trap Methanol	1ml

Product No.	Analyte	Concentration & Matrix	Pack size
REVOC346	Chloroethane	1000µg/ml in Purge & Trap Methanol	1ml
REVOC347	Chloroethane	2000µg/ml in Purge & Trap Methanol	1ml
REVOC348	Chloromethane	1000µg/ml in Purge & Trap Methanol	1ml
REVOC349	Chloromethane	2000µg/ml in Purge & Trap Methanol	1ml
REVOC350	Chloroprene	1000µg/ml in Purge & Trap Methanol	1ml
REVOC351	Chloroprene	2000µg/ml in Purge & Trap Methanol	1ml
REVOC352	cis-1,4-Dichloro-2-butene	1000µg/ml in Purge & Trap Methanol	1ml
REVOC353	cis-1,4-Dichloro-2-butene	2000µg/ml in Purge & Trap Methanol	1ml
REVOC354	Crotonaldehyde	1000µg/ml in Purge & Trap Methanol	1ml
REVOC355	Crotonaldehyde	2000µg/ml in Purge & Trap Methanol	1ml
REVOC356	Dichlorodifluoromethane	1000µg/ml in Purge & Trap Methanol	1ml
REVOC357	Dichlorodifluoromethane	2000µg/ml in Purge & Trap Methanol	1ml
REVOC358	Epichlorohydrin	1000µg/ml in Purge & Trap Methanol	1ml
REVOC359	Epichlorohydrin	2000µg/ml in Purge & Trap Methanol	1ml
REVOC360	Ethanol	1000µg/ml in Purge & Trap Methanol	1ml
REVOC361	Ethanol	2000µg/ml in Purge & Trap Methanol	1ml
REVOC362	Ethyl acetate	1000µg/ml in Purge & Trap Methanol	1ml
REVOC363	Ethyl acetate	2000µg/ml in Purge & Trap Methanol	1ml
REVOC364	Ethyl methacrylate	1000µg/ml in Purge & Trap Methanol	1ml
REVOC365	Ethyl methacrylate	2000µg/ml in Purge & Trap Methanol	1ml
REVOC366	Ethylene oxide	1000µg/ml in Purge & Trap Methanol	1ml
REVOC367	Ethylene oxide	2000µg/ml in Purge & Trap Methanol	1ml
REVOC368	Hexachloroethane	1000µg/ml in Purge & Trap Methanol	1ml
REVOC369	Hexachloroethane	2000µg/ml in Purge & Trap Methanol	1ml
REVOC370	Iodomethane	1000µg/ml in Purge & Trap Methanol	1ml
REVOC371	Iodomethane	2000µg/ml in Purge & Trap Methanol	1ml
REVOC372	Isobutyl alcohol	1000µg/ml in Purge & Trap Methanol	1ml
REVOC373	Isobutyl alcohol	2000µg/ml in Purge & Trap Methanol	1ml
REVOC374	Malononitrile	1000µg/ml in Purge & Trap Methanol	1ml
REVOC375	Malononitrile	2000µg/ml in Purge & Trap Methanol	1ml
REVOC376	Methacrylonitrile	1000µg/ml in Purge & Trap Methanol	1ml
REVOC377	Methacrylonitrile	2000µg/ml in Purge & Trap Methanol	1ml
REVOC378	Methyl methacrylate	1000µg/ml in Purge & Trap Methanol	1ml
REVOC379	Methyl methacrylate	2000µg/ml in Purge & Trap Methanol	1ml
REVOC380	Nitrobenzene	1000µg/ml in Purge & Trap Methanol	1ml
REVOC381	Nitrobenzene	2000µg/ml in Purge & Trap Methanol	1ml
REVOC382	N-Nitroso-di-n-butylamine	1000µg/ml in Acetone	1ml
REVOC383	N-Nitroso-di-n-butylamine	1000µg/ml in Purge & Trap Methanol	1ml
REVOC384	N-Nitroso-di-n-butylamine	2000µg/ml in Acetone	1ml
REVOC385	N-Nitroso-di-n-butylamine	2000µg/ml in Purge & Trap Methanol	1ml
REVOC386	Pentachloroethane	1000µg/ml in Purge & Trap Methanol	1ml
REVOC387	Pentachloroethane	2000µg/ml in Purge & Trap Methanol	1ml
REVOC388	Propargyl alcohol	1000µg/ml in Purge & Trap Methanol	1ml
REVOC389	Propargyl alcohol	2000µg/ml in Purge & Trap Methanol	1ml
REVOC390	Propionitrile (ethyl cyanide)	1000µg/ml in Purge & Trap Methanol	1ml
REVOC391	Propionitrile (ethyl cyanide)	2000µg/ml in Purge & Trap Methanol	1ml
REVOC392	Pyridine	1000µg/ml in Purge & Trap Methanol	1ml
REVOC393	Pyridine	2000µg/ml in Purge & Trap Methanol	1ml
REVOC394	trans-1,4-Dichloro-2-butene	1000µg/ml in Purge & Trap Methanol	1ml
REVOC395	trans-1,4-Dichloro-2-butene	2000µg/ml in Purge & Trap Methanol	1ml
REVOC396	Trichlorofluoromethane	1000µg/ml in Purge & Trap Methanol	1ml
REVOC397	Trichlorofluoromethane	2000µg/ml in Purge & Trap Methanol	1ml
REVOC398	Vinyl acetate	1000µg/ml in Purge & Trap Methanol	1ml
REVOC399	Vinyl acetate	2000µg/ml in Purge & Trap Methanol	1ml
REVOC400	Vinyl chloride	1000µg/ml in Purge & Trap Methanol	1ml
REVOC401	Vinyl chloride	2000µg/ml in Purge & Trap Methanol	1ml

## CASE STUDY:

# Global Medical Device Manufacturer The Challenge:

Our customer - A Medical Device Manufacturer - was deploying critical resource and incurring significant costs in the production of buffered eluents in-house. In addition to the resource and cost requirement, it brought the following challenges:

- Internal testing and re-testing to meet QC standards
- Audit-compliance
- Guaranteeing the product's shelf life and stability
- Purchase of raw materials
- Planning to ensure continuous product availability
- Staff management

## The Solution:

Following discussions with Reagecon, we developed and produced 12-lines of custom-made buffered eluents to meet the customers' specific requirements, enabling us to deliver the following benefits:

- Improved quality and availability of product supply
- Re-deployment of two full time resources into a new project
- Elimination of the need to procure and manage stocks of raw materials
- Save investment in capital equipment
- NIST Traceability
- Independently tested and certified to ISO 17025 standards
- Guaranteed Accuracy and Stability
- Guaranteed Availability, all with Certificates of Analysis and MSDS



# Buffered Eluents

## Commercial Benefits

- Reduce sample preparation time
- Focus on core activities
- Ensure Consistency of product
- Free up valuable Laboratory Space
- Achieve peace of mind

## Technical Benefits

- Produced in accordance with USP
- Consistency of product - Independent, Traceable, Certified
- Certificates of Analysis and Safety Data Sheets available online

Reagecon is pleased to announce a new range of Ready to Use Buffered Eluents for Liquid Chromatography. The control of Mobile Phase pH, when analysing ionisable compounds using HPLC is well recognised. There is also a substantial body of literature supporting the use of pH control when working with field samples of non-ionisable compounds due to the presence of ionisable impurities or contaminants. The use of Reagecon's high quality buffer systems will minimise variations of mobile phase pH, leading to dramatically improved selectivity, retention factor, peak shape, resolution and reproducibility. These Buffered Eluents, which are not available from any other manufacturer, bring you multiple benefits that include:

- Significant reduction in the amount of time and expense required to prepare them in house - "lean labs"
- Produced according to relevant Pharmacopoeia requirements - no deviation in materials or methodology
- Manufactured under controlled processes and batch certified to ensure lot-to-lot consistency and reproducibility of results

Reagecon has selected 19 of the most commonly recommended buffering systems from scientific literature and from the currently published 2,400 monographs of the USP, these are listed below. However, there are several hundred other buffering systems contained in the monographs and we are happy to quote for these also.

Description	Product No. 500ml	Product No. 1L
pH 2- 6.8g/L Monobasic Potassium Phosphate	USP8005	USP801
pH 2.5-0.01M Phosphoric Acid and 0.01M Monobasic Sodium Phosphate	USP8105	USP811
pH 2.5 - Monobasic Potassium Phosphate	USP8205	USP821
pH 3 - Monobasic Potassium Phosphate	USP8305	USP831
pH 3.5 - Monobasic Sodium Phosphate	USP8405	USP841
pH 4 - Monobasic Potassium Phosphate	USP8505	USP851
pH 4.5 - Sodium Acetate Trihydrate	USP8605	USP861
pH 4.5 - Monobasic Potassium Phosphate	USP8705	USP871
pH 5 - Monobasic Potassium Phosphate	USP8805	USP881
pH 5.5 - Monobasic / Dibasic Potassium Phosphate	USP8905	USP891
pH 6 - Monobasic Potassium Phosphate	USP9005	USP901
pH 6.5- Monobasic Potassium Phosphate	USP9105	USP911
pH 6.8 - Monobasic Potassium Phosphate	USP9205	USP921
pH 6.8 - Monobasic Potassium Phosphate / Dibasic Sodium phosphate	USP9305	USP931
pH 7 - Monobasic Potassium Phosphate / Dibasic sodium phosphate	USP9405	USP941
pH 7 - Monobasic Potassium Phosphate / Sodium Hydroxide	USP9505	USP951
pH 7.5 - Monobasic Potassium Phosphate	USP9605	USP961
pH 7.5 - Dibasic Potassium/ Monobasic Sodium Phosphate	USP9705	USP971
pH 8 - Monobasic Sodium Phosphate/ Disodium Hydrogen Phosphate	USP9805	USP981

# Azo Dye Standards

Azo dyes are notable for providing excellent colourant properties, to textile and leather goods. They are a group of synthetic products, based on the presence of nitrogen. The problem with the use of such products arises from the breakdown metabolites that can be created in vivo, by the reductive cleavage of the azo group into Aromatic Amines. Such products may be allergenic, carcinogenic or mutagenic. Azo dyes that release one or more of these aromatic amines in concentrations of 30ppm must not be used in items of clothing (EU Directive 2002/61/EC), but acceptable levels may differ between different countries. Such substances may be ingested intradermally or orally from exposure to clothing, but textile workers are also at high risk. Azo dyes are completely banned from foodstuffs.

Multiple methods are described in the literature to analyse azo dyes and their metabolites including GC-MS, LC-MS, LC-UV and LC-MS/MS. For accurate and fit for purpose analysis, azo dye standards are now available from Reagecon.



Product No.	Analyte	Concentration & Matrix	Pack size
REAZO001	2,4-Diaminoanisole	1000µg/ml in HPLC Water	1ml
REAZO002	2,4-Diaminoanisole	2000µg/ml in HPLC Water	1ml
REAZO003	2,4-Diaminotoluene	1000µg/ml in Purge & Trap Methanol	1ml
REAZO004	2,4-Diaminotoluene	2000µg/ml in Purge & Trap Methanol	1ml
REAZO005	3,3-Dichlorobenzidine	1000µg/ml in Purge & Trap Methanol	1ml
REAZO006	3,3-Dichlorobenzidine	2000µg/ml in Purge & Trap Methanol	1ml
REAZO007	3,3-Dimethoxybenzidine	1000µg/ml in Purge & Trap Methanol	1ml
REAZO008	3,3-Dimethoxybenzidine	2000µg/ml in Purge & Trap Methanol	1ml
REAZO009	3-Aminobiphenyl	1000µg/ml in Ethyl Acetate	1ml
REAZO010	3-Aminobiphenyl	2000µg/ml in Ethyl Acetate	1ml
REAZO011	4,4,-Diaminodiphenylmethane	1000µg/ml in Purge & Trap Methanol	1ml
REAZO012	4,4,-Diaminodiphenylmethane	2000µg/ml in Purge & Trap Methanol	1ml
REAZO013	4,4-Methylenebis(2-chloroaniline)	1000µg/ml in Purge & Trap Methanol	1ml
REAZO014	4,4-Methylenebis(2-chloroaniline)	2000µg/ml in Purge & Trap Methanol	1ml
REAZO015	4-Aminoazotoluene	1000µg/ml in Purge & Trap Methanol	1ml
REAZO016	4-Aminoazotoluene	2000µg/ml in Purge & Trap Methanol	1ml
REAZO017	4-Aminobiphenyl	1000µg/ml in Purge & Trap Methanol	1ml
REAZO018	4-Aminobiphenyl	2000µg/ml in Purge & Trap Methanol	1ml
REAZO019	4-Chloroaniline	1000µg/ml in Purge & Trap Methanol	1ml
REAZO020	4-Chloroaniline	2000µg/ml in Purge & Trap Methanol	1ml
REAZO021	5-Nitro-o-toluidine	1000µg/ml in Purge & Trap Methanol	1ml
REAZO022	5-Nitro-o-toluidine	2000µg/ml in Purge & Trap Methanol	1ml
REAZO023	Anilazine	1000µg/ml in Purge & Trap Methanol	1ml
REAZO024	Anilazine	2000µg/ml in Purge & Trap Methanol	1ml
REAZO025	Azobenzene	1000µg/ml in Purge & Trap Methanol	1ml
REAZO026	Azobenzene	2000µg/ml in Purge & Trap Methanol	1ml
REAZO027	Benzidine	1000µg/ml in Purge & Trap Methanol	1ml
REAZO028	Benzidine	2000µg/ml in Purge & Trap Methanol	1ml
REAZO029	Dimethylaminoazobenzene	1000µg/ml in Purge & Trap Methanol	1ml
REAZO030	Dimethylaminoazobenzene	2000µg/ml in Purge & Trap Methanol	1ml
REAZO031	o-anisidine	1000µg/ml in Purge & Trap Methanol	1ml
REAZO032	o-anisidine	2000µg/ml in Purge & Trap Methanol	1ml
REAZO033	o-Toluidine	1000µg/ml in Purge & Trap Methanol	1ml
REAZO034	o-Toluidine	2000µg/ml in Purge & Trap Methanol	1ml

# The Labcal™ Standards Stability System

Reagecon has developed a novel new packaging system designed to eliminate contamination of chemically or physically sensitive materials such as high specification analytical standards, buffers and reagents. This system is unique and applicable to pack sizes of greater than 100mls.

## The Problem:

The following problems typically occur in plastic bottles:

1. Gasses transpire across the wall of the bottle in both directions.
2. Air or other fume contaminants can enter the bottle through the neck.
3. Ions or plasticisers can leach from the wall of the bottle into the liquid contents.
4. Foreign objects such as pH electrodes or conductivity cells can be put by the user into the bottle (as part of bad laboratory procedure).
5. There may be cross contamination by other liquids from any extraneous source into the plastic bottle.

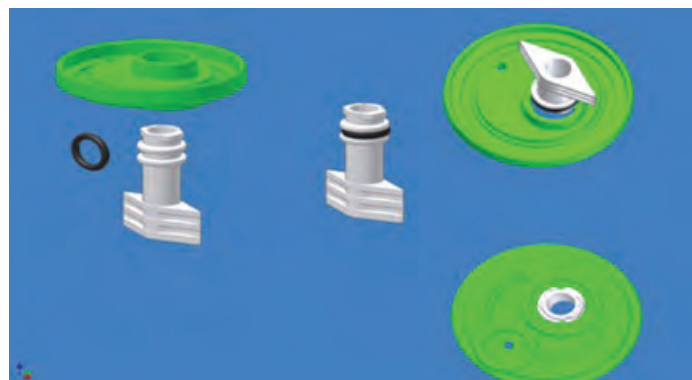
## The Solution:

The problem has been solved by the development of a new device that consists of the following:

- An inner pouch which is resistant to chemical leaching and transpiration of gasses
- A one-way valve in the neck which neither allows gas, fumes or liquid to come in contact with the device contents

## Features and Benefits:

- The new device brings to the market place a level of compliance that is not available currently. Standards, buffers or reagents are usually specified within very tight tolerances. This potential solution gives the customer assurance that the material continues to meet the specification after the user has opened the material for the shelf life of the material. This removes a big risk factor in testing.
- The new device offers proof and certainty of the property value of the standard or reagent supplied in the stability bottle and a guarantee of ongoing stability of the product. The customer will have peace of mind that the product is stable for the duration of its shelf life.



# New Pesticide Standards

Reagecon already offer over 160 Pesticide standards. Details of these are available in our Physical and Chemical Standards catalogue or at [www.reagecon.com](http://www.reagecon.com). These include Aroclors, Chlordanes and other families as single and multi component standards. The following pesticide standards have recently been added to the Reagecon product range and are presented here for the first time.



Product No.	Analyte	Concentration & Matrix	Pack size
REPET300	1,2-Diphenylhydrazine	1000µg/ml in Purge & Trap Methanol	1ml
REPET301	1,2-Diphenylhydrazine	2000µg/ml in Purge & Trap Methanol	1ml
REPET302	1,4-Phenylenediamine	1000µg/ml in Purge & Trap Methanol	1ml
REPET303	1,4-Phenylenediamine	2000µg/ml in Purge & Trap Methanol	1ml
REPET304	5,5-Diphenylhydantoin	1000µg/ml in Purge & Trap Methanol	1ml
REPET305	5,5-Diphenylhydantoin	2000µg/ml in Purge & Trap Methanol	1ml
REPET306	Barban	1000µg/ml in Purge & Trap Methanol	1ml
REPET307	Barban	2000µg/ml in Purge & Trap Methanol	1ml
REPET308	Bromoxynil	1000µg/ml in Purge & Trap Methanol	1ml
REPET309	Bromoxynil	2000µg/ml in Purge & Trap Methanol	1ml
REPET310	Captafol	1000µg/ml in Acetone	1ml
REPET311	Captafol	2000µg/ml in Acetone	1ml
REPET312	Captan	1000µg/ml in Acetone	1ml
REPET313	Captan	2000µg/ml in Acetone	1ml
REPET314	Carbaryl	1000µg/ml in Acetonitrile	1ml
REPET315	Carbaryl	2000µg/ml in Acetonitrile	1ml
REPET316	Carbofuran	1000µg/ml in Purge & Trap Methanol	1ml
REPET317	Carbofuran	2000µg/ml in Purge & Trap Methanol	1ml
REPET318	Carbophenothion	1000µg/ml in Purge & Trap Methanol	1ml
REPET319	Carbophenothion	2000µg/ml in Purge & Trap Methanol	1ml
REPET320	Chlordane (NOS)	1000µg/ml in Hexane	1ml
REPET321	Chlordane (NOS)	2000µg/ml in Hexane	1ml
REPET322	Chlorfenvinphos	1000µg/ml in Acetone	1ml
REPET323	Chlorfenvinphos	2000µg/ml in Acetone	1ml
REPET324	Coumaphos	1000µg/ml in Acetone	1ml
REPET325	Coumaphos	2000µg/ml in Acetone	1ml
REPET326	Crotoxyphos	1000µg/ml in Purge & Trap Methanol	1ml
REPET327	Crotoxyphos	2000µg/ml in Purge & Trap Methanol	1ml
REPET328	Demeton O	1000µg/ml in Acetonitrile	1ml
REPET329	Demeton O	1000µg/ml in Purge & Trap Methanol	1ml
REPET330	Demeton O	2000µg/ml in Acetonitrile	1ml
REPET331	Demeton O	2000µg/ml in Purge & Trap Methanol	1ml
REPET332	Demeton-S	1000µg/ml in Acetone	1ml
REPET333	Demeton-S	2000µg/ml in Acetone	1ml

Product No.	Analyte	Concentration & Matrix	Pack size
REPET334	Diallate (cis or trans)	1000µg/ml in Acetone	1ml
REPET335	Diallate (cis or trans)	2000µg/ml in Acetone	1ml
REPET336	Dichlone	1000µg/ml in Purge & Trap Methanol	1ml
REPET337	Dichlone	2000µg/ml in Purge & Trap Methanol	1ml
REPET338	Dicrotophos	1000µg/ml in Purge & Trap Methanol	1ml
REPET339	Dicrotophos	2000µg/ml in Purge & Trap Methanol	1ml
REPET340	Dinocap	1000µg/ml in Purge & Trap Methanol	1ml
REPET341	Dinocap	2000µg/ml in Purge & Trap Methanol	1ml
REPET342	Dioxathion	1000µg/ml in Purge & Trap Methanol	1ml
REPET343	Dioxathion	2000µg/ml in Purge & Trap Methanol	1ml
REPET344	Diphenylamine	1000µg/ml in Purge & Trap Methanol	1ml
REPET345	Diphenylamine	2000µg/ml in Purge & Trap Methanol	1ml
REPET346	EPN	1000µg/ml in Acetone	1ml
REPET347	EPN	1000µg/ml in Purge & Trap Methanol	1ml
REPET348	EPN	2000µg/ml in Acetone	1ml
REPET349	EPN	2000µg/ml in Purge & Trap Methanol	1ml
REPET350	Ethyl carbamate (urethane)	1000µg/ml in Purge & Trap Methanol	1ml
REPET351	Ethyl carbamate (urethane)	2000µg/ml in Purge & Trap Methanol	1ml
REPET352	Ethyl methanesulfonate	1000µg/ml in Purge & Trap Methanol	1ml
REPET353	Ethyl methanesulfonate	2000µg/ml in Purge & Trap Methanol	1ml
REPET354	Famphur	1000µg/ml in Purge & Trap Methanol	1ml
REPET355	Famphur	2000µg/ml in Purge & Trap Methanol	1ml
REPET356	Fensulfothion	1000µg/ml in Acetone	1ml
REPET357	Fensulfothion	2000µg/ml in Acetone	1ml
REPET358	Fenthion	1000µg/ml in Acetone	1ml
REPET359	Fenthion	2000µg/ml in Acetone	1ml
REPET360	Fluchloralin	1000µg/ml in Purge & Trap Methanol	1ml
REPET361	Fluchloralin	2000µg/ml in Purge & Trap Methanol	1ml
REPET362	Isodrin	1000µg/ml in Purge & Trap Methanol	1ml
REPET363	Isodrin	2000µg/ml in Purge & Trap Methanol	1ml
REPET364	Isophorone	1000µg/ml in Purge & Trap Methanol	1ml
REPET365	Isophorone	2000µg/ml in Purge & Trap Methanol	1ml
REPET366	Isosafrole	1000µg/ml in Purge & Trap Methanol	1ml
REPET367	Isosafrole	2000µg/ml in Purge & Trap Methanol	1ml
REPET368	Kepone	1000µg/ml in Purge & Trap Methanol	1ml
REPET369	Kepone	2000µg/ml in Purge & Trap Methanol	1ml
REPET370	Leptophos	1000µg/ml in Purge & Trap Methanol	1ml
REPET371	Leptophos	2000µg/ml in Purge & Trap Methanol	1ml
REPET372	Malathion	1000µg/ml in Purge & Trap Methanol	1ml
REPET373	Malathion	2000µg/ml in Purge & Trap Methanol	1ml
REPET374	Methyl methanesulfonate	1000µg/ml in Purge & Trap Methanol	1ml
REPET375	Methyl methanesulfonate	2000µg/ml in Purge & Trap Methanol	1ml
REPET376	Mexacarbate	1000µg/ml in Purge & Trap Methanol	1ml
REPET377	Mexacarbate	2000µg/ml in Purge & Trap Methanol	1ml
REPET378	Mirex	1000µg/ml in Hexane:Toluene	1ml
REPET379	Mirex	2000µg/ml in Hexane:Toluene	1ml
REPET380	Monocrotophos	1000µg/ml in Acetonitrile	1ml
REPET381	Monocrotophos	2000µg/ml in Acetonitrile	1ml
REPET382	Naled	1000µg/ml in Methylene Chloride	1ml
REPET383	Naled	2000µg/ml in Methylene Chloride	1ml
REPET384	Nitrofen	1000µg/ml in Purge & Trap Methanol	1ml
REPET385	Nitrofen	2000µg/ml in Purge & Trap Methanol	1ml
REPET386	O,O,O-Triethyl phosphorothioate	1000µg/ml in Purge & Trap Methanol	1ml
REPET387	O,O,O-Triethyl phosphorothioate	2000µg/ml in Purge & Trap Methanol	1ml

Product No.	Analyte	Concentration & Matrix	Pack size
REPET388	Octamethyl pyrophosphoramidate	1000µg/ml in Acetone	1ml
REPET389	Octamethyl pyrophosphoramidate	2000µg/ml in Acetone	1ml
REPET390	Parathion	1000µg/ml in Purge & Trap Methanol	1ml
REPET391	Parathion	2000µg/ml in Purge & Trap Methanol	1ml
REPET392	Pentachlorobenzene	1000µg/ml in Purge & Trap Methanol	1ml
REPET393	Pentachlorobenzene	2000µg/ml in Purge & Trap Methanol	1ml
REPET394	Pentachloronitrobenzene	1000µg/ml in Purge & Trap Methanol	1ml
REPET395	Pentachloronitrobenzene	2000µg/ml in Purge & Trap Methanol	1ml
REPET396	Phorate	1000µg/ml in Purge & Trap Methanol	1ml
REPET397	Phorate	2000µg/ml in Purge & Trap Methanol	1ml
REPET398	Phosalone	1000µg/ml in Purge & Trap Methanol	1ml
REPET399	Phosalone	2000µg/ml in Purge & Trap Methanol	1ml
REPET400	Phosphamidon	1000µg/ml in Purge & Trap Methanol	1ml
REPET401	Phosphamidon	2000µg/ml in Purge & Trap Methanol	1ml
REPET402	Strychnine	1000µg/ml in Purge & Trap Methanol	1ml
REPET403	Strychnine	2000µg/ml in Purge & Trap Methanol	1ml
REPET404	Thionazine	1000µg/ml in Acetone	1ml
REPET405	Thionazine	1000µg/ml in Purge & Trap Methanol	1ml
REPET406	Thionazine	2000µg/ml in Acetone	1ml
REPET407	Thionazine	2000µg/ml in Purge & Trap Methanol	1ml
REPET408	Trimethyl phosphate	1000µg/ml in Purge & Trap Methanol	1ml
REPET409	Trimethyl phosphate	2000µg/ml in Purge & Trap Methanol	1ml
REPET410	Tris(2,3-dibromopropyl) phosphate	1000µg/ml in Methylene Chloride	1ml
REPET411	Tris(2,3-dibromopropyl) phosphate	2000µg/ml in Methylene Chloride	1ml



# Semi-Volatile Organic Compounds (SVOC's)

Semi-volatile organic compounds (SVOC's) include several classes of chemicals that have found their way into everyday use, particularly in Western society. Dioxins, Polychlorinated Biphenyl's (PCB's), various Brominated Flame Retardants and Organochlorine Pesticides have a tendency to bind to the organic fraction of dust, sludge, sediment and soil and bioaccumulate in livestock and humans. SVOC's also include some Phenols and Polynuclear Aromatic Hydrocarbons (PAH's).

Ingredients in cleaning agents (triclosan), wood preservatives (pentachlorophenols), and products found in plastic materials that adulterate food (such as phthalates and bisphenol A) are now ubiquitous and well in excess of 1000 SVOC's are of interest to Environmental Protection Agencies around the world. Exposure to such chemicals may occur directly through the alimentary canal, the respiratory tract or transdermally. Indirect exposure may be through adulterated food, human or cows milk or freshwater fish. Many of these substances tend to effect the endocrine system in particular and give behavioural, reproductive, metabolic or carcinogenic changes which are pathological.

The testing of these materials is generally carried out using GC-MS following EPA methods 8270, 525, 625, 610 and 8100, although in some instances HPLC-MS can be used. The preparation for analysis may be challenging for a lot of these substances, because the target material, may be heavily contaminated with non-target components such as hydrocarbons. The extraction method needs to be able to separate and recover fully a wide variety of compounds of interest, while removing interfering non target contaminants.

Reagecon is delighted to launch through the medium of this periodical, for the first time an extensive new range of SVOC standards. The products are presented in 1ml ampoules at concentrations of 1000 and 2000 µg/ml in a variety of appropriate matrices. Several multi-component mixtures are also available. We can also offer many permutations and combinations of customised SVOC's.

We hope these products meet or exceed your expectations.

Product No.	Analyte	Concentration & Matrix	Pack size
RESVOC001	1,2,4,5-Tetrachlorobenzene	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC002	1,2,4,5-Tetrachlorobenzene	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC003	1,4-Naphthoquinone	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC004	1,4-Naphthoquinone	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC005	1-Acetyl-2-thiourea	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC006	1-Acetyl-2-thiourea	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC007	1-Aminonaphthalene	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC008	1-Aminonaphthalene	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC009	1-Chloronaphthalene	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC010	1-Chloronaphthalene	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC011	2-Aminoanthraquinone	1000µg/ml in MeCl:Benzene:Tetrahydrofuran	1ml
RESVOC012	2-Aminoanthraquinone	2000µg/ml in MeCl:Benzene:Tetrahydrofuran	1ml
RESVOC013	2-Aminonaphthalene	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC014	2-Aminonaphthalene	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC015	2-Chloroaniline	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC016	2-Chloroaniline	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC017	2-Chloronaphthalene	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC018	2-Chloronaphthalene	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC019	2-Nitroaniline	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC020	2-Nitroaniline	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC021	3-Amino-9-ethylcarbazole.	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC022	3-Amino-9-ethylcarbazole.	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC023	3-Methylcholanthrene	1000µg/ml in Methylene Chloride	1ml

Product No.	Analyte	Concentration & Matrix	Pack size
RESVOC024	3-Methylcholanthrene	2000µg/ml in Methylene Chloride	1ml
RESVOC025	3-Nitroaniline	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC026	3-Nitroaniline	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC027	4-Chloro-1,2-phenylenediamine	1000µg/ml in Acetonitrile	1ml
RESVOC028	4-Chloro-1,2-phenylenediamine	2000µg/ml in Acetonitrile	1ml
RESVOC029	4-Chloro-1,3-phenylenediamine	1000µg/ml in Acetone	1ml
RESVOC030	4-Chloro-1,3-phenylenediamine	2000µg/ml in Acetone	1ml
RESVOC031	4-Nitroaniline	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC032	4-Nitroaniline	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC033	4-Nitrobiphenyl	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC034	4-Nitrobiphenyl	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC035	5-Chloro-2-methylaniline	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC036	5-Chloro-2-methylaniline	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC037	5-Nitroacenaphthene	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC038	5-Nitroacenaphthene	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC039	Aniline	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC040	Aniline	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC041	Benzoic acid	1000µg/ml in Methylene Chloride	1ml
RESVOC042	Benzoic acid	2000µg/ml in Methylene Chloride	1ml
RESVOC043	Benzyl alcohol	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC044	Benzyl alcohol	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC045	Dibenzofuran	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC046	Dibenzofuran	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC047	Diethyl sulfate	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC048	Diethyl sulfate	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC049	Diethylstilbestrol	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC050	Diethylstilbestrol	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC051	Hexachlorophene	1000µg/ml in Methylene Chloride	1ml
RESVOC052	Hexachlorophene	2000µg/ml in Methylene Chloride	1ml
RESVOC053	Hexachloropropene	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC054	Hexachloropropene	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC055	Hexamethylphosphoramide	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC056	Hexamethylphosphoramide	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC057	Hydroquinone	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC058	Hydroquinone	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC059	Maleic anhydride	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC060	Maleic anhydride	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC061	Nicotine	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC062	Nicotine	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC063	Nitroquinoline-1-oxide	1000µg/ml in Methylene Chloride	1ml
RESVOC064	Nitroquinoline-1-oxide	2000µg/ml in Methylene Chloride	1ml
RESVOC065	p-Benzoquinone	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC066	p-Benzoquinone	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC067	Resorcinol	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC068	Resorcinol	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC069	Safrole	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC070	Safrole	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC071	Tetraethyl dithiopyrophosphate	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC072	Tetraethyl dithiopyrophosphate	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC073	Thiophenol (Benzenethiol)	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC074	Thiophenol (Benzenethiol)	2000µg/ml in Purge & Trap Methanol	1ml
RESVOC075	Toluene diisocyanate	1000µg/ml in Purge & Trap Methanol	1ml
RESVOC076	Toluene diisocyanate	2000µg/ml in Purge & Trap Methanol	1ml

## Multi Components Standards

Product No.	Description	Component	Packaging	Pack Size
RESVOC200	13 Component mix of Haloethers & Phthalates in accordance to EPA 8270	bis(2-Chloroethoxy)methane	Each @ 2,000	1ml
		Bis(2-chloroethyl) ether	µg/mL in	
		Bis(2-chloroisopropyl) ether	Methylene Chloride	
		Bis(2-ethylhexyl) phthalate		
		4-Bromophenyl phenyl ether		
		Butyl benzyl phthalate		
		4-Chlorophenyl phenyl ether		
		Di-n-octyl phthalate		
		Diethyl phthalate		
		Dimethyl phthalate		
		Di-n-octyl phthalate		
		N-Nitrosodi-n-propylamine		
		N-Nitrosodiphenylamine		
RESVOC201	3 Low level Aniline Component mix in accordance to SOW 10/92	2-Nitroaniline	Each @ 2,000 µg/mL	1ml
		3-Nitroaniline	in Methylene Chloride	
		4-Nitroaniline		
RESVOC202	12 Component Base Neutral mix in accordance to SW-846 Method 8270C	Acetophenone	Each @ 2,000 µg/mL	1ml
		1,3-Dinitrobenzene	in Methylene Chloride	
		2,4-Dinitrotoluene		
		2,6-Dinitrotoluene		
		Ethyl methanesulfonate		
		Isophorone		
		Isosafrole		
		Methyl methanesulfonate		
		1,4-Naphthoquinone		
		Nitrobenzene		
		Pentachloronitrobenzene		
		1,3,5-Trinitrobenzene		
RESVOC203	9 Component Nitrosamine mix in accordance to SW-846 Method 8270C	N-Nitrosodi-n-butylamine	Each @ 2,000 µg/mL	1ml
		N-Nitrosodiethylamine	in Methylene Chloride	
		N-Nitrosodimethylamine		
		N-Nitrosodiphenylamine		
		N-Nitrosodi-n-propylamine		
		N-Nitrosomethylethylamine		
		N-Nitrosomorpholine		
		N-Nitrosopiperidine		
		N-Nitrosopyrrolidine		
RESVOC204	11 Component Haloether & Phthalate mix in accordance to SW-846 Method 8270C	Bis(2-chloroethoxy)methane	Each @ 2,000 µg/mL	1ml
		Bis(2-chloroethyl) ether	in Methylene Chloride	
		Bis(2-chloroisopropyl) ether		
		Bis(2-ethylhexyl) phthalate		
		4-Bromophenyl phenyl ether		
		Butyl benzyl phthalate		
		4-Chlorophenyl phenyl ether		
		Di-n-butyl phthalate		
		Diethyl phthalate		
		Dimethyl phthalate		
		Di-n-octyl phthalate		

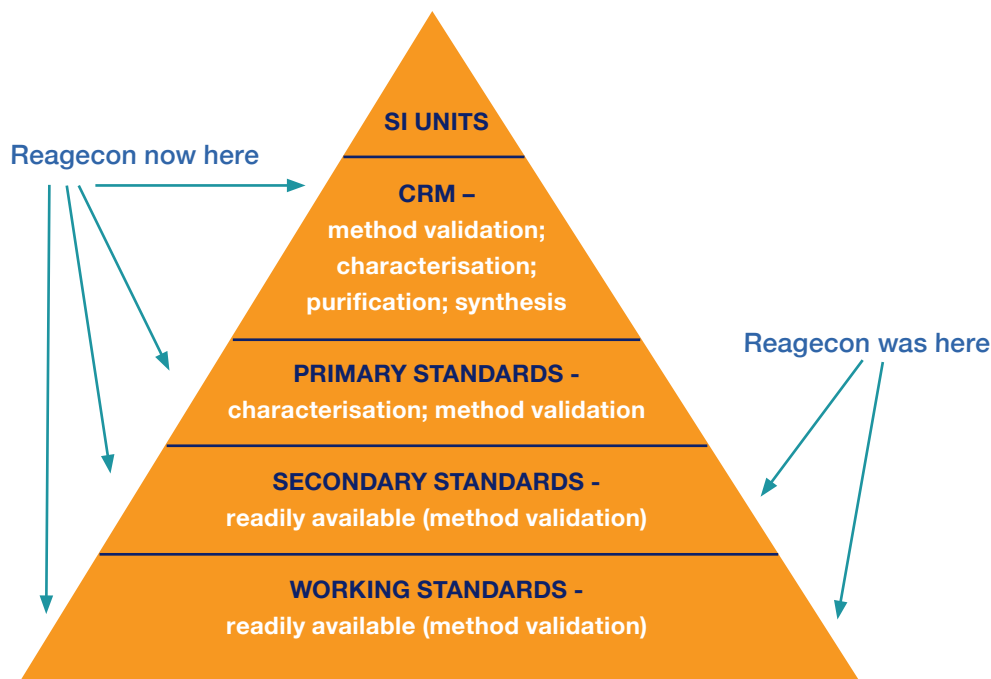
Product No.	Description	Component	Packaging	Pack Size
RESVOC205	10 Component mix in accordance to Method 8270	1-Acetyl-2-thiourea	Each @ 2,000 µg/mL	1ml
		Diethyl sulfate	in Methylene Chloride:	
		Hexamethylphosphoramide	benzene	
		Propylthiouracil		
		Tetraethyl dithiopyrophosphate		
		Tetraethyl pyrophosphate		
		Trimethyl phosphate		
		Tris(2,3-dibromopropyl) phosphate		
		Tri-p-tolyl phosphate		
		Toluene diisocyanate		
RESVOC206	4 Component RCRA Haloether Mix in accordance to SW-846 Method 8111	Bis(2-chloroethoxy)methane	Each @ 2,000 µg/mL	1ml
		Bis(2-chloroethyl) ether	in methanol	
		Bis(2-chloroisopropyl) ether		
		4-Chlorophenyl phenyl ether		
RESVOC207	5 Component Haloether Mix in accordance to SW-846 Method 8110	4-Bromophenyl phenyl ether	Each @ 2,000 µg/mL	1ml
		Bis(2-chloroethoxy)methane	in Methanol	
		Bis(2-chloroethyl) ether	(Purge & Trap)	
		Bis(2-chloroisopropyl) ether		
		4-Chlorophenyl phenyl ether		
RESVOC208	6 Component Mix in accordance to SW-846 Method 8091	1,4-Dichlorobenzene	Each @ 2,000 µg/mL	1ml
		2,4-Dinitrotoluene	in Methanol	
		2,6-Dinitrotoluene	(Purge & Trap)	
		1,4-Naphthoquinone		
		Nitrobenzene		
		Pentachloronitrobenzene		
RESVOC209	4 Component Nitroaromatics and Isophorone Mix in accordance to SW-846 Method 8090	2,4-Dinitrotoluene	Each @ 2,000 µg/mL	1ml
		2,6-Dinitrotoluene	in Methanol	
		Isophorone	(Purge & Trap)	
		Nitrobenzene		
RESVOC210	3 Component Nitrosamine Mix in accordance to SW-846 Method 8091	N-Nitrosodimethylamine	Each @ 2,000 µg/mL	1ml
		N-Nitrosodi-n-propylamine	in Methanol	
		N-Nitrosodiphenylamine	(Purge & Trap)	
RESVOC211	6 Component Phthalate Esters in accordance to SW-846 Method 8060	Bis(2-ethylhexyl) phthalate	Each @ 2,000 µg/mL	1ml
		Butyl benzyl phthalate	in Methanol	
		Di-n-butyl phthalate	(Purge & Trap)	
		Dimethyl phthalate		
		Di-n-octyl phthalate		
		Diethyl phthalate		
RESVOC212	4 Component Mix in accordance to US EPA Method 609	2,4-Dinitrotoluene	Each @ 2,000 µg/mL	1ml
		2,6-Dinitrotoluene	in Hexane	
		Isophorone		
		Nitrobenzene		

# The Reagecon Hierarchy of Standards

Traditionally, Reagecon's manufactured products were on the lower end of the value chain and fitted into the classification of working/secondary standards. The development and production of such standards was consistent with our main technical competence (method validation/accreditation).

## Standards Value Chain:

**Reagecon**



Since 2011, we have escalated dramatically the range of working and secondary standards that we offer. Because of our recently developed ability to perform raw material characterization we are now also producing primary standards and certified reference materials. In the past the production of standards at the higher end of the value chain such as Primary Standards and Certified Reference Materials was the preserve of government funded agencies such as the National Institute of Science and Technology (NIST) in Washington, DC. Now, due to affordable technology, a number of privately funded companies have developed and are marketing primary standards and Certified Reference Materials. These companies generally have well-developed characterisation, purification and synthesis capability. Reagecon has grasped these opportunities with enthusiasm and are a leading producer of such materials.

As a producer of Metrological Standards we are concerned with enabling the end user (analyst) to achieve an analytical result that is fit for purpose and to provide proof of the correctness of that result. These two objectives are achieved through the following:

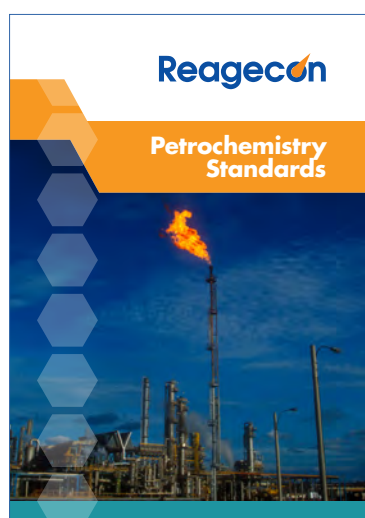
- Accreditation
- Accuracy
- Sensitivity
- Reproducibility
- Comparability
- Traceability
- Precision
- Limit of Detection (LOD)
- Measurement uncertainty

As a Metrology Company, it is a basic requirement that we have detailed knowledge and skills in the Chemical and Biological Sciences, Physics, Statistics, and Engineering. As a manufacturer of metrological products it is mandatory that we have skills and expertise in automation, programmable logic controllers, (PLC's), cleanroom technology and lean (5S, Kaizen, Value Stream Mapping).

# Industry Specific Catalogues

Reagecon has developed several Industry Specific Catalogues and at the time of writing (June 2015), we have 37 such catalogues on offer. These catalogues allow you to pick the required compendium method and locate all of the standards and reagents required to perform your analysis. No other catalogue from any supplier offers this unique functionality. These catalogues can also be viewed at [www.reagecon.com](http://www.reagecon.com). Using these Industry specific catalogues will allow easy and simple selection of certified standards, control solutions and necessary reagents all from one source, reducing vendors, saving time, maximising spend and delivering genuine value.

## Petrochemistry



- Asphalt
- Biofuels
- Coke
- Fuel Oil
- Lubricating Oils
- Gasoline
- Greases
- Kerosne
- Naptha
- Other Petroleums
- Waxes

## Food



- Cereals
- Coffee & tea
- Dairy
- Vegetables
- Oils & Fats
- Flavours & Fragrances
- Fruits
- Ingredients
- Meat & Fish
- Sugars

## Agriculture



- Animal Feeds
- Fertilizers
- Plants
- Soil

## Beverages



- Beer
- Nonalcoholic Beverages & Concentrates
- Spirits
- Wine

## Pharmaceutical



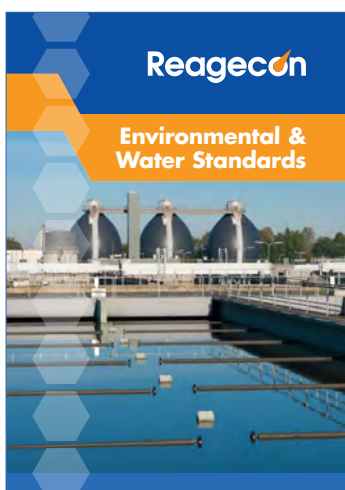
- Cosmetics
- Chinese Pharmacopoeia
- European Pharmacopoeia
- Japanese Pharmacopoeia
- United States Pharmacopoeia

## Industrial Manufacturing



- Pesticide Formulations

## Environmental & Water



- APHA, AWWA, WEF Standard Methods
- Salt in Water

## Pulp & Paper



## Textiles



# Spectrophotometry Standards

## Summary of Features & Benefits:

### Commercial Benefits

- Can be used with all UV-VIS Spectrophotometers
- Permanently sealed cuvettes available
- No Waste
- Ready to Use
- Standards also available in 100ml amber bottles - economy of scale

### Technical 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
- Consistency of product - Independent, Traceable, Certified
- 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 (INAB ref: 265C). The resulting Balance Certificate of Calibration is issued in accordance with the requirements of ISO/IEC 17025. The certified values of each standard are verified using a high performance spectrophotometer calibrated with NIST traceable, ISO Guide 34 Certified Standards.

## Sample Certificate for a Wavelength Standard

**Reagecon**  
*Certificate of Analysis*

**PRODUCT:** Holmium Oxide Solution UV and Visible Wavelength Standard 240nm to 640nm  
**PRODUCT NO:** RSPEC00151  
**LOT NO:** RSPEC1513D1  
**DATE OF TEST:** 05<sup>th</sup> April 2013  
**EXPIRY DATE:** 28<sup>th</sup> April 2015

SBW	Peak Wavelength (nm)
0.10	240.72 250.85 277.03 345.58 360.99 385.41 415.88 451.63 467.83 484.98 535.33 640.28
0.20	240.81 249.62 278.06 345.66 361.26 385.56 416.01 452.01 467.81 485.21 536.51 640.36
0.50	240.92 249.72 278.17 345.42 361.17 385.52 416.07 451.92 467.72 485.17 536.52 640.52
1.00	241.06 249.81 278.16 345.51 361.26 385.71 416.31 451.46 467.81 485.26 536.66 640.56
2.00	241.11 250.02 278.16 345.56 360.16 385.96 416.71 451.71 467.91 485.51 536.96 640.81

**TEST METHOD:**  
The result reported above was determined by analysis of a sample of this lot taken at time of manufacture. The wavelength values of the standard was determined using a high performance calibrated, UV Spectrometer according to TPU/VWAV1. This test method provides traceability to high purity ISO Guide 34 Certified Reference Materials and to National Institute of Standards and Technology (NIST)

This certificate relates solely to the lot number given above. The uncertainty of measurement has been calculated not to exceed  $\pm 0.50\text{nm}$  at 95% confidence level, i.e. coverage factor k=2.

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**TRACEABILITY IN THE PRODUCTION OF THIS STANDARD:**  
This product was prepared gravimetrically on a weight/weight basis. Both solute and solvent were weighed on a balance calibrated by Reagecon engineers using OIML traceable weights. Reagecon holds ISO 17025 accreditation for calibration of non-automatic weighing machines (265C). The resulting Balance Certificate of Calibration was issued in accordance with the requirements of ISO/IEC 17025. The balance was calibrated under monitored environmental conditions and atmospheric pressure. Tests were performed for capacity, readability, repeatability, eccentricity and linearity.

**BALANCE ID No:** RRD006  
**CALIBRATION DATE OF BALANCE:** 28<sup>th</sup> September 2012  
**CALIBRATION AUTHORITY OF BALANCE:** Reagecon Diagnostics Ltd, ISO17025 Accreditation No. 265C

**WEIGHTS No.1:** RTS12  
**CALIBRATION DATE OF WEIGHTS:** 19<sup>th</sup> May 2012  
**CALIBRATION AUTHORITY OF WEIGHTS:** Complete Calibration, ISO17025 Accreditation No. 282C

**WEIGHTS No.2:** RTS11  
**CALIBRATION DATE OF WEIGHTS:** 31<sup>st</sup> October 2011  
**CALIBRATION AUTHORITY OF WEIGHTS:** European Instruments (UKAS No. 0438)

**INSTRUCTIONS FOR USE:**  
• Run against an Air Blank  
• Shake well before use

**Date:** 05<sup>th</sup> April 2013  
This certificate must not be reproduced except in full

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## Linearity Standards @ 235, 257, 313 & 350nm

Product No.	Description	Concentration	Pack Size
RSPEC1022	Potassium Dichromate Linearity Set With Blank in Sealed Cuvettes	0mg/l, 20mg/l, 40mg/l, 60mg/l, 80mg/l, 100mg/l	6 x Permanently sealed UV Cuvettes
RSPEC0022	Potassium Dichromate Absorbance/Transmission Standard	20mg/l	2 x Permanently Sealed UV Cuvettes (including blank)
RSPEC0023	Potassium Dichromate Absorbance/Transmission Standard	40mg/l	2 x Permanently Sealed UV Cuvettes (including blank)
RSPEC0024	Potassium Dichromate Absorbance/Transmission Standard	60mg/l	2 x Permanently Sealed UV Cuvettes (including blank)
RSPEC0025	Potassium Dichromate Absorbance/Transmission Standard	80mg/l	2 x Permanently Sealed UV Cuvettes (including blank)
RSPEC0026	Potassium Dichromate Absorbance/Transmission Standard	100mg/l	2 x Permanently Sealed UV Cuvettes (including blank)
RSPEC00511	Blank - 0.001M Perchloric Acid	0mg/l	100ml Amber Bottle
RSPEC00221	Potassium Dichromate Absorbance/Transmission Standard	20mg/l	100ml Amber Bottle
RSPEC00231	Potassium Dichromate Absorbance/Transmission Standard	40mg/l	100ml Amber Bottle
RSPEC00241	Potassium Dichromate Absorbance/Transmission Standard	60mg/l	100ml Amber Bottle
RSPEC00251	Potassium Dichromate Absorbance/Transmission Standard	80mg/l	100ml Amber Bottle
RSPEC00261	Potassium Dichromate Absorbance/Transmission Standard	100mg/l	100ml Amber Bottle

## Linearity Standards @ 213 & 261nm

Product No.	Description	Concentration	Pack Size
RSPEC1027	Nicotinic Acid Linearity Set With Blank in Sealed Cuvettes	0mg/l, 6mg/l, 12mg/l, 18mg/l, 24mg/l	5 x Permanently sealed UV Cuvettes (including blank)
RSPEC0027	Nicotinic Acid Absorbance/Transmission Standard	6mg/l	2 x Permanently Sealed UV Cuvettes (including blank)
RSPEC0028	Nicotinic Acid Absorbance/Transmission Standard	12mg/l	2x Permanently Sealed UV Cuvettes (including blank)
RSPEC0029	Nicotinic Acid Absorbance/Transmission Standard	18mg/l	2 x Permanently Sealed UV Cuvettes (including blank)
RSPEC0030	Nicotinic Acid Absorbance/Transmission Standard	24mg/l	2 x Permanently Sealed UV Cuvette (including blank)
RSPEC00521	Blank -- 0.1M Hydrochloric Acid	0mg/l	100ml Amber Bottle
RSPEC00271	Nicotinic Acid Absorbance/Transmission Standard	6mg/l	100ml Amber Bottle
RSPEC00281	Nicotinic Acid Absorbance/Transmission Standard	12mg/l	100ml Amber Bottle
RSPEC00291	Nicotinic Acid Absorbance/Transmission Standard	18mg/l	100ml Amber Bottle
RSPEC00301	Nicotinic Acid Absorbance/Transmission Standard	24mg/l	100ml Amber Bottle

## Wavelength Standards (certified at 0.1nm, 0.2nm, 0.5nm, 1.0nm & 2.0nm slit widths)

Product No.	Description	Nominal Peak Wavelengths (0.2nm Slit Width)	Pack Size
RSPEC0001	Didymium Solution UV and Visible Wavelength Standard 298nm to 865nm	298nm, 328.8nm, 353.8nm, 443.8nm, 468.5nm, 481.3nm, 511.5nm, 521.6nm, 574.8nm, 731.4nm, 739.6nm, 794nm, 801.1nm, 865nm	1 x Permanently Sealed UV Cuvette
RSPEC0008	Samarium Solution UV and Visible Wavelength Standard 235nm to 480nm	235nm, 278.8nm, 290.1nm, 305.2nm, 317.4nm, 331.6nm, 344.4nm, 362.2nm, 374.1nm, 390.4nm, 401.1nm, 415.3nm, 463.4nm, 478.6nm	1 x Permanently Sealed UV Cuvette
RSPEC0015	Holmium Oxide Solution UV and Visible Wavelength Standard 240nm to 640nm	240.8nm, 249.6nm, 278nm, 286.8nm, 333nm, 345.4nm, 361.1nm, 385.2nm, 416nm, 451.8nm, 467.6nm, 485nm, 536.3nm, 640.2nm	1 x Permanently Sealed UV Cuvette
RSPEC00011	Didymium Solution UV and Visible Wavelength Standard 298nm to 865nm	298nm, 328.8nm, 353.8nm, 443.8nm, 468.5nm, 481.3nm, 511.5nm, 521.6nm, 574.8nm, 731.4nm, 739.6nm, 794nm, 801.1nm, 865nm	100ml Amber Bottle
RSPEC00081	Samarium Solution UV and Visible Wavelength Standard 235nm to 480nm	235nm, 278.8nm, 290.1nm, 305.2nm, 317.4nm, 331.6nm, 344.4nm, 362.2nm, 374.1nm, 390.4nm, 401.1nm, 415.3nm, 463.4nm, 478.6nm	100ml Amber Bottle
RSPEC00151	Holmium Oxide Solution UV and Visible Wavelength Standard 240nm to 640nm	240.8nm, 249.6nm, 278nm, 286.8nm, 333nm, 345.4nm, 361.1nm, 385.2nm, 416nm, 451.8nm, 467.6nm, 485nm, 536.3nm, 640.2nm	100ml Amber Bottle

## Stray Light Standards

Product No.	Description	Cut Off	Packed in
RSPEC0036	Stray Light Inorganic Cut-off filter - Sodium Nitrite	390nm	2 x Permanently sealed UV Cuvettes (including blank)
RSPEC0037	Stray Light Inorganic Cut-off filter - Potassium Iodide	260nm	2 x Permanently Sealed UV Cuvettes (including blank)
RSPEC0038	Stray Light Inorganic Cut-off filter - Sodium Iodide	260nm	2 x Permanently Sealed UV Cuvettes (including blank)
RSPEC0039	Stray Light Inorganic Cut-off filter - Lithium Carbonate	227nm	2 x Permanently Sealed UV Cuvettes (including blank)
RSPEC0040	Stray Light Inorganic Cut-off filter - Sodium Chloride	205nm	2 x Permanently Sealed UV Cuvettes (including blank)
RSPEC0041	Stray Light Inorganic Cut-off filter - Potassium chloride	200nm	2 x Permanently Sealed UV Cuvettes (including blank)
RSPEC00541	Stray Light Blank - Aqueous		100ml Amber Bottle
RSPEC00361	Stray Light Inorganic Cut-off filter - Sodium Nitrite	390nm	100ml Amber Bottle
RSPEC00371	Stray Light Inorganic Cut-off filter - Potassium Iodide	260nm	100ml Amber Bottle
RSPEC00381	Stray Light Inorganic Cut-off filter - Sodium Iodide	260nm	100ml Amber Bottle
RSPEC00391	Stray Light Inorganic Cut-off filter - Lithium Carbonate	227nm	100ml Amber Bottle
RSPEC00401	Stray Light Inorganic Cut-off filter - Sodium Chloride	205nm	100ml Amber Bottle
RSPEC00411	Stray Light Inorganic Cut-off filter - Potassium chloride	200nm	100ml Amber Bottle

## Bandwidth Standard

Product No.	Description	Certified Value	Packed in
RSPEC1031	Toluene in Hexane Bandwidth Standard	Ratio of 268.7nm peak to 266.8nm trough	2 x Permanently sealed UV Cuvettes (including blank)
RSPEC00311	Bandwidth Standard - Toluene in Hexane	Ratio of 268.7nm peak to 266.8nm trough	100ml Amber Bottle
RSPEC00531	Bandwidth Standard - Blank	Ratio of 268.7nm peak to 266.8nm trough	100ml Amber Bottle

# NEW Product Packaging

Packaging has a critical impact on all products' quality and user experience - Reagecon's Chemical Standards and Reagents are no exception to this. Appropriate packaging must have the correct form and structural integrity to protect the product and the user, but must also be aesthetic to enhance the user experience.

Reagecon is about to launch a novel new packaging solution for high value added products that includes the following features;

- Bottles (Glass or plastic) and ampoules packed in high quality individual tamper proof boxes.
- Products packed securely using custom made recyclable foams
- Products more secure from a handling, shipping and storage perspective.
- Internal space left in the packaging for;
  - Certificates of Analysis (which will be shipped with every product)
  - Additional Product information
- All products and packing labels provided with QR codes to enable you to download application, information, features, benefits and details of other products from the same family using any mobile device.

We hope you find this innovation helpful and look forward to any feedback you may have.



# In your next Edition of 'The Metrologist' (January 2016)

## NEW PRODUCT LAUNCHES

### Phthalate Standards

Phthalates are produced by esterification of phthalic acid with different alcohols. They are commonly used plasticisers, added to plastics in order to increase flexibility, transparency and durability. Phthalates may be classified into two groups, based on molecular weight. Low molecular weight (MW) phthalates have ester side chain lengths of one to four carbons and include such compounds as dibutylphthalates (DBP) and high MW products with side chains of five or more carbons, which include bis (2 n-ethylhexyl)phthalate (BEHP). Since phthalates are incorporated into a wide range of plastics, they often migrate into food or beverages from the wrapping or bottling materials. Phthalates have been associated with a number of health problems that include endocrine, respiratory, neurological and reproductive disorders. Several phthalates have been prioritised as significantly hazardous substances by the US EPA and other protection organisations.

There is a significant and growing body of literature on sensitive and rugged methods for the detection of phthalates, including the use of HPLC-MS. However, GC-MS is the method of choice currently and Reagecon has developed a significant range of standards, to enable such measurements.

### Petrochemical Standards

Reagecon has developed an extensive offering of Standards and Reference Materials targeted at the Petrochemistry Industry. Products available between now and January 2016 include:

- PIANO/PONA/PNA

#### These include:

- PIANO isoparaffins mixes
- PIANO n-paraffins mixes
- PIANO aromatics mixes
- PIANO naphthene mixes
- PIANO olefins mixes



Several combinations of these products are available as PIANO's, PONA's and PNA's. This type of analysis is used by petrochemists to differentiate fuel types, biodegradation analysis and alteration of the fuel due to weathering. These products are suitable singly or in combination for analysis following ASTM Methods P0030, P0031, P0032, P0033, P0034 and P0035.

- Oxygenates
- Biofuel Standards (FAME's, FAEE's and glycerides)

Also available in 2016:

- Thiol Standards
- Nitrosamine Standards
- Solvent Residue Standards
- Additions to Polycyclic Aromatic Hydrocarbon Standards (PAH's)



We already offer a significant range of PAH standards in single and multi component formats. New PAH standards are currently being developed.



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