avantor™

VWR® for calibration

01. TRACEABILITY

02. ACCURACY

03. RELIABILITY

VWR®

VWR® for calibration

Scientific analysis becomes ever more sensitive and the need to ensure that results are verified and traceable gathers pace in all industries. Avantor's VWR brand offers a selection of products to support you each and every day to help you with continuity and reproducibility of your results and discoveries.

From discovery to delivery, our objective is to be the trusted global partner to customers and suppliers in the life science and advanced technology industries. By providing superior product and service solutions, we accelerate innovation and empower the success of our customers.

We set science in motion to create a better world.

Integrity and quality are, and always will be our highest priority. That means delivering High Purity Standards and Certified Reference Materials to the market – supporting you every day.

- Calibration optimises the accuracy of measuring devices
- Accurate measuring tools improve product quality
- Instrument calibration is an essential maintenance step that's required to ensure you get the most out of your equipment investment

Table of contents

ASTM COLOUR SOLUTIONS

Ready to use solutions that are prepared gravimetrically on a weight/weight basis.

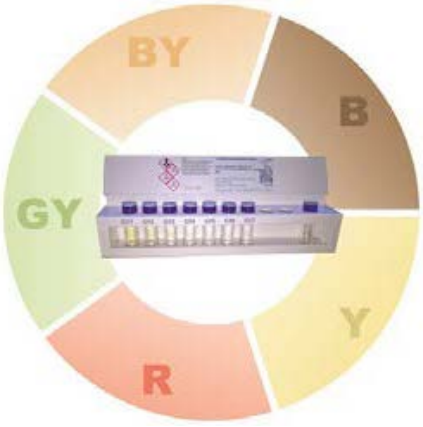
- Use either as calibration and/or quality control standards
- Designed specifically for use in ASTM analytical methods and produced in accordance with ASTM D1500, D6045, D1209
- Traceable product certified by an independent laboratory
- Supplied in high quality, tamper-evident bottles

Colour standards, Platinum-Cobalt (Pt-Co)Hazen - plastic bottle	Cat. No. Pk 1000 ml
0	84806.290
10	84807.290
25	84808.290
40	84809.290
50	84810.290
80	84811.290
100	84812.290
250	84813.290
500	84814.290

Colour standards - Saybolt - glass bottle	Cat. No. Pk 100 ml	Cat. No. Pk 500 ml
-15	84805.180	84805.260
0	84804.180	84804.260
12	84803.180	84803.260
15	84802.180	84802.260
19	84801.180	84801.260
25	84800.180	84800.260
30	84799.180	84799.260

Colour standards - Gardner - glass bottle	Cat. No. Pk 500 ml
2	84815.260
4	84816.260
6	84817.260
8	84818.260
10	84819.260
12	84820.260
14	84821.260
16	84822.260

Colour standards solutions - ASTM - glass bottle	Cat. No. Pk 100 ml	Cat. No. Pk 500 ml
A1	84834.180	84834.260
A3	84796.180	84796.260
A5	84797.180	84797.260
A7	84798.180	84798.260



Colour reference solutions

COLOUR REFERENCE SOLUTIONS ACC. TO PH. EUR., READY TO USE

These solutions are developed and produced according to chapter 2.2.2. Degree of coloration of liquids of the European Pharmacopeia. (brown, brown-yellow, green-yellow, red and yellow). These kits are ready to use, and are dedicated to help you save time and money because preparation of these solutions is very complex.

- Easy to use kits
- Ready to use solutions
- Stable - shelf life of 36 months
- Certificate of Analysis provided with the kit

The kits are easy to use: Just add the sample into the empty vial provided with the kit and compare the colour with the reference solution in the rack.

Description	Pk	Cat. No.
Colour reference solutions B (B1 - B9)	9 x 2 ml vials + 1 empty sample vial	85752.001
Colour reference solutions BY (BY1 - BY7)	7 x 2 ml vials + 3 empty sample vials	85753.001
Colour reference solutions Y (Y1-Y7)	7 x 2 ml vials + 3 empty sample vials	85754.001
Colour reference solutions GY (GY1 - GY7)	7 x 2 ml vials + 3 empty sample vials	85755.001
Colour reference solutions R (R1 - R7)	7 x 2 ml vials + 3 empty sample vials	85756.001
Transparent empty glass vials	10 x 2 ml	88364.001

All standards are visible behind. Click here

OXIDATION/REDOX STANDARDS

Avantor offers a wide range of REDOX (ORP) standards, which are produced from high quality reagents.These reference materials can be used as control standards to check the functionality of both the elextrodes and the measuring instruments. The values are temperature dependent, so it is important to control the environment of the measurement. A table of temperatue and corresponding Redox value is available on both the label and the batch specific certificate.

CERTIFIED HUMIDITY STANDARDS

Although most relative humidity (RH) probes have excellent long-term stability, it is recommended that their calibration be checked regularly.

- Traceable to national standard – SCS (Swiss Calibration Service) certificate included
- Ampoules contain unsaturated salt solutions (~0,8 ml)
- Inexpensive on-site calibration
- Simple and safe use
- 10 year shelf life
- Practical packs of five ampoules of the same humidity value

Each ampoule is labelled with the humidity value and serial number.

Values and accuracy (measurement uncertainty values) below are measured at 23 °C.

Relative humidity (RH%)	Accuracy	Cat. No.
0,5%	±0,3% RH	**620-2272**
10%	±0,3% RH	**620-2223**
20%	±0,3% RH	**620-2758**
35%	±0,5% RH	**620-2224**
50%	±0,9% RH	**620-2225**
65%	±0,9% RH	**707-0044**
80%	±1,2% RH	**620-2226**
95%	±1,2% RH	**707-0045**

RELATIVE DENSITY STANDARDS WITHIN THE RANGE OF 15 TO 25 °C

This range of relative density standards are certified in accordance with primary level ASTM D1480 methodology and are dual-certified to ISO 17025 / ISO 17034 under UKAS accreditation. Relative density standards are designed for the calibration or verification of instruments used to measure density and relative density of materials at the desired test temperature within the range of 15 to 25 °C.

- Certified in accordance with primary level ASTM D1480 methodology
- Full traceability to national standards
- Supplied in tamper-evident packaging with a 2 year shelf life

Relative density is calculated by dividing the density, as obtained from ASTM D1480, by the density of water at the reference temperature.

The density of water was taken from the table «Density of Water» found in ASTM D1480 and confirms to the International Temperature Scale (ITS 90).

Dual-certified to ISO 17025 / ISO 17034 under UKAS accreditation.

The density given in the ordering table below is the nominal relative density value - actual batch values are given in the certification documents supplied with the product and also on the label.

Density	Reference Temperature	Test Method	Pack type	Pk	Cat. No.
0,6643	15 °C	ASTM D1480	Glass bottle	500 ml	**99131.260**
0,7186	15 °C	ASTM D1480	Glass bottle	500 ml	**99132.260**
0,7807	15 °C	ASTM D1480	Glass bottle	500 ml	**99133.260**
0,8163	15 °C	ASTM D1480	Glass bottle	500 ml	**99134.260**
0,8494	15 °C	ASTM D1480	Glass bottle	500 ml	**99135.260**
0,8642	15 °C	ASTM D1480	Glass bottle	500 ml	**99136.260**
0,8797	15 °C	ASTM D1480	Glass bottle	500 ml	**99137.260**
0,6597	20 °C	ASTM D1480	Glass bottle	500 ml	**99138.260**
0,7145	20 °C	ASTM D1480	Glass bottle	500 ml	**99139.260**

Density	Reference Temperature	Test Method	Pack type	Pk	Cat. No.
0,7769	20 °C	ASTM D1480	Glass bottle	500 ml	**99140.260**
0,8400	20 °C	ASTM D1480	Glass bottle	500 ml	**99141.260**
0,8452	20 °C	ASTM D1480	Glass bottle	500 ml	**99142.260**
0,8723	20 °C	ASTM D1480	Glass bottle	500 ml	**99143.260**
0,6552	25 °C	ASTM D1480	Glass bottle	500 ml	**99144.260**
0,7104	25 °C	ASTM D1480	Glass bottle	500 ml	**99145.260**
0,7730	25 °C	ASTM D1480	Glass bottle	500 ml	**99146.260**
0,8366	25 °C	ASTM D1480	Glass bottle	500 ml	**99147.260**
0,8693	25 °C	ASTM D1480	Glass bottle	500 ml	**99148.260**

DENSITY STANDARDS

These products can be used as calibration standards for density measurements by pycnometric, vibrational or hydrometer-based techniques.

- High accuracy across an extensive density range
- No toxic heavy metals used in any formulation
- Can be used with any brand or type of density measuring instrument
- Supplied in a high quality, tamper proof, amber glass bottle

These standards are prepared gravimetrically (solute and solvent) using OIML traceable weights. The standard's density are established using fully calibrated reference pycnometers.

In accordance with ASTM D1480-12 for testing of density or relative density. A Certificate of Calibration is issued in accordance with the requirements of ISO/IEC 17025.

Conc. at 15 °C (g/ml)	Cat. No.
0,6960	85140.180
0,7073	85141.180
0,7184	85142.180
0,7298	85143.180
0,7411	85144.180
0,7524	85145.180
0,7721	85146.180
0,7933	85147.180
0,8168	85148.180
0,8428	85149.180
0,8715	85150.180
0,9135	85151.180
0,9514	85152.180
1,0040	85153.180
1,0337	85154.180

Conc. at 15 °C (g/ml)	Cat. No.
1,0828	85155.180
1,1661	85156.180
1,2498	85157.180
1,3318	85158.180
1,4152	85159.180
1,5820	85160.180
1,7495	85161.180
1,9171	85162.180
2,0846	85163.180
2,2568	85164.180
2,4261	85165.180
2,6055	85166.180
2,7588	85167.180
2,9418	85168.180
3,1140	85169.180

Conc. at 20 °C (g/ml)	Cat. No.
0,6919	85170.180
0,7033	85171.180
0,7148	85172.180
0,7261	85173.180
0,7374	85174.180
0,7488	85175.180
0,7683	85176.180
0,7893	85177.180
0,8126	85178.180
0,8384	85179.180
0,8668	85180.180
0,9098	85181.180
0,9476	85182.180
1,0005	85183.180
1,0301	85184.180

Conc. at 20 °C (g/ml)	Cat. No.
1,0792	85185.180
1,1651	85186.180
1,2486	85187.180
1,3304	85188.180
1,4136	85189.180
1,5799	85190.180
1,7470	85191.180
1,9141	85192.180
2,0812	85193.180
2,2531	85194.180
2,4219	85195.180
2,6011	85196.180
2,7542	85197.180
2,9370	85198.180
3,1096	85199.180

Conc. at 25 °C (g/ml)	Cat. No.
0,6878	85200.180
0,6993	85201.180
0,7111	85202.180
0,7223	85203.180
0,7337	85204.180
0,7452	85205.180
0,7645	85206.180
0,7853	85207.180
0,8084	85208.180
0,8340	85209.180
0,8622	85210.180
0,9060	85211.180
0,9438	85212.180
0,9969	85213.180
1,0265	85214.180

Conc. at 25 °C (g/ml)	Cat. No.
1,0755	85215.180
1,1639	85216.180
1,2471	85217.180
1,3287	85218.180
1,4117	85219.180
1,5775	85220.180
1,7441	85221.180
1,9108	85222.180
2,0775	85223.180
2,2490	85224.180
2,4175	85225.180
2,5964	85226.180
2,7493	85227.180
2,9319	85228.180
3,1043	85229.180

Conc. at 40 °C (g/ml)	Cat. No.
0,6752	85230.180
0,6872	85231.180
0,6997	85232.180
0,7109	85233.180
0,7226	85234.180
0,7343	85235.180
0,7531	85236.180
0,7733	85237.180
0,7958	85238.180
0,8207	85239.180
0,8482	85240.180
0,8945	85241.180
0,9323	85242.180
0,9857	85243.180
1,0152	85244.180

Conc. at 40 °C (g/ml)	Cat. No.
1,0642	85245.180
1,1581	85246.180
1,2408	85247.180
1,3217	85248.180
1,4039	85249.180
1,5685	85250.180
1,7339	85251.180
1,8994	85252.180
2,0649	85253.180
2,2352	85254.180
2,4028	85255.180
2,5807	85256.180
2,7329	85257.180
2,9132	85258.180
3,0852	85259.180

Conc. at 50 °C (g/ml)	Cat. No.
0,6668	85260.180
0,6791	85261.180
0,6917	85262.180
0,7033	85263.180
0,7151	85264.180
0,7269	85265.180
0,7454	85266.180
0,7653	85267.180
0,7873	85268.180
0,8118	85269.180
0,8387	85270.180
0,8868	85271.180
0,9245	85272.180
0,9777	85273.180
1,0073	85274.180

Conc. at 50 °C (g/ml)	Cat. No.
1,0562	85275.180
1,1512	85276.180
1,2346	85277.180
1,3138	85278.180
1,3973	85279.180
1,5609	85280.180
1,7257	85281.180
1,8904	85282.180
2,0551	85283.180
2,2247	85284.180
2,3916	85285.180
2,5689	85286.180
2,7207	85287.180
2,9005	85288.180
3,0721	85289.180

Conc. at 60 °C (g/ml)	Cat. No.
0,6582	85290.180
0,6708	85291.180
0,6835	85292.180
0,6955	85293.180
0,7076	85294.180
0,7196	85295.180
0,7376	85296.180
0,7572	85297.180
0,7788	85298.180
0,8027	85299.180
0,8292	85300.180
0,8790	85301.180
0,9166	85302.180
0,9695	85303.180
0,9990	85304.180
1,0478	85305.180

Conc. at 80 °C (g/ml)	Cat. No.
0,6407	85306.180
0,6538	85307.180
0,6661	85308.180
0,6798	85309.180
0,6923	85310.180
0,7047	85311.180
0,7220	85312.180
0,7407	85313.180
0,7614	85314.180
0,7844	85315.180
0,8098	85316.180
0,8629	85317.180
0,9006	85318.180
0,9520	85319.180
0,9815	85320.180
1,0302	85321.180

MELTING POINT STANDARDS

These standards can be used with any melting point apparatus and are prepared using pure raw materials. Melting points are determined using a high accuracy Differential Scanning Calorimeter (DSC) system that is calibrated to the ITS 90 International Temperature Scale.

- Ready to use
- Traceable
- Uncertainty of measurement up to ±0,3 °C

The melting points of these standards range from benzophenone (+47...+49 °C) to anthraquinone (+283...+286 °C).

Description	Melting pt.	Pk (g)	Cat. No.
4-Acetylbenzonitrile	56...59 °C	1	**88442.001**
Acetanilide	113...116 °C	1	**88445.001**
Anthraquinone	283...286 °C	1	**85110.001**
Benzoic acid	121...123 °C	1	**85104.001**
Benzophenone	47...49 °C	1	**85101.001**
Caffeine	235...238 °C	1	**85108.001**
Carbazole	243...247 °C	1	**85109.001**
m-Toluic acid	107...113 °C	1	**88444.001**
Phenacetin	133...135 °C	0,5	**85105.005**
Phenacetin	133...135 °C	1	**85105.001**
Phenolphthalein	258...263 °C	1	**88446.001**
Saccharin	226...229 °C	1	**88449.001**
Salicylic acid	158...160 °C	1	**85106.001**
Sulphanilamide	164 ...166 °C	1	**85107.001**
Vanillin	81...83 °C	1	**85103.001**
Melting point standard set (benzophenone/benzoic acid/anthraquinone)	47...49 °C/121...123 °C/283...286 °C	3 *	**85112.003**
Melting point standard set (sulphanilamide/caffeine/vanillin)	164 ...166 °C/235...238 °C/81...83 °C	3*	**85111.003**
Melting point standard set, (vanillin/phenacetin/caffeine)	81...83 °C/134…136 °C/235...237 °C	3*	**85113.003**

*1 g of each substance

REFRACTIVE INDEX STANDARDS

Refractive index of a standard is verified using a calibrated- and temperature-controlled refractometer.

- Standards are prepared gravimetrically on weight/weight basis
- Solute (sucrose) and solvent (water) are weighed on a calibrated balance using OIML traceable weights

Certificate of Calibration is issued in accordance with the requirements of ISO/IEC 17025.

Description	Refractive index	Pk	Cat. No.
Refractive index standard at 20 °C, solvent-based	1,38779 nD	15 ml	**85114.015**
Refractive index standard at 20 °C, solvent-based	1,40485 nD	15 ml	**85115.015**
Refractive index standard at 20 °C, solvent-based	1,42345 nD	15 ml	**85116.015**
Refractive index standard at 20 °C, solvent-based	1,44468 nD	15 ml	**85117.015**
Refractive index standard at 20 °C, solvent-based	1,46768 nD	15 ml	**85118.015**
Refractive index standard at 20 °C, solvent-based	1,49672 nD	15 ml	**85119.015**
Refractive index standard at 20 °C, solvent based	1,50044 nD	15 ml	**85120.015**
Refractive index standard at 20 °C, solvent-based	1,51726 nD	15 ml	**85121.015**
Refractive index standard at 20 °C, solvent-based	1,53660 nD	15 ml	**85122.015**
Refractive index standard at 20 °C, solvent-based	1,65808 nD	15 ml	**85123.015**
Refractive index standard at 20 °C, stabilised sucrose	1,34325 nD	15 ml	**85124.015**
Refractive index standard at 20 °C, stabilised sucrose	1,34782 nD	15 ml	**85125.015**
Refractive index standard at 20 °C, stabilised sucrose	1,34968 nD	15 ml	**85126.015**

Description	Refractive index	Pk	Cat. No.
Refractive index standard at 20 °C, stabilised sucrose	1,35015 nD	15 ml	**85127.015**
Refractive index standard at 20 °C, stabilised sucrose	1,35093 nD	15 ml	**85129.015**
Refractive index standard at 20 °C, stabilised sucrose	1,35171 nD	15 ml	**85128.015**
Refractive index standard at 20 °C, stabilised sucrose	1,35568 nD	15 ml	**85130.015**
Refractive index standard at 20 °C, stabilised sucrose	1,37233 nD	15 ml	**85131.015**
Refractive index standard at 20 °C, stabilised sucrose	1,38115 nD	15 ml	**85132.015**
Refractive index standard at 20 °C, stabilised sucrose	1,39032 nD	15 ml	**85133.015**
Refractive index standard at 20 °C, stabilised sucrose	1,39986 nD	15 ml	**85134.015**
Refractive index standard at 20 °C, stabilised sucrose	1,40978 nD	15 ml	**85135.015**
Refractive index standard at 20 °C, stabilised sucrose	1,42009 nD	15 ml	**85136.015**
Refractive index standard at 20 °C, stabilised sucrose	1,43080 nD	15 ml	**85137.015**
Refractive index standard at 20 °C, stabilised sucrose	1,44193 nD	15 ml	**85138.015**

Refractive index standard kits.

REFRACTIVE INDEX STANDARD KITS FOR CALIBRATION ACCORDING TO PH. EUR. 2.2.6

These standards are for the calibration of refractometers prior to use.

Description	Refractive index	Pk	Cat. No.
Refractive index kit 1 (isooctane/water)	1,3915 / 1,3330	1 KIT	**85757.001**
Refractive index kit 2 (toluene/water)	1,4969 / 1,3330	1 KIT	**85758.001**

REFRACTIVE INDEX CERTIFIED REFERENCE MATERIAL AT 20, 25 AND 30 °C

Refractive Index Certified Reference Materials (CRMs) are ideal for verification and calibration of temperature controlled refractometers, with each CRM providing certified values for refractive index measurements at 20, 25 and 30 °C.

- Certified in strict accordance to ISO 17025 and ISO 17034 under UKAS accreditation
- Highest level of accreditation guarantee, providing the most credible certified data available worldwide
- All measurements are fully traceable to NIST and international protocols
- Low levels of uncertainty, ensuring maximum accuracy of data at hand and dependable results
- Available in single 10 ml volume tamper-evident glass bottles or as a multi-pack of 5 per material (includes set of disposable pipettes)
- 12 month shelf life
- Manufactured in the United Kingdom

Refractive Index is measured for many reasons and is useful for multiple applications. It is a parameter that provides valuable information into determining the concentration of liquid mixtures (i.e. any dissolved mixtures), as well as provide information into the sample's purity and clarity. This is useful for identification and quality control purposes.

Many industries will use refractometers for quality control purposes, particularly within food and beverage industries, from portable handheld machines to bench top-based refractometers such as Abbe or automatic digital refractometers. Temperature controlled refractometers are ideal for high precision refractive index measurements. These are ideal for food, beverage, pharmaceutical, medical and petrochemical industries and applications.

UKAS ISO 17025 & ISO 17034

Description	Pack type	Packed	Pk	Nominal Refractive Index at 25 °C	Cat. No.
Refractive index certified reference material	Glass bottle	1×10 ml	10 ml	1,3325	**99177.100**
Refractive index certified reference material	Glass bottles	5×10 ml	1 SET	1,3325	**99177.001**
Refractive index certified reference material	Glass bottle	1×10 ml	10 ml	1,3891	**99178.100**
Refractive index certified reference material	Glass bottles	5×10 ml	1 SET	1,3891	**99178.001**
Refractive index certified reference material	Glass bottle	1×10 ml	10 ml	1,4023	**99179.100**
Refractive index certified reference material	Glass bottles	5×10 ml	1 SET	1,4023	**99179.001**
Refractive index certified reference material	Glass bottle	1×10 ml	10 ml	1,4196	**99180.100**
Refractive index certified reference material	Glass bottles	5×10 ml	1 SET	1,4196	**99180.001**
Refractive index certified reference material	Glass bottle	1×10 ml	10 ml	1,4206	**99181.100**
Refractive index certified reference material	Glass bottles	5×10 ml	1 SET	1,4206	**99181.001**
Refractive index certified reference material	Glass bottle	1×10 ml	10 ml	1,4573	**99182.100**
Refractive index certified reference material	Glass bottles	5×10 ml	1 SET	1,4573	**99182.001**
Refractive index certified reference material	Glass bottle	1×10 ml	10 ml	1,4941	**99183.100**
Refractive index certified reference material	Glass bottles	5×10 ml	1 SET	1,4941	**99183.001**
Refractive index certified reference material	Glass bottle	1×10 ml	10 ml	1,5349	**99184.100**
Refractive index certified reference material	Glass bottles	5×10 ml	1 SET	1,5349	**99184.001**
Refractive index certified reference material	Glass bottle	1×10 ml	10 ml	1,5440	**99185.100**
Refractive index certified reference material	Glass bottles	5×10 ml	1 SET	1,5440	**99185.001**
Refractive index certified reference material	Glass bottle	1×10 ml	10 ml	1,6556	**99186.100**
Refractive index certified reference material	Glass bottles	5×10 ml	1 SET	1,6556	**99186.001**

Sucrose (Brix) standard, stabilised.

SUCROSE (BRIX) STANDARDS, STABILISED SOLUTIONS FOR REFRACTOMETRY

A range of Brix/refractive index standards for ease of use when calibrating all types of refractometers.

- Manufactured using high purity raw materials
- Contain the same raw materials as the ICUMSA range, but are stabilised to have an extended shelf life of 12 months

These products represent excellent value for users that are not required to follow ICUMSA guidelines.

Note: The Brix scale is shown with the degree type symbol (x°) but it equates to the % concentration of the stabilised sucrose solution used.

Therefore 0° = 0% concentration

5° = 5% concentration

* The refractive index value in the table below refers to the nominal refractive index and is taken from the ICUMSA published tables for all product numbers except 87022.015 (Brix value 67,5°) which is a measured value.

Description	Refractive index	Pk	Cat. No.
Sucrose (Brix) standard, stabilised, 0°	1.332986	15 ml	87000.015
Sucrose (Brix) standard, stabilised, 5°	1.340264	15 ml	87001.015
Sucrose (Brix) standard, stabilised, 7°	1.343253	15 ml	87002.015
Sucrose (Brix) standard, stabilised, 10°	1.347824	15 ml	87003.015
Sucrose (Brix) standard, stabilised, 11,2°	1.349682	15 ml	87004.015
Sucrose (Brix) standard, stabilised, 11,5°	1.350149	15 ml	87005.015
Sucrose (Brix) standard, stabilised, 12°	1.35093	15 ml	87006.015
Sucrose (Brix) standard, stabilised, 12,5°	1.351714	15 ml	87007.015
Sucrose (Brix) standard, stabilised, 14,9°	1.355519	15 ml	87008.015
Sucrose (Brix) standard, stabilised, 15°	1.355679	15 ml	87009.015
Sucrose (Brix) standard, stabilised, 20°	1.363842	15 ml	87011.015
Sucrose (Brix) standard, stabilised, 25°	1.372328	15 ml	87012.015
Sucrose (Brix) standard, stabilised, 30°	1.381149	15 ml	87013.015
Sucrose (Brix) standard, stabilised, 35°	1.390322	15 ml	87014.015
Sucrose (Brix) standard, stabilised, 40°	1.39986	15 ml	87015.015
Sucrose (Brix) standard, stabilised, 45°	1.409777	15 ml	87016.015
Sucrose (Brix) standard, stabilised, 50°	1.420087	15 ml	87018.015
Sucrose (Brix) standard, stabilised, 55°	1.4308	15 ml	87019.015
Sucrose (Brix) standard, stabilised, 60°	1.441928	15 ml	87021.015
Sucrose (Brix) standard, stabilised, 67,5°	1.45929	15 ml	87022.015

UV/Vis standards.

UV/VIS STANDARDS

For spectrophotometer calibration according to European Pharmacopoeia (Ph. Eur.)

- Absorbance control
- Testing of resolution power
- Stray light testing
- Wavelength accuracy testing

In the pharmaceutical industry, a regular check of UV/Visible spectrophotometers according to Ph. Eur. is mandatory. Even in other industries, researchers who are using UV/Visible spectrophotometers, and who are working according to e.g. GMP, GLP, USP or ISO guidelines, need to check and qualify their instruments on a regular basis.

Description	Pk	Cat. No.
UV/Vis standard 1, for absorbance control	Set of 2 x 10 ml Potassium Dichromate Solution (235-350nm) and 6 x 10 ml blank	86124.001
UV/Vis standard 1A, for absorbance control	Set of 2 x 10 ml Potassium Dichromate Solution (430nm) and 6 x 10 ml blank	86125.001
UV/Vis standard 2, for stray light testing	Sodium Nitrite Solution (3 x 10 ml)	86126.001
UV/Vis standard 3, for stray light testing	Sodium Iodide Solution (3 x 10 ml)	86127.001
UV/Vis standard 4, for stray light testing	Potassium Chloride Solution (3 x 10 ml)	86128.001
UV/Vis standard 5, toluene solution in n-hexane for resolution testing	Set of 2 x 10 ml Toluene/ Hexane Solution and 6 x 10 ml Blank	86129.001
UV/Vis standard 6, for wavelength testing	Holmium Oxide Solution (3 x 10 ml)	86130.001

UV/VIS SPECTROSCOPY STANDARDS

The checking of UV/Visible spectrophotometers is required in many industries that use standards and guidelines, such as GLP, GMP and ISO 9001, to check their analytical systems at regular intervals, and to document such checks. VWR Chemicals offer ready to use chemicals for individual analyses or sealed cuvettes that avoid any additional handling.

Linearity standards

Description	Pk	Cat. No.
Supplied in 100 ml amber glass bottles - 235, 257, 313 and 350 nm		
Blank - 0,001 M perchloric acid	-	**84756.180**
Potassium dichromate absorbance/transmission standard - concentration mg/l	20	**84757.180**
	40	**84758.180**
	60	**84759.180**
	80	**84760.180**
	100	**84761.180**
Supplied in 100 ml amber glass bottles - 213 and 261 nm		
Blank - 0,1 M hydrochloric acid	-	**84767.180**
Nicotinic acid absorbance/transmission standard - concentration mg/l	6	**84768.180**
	12	**84769.180**
	18	**84770.180**
	24	**84771.180**
Set contents - full sets - supplied in permenantly sealed UV cuvettes		
Potassium dichromate linearity standards at 235, 257, 313 and 350 - 0 mg/l, 20 mg/l, 40 mg/l, 60 mg/l, 80 mg/l, 100 mg/l (6 permanently sealed UV cuvettes plus blank)		**84750.600**
Nicotinic acid linearity standard set - 0 mg/L, 6 mg/L, 12 mg/L, 18 mg/L, 24 mg/L at 213 and 261 nm (set of 5 permanently sealed UV cuvettes plus blank)		**84762.600**

Stray light standards

Substance	Cut-off filter wavelength (nm)	Cat. No.
Supplied in 100 ml amber glass bottles		
Stray light blank	-	**84829.180**
Potassium chloride	200	**84789.180**
Sodium chloride	205	**84788.180**
Lithium carbonate	227	**84787.180**
Sodium iodide	260	**84786.180**
Potassium iodide	260	**84785.180**
Sodium nitrite	390	**84784.180**
Supplied in single permenantly sealed cuvettes		
Potassium chloride	200	**84783.600**
Sodium chloride	205	**84782.600**
Lithium carbonate	227	**84781.600**
Sodium iodide	260	**84780.600**
Potassium iodide	260	**84779.600**
Sodium nitrite	390	**84778.600**

Absorbance/transmission standards

Description	Pk	Cat. No.
Single cuvettes with blank - 235, 257, 313 and 350 nm		
Potassium dichromate absorbance/transmission standard - concentration mg/l	20	**84751.600**
	40	**84752.600**
	60	**84753.600**
	80	**84754.600**
	100	**84755.600**
Single cuvettes with blank - 213 and 261nm		
Nicotinic acid absorbance/transmission standard - concentration mg/l	6	**84763.600**
	12	**84764.600**
	18	**84765.600**
	24	**84766.600**

Wavelength standards

Substance	UV/Vis wavelength standard (nm), certified at 0,1 nm, 0,2 nm, 0,5 nm, 1,0 nm, 2,0 nm and 5 nm slit widths	Cat. No.
Supplied in 100 ml amber glass bottles		
Samarium solution	235 - 480	**84776.180**
Holmium oxide solution	240 - 640	**84777.180**
Didymium solution	298 - 865	**84775.180**
Supplied in single permenantly sealed UV cuvette		
Samarium solution	235 - 480	**84773.600**
Holmium oxide solution	240 - 640	**84774.600**
Didymium solution	298 - 865	**84772.600**

Bandwidth standards

Description	Pk	Cat. No.
Supplied in 100 ml amber glass bottles		
Bandwidth standard - blank - ratio of 268,7 nm peak to 266,8 nm trough	-	**84795.180**
Bandwidth standard - toluene in hexane - ratio of 268,7 nm peak to 266,8 nm trough	-	**84833.180**
Supplied in single permenantly sealed cuvettes		
Blank - ratio of 268,7 nm peak to 266,8 nm trough	Sealed cuvette	**84832.600**
Toluene in hexane - with blank, ratio of 268,7 nm peak to 266,8 nm trough	2 sealed cuvettes	**84830.600**

Potassium dichromate in sulphuric acid.

STANDARD SOLUTION SET (POTASSIUM DICHROMATE SOLUTIONS) FOR CALIBRATION OF UV/VISIBLE SPECTROPHOTOMETERS

A set for linearity check of the absorbance of spectrophotometers.

A set of reagents for calibration of spectrophotometers, to provide the user with a range two different concentration of potassium dichromate and additional sulphuric acid as a reference solution.

Set contains

- 1x250 ml potassium dichromate 50 mg/L in H_2SO_4 (0,005 M)
- 1x250 ml potassium dichromate 100 mg/L in H_2SO_4 (0,005 M)
- 2x250 ml sulphuric acid (0,005 M)

Description	Pk	Cat. No.
Potassium dichromate solutions set	1 SET	**85969.001**

Holmium perchlorate standard solution 100 ml

HOLMIUM PERCHLORATE STANDARD SOLUTION FOR WAVELENGTH CALIBRATION OF SPECTOPHOTOMETERS, REAG. PH. EUR

Description	Pk	Cat. No.
Holmium perchlorate standard solution, Reag. Ph. Eur	30 ml	**85970.030**
Holmium perchlorate standard solution, Reag. Ph. Eur	100 ml	**85970.180**

Osmolality standards

OSMOLALITY STANDARDS

Avantor now offers a comprehensive line of osmolality standards as Certified Reference Materials (CRM) for the calibration of osmometers.

Intended use:

- Calibration of osmometers
- Validation of analytical methods
- Preparation of 'working reference samples'
- Detection limit and linearity studies

Osmolality standards (compatible with all osmometers) are aqueous solutions of known osmolality containing high purity sodium chloride dissolved in 18 MOhm deionised water (filtered through a 0,22 µm filter). Metrological traceability is assured through calibration on a osmometer. The calibration curve is drawn using standard solutions prepared gravimetrically acc. to table 2.2.35-1 from European Pharmacopoeia. All contributions in relation to the preparation of standard solutions are considered when evaluating the uncertainty.

Measurement results are traceable to SI. All analytical balances used for the preparation of the solution are calibrated yearly under an in-house procedure with class E1 and class E2 analytical weights, traceable to DKD and are daily checked. Class A laboratory glassware is used. The results from temperature measurement are traceable to SI. The thermometers used for the solution's calibration are calibrated from an ISO 17025 accredited laboratory. Ambient conditions are controlled with a hygrometer calibrated from an ISO 17025 accredited laboratory.

- All products are CRM acc. ISO 17025 and ISO 17034.
- According to Ph. Eur. 2.2.35 (for 100, 200, 300, 400, 500, 600 and 700 mOsm/kg).
- Supplied in handy sets of 12x5 ml (3 packs of 4x5 ml). 24 months shelf life
- Ready to use in convenient ampoules.

Description	Osmolality ()	Pk	Cat. No.
Osmolality Standard	50 mOsm/kg H_2O	1 SET	**88270.001**
Osmolality Standard, CRM acc. Ph. Eur. 2.2.35	100 mOsm/kg H_2O	1 SET	**88271.001**
Osmolality Standard, CRM acc. Ph. Eur. 2.2.35	200 mOsm/kg H_2O	1 SET	**88272.001**
Osmolality Standard	290 mOsm/kg H_2O	1 SET	**88273.001**
Osmolality Standard, CRM acc. Ph. Eur. 2.2.35	300 mOsm/kg H_2O	1 SET	**88274.001**
Osmolality Standard, CRM acc. Ph. Eur. 2.2.36	400 mOsm/kg H_2O	3 SET	**88275.001**
Osmolality Standard, CRM acc. Ph. Eur. 2.2.37	500 mOsm/kg H_2O	1 SET	**88276.001**
Osmolality Standard, CRM acc. Ph. Eur. 2.2.38	600 mOsm/kg H_2O	1 SET	**88277.001**
Osmolality Standard, CRM acc. Ph. Eur. 2.2.39	700 mOsm/kg H_2O	1 SET	**88278.001**
Osmolality Standard	850 mOsm/kg H_2O	1 SET	**88279.001**
Osmolality Standard	900 mOsm/kg H_2O	1 SET	**88280.001**
Osmolality Standard	1000 mOsm/kg H_2O	1 SET	**88281.001**
Osmolality Standard	1500 mOsm/kg H_2O	1 SET	**88282.001**
Osmolality Standard	2000 mOsm/kg H_2O	1 SET	**88283.001**

CERTIFIED REFERENCE MATERIAL, CLEVELAND OPEN CUP FLASH POINT

Flash Point Certified Reference Materials are for the verification of laboratory flash point instruments that are used in testing petroleum and derivative products. COC Flash Point Standards are tested and certified in accordance with ASTM D92 'Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester.'

- Fully certified in accordance with ISO 17025 and ISO 17034
- Highest level of accreditation guarantee, providing the most credible data currently available worldwide
- All data generated exclusively by ISO 17025 accredited independent laboratories
- Ensures good inter-laboratory correlation
- Certified in accordance with ASTM / EN or IP test method protocols
- Fully traceable to International Standards
- Supplied in tamper-evident UN compliant security pack

Flash Point Certified Reference Materials are for the verification of laboratory flash point instruments that are used in testing petroleum and derivative products. These CRMs are used for Cleveland Open Cup (ASTM D92, IP 36, ISO 2592).

UKAS ISO 17025 & ISO 17034

The flash point given in the ordering table below is the nominal flash point - actual batch values are given in the certification documents supplied with the product and also on the label.

Description	Flash point	Pk	Cat. No.
Certified reference material, Cleveland Open Cup flash point	111,0 °C	1 SET	**99149.001**
Certified reference material, Cleveland Open Cup flash point	161,4 °C	1 SET	**99150.001**
Certified reference material, Cleveland Open Cup flash point	262,0 °C	1 SET	**99151.001**
Certified reference material, Cleveland Open Cup flash point (lubricant)	256,8 °C	250 ml	**99114.230**

1 SET = 3x80ml

CERTIFIED REFERENCE MATERIAL, PENSKY MARTENS FLASH POINT

Flash Point Certified Reference Materials are for the verification of laboratory flash point instruments that are used in testing petroleum and derivative products. PMCC Flash Point Standards are tested and certified in accordance with ASTM D93 'Standard Test Method for Flash Point by Pensky Martens Closed Cup Tester - Procedure A'

- Fully certified in accordance with ISO 17025 and ISO 17034
- Highest level of accreditation guarantee, providing the most credible data currently available worldwide
- All data generated exclusively by ISO 17025 accredited independent laboratories
- Ensures good inter-laboratory correlation
- Certified in accordance with ASTM / EN or IP test method protocols
- Fully traceable to International Standards
- Supplied in tamper-evident UN compliant security pack

Flash Point Certified Reference Materials are for the verification of laboratory flash point instruments that are used in testing petroleum and derivative products. These CRMs are used for Pensky-Martens Closed Cup (ASTM D93, IP 34, ISO 2719).

UKAS ISO 17025 & ISO 17034

The flash point given in the ordering table below is the nominal flash point - actual batch values are given in the certification documents supplied with the product and also on the label.

Description	Flash point	Pk	Cat. No.
Certified reference material, Pensky-Martens flash point, diesel	56,2 °C	250 ml	**99115.230**
Certified reference material, Pensky-Martens flash point	76,5 °C	1 SET	**99152.001**
Certified reference material, Pensky-Martens flash point, lubricant	100,7 °C	250 ml	**99113.230**
Certified reference material, Pensky-Martens flash point	135,4 °C	1 SET	**99153.001**
Certified reference material, Pensky-Martens flash point, lubricant	190,5 °C	250 ml	**99112.230**
Certified reference material, Pensky-Martens flash point	210,5 °C	1 SET	**99154.001**

1 SET = 3x80ml

FLASH POINT REFERENCE STANDARD, CLEVELAND OPEN CUP

COC Flash Point Standards are tested and certified in accordance with ASTM D92 'Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester.'

- Certified according to ISO 17025 / ISO 17034 under UKAS accreditation
- One bottle per test ensures zero contamination / high-end volatile loss
- Fully traceable to International Standards
- Supplied with MSDS
- Tamper-evident security packaging
- 12 month shelf life

These UKAS certified standards are specifically designed to be used for regular instrument performance checks. Packed uniquely in 3x80 ml 'single shot' bottles ensuring the highest level of sample integrity. An economical, time saving addition to any laboratory concerned with the generation of valid analytical test data. Typically used in, but not limited to, the analysis of petroleum products with flash points above 79 °C (175 °F) and below 400 °C (752 °F)

UKAS ISO 17025 & ISO 17034

The flash point given in the ordering table below is the nominal flash point - actual batch values are given in the certification documents supplied with the product and also on the label.

Description	Flash point	Test method	Pk	Cat. No.
Flash point reference standard, Cleveland Open Cup	84 °C	ASTM D92	1 SET	**99161.001**
Flash point reference standard, Cleveland Open Cup	164 °C	ASTM D92	1 SET	**99162.001**
Flash point reference standard, Cleveland Open Cup	205 °C	ASTM D92	1 SET	**99163.001**
Flash point reference standard, Cleveland Open Cup	259 °C	ASTM D92	1 SET	**99164.001**
Flash point reference standard, Cleveland Open Cup	118 °C	ASTM D92	1 SET	**99165.001**

1 SET = 3x80ml

FLASH POINT REFERENCE STANDARD, PENSKY-MARTENS

PMCC Flash Point Standards are tested and certified in accordance with ASTM D93 'Standard Test Method for Flash Point by Pensky Martens Closed Cup Tester - Procedure A'

- Certified according to ISO 17025 / ISO 17034 under UKAS accreditation
- One bottle per test ensures zero contamination / high-end volatile loss
- Fully traceable to International Standards
- Supplied with MSDS
- Tamper-evident security packaging
- 12 month shelf life

Procedure A is applicable to distillate fuels - diesels, bio-diesel blends, kerosene, heating oil, turbine fuels and lubricating oils. These UKAS certified standards are specifically designed to be used for regular instrument performance checks. Packed uniquely in 3x80 ml 'single shot' bottles ensuring the highest level of sample integrity. An economical, time saving addition to any laboratory concerned with the generation of valid analytical test data. Typically used in, but not limited to, the analysis of petroleum products with flash points above 40 °C and below 360 °C.

UKAS ISO 17025 & ISO 17034

The flash point given in the ordering table below is the nominal flash point - actual batch values are given in the certification documents supplied with the product and also on the label.

Description	Flash point	Pk	Cat. No.
Flash point reference standard, Pensky-Martens	55,0 °C	1 SET	**99155.001**
Flash point reference standard, Pensky-Martens	75,5 °C	1 SET	**99156.001**
Flash point reference standard, Pensky-Martens	109,0 °C	1 SET	**99157.001**
Flash point reference standard, Pensky-Martens	137,5 °C	1 SET	**99158.001**
Flash point reference standard, Pensky-Martens	175,0 °C	1 SET	**99159.001**
Flash point reference standard, Pensky-Martens	219,5 °C	1 SET	**99160.001**

1 SET = 3x80ml

FLASH POINT REFERENCE STANDARD, ABEL CLOSED CUP, JET AVIATION FUEL

Flash Point Certified Reference Material for the calibration and verification of laboratory instruments used in testing petroleum and derivative products for Abel Closed-Cup (IP 170, ISO 13736).

- Certified according to ISO 17025 / ISO 17034 under UKAS accreditation
- Fully traceable to International Standards
- Supplied with MSDS
- Tamper-evident security packaging
- 12 month shelf life

UKAS ISO 17025 & ISO 17034

The flash point given in the ordering table below is the nominal flash point - actual batch values are given in the certification documents supplied with the product and also on the label.

Description	Flash point	Test method	Pk	Cat. No.
Flash point reference standard, Abel Closed Cup, jet aviation fuel	41,2 °C	IP 170, ISO 13736	250 ml	**99116.230**

FLASH POINT REFERENCE STANDARD, TAG CLOSED CUP, JET AVIATION FUEL

Flash Point Certified Reference Material for the calibration and verification of laboratory instruments used in testing petroleum and derivative products for TAG Closed Cup (ASTM D56).

- Certified according to ISO 17025 / ISO 17034 under UKAS accreditation
- Fully traceable to International Standards
- Supplied with MSDS
- Tamper-evident security packaging
- 12 month shelf life

UKAS ISO 17025 & ISO 17034

The flash point given in the ordering table below is the Nominal flash point - the actual batch values are given in the certification documents supplied with the product and also on the label.

Description	Flash point	Test method	Pk	Cat. No.
Flash point reference standard, TAG closed cup, jet aviation fuel	40,4 °C	ASTM D56	250 ml	**99117.230**

VISCOSITY STANDARDS

These standards can be used for calibration, control, verification, qualification or method validation of kinematic and dynamic viscosity measurement instruments (both manual and automatic). Each standard is certified for kinematic viscosity (mm^2/s, cSt), dynamic viscosity (cP) and density (g/ml) at a range of temperatures.

- Manufactured from high quality, stable base oils and additives
- Extended shelf life with secure package
- All standards observe Newtonian fluid behaviour

These standards 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 1,0034 mm^2/s (cSt) by ISO 3666.

Certified according to ASTM D2162 using Ubbelohde master viscometers and ISO 17025 accreditation for calibration.

Viscosity standards (CSt), supplied in packs of 500 ml

at 20 °C	at 25 °C	at 37,78 °C	at 40 °C	at 50 °C	Cat. No.
0,47	0,45	0,41	0,4	-	**85067.260**
0,74	0,7	0,61	0,6	-	**85068.260**
1,3	1,2	1	0,97	0,87	**85069.260**
2,9	2,6	2,1	2	1,7	**85078.260**
4,4	3,9	3	2,9	2,4	**85095.260**
6,7	5,8	4,2	4	3,2	**85084.260**
10	8,7	6	5,7	4,4	**85097.260**
14	12	8	7,5	5,8	**85089.260**
20	16	11	10	7,5	**85070.260**
30	24	15	14	10	**85074.260**
43	34	20	18	13	**85092.260**
59	47	27	25	18	**85081.260**
88	66	35	32	21	**85082.260**
110	87	48	44	30	**85087.260**
160	120	60	54	35	**85098.260**
210	160	83	75	50	**85090.260**
320	230	110	98	61	**85071.260**
400	300	160	140	90	**85075.260**
550	400	200	180	110	**85093.260**
790	580	280	250	160	**85079.260**
980	710	340	310	190	**85083.260**
1400	1000	470	410	250	**85086.260**
1800	1300	590	520	310	**85099.260**
2600	1800	850	750	450	**85091.260**
3300	2300	1100	940	560	**85072.260**
4900	3500	1600	1400	30	**85076.260**
7900	5800	2800	2500	1500	**85080.260**
8400	5300	1900	1600	810	**85094.260**
100000	64000	-	18000	8500	**85077.260**
19000	12000	4000	3400	1,700	**85085.260**
28000	17000	6000	5100	2500	**85088.260**
41000	25000	8000	6700	3200	**85100.260**
58000	36000	-	10000	4900	**85073.260**
77000	47000	-	13000	6100	**85324.260**

Viscosity standard, general purpose

GENERAL PURPOSE VISCOSITY STANDARDS

These ISO 17025 & ISO 17034 certified general purpose viscosity standards provide certified kinematic viscosity, dynamic viscosity and density data across temperature ranges from 20 to 100 °C.

- Certified in strict accordance with ASTM D2162
- Density g/ml in accordance with ASTM D1480
- For use with glass capillary viscometers, automatic viscometers and other viscosity measuring equipment
- Kinematic (cSt) and dynamic viscosity (mPa·s) given at all temperatures
- Fully traceable to National Standards
- Ensures full compliance to ASTM and IP test method protocols
- Tamper-evident security packaging

Certified in strict accordance with ASTM D2162, the primary method for viscosity standards manufacture.

These products have been tested at primary level using master viscometers in accordance with ASTM D2162 to ensure the lowest uncertainty of measurement, thus providing standards that are certified with primary level accuracy. ASTM D2162 is the only referenced method for the certification of viscosity standards when adopting ASTM test method protocols.

Certified according to ISO 17025 / ISO 17034 under UKAS accreditation.

The viscosity value given in the ordering table below is the nominal viscosity value - actual batch values are given in the certification documents supplied with the product and also on the label.

Description	No.	Viscosity at 25 °C	Test method	Packed	Pk	Cat. No.
Standard with certified values at 20 °C to 40 °C	N.4	0,2950 mPa.s	ASTM D2162	Glass bottle	500 ml	99444.260
Standard with certified values at 20 °C to 40 °C	N.8	0,5204 mPa.s	ASTM D2162	Glass bottle	500 ml	99445.260
Standard with certified values at 20 °C to 50 °C	N1.0	0,9525 mPa.s	ASTM D2162	Glass bottle	500 ml	99446.260
Standard with certified values at 20 °C to 60 °C	N2	2,144 mPa.s	ASTM D2162	Glass bottle	500 ml	99456.260
Standard with certified values at 20 °C to 100 °C	S3	3,291 mPa.s	ASTM D2162	Glass bottle	500 ml	99472.260
Standard with certified values at 20 °C to 100 °C	D5	4,745 mPa.s	ASTM D2162	Glass bottle	500 ml	99440.260
Standard with certified values at 20 °C to 100 °C	S6	7,442 mPa.s	ASTM D2162	Glass bottle	500 ml	99474.260
Standard with certified values at 20 °C to 100 °C	N7.5	8,559 mPa.s	ASTM D2162	Glass bottle	500 ml	99466.260
Standard with certified values at 20 °C to 100 °C	D10	10,37 mPa.s	ASTM D2162	Glass bottle	500 ml	99438.260
Standard with certified values at 20 °C to 100 °C	N10	14,42 mPa.s	ASTM D2162	Glass bottle	500 ml	99447.260
Standard with certified values at 20 °C to 100 °C	N14	20,4 mPa.s	ASTM D2162	Glass bottle	500 ml	99448.260
Standard with certified values at 20 °C to 100 °C	S20	29,04 mPa.s	ASTM D2162	Glass bottle	500 ml	99469.260
Standard with certified values at 20 °C to 100 °C	N26	48,59 mPa.s	ASTM D2162	Glass bottle	500 ml	99459.260
Standard with certified values at 20 °C to 100 °C	N35	55,36 mPa.s	ASTM D2162	Glass bottle	500 ml	99460.260
Standard with certified values at 20 °C to 100 °C	N44	71,11 mPa.s	ASTM D2162	Glass bottle	500 ml	99462.260
Standard with certified values at 20 °C to 100 °C	S60	100,7 mPa.s	ASTM D2162	Glass bottle	500 ml	99475.260
Standard with certified values at 20 °C to 100 °C	N75	124,9 mPa.s	ASTM D2162	Glass bottle	500 ml	99467.260
Standard with certified values at 20 °C to 100 °C	N100	202,6 mPa.s	ASTM D2162	Glass bottle	500 ml	99449.260
Standard with certified values at 20 °C to 100 °C	N140	258 mPa.s	ASTM D2162	Glass bottle	500 ml	99451.260
Standard with certified values at 20 °C to 100 °C	S200	392 mPa.s	ASTM D2162	Glass bottle	500 ml	99470.260
Standard with certified values at 20 °C to 100 °C	N250	488,1 mPa.s	ASTM D2162	Glass bottle	500 ml	99457.260
Standard with certified values at 20 °C to 100 °C	D500	494 mPa.s	ASTM D2162	Glass bottle	500 ml	99441.260
Standard with certified values at 20 °C to 100 °C	N350	717,4 mPa.s	ASTM D2162	Glass bottle	500 ml	99461.260
Standard with certified values at 20 °C to 100 °C	N415	796,5 mPa.s	ASTM D2162	Glass bottle	500 ml	99463.260
Standard with certified values at 20 °C to 100 °C	D1000	990,9 mPa.s	ASTM D2162	Glass bottle	500 ml	99439.260
Standard with certified values at 20 °C to 100 °C	S600	1273 mPa.s	ASTM D2162	Glass bottle	500 ml	99476.260
Standard with certified values at 20 °C to 100 °C	N750	1690 mPa.s	ASTM D2162	Glass bottle	500 ml	99468.260
Standard with certified values at 20 °C to 100 °C	N1000	2610 mPa.s	ASTM D2162	Glass bottle	500 ml	99452.260
Standard with certified values at 20 °C to 100 °C	N1400	3481 mPa.s	ASTM D2162	Glass bottle	500 ml	99453.260
Standard with certified values at 20 °C to 100 °C	S2000	4599 mPa.s	ASTM D2162	Glass bottle	500 ml	99471.260
Standard with certified values at 20 °C to 100 °C	D5000	5738 mPa.s	ASTM D2162	Glass bottle	500 ml	99442.260
Standard with certified values at 20 °C to 100 °C	N2500	6618 mPa.s	ASTM D2162	Glass bottle	500 ml	99458.260
Standard with certified values at 20 °C to 100 °C	D7500	7657 mPa.s	ASTM D2162	Glass bottle	500 ml	99443.260
Standard with certified values at 20 °C to 100 °C	N4000	10030 mPa.s	ASTM D2162	Glass bottle	500 ml	99464.260
Standard with certified values at 20 °C to 100 °C	N5100	15406 mPa.s	ASTM D2162	Glass bottle	500 ml	99465.260
Standard with certified values at 20 °C to 100 °C	S8000	19588 mPa.s	ASTM D2162	Glass bottle	500 ml	99477.260
Standard with certified values at 20 °C to 100 °C	N10200	30991 mPa.s	ASTM D2162	Glass bottle	500 ml	99450.260
Standard with certified values at 20 °C to 100 °C	N15000	40049 mPa.s	ASTM D2162	Glass bottle	500 ml	99454.260
Standard with certified values at 20 °C to 100 °C	N18000	54900 mPa.s	ASTM D2162	Glass bottle	500 ml	99455.260
Standard with certified values at 20 °C to 100 °C	S30000	72328 mPa.s	ASTM D2162	Glass bottle	500 ml	99473.260

New standards for Petrochemistry brochure

VISCOSITY CHECK OILS

The viscosity values for the certified viscosity check oils have been tested and certified at typical blend targets. These check oils are for validating the performance of cold cranking simulators and kinematic viscometers by measuring commercially available formulated engine oils.

- Kinematic viscosity mm^2/s (cSt) in accordance with ASTM D445
- Fully traceable to National Standards
- Tamper-evident security packaging

Kinematic viscosity measurements have been made in accordance with ASTM D445, using reference viscometers certified in accordance with ASTM D446 and ASTM D2162.

Values for density (ASTM D4052), CCS Dynamic Viscosity mPa.s (cP) in accordance with ASTM D5293 and Viscosity Index in accordance with ASTM D2270 are provided with documentation.

Manufactured and certified in strict accordance with the requirements of ISO 17025 and ISO 17034.

The kinematic viscosity value given in the ordering table below is the nominal kinematic viscosity value - actual batch values are given in the certification documents supplied with the product and also on the label.

Description	Viscosity at 40 °C	Pk	Cat. No.
Check oil 5W30	65,90 mm^2/s	500 ml	**99170.260**
Check oil 5W30	65,90 mm^2/s	5 L	**99170.360**
Check oil 10W30	67,27 mm^2/s	500 ml	**99171.260**

Description	Viscosity at 40 °C	Pk	Cat. No.
Check oil 10W30	67,27 mm^2/s	5 L	**99171.360**
Check oil 15W40	103,1 mm^2/s	500 ml	**99172.260**
Check oil 15W40	103,1 mm^2/s	5 L	**99172.360**

COLD CRANKING SIMULATOR (CCS) VISCOSITY STANDARDS

High quality CCS Viscosity Standards are ideal for the calibration and verification of analytical equipment used in Cold Cranking Simulator (CCS) testing.

- Full traceability to National Standards
- Ensures full compliance to ASTM and IP test method protocols
- Tamper-evident security packaging
- CCS kits available (set of 8, 14 or 18)

These Cold Cranking Simulator (CCS) Viscosity Standards are for the calibration and verification of analytical equipment used in Cold Cranking Simulator (CCS) testing to ASTM D5293 and SAE Specification J300.

Certified according to ISO 17025 / ISO 17034 under UKAS accreditation.

The viscosity value given in the ordering table below is the nominal viscosity value - actual batch values are given in the certification documents supplied with the product and also on the label.

Description	No.	Viscosity (mPa s)	Pk	Cat. No.
CCS viscosity standard	CL08	(–35,00°C) 857,1	500 ml	**99376.260**
CCS viscosity standard	CL09	(–35,00°C) 1175	500 ml	**99377.260**
CCS viscosity standard	CL10	(–30,00°C) 896,2	500 ml	**99378.260**
CCS viscosity standard	CL11	(–30,00°C) 1035	500 ml	**99379.260**
CCS viscosity standard	CL12	(–25,00°C) 770,4	500 ml	**99380.260**
CCS viscosity standard	CL13	(–25,00°C) 980,1	500 ml	**99381.260**
CCS viscosity standard	CL14	(–20,00°C) 826,1	500 ml	**99382.260**
CCS viscosity standard	CL15	(–20,00°C) 921,0	500 ml	**99383.260**
CCS viscosity standard	CL16	(–20,00°C) 1186	500 ml	**99384.260**
CCS viscosity standard	CL17	(–15,00°C) 872,6	500 ml	**99385.260**
CCS viscosity standard	CL19	(–15,00°C) 1075	500 ml	**99386.260**
CCS viscosity standard	CL20	(–10,00°C) 870,7	500 ml	**99387.260**
CCS viscosity standard	CL22	(–10,00°C) 1030	500 ml	**99388.260**
CCS viscosity standard	CL24	(–10,00°C) 1211	500 ml	**99389.260**

Description	No.	Viscosity (mPa s)	Pk	Cat. No.
CCS viscosity standard	CL25	(–10,00°C) 1376	500 ml	**99390.260**
CCS viscosity standard	CL26	(–10,00°C) 1680	500 ml	**99391.260**
CCS viscosity standard	CL28	(–10,00°C) 2016	500 ml	**99392.260**
CCS viscosity standard	CL30	(–10,00°C) 2431	500 ml	**99393.260**
CCS viscosity standard	CL32	(–10,00°C) 3049	500 ml	**99394.260**
CCS viscosity standard	CL34	(–10,00°C) 3431	500 ml	**99395.260**
CCS viscosity standard	CL38	(–10,00°C) 4199	500 ml	**99396.260**
CCS viscosity standard	CL42	(–10,00°C) 4969	500 ml	**99397.260**
CCS viscosity standard	CL48	(–10,00°C) 6135	500 ml	**99398.260**
CCS viscosity standard	CL53	(–10,00°C) 7440	500 ml	**99399.260**
CCS viscosity standard	CL60	(–10,00°C) 9303	500 ml	**99400.260**
CCS viscosity standard	CL68	(–10,00°C) 11417	500 ml	**99401.260**
CCS viscosity standard	CL74	(–10,00°C) 12567	500 ml	**99402.260**

Description	No.	Type	Pk	Cat. No.
Sets				
CCS viscosity standard kit 8	VIS-CCS-8	8 Set: CL14, CL19, CL22, CL25, CL28, CL32, CL48, CL68.	1 SET	**99403.001**
CCS viscosity standard kit 14	VIS-CCS-14	14 Set: CL10, CL12, CL14, CL16, CL19, CL22, CL25 (2) , CL28, CL32, CL38, CL48, CL60, CL68.	1 SET	**99404.001**
CCS viscosity standard kit 18	VIS-CCS-18	18 Set: CL08, CL09, CL10, CL11, CL12, CL13, CL14, CL15, CL16, CL19, CL22, CL25(x2), CL28, CL32, CL38, CL48 & CL60.	1 SET	**99405.001**

CONE AND PLATE VISCOSITY STANDARDS

High quality Cone & Plate Viscosity Standards are ideal for the paints and coatings industry.

- Kinematic viscosity certified in strict accordance with ASTM D2162 at 20, 23 and 25 °C
- Kinematic viscosity certified in accordance with ASTM D341 at intermediate temperatures
- Density, dynamic viscosity and kinematic viscosity quoted at all temperatures
- Ensures full compliance to ASTM and IP test method protocols and had full traceability to National Standards
- Tamper-evident security packaging

Certified according to ISO 17025 / ISO 17034 under UKAS accreditation. The viscosity value given in the ordering table below is the nominal viscosity value - actual batch values are given in the certification

Cone & plate viscosity standard 20.00 °C, 21.00 °C, 22.00 °C, 23.00 °C, 24.00 °C & 25.00 °C

No.	Viscosity at 25 °C	Test method	Pack type	Pk	Cat. No.
2162/21	14,50 mPa.s	ASTM D2162 / ASTM D341	Glass bottle	500 ml	**99419.260**
2162/22	28,97 mPa.s	ASTM D2162 / ASTM D342	Glass bottle	500 ml	**99420.260**
2162/1	56,14 mPa.s	ASTM D2162 / ASTM D343	Glass bottle	500 ml	**99406.260**
2162/2	75,19 mPa.s	ASTM D2162 / ASTM D344	Glass bottle	500 ml	**99417.260**
2162/3	100,4 mPa.s	ASTM D2162 / ASTM D345	Glass bottle	500 ml	**99422.260**
2162/4	150,0 mPa.s	ASTM D2162 / ASTM D346	Glass bottle	500 ml	**99423.260**
2162/5	200,4 mPa.s	ASTM D2162 / ASTM D347	Glass bottle	500 ml	**99424.260**
2162/6	250,2 mPa.s	ASTM D2162 / ASTM D348	Glass bottle	500 ml	**99425.260**
2162/7	300,8 mPa.s	ASTM D2162 / ASTM D349	Glass bottle	500 ml	**99426.260**
2162/8	351,1 mPa.s	ASTM D2162 / ASTM D350	Glass bottle	500 ml	**99427.260**
2162/9	391,0 mPa.s	ASTM D2162 / ASTM D351	Glass bottle	500 ml	**99428.260**
2162/10	498,1 mPa.s	ASTM D2162 / ASTM D352	Glass bottle	500 ml	**99407.260**

Cone & plate viscosity standard 20.00 °C, 21.00 °C, 22.00 °C, 23.00 °C, 24.00 °C & 25.00 °C

No.	Viscosity at 25 °C	Test method	Pack type	Pk	Cat. No.
2162/11	714,8 mPa.s	ASTM D2162 / ASTM D353	Glass bottle	500 ml	**99408.260**
2162/12	1008 mPa.s	ASTM D2162 / ASTM D354	Glass bottle	500 ml	**99409.260**
2162/13	1517 mPa.s	ASTM D2162 / ASTM D355	Glass bottle	500 ml	**99410.260**
2162/24	2044 mPa.s	ASTM D2162 / ASTM D356	Glass bottle	500 ml	**99421.260**
2162/14	2506 mPa.s	ASTM D2162 / ASTM D357	Glass bottle	500 ml	**99411.260**
2162/15	3993 mPa.s	ASTM D2162 / ASTM D358	Glass bottle	500 ml	**99412.260**
2162/16	6055 mPa.s	ASTM D2162 / ASTM D359	Glass bottle	500 ml	**99413.260**
2162/17	8081 mPa.s	ASTM D2162 / ASTM D360	Glass bottle	500 ml	**99414.260**
2162/18	10030 mPa.s	ASTM D2162 / ASTM D361	Glass bottle	500 ml	**99415.260**
2162/19	15166 mPa.s	ASTM D2162 / ASTM D362	Glass bottle	500 ml	**99416.260**
2162/20	20077 mPa.s	ASTM D2162 / ASTM D363	Glass bottle	500 ml	**99418.260**

FLOW CUP VISCOSITY STANDARDS

Flow Cup Viscosity Standards are specifcally formulated for use with viscosity flow cups such as Ford, Shell and, Zahn.

- Certified in strict accordance with ASTM D2162
- Density g/ml in accordance with ASTM D1480
- Density, dynamic viscosity and kinematic viscosity quoted at all temperatures
- Ensures full compliance to ASTM and IP test method protocols
- Full traceability to National Standards
- Tamper-evident security packaging

Certified data for kinematic viscosity, dynamic viscosity and density at 20 °C and 25 °C including relevent flow cup information.

Each standard is dual-certified to ISO 17025 and ISO 17034 under UKAS.

The viscosity value given in the ordering table below is the nominal viscosity value - actual batch values are given in the certification documents supplied with the product and also on the label.

Description	No.	Viscosity at 20 °C	Test method	Packed	Pk	Cat. No.
Standard with certified values at 20 °C & 25 °C	C6	8,945 mPa.s	ASTM D2162	Glass bottle	500 ml	**99435.260**
Standard with certified values at 20 °C & 25 °C	C10	17,78 mPa.s	ASTM D2162	Glass bottle	500 ml	**99429.260**
Standard with certified values at 20 °C & 25 °C	C20	37,22 mPa.s	ASTM D2162	Glass bottle	500 ml	**99431.260**
Standard with certified values at 20 °C & 25 °C	C35	72,9 mPa.s	ASTM D2162	Glass bottle	500 ml	**99433.260**
Standard with certified values at 20 °C & 25 °C	C60	135,9 mPa.s	ASTM D2162	Glass bottle	500 ml	**99436.260**
Standard with certified values at 20 °C & 25 °C	C100	281,4 mPa.s	ASTM D2162	Glass bottle	500 ml	**99430.260**
Standard with certified values at 20 °C & 25 °C	C200	557,7 mPa.s	ASTM D2162	Glass bottle	500 ml	**99432.260**
Standard with certified values at 20 °C & 25 °C	C600	1882 mPa.s	ASTM D2162	Glass bottle	500 ml	**99437.260**

HIGH TEMPERATURE VISCOSITY STANDARDS

High Temperature Viscosity Standards are ideal for the calibration and verification of glass capillary viscometers and other viscosity measuring equipment where operating temperature is controlled precisely.

- Kinematic (cSt), dynamic viscosity (mPa·s) and density (g/ml) given at all temperatures
- Standard pack size is 500 ml, in tamper-evident packaging
- Fully traceable to National Standards
- Ensures full compliance to ASTM and IP test method protocols

Certified according to ISO 17025 / ISO 17034 under UKAS accreditation.

The viscosity value given in the ordering table below is the nominal viscosity value - actual batch values are given in the certification documents supplied with the product and also on the label.

Description	No.	Viscosity (mPa s)	Pk	Cat. No.
High temp. viscosity standard, 20 °C through to 150 °C	S6S	(60 °C) 2,935	500 ml	**99491.260**
High temp. viscosity standard, 20 °C through to 150 °C	S20S	(60 °C) 7,806	500 ml	**99492.260**
High temp. viscosity standard, 20 °C through to 150 °C	S60S	(60 °C) 20,05	500 ml	**99493.260**
High temp. viscosity standard, 20 °C through to 150 °C	N100S	(60 °C) 34,33	500 ml	**99494.260**
High temp. viscosity standard, 20 °C through to 150 °C	S200S	(60 °C) 57,98	500 ml	**99495.260**
High temp. viscosity standard, 20 °C through to 150 °C	S600S	(60 °C) 149,2	500 ml	**99496.260**
High temp. viscosity standard, 20 °C through to 150 °C	S2000S	(60 °C) 431,7	500 ml	**99497.260**
High temp. viscosity standard, 20 °C through to 150 °C	S8000S	(60 °C) 1533	500 ml	**99498.260**
High temp. viscosity standard, 20 °C through to 150 °C	S30000S	(60 °C) 4897	500 ml	**99499.260**
High temp. viscosity standard, 25 °C, 60 °C & 135 °C	N600	(60 °C) 149,2	500 ml	**99500.260**
High temp. viscosity standard, 25 °C, 60 °C & 135 °C	N2000	(60 °C) 431,7	500 ml	**99501.260**
High temp. viscosity standard, 100 °C, 110 °C, 120 °C, 130 °C, 140 °C & 150 °C	N100HT	(100 °C) 11,57	500 ml	**99502.260**
High temp. viscosity standard, 100 °C, 110 °C, 120 °C, 130 °C, 140 °C & 150 °C	S200HT	(100 °C) 17,43	500 ml	**99503.260**
High temp. viscosity standard, 100 °C, 110 °C, 120 °C, 130 °C, 140 °C & 150 °C	S600HT	(100 °C) 36,15	500 ml	**99504.260**

LOW TEMPERATURE VISCOSITY STANDARDS

Low Temperature Viscosity Standards have certified data for kinematic viscosity, dynamic viscosity and density for various low temperatures.

- Fully traceable to National Standards
- Ensures full compliance to ASTM and IP test method protocols
- Tamper-evident security packaging

Low Temperature Viscosity Standards are for the calibration and verification of glass capillary viscometers and other viscosity measuring equipment where operating temperature is controlled precisely.

Certified according to ISO 17025 / ISO 17034 under UKAS accreditation.

The viscosity value given in the ordering table below is the nominal viscosity value - actual batch values are given in the certification documents supplied with the product and also on the label.

Description	No.	Viscosity (mm^2/s)	Pk	Cat. No.
Standard with certified values at –20 °C and –40 °C	N2B	(–20 °C): 9,095	500 ml	**99487.260**
Standard with certified values at –0 °C and –20 °C	JF1-H	(–40 °C): 17,68	500 ml	**99479.260**
Standard with certified values at –20 °C and –40 °C	J10	(–40 °C): 894,8	500 ml	**99478.260**
Standard with certified values at –40 °C	N14B	(–40 °C): 19605	500 ml	**99485.260**
Standard with certified values at –25 °C, –30 °C, –35 °C and –40 °C	N27B	(–40 °C): 24522	500 ml	**99486.260**
Standard with certified values at –19 °C, –19.5 °C, –20 °C, –20.5 °C, –21 °C and –25 °C	N105B	(–20 °C): 34202	500 ml	**99481.260**
Standard with certified values at –24 °C, –24.5 °C, –25 °C, –25.5 °C and –26 °C	N400B	(–25 °C): 68176	500 ml	**99488.260**
Standard with certified values at –25 °C, –25.5 °C, –26 °C, –26.11 °C, –26.5 °C and –27 °C	N480B	(–25 °C): 148029	500 ml	**99489.260**
Standard with certified values at 20 °F, 10 °F, 0 °F, –10 °F, –15 °F and –20 °F	N115B	(–20 °F): 158559	500 ml	**99482.260**
Standard with certified values at –11 °C, –11.5 °C, –12 °C, –12.22 °C, –12.5 °C and –13 °C	N1400B	(–12 °C): 170492	500 ml	**99484.260**
Standard with certified values at –39 °C, –39.5 °C, –40 °C, –40.5 °C, and –41 °C	N120B	(–40 °C): 172601	500 ml	**99483.260**

MEDICAL GRADE VISCOSITY STANDARDS

Medical Grade Viscosity Standards provide certified dynamic viscosity data at 25 and 37 °C, are dual-certified to ISO 17025 and ISO 17034 under UKAS and are ideal for the calibration and verification of viscosity measuring equipment.

- Full traceability to National Standards
- Contains anti-bacterial agent
- Tamper-evident security packaging

Certified according to ISO 17025 / ISO 17034 under UKAS accreditation.

The viscosity value given in the ordering table below is the nominal viscosity value - actual batch values are given in the certification documents supplied with the product and also on the label.

Medical Grade Viscosity Standard, 25.00 °C & 37.00 °C

No.	Viscosity at 25 °C	Test method	Pack type	Pk	Cat. No.
MGVS12	1,2 mPa.s	ASTM D2162	Glass bottle	100 ml	**99505.180**
MGVS12	1,2 mPa.s	ASTM D2163	Glass bottle	500 ml	**99505.260**
MGVS16	1,6 mPa.s	ASTM D2164	Glass bottle	100 ml	**99506.180**
MGVS16	1,6 mPa.s	ASTM D2165	Glass bottle	500 ml	**99506.260**
MGVS20	2,0 mPa.s	ASTM D2166	Glass bottle	100 ml	**99507.180**
MGVS20	2,0 mPa.s	ASTM D2167	Glass bottle	500 ml	**99507.260**
MGVS30	3,0 mPa.s	ASTM D2168	Glass bottle	100 ml	**99508.180**
MGVS30	3,0 mPa.s	ASTM D2169	Glass bottle	500 ml	**99508.260**
MGVS40	4,0 mPa.s	ASTM D2170	Glass bottle	100 ml	**99509.180**
MGVS40	4,0 mPa.s	ASTM D2171	Glass bottle	500 ml	**99509.260**
MGVS60	6,0 mPa.s	ASTM D2172	Glass bottle	100 ml	**99510.180**
MGVS60	6,0 mPa.s	ASTM D2173	Glass bottle	500 ml	**99510.260**
MGVS100	10,0 mPa.s	ASTM D2174	Glass bottle	100 ml	**99511.180**
MGVS100	10,0 mPa.s	ASTM D2175	Glass bottle	500 ml	**99511.260**

MINERAL OIL ROTATIONAL VISCOSITY STANDARDS

Mineral Oil Rotational Viscosity Standards are specifically formulated for use with rotational viscometers and are dual-certified to ISO 17025 and ISO 17034 under UKAS.

- Certified in strict accordance with ASTM D2162 at 20 and 25 °C
- Density g/ml in accordance with ASTM D1480 at 20 and 25 °C
- Kinematic viscosity at other temperatures are calculated in accordance with ASTM D341
- Densities at other temperatures are derived from proportional calculations of the measurements at 20 and 25 °C
- Inert glass packaging (500 ml) with tamper-evident cap provides absolute assurance of sample integrity
- Full traceability to National Standards

These mineral oil rotational viscosity standards are the first choice option where end users are unable to have silicone in their process. This range of standards provide both calibration and verification options for rotational viscometer test equipment.

Certified according to ISO 17025 / ISO 17034 under our UKAS accreditation.

The viscosity value given in the ordering table below is the nominal viscosity value - actual batch values are given in the certification documents supplied with the product and also on the label.

Standard with certified values at 20 °C to 25 °C

No.	Viscosity at 25 °C	Test method	Pack type	Pk	Cat. No.
RTM1	0,3051 mPa.s	ASTM D2162	Glass bottle	500 ml	**99527.260**
RTM2	0,5204 mPa.s	ASTM D2162	Glass bottle	500 ml	**99528.260**
RTM3	0,9525 mPa.s	ASTM D2162	Glass bottle	500 ml	**99529.260**
RTM4	2,144 mPa.s	ASTM D2162	Glass bottle	500 ml	**99530.260**
RTM5	3,329 mPa.s	ASTM D2162	Glass bottle	500 ml	**99531.260**
RTM6	4,745 mPa.s	ASTM D2162	Glass bottle	500 ml	**99532.260**
RTM7	7,520 mPa.s	ASTM D2162	Glass bottle	500 ml	**99533.260**
RTM8	10,37 mPa.s	ASTM D2162	Glass bottle	500 ml	**99534.260**
RTM9	14,50 mPa.s	ASTM D2162	Glass bottle	500 ml	**99535.260**
RTM10	20,40 mPa.s	ASTM D2162	Glass bottle	500 ml	**99536.260**
RTM11	29,04 mPa.s	ASTM D2162	Glass bottle	500 ml	**99537.260**
RTM12	55,68 mPa.s	ASTM D2162	Glass bottle	500 ml	**99538.260**
RTM13	75,19 mPa.s	ASTM D2162	Glass bottle	500 ml	**99539.260**
RTM14	101,4 mPa.s	ASTM D2162	Glass bottle	500 ml	**99540.260**
RTM15	150,0 mPa.s	ASTM D2162	Glass bottle	500 ml	**99541.260**
RTM16	203,1 mPa.s	ASTM D2162	Glass bottle	500 ml	**99542.260**
RTM17	250,0 mPa.s	ASTM D2162	Glass bottle	500 ml	**99543.260**
RTM18	300,8 mPa.s	ASTM D2162	Glass bottle	500 ml	**99544.260**
RTM19	351,1 mPa.s	ASTM D2162	Glass bottle	500 ml	**99545.260**
RTM20	389,1 mPa.s	ASTM D2162	Glass bottle	500 ml	**99546.260**
RTM21	494,0 mPa.s	ASTM D2162	Glass bottle	500 ml	**99547.260**
RTM22	719,7 mPa.s	ASTM D2162	Glass bottle	500 ml	**99548.260**
RTM23	796,5 mPa.s	ASTM D2162	Glass bottle	500 ml	**99549.260**
RTM24	1008 mPa.s	ASTM D2162	Glass bottle	500 ml	**99550.260**
RTM25	1260 mPa.s	ASTM D2162	Glass bottle	500 ml	**99551.260**
RTM26	1517 mPa.s	ASTM D2162	Glass bottle	500 ml	**99552.260**
RTM27	2013 mPa.s	ASTM D2162	Glass bottle	500 ml	**99553.260**
RTM28	2556 mPa.s	ASTM D2162	Glass bottle	500 ml	**99554.260**
RTM29	4024 mPa.s	ASTM D2162	Glass bottle	500 ml	**99555.260**
RTM30	4588 mPa.s	ASTM D2162	Glass bottle	500 ml	**99556.260**
RTM31	5738 mPa.s	ASTM D2162	Glass bottle	500 ml	**99557.260**
RTM32	6055 mPa.s	ASTM D2162	Glass bottle	500 ml	**99558.260**
RTM33	7657 mPa.s	ASTM D2162	Glass bottle	500 ml	**99559.260**
RTM34	8081 mPa.s	ASTM D2162	Glass bottle	500 ml	**99560.260**
RTM35	10030 mPa.s	ASTM D2162	Glass bottle	500 ml	**99561.260**
RTM36	15166 mPa.s	ASTM D2162	Glass bottle	500 ml	**99562.260**
RTM37	19588 mPa.s	ASTM D2162	Glass bottle	500 ml	**99563.260**
RTM38	40049 mPa.s	ASTM D2162	Glass bottle	500 ml	**99564.260**
RTM39	72328 mPa.s	ASTM D2162	Glass bottle	500 ml	**99565.260**

SILICONE ROTATIONAL VISCOSITY STANDARDS

Silicone Rotational Viscosity Standards are specifically formulated for use with equipment with minimal temperature control. Supplied in 600 ml 'ready to use' packs specially designed to eliminate cleaning of laboratory glassware, which is inherently difficult due to the nature of silicone.

- Ensures full compliance to international test method protocols
- Full traceability to National Standards
- Tamper-evident security packaging
- Safer working, less mess, less waste, higher throughput

This range of standards provide both calibration and verification options for rotational viscometer test equipment.

Certified according to ISO 17025 / ISO 17034 under UKAS accreditation.

600 ml of product supplied in a ready to use 'test in pack' container.

Note: Applicable to all spindles with the exception of the L1 spindle, further provision should be made when using the L1 spindle

The viscosity value given in the ordering table below is the nominal viscosity value - actual batch values are given in the certification documents supplied with the product and also on the label.

Rotational Viscosity Standard, 20.00 °C & 25.00 °C

No.	Type	Viscosity at 25 °C	Pack type	Pk	Cat. No.
VIS-RT5	Silicone	4,988 mPa.s	HDPE container	600 ml	**99521.271**
VIS-RT10	Silicone	10,12 mPa.s	HDPE container	600 ml	**99512.271**
VIS-RT50	Silicone	50,49 mPa.s	HDPE container	600 ml	**99522.271**
VIS-RT75	Silicone	75,53 mPa.s	HDPE container	600 ml	**99526.271**
VIS-RT100	Silicone	100,7 mPa.s	HDPE container	600 ml	**99514.271**
VIS-RT250	Silicone	251,5 mPa.s	HDPE container	600 ml	**99518.271**
VIS-RT350	Silicone	357,0 mPa.s	HDPE container	600 ml	**99520.271**
VIS-RT500	Silicone	503,9 mPa.s	HDPE container	600 ml	**99523.271**

No.	Type	Viscosity at 25 °C	Pack type	Pk	Cat. No.
VIS-RT1K	Silicone	1003 mPa.s	HDPE container	600 ml	**99516.271**
VIS-RT5K	Silicone	5034 mPa.s	HDPE container	600 ml	**99524.271**
VIS-RT10K	Silicone	9970 mPa.s	HDPE container	600 ml	**99513.271**
VIS-RT12K	Silicone	12423 mPa.s	HDPE container	600 ml	**99517.271**
VIS-RT30K	Silicone	30036 mPa.s	HDPE container	600 ml	**99519.271**
VIS-RT60K	Silicone	60139 mPa.s	HDPE container	600 ml	**99525.271**
VIS-RT100K	Silicone	100075 mPa.s	HDPE container	600 ml	**99515.271**

SMALL SAMPLE VISCOSITY STANDARDS - ASTM D7279

These standards are certified in strict accordance with ASTM D2162 at 40 and 100 °C under ISO 17025 and ISO 17034 accreditation, and have been manufactured specifically for the users of ASTM D7279, Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids by Automated Houillon Viscometer and other similar type test equipment.

- Fully traceable to International Standards
- Ensures full compliance to ASTM and IP test method protocols
- Certified in strict accordance with ASTM D2162
- 60 ml pack is a lower volume cost effective solution
- Tamper-evident security packaging

ISO 17025 and ISO 17034 accreditations

The viscosity value given in the ordering table below is the nominal kinematic viscosity value - actual batch values are given in the certification documents supplied with the product and also on the label.

New standards for Petrochemistry brochure

Viscosity at 40 °C	Test method	Pack type	Pk	Cat. No.
10,0 cSt	ASTM D2162	Glass bottle	60 ml	**99362.600**
100,3 cSt	ASTM D2162	Glass bottle	60 ml	**99365.600**
1009 cSt	ASTM D2162	Glass bottle	60 ml	**99369.600**
1705 cSt	ASTM D2162	Glass bottle	60 ml	**99370.600**
181,3 cSt	ASTM D2162	Glass bottle	60 ml	**99366.600**
2,884 cSt	ASTM D2162	Glass bottle	60 ml	**99360.600**
2094 cSt	ASTM D2162	Glass bottle	60 ml	**99371.600**
23037 cSt	ASTM D2162	Glass bottle	60 ml	**99375.600**

Viscosity at 40 °C	Test method	Pack type	Pk	Cat. No.
3072 cSt	ASTM D2162	Glass bottle	60 ml	**99374.600**
31,99 cSt	ASTM D2162	Glass bottle	60 ml	**99363.600**
313,7 cSt	ASTM D2162	Glass bottle	60 ml	**99367.600**
3351 cSt	ASTM D2162	Glass bottle	60 ml	**99372.600**
5,697 cSt	ASTM D2162	Glass bottle	60 ml	**99361.600**
524.8 cSt	ASTM D2162	Glass bottle	60 ml	**99368.600**
54,13 cSt	ASTM D2162	Glass bottle	60 ml	**99364.600**
6684 cSt	ASTM D2162	Glass bottle	60 ml	**99373.600**

PAINTS AND COATINGS VISCOSITY STANDARDS

Paints and Coatings Viscosity Standards provide certified kinematic viscosity, dynamic viscosity, density and (where applicable) Krebs data across temperature ranges at 20, 23 and 25 °C, also includes the calculated flow time of the oil in 0,5 °C intervals. Ideal for those in the paints and coatings industry.

- Certified in strict accordance with ASTM D2162
- Density g/ml in accordance with ASTM D1480
- Calculated viscosity at temperatures at 0,5 °C intervals between 20 and 25 °C, and a calibration graph are included on the certificate.
- The calibration certificate quotes viscosity in mm^2/s (centistokes), mPa.s (centipoise) and (where applicable) Krebs units
- Fully traceable to National Standards ensuring full compliance to ASTM and IP test method protocols

These products are sold in 500 ml volume, tamper-evident packaging and are supplied with a 2 year shelf life.

This product range has been tested at primary level using master viscometers in accordance with ASTM D2162 to ensure the lowest uncertainty of measurement, thus providing standards that are certified with primary level accuracy. ASTM D2162 is the only referenced method for the certification of viscosity standards when adopting ASTM test method protocols.

All density measurements at 20, 23 and 25 °C have been made in accordance with ASTM D1480. Dynamic viscosities at 20, 23 and & 25 °C were calculated from these measured values. Temperature measurements were made using thermometers meeting the requirements specified in ASTM D2162 and ASTM D1480, which have a current calibration traceable to recognised National Standards, the National Physical Laboratory (NPL), National Institute Standards and Technology (NIST), and other recognised national standards laboratories. Calibrations of this product are traceable to NIST.

Certified according to ISO 17025 / ISO 17034 under UKAS accreditation.

The certificate supplied with the product includes calculated viscosity at 0,5 °C intervals between 20 and 25 °C, as well as a calibration graph.

The viscosity value given in the ordering table below is nominal - actual batch values are given in the certification documents supplied with the product and also on the label.

Description	No.	Viscosity at 20 °C	Pk	Cat. No.
Viscosity standard, flow cup	PSU0100	**26,37 mPa.s**	500 ml	**99567.260**
Viscosity standard, flow cup	PSU0200	**74,13 mPa.s**	500 ml	**99568.260**
Viscosity standard, flow cup	PSU0400	**100,0 mPa.s**	500 ml	**99569.260**
Viscosity standard, flow cup	PSU0600	**135,1 mPa.s**	500 ml	**99570.260**
Viscosity standard, flow cup	PSU0800	**209,9 mPa.s**	500 ml	**99571.260**
Viscosity standard, flow cup	PSU1000	**285,6 mPa.s**	500 ml	**99572.260**
Viscosity standard, flow cup	PSU1200	**354,4 mPa.s**	500 ml	**99573.260**
Viscosity standard, flow cup	PSU1400	**427,6 mPa.s**	500 ml	**99574.260**
Viscosity standard, flow cup	PSU1600	**501,7 mPa.s**	500 ml	**99575.260**
Viscosity standard, flow cup	PSU1800	**653,2 mPa.s**	500 ml	**99576.260**
Viscosity standard, flow cup	PSU2000	**732,2 mPa.s**	500 ml	**99577.260**
Viscosity standard, flow cup	PSU2200	**1083 mPa.s**	500 ml	**99578.260**
Viscosity standard, flow cup	PSU2400	**1503 mPa.s**	500 ml	**99579.260**
Viscosity standard, flow cup	PSU2600	**2294 mPa.s**	500 ml	**99580.260**
Viscosity standard, flow cup	PSU2800	**4069 mPa.s**	500 ml	**99581.260**
Viscosity standard, flow cup	PSU3000	**6166 mPa.s**	500 ml	**99582.260**
Viscosity standard, flow cup	PSU3100	**9065 mPa.s**	500 ml	**99583.260**
Viscosity standard, flow cup	PSU3200	**9274 mPa.s**	500 ml	**99584.260**
Viscosity standard, flow cup	PSU3400	**12325 mPa.s**	500 ml	**99585.260**
Viscosity standard, flow cup	PSU3600	**15368 mPa.s**	500 ml	**99586.260**
Viscosity standard, flow cup	PSU3800	**23912 mPa.s**	500 ml	**99587.260**
Viscosity standard, flow cup	PSU4000	**33326 mPa.s**	500 ml	**99588.260**

PURE WATER VISCOSITY STANDARD

Pure Water Viscosity Standard has certified data for kinematic viscosity, dynamic viscosity and density at 5, 20, 25 and 37 °C.

- Certified in strict accordance with ASTM D2162 for 20, 25 and 37 °C
- Density g/ml in accordance with ASTM D1480 for all temperatures
- For use with glass capillary viscometers, automatic viscometers and other viscosity measuring equipment
- Kinematic (cSt) and dynamic viscosity (mPa·s) given at all temperatures
- Fully traceable to National Standards
- Ensures full compliance to ASTM and IP test method protocols
- Tamper-evident security packaging

Pure Water Viscosity standards are for the calibration and verification of glass capillary viscometers and other viscosity measuring equipment where operating temperature is controlled precisely.

These standards are certified in strict accordance with ASTM D2162, the primary method for viscosity standards manufacture, for temperatures at 20, 25 and 37 °C. These products have been tested at Primary level using master viscometers in accordance with ASTM D2162 to ensure the lowest uncertainty of measurement, thus providing standards that are certified with primary level accuracy.

Certified according to ISO 17025 / ISO 17034 under UKAS accreditation.

The viscosity value given in the ordering table below is the nominal viscosity value - actual batch values are given in the certification documents supplied with the product and also on the label.

New Standards for Petrochemistry brochure

Standard with certified values at 5 °C, 20 °C, 25 °C & 37 °C

No.	Viscosity at 25 °C	Test method	Pack type	Pk	Cat. No.
VISC-WAT	1,0018 mPa.s	ASTM D2162	Glass bottle	100 ml	**99566.180**

COLD FILTER PLUGGING POINT (CFPP) STANDARDS, CERTIFIED REFERENCE MATERIALS

Cold Filter Plugging Point (CFPP) Certified Reference Materials are for the verification of laboratory instruments used in testing petroleum and derivative products for Cold Filter Plugging Point (CFPP) according to IP 309, EN 116 and ASTM D6371 also other equivalent test methodology.

- Tested in accordance with ASTM / EN or IP test method protocols
- Low level of uncertainty achieves maximum accuracy of data
- Supplied in tamper-evident UN compliant security pack with 12 month shelf life

Fully certified in accordance with ISO 17034 under accreditation by UKAS.

Description	Temp. (°C)	Pk	Cat. No.
CFPP standard (CRM)	–21,7	250 ml	**99102.230**
CFPP standard (CRM)	–12,4	250 ml	**99103.230**

CLOUD POINT STANDARD, CERTIFIED REFERENCE MATERIAL (CRM)

Cloud Point Certified Reference Materials are for the verification of laboratory instruments used in testing petroleum and derivative products for Cloud Point according to IP 219, ISO 3015, EN 23015, ASTM D2500 and other equivalent test methodology.

- Tested in accordance with ASTM / EN or IP test method protocols
- Low level of uncertainty achieves maximum accuracy of data
- Supplied in tamper-evident UN compliant security pack with 12 month shelf life
- Fully traceable to International Standards

IP 219, ISO 3015, EN 23015, ASTM D2500

Fully certified in accordance with UKAS and ISO/IEC 17034.

Description	Temp. (°C)	Pk	Cat. No.
Cloud point standard	–7,6 °C (nominal value)	250 ml	**99104.230**

DISTILLATION STANDARDS FOR THE PETROLEUM INDUSTRY, CERTIFIED REFERENCE MATERIALS

Distillation Certified Reference Materials are for the verification of laboratory instruments used in testing petroleum and derivative products for distillation at atmospheric pressure according to ASTM D86, IP 123, ISO 3405 and other such equivalent international methodology.

- Certified in accordance with ASTM / EN or IP test method protocols
- Certified by Round Robin Method using independant test laboratories ensuring good inter-laboratory correlation
- Low level of uncertainty achieves maximum accuracy of data
- Fully traceable to International Standards
- Supplied in tamper-evident bottles with 12 months shelf life

Fully certified in accordance with ISO 17034 under accreditation by UKAS

Description	Temp. (°C)	Pk	Cat. No.
Distillation standard, diesel	Nominal 152,9… 358,1	250 ml	**99106.230**
Distillation standard, gasoline	Nominal 26,4… 174,9	250 ml	**99107.230**
Distillation standard, jet aviation fuel	Nominal 148,1…260,3	250 ml	**99108.230**

FUEL TESTING STANDARDS - JET AVIATION FUEL

Fuel Testing Certified Reference Materials are for the verification of laboratory instruments used in testing petroleum and derivative products. This includes, but is not limited to, the analysis and measurement of: Acidity content, sulphur content, aniline point, Fluorescent Indicator Adsorption (FIA) aromatics, freezing point.

- Highest level of accreditation guarantee, providing the most credible data currently available worldwide
- Low levels of uncertainty achieves maximum accuracy of data
- All data generated exclusively by ISO 17025 accredited independent laboratories
- Ensures good inter-laboratory correlation
- Certified in accordance with ASTM / EN or IP test method protocols
- Fully traceable to International Standards
- Tamper-evident security packaging

Fully certified in accordance with ISO 17034 under accreditation by UKAS.

Description	Concentration	Test method	Temp. (°C)	Pk	Cat. No.
Acidity standard	0,0083 mg KOH/g	ASTM D3242		250 ml	**99122.230**
Aniline point	—	ASTM D611	58,48	250 ml	**99123.230**
FIA aromatics	17,7% (vol)	ASTM D1319		250 ml	**99124.230**
Sulphur standard	7,4 mg/kg	ASTM D3227 / IP 342 / ISO 3012		250 ml	**99126.230**
Freezing point	—	ASTM D2386, IP 16, ISO 3013	–55,5	250 ml	**99127.230**

SMOKE POINT STANDARD

Fuels Testing Certified Reference Material for the calibration and verification of laboratory instruments used in testing petroleum and derivative products for Smoke Point ASTM D1322 / IP 57.

- Certified in accordance with ASTM / EN or IP test method protocols
- Fully traceable to International Standards
- Tamper-evident security packaging

Fully certified in accordance with ISO 17034 under accreditation by UKAS.

Description	Test method	Pk	Cat. No.
Smoke Point standard jet aviation fuel, 24.47 mm	ASTM D1322 / IP 57	250 ml	**99125.230**

New standards for Petrochemistry brochure

CETANE NUMBER STANDARD, ASTM D 613

Fuels Testing Certified Reference Material for the calibration and verification of laboratory instruments used in testing petroleum and derivative products for Cetane Number ASTM D613

- Certified in accordance with ASTM / EN or IP test method protocols
- Certified by Round Robin method using independent test laboratories.
- Ensures good inter-laboratory correlation
- Tamper-evident security pack

Description	Test method	Pk	Cat. No.
Cetane Number standard, nominal value 52,6	ASTM D613	1 L	**99128.290**

FUEL TESTING STANDARDS - GASOLINE

Fuel Testing Certified Reference Material for the calibration and verification of laboratory instruments used in testing petroleum and derivative products for Octane Number.

- Certified in accordance with ASTM / EN or IP test method protocols
- Certified by Round Robin method using independent test laboratories.
- Ensures good inter-laboratory correlation
- Supplied in tamper-evident, UN compliant security pack

Description	Test method	Pk	Cat. No.
Motor octane number standard, nominal value 86,9	ASTM D2700	1 L	**99129.290**
Research octane number standard, nominal value 98	ASTM D2699	1 L	**99130.290**

POUR POINT STANDARDS

Pour Point Certified Reference Materials for the verification of laboratory instruments used in testing petroleum and derivative products for Pour Point to ASTM D97, IP 15, ISO 3016 and other equivalent international test methodology.

- Highest level of accreditation guarantee, providing the most credible data currently available worldwide
- Low levels of uncertainty achieves maximum accuracy of data
- Certified in accordance with ASTM / EN or IP test method protocols
- Fully traceable to International Standards
- Tamper-evident security packaging

Fully certified in accordance with ISO 17034 under accreditation by UKAS. All data generated exclusively by ISO 17025 accredited independent laboratories.

The temperature value given in the ordering table below is the nominal temperature for the pour point value - actual batch values are given in the certification documents supplied with the product and also on the label.

Description	Test method	Temp. (°C)	Pk	Cat. No.
Pour Point standard, diesel	ASTM D97, IP 15, ISO 3016	–30	250 ml	**99118.230**
Pour Point standard, lubricant	ASTM D97, IP 15, ISO 3016	–14,7	250 ml	**99119.230**
Pour Point standard, lubricant	ASTM D97, IP 15, ISO 3016	–30,3	250 ml	**99120.230**
Pour Point standard, lubricant	ASTM D97, IP 15, ISO 3016	–38	250 ml	**99121.230**

DIESEL AND LUBRICANT, MULTI-PARAMETER CERTIFIED REFERENCE MATERIALS (MPCRMS)

MPCRM's provide both calibration and verification options for laboratory test equipment, all from the same sample, with their values certified to the highest level of accreditation integrity available globally.

- Highest level of accreditation guarantee, providing the most credible certified data currently available worldwide
- Low levels of uncertainty achieves maximum accuracy of data
- Multiple test parameters provide a flexible and cost effective solution
- Fully traceable to International Standards
- Glass packaging with tamper-evident cap

Diesel: Certified for Viscosity, Density, Flash Point, Cloud Point, CFPP & Distillation using ASTM / IP and EN test method protocols

Lubricant: Certified for Viscosity, Density, Flash Point & Pour Point using ASTM / IP and EN test method protocols

Fully dual-certified in accordance with ISO 17025 and ISO 17034 under accreditation by UKAS

The ordering table below provides a small sample of the data availble with the documentation.

Description	Flash point	Temp. (°C)	Pk	Cat. No.
MPCRM diesel, dynamic viscosity 2,187 mPa.s	PMCC 66 °C	Cloud point: –7,4	500 ml	**99100.260**
MPCRM lubricant, kinematic viscosity (at 40 °C) 76,78 mPa.s	PMCC 182,6 °C	Pour point:–30,3	500 ml	**99101.260**

Polysulphide, in light mineral oil.

POLYSULPHIDE, CERTIFIED REFERENCE MATERIALS, IN LIGHT MINERAL OIL

Polysulphide CRMs are suitable for calibration, verification, or for use in quality control procedures used for analysing sulphur content in petroleum products.

- Certified in strict accordance to ISO 17025 and ISO 17034 under UKAS accreditation
- Highest level of accreditation guaranteed, providing the most credible certified data available worldwide
- Suitable for, but not limited to, internationally recognised test methods and protocols: ASTM D2622, ASTM D3120, ASTM D4294, ASTM D5453, ASTM D7039, IP 336, IP 496 and IP 497
- Fully traceable to International Standards, and low levels of uncertainty that achieve maximum data accuracy
- Supplied in 100 ml, tamper-evident glass packaging, providing assurance of sample integrity

Quantitative analysis of sulphur in crude oil, petroleum products and feedstock is extremely important to ensure compliance with regulatory bodies and legislation, failure to do so can result in costly fines. Analysis techniques for sulphur content measurement include wet chemistry, X-ray fluorescence, atomic spectroscopy and various thermal combustion methods with different detection limits. Regardless of the technique employed for measurement, robust analytical data is paramount for calibration and/or verification.

UKAS ISO 17025 and ISO 17034.

Description	Concentration ()	Pk	Cat. No.
Polysulphide in light mineral oil	0,0005% (5 ppm)	100 ml	**99589.180**
Polysulphide in light mineral oil	0,0010% (10 ppm)	100 ml	**99590.180**
Polysulphide in light mineral oil	0,0025% (25 ppm)	100 ml	**99591.180**
Polysulphide in light mineral oil	0,0050% (50 ppm)	100 ml	**99592.180**
Polysulphide in light mineral oil	0,0100% (100 ppm)	100 ml	**99593.180**
Polysulphide in light mineral oil	0,0250% (250 ppm)	100 ml	**99594.180**
Polysulphide in light mineral oil	0,0300% (300 ppm)	100 ml	**99595.180**
Polysulphide in light mineral oil	0,0500% (500 ppm)	100 ml	**99596.180**
Polysulphide in light mineral oil	0,0700% (700 ppm)	100 ml	**99597.180**
Polysulphide in light mineral oil	0,0750% (750 ppm)	100 ml	**99598.180**
Polysulphide in light mineral oil	0,1000% (1000 ppm)	100 ml	**99599.180**
Polysulphide in light mineral oil	0,2500% (2500 ppm)	100 ml	**99600.180**
Polysulphide in light mineral oil	0,3000% (3000 ppm)	100 ml	**99601.180**
Polysulphide in light mineral oil	0,5000% (5000 ppm)	100 ml	**99602.180**
Polysulphide in light mineral oil	1,0000% (10000 ppm)	100 ml	**99603.180**
Polysulphide in light mineral oil	1,5000% (15000 ppm)	100 ml	**99604.180**
Polysulphide in light mineral oil	2,0000% (20000 ppm)	100 ml	**99605.180**
Polysulphide in light mineral oil	3,0000% (30000 ppm)	100 ml	**99606.180**
Polysulphide in light mineral oil	0% (0 ppm) / blank	100 ml	**99609.180**

Conductivity standards, Certified Reference Materials.

CONDUCTIVITY STANDARDS, CERTIFIED REFERENCE MATERIALS (CRMs) FOR PRIMARY CALIBRATION OF CONDUCTIVITY METERS

Avantor offers a comprehensive range of conductivity standards as Certified Reference Materials with primary use calibration of conductivity meters.

- Accredited acc. ISO 17025 / ISO 7034
- Traceable to NIST
- Certificate of Analysis including temperature correction chart

Intended uses:

- Calibration, qualification and monitoring of instruments for conductivity measurement
- Validation of analytical methods
- Preparation of working reference samples
- Detection limit and linearity studies

These standards are produced by dissolving potassium chloride (KCl) in 18 MOhm of deionised water, except where indicated, then filtered through a 0,22 µm filter in equilibrium with atmospheric carbon dioxide. The certified value and expanded uncertainty are obtained using conductivity meter calibration according to ISO/IEC 17025. Homogeneity and stability studies are performed according to the requirement of ISO 17034 and ISO Guide 35. All conductivity standards are traceable to SI (NIST).

Description	Conductivity	Pack type	Pk	Cat. No.
Conductivity standard CRM	0 - 2 µS/cm (nominal)	Plastic bottle	250 ml	**89001.230**
Conductivity standard CRM	5	Plastic bottle	500 ml	**89002.270**
Conductivity standard CRM	10	Plastic bottle	500 ml	**89003.270**
Conductivity standard CRM	15	Plastic bottle	500 ml	**89005.270**
Conductivity standard CRM	20	Plastic bottle	500 ml	**89006.270**
Conductivity standard CRM	25	Plastic bottle	500 ml	**89007.270**
Conductivity standard CRM	50	Plastic bottle	500 ml	**89008.270**
Conductivity standard CRM	84	Plastic bottle	500 ml	**89009.270**
Conductivity standard CRM	100	Plastic bottle	500 ml	**89010.270**
Conductivity standard CRM	147	Plastic bottle	500 ml	**89011.270**
Conductivity standard CRM	200	Plastic bottle	500 ml	**89012.270**
Conductivity standard CRM	500	Plastic bottle	500 ml	**89013.270**
Conductivity standard CRM	718	Plastic bottle	500 ml	**89014.270**
Conductivity standard CRM	1000	Plastic bottle	500 ml	**89015.270**
Conductivity standard CRM	1413	Plastic bottle	500 ml	**89018.270**
Conductivity standard CRM	1500	Plastic bottle	500 ml	**89019.270**
Conductivity standard CRM	2000	Plastic bottle	500 ml	**89020.270**
Conductivity standard CRM	3000	Plastic bottle	500 ml	**89021.270**
Conductivity standard CRM	10000	Plastic bottle	500 ml	**89023.270**
Conductivity standard CRM	12880	Plastic bottle	500 ml	**89025.270**
Conductivity standard CRM	15000	Plastic bottle	500 ml	**89026.270**
Conductivity standard CRM	20000	Plastic bottle	500 ml	**89027.270**
Conductivity standard CRM	30000	Plastic bottle	500 ml	**89028.270**
Conductivity standard CRM	50000	Plastic bottle	500 ml	**89029.270**
Conductivity standard CRM	100000	Plastic bottle	500 ml	**89030.270**
Conductivity standard CRM	111.3	Plastic bottle	500 ml	**89031.270**

CONDUCTIVITY STANDARD SOLUTIONS

A complete range of certified control standards with values ranging from 10 to 100 000 µS to meet all the requirements for electrochemical analysis.

- Accurate to ±1%
- Traceable to NIST, meeting Ph. Eur. and USP requirements
- Tested using INAB accredited test methods to ISO 17025

Standard values (25 °C)

Used for determining cell constant - see recommendations of instrument manufacturer for the relevant cell design.

Premium values (25 °C)

These standards are for verifying that the measuring system (instrument, probe and operator) can accurately detect sample values in the area of interest (e.g. 10 µS/cm for pharmaceutical water, or 500 000 µS/cm for environmental samples).

Description	Pk (ml)	Cat. No.
Standard values (25 °C) - (µS/cm)		
84	100	**84131.180**
84	500	**84131.260**
147	500	**84132.260**
1413	100	**84135.180**
1413	500	**84135.260**
1413	1000	**84135.290**
12880	100	**84136.180**
12880	500	**84136.260**
12880	1000	**84136.290**
Premium values (25 °C) - (µS/cm)		
1.3	500	**84134.260**
5	500	**84133.260**
10	500	**84137.260**
15	500	**84107.260**
20	500	**84140.260**
50	500	**84143.260**
100	500	**84139.260**
200	500	**84145.260**
500	500	**84138.260**
1000	500	**84141.260**
10000	500	**84146.260**
111800	500	**84108.260**
20000	500	**84149.260**
50000	500	**84142.260**
100000	500	**84144.260**
150000	500	**85917.260**
200000	500	**85918.260**
500000	500	**85919.260**

ISO 17034 - Certified Reference Material
Accredited by BELAC under accreditation N°: 542-RM

BUFFER SOLUTIONS, 25 °C AVS TITRINORM

- Solutions prepared from AnalaR® NORMAPUR® grade analytical reagents
- True analytical value on the label to an accuracy of ±0,02 pH units
- Traceable to SRM from NIST
- Batch number and packing date for traceability
- Buffers @ 25 °C conform to Reag. Ph. Eur.

Certificate of Analysis available from **vwr.com**

All the products below are produced and certified in accordance with ISO 17034 accreditation

pH value	pH buffer type	Colour	Pack type	Pk	Cat. No.
1,68	Oxalate	Colourless	Plastic bottle	500 ml	**85506.260**
4,01	Phthalate	Colourless	Plastic bottle	500 ml	**85511.260**
6,87	Phosphate	Colourless	Plastic bottle	500 ml	**85515.260**
7,41	Phosphate	Colourless	Plastic bottle	500 ml	**85516.260**
9,18	Borate	Colourless	Plastic bottle	500 ml	**85517.260**
10,01	Carbonate	Colourless	Plastic bottle	500 ml	**85518.260**

ISO 17034 - Certified Reference Material
Accredited by BELAC under accreditation N°: 542-RM

BUFFER SOLUTIONS, SECONDARY STANDARDS

- Solution standardised at 25 °C
- Accurate to ±0,010 pH units (except buffer 12,454 with accuracy ±0,050)
- Fully traceable for optimum pH calibration (traceable to NIST), DIN 19266 and IUPAC
- Supplied with detailed Certificate of Analysis
- Temperature dependence data is printed on the labels as are batch number and expiry date

pH value	pH accuracy	Pk	Cat. No.
1,679	±0,010	500 ml	**84.580.260**
3,776	±0,010	500 ml	**84.581.260**
4,005	±0,010	500 ml	**84.582.260**
6,865	±0,010	500 ml	**84.583.260**
7,413	±0,010	500 ml	**84.584.260**
9,18	±0,010	500 ml	**84.585.260**
10,012	±0,010	500 ml	**84.586.260**
12,45	±0,05	500 ml	**84.593.260**
12,454	±0,050	500 ml	**84.587.260**

pH BUFFER SOLUTIONS IN SACHETS, 20 °C, AVS TITRINORM FOR PH METER CALIBRATION

- Practical colour coded 30 ml sachets - one use per sachet - no risk of contamination
- Ideal for on-site analyses
- Accuracy: pH is ±0,02 at 20 °C
- Traceable to SRM from NIST

pH value	pH accuracy	pH buffer type	Colour	Pack type	Pk Info	Pk	Cat. No.
4,00	±0,02	Phthalate	Colourless	Sachet	30×30 ml	1 KIT	**85041.001**
7,00	±0,02	Phosphate	Colourless	Sachet	30×30 ml	1 KIT	**85042.001**
9,00	±0,02	Borate	Colourless	Sachet	30×30 ml	1 KIT	**85043.001**
10,00	±0,02	Borate	Colourless	Sachet	30×30 ml	1 KIT	**85044.001**

pH value	Colour	Packed	Pk	Cat. No.
Assorted buffer kits				
4,00/7,00/9,00	Colourless	10×30 ml sachets of pH 4,01; 10×30 ml sachets of pH 7,00; 10×30 ml sachets of pH 9,00	1 KIT	**85045.001**
4,00/7,00/10,00	Colourless	10×30 ml sachets of pH 4,01; 10×30 ml sachets of pH 7,00; 10×30 ml sachets of pH 10,00	1 KIT	**85046.001**

BUFFER TABLETS, GURR® FOR HAEMATOLOGY

- These tablets provide a rapid and convenient method of preparing a buffer solution
- Gurr® buffer tablets also for the preparation of microscopical stain solutions
- One tablet dissolved in distilled water, and made up to 100 ml, produces a solution of the stated pH at 20 °C
- The molarity of the buffer solutions is 0,005 M

Description	pH	Pk	Cat. No.
Buffer tablets	4,0 ±0,02	50 Tab.	**331542Q**
Buffer tablets	7,0 ±0,02	50 Tab.	**331552S**
Buffer tablets	9,2 ±0,02	50 Tab.	**331562U**
Buffer tablets	6.8+/-0.02	50 Tab.	**331932D**
Buffer tablets	7.2 +/-0.02	50 Tab.	**331942F**

pH BUFFER CAPSULES

- Colour coded for easy identification
- Preservative-free
- Extended shelf life
- Add one capsule to 100 ml of distilled water

pH value	pH accuracy	Colour	Final volume (ml)	Packed	Pk	Cat. No.
4,01	±0,02	Orange	100	5 plastic tubes, 10 capsules/tube	50	**332732B**
7,00	±0,02	Green	100	5 plastic tubes, 10 capsules/tube	50	**332742D**
10,00	±0,02	Blue	100	5 plastic tubes, 10 capsules/tube	50	**332762H**

BUFFER SOLUTIONS, 20 °C AVS TITRINORM

- Solutions prepared from AnalaR® NORMAPUR® grade analytical reagents
- True analytical value on the label to an accuracy of ±0,02 pH units (pH 1 to 11)
- (±0,05 for pH 12,00 buffer)
- Traceable to SRM from NIST
- Batch number and packing date for traceability
- Certificate of Analysis available from **vwr.com**
- Available in colourless and coloured solutions

All the products below are produced and certified in accordance with ISO 17034 accreditation

If significantly large volumes are required please contact your local Avantor sales office for a customised offer.

* For total hardness in water

pH value	pH accuracy	Accreditation	pH buffer type	Colour	Pack type	Pk	Cat. No.
Buffer solutions in bottles							
1,00	±0,02	-	Glycine	Colourless	Plastic bottle	1 L	**32031.297**
2,00	±0,02	ISO 17034	Citrate	Colourless	Plastic bottle	500 ml	**32032.260**
2,00	±0,02	ISO 17034	Citrate	Colourless	Plastic bottle	1 L	**32032.291**
3,00	±0,02	ISO 17034	Citrate	Colourless	Plastic bottle	1 L	**32033.294**
3,00	±0,02	ISO 17034	Citrate	Colourless	Bag-in-box (Cubitainer)	5 L	**32033.374**
4,00	±0,02	ISO 17034	Phthalate	Colourless	Plastic bottle	100 ml	**32095.184**
4,00	±0,02	ISO 17034	Phthalate	Colourless	Plastic bottle	500 ml	**32095.264**
4,00	±0,02	ISO 17034	Phthalate	Colourless	Plastic bottle	1 L	**32095.297**
4,00	±0,02	ISO 17034	Phthalate	Colourless	Plastic bottle	5 L	**32095.366**
4,00	±0,02	ISO 17034	Phthalate	Colourless	Bag-in-box (Cubitainer)	5 L	**32095.377**
4,00	±0,02	ISO 17034	Phthalate	Red	Plastic bottle	500 ml	**32044.268**
4,00	±0,02	ISO 17034	Phthalate	Red	Dosing bottle (plastic)	1 L	**32044.290**
4,66	±0,02	ISO 17034	Acetate	Colourless	Plastic bottle	500 ml	**98192.260**
4,66	±0,02	ISO 17034	Acetate	Colourless	Plastic bottle	1 L	**98192.290**
5,00	±0,02	ISO 17034	Citrate	Colourless	Plastic bottle	1 L	**32035.291**
6,00	±0,02	ISO 17034	Citrate	Colourless	Plastic bottle	1 L	**32036.294**
6,88	±0,02	ISO 17034	Phosphate	Colourless	Plastic bottle	500 ml	**83601.260**
6,88	±0,02	ISO 17034	Phosphate	Colourless	Plastic bottle	1 L	**83601.290**
7,00	±0,02	ISO 17034	Phosphate	Colourless	Plastic bottle	100 ml	**32096.187**
7,00	±0,02	ISO 17034	Phosphate	Colourless	Plastic bottle	500 ml	**32096.267**
7,00	±0,02	ISO 17034	Phosphate	Colourless	Plastic bottle	1 L	**32096.291**
7,00	±0,02	ISO 17034	Phosphate	Colourless	Plastic bottle	5 L	**32096.360**
7,00	±0,02	ISO 17034	Phosphate	Colourless	Bag-in-box (Cubitainer)	5 L	**32096.371**
7,00	±0,02	ISO 17034	Phosphate	Colourless	Bag-in-box (cubitainer)	10 L	**32096.400**
7,00	±0,02	ISO 17034	Phosphate	Green	Plastic bottle	500 ml	**32045.262**
7,00	±0,02	ISO 17034	Phosphate	Green	Dosing bottle (plastic)	1 L	**32045.290**
7,00	±0,02	ISO 17034	Phosphate	Green	Plastic bottle	1 L	**32045.295**
7,00	±0,02	ISO 17034	Phosphate	Green	Bag-in-box (cubitainer)	5 L	**32045.375**
8,00	±0,02	ISO 17034	Borate	Colourless	Plastic bottle	1 L	**32038.291**
9,00	±0,02	ISO 17034	Borate	Colourless	Plastic bottle	500 ml	**32039.261**
9,00	±0,02	ISO 17034	Borate	Colourless	Plastic bottle	1 L	**32039.294**
9,00	±0,02	ISO 17034	Borate	Colourless	Bag-in-box (Cubitainer)	5 L	**32039.374**
9,00	±0,02	ISO 17034	Borate	Blue	Plastic bottle	500 ml	**32046.265**
9,00	±0,02	ISO 17034	Borate	Blue	Plastic bottle	1 L	**32046.298**
9,00	±0,02	ISO 17034	Borate	Blue	Bag-in-box (cubitainer)	5 L	**32046.378**
9,22	±0,02	ISO 17034	Borate	Colourless	Plastic bottle	500 ml	**32097.261**
9,22	±0,02	ISO 17034	Borate	Colourless	Plastic bottle	1 L	**32097.290**
10,00	±0,02	ISO 17034	Carbonate	Colourless	Plastic bottle	100 ml	**32040.185**
10,00	±0,02	ISO 17034	Carbonate	Colourless	Plastic bottle	500 ml	**32040.260**
10,00	±0,02	ISO 17034	Carbonate	Colourless	Plastic bottle	1 L	**32040.298**
10,00	±0,02	ISO 17034	Carbonate	Colourless	Bag-in-box (Cubitainer)	5 L	**32040.378**
10,00	±0,05	-	Ammonia	Colourless	Plastic bottle	500 ml	**98213.260**
10,00	±0,02	ISO 17034	Borate	Yellow	Plastic bottle	500 ml	**85680.260**
10,00	±0,02	ISO 17034	Borate	Yellow	Dosing bottle (plastic)	1 L	**85680.290**
10,00	±0,02	ISO 17034	Borate	Yellow	Plastic bottle	1 L	**85680.295**
11,00	±0,02	-	Phosphate	Colourless	Plastic bottle	1 L	**32041.292**
12,00	±0,05	-	Phosphate	Colourless	Plastic bottle	1 L	**32042.295**
Buffer solution sets							
10,00/7,00/4,00	±0,02	ISO 17034		Blue/green/red	Plastic bottle (3×100 ml)	1	**83610.600**
10,00/7,00/4,00	±0,02	ISO 17034		Blue/green/red	Plastic bottle (3×250 ml)	1	**83610.610**

Certified reference material for standardisation of volumetric solutions.

CERTIFIED REFERENCE MATERIALS (CRMs) FOR STANDARDISATION OF VOLUMETRIC SOLUTIONS

CRM's - secondary reference materials intended for standardisation of volumetric solutions in accordance to the Pharmacopoeia (Ph. Eur. and USP). These volumetric standards are prepared from high purity salts. The certified mass fraction was determined by classical analysis according to ISO/IEC 17025. Homogeneity and stability studies have been performed according to the requirement of ISO 17034 and ISO Guide 35. All volumetric standards are traceable to SI (NIST or BAM).

- High purity prevents possible titration interference
- Accurately determined content decreases mistakes linked to the method
- Complete Certificate of Analysis supplied with each standard offers quality assurance
- Traceable to NIST or BAM standards

Certifications: ISO 17025 / 17034

CAS No.	65-85-0	471-34-1	62-76-0	34962-29-3	7778-50-9	877-24-7	7758-05-6	497-19-8	7647-14-5	77-86-1	7440-66-6
Description	Benzoic acid	Calcium carbonate	di-Sodium oxalate	Iron(II)ethyl-enediammoni-um sulfate	Potassium dichromate	Potasium hydrogen phthalate	Potassium iodate	Sodium carbonate anhydrous	Sodium chloride	Tris-(hydrox-ymethyl)-ami-nomethane (TRIS)	Zinc
Formula	$C_7H_6O_2$	$CaCO_3$	$C_2Na_2O_4$	$FeSO_4 \cdot NH_3CH_2CH_2N\text{-}H_3SO_4$	$K_2Cr_2O_7$	$KC_8H_5O_4$	KIO_3	Na_2CO_3	NaCl	$C_4H_{11}NO_3$	Zn

Description	Standards	Pk	Cat. No.
Benzoic acid	CRM	60 g	**88395.060**
Calcium carbonate	CRM	50 g	**88396.050**
di-Sodium oxalate	CRM	60 g	**88397.060**
Iron(II)ethylenediammonium sulfate	CRM	80 g	**88398.080**
Potassium dichromate	CRM	80 g	**88399.080**
Potasium hydrogen phthalate	CRM	80 g	**88400.080**
Potassium iodate	CRM	100 g	**88401.100**
Sodium carbonate anhydrous	CRM	80 g	**88402.080**
Sodium chloride	CRM	80 g	**88403.080**
Tris-(hydroxymethyl)-aminomethane (TRIS)	CRM	80 g	**88404.080**
Zinc	CRM	100 g	**88405.100**

STANDARDS FOR WATER DETERMINATION BY THE KARL FISCHER METHOD

The tightening of regulatory requirements and the increasing demands of QA/QC methodology is becoming more important across all market sectors. The demand for standards, to support the testing methods, continues to increase and this growth applies to water determination according to Karl Fischer. Avantor now offers a complete range of Karl Fischer water standards as CRMs, to calibrate and monitor equipment and check test results.

- CRMs acc. to ISO 17025 / ISO 17034
- CRM acc. to ASTM (in liquid petroleum)
- Broad product range for both volumetric + KF coulometric titrations and indirect oven method
- Liquid and solid water standards available
- Supplied with a detailed Certificate of Analysis

Our range of Karl Fischer water standards are Certified Reference Materials acc to ISO 17025 and ISO 17034. The standards are available both in liquid and solid form.

We also offer a range of Karl Fischer water standards as CRM for determination in liquid petroleum according to ASTM. The water content in standards in liquid petroleum is determined using the ASTM D6304 method.

When the Cat. No. (Pk) ends with a

- .005 then it is 10×5 ml
- .002 then it is 10×2 ml
- .020 then it is 5×20 ml

Description	Concentration ()	Pack type	Pk	Cat. No.
KF water standards				
Coulometric standard 0,01% water (xylenes based)	100 µg/g	Pack of 10x4 g ampoules	10 Ampoul	**88434.004**
Coulometric standard 0,01% water (propylene carbonate based)	100 µg/g	Pack of 10x4 g ampoules	10 Ampoul	**88435.004**
Coulometric standard 0,1% water	1000 µg/g	Pack of 10×4 g ampoules	10 Ampoul	**88427.004**
Coulometric standard 0,1% water	1000 µg/g	Pack of 10×8 g ampoules	10 Ampoul	**88427.008**
Coulometric standard 1% water	10000 µg/g	Pack of 10×4 g ampoules	10 Ampoul	**85487.004**
Coulometric standard 1% water	10000 µg/g	Pack of 10×8 g ampoules	10 Ampoul	**85487.008**
KF water standards in liquid petroleum conforming to ASTM D1744, E1064, D4377				
CRM water standard	60 µg/g	Pack of 10×5 ml vials	1 KIT	**85482.005**
CRM water standard	100 µg/g	Pack of 10×2 ml vials	1 KIT	**85483.002**
CRM water standard	100 µg/g	Pack of 10×5 ml vials	1 KIT	**85483.005**
CRM water standard	100 µg/g	Pack of 5×20 ml vials	1 KIT	**85483.020**
CRM water standard	1000 µg/g	Pack of 10×2 ml vials	1 KIT	**85484.002**
CRM water standard	1000 µg/g	Pack of 10×5 ml vials	1 KIT	**85484.005**
CRM water standard	1000 µg/g	Pack of 5×20 ml vials	1 KIT	**85484.020**
CRM water standard	5000 µg/g	Pack of 10×2 ml vials	1 KIT	**85485.002**
CRM water standard	5000 µg/g	Pack of 10×5 ml vials	1 KIT	**85485.005**
CRM waterAb standard	5000 µg/g	Pack of 5×20 ml vials	1 KIT	**85485.020**
KF water standards				
Volumetric standard 0,5% water	5000 µg/ml	Bottle	250 ml	**85488.230**
Volumetric standard 0,5% water	5000 µg/ml	Bottle	500 ml	**85488.260**
Volumetric standard 0,5% water	5000 µg/ml	Bottle	1 L	**85488.290**
Volumetric standard 1,0% water	10000 µg/ml	Bottle	500 ml	**85489.260**
Karl Fischer Solid standard for oven method	1%	Bottle	5 g	**88433.005**
Lactose solid standard	4,98 ±0,03% H_2O		10 g	**85449.100**
Karl Fischer potassium citrate standard for oven method	5,55%	Bottle	10 g	**88432.100**
Karl Fischer volumetric fixed water standard - sodium tartrate dihydrate	15,.66 +/- 0,05% H_2O	Glass bottle	1 g	**88428.001**
Karl Fischer volumetric fixed water standard - sodium tartrate dihydrate	15,.66 +/- 0,05% H_2O	Glass bottle	10 g	**88428.100**
Karl Fischer standard di-sodium tartrate dihydrate	15,61 - 15,71% H_2O	Glass bottle	100 g	**85692.100**
Karl Fischer liquid standard mineral oil based	<30 ppm	Pack of 10x8 g ampoules	10 Ampoul	**88429.008**

TOTAL ACID NUMBER (TAN) STANDARDS

Total Acid Number (TAN) Standards are specifically manufactured for the verification of analytical instruments used to determine acid number by potentiometric titration. Each standard is certified in strict accordance with international test method protocols, ASTM D664 / IP 177.

- Typically used in, but not limited to, the analysis of used oils and lubricants
- Acid Number (AN) tested and certified in accordance with ASTM D664 / IP 177
- Fully traceable to International Standards and low levels of uncertainty achieves maximum accuracy of data
- Supplied in tamper-evident glass packaging, providing assurance of sample integrity

Manufacture and certification is carried out in strict accordance with dual-AKAS accreditations to ISO 17025 and ISO 17034. This dual-accreditation ensures the highest level of accreditation guarantee, and provides the most credible certified data available worldwide.

The concentration value given in the ordering table below is the nominal concentration for the TAN value - actual batch values are given in the certification documents supplied with the product and also on the label.

Description	Concentration	Test method	Pk	Cat. No.
TAN001	0,10 mg KOH/g	ASTM D664/IP 177	125 g	**99343.202**
TAN001	0,10 mg KOH/g	ASTM D664/IP 177	1 SET	**99343.001**
TAN005	0,49 mg KOH/g	ASTM D664/IP 177	125 g	**99344.202**
TAN005	0,49 mg KOH/g	ASTM D664/IP 177	1 SET	**99344.001**
TAN010	0,99 mg KOH/g	ASTM D664/IP 177	125 g	**99345.202**
TAN010	0,99 mg KOH/g	ASTM D664/IP 177	1 SET	**99345.001**
TAN015	1,54 mg KOH/g	ASTM D664/IP 177	125 g	**99346.202**
TAN015	1,54 mg KOH/g	ASTM D664/IP 177	1 SET	**99346.001**
TAN020	2,02 mg KOH/g	ASTM D664/IP 177	50 g	**99347.154**

Description	Concentration	Test method	Pk	Cat. No.
TAN020	2,02 mg KOH/g	ASTM D664/IP 177	1 SET	**99347.001**
TAN025	2,48 mg KOH/g	ASTM D664/IP 177	50 g	**99348.154**
TAN025	2,48 mg KOH/g	ASTM D664/IP 177	1 SET	**99348.001**
TAN030	2,93 mg KOH/g	ASTM D664/IP 177	50 g	**99349.154**
TAN030	2,93 mg KOH/g	ASTM D664/IP 177	1 SET	**99349.001**
TAN050	4,57 mg KOH/g	ASTM D664/IP 177	50 g	**99350.154**
TAN050	4,57 mg KOH/g	ASTM D664/IP 177	1 SET	**99350.001**
TAN100	10,14 mg KOH/g	ASTM D664/IP 177	50 g	**99351.154**
TAN100	10,14 mg KOH/g	ASTM D664/IP 177	1 SET	**99351.001**

Add : 1 ST = 3x125 g

TOTAL BASE NUMBER (TBN) STANDARDS

Total Base Number (TBN) Standards are specifically manufactured for the verification of analytical instruments used to determine base number by potentiometric titration. Each standard is certified in strict accordance with international test method protocols, ASTM D2896 / IP 276.

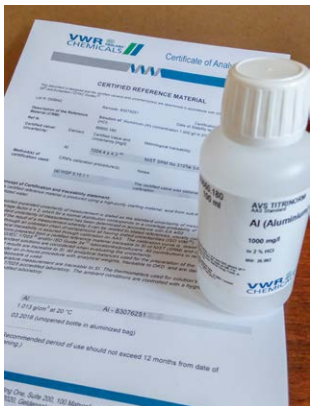
- Typically used in, but not limited to, the analysis of used oils and lubricants
- Base Number (BN) tested and certified in accordance with ASTM D2896 / IP 276
- Fully traceable to International Standards and low levels of uncertainty achieves maximum accuracy of data
- Supplied in tamper-evident glass packaging, providing assurance of sample integrity

Manufacture and certification is carried out in strict accordance with dual UKAS accreditations to ISO 17025 & ISO 17034. This dual accreditation ensures the highest level of accreditation guarantee and provides the most credible certified data available worldwide.

The concentration value given in the ordering table below is the nominal concentration for the TBN value - actual batch values are given in the certification documents supplied with the product and also on the label.

Description	Concentration	Test method	Pk	Cat. No.
TBN1	0,99 mg KOH/g	ASTM D2896/IP 276	125 g	**99352.202**
TBN1	0,99 mg KOH/g	ASTM D2896/IP 276	1 SET	**99352.001**
TBN3	3,01 mg KOH/g	ASTM D2896/IP 276	50 g	**99353.154**
TBN3	3,01 mg KOH/g	ASTM D2896/IP 276	1 SET	**99353.001**
TBN6	6,06 mg KOH/g	ASTM D2896/IP 276	50 g	**99358.154**
TBN6	6,06 mg KOH/g	ASTM D2896/IP 276	1 SET	**99358.001**
TBN10	10,01 mg KOH/g	ASTM D2896/IP 276	50 g	**99354.154**
TBN10	10,01 mg KOH/g	ASTM D2896/IP 276	1 SET	**99354.001**
TBN15	15,17 mg KOH/g	ASTM D2896/IP 276	50 g	**99355.154**
TBN15	15,17 mg KOH/g	ASTM D2896/IP 276	1 SET	**99355.001**
TBN30	30,17 mg KOH/g	ASTM D2896/IP 276	50 g	**99356.154**
TBN30	30,17 mg KOH/g	ASTM D2896/IP 276	1 SET	**99356.001**
TBN40	40,51 mg KOH/g	ASTM D2896/IP 276	50 g	**99357.154**
TBN40	40,51 mg KOH/g	ASTM D2896/IP 276	1 SET	**99357.001**
TBN70	70,24 mg KOH/g	ASTM D2896/IP 276	50 g	**99359.154**
TBN70	70,24 mg KOH/g	ASTM D2896/IP 276	1 SET	**99359.001**

Add : 1 SET = 3x125 g



AVS TITRINORM® AAS STANDARDS

This classic range of AAS standards (1000 mg/L) has been extended with 37 new elements.

- Complete range of 66 different standards
- Very competitive price
- Real value ±0,3%
- Delivered with a complete Certificate of Analysis in a single aluminium bag
- Tested according to ISO EN 17025 and ISO EN 17034
- Traceable to NIST
- Available in 100 and 500 ml

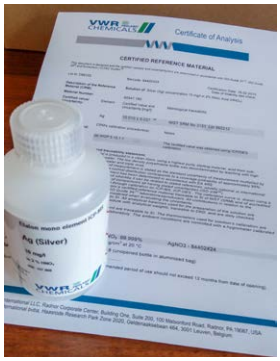
Element	Matrix	Cat. No.	
		Pk 100 ml	Pk 500 ml
Ag	2% HNO_3	86659.180	86659.260
Al	2% HCl	86660.180	86660.260
As	2% HNO_3	86661.180	86661.260
Au	2% HCl	86662.180	86662.260
B	Water	86663.180	86663.260
Ba	2% HNO_3	86664.180	86664.260
Be	2% HCl	86665.180	86665.260
Bi	10% HNO_3	86666.180	86666.260
Ca	2% HNO_3	86667.180	86667.260
Cd	2% HNO_3	86668.180	86668.260
Ce	2% HNO_3	86669.180	86669.260
Co	2% HNO_3	86670.180	86670.260
Cr	2% HNO_3	86671.180	86671.260
Cs	2% HNO_3	86672.180	86672.260
Cu	2% HNO_3	86673.180	86673.260
Dy	2% HNO_3	86674.180	86674.260
Er	2% HNO_3	86675.180	86675.260
Eu	2% HNO_3	86676.180	86676.260
Fe	2% HCl	86677.180	86677.260
Ga	2% HNO_3	86678.180	86678.260
Gd	2% HNO_3	86679.180	86679.260
Ge	5% HNO_3	86680.180	86680.260
Hf	2% HNO_3	86681.180	86681.260
Hg	10% HNO_3	86682.180	86682.260
Ho	2% HNO_3	86683.180	86683.260
In	2% HNO_3	86684.180	86684.260
Ir	10% HCl	86685.180	86685.260
K	2% HNO_3	86686.180	86686.260
La	2% HNO_3	86687.180	86687.260
Li	2% HNO_3	86688.180	86688.260
Mg	2% HNO_3	86690.180	86690.260
Mn	2% HNO_3	86691.180	86691.260
Mo	Water	86692.180	86692.260

Element	Matrix	Cat. No.	
		Pk 100 ml	Pk 500 ml
Na	2% HNO_3	86693.180	86693.260
Nb	5% HNO_3	86694.180	86694.260
Nd	2% HNO_3	86695.180	86695.260
Ni	2% HNO_3	86696.180	86696.260
Os	5% HCl	86697.180	–
P	Water	86698.180	86698.260
Pb	2% HNO_3	86699.180	86699.260
Pd	5% HCl	86700.180	86700.260
Pt	10% HCl	86701.180	86701.260
Rb	2% HNO_3	86702.180	86702.260
Rh	2% HNO_3	86703.180	86703.260
Rh	5% HCl	86704.180	86704.260
Ru	5% HCl	86705.180	86705.260
S	Water	86706.180	86706.260
Sb	5% HNO_3	86707.180	86707.260
Sc	2% HNO_3	86708.180	86708.260
Se	2% HNO_3	86709.180	86709.260
Si	Water	86710.180	86710.260
Sa	2% HNO_3	86711.180	86711.260
Sn	20% HCl	86712.180	86712.260
Sr	2% HNO_3	86713.180	86713.260
Ta	5% HNO_3	86714.180	86714.260
Te	10% HNO_3	86715.180	86715.260
Ti	5% HNO_3	86717.180	86717.260
Tl	2% HNO_3	86718.180	86718.260
Tm	2% HNO_3	86719.180	86719.260
V	2% $H2SO_4$	86721.180	86721.260
W	1% HNO_3	86722.180	86722.260
Y	2% HNO_3	86723.180	86723.260
Yb	2% HNO_3	86724.180	86724.260
Zn	-	86725.180	86725.260
Zr	5% HCl	86726.180	86726.260

ARISTAR® ICP SINGLE ELEMENT STANDARDS

- Available as 1000 or 10 000 ppm in 2 packs of 100 and 500 ml
- Produced from high purity acids, water ASTM I 18 MΩ and 99,999% high purity salts
- Solution assayed by titration
- Final concentration verified against ICP standards from NIST
- Total maximum uncertainty: ±1%
- Delivered in an aluminium bag with a complete Certificate of Analysis
- Produced by accreditated supplier according to ISO EN 17025 and ISO 17034

ICP standard	Cat. No.	Cat. No.			
Element	Composition	ICP 1000 ppm		ICP 10 000 ppm	
		Pk 100 ml	Pk 500 ml	Pk 100 ml	Pk 500 ml
Aluminium	$(Al(NO_3)3.9H_2O$ in HNO_3 2-5%	455002C	455004E	455012E	455014G
Antimony	Sb in HNO_3 2-5%	455022G	455024Y	-	455034K
Arsenic	As in HNO_3 2-5%	455042K	455044M	455052M	455054X
Barium	$(Ba(NO_3)2$ in HNO_3 2-5%	455062X	455064Q	455072Q	-
Beryllium	$BeO(C_2H_3O_2)6$ in HNO_3 2-5%	455082S	455084U	455092U	455094W
Bismuth	Bi in HNO_3 2-5%	455102F	455104H	455112H	455114J
Boron	H_3BO_3 in H_2O and NH_4OH traces	455122J	455124L	455132L	455134N
Cadmium	Cd in HNO_3 2-5%	455142N	455144P	455152P	455154R
Calcium	$CaCO_3$ in HNO_3 2-5%	455162R	455164T	455172T	455174V
Cerium	$(NH_4)2Ce(NO_3)6$ in HNO_3 2-5%	455182V	455184A	455192A	-
Caesium	$CsNO_3$ in HNO_3 2-5%	455202Y	455204K	455212K	455214M
Chromium	$(NH_4)2Cr_2O_7$ in HCl 5%	455242Q	455244S	455252S	455254U
Cobalt	Co in HNO_3 2-5%	455262U	455264W	455272W	455274B
Copper	Cu in HNO_3 2-5%	455282B	455284D	455292D	455294F
Dysprosium	Dy_2O_3 in HNO_3 2-5%	455302L	455304N	455212N	455214P
Erbium	Er_2O_3 in HNO_3 2-5%	455322P	455324R	-	455334T
Europium	Eu_2O_3 in HNO_3 2-5%	455342T	455344V	455352V	455354A
Gadolinium	Gd_2O_3 in HNO_3 2-5%	455362A	455364C	455372C	455374E
Gallium	Ga in HNO_3 2-5%	455382E	455384G	455392G	-
Germanium	$(NH_4)2GeF_6$ in H_2O, HF traces	455402X	455404Q	455412Q	-
Gold	Au in HCl 10%	455422S	455424U	455432U	455434W
Hafnium	HfO_2 in HNO_3 2-5%, HF traces	455442W	455444B	455452B	455454D
Holmium	Ho_2O_3 in HNO_3 2-5%	455462D	455464F	455472F	455474H
Indium	In in HNO_3 2-5%	455482H	455484J	455492J	-
Iridium	$IrCl3.3H_2O$ in HCl 10%	455502R	455504T	-	-
Iron	Fe in HNO_3 2-5%	455522V	455524A	455532A	455534C
Lanthanum	La_2O_3 in HNO_3 2-5%	455542C	455544E	-	455554G
Lead	$Pb(NO_3)2$ in HNO_3 2-5%	455562G	455564Y	455572Y	455574K
Lithium	Li_2CO_3 in HNO_3 2-5%	455582K	455584M	455592M	455594X
Lutetium	Lu_2O_3 in HNO_3 2-5%	455602U	455604W	455612W	455614B
Magnesium	Mg in HNO_3 2-5%	455622B	455624D	455632D	455634F
Manganese	Mn in HNO_3 2-5%	455642F	455644H	455652H	455654J
Mercury	Hg in HNO_3 10%	455662J	455664L	455672L	455674N
Molybdenum	$(NH_4)2MoO_4$ in HNO_3, HF traces	455682N	455684P	455692P	-
Neodymium	Nd_2O_3 in HNO_3 2-5%	455702A	455704C	455712C	455714E
Nickel	Ni in HNO_3 2-5%	455722E	455724G	455732G	455734Y
Niobium	Nb_2O_5 in H_2O, HF traces	455742Y	455744K	455752K	-
Palladium	Pd in HCl 10%	455762M	455764X	455772X	-
Phosphorus	P in H_2O	455782Q	455784S	455792S	455794U
Platinium	Pt in HCl 10%	455802D	455804F	458812F	-
Potassium	KNO_3 in HNO_3 2-5%	455822H	455824J	455832J	455834L
Praseodymium	Pr_6O_{11} in HNO_3 2-5%	455842L	455844N	455852N	-
Rhenium	Re in H_2O, HNO_3 traces	455862P	455864R	455872R	-
Rhodium	Rh in HCl 10%	455882T	455884V	-	-
Rubidium	$RbNO_3$ in HNO_3 2-5%	455902G	455904Y	455912Y	-
Ruthenium	$RuCl_3.3H_20$ in HCl 10%	455922K	455924M	455932M	-
Samarium	Sm_2O_3 in HNO_3 2-5%	455942X	455944Q	455952Q	455954S
Scandium	Sc in HNO_3 2-5%	455962S	455964U	455972U	455974W
Selenium	Se in HNO_3 2-5%	455982W	455984B	455992B	-
Silicon	$(NH_4)2SiF_6$ in H_20, HF traces	456002G	456004Y	456012Y	-
Silver	Ag in HNO_3 2-5%	456022K	456024M	456032M	-
Sodium	$NaNO_3$ in HNO_3 2-5%	456042X	456044Q	456052Q	456054S
Strontium	Sr in HNO_3 2-5%	456062S	-	456072U	-
Sulphur	$(NH_4)2SO_4$ in H_2O	456082W	456084B	456092B	456094D
Tantalum	Ta in H_2O,HF traces	456102J	456104L	456112L	456114N
Tellurium	Te in HCl 20%	456122N	456124P	456132P	-
Terbium	Tb_4O_7 in HNO_3 2-5%	456142R	456144T	456152T	456154V
Thallium	Tl in HNO_3 2-5%	456162V	456164A	456172A	456174C
Tin	Sn in HNO_3 2-5%, HF traces	456222Q	456224S	456232S	-
	Sn in HCl 20%	456242U	456244W	456252W	456254B
Titanium	Ti in H_2O, HF traces	456262B	456264D	456272D	-
Vanadium	V_2O_5 in HNO_3 2-5%	456322T	456324V	456332V	456334A
Ytterbium	Yb_2O_3 in HNO_3 2-5%	456342A	456344C	456352C	456354E
Yttrium	Y in HNO_3 2-5%	456362E	456364G	456372G	456374Y
Zinc	Zn in HNO_3 2-5%	456382Y	456384K	456392K	456394M
Zirconium	$ZrO(NO_3)2$ in HNO_3 2-5%	456402S	456404U	456412U	456414W
Tungsten	W in H_2O, NH_4OH traces	457182G	457184Y	457172E	457174G



ICP-MS STANDARDS, ARISTAR®

- Produced from high purity acids, water ASTM I 18 MΩ
- Solution assayed by titration
- Final concentration verified against ICP standards from NIST
- Total maximum uncertainty: ±1%
- Delivered with complete Certificate of Analysis

Produced by accreditated supplier in compliance with ISO EN 17034 and ISO EN 17025.

Safety note: These standards are in acid solutions, for full details of hazards and specification, please see **vwr.com** and the links to the Safety Data Sheets (SDS) and Certificates of Analysis.

ICP-MS standard Concentration (ppm)		Cat. No. 10 ppm		Cat. No. 1000 ppm
Element	**Matrix**		**Matrix**	
Aluminum	2-5% HNO_3	**85548.180**	2-5% HNO_3	**457202A**
Antimony	2% HNO_3/0,5% HF	**85560.180**	2-5% HNO_3	**456632H**
Arsenic	2-5% HNO_3	**85595.180**	-	**-**
Barium	2-5% HNO_3	**85549.180**	2-5% HNO_3	**456652L**
Beryllium	2-5% HNO_3	**85552.180**	2-5% HNO_3	**456662N**
Bismuth	2-5% HNO_3	**85553.180**	2-5% HNO_3	**456672P**
Boron	H_2O/tr.NH_4OH	**85554.180**	H_2O/tr.NH_4OH	**457213B**
Cadmium	2-5% HNO_3	**85551.180**	2-5% HNO_3	**456682R**
Calcium	2-5% HNO_3	**85556.180**	2-5% HNO_3	**456692T**
Cerium	2% HNO_3	**85555.180**	2-5% HNO_3	**457224C**
Cesium	2-5% HNO_3	**85557.180**	2% HNO_3	**457235D**
Chromium	2% HNO_3	**85559.180**	2-5% HNO_3	**-**
Cobalt	2-5% HNO_3	**85558.180**	2-5% HNO_3	**457062W**
Copper	2-5% HNO_3	**85561.180**	2-5% HNO_3	**456722Y**
Dysprosium	2-5% HNO_3	**85562.180**	2-5% HNO_3	**457246F**
Erbium	2-5% HNO_3	**85563.180**	2-5% HNO_3	**457257G**
Europium	2-5% HNO_3	**85564.180**	2-5% HNO_3	**457268H**
Gadolinium	2-5% HNO_3	**85567.180**	2-5% HNO_3	**457279J**
Gallium	2-5% HNO_3	**85566.180**	2-5% HNO_3	**457281A**
Germanium	2% HNO_3/0,2% HF	**85568.180**	H_2O/tr HF	**456732K**
Gold	2% HCl	**85550.180**	10% HCl	**456742M**
Hafnium	2% HNO_3/0,5% HF	**85569.180**	2% HNO_3/0,5% HF	**457292B**
Holmium	2-5% HNO_3	**85571.180**	2-5% HNO_3	**457303C**
Indium	2-5% HNO_3	**85572.180**	2-5% HNO_3	**456752X**
Iridium	10% HCl	**85573.180**	10% HCl	**457314D**
Iron	2-5% HNO_3	**85565.180**	2-5% HNO_3	**456762Q**
Lanthanum	2-5% HNO_3	**85575.180**	2-5% HNO_3	**457325E**
Lead	2-5% HNO_3	**85586.180**	2-5% HNO_3	**456772S**
Lithium	2-5% HNO_3	**85576.180**	2-5% HNO_3	**456782U**
Lutetium	2-5% HNO_3	**85577.180**	2-5% HNO_3	**457336F**
Magnesium	2-5% HNO_3	**85578.180**	2-5% HNO_3	**456792W**
Manganese	2-5% HNO_3	**85579.180**	2-5% HNO_3	**456802H**
Mercury	5% HNO_3	**85570.180**	10% HNO_3	**456812J**
Molybdenum	H_2O/tr HF	**85580.180**	H_2O/tr.NH_4OH	**457347G**

ICP-MS standard Concentration (ppm)		Cat. No. 10 ppm		Cat. No. 1000 ppm
Element	**Matrix**		**Matrix**	
Neodymium	2-5% HNO_3	**85583.180**	2-5% HNO_3	**457358H**
Nickel	2-5% HNO_3	**85584.180**	2-5% HNO_3	**456832N**
Niobium	2% HNO_3/0,5% HF	**85582.180**	H_2O/tr HF	**457369J**
Palladium	2% HNO_3	**85587.180**	10% HCl	**457371K**
Phosphorus	H_2O	**85585.180**	H_2O	**456842P**
Platinum	2% HCl	**85589.180**	10% HCl	**457382L**
Potassium	2-5% HNO_3	**85574.180**	2-5% HNO_3	**456852R**
Praseodymium	2-5% HNO_3	**85588.180**	2-5% HNO_3	**457393M**
Rhenium	H_2O/tr HNO_3	**85591.180**	H_2O/tr HNO_3	**457404N**
Rhodium	2% HCl	**85592.180**	10% HCl	**456862T**
Rubidium	2-5% HNO_3	**85590.180**	2-5% HNO_3	**457415P**
Ruthenium	2% HCl	**85593.180**	10% HCl	**457426Q**
Samarium	2% HNO_3	**85599.180**	2-5% HNO_3	**457437R**
Scandium	2% HNO_3	**85596.180**	2-5% HNO_3	**456872V**
Selenium	2% HNO_3	**85597.180**	2-5% HNO_3	**456882A**
Silicon	H_2O/tr HF	**85598.180**	H_2O/tr HF	**457448S**
Silver	2% HNO_3	**85547.180**	2-5% HNO_3	**456892C**
Sodium	2-5% HNO_3	**85581.180**	2-5% HNO_3	**456902K**
Strontium	2% HNO_3	**85631.180**	2-5% HNO_3	**456912M**
Sulphur	H_2O	**85594.180**	H_2O	**456922X**
Tantalum	2% HNO_3/0,5% HF	**85632.180**	H_2O/tr HF	**457459V**
Tellurium	2% HNO_3	**85634.180**	20% HCl	**457461A**
Terbium	2% HNO_3	**85633.180**	2-5% HNO_3	**456932Q**
Thallium	2% HNO_3	**85639.180**	2-5% HNO_3	**456942S**
Thulium	2% HNO_3	**85640.180**	–	**–**
Tin	1% HNO_3	**85630.180**	2% HNO_3/0,5% HF	**456952U**
Titanium	H_2O/tr HF	**85636.180**	H_2O/tr HF	**456962W**
Tungsten	H_2O/tr.NH_4OH	**85644.180**	H_2O/tr.NH_4OH	**457494D**
Uranium	2% HNO_3	**85641.180**	–	**–**
Vanadium	2% HNO_3	**85643.180**	2-5% HNO_3	**456972B**
Ytterbium	2% HNO_3	**85647.180**	2-5% HNO_3	**457472B**
Yttrium	2% HNO_3	**85646.180**	2-5% HNO_3	**456982D**
Zinc	2% HNO_3	**85648.180**	2-5% HNO_3	**456992F**
Zirconium	2% HNO_3	**85649.180**	2-5% HNO_3	**457483C**

ARISTAR® ICP AND ICP-MS MULTI-ELEMENT STANDARDS

Multi-element standards are directly traceable to NIST. A Certificate of Analysis is delivered with each product including exact data on content, composition, traceability, date of release and minimum shelf life.

Description	Cat. No.
ICP multi-element solution according USP232 dietary supplements 4 elements: Cd 5 mg/L, Pb 10 mg/L, as 15 mg/L, Hg 15 mg/L in HNO_3 7%	85035.180
ICP multi-element solution according USP232 oral dose 8 elements: Cd 25 mg/L, Pb 5 mg/L, as 1,5 mg/L, Hg 15 mg/L, Mo 100 mg/L, Ni 500 mg/L, V 100 mg/L, Cu 1000 mg/L in HNO_3 7%	85036.180
ICP multi-element solution diluted according USP232 oral dose 8 elements: Cd 2,5 mg/L, Pb 5 mg/L, as 1,5 mg/L, Hg 1,5 mg/L, Mo 10 mg/L, Ni 50 mg/L, V 10 mg/L, Cu 100 mg/L in HNO_3 7%	85037.180
ICP multi-element solution according USP232 parental dose 6 elements: 100 mg/L each of Ir; Pt; Os; Rh; Pd; Ru in HCl 15%	85038.180
ICP multi-element solution according USP232 parental dose 6 elements: 10 mg/L each of Ir; Pt; Os; Rh; Pd; Ru in HCl 15%	85039.180

ARISTAR® ICP and ICP-MS multi-element standards			Pk (ml)	Cat. No.
No. Element	**Composition**	**ARISTAR® grade matrix**		
-	ICP nitric acid calibration blank ARISTAR®: HNO_3 5% in H_2O	Water	500	456484N
Multi-element quality control/calibration standards for ICP				
3	K 10000 mg/L, Li 250 mg/L, Na 1000 mg/L	HNO_3 2%	100	456462H
4	1000 mg/L: Ba, Ca, Mg, Sr	HNO_3 2%	100	456472J
7	Ag 50 mg/L, Al, B, Ba, Na at 100 mg/L, K at 1000 mg/L, Si 500 mg/	HNO_3 5%, HF traces	100	456432B
			500	456434D
9	100 mg/L: Au, Ir, Os, Pd, Pt, Rh, Ru, Sn, Te	HCl 10%	100	84792.18
15	100 mg/L: Al, Ba, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Ni, Na, Ti, Zn	HNO_3 5%	100	456442D
			500	456444F
19	Ag, Ni 50 mg/L, Al 100 mg/L, B, Fe 15 mg/L, Ba, Mn 5 mg/L, Be, Sr 1 mg/L, Bi, In, Pb 200 mg/L, Cd, Co, Cu, Zn 20 mg/L, Cr 25 mg/L, Ga 150 mg/L, Tl 40 mg/L	HNO_3 5%	100	456452F
21	100 mg/L: Al, As, B, Ca, Cd, Cr, Co, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, Pb, P, Ti, Zn, Si, S	HNO_3 5%	100	89166.180
21	1000 mg/L: Ag, As, Al, B, Ba, Bi, Cd, Co, Cr, Cu, Fe, Ga, In, Li, Mn, Ni, Pb, Sr, Tl, Zn, Si	HNO_3 4%	100	87629.180
22	10 mg/L: As, Ba, Be, Cd, Co, Cr, Cu, Fe, Al, Mn, Mo, Ni, Pb, Sb, Se, Sn, Ti, Tl, V, U, Te, Zn	HNO_3 5%	50	88724.150
23	100 mg/L: As, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Li, Mg, Mn, Mo, Ni, Pb, Sb, Se, Sr, Ti, Tl, V, Zn	HNO_3 5%	100	84790.180
23	100 mg/L: As, Be, Ca, Cd, Co, Cr, Cu, Fe, Li, Mg, Mn, Mo, Ni, P, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn	HNO_3 5%, HF traces	100	456422W
			500	456424B
23	1000 mg/L: Ag, Al, B, Ba, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, In, K, Li, Mg, Mn, Na, Ni, Pb, Sr, Tl, Zn	HNO_3 5%	100	85025.180
28	1 mg/L: Al, Ag, As, B, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Sr, Ti, Tl, V, Zn	HNO_3 2%	100	5200.185
28	100 mg/L: Al, Ag, As, B, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Sr, Ti, Tl, V, Zn	HNO_3 2%	100	85006.186
32	100 mg/L: Ag, Al, Ba, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, Ge, In, K, Li, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Re, Sb, Si, Sn, Ta, Ti, V, W, Zn	HNO_3 5%	100	89186.180
33	100 mg/L: Al, Ag, As, B, Ba, Be, Bi, Ca, Cd, Cs, Co, Cr, Cu, Fe, In, K, Li, Mg, Mn, Mo, Na, Ni, Nb, Pb, Rb, Sb, Se, Sr, Ti, Tl, V, U, Zn	HNO_3 5%	100	84791.180
24	100 mg/L each of Al; B; Ba; Be; Bi; Ca; Cd; Co; Cr; Cu; Fe; Ga; K; Li; Mg; Mn; Na; N ; Pb; Se; Sr; Te; Tl; Zn	HNO_3 2%	100	87047.180
9	100 mg/L each of As; Be; Pb; Cd; Cr; Ni; Hg; Se; Tl HNO_3 5%		100	87048.180
23	As 50 µ/l; B 100 µ/l; Ba 50 µ/l; Be 20 µ/l; Bi 10 µ/l; Ca 35000 µ/l; Cd 20 µ/l; Co 25 µ/l; Cr 20 µ/l; Cu 20 µ/l; Fe 100 µ/l; K 3000 µ/l; Mg 15000 µ/l; Mn 30 µ/l; Mo 100 µ/l; Na 8000 µ/l; Ni 50 µ/l; Pb 25 µ/l; Se 10 µ/l; Sr 100 µ/l; Tl 10 µ/l; V 50 µ/l; Zn 50 µ/l	HNO_3 5%	100	87044.180
7	Cd 10 mg/L; Cr 900 mg/L; Cu 800 mg/L; Ni 200 mg/L; Pb 900 mg/L; Zn 2500 mg/L; Hg 8 mg/L	HNO_3 5%	100	87046.180
15	500 mg/L Al; 250 mg/L V; 100 mg/L As, Be, Co, Cr, Cu, Fe, Mn, Ni, Pb, Zn; 25 mg/L Cd, Se; 5 mg/L Hg;	HNO_3 5%	100	87045.180
7	100 mg/L each of Hf; Ir; Sb; Sn; Ta; Ti; Zr	HCl/tr. HF/tr.HNO_3 15%	100	87049.180
Multi-element quality control standards for ICP-MS				
9	100 mg/L: Be, I, Bi, Li, Cr, Mg, Co, Pb, U	HNO_3 5%	250	88175.230
9	10 mg/L: Be, Bi, Ce, Co, In, Pb, Mg, Ni, U	HNO_3 2%	100	456592Q
12	10 mg/L: Hf, Ge, Mo, Nb, Sb, Si, Sn, Ta, Te, Ti, W, Zr	HNO_3 2%, HF traces	100	84794.180
12	10 mg/L: B, Ge, Mo, Nb, P, Re, S, Si, Ta, Ti, W, Zr	Water	100	456522C
17	10 mg/L: Ce, Dy, Er, Eu, Gd, Ho, La, Lu, Nd, Pr, Sc, Sm, Tb, Th, Tm, Y, Yb	HNO_3 5%	100	456622F
25	10 mg/L: Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Th, Tl, U, V, Zn	HNO_3 5%	100	456602B
29	10 mg/L: Ag, Al, As, Ba, Be, Bi, Ca, Cd, Co, Cr, Cs, Cu, Fe, Ga, In, K, Li, Mg, Mn, Na, Ni, P, Rb, Se, Sr, Tl, U, V, ZN	HNO5 5%	100	456502V
30	1000 mg/L: As, B, Be, Fe, Se, Zn at 100 mg/L, Ba, Bi, Cd, Co, Cr, Cu, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Rb, Sr, Te, Ti, U, V at 10 mg/L,Ca	HNO_3 2%, HF traces	100	85026.180
36	10 mg/L: Al, Ag, As, B, Ba, Ca, Cd, Ce, Co, Cr, Cu, Dy, Er, Eu, Fe, Gd, Ho, K, La, Li, Lu, Mg, Mn, Na, Nd, Ni, P, Pb, Rb, Se, Sm, Sr, Tl, Tm, V, Zn	HNO_3 2%	100	84793.180
ICP-MS Tuning solutions				
8	100 mg/L: Ba, Be, Cu, In, Li, Mg, Tl, U	HNO_3 2%	100	456532E
13	100 mg/L: Ba, Be, Bi, Ce, Cu, Ho, In, Li, Mg, Pb, Tl, U, Y	HNO_3 2%	100	456542G
ICP-MS interference check				
11	Ag, C, Cr, Cu, Mn, Ni, V at 20 mg/L, As, Cd, Se, Zn at 10 mg/L	HNO_3 1%	100	456562K
12	Cl 18000 mg/L: Al, K, Mg, P, S 1000 mg/L, C 2000 mg/L, Ca 3000 mg/L, Fe, Na 2500 mg/L, Mo, Ti 20 mg/L	HNO_3 1%	100	456552Y

IC STANDARDS, ARISTAR®

Ion chromatography (IC) is used in many different industries such as food and beverage, environmental, life sciences, pharmaceutical, power generation, electronics and many more. The large number of applications include analytes like inorganic anions and cations, organic acids, carbohydrates, amino acids, proteins, fatty acids, polysaccharides, polyphosphates, surfactants and more.

- High quality
- Complete range of 52 elements
- Available in 100 ml and also in 500 ml packs for the most commonly used materials
- Certificate of Analysis delivered with the product in individual packaging
- Traceability to NIST
- Control lab accreditated to ISO EN 17034 and ISO EN 17025

Please note all products are 1000 mg/L in water unless otherwise stated.

Description	Cat. No. Pk 100 ml	Cat. No. Pk 500 ml
Acetate	84951.180	-
Ammonium	84952.180	84952.260
Ammonium (in N)	84953.180	84953.260
Barium	84954.180	-
Benzoate	84955.180	-
Bromate	84956.180	-
Bromide	84957.180	84957.260
Calcium	84958.180	-
Cesium	84959.180	-
Chlorate	84960.180	-
Chlorite 1000 mg/L in NaOH solution	84961.180	-
Chloride	84962.180	84962.260
Chromate (in Cr VI)	84963.180	-
Citrate water	84965.180	-
Fluoride	84966.180	84966.260
Formate	84967.180	-
Glycolate	84968.180	-
Hydrogenophthalate	84969.180	-
Hydrogenosulphite	84970.180	-
Iodate	84971.180	-
Iodide	84972.180	84972.260
Lactate	84973.180	-
Lithium	84974.180	-
Magnesium	84975.180	84975.260
Maleate	84976.180	-
Methane sulphonate	84977.180	-
3-Methoxypropylamine	84978.180	-

Description	Cat. No. Pk 100 ml	Cat. No. Pk 500 ml
Monoethanolamine	84979.180	-
Monomethylamine	84980.180	-
Nitrate	84981.180	84981.260
Nitrate (in N)	84982.180	84982.260
Nitrilotriacetate	84983.180	-
Nitrite	84984.180	84984.260
Nitrite (in N)	84985.180	84985.260
Oxalate	84986.180	-
Perchlorate	84987.180	-
Phosphate	84988.180	84988.260
Phosphate (in P)	84989.180	84989.260
Potassium	84990.180	84990.260
Propionate	84991.180	-
Silicate	84992.180	-
Sodium	84993.180	84993.260
Strontium	84994.180	-
Succinate	84995.180	-
Sulphate	84996.180	84996.260
Sulphite (in HSO_3-)	84997.180	84997.260
Tartrate	84998.180	-
Thiocyanate	84999.180	-
Thiosulphate 1000 mg/L in amylic alcohol	85000.180	-
Triethanolamine	85001.180	-
Triethylamine	85002.180	-
Trimetylamine	85003.180	-

MULTI-ELEMENT STANDARDS, ANIONIC, FOR ION CHROMATOGRAPHY, ARISTAR®

- Traceable to NIST
- Manufactured and tested under ISO EN 17034 and ISO EN 17025 accredited facilities
- Supplied with a Certificate of Analysis

Description	Contents	Concentration	Pk	Cat. No
IC anion multi-element standard solution I	F,Br, PO_4 at 1000 mg/L each	1000 mg/L	500 ml	87037.260
IC anion multi-element standard solution II	Cl, NO_4, SO_4 at 1000 mg/L each	1000 mg/L	500 ml	87038.260
IC multi-element standard solution I	F 100mg/L, Cl 250 mg/L, NO_3 and SO_4 500 mg/L, PO_4 1000 mg/L	100 - 1000 mg/L	500 ml	87039.260
IC multi-element standard solution V	F and Br 10 mg/L, NO_3 andv PO_4 50 mg/L, Cl 100 mg/L and SO_4 200 mg/L	10 - 200 mg/L	100 ml	87040.180

MULTI-ELEMENT STANDARDS, CATIONIC FOR ION CHROMATOGRAPHY, ARISTAR®

- Traceable to NIST
- Manufactured and tested in ISO EN 17034 and ISO EN 17025 accredited facilities
- Supplied with a Certificate of Analysis
- Ion chromatography cation multi-element standard solution VII, ARISTAR® (100 mg/L: Li, Na, K, NH_4, Mn, Ca, Mg, Sr, Ba in 0.1% HNO_3)

Description	Concentration	Pk	Cat. No
Ion chromatography cation multi-element standard solution VII	100 mg/L: Ba_2+, Ca_2+, K+, Li+, Mg_2+, Mn_2+, Na+, NH_4+, Sr_2+	100 ml	87041.180
Ion chromatography cation multi-element standard solution VI	100 mg/L: NH_4 10, K 50, Na, Ca and Mg 100 mg/L	100 ml	87042.180

SULPHUR, CERTIFIED REFERENCE MATERIALS, IN LIGHT MINERAL OIL

Sulphur CRMs are suitable for calibration, verification or for use in quality control procedures used for analysing sulphur content in petroleum products.

- Certified in strict accordance to ISO 17025 and ISO 17034 under UKAS accreditation
- Highest level of accreditation guarantee, providing the most credible certified data available worldwide
- Suitable for but not limited to internationally recognised test methods and protocols: ASTM D2622, ASTM D3120, ASTM D4294, ASTM D5453, ASTM D7039, IP 336, IP 496, IP 497
- Fully traceable to International Standards and low levels of uncertainty achieves maximum accuracy of data
- Supplied in 100 ml volume, tamper-evident glass packaging, providing assurance of sample integrity

Quantitative analysis of sulphur in crude oil, petroleum products and feedstock is extremely important to ensure compliance with regulatory bodies and legislation, failure to do so can result in costly fines. Analysis techniques for sulphur content measurement include wet chemistry, X-ray fluorescence, atomic spectroscopy and various thermal combustion methods with different detection limits. Regardless of the technique employed for measurement, robust analytical data is paramount, calibration and/or verification.

Convenient sets, are available for different testing criteria.

UKAS ISO 17025 & ISO 17034

Description	Concentration	Pk	Cat. No.
Sulphur in light mineral oil	0,0005% (5ppm)	100 ml	**99187.180**
Sulphur in light mineral oil	0,0010% (10ppm)	100 ml	**99188.180**
Sulphur in light mineral oil	0,0025% (25ppm)	100 ml	**99189.180**
Sulphur in light mineral oil	0,0050% (50ppm)	100 ml	**99190.180**
Sulphur in light mineral oil	0,0100% (100ppm)	100 ml	**99191.180**
Sulphur in light mineral oil	0,0250% (250ppm)	100 ml	**99192.180**
Sulphur in light mineral oil	0,0300% (300ppm)	100 ml	**99193.180**
Sulphur in light mineral oil	0,0500% (500ppm)	100 ml	**99194.180**
Sulphur in light mineral oil	0,0700% (700ppm)	100 ml	**99195.180**
Sulphur in light mineral oil	0,0750% (750ppm)	100 ml	**99196.180**
Sulphur in light mineral oil	0,1000% (1000ppm)	100 ml	**99197.180**

Description	Concentration	Pk	Cat. No.
Sulphur in light mineral oil	0,2500% (2500ppm)	100 ml	**99198.180**
Sulphur in light mineral oil	0,3000% (3000ppm)	100 ml	**99199.180**
Sulphur in light mineral oil	0,5000% (5000ppm)	100 ml	**99200.180**
Sulphur in light mineral oil	1,0000% (10000ppm)	100 ml	**99201.180**
Sulphur in light mineral oil	1,5000% (15000ppm)	100 ml	**99202.180**
Sulphur in light mineral oil	2,0000% (20000ppm)	100 ml	**99203.180**
Sulphur in light mineral oil	3,0000% (30000ppm)	100 ml	**99204.180**
Sulphur in light mineral oil	4,0000% (40000ppm)	100 ml	**99205.180**
Sulphur in light mineral oil	5,0000% (50000ppm)	100 ml	**99206.180**
Sulphur in light mineral oil	0% (0 ppm) / Blank	100 ml	**99207.180**

Description	Concentration	Test method	Packed	Pk	Cat. No.
Sulphur in light mineral oil, calibration set A	Blank, 5 ppm, 10 ppm, 100 ppm, 250 ppm, 500 ppm, 750 ppm, 1000 ppm	ASTM D2622	8x100 ml	1 SET	**99250.001**
Sulphur in light mineral oil, calibration set B	1000 ppm, 2500 ppm, 5000 ppm,10000 ppm	ASTM D2622	4x100 ml	1 SET	**99251.001**
Sulphur in light mineral oil, calibration set C	10000 ppm, 20000 ppm, 30000 ppm, 40000 ppm, 50000 ppm	ASTM D2622	5x100 ml	1 SET	**99252.001**
Sulphur in light mineral oil, calibration set A	Blank, 5 ppm, 10 ppm, 100 ppm, 250 ppm, 500 ppm, 750 ppm, 1000 ppm	ASTM D4294	8x100 ml	1 SET	**99256.001**
Sulphur in light mineral oil, calibration set B	1000 ppm, 2500 ppm, 5000 ppm, 10000 ppm	ASTM D4294	4x100 ml	1 SET	**99257.001**
Sulphur in light mineral oil, calibration set C	10000 ppm, 20000 ppm, 30000 ppm, 40000 ppm, 50000 ppm	ASTM D4294	5x100 ml	1 SET	**99258.001**
Sulphur in light mineral oil, calibration set A	Blank, 5 ppm, 50 ppm, 250 ppm, 500 ppm	ASTM D7039	5x100 ml	1 SET	**99262.001**
Sulphur in light mineral oil, calibration set B	Blank, 25 ppm, 100 ppm, 500 ppm, 1000 ppm, 3000 ppm	ASTM D7039	6x100 ml	1 SET	**99263.001**
Sulphur in light mineral oil, calibration set A	Blank, 5 ppm, 10 ppm, 25 ppm, 50 ppm	ASTM D7220	5x100 ml	1 SET	**99266.001**
Sulphur in light mineral oil, calibration set B	50 ppm, 100 ppm, 250 ppm, 500 ppm, 750 ppm, 1000 ppm	ASTM D7220	6x100 ml	1 SET	**99267.001**
Sulphur in light mineral oil, calibration set A	Blank, 300 ppm, 500 ppm, 700 ppm, 1000 ppm	IP 336	5x100 ml	1 SET	**99270.001**
Sulphur in light mineral oil, calibration set B	Blank, 1000 ppm, 3000 ppm, 5000 ppm	IP 336	4x100ml	1 SET	**99271.001**
Sulphur in light mineral oil, calibration set C	5000 ppm, 10000 ppm, 15000 ppm, 20000 ppm	IP 336	4x100ml	1 SET	**99272.001**
Sulphur in light mineral oil, calibration set D	20000 ppm, 30000 ppm, 40000 ppm, 50000 ppm	IP 336	4x100 ml	1 SET	**99273.001**
Sulphur in light mineral oil, calibration set E	Blank, 300 ppm, 500 ppm, 700 ppm, 1000 ppm, 3000 ppm, 5000 ppm	IP 336	7x100 ml	1 SET	**99274.001**
Sulphur in light mineral oil, calibration set F	5000 ppm, 10000 ppm, 15000 ppm, 20000 ppm, 30000 ppm, 40000 ppm, 50000 ppm	IP 336	7x100 ml	1 SET	**99275.001**
Sulphur in light mineral oil, calibration set A	Blank, 100 ppm, 300 ppm, 500 ppm, 700 ppm, 1000 ppm	IP 496	6x100 ml	1 SET	**99282.001**
Sulphur in light mineral oil, calibration set A	Blank, 50 ppm, 100 ppm, 250 ppm, 300 ppm, 500 ppm	IP 497	6x100 ml	1 SET	**99284.001**

SULPHUR, CERTIFIED REFERENCE MATERIALS, IN HEAVY MINERAL OIL

Sulphur CRMs are suitable for calibration, verification or for use in quality control procedures used for analysing sulphur content in petroleum products.

- Certified in strict accordance to ISO 17025 and ISO 17034 under UKAS accreditation
- Highest level of accreditation guarantee, providing the most credible certified data available worldwide
- Suitable for but not limited to internationally recognised test methods and protocols: ASTM D2622, ASTM D3120, ASTM D4294, ASTM D5453, ASTM D7039, IP 336, IP 496, IP 497
- Fully traceable to International Standards and low levels of uncertainty achieves maximum accuracy of data
- Supplied in 100 ml volume, tamper-evident glass packaging, providing assurance of sample integrity

Quantitative analysis of sulphur in crude oil, petroleum products and feedstock is extremely important to ensure compliance with regulatory bodies and legislation, failure to do so can result in costly fines. Analysis techniques for sulphur content measurement include wet chemistry, X-ray fluorescence, atomic spectroscopy and various thermal combustion methods with different detection limits. Regardless of the technique employed for measurement, robust analytical data is paramount, calibration and/or verification.

Convenient sets, are available for different testing criteria.

UKAS ISO 17025 & ISO 17034

New Standards for Petrochemistry brochure

Description	Concentration	Pk	Cat. No.
Sulphur in heavy mineral oil	0,0005% (5 ppm)	100 ml	**99208.180**
Sulphur in heavy mineral oil	0,0010% (10 ppm)	100 ml	**99209.180**
Sulphur in heavy mineral oil	0,0025% (25 ppm)	100 ml	**99210.180**
Sulphur in heavy mineral oil	0,0050% (50 ppm)	100 ml	**99211.180**
Sulphur in heavy mineral oil	0,0100% (100 ppm)	100 ml	**99212.180**
Sulphur in heavy mineral oil	0,0250% (250 ppm)	100 ml	**99213.180**
Sulphur in heavy mineral oil	0,0300% (300 ppm)	100 ml	**99214.180**
Sulphur in heavy mineral oil	0,0500% (500 ppm)	100 ml	**99215.180**
Sulphur in heavy mineral oil	0,0700% (700 ppm)	100 ml	**99216.180**
Sulphur in heavy mineral oil	0,0750% (750 ppm)	100 ml	**99217.180**
Sulphur in heavy mineral oil	0,1000% (1000 ppm)	100 ml	**99218.180**

Description	Concentration	Pk	Cat. No.
Sulphur in heavy mineral oil	0,2500% (2500 ppm)	100 ml	**99219.180**
Sulphur in heavy mineral oil	0,3000% (3000 ppm)	100 ml	**99220.180**
Sulphur in heavy mineral oil	0,5000% (5000 ppm)	100 ml	**99221.180**
Sulphur in heavy mineral oil	1,0000% (10000 ppm)	100 ml	**99222.180**
Sulphur in heavy mineral oil	1,5000% (15000 ppm)	100 ml	**99223.180**
Sulphur in heavy mineral oil	2,0000% (20000 ppm)	100 ml	**99224.180**
Sulphur in heavy mineral oil	3,0000% (30000 ppm)	100 ml	**99225.180**
Sulphur in heavy mineral oil	4,0000% (40000 ppm)	100 ml	**99226.180**
Sulphur in heavy mineral oil	5,0000% (50000 ppm)	100 ml	**99227.180**
Sulphur in heavy mineral oil	0% (0 ppm) / Blank	100 ml	**99228.180**

Description	Concentration	Test method	Packed	Pk	Cat. No.
Sulphur in heavy mineral oil, calibration set A	Blank, 5 ppm, 10 ppm, 100 ppm, 250 ppm, 500 ppm, 750 ppm, 1000 ppm	ASTM D2622	8x100 ml	1 SET	**99253.001**
Sulphur in heavy mineral oil, calibration set B	1000 ppm, 2500 ppm, 5000 ppm,10000 ppm	ASTM D2622	4x100 ml	1 SET	**99254.001**
Sulphur in heavy mineral oil, calibration set C	10000 ppm, 20000 ppm, 30000 ppm, 40000 ppm, 50000 ppm	ASTM D2622	5x100 ml	1 SET	**99255.001**
Sulphur in heavy mineral oil, calibration set A	Blank, 5 ppm, 10 ppm, 100 ppm, 250 ppm, 500 ppm, 750 ppm, 1000 ppm	ASTM D4294	8x100 ml	1 SET	**99259.001**
Sulphur in heavy mineral oil, calibration set B	1000 ppm, 2500 ppm, 5000 ppm, 10000 ppm	ASTM D4294	4x100 ml	1 SET	**99260.001**
Sulphur in heavy mineral oil, calibration set C	10000 ppm, 20000 ppm, 30000 ppm, 40000 ppm, 50000 ppm	ASTM D4294	5x100 ml	1 SET	**99261.001**
Sulphur in heavy mineral oil, calibration set A	Blank, 5 ppm, 50 ppm, 250 ppm, 500 ppm	ASTM D7039	5x100 ml	1 SET	**99264.001**
Sulphur in heavy mineral oil, calibration set B	Blank, 25 ppm, 100 ppm, 500 ppm, 1000 ppm, 3000 ppm	ASTM D7039	6x100 ml	1 SET	**99265.001**
Sulphur in heavy mineral oil, calibration set A	Blank, 5 ppm, 10 ppm, 25 ppm, 50 ppm	ASTM D7220	5x100 ml	1 SET	**99268.001**
Sulphur in heavy mineral oil, calibration set B	50 ppm, 100 ppm, 250 ppm, 500 ppm, 750 ppm, 1000 ppm	ASTM D7220	6x100 ml	1 SET	**99269.001**
Sulphur in heavy mineral oil, calibration set A	Blank, 300 ppm, 500 ppm, 700 ppm, 1000 ppm	IP 336	5x100 ml	1 SET	**99276.001**
Sulphur in heavy mineral oil, calibration set B	Blank, 1000 ppm, 3000 ppm, 5000 ppm	IP 336	4x100ml	1 SET	**99277.001**
Sulphur in heavy mineral oil, calibration set C	5000 ppm, 10000 ppm, 15000 ppm, 20000 ppm	IP 336	4x100ml	1 SET	**99278.001**
Sulphur in heavy mineral oil, calibration set D	20000 ppm, 30000 ppm, 40000 ppm, 50000 ppm	IP 336	4x100 ml	1 SET	**99279.001**
Sulphur in heavy mineral oil, calibration set E	Blank, 300 ppm, 500 ppm, 700 ppm, 1000 ppm, 3000 ppm, 5000 ppm	IP 336	7x100 ml	1 SET	**99280.001**
Sulphur in heavy mineral oil, calibration set F	5000 ppm, 10000 ppm, 15000 ppm, 20000 ppm, 30000 ppm, 40000 ppm, 50000 ppm	IP 336	7x100 ml	1 SET	**99281.001**
Sulphur in heavy mineral oil, calibration set A	Blank, 100 ppm, 300 ppm, 500 ppm, 700 ppm, 1000 ppm	IP 496	6x100 ml	1 SET	**99283.001**
Sulphur in heavy mineral oil, calibration set A	Blank, 50 ppm, 100 ppm, 250 ppm, 300 ppm, 500 ppm	IP 497	6x100 ml	1 SET	**99285.001**

SULPHUR, CERTIFIED REFERENCE MATERIALS, IN SYNTHETIC DIESEL

CRMs are suitable for calibration, verification or for use in quality control procedures used for analysing sulphur content in petroleum products.

- Certified in strict accordance to ISO 17025 and ISO 17034 under UKAS accreditation
- Highest level of accreditation guarantee, providing the most credible certified data available worldwide
- Suitable for but not limited to internationally recognised test methods and protocol: ASTM D2622, ASTM D3120, ASTM D4294, ASTM D5453, ASTM D7039, IP 336, IP 496, IP 497
- Fully traceable to International Standards and low levels of uncertainty achieves maximum accuracy of data
- Supplied in 100 ml volume, tamper-evident glass packaging, providing assurance of sample integrity

Quantitative analysis of sulphur in crude oil, petroleum products and feedstock is extremely important to ensure compliance with regulatory bodies and legislation, failure to do so can result in costly fines. Analysis techniques for Sulfur content measurement include wet chemistry, X-ray fluorescence, atomic spectroscopy and various thermal combustion methods with different detection limits. Regardless of the technique employed for measurement, robust analytical data is paramount, calibration and/or verification.

Convenient sets, are available for different testing criteria.

UKAS ISO 17025 & ISO 17034

Description	Concentration	Pk	Cat. No.
Sulphur in synthetic diesel	0,0005% (5 ppm)	100 ml	**99229.180**
Sulphur in synthetic diesel	0,0010% (10 ppm)	100 ml	**99230.180**
Sulphur in synthetic diesel	0,0025% (25 ppm)	100 ml	**99231.180**
Sulphur in synthetic diesel	0,0050% (50 ppm)	100 ml	**99232.180**
Sulphur in synthetic diesel	0,0100% (100 ppm)	100 ml	**99233.180**
Sulphur in synthetic diesel	0,0250% (250 ppm)	100 ml	**99234.180**
Sulphur in synthetic diesel	0,0300% (300 ppm)	100 ml	**99235.180**
Sulphur in synthetic diesel	0,0500% (500 ppm)	100 ml	**99236.180**
Sulphur in synthetic diesel	0,0700% (700 ppm)	100 ml	**99237.180**
Sulphur in synthetic diesel	0,0750% (750 ppm)	100 ml	**99238.180**
Sulphur in synthetic diesel	0,1000% (1000 ppm)	100 ml	**99239.180**

Description	Concentration	Pk	Cat. No.
Sulfur in synthetic diesel	0,2500% (2500 ppm)	100 ml	**99240.180**
Sulfur in synthetic diesel	0,3000% (3000 ppm)	100 ml	**99241.180**
Sulfur in synthetic diesel	0,5000% (5000 ppm)	100 ml	**99242.180**
Sulfur in synthetic diesel	1,0000% (10000 ppm)	100 ml	**99243.180**
Sulfur in synthetic diesel	1,5000% (15000 ppm)	100 ml	**99244.180**
Sulfur in synthetic diesel	2,0000% (20000 ppm)	100 ml	**99245.180**
Sulfur in synthetic diesel	3,0000% (30000 ppm)	100 ml	**99246.180**
Sulfur in synthetic diesel	4,0000% (40000 ppm)	100 ml	**99247.180**
Sulfur in synthetic diesel	5,0000% (50000 ppm)	100 ml	**99248.180**
Sulfur in synthetic diesel	0% (0 ppm) / Blank	100 ml	**99249.180**

Description	Concentration	Test method	Packed	Pk	Cat. No.
Sulphur in synthetic diesel, calibration set A	Blank, 5 ppm, 10 ppm, 100 ppm, 250 ppm, 500 ppm, 750 ppm, 1000 ppm	ASTM D2622	8x100 ml	1 SET	**99286.001**
Sulphur in synthetic diesel, calibration set B	1000 ppm, 2500 ppm, 5000 ppm,10000 ppm	ASTM D2622	4x100 ml	1 SET	**99287.001**
Sulphur in synthetic diesel, calibration set C	10000 ppm, 20000 ppm, 30000 ppm, 40000 ppm, 50000 ppm	ASTM D2622	5x100 ml	1 SET	**99288.001**
Sulphur in synthetic diesel, calibration set A	Blank, 5 ppm, 10 ppm, 100 ppm, 250 ppm, 500 ppm, 750 ppm, 1000 ppm	ASTM D4294	8x100 ml	1 SET	**99289.001**
Sulphur in synthetic diesel, calibration set B	1000 ppm, 2500 ppm, 5000 ppm, 10000 ppm	ASTM D4294	4x100 ml	1 SET	**99290.001**
Sulphur in synthetic diesel, calibration set C	10000 ppm, 20000 ppm, 30000 ppm, 40000 ppm, 50000 ppm	ASTM D4294	5x100 ml	1 SET	**99291.001**
Sulphur in synthetic diesel, calibration set A	Blank, 5 ppm, 50 ppm, 250 ppm, 500 ppm	ASTM D7039	5x100 ml	1 SET	**99292.001**
Sulphur in synthetic diesel, calibration set B	Blank, 25 ppm, 100 ppm, 500 ppm, 1000 ppm, 3000 ppm	ASTM D7039	6x100 ml	1 SET	**99293.001**
Sulphur in synthetic diesel, calibration set A	Blank, 5 ppm, 10 ppm, 25 ppm, 50 ppm	ASTM D7220	5x100 ml	1 SET	**99294.001**
Sulphur in synthetic diesel, calibration set B	50 ppm, 100 ppm, 250 ppm, 500 ppm, 750 ppm, 1000 ppm	ASTM D7220	6x100 ml	1 SET	**99295.001**
Sulphur in synthetic diesel, calibration set A	Blank, 300 ppm, 500 ppm, 700 ppm, 1000 ppm	IP 336	5x100 ml	1 SET	**99296.001**
Sulphur in synthetic diesel, calibration set B	Blank, 1000 ppm, 3000 ppm, 5000 ppm	IP 336	4x100 ml	1 SET	**99297.001**
Sulphur in synthetic diesel, calibration set C	5000 ppm, 10000 ppm, 15000 ppm, 20000 ppm	IP 336	4x100 ml	1 SET	**99298.001**
Sulphur in synthetic diesel, calibration set D	20000 ppm, 30000 ppm, 40000 ppm, 50000 ppm	IP 336	4x100 ml	1 SET	**99299.001**
Sulphur in synthetic diesel, calibration set E	Blank, 300 ppm, 500 ppm, 700 ppm, 1000 ppm, 3000 ppm, 5000 ppm	IP 336	7x100 ml	1 SET	**99300.001**
Sulphur in synthetic diesel, calibration set F	5000 ppm, 10000 ppm, 15000 ppm, 20000 ppm, 30000 ppm, 40000 ppm, 50000 ppm	IP 336	7x100 ml	1 SET	**99301.001**
Sulphur in synthetic diesel, calibration set A	Blank, 100 ppm, 300 ppm, 500 ppm, 700 ppm, 1000 ppm	IP 496	6x100 ml	1 SET	**99302.001**
Sulphur in synthetic diesel, calibration set A	Blank, 50 ppm, 100 ppm, 250 ppm, 300 ppm, 500 ppm	IP 497	6x100 ml	1 SET	**99303.001**

SULPHUR, CERTIFIED REFERENCE MATERIALS, IN ODOURLESS KEROSENE

Sulphur CRMs are suitable for calibration, verification or for use in quality control procedures used for analysing sulphur content in petroleum products.

- Certified in strict accordance to ISO 17025 and ISO 17034 under UKAS accreditation
- Highest level of accreditation guarantee, providing the most credible certified data available worldwide
- Suitable for but not limited to internationally recognised test methods and protocol: ASTM D2622, ASTM D3120, ASTM D4294, ASTM D5453, ASTM D7039, IP 336, IP 496, IP 497
- Fully traceable to International Standards and low levels of uncertainty achieves maximum accuracy of data
- Supplied in 100 ml volume, tamper-evident glass packaging, providing assurance of sample integrity

Quantitative analysis of sulphur in crude oil, petroleum products and feedstock is extremely important to ensure compliance with regulatory bodies and legislation, failure to do so can result in costly fines. Analysis techniques for sulphur content measurement include wet chemistry, X-ray fluorescence, atomic spectroscopy and various thermal combustion methods with different detection limits. Regardless of the technique employed for measurement, robust analytical data is paramount, calibration and/or verification.

Convenient sets, are available for different testing criteria.

UKAS ISO 17025 & ISO 17034

New standards for Petrochemistry brochure

Description	Concentration	Pk	Cat. No.
Sulphur in odourless kerosene	0,0005% (5 ppm)	100 ml	**99304.180**
Sulphur in odourless kerosene	0,0010% (10 ppm)	100 ml	**99305.180**
Sulphur in odourless kerosene	0,0025% (25 ppm)	100 ml	**99306.180**
Sulphur in odourless kerosene	0,0050% (50 ppm)	100 ml	**99307.180**
Sulphur in odourless kerosene	0,0100% (100 ppm)	100 ml	**99308.180**
Sulphur in odourless kerosene	0,0250% (250 ppm)	100 ml	**99309.180**
Sulphur in odourless kerosene	0,0300% (300 ppm)	100 ml	**99310.180**
Sulphur in odourless kerosene	0,0500% (500 ppm)	100 ml	**99311.180**
Sulphur in odourless kerosene	0,0700% (700 ppm)	100 ml	**99312.180**
Sulphur in odourless kerosene	0,0750% (750 ppm)	100 ml	**99313.180**
Sulphur in odourless kerosene	0,1000% (1000 ppm)	100 ml	**99314.180**

Description	Concentration	Pk	Cat. No.
Sulphur in odourless kerosene	0,2500% (2500 ppm)	100 ml	**99315.180**
Sulphur in odourless kerosene	0,3000% (3000 ppm)	100 ml	**99316.180**
Sulphur in odourless kerosene	0,5000% (5000 ppm)	100 ml	**99317.180**
Sulphur in odourless kerosene	1,0000% (10000 ppm)	100 ml	**99318.180**
Sulphur in odourless kerosene	1,5000% (15000 ppm)	100 ml	**99319.180**
Sulphur in odourless kerosene	2,0000% (20000 ppm)	100 ml	**99320.180**
Sulphur in odourless kerosene	3,0000% (30000 ppm)	100 ml	**99321.180**
Sulphur in odourless kerosene	4,0000% (40000 ppm)	100 ml	**99322.180**
Sulphur in odourless kerosene	5,0000% (50000 ppm)	100 ml	**99323.180**
Sulphur in odourless kerosene	0% (0 ppm) / Blank	100 ml	**99324.180**

Description	Concentration	Test method	Packed	Pk	Cat. No.
Sulphur in kerosene (odourless), calibration set A	Blank, 5 ppm, 10 ppm, 100 ppm, 250 ppm, 500 ppm, 750 ppm, 1000 ppm	ASTM D2622	8x100 ml	1 SET	**99325.001**
Sulphur in kerosene (odourless), calibration set B	1000 ppm, 2500 ppm, 5000 ppm,10000 ppm	ASTM D2622	4x100 ml	1 SET	**99326.001**
Sulphur in kerosene (odourless), calibration set C	10000 ppm, 20000 ppm, 30000 ppm, 40000 ppm, 50000 ppm	ASTM D2622	5x100 ml	1 SET	**99327.001**
Sulphur in kerosene (odourless), calibration set A	Blank, 5 ppm, 10 ppm, 100 ppm, 250 ppm, 500 ppm, 750 ppm, 1000 ppm	ASTM D4294	8x100 ml	1 SET	**99328.001**
Sulphur in kerosene (odourless), calibration set B	1000 ppm, 2500 ppm, 5000 ppm, 10000 ppm	ASTM D4294	4x100 ml	1 SET	**99329.001**
Sulphur in kerosene (odourless), calibration set C	10000 ppm, 20000 ppm, 30000 ppm, 40000 ppm, 50000 ppm	ASTM D4294	5x100 ml	1 SET	**99330.001**
Sulphur in kerosene (odourless), calibration set A	Blank, 5 ppm, 50 ppm, 250 ppm, 500 ppm	ASTM D7039	5x100 ml	1 SET	**99331.001**
Sulphur in kerosene (odourless), calibration set B	Blank, 25 ppm, 100 ppm, 500 ppm, 1000 ppm, 3000 ppm	ASTM D7039	6x100 ml	1 SET	**99332.001**
Sulphur in kerosene (odourless), calibration set A	Blank, 5 ppm, 10 ppm, 25 ppm, 50 ppm	ASTM D7220	5x100 ml	1 SET	**99333.001**
Sulphur in kerosene (odourless), calibration set B	50 ppm, 100 ppm, 250 ppm, 500 ppm, 750 ppm, 1000 ppm	ASTM D7220	6x100 ml	1 SET	**99334.001**
Sulphur in kerosene (odourless), calibration set A	Blank, 300 ppm, 500 ppm, 700 ppm, 1000 ppm	IP 336	5x100 ml	1 SET	**99335.001**
Sulphur in kerosene (odourless), calibration set B	Blank, 1000 ppm, 3000 ppm, 5000 ppm	IP 336	4x100 ml	1 SET	**99336.001**
Sulphur in kerosene (odourless), calibration set C	5000 ppm, 10000 ppm, 15000 ppm, 20000 ppm	IP 336	4x100 ml	1 SET	**99337.001**
Sulphur in kerosene (odourless), calibration set D	20000 ppm, 30000 ppm, 40000 ppm, 50000 ppm	IP 336	4x100 ml	1 SET	**99338.001**
Sulphur in kerosene (odourless), calibration set E	Blank, 300 ppm, 500 ppm, 700 ppm, 1000 ppm, 3000 ppm, 5000 ppm	IP 336	7x100 ml	1 SET	**99339.001**
Sulphur in kerosene (odourless), calibration set F	5000 ppm, 10000 ppm, 15000 ppm, 20000 ppm, 30000 ppm, 40000 ppm, 50000 ppm	IP 336	7x100 ml	1 SET	**99340.001**
Sulphur in kerosene (odourless), calibration set A	Blank, 100 ppm, 300 ppm, 500 ppm, 700 ppm, 1000 ppm	IP 496	6x100 ml	1 SET	**99341.001**
Sulphur in kerosene (odourless), calibration set A	Blank, 50 ppm, 100 ppm, 250 ppm, 300 ppm, 500 ppm	IP 497	6x100 ml	1 SET	**99342.001**

ORGANIC REFERENCE STANDARDS

Organic standards, typically used as a reference material for gas chromatography, across a wide range of applications.

Substance	Concentration	Pk (ml)	Cat. No.
Aroclor 1260 (PCB-mixture, 60% chlorinated)	35 µg/ml in isooctane	1	122732H
Aroclor 1242 (PCB-mixture, 42% chlorinated)	1,000 µg/ml in hexane	1	122792T
Benzo[a]pyrene	50 µg/ml in toluene	1	122932N
Benzene	200 µg/ml in methanol	1	123152U
Bromomethane	200 µg/ml in methanol	1	123472K
Chloroethylene	200 µg/ml in methanol	1	123462Y
Chloroethane	200 µg/ml in methanol	1	123482M
Chlorpyrifos	100 µg/ml in methanol	1	123692U
Diazinon	100 µg/ml in methanol	1	123972C

Substance	Concentration	Pk (ml)	Cat. No.
		1	87345.290
Imidazole	1000 mg/ml in water	100	87345.180
Malathion (1,2-Bis(ethoxycarbonyl) ethyl O,O-dimethyl phosphorodithioate)	100 µg/ml in methanol	1	124312W
Morpholine	1000 mg/l in aqueous solution for ion chromatography	500	87732.260
		5×1	87496.005
		10×1	87496.010
		1×10	87496.011
Stearyl stearate	2,000 µg/ml in hexane	1×1	87496.030

PESTINORM® CRM for GC.

GAS CHROMATOGRAPHY (GC) CERTIFIED REFERENCE STANDARDS (CRMs), PESTINORM®

Due to its excellent separation capacity and its high sensitivity gas chromatography is a widely used technique for analytical purposes. In order to get proper identification and quantification results of the analysed compounds, reference standards are needed. These PESTINORM® reference substances can be used for the characterisation of GC column properties. In addition they may also be used for the identification of unknown compounds in a gas chromatogram or as standards in quantitative GC analysis.

- All products are CRM acc ISO/IEC 17025 and ISO 17034
- All products supplied with a Certificate of Analysis and batch-specific chromatogram
- Assay typically min 99,0% in many cases over 99.5%
- 24 month shelf life

Intended uses:

- For calibration of TLC, GC-FID, GC-TCD, GC-ECD, GC-MS, GC-MS-MS, LC-UV, LC-MS and LC-MS-MS
- Validation of analytical methods
- Preparation of 'working reference samples'
- Detection limit and linearity studies

Description	CAS No.	Pack type	Pk	Cat. No.
1,2,3,4-Tetrahydronaphthalene, PESTINORM® min. 99,0%	119-64-2	Ampoule in a box	5 ml	91070.050
1,2-Dichloroethane, PESTINORM® min. 99,5%	107-06-2	Ampoule in a box	5 g	91049.050
1,4-Dioxane, PESTINORM® min. 99,0%	123-91-1	Ampoule in a box	5 ml	91009.050
1-Butanol, PESTINORM® min. 99,0%	71-36-3	Ampoule in a box	5 ml	91061.050
1-Methyl-2-Pyrrolidone, PESTINORM® min. 99,0%	872-50-4	Ampoule in a box	5 ml	91030.050
1-Propanol, PESTINORM® min. 99,5%	71-23-8	Ampoule in a box	5 ml	91037.050
2-Butanol, PESTINORM® min. 99,0%	78-92-2	Ampoule in a box	5 ml	91062.050
2-Methylbutane, PESTINORM® min. 97,0%	78-78-4	Ampoule in a box	1 ml	91020.010
2-Propanol, PESTINORM® min. 99,5%	67-63-0	Ampoule in a box	5 ml	91038.050
3-Methylheptane, PESTINORM® min. 97,0%	589-81-1	Ampoule in a box	250 mg	91022.001
3-Methylhexane, PESTINORM® min. 95,0%	589-34-4	Ampoule in a box	5 ml	91023.050
4-Methyl-2-pentanone, PESTINORM® min. 99,5%	108-10-1	Ampoule in a box	5 ml	91056.050
Acetone, PESTINORM® min 99,9%	67-64-1	Ampoule in a box	5 ml	91046.050
Acetonitrile, PESTINORM® min 99,9%	75-05-8	Ampoule in a box	5 ml	91047.050
n-Amylalcohol, PESTINORM® min. 99,0%	71-41-0	Ampoule in a box	5 ml	91059.050
Anisole, PESTINORM® min. 99,0%	100-66-3	Ampoule in a box	5 g	91060.050
Benzene, PESTINORM® min. 99,5%	71-43-2	Ampoule in a box	5 ml	91000.050
n-Butylacetate, PESTINORM® min. 99,0%	123-86-4	Ampoule in a box	5 ml	91001.050
Chlorobenzene, PESTINORM® min. 98,0%	108-90-7	Ampoule in a box	5 ml	91063.050
Chloroform, PESTINORM® min. 99,5%	67-66-3	Ampoule in a box	5 ml	91003.050
Cyclohexane, PESTINORM® min. 99,5%	110-82-7	Ampoule in a box	5 ml	91004.050

Description	CAS No.	Pack type	Pk	Cat. No.
Cyclohexanol, PESTINORM® min. 99,0%	108-93-0	Ampoule in a box	5 ml	**91005.050**
Cyclohexanone, PESTINORM® min. 99,0%	108-94-1	Ampoule in a box	5 ml	**91006.050**
Cyclopentane, PESTINORM® min. 98,0%	287-92-3	Ampoule in a box	5 ml	**91007.050**
D-Camphor, PESTINORM® min. 98,0%	464-49-3	Vial in a box	5 g	**91002.050**
n-Decane, PESTINORM® min. 99,0%	124-18-5	Ampoule in a box	5 ml	**91008.050**
Dichloromethane, PESTINORM® min. 99,9%	75-09-2	Ampoule in a box	5 ml	**91050.050**
Diethylether, PESTINORM® min. 99,5%	60-29-7	Ampoule in a box	5 g	**91064.050**
N,N-Dimethylacetamide, PESTINORM® min. 99,0%	127-19-5	Ampoule in a box	5 ml	**91052.050**
Dimethylformamide, PESTINORM® min. 99,5%	68-12-2	Ampoule in a box	5 ml	**91053.050**
Dimethylsulphoxide, PESTINORM® min. 99,5%	67-68-5	Ampoule in a box	5 ml	**91054.050**
n-Dodecane, PESTINORM® min. 99,0%	112-40-3	Ampoule in a box	5 ml	**91010.050**
Ethylacetate, PESTINORM® min. 99,5%	141-78-6	Ampoule in a box	5 ml	**91012.050**
Ethylbenzene, PESTINORM® min 99,5%	100-41-4	Ampoule in a box	5 ml	**91013.050**
Ethyleneglycol monoethylether, PESTINORM® min. 99,0%	110-80-5	Ampoule in a box	5 ml	**91065.050**
Ethylmethylketone, PESTINORM® min. 99,0%	78-93-3	Ampoule in a box	5 g	**91014.050**
n-Heptadecane, PESTINORM® min. 99,0%	629-78-7	Ampoule in a box	5 ml	**91015.050**
n-Heptane, PESTINORM® min. 99,5%	142-82-5	Ampoule in a box	5 ml	**91016.050**
n-Hexadecane, PESTINORM® min. 99,0%	544-76-3	Ampoule in a box	5 ml	**91017.050**
Hexamethyldisiloxane, PESTINORM® min. 99,0%	107-46-0	Ampoule in a box	5 ml	**91018.050**
n-Hexane, PESTINORM® min. 99,5%	110-54-3	Ampoule in a box	5 ml	**91019.050**
Isobutanol, PESTINORM® min. 99,0%	78-83-1	Ampoule in a box	5 ml	**91066.050**
Isobutylacetate, PESTINORM® min. 99,0%	110-19-0	Ampoule in a box	5 ml	**91067.050**
Isooctane, PESTINORM® min. 99,9%	540-84-1	Ampoule in a box	5 ml	**91058.050**
Isopropylether, PESTINORM® min. 99,0%	108-20-3	Ampoule in a box	5 ml	**91051.050**
Methanol, PESTINORM® min. 99,5%	67-56-1	Ampoule in a box	5 ml	**91055.050**
Methylacetate, PESTINORM® min. 99,0%	79-20-9	Ampoule in a box	5 ml	**91068.050**
Methyl-tert.butylether, PESTINORM® min. 99,8%	1634-04-4	Ampoule in a box	5 ml	**91048.050**
n-Nonane, PESTINORM® min. 99,0%	111-84-2	Ampoule in a box	5 ml	**91032.050**
n-Octadecane, PESTINORM® min. 99,0%	593-45-3	Vial in a box	5 g	**91033.050**
n-Octane, PESTINORM® min. 99,0%	111-65-9	Ampoule in a box	5 ml	**91034.050**
n-Pentadecane, PESTINORM® min. 99,0%	629-62-9	Ampoule in a box	5 ml	**91035.050**
n-Pentane, PESTINORM® min. 97,0%	109-66-0	Ampoule in a box	5 ml	**91036.050**
Pyridine, PESTINORM® min. 99,0%	110-86-1	Ampoule in a box	5 ml	**91069.050**
n-Tetradecane, PESTINORM® min. 99,0%	629-59-4	Ampoule in a box	5 ml	**91039.050**
Tetrahydrofuran, PESTINORM® min. 99,7%	109-99-9	Ampoule in a box	5 ml	**91057.050**
Toluene, PESTINORM® min. 99,5%	108-88-3	Ampoule in a box	5 ml	**91040.050**
n-Tridecane, PESTINORM® min. 99,0%	629-50-5	Ampoule in a box	5 ml	**91041.050**
n-Undecane, PESTINORM® min. 99,0%	1120-21-4	Ampoule in a box	5 ml	**91042.050**
o-Xylene, PESTINORM® min. 98,0%	95-47-6	Ampoule in a box	5 ml	**91044.050**
m-Xylene, PESTINORM® min. 99,0%	108-38-3	Ampoule in a box	5 ml	**91043.050**
p-Xylene, PESTINORM® min. 99,0%	106-42-3	Ampoule in a box	5 ml	**91045.050**
Xylene, PESTINORM® min. 99,0%	1330-20-7	Ampoule in a box	5 ml	**91071.050**

Description	Pk	Cat. No.
Fatty Acid Methyl Esters (FAME) standards for GC, PESTINORM®		
Methyloctanoate, PESTINORM®, min. 99,0%	5 ml	**91028.050**
Methyldecanoate, PESTINORM®, min. 99,0%	5 ml	**91021.050**
Methyllaurate, PESTINORM®, min. 99,0%	5 ml	**91024.050**
Methylmyristate, PESTINORM®, min. 98,0%	5 ml	**91027.050**
Methylmargarate, PESTINORM®, min. 98,0%	5 g	**91026.050**
Methylstearate, PESTINORM®, min. 99,0%	5 g	**91031.050**
Methyloleate, PESTINORM®, min. 99,0%	5 g	**91029.050**
Methyl linoleate, PESTINORM® min. 95,0%	5 ml	**91025.050**

Stearyl stearate solution

STANDARDS FOR THE DETERMINATION OF HYDROCARBON OIL INDEX (HOI)

VWR offers a complete range of products for the determination of the hydrocarbon oil index (HOI) in accordance with EN ISO 9377-2 (DIN H53).

- All standards are CRMs according to ISO 17025 and ISO 17034
- Shelf life of 24 months
- Storage: 2 – 8°C
- Supplied with a detailed, batch-specific certificate of analysis

The Hydrocarbon Oil Index (HOI) is defined as the total amount of compounds which can be extracted from the sample (drinking water, surface water and waste water) with a non-polar solvent having a boiling point between 39°C and 69°C .

In addition, the compounds must not absorb on Florisil® (magnesium sulphate) and must elute between n-decane (C10H24) and n-tetracontane (C40H82) when analyzed by GC using an apolar analytical column.

ISO 17025 / ISO 17034. ISO 9377-2.

Delivered with Certificate of Analysis, reference and batch number of source materials.

Most articles are packaged in glass ampoules. Certan® bottles provide the advantage of a sealed ampoule with the flexibility of a screw cap bottle or a septum vial. These unique, screw-cap sample containers with a 1,2×28 mm height capillary opening are designed for the storage of volatile samples and reference standards.

Description	Pk	Cat. No.
N-Alkane standard solution, 16 components each 50 mg/l in n-hexane	1 ml	**88391.001**
N-Alkane standard solution, 16 components each 50 mg/l in n-hexane	5 ml	**88391.005**
N-Alkane standard solution, 16 components each 100 mg/l in n-hexane/petroleum ether	1 KIT	**87499.005**
N-Alkane standard solution, 16 components each 100 mg/l in n-hexane/petroleum ether	5 ml	**87499.006**
N-Alkane standard solution, 19 components each 50 mg/l in Isooctane	5 ml	**88392.005**
Extraction solvent stock solution, 20 µl/l n-decane and 20 mg/l n-tetracontane in n-hexane	10 ml	**88393.011**
Florisil® quality control standard, 1000 mg/l mineral oil and 1000 mg/l diesel in n-hexane	5 ml	**88394.005**
Standard mixture of mineral oils, 5000 mg/l mineral oil and 5000 mg/l diesel in n-hexane	5 Vial	**87495.005**
Standard mixture of mineral oils, 5000 mg/l mineral oil and 5000 mg/l diesel in n-hexane	10 ml	**87495.011**
Standard mixture of mineral oils, 5000 mg/l mineral oil and 5000 mg/l diesel in n-hexane	4,5 ml	**87502.002**
Standard mixture of mineral oils, 500 mg/l mineral oil and 500 mg/l diesel in acetone	1 KIT	**88378.005**
Standard mixture of mineral oils, 500 mg/l mineral oil and 500 mg/l diesel in acetone	10 ml	**88378.011**
Stearyl stearate test solution, 2000 mg/l in n-hexane	5 Ampoule	**87496.005**
Stearyl stearate test solution, 2000 mg/l in n-hexane	10 ml	**87496.011**
Mixture of mineral oils (Diesel Fuel / Lubricating Oil) : 1/1	1 ml	**88418.001**
Mixture of mineral oils (Diesel Fuel / Lubricating Oil) : 1/1	5 ml	**88418.005**
Quality Control Standard of Mineral Oils; 1000mg/l each of Mineral Oil and Diesel Oil in Acetone	5 ml	**88419.005**
Mineral oil standard mixture; 10g/l each of Mineral Oil and Diesel Oil in n-Heptane	10 ml	**88420.011**
Quality Control Standard of Mineral Oils; 10000mg/l each of Mineral Oil and Diesel Oil in n-Hexane	5 ml	**88421.005**
BTEX Standard Solution 6 components (ISO 9377-2-Mod)in Methanol	1 ml	**88422.001**

SECONDARY REFERENCE STANDARDS FOR GAS CHROMATOGRAPHY, PESTINORM®

Avantor offers a wide range of secondary GC solvent reference standards for various chromatographic and analytical applications.

- Purity and the specific impurity profile is determined by GC-MS and reported in the Certificate of Analysis
- Traceability data to specific current lot of primary standard
- Completely synthetic and typically over 99,9% pure by GC-FID

Assay values are reported by mass balance according to ISO/IEC 17025 which allows the secondary standard to be used as reference material for qualitative or quantitative use.

The FDA, USP and EP all recognise the use of secondary standards and working standards that are established with reference to the corresponding primary standard. PESTINORM® secondary GC standards provide a convenient and cost effective alternative to Pharmacopoeia primary standards, and allow laboratories to focus resources on their core activities rather than preparing internal working standards. These standards are traceable to the current lots of USP, and if available to Ph. Eur.

Certificates of Analysis will show the analytical methods for determining the purity and assay, together with the handling and storage conditions and manufacturing plus expiry dates.

Supplied in 100 ml packs

Standard for GC	Cat. No.
1,2-Dichloroethane	85657.180
1,4-Dioxan	85664.180
1-Propanol	85675.180
2,2,4-Trimethylpentane	85674.180
2-Propanol	85676.180
Acetone	85653.180
Acetonitrile	85654.180
Butyl acetate	85655.180
Cyclohexane	85656.180
Dichloromethane (DCM)	85658.180
Di-iso- propyl ether	85659.180
Dimethylsulphoxide (DMSO)	85663.180

Standard for GC	Cat. No.
Ethanol	85665.180
Ethyl acetate	85666.180
iso-Butyl methyl ketone	85673.180
Methanol	85670.180
N,N-Dimethylacetamide	85661.180
N,N-Dimethylformamide	85662.180
n-Heptane	85667.180
n-Hexane	85668.180
tert-Butyl methyl ether	85671.180
Tetrahydrofuran (THF)	85677.180
Toluene	85678.180

RESIDUAL SOLVENT STANDARDS ACCORDING TO ICH GUIDELINES

The level of volatile organic solvents in pharmaceutical raw materials or finished product is defined and monitored in accordance with ICH guidelines. Residual solvents are classified according to their risk assessment as Class 1, Class 2 or Class 3.

A selection of residual solvent standards is now available from Avantor.

- Conforms to the latest Ph. Eur. edition
- Conforms to ICH guidelines
- Delivered with comprehensive Certificate of Analysis
- Packed in 1 or 1,5 ml glass ampoules

Residual solvent standards according to ICH guidelines	Pk(ml)	Cat. No.
Residual Solvents Class 3 acc. to Ph Eur Ver 10 and USP 467 MIX A: 23 components; 5000 mg/L each of n-Heptane; Acetone; Acetic acid-isobutyl ester; Anisole; Acetic acid-isopropyl ester; 1-Butanol; Methyl acetate; 2-Butanol; Isoamyl alcohol; n-Butylacetate; 2-Butanone; Methyl-tert.butylether; 2-Methyl-1-propanol; Dimethylsulfoxide; n-Pentane; Ethanol; 1-Pentanol; Ethyl Acetate; 1-Propanol; Diethylether; 2- Propanol; Ethyl formate; Acetic acid n-propyl ester in Dimethylformamide	1 ml	88210.001
Residual Solvents Class 3 acc. to Ph Eur Ver 10 and USP 467 MIX B: 2 components; 5000 mg/L each of Acetic acid and Formic acid in Dimethylformamide	1 ml	88211.001
Residual Solvents Class 3 acc. to Ph Eur Ver 10 and USP 467 MIX C: Triethylamine 5000 mg/L in Water	1 ml	88213.001
Residual solvents (0861): Class 3 acc. to Ph Ch MIX A: 25 components: 5000 mg/L each of Acetone; Anisole; 1-Butanol; 2-Butanol; 2-Butanone; n-Butylacetate; Diethylether; Dimethyl sulphoxide; Ethanol; Ethyl Acetate; Ethyl formate; n-Heptane; 2-Methyl-1-propanol; Acetic acid-isobutyl ester; Acetic acid-isopropyl ester; Methyl acetate; Isoamyl alcohol; 4-Methyl-2-pentanone; Methyl-tert.butylether; n-Pentane; 1-Pentanol; 1-Propanol; 2- Propanol; Acetic acid n-propyl ester; Isopropylbenzene in Dimethylformamide	1 ml	88220.001
Residual solvents (0861): Class 3 acc. to Ph Ch MIX B: 2 components: 5000 mg/L each of Acetic acid and Formic acid in Dimethylformamide	1 ml	88221.001
Residual Solvents Class 2 acc. to Ph Eur Ver 10 MIX A: 14 components: Chlorobenzene 360 mg/L; Cyclohexane 3880 mg/L; cis-1,2-Dichloroethene 1870 mg/L; Dichloromethane 600 mg/L; Ethylbenzene 369 mg/L; n-Hexane 290 mg/L; Methylcyclohexane 1180 mg/L; N,N - Dimethylformamide 880 mg/L; Toluene 890 mg/L; 1,1,2-Trichloroethene 80 mg/L; m-Xylene 1302 mg/L; o-Xylene 195 mg/L; p-Xylene 304 mg/L; Tetrahydrofuran 720 mg/L in Dimethylsulphoxide	1 ml	88216.001
Residual Solvents Class 2 acc. to Ph Eur Ver 10 MIX A: 13 components: Chlorobenzene 360 mg/L; Cyclohexane 3880 mg/L; cis-1,2-Dichloroethene 1870 mg/L; Dichloromethane 600 mg/L; N,N Dimethylformamide 880 mg/L; Ethylbenzene 369 mg/L; n-Hexane 290 mg/L; Methylcyclohexane 1180 mg/L; Toluene 890 mg/L; 1,1,2-Trichloroethene 80 mg/L; m-Xylene 1302 mg/L; o-Xylene 195 mg/L; p-Xylene 304 mg/L in Dimethylsulfoxide	1 ml	88207.001
	1.5 ml	88207.015
Residual Solvents Class 2 acc. to Ph Eur Ver 10 MIX B: 10 components; Acetonitrile 410 mg/L; Chloroform 60 mg/L; 1,2-Dimethoxyethane 100 mg/L; N,N-Dimethylacetamide 1090 mg/L; Dioxan 380 mg/L; 2-Hexanone 50 mg/L; Methanol 3000 mg/L; Nitromethane 50 mg/L; Pyridine 200 mg/L; 1,2,3,4-Tetrahydronaphthalene 100 mg/L in Dimethylsulfoxide / Water (9/1)	1 ml	88208.001
	1.5 ml	88208.015
Residual Solvents Class 2 acc. to Ph Eur Ver 10 MIX B: 11 components; Acetonitrile 410 mg/L; Chloroform 60 mg/L; 1,2-Dimethoxyethane 100 mg/L; N,N-Dimethylacetamide 1090 mg/L; Dioxan 380 mg/L; 2-Hexanone 50 mg/L; Methanol 3000 mg/L; Nitromethane 50 mg/L; Pyridine 200 mg/L; 1,2,3,4-Tetrahydronaphthalene 100 mg/L; Isopropylbenzene 70 mg/L in Dimethylsulfoxide / Water (9/1)	1 ml	88217.001
Residual Solvents Class 2 acc. to Ph Eur Ver 10 Mix C: 7 components; 2-Ethoxyethanol 160 mg/L; Ethylene glycol 620 mg/L; Formamide 220 mg/L; 2-Methoxyethanol 50 mg/L; N-Methyl Pyrrolidone 530 mg/L; Sulfolan 160 mg/L; 4-Methyl-2-pentanone 4500 mg/L in Water	1 ml	88218.001
"Residual Solvents Class 2 acc to Ph Eur Ver 8.8 MIX C: 6 components 2-Ethoxyethanol 160 mg/L; Ethyleneglycol 620 mg/L; Formamide 220 mg/L; 2-Methoxyethanol 50 mg/L; 1-Methyl-2-pyrrolidon 4840 mg/L; Sulfolan 160 mg/L in Water"	1 ml	88219.001
Residual Solvents Class 2 acc. to Ph Eur Ver 10 Mix C: 6 components; 2-Ethoxyethanol 160 mg/L; Ethylene glycol 620 mg/L; Formamide 220 mg/L; 2-Methoxyethanol 50 mg/L; N-Methyl Pyrrolidone 4840 mg/L; Sulfolan 160 mg/L in Water	1 ml	88209.001
	1.5 ml	88209.015
Residual Solvents Class 1 acc. to Ph Eur Ver 10: 5 components; Benzene 2 mg/L; Carbon tetrachloride 4 mg/L; 1,2-Dichloroethane 5 mg/L; 1,1-Dichloroethene 8 mg/L; 1,1,1-Trichloroethane 1500 mg/L in Dimethylsulfoxide	1 ml	88214.001
Residual Solvents Class 1 acc to Ph Eur Ver 8.8: 5 components; Benzene 4 mg/L; 1,2-Dichloroethane 10 mg/L; Tetrachloromethane 8 mg/L; 1,1-Dichloroethene 16 mg/L; 1,1,1-Trichloroethane 20 mg/L in Dimethylsulfoxide	1 ml	88215.001
Residual Solvents Class 1 acc to Ph Eur Ver 8.8: 5 components; Benzene 2 mg/L; 1,2-Dichloroethane 5 mg/L; Tetrachloromethane 4 mg/L; 1,1-Dichloroethene 8 mg/L; 1,1,1-Trichloroethane 10 mg/L in Dimethylsulfoxide	1 ml	88206.001
	1.5 ml	88206.015

FATTY ACID METHYL ESTERS (FAME) STANDARDS FOR GC, PESTINORM®

Avantor offers an extensive range of FAME standards as Certified Reference Materials under the well known PESTINORM® brand.

- All products are CRM acc ISO/IEC 17025 and ISO 17034
- All products are NEAT
- 24 month shelf life

Esterification of fatty acids is an important tool to determine content and characterise fats and oils in food, especially for measurement by GC methods. The simple derivatisation to create the methyl ester analogue is also used widely as a preliminary technique for assessing the quality and purity of biofuels. Avantor offers a comprehensive range of fatty acid methyl esters (FAME) Certified Reference Materials for calibration of GC instruments, for validation of analytical methods, preparation of 'working reference samples' or for detection limit and linearity studies.

ISO 17025 / 17034

Description	CAS No.	Pack type	Pk	Cat. No.
Methyl valerate, PESTINORM®, min. 99,0%	624-24-8	Ampoule	1 ml	**91072.010**
Methyl valerate, PESTINORM®, min. 99,0%	624-24-8	Ampoule	5 ml	**91072.050**
Methyl hexanoate, PESTINORM®, min. 98,0%	106-70-7	Ampoule	1 ml	**91073.010**
Methyl hexanoate, PESTINORM®, min. 98,0%	106-70-7	Ampoule	5 ml	**91073.050**
Methyl heptanoate, PESTINORM®, min. 97,0%	106-73-0	Ampoule	1 ml	**91074.010**
Methyl heptanoate, PESTINORM®, min. 97,0%	106-73-0	Ampoule	5 ml	**91074.050**
Methyloctanoate, PESTINORM®, min. 99,0%	111-11-5	Ampoule	1 ml	**91028.010**
Methyloctanoate, PESTINORM®, min. 99,0%	111-11-5	Ampoule	5 ml	**91028.050**
Methyl nonanoate, PESTINORM®, min. 96,0%	1731-84-6	Ampoule	1 g	**91076.010**
Methyl nonanoate, PESTINORM®, min. 96,0%	1731-84-6	Ampoule	5 g	**91076.050**
Methyldecanoate, PESTINORM®, min. 99,0%	110-42-9	Ampoule	1 ml	**91021.010**
Methyldecanoate, PESTINORM®, min. 99,0%	110-42-9	Ampoule	5 ml	**91021.050**
Methyl undecanoate, PESTINORM®, min. 98,0%	1731-86-8	Ampoule	1 g	**91078.010**
Methyl undecanoate, PESTINORM®, min. 98,0%	1731-86-8	Ampoule	5 g	**91078.050**
Methyllaurate, PESTINORM®, min. 99,0%	111-82-0	Ampoule	1 ml	**91024.010**
Methyllaurate, PESTINORM®, min. 99,0%	111-82-0	Ampoule	5 ml	**91024.050**
Methyl tridecanoate, PESTINORM®, min. 98,0%	1731-88-0	Ampoule	1 g	**91080.010**
Methyl tridecanoate, PESTINORM®, min. 98,0%	1731-88-0	Ampoule	5 g	**91080.050**
Methylmyristate, PESTINORM®, min. 98,0%	124-10-7	Ampoule	1 ml	**91027.010**
Methylmyristate, PESTINORM®, min. 98,0%	124-10-7	Ampoule	5 ml	**91027.050**
Methyl pentadecanoate, PESTINORM®, min. 98,0%	7132-64-1	Ampoule	1 ml	**91082.010**
Methyl pentadecanoate, PESTINORM®, min. 98,0%	7132-64-1	Ampoule	5 ml	**91082.050**
Methyl palmitate, PESTINORM®, min. 97,0%	1731-88-0	Vial	250 mg	**91083.002**
Methyl palmitate, PESTINORM®, min. 97,0%	1731-88-0	Ampoule	1 g	**91083.010**
Methyl palmitate, PESTINORM®, min. 97,0%	1731-88-0	Ampoule	5 g	**91083.050**
Methylmargarate, PESTINORM®, min. 98,0%	1731-92-6	Vial	100 mg	**91026.001**
Methylmargarate, PESTINORM®, min. 98,0%	1731-92-6	Ampoule	5 g	**91026.050**
Methylstearate, PESTINORM®, min. 99,0%	112-61-8	Vial	5 g	**91031.050**
Methylstearate, PESTINORM®, min. 99,0%	112-61-8	Vial	1 ml	**91031.010**
Methyloleate, PESTINORM®, min. 99,0%	112-62-9	Vial	100 mg	**91029.001**
Methyloleate, PESTINORM®, min. 99,0%	112-62-9	Ampoule	1 g	**91029.010**
Methyloleate, PESTINORM®, min. 99,0%	112-62-9	Ampoule	5 g	**91029.050**
Methyl linoleate, PESTINORM® min. 95,0%	112-63-0	Ampoule	5 ml	**91025.050**
Methyl nonadecanoate, PESTINORM®, min. 98,0%	1731-94-8	Vial	250 mg	**91087.002**
Methyl nonadecanoate, PESTINORM®, min. 98,0%	1731-94-8	Ampoule	1 g	**91087.010**
Methyl nonadecanoate, PESTINORM®, min. 98,0%	1731-94-8	Ampoule	5 g	**91087.050**
Methyl arachidate, PESTINORM®, min. 98,0%	1120-28-1	Vial	100 mg	**91088.001**
Methyl arachidate, PESTINORM®, min. 98,0%	1120-28-1	Ampoule	1 g	**91088.010**
Methyl arachidate, PESTINORM®, min. 98,0%	1120-28-1	Ampoule	5 g	**91088.050**
Methyl cis-11-eicosenoate, PESTINORM®, min. 99,0%	2390-09-2	Vial	100 mg	**91089.001**
Methyl behenate, PESTINORM®, min. 90,0%	929-77-1	Vial	100 mg	**91090.001**
Methyl behenate, PESTINORM®, min. 90,0%	929-77-1	Ampoule	1 g	**91090.010**
Methyl behenate, PESTINORM®, min. 90,0%	929-77-1	Ampoule	5 g	**91090.050**
Methyl tetracosanoate, PESTINORM®, min. 98,0%	2442-49-1	Vial	100 mg	**91091.001**
Methyl tetracosanoate, PESTINORM®, min. 98,0%	2442-49-1	Vial	250 mg	**91091.002**
Methyl tetracosanoate, PESTINORM®, min. 98,0%	2442-49-1	Ampoule	1 g	**91091.010**

COD calibration standards.

COD CALIBRATION STANDARDS, CERTIFIED REFERENCE MATERIALS (CRMs)

Avantor now offers a complete range of COD (Chemical Oxygen Demand) calibration standards (traceable to BAM) as CRM with concentrations between 20 and 10000 mg/L. Can be used to calibrate, control, verify or validate all COD test methods.

- Traceable to BAM
- Supplied with a detailed Certificate of Analysis
- Complete range from 10 to 10000 mg/L
- Customised COD standards available on request
- Shelf life of 24 months / shelf life after opening: 1 month
- Storage at 2 to 8 °C
- Convenient pack size in 100 and 500 ml

COD is defined as the amount of oxygen equivalents consumed in the chemical oxidation of organic matter by strong oxidant (e.g., potassium dichromate) to carbon dioxide.

COD is often used as a measurement of pollutants in water, wastewater, and aqueous hazardous wastes.

The traditional chemical oxygen demand (COD) analysis method is the wet chemistry method. This involves a 2 hour digestion at high heat under acidic conditions in which potassium dichromate acts as the oxidant for any organic material present in a water sample. Silver sulphate is present as the catalyst and mercuric sulphate acts to complex out any interfering chloride. Following digestion, the extent of oxidation is measured through indirect measurement of oxygen demand via electrons consumed in the reduction of Cr^{6+} to Cr^{3+}. This can be done by titration or spectrophotometry. Colorimetric measurement of COD is faster and easier method to perform than titrimetric analysis and does not require additional reagents.

COD is expressed in mg/L, which indicates the mass of oxygen consumed per liter of solution.

To ensure the lowest possible uncertainty levels COD calibration standards certified values are obtained by a weighted mean of the results of two independent calibration methods: Classical Volumetric and Instrumental (digestion of the chemically bonded organic carbon in the presence of a chemical oxidant and subsequent absorption measurement at 430 nm, using a spectrophotometer).

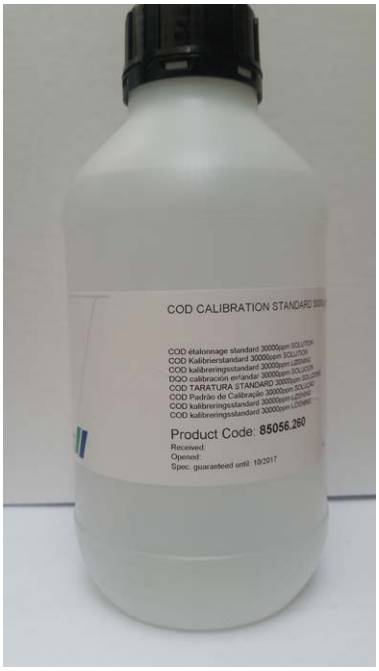
Certified Reference Materials acc. ISO 17025 and ISO 17034

Description	Concentration	Pk	Cat. No.
COD calibration standard	20 mg/L	100 ml	**88406.180**
COD calibration standard	20 mg/L	500 ml	**88406.260**
COD calibration standard	50 mg/L	100 ml	**88407.180**
COD calibration standard	50 mg/L	500 ml	**88407.260**
COD calibration standard	100 mg/L	100 ml	**88408.180**
COD calibration standard	100 mg/L	500 ml	**88408.260**
COD calibration standard	200 mg/L	100 ml	**88409.180**
COD calibration standard	200 mg/L	500 ml	**88409.260**
COD calibration standard	400 mg/L	100 ml	**88410.180**
COD calibration standard	400 mg/L	500 ml	**88410.260**
COD calibration standard	500 mg/L	100 ml	**88411.180**
COD calibration standard	500 mg/L	500 ml	**88411.260**
COD calibration standard	1000 mg/L	100 ml	**88412.180**
COD calibration standard	1000 mg/L	500 ml	**88412.260**
COD calibration standard	2000 mg/L	100 ml	**88413.180**
COD calibration standard	2000 mg/L	500 ml	**88413.260**
COD calibration standard	10000 mg/L	100 ml	**88414.180**
COD calibration standard	10000 mg/L	500 ml	**88414.260**

COD CALIBRATION STANDARDS

These standards are ideal to use as control standards for COD (Chemical Oxygen Demand) measurements to verify that correct analysis for COD has taken place.

Achieving an acceptable result for the control standard will improve confidence in sample readings for this important environmental parameter. Available in 500 ml packs.



Description	Pack type	Pk	Cat. No.
COD calibration standard 10 mg/L solution	Plastic bottles	500 ml	**85050.260**
COD calibration standard 20 mg/L solution	Plastic bottles	500 ml	**85053.260**
COD calibration standard 50 mg/L solution	Plastic bottles	500 ml	**85063.260**
COD calibration standard 100 mg/L solution	Plastic bottles	500 ml	**85059.260**
COD calibration standard 200 mg/L solution	Plastic bottles	500 ml	**85062.260**
COD calibration standard 500 mg/L solution	Plastic bottles	500 ml	**85064.260**
COD calibration standard 600 mg/L solution	Plastic bottles	500 ml	**85066.260**
COD calibration standard 1000 mg/L solution	Plastic bottles	500 ml	**85060.260**
COD calibration standard 1300 mg/L solution	Plastic bottles	500 ml	**85051.260**
COD calibration standard 1500 mg/L solution	Plastic bottles	500 ml	**85052.260**
COD calibration standard 2000 mg/L solution	Plastic bottles	500 ml	**85054.260**
COD calibration standard 5000 mg/L solution	Plastic bottles	500 ml	**85065.260**
COD calibration standard 6000 mg/L solution	Plastic bottles	500 ml	**85057.260**
COD calibration standard 10 000 mg/L solution	Plastic bottles	500 ml	**85061.260**
COD calibration standard 20 000 mg/L solution	Plastic bottles	500 ml	**85055.260**
COD calibration standard 30 000 ppm solution	Plastic bottles	500 ml	**85056.260**
COD calibration standard 60 000 mg/L solution	Plastic bottles	500 ml	**85058.260**

TOTAL INORGANIC CARBON (TIC) STANDARDS

Standard solutions of sodium carbonate.

1000 mg/L sodium carbonate solution according to EN 1484.

Manufacturer quality system is ISO 9001 certified.

Accredited according to ISO/IEC 17025 - Testing and to ISO 17034.

Description	Concentration	Pk	Cat. No.
TIC standard solution	1000 mg/L	100 ml	**88248.180**
TIC standard solution	1000 mg/L	500 ml	**88248.260**
TIC standard solution	10000 mg/L	100 ml	**88249.180**
TIC standard solution	10000 mg/L	500 ml	**88249.260**

TOC standard solutions

TOC STANDARD SOLUTIONS

Potassium hydrogen phthalate solutions.

- Broad range of the most relevant standards from 5 to 2000 mg/L
- Excellent quality
- Ease of use
- Reliable results

VWR TOC standards were developed for a broad and routine set of applications. They can be used on a wide variety of instruments including where instrument-specific standards are not required.

Total organic carbon (TOC) is the amount of carbon found in an organic compound. It is often used as a non specific indicator both for water quality and cleanliness of pharmaceutical manufacturing equipment.

TOC may also refer to the amount of organic carbon in soil, or in a geological formation.

TOC analysis acc. to EN 1484-H3.

This EU standard has been implemented for the analysis of TOC (replacing DIN 38409-H3). It regulates and provides guidelines for the determination of total organic carbon (TOC) in different types of water (drinking, waste, ground, surface or lake). Our VWR TOC standards acc. to EN 1484 are especially designed for the easy calibration of TOC instruments according to this EU standard and to guarantee reliable analytical results.

Accredited according to ISO 17034, ISO 17025. ISO 9001 certified.

Store under normal laboratory conditions, at temperatures between 15 to 25 °C.

Description	Pack size	Cat. No.
TOC standard solution 5 mg/L	100 ml	88223.180
TOC standard solution 5 mg/L	500 ml	88223.260
TOC standard solution 10 mg/L	100 ml	88224.180
TOC standard solution 10 mg/L	500 ml	88224.260
TOC standard solution 25 mg/L as potassium hydrogen phthalate.	100 ml	88229.180
TOC standard solution 50 mg/L	100 ml	88225.180
TOC standard solution 50 mg/L	500 ml	88225.260
TOC standard solution 100 mg/L (standard solution acc. to EN 1484)	100 ml	88226.180
TOC standard solution 100 mg/L (standard solution acc. to EN 1484)	500 ml	88226.260
TOC standard solution 200 mg/L	100 ml	88227.180
TOC standard solution 200 mg/L	500 ml	88227.260
TOC standard solution 500 mg/L	100 ml	88228.180
TOC standard solution 500 mg/L	500 ml	88228.260
TOC standard solution 1000 mg/L (stock solution acc. to EN 1484)	100 ml	88222.180
TOC standard solution 1000 mg/L (stock solution acc. to EN 1484)	500 ml	88222.260
TOC standard solution 2000 mg/L	100 ml	88230.180
TOC standard solution 2000 mg/L	500 ml	88230.260

TURBIDITY STANDARDS

Turbidity standards in kit form or alternatively as formazine stock solutions which allows users to create their own defined standards.

- Set of standards designed for use with turbidity meters with a measuring range from 0,01 to 1100 NTU
- Ideal for units that measure scattered light at an angle of 90°, as stipulated in EN ISO 7027
- Kit supplied in handy case

Description	Pk	Cat. No.
Set of turbidity standards TSK (<0,1; 20; 200; 800 NTU)	1 KIT	**84209.600**
Formazine stock solution, 4000 NTU	100 ml	**84210.180**
Formazine stock solution, 4000 NTU	250 ml	**84211.230**

INNOVATIONS - visit **vwr.com** and search Cat. No. **88231.180** to learn about formazin turbidity standards.

TURBIDITY STANDARDS CRMs, FORMAZIN

All turbidity standard solutions are Certified Reference Materials.

This standard also meets the requirements of the European Pharmacopoeia on a "2.2.1. Clarity and degree of opalescence of liquids" and ISO 7027-1 "Water quality – Determination of turbidity – part 1: Quantitative methods».

Produced and calibrated under a quality system that is:

- ISO 9001 certified
- Accredited according to ISO/IEC 17025 - Testing
- Accredited according to ISO 17034 - Reference Material Producer

Turbidity standard, Formazin, 1000 NTU

Description	Turbidity	Type	Pk	Cat. No.
Turbidity Standard	1 NTU	Formazin	100 ml	**88231.180**
Turbidity Standard	1 NTU	Formazin	500 ml	**88231.270**
Turbidity Standard	5 NTU	Formazin	100 ml	**88232.180**
Turbidity Standard	5 NTU	Formazin	500 ml	**88232.270**
Turbidity Standard	10 NTU	Formazin	100 ml	**88233.180**
Turbidity Standard	10 NTU	Formazin	500 ml	**88233.270**
Turbidity Standard	15 NTU	Formazin	100 ml	**88234.180**
Turbidity Standard	15 NTU	Formazin	500 ml	**88234.270**
Turbidity Standard	20 NTU	Formazin	100 ml	**88235.180**
Turbidity Standard	20 NTU	Formazin	500 ml	**88235.270**
Turbidity Standard	50 NTU	Formazin	100 ml	**88236.180**
Turbidity Standard	50 NTU	Formazin	500 ml	**88236.270**
Turbidity Standard	100 NTU	Formazin	100 ml	**88237.180**
Turbidity Standard	100 NTU	Formazin	500 ml	**88237.270**
Turbidity Standard	200 NTU	Formazin	100 ml	**88238.180**
Turbidity Standard	200 NTU	Formazin	500 ml	**88238.270**
Turbidity Standard	500 NTU	Formazin	100 ml	**88240.180**
Turbidity Standard	500 NTU	Formazin	500 ml	**88240.270**
Turbidity Standard	750 NTU	Formazin	100 ml	**88241.180**
Turbidity Standard	750 NTU	Formazin	500 ml	**88241.270**
Turbidity Standard	800 NTU	Formazin	100 ml	**88244.180**
Turbidity Standard	800 NTU	Formazin	500 ml	**88244.270**
Turbidity Standard	1000 NTU	Formazin	100 ml	**88245.180**
Turbidity Standard	1000 NTU	Formazin	500 ml	**88245.270**
Turbidity Standard	2000 NTU	Formazin	100 ml	**88246.180**
Turbidity Standard	2000 NTU	Formazin	500 ml	**88246.270**
Turbidity Standard	4000 NTU	Formazin	100 ml	**88247.180**
Turbidity Standard	4000 NTU	Formazin	500 ml	**88247.270**

CERTIFIED REFERENCE MATERIALS FOR ENVIRONMENTAL ANALYSIS

Certified Reference Materials (CRMs), produced by VKI, are designed to provide appropriate homogenous stable reference materials for quality control of environmental analyses. Certification is carried out in accordance with ISO guide 30, 31, 33, 34, 35, ISO 5725 and ISO/REMCO N 37. All CRMs are traceable to a National Standard, or verified by a group of internationally recognised laboratories, and come with a Certificate of Analysis which states the certified value and the uncertainty at a stated level of confidence.

- Liquid references supplied in packs of glass ampoules ready for easy dilution

Type	Description	Pk	Cat. No.
Waste water			
QC WW1B	NO_3-N 5,0 mg/L, NH_4-N 1,0 mg/L, PO_4-P 0,5 mg/L	10	**QCWW1B-10**
QC WW1B	NO_3-N 5,0 mg/L, NH_4-N 1,0 mg/L, PO_4-P 0,5 mg/L	50	**QCWW1B-50**
QC WW2.1	NH_4-N 10 mg/L; PO_4-P (Ortho) 5 mg/L	10	**QCWW2.1-10**
QC WW2.1	NH_4-N 10 mg/L; PO_4-P (Ortho) 5 mg/L	50	**QCWW2.1-50**
QC WW2.2	NO_3-N 1 mg/L	10	**QCWW2.2-10**
QC WW2.2	NO_3-N 1 mg/L	50	**QCWW2.2-50**
QC WW3	N (total) 7,5 mg/L; P(total) 1,5 ppm	10	**QCWW3-10**
QC WW3	N (total) 7,5 mg/L; P(total) 1,5 ppm	50	**QCWW3-50**
QC WW4	COD 500 mg/L; TOC 200 mg/L	10	**QCWW4-10**
QC WW4	COD 500 mg/L; TOC 200 mg/L	50	**QCWW4-50**
QC WW4A	COD 50 mg/L; TOC 20 mg/L	10	**QCWW4A-10**
QC WW4A	COD 50 mg/L; TOC 20 mg/L	50	**QCWW4A-50**
QC WW5	BOD 200 mg/L	10	**QCWW5-10**
QC WW5	BOD 200 mg/L	50	**QCWW5-50**
QC WW6	Suspended solids 240 mg/L	10	**QCWW6-10**
QC WW6	Suspended solids 240 mg/L	50	**QCWW6-50**
Surface and fresh water rivers			
QC RW1	NO_3-N 100 mg/L; NH_4-N 100 mg/L; PO_4-P 100 mg/L	10	**QCRW1-10**
QC RW1	NO_3-N 100 mg/L; NH_4-N 100 mg/L; PO_4-P 100 mg/L	50	**QCRW1-50**
QC RW2	N (total) 250 mg/L; P (total) 200 mg/L)	10	**QCRW2-10**
QC RW2	N (total) 250 mg/L; P (total) 200 mg/L)	50	**QCRW2-50**
Sea water			
QC SW3.1	NH_4 2 µM; NO_2 1 µM; NO_2+$NO_3$10µM; N (total) 15 µM: Coastal water	10	**QCSW3.1B**
QC SW3.2	PO_4 2 µM; P (total) 2 µM; SiO_4 20 µM: Coastal water	10	**QCSW3.2B**
QC SW4.1	NH_4 2 µM; NO_2 0,2 µM; NO_2+NO_3 5 µM; N (total) 12 µM: Seawater	10	**QCSW4.1B**
QC SW4.2	PO_4 1 µM; P (total) 1 µM; SiO_4 5 µM: Seawater	10	**QCSW4.2B**
Soil			
QC LOAM SOIL B	As, Pb, Cd, Cr, Cu, Hg, Ni, Zn, K, N (tot), P (tot)	200 g	**QCLOAMSOILB200**
QC OIL IN SOIL	Oil fractions nC_{10} - C_{25}; nC_{25} - C_{35}; total carbohydrate, all as mg/kg dry weight	100 g	**QCOILINSOIL100**
QC OIL IN SOIL	Oil fractions nC_{10} - C_{25}; nC_{25} - C_{35}; total carbohydrate, all as mg/kg dry weight	500 g	**QCOILINSOIL500**
Sludge			
QC ENDOCRDISUP	Endocrine disruptors in sludge, including DEHP, NPE, nonylphenol	100 g	**QCENDOCRDISRUP**
QC ORGSLUDGE	Organic components: 14xPAH,DEHP, C10-C12LAS, 3xNPE	100 g	**QCORGSLUD100**
QC ORGSLUDGE	Organic components: 14xPAH,DEHP, C10-C12LAS, 3xNPE	500 g	**QCORGSLUD5X100**
Drinking and groundwater			
QC DW4	TOC	10	**QCDW4-10**
QC DW4	TOC	50	**QCDW4-50**
QC DWB	Na, K, Ca, Mg, Cl, F, SO_4, HCO_3, dry matter, pH, conductivity (K25)	10 KIT	**QCDWB**
QC METALCOMBI	QC METAL LL1, QC METAL LL_2, QC METAL HL_1, QC METAL HL_2	4	**QCMETALCOMBI**
QC METAL HL1	Al, Fe, Mn, Pb, Zn mg/L-level	1	**QCMETALHL1**
QC METAL HL2	Ag, Ba, Cd, Co, Cr, Cu, Ni, Sr mg/L-level	1	**QCMETALHL2**
QC METAL LL1	Al, As, Cr, Cu, Mo, Ni, Sn, V, Zn µg/l-level	1	**QCMETALLL1**
QC METAL LL2	Ag, Ba, Cd, Co, Fe, Mn, Pb, Sb, Se, Sr µg/l-level	1	**QCMETALLL2**
QC METAL LL3	Hg 5 µg/l	1	**QCMETALLL3**
QC METAL LL3A	Hg: 0,5 µg/l	1	**QCMETALLL3A**

Avantor Services

avantor™

Equipment Services

Keep your laboratory in compliance and in operation

Providing a carefree equipment lifecycle with Avantor Services

- Installation
- Preventive maintenance
- Warranty and repair
- Calibration
- Qualification, validation and certification (IQ/OQ/PQ)
- Equipment management
- Training

VWR.COM/EIS

PB18028-EN

LIGHT METER, DUAL-DISPLAY, TRACEABLE®

Dual-displays show lux or foot-candles, or percent differential from a reference point, and the selected light source (daylight, tungsten, fluorescent, or mercury). Traceable® light meter has computer output that allows it to be connected to a computer or data logger for monitoring and keeping results. To ensure accuracy an individually serial numbered Traceable® certificate is provided from ISO 17025 calibration laboratory accredited by A2LA. It indicates traceability to standards provided by NIST (National Institute of Standards and Technology).

- Two displays show lux or foot-candles
- Computer output
- Data hold button 'freezes' the display

Readings in lux and foot-candles: Dual-display meter measures lux in three ranges: 0 to 1999 (1 lux resolution), 2000 to 19990 (10 lux resolution), and 20000 to 50000 (100 lux resolution). Readings in foot-candles: 0 to 199,9 (0,1 Fc resolution), 200 to 1999 (1 Fc resolution), 2000 to 5000 (10 Fc resolution). Unit has zero reference settings for all light sources.

Monitor and store results: Data hold button freezes the display to capture readings. Precise photodiode and colour-correction filter provide cosine- and colour-corrected measurements.

Supplied with round photocell, Traceable® certificate, 9 volt alkaline battery, and computer output.

Accuracy	±4,5%
Display	LCD
Resolution	1 lux/10 lux/100 lux or 0,1 Fc/1Fc/10Fc
Weight (g)	240
W×D×H (mm)	76×32×178

Description	Pk	Cat. No.
Dual-display light meter, Traceable®	1	**662-0940**

ROOM CLIMATE MONITOR, AM 100

This device measures and displays the air temperature and humidity as well as CO_2 concentration, simultaneously.

- Three different LEDs (green, yellow, red) indicate the CO_2 value in the air as good, medium or bad
- Acoustic alarm when CO_2 limit is exceeded
- Helps to improve room climate and prevent mould formation
- Large LCD with backlight for easy reading in the dark
- MUTE button for alarm on/off
- For bench top or wall mounting

This smart, compact and easy to use device was designed to help people taking care of Indoor Air Quality. The AM 100 can be widely used in office buildings, schools, exhibition halls, shopping malls, meeting rooms, fitness centres, restaurants and other public places where personal comfort and a healthy environment is important.

Supplied with AC/DC adapter and factory calibration certificate.

Description	Range ()	Weight (g)	Pk	Cat. No.
Room climate monitor, AM 100	0...+50 °C / 20 - 90% RH / 0 - 3000 ppm (CO_2)	200	1	**620-2624**

DIGITAL CALIPERS

Made from stainless steel. Battery life is about 10 000 hours.

- Ergonomic body and friction thumb roller make readings fast
- Easy to read, jumbo digit display
- Moisture and dust resistant steel

Zero button instantly sets closed jaws or any reference point to zero. Floating zero may also be set mid-measurement to read difference results without calculations.

Weight: 255 g

A serial numbered certificate is provided from an ISO 17025 calibration laboratory accredited by A2LA to indicate instrument traceability to standards provided by NIST.

Description	Range (mm)	Resolution (mm)	Accuracy	Pk	Cat. No.
Digital caliper	0 - 150	0,01	±0,03 mm	1	819-0012
Digital caliper	0 - 200	0,01	±0,03 mm	1	819-0013

SIEVE STANDARDS, NIST AND NPL TRACEABLE

Unique microsphere method of sieve calibration applicable to all sieves from 20 to 3350 µm.

- Method analyses over 80% of the sieve surface
- Results independent of sieve shaking method
- No need to send sieves away for calibration
- Typical calibration time of about 1 minute
- Single-use bottles remove operator bias

Accuracy and repeatability better than 1 µm.

Mean aperture size traceable to NIST and NPL.

Description	For	Calibration range	Pk	Cat. No.
Sieve standards	Sieve size 20 µm	19 - 24 µm	5	510-0166
Sieve standards	Sieve size 25 µm	22 - 30 µm	5	510-0167
Sieve standards	Sieve size 32 µm	28 - 34 µm	5	510-0168
Sieve standards	Sieve size 38 µm	34 - 41 µm	5	510-0169
Sieve standards	Sieve size 45 µm	42 - 50 µm	5	510-0170
Sieve standards	Sieve size 53 µm	48 - 59 µm	5	510-0171
Sieve standards	Sieve size 63 µm	57 - 70 µm	5	510-0172
Sieve standards	Sieve size 75 µm	67 - 83 µm	5	510-0173
Sieve standards	Sieve size 90 µm	79 - 97 µm	5	510-0174
Sieve standards	Sieve size 106 µm	91 - 117 µm	5	510-0175
Sieve standards	Sieve size 125 µm	112 - 140 µm	5	510-0176
Sieve standards	Sieve size 150 µm	134 - 167 µm	5	510-0177
Sieve standards	Sieve size 180 µm	161 - 200 µm	5	510-0178
Sieve standards	Sieve size 212 µm	191 - 237 µm	5	510-0179
Sieve standards	Sieve size 250 µm	226 - 281 µm	5	510-0180
Sieve standards	Sieve size 300 µm	270 - 333 µm	5	510-0181
Sieve standards	Sieve size 355 µm	322 - 398 µm	5	510-0182
Sieve standards	Sieve size 425 µm	377 - 470 µm	5	510-0183
Sieve standards	Sieve size 500 µm	440 - 557 µm	5	510-0184
Sieve standards	Sieve size 600 µm	526 - 657 µm	5	510-0185
Sieve standards	Sieve size 710 µm	648 - 809 µm	5	510-0186
Sieve standards	Sieve size 850 µm	774 - 950 µm	5	510-0187
Sieve standards	Sieve size 1,00 mm	0,91 -1,11 mm	5	510-0377
Sieve standards	Sieve size 1,18 mm	1,09 - 1,33 mm	5	510-0378
Sieve standards	Sieve size 1,40 mm	1,29 - 1,61 mm	5	510-0379
Sieve standards	Sieve size 1,70 mm	1,51 - 1,87 mm	5	510-0380
Sieve standards	Sieve size 2,00 mm	1,84 - 2,24 mm	5	510-0381
Sieve standards	Sieve size 2,36 mm	2,15 - 2,66 mm	5	510-0382
Sieve standards	Sieve size 2,80 mm	2,56 - 3,23 mm	5	510-0383
Sieve standards	Sieve size 3,35 mm	3,07 - 3,78 mm	5	510-0384
Sieve standards	Sieve size 100 mm	100 - 112 µm	5	510-2089
Sieve standards	Sieve size 100 mm	250 - 280 µm	5	510-2090

Timers selector guide

609-0199

609-0184

Timing capacity	Accuracy	Count	Memory	Alarm			Cat. No.
				Audible	Visual	Other	
Mechanical model							
60 min	3 min	↓	No	Yes	No	No	**609-0127**
Digital single channel models without clock, supplied with calibration certificate							
99 min, 59 s	±0,01%	↓	Yes	Loud	No	No	**609-0185**
		↕	No	Yes	No	No	**609-0203**
	3 s	↕	Yes	Yes	No	No	**609-0128**
	±0,01%	↓	Yes	Loud	No	No	**609-0184**
		↕	Yes	No	No	No	**609-0197**
	±5 s/day (res ,01)	↕	Yes	Yes	Yes	Indicates time elapsed since alarm	**609-0206**
	±0,01%	↑	Yes	Yes	No		**609-0189**
		↕	3 countdown memories	Adjustable	Flashing LED		**609-0198**
19 h, 59 min or 99 min, 59 s	±5 s/day (res ,01)	↓	Yes	Yes	No	Indicates time elapsed since alarm	**609-0190**
		↕	Yes	Yes	Yes	Vibration	**609-0207**
99 h, 59 min, 59 s	±0,01%	↕	Yes	Yes	No	No	**609-0205**
Digital, 2 channels with clock							
23 h, 59 min, 59 s	±0,01%	↕	Yes	Yes	Yes	No	**609-0090**
Digital, 2 channels without clock							
99 h, 59 min, 59 s	±0,01%	↓	Yes	Adjustable	Green LED flashes while counting down // RED LED flashes once zero has been reached	No	**609-0199**
Digital, 3 channels with clock							
99 h, 59 min, 59 sec	±0,01%	↕	Yes	Yes	No	No	**609-0204**
Digital, 4 channels with clock							
99 h, 59 min, 59 s	(±3 s/day) ±0,01 s	↕	Yes	Loud	No	No	**609-0181**
	±0,01%	↑	Yes	Yes	No	Indicates time elapsed since start	**609-0195**
Switchable timing capacity: 23 h, 59 min or 59 min, 59 s	±5 s/day (res ,01)	↕	Yes	Yes	No	Indicates time elapsed since alarm	**609-0208**

BULB PIPETTES, ONE MARK, CLASS AS

Borosilicate 3.3 glass.

- Calibrated to deliver, total delivery
- Ring mark and inscriptions in high contrast amber stain
- Not available with individual certificate

DIN EN ISO 648

Dated batch identification and batch certificate included.

Capacity (ml)	Tolerance (± ml)	Length (mm)	Pk	Cat. No.
1	0,007	300	3	612-4129
2	0,010	330	3	612-4130
3	0,010	350	3	612-4131
4	0,015	410	3	612-4132
5	0,015	410	3	612-4133
10	0,020	450	3	612-4134
20	0,030	520	2	612-4135
25	0,030	530	2	612-4136
50	0,050	550	2	612-4137
100	0,080	600	2	612-4138

BULB PIPETTES, TWO MARKS, CLASS AS

Borosilicate 3.3 glass.

- Calibrated to deliver (TD, Ex)
- Ring mark and inscriptions in high contrast amber stain

DIN EN ISO 648

Dated batch identification and batch certificate.

Capacity (ml)	Tolerance (± ml)	Length (mm)	Pk	Cat. No.
1	0,007	300	3	612-4775
2	0,010	330	3	612-4776
3	0,010	350	3	612-4777
4	0,015	410	3	612-4778
5	0,015	410	3	612-4779
10	0,020	450	3	612-4780
20	0,030	520	2	612-4781
25	0,030	530	2	612-4782
50	0,050	550	2	612-4783
100	0,080	600	2	612-4784

GRADUATED PIPETTES, TYPE 3, CLASS AS

Borosilicate 3.3 glass.

- Calibrated to deliver (TD, Ex)
- Marks and inscriptions in amber stain
- Cotton plug ending (cotton plugs not included)

DIN 12696, ISO 835

Indludes a lot certificate.

Capacity (ml)	Division (ml)	Tolerance (± ml)	Pk	Cat. No.
0,5	0,01	0,0075	3	612-4767
1	0,01	0,01	3	612-4768
2	0,02	0,015	3	612-4769
5	0,1	0,045	3	612-4770
10	0,1	0,075	3	612-4771
20	0,1	0,15	2	612-4772
25	0,1	0,15	2	612-4773
50	0,2	0,3	2	612-4774

MEASURING CYLINDERS

Borosilicate 3.3 glass, class A, tall form.

- Calibrated to contain (TC, In)
- Hexagonal glass base with spout
- Blue graduations with ring marks at major graduations

DIN 12680

Batch number and enclosed batch certificate.

Capacity (ml)	Division (ml)	Tolerance (± ml)	Pk	Cat. No.
5	0,1	0,05	2	612-3832
10	0,2	0,1	2	612-3833
25	0,5	0,25	2	612-3834
50	1	0,5	2	612-3835
100	1	0,5	2	612-3836
250	2	1	2	612-3837
500	5	2,5	2	612-3838
1000	10	5	1	612-3839
2000	20	10	1	612-3840

MIXING MEASURING CYLINDERS

Borosilicate 3.3 glass, class A.

- Calibrated to contain (TC, In)
- Hexagonal glass base, NS ground and PE stopper
- Ring marks at major graduations, marks and inscriptions in blue colour

DIN EN ISO 4788

Batch certificate included.

Capacity (ml)	Division (ml)	Height (mm)	Pk	Cat. No.
10	0,2	160	2	612-5771
25	0,5	190	2	612-5772
50	1,0	220	2	612-5773
100	1,0	285	2	612-5774
250	2,0	350	2	612-5775
500	5,0	395	2	612-5776
1000	10,0	500	1	612-5777

VOLUMETRIC FLASKS

Borosilicate 3.3 glass, amber, class A.

- Red PE stopper
- Marks and inscriptions in white enamel
- Calibrated to contain (TC, In)

DIN EN ISO 1042

Batch number and enclosed batch certificate.

Capacity (ml)	NS	Tolerance (± ml)	Pk	Cat. No.
5	10/19	0,04	2	612-3821
10	10/19	0,04	2	612-3822
20	10/19	0,04	2	612-3823
25	10/19	0,04	2	612-3824
50	12/21	0,06	2	612-3825
100	14/23	0,10	2	612-3826
200	14/23	0,15	2	612-3827
250	14/23	0,15	2	612-3828
500	19/26	0,25	2	612-3829
1000	24/29	0,40	1	612-3830
2000	29/32	0,60	1	612-3831

VOLUMETRIC FLASKS

Borosilicate 3.3 glass, class A.

- PP white stopper
- Marks in white and inscriptions in blue enamel
- Calibrated to contain (TC, In)

DIN EN ISO 1042.

Batch number and enclosed batch certificate.

Capacity (ml)	NS	Tolerance (± ml)	Pk	Cat. No.
5	10/19	0,040	2	**612-3738**
10	10/19	0,040	2	**612-3740**
20	10/19	0,040	2	**612-3741**
25	10/19	0,040	2	**612-3742**
50	12/21	0,060	2	**612-3743**
100	14/23	0,100	2	**612-3744**
200	14/23	0,150	2	**612-3745**
250	14/23	0,150	2	**612-3746**
500	19/26	0,250	2	**612-3818**
1000	24/29	0,400	1	**612-3819**
2000	29/32	0,600	1	**612-3820**

WEIGHING BOTTLES

Borosilicate 3.3 glass, low form.

- Interchangeable knobbed lid with ground joint
- Writing area in white
- Resistant against chemicals and thermal shock

Capacity (ml)	Ø×H (mm)	NS	Pk	Cat. No.
6	25×25	24/12	1	**611-3817**
15	35×30	34/12	1	**611-3818**
15	40×25	40/12	1	**611-3819**
30	50×30	50/12	1	**611-3820**
45	60×30	60/12	1	**611-3821**
80	80×30	80/12	1	**611-3822**

CALIBRATION WEIGHTS E1 WITH CALIBRATION CERTIFICATE

Individual E1 OIML class weights are intended to ensure traceability between the national mass standards (with values derived from the International Prototype of the kilogram) and Class E2 and lower weights. They are also used with microbalances. Anti-magnetic, cobalt alloy weights are available from 1 to 500 mg. Packed in a plastic case, the wire weights are easy to store. Anti-magnetic, corrosion resistant, highly polished stainless steel knob weights are available from 1 to 200 g. Packed in a plastic case the weights are easy to store. Sets of weights are also available in either cobalt alloy or stainless steel with a choice of a plastic or wooden storage box.

- Identification number guarantees traceability for weights from 1 g upwards
- Laser engraving improves legibility of the markings
- Supplied with COFRAC certificate

Conform to OILM R111 recommendations.

Set	Weights included												
		1 mg	2 mg	5 mg	10 mg	20 mg	50 mg	100 mg	200 mg	500 mg			
1 - 500 mg		1	2	1	1	2	1	1	2	1			
	Includes 1 - 500 mg set +	1 g	2 g	5 g	10 g	20 g	50 g	100 g	200 g	500 g	1 kg	2 kg	5 kg	10 kg
1 mg - 50 g	1	1	2	1	1	2	1							
1 mg - 100 g	1	1	2	1	1	2	1	1						
1 mg - 200 g	1	1	2	1	1	2	1	1	2					
1 mg - 500 g	1	1	2	1	1	2	1	1	2	1				
1 mg - 1 kg	1	1	2	1	1	2	1	1	2	1	1			
1 mg - 2 kg	1	1	2	1	1	2	1	1	2	1	1	2		
1 mg - 5 kg	1	1	2	1	1	2	1	1	2	1	1	2	1	
1 mg - 10 kg	1	1	2	1	1	2	1	1	2	1	1	2	1	1
1 g - 50 g		1	2	1	1	2	1							
1 g - 100 g		1	2	1	1	2	1	1						
1 g - 200 g		1	2	1	1	2	1	1	2					
1 g - 500 g		1	2	1	1	2	1	1	2	1				
1 g - 1 kg		1	2	1	1	2	1	1	2	1	1			
1 g - 2 kg		1	2	1	1	2	1	1	2	1	1	2		
1 g - 5 kg		1	2	1	1	2	1	1	2	1	1	2	1	
1 g - 10 kg		1	2	1	1	2	1	1	2	1	1	2	1	1

Weight	Weight set	No. of weights	Tolerance	Total weight (g)	Type	Pk	Cat. No.
E1 cobalt alloy weights in plastic box with COFRAC certificate							
1 mg			±3 µg		Wire weight	1	**611-3635**
2 mg			±3 µg		Wire weight	1	**611-3636**
5 mg			±3 µg		Wire weight	1	**611-3637**
10 mg			±3 µg		Wire weight	1	**611-3638**
20 mg			±3 µg		Wire weight	1	**611-3639**
50 mg			±4 µg		Wire weight	1	**611-3640**
100 mg			±5 µg		Wire weight	1	**611-3641**
200 mg			±6 µg		Wire weight	1	**611-3642**
500 mg			±8 µg		Wire weight	1	**611-3643**
Set of 12 cobalt alloy weights in plastic box with COFRAC certificate							
	1 - 500 mg	12		1,11		1 SET	**611-3652**
Set of 12 cobalt alloy weights in wooden box with COFRAC certificate							
	1 - 500 mg	12		1,11		1 SET	**611-3653**
Set of 21 stainless steel weights in plastic box with COFRAC certificate							
	1 mg - 100 g	21		211,11		1 SET	**611-3654**
Set of 21 stainless steel weights in plastic box with COFRAC certificate							
	1 mg - 100 g	21		211,11		1 SET	**611-3655**
Set of 23 stainless steel weights in plastic box with COFRAC certificate							
	1 mg - 200 g	23		611,11		1 SET	**611-3656**
Set of 23 stainless steel weights in plastic box with COFRAC certificate							
	1 mg - 200 g	23		611,11		1 SET	**611-3657**

CALIBRATION WEIGHTS, CLASS E2

Weights made from solid, anti-magnetic, polished stainless steel.

- Wire weights up to 500 mg in cobalt alloy
- Identification number guarantees traceability for weights from 1 g upwards
- Laser engraving improves legibility of the markings
- Available with or without COFRAC certificate

Suitable for high resolution electronic balances.

Conform to OILM R111 recommendations.

All weights from 1 mg to 20 kg are available with or without COFRAC certificate - please visit **vwr.com** or contact your local Avantor sales office. A range of weight sets are also available - please search for product 'Calibration weight sets, Class E2'.

Weight	Tolerance (± mg)	Pk	Cat. No.
1 mg	0,006	1	611-8131
2 mg	0,006	1	611-8132
5 mg	0,006	1	611-8133
10 mg	0,008	1	611-8134
20 mg	0,010	1	611-8135
50 mg	0,012	1	611-8136
100 mg	0,016	1	611-8137
200 mg	0,020	1	611-8138
500 mg	0,025	1	611-8139
1 g	0,03	1	611-8140
2 g	0,04	1	611-8141
5 g	0,05	1	611-8142
10 g	0,06	1	611-8143
20 g	0,08	1	611-8144
50 g	0,10	1	611-8145
100 g	0,16	1	611-8146
200 g	0,30	1	611-8147
500 g	0,75	1	611-8148
1 kg	1,6	1	611-8149
2 kg	3,0	1	611-8150
5 kg	7,5	1	611-8151
10 kg	16,0	1	611-8152
20 kg	30,0	1	611-8428
E2 weights in wooden boxes with COFRAC certificate			
500 g	0,75	1	611-8399
1 kg	1,6	1	611-8400
2 kg	3	1	611-8423
5 kg	7,5	1	611-8424
10 kg	16	1	611-8425
20 kg	30	1	611-8426
50 kg	50	1	611-8427

Weight	Tolerance (± mg)	Pk	Cat. No.
E2 weights in plastic cases without certificate			
1 mg	0,006	1	611-8101
2 mg	0,006	1	611-8102
5 mg	0,006	1	611-8103
10 mg	0,008	1	611-8104
20 mg	0,010	1	611-8105
50 mg	0,012	1	611-8106
100 mg	0,016	1	611-8107
200 mg	0,020	1	611-8108
500 mg	0,025	1	611-8109
1 g	0,03	1	611-8110
2 g	0,04	1	611-8111
5 g	0,05	1	611-8112
10 g	0,06	1	611-8113
20 g	0,08	1	611-8114
50 g	0,10	1	611-8115
100 g	0,16	1	611-8116
200 g	0,30	1	611-8117
500 g	0,75	1	611-8118
1 kg	1,6	1	611-8119
2 kg	3,0	1	611-8120
5 kg	7,5	1	611-8121
10 kg	16,0	1	611-8122
20 kg	30,0	1	611-8398
E2 weights in wooden boxes without certificate			
500 g	0,75	1	611-8391
1 kg	1,6	1	611-8392
2 kg	3	1	611-8393
5 kg	7,5	1	611-8394
10 kg	16	1	611-8395
20 kg	30	1	611-8396
50 kg	50	1	611-8397

CALIBRATION WEIGHT SETS, CLASS E2

Weights made from solid, anti-magnetic, polished stainless steel. Suitable for high resolution electronic balances.

- Wire weights up to 500 mg in cobalt alloy
- Identification number guarantees traceability for weights from 1 g upwards
- Laser engraving improves legibility of the markings
- Available with or without COFRAC certificate

Conform to OILM R111 recommendations.

All weight sets listed in the 'set contents' table are available with or without COFRAC certificate - please visit **vwr.com** or contact your local Avantor sales office. Weights are also available individually - please search for product 'Calibration weights, Class E2'.

Set		Weights included												
		1 mg	2 mg	5 mg	10 mg	20 mg	50 mg	100 mg	200 mg	500 mg				
1 - 500 mg		1	2	1	1	2	1	1	2	1				
	Includes 1 - 500 mg set +	1 g	2 g	5 g	10 g	20 g	50 g	100 g	200 g	500 g	1 kg	2 kg	5 kg	10 kg
1 mg - 50 g	1	1	2	1	1	2	1							
1 mg - 100 g	1	1	2	1	1	2	1	1						
1 mg - 200 g	1	1	2	1	1	2	1	1	2					
1 mg - 500 g	1	1	2	1	1	2	1	1	2	1				
1 mg - 1 kg	1	1	2	1	1	2	1	1	2	1	1			
1 mg - 2 kg	1	1	2	1	1	2	1	1	2	1	1	2		
1 mg - 5 kg	1	1	2	1	1	2	1	1	2	1	1	2	1	
1 mg - 10 kg	1	1	2	1	1	2	1	1	2	1	1	2	1	1
1 g - 50 g		1	2	1	1	2	1							
1 g - 100 g		1	2	1	1	2	1	1						
1 g - 200 g		1	2	1	1	2	1	1	2					
1 g - 500 g		1	2	1	1	2	1	1	2	1				
1 g - 1 kg		1	2	1	1	2	1	1	2	1	1			
1 g - 2 kg		1	2	1	1	2	1	1	2	1	1	2		
1 g - 5 kg		1	2	1	1	2	1	1	2	1	1	2	1	
1 g - 10 kg		1	2	1	1	2	1	1	2	1	1	2	1	1

Weight set	No. of weights	Total weight (g)	Pk	Cat. No.
1 mg - 500 mg	12	1,11	1	611-8742
1 mg - 50 g	20	111,11	1	611-8743
1 mg - 100 g	21	211,11	1	611-8744
1 mg - 200 g	23	611,11	1	611-8745
1 mg - 500 g	24	1111,11	1	611-8746
1 mg - 1 kg	25	2111,11	1	611-8747
1 mg - 2 kg	27	6111,11	1	611-8748
1 mg - 5 kg	28	11111,11	1	611-8749
1 mg - 10 kg	29	21111,11	1	611-8750
1 g - 50 g	8	110	1	611-8751
1 g - 100 g	9	210	1	611-8752
1 g - 200 g	11	610	1	611-8753
1 g - 500 g	12	1110	1	611-8754
1 g - 1 kg	13	2110	1	611-8755
1 g - 2 kg	15	6110	1	611-8756
1 g - 5 kg	16	11110	1	611-8757
1 g - 10 kg	17	21110	1	611-8758
E2 weight sets in plastic cases with certificate				
1 mg - 500 mg	12	1,11	1	611-8454
1 mg - 100 g	21	211,11	1	611-8455
1 mg - 200 g	23	611,11	1	611-8456
1 mg - 500 g	24	1111,11	1	611-8457

Weight set	No. of weights	Total weight (g)	Pk	Cat. No.
E2 weight sets in wooden boxes with certificate				
1 g - 100 g	9	210	1	611-8458
1 g - 200 g	11	610	1	611-8459
1 g - 500 g	12	1110	1	611-8460
E2 weight sets in wooden boxes without certificate				
1 mg - 500 mg	12	1,11	1	611-8722
1 mg - 50 g	20	111,11	1	611-8723
1 mg - 100 g	21	211,11	1	611-8724
1 mg - 200 g	23	611,11	1	611-8725
1 mg - 500 g	24	1111,11	1	611-8726
1 mg - 1 kg	25	2111,11	1	611-8727
1 mg - 2 kg	27	6111,11	1	611-8728
1 mg - 5 kg	28	11111,11	1	611-8729
1 mg - 10 kg	29	21111,11	1	611-8730
1 g - 50 g	8	110	1	611-8731
1 g - 100 g	9	210	1	611-8732
1 g - 200 g	11	610	1	611-8733
1 g - 500 g	12	1110	1	611-8734
1 g - 1 kg	13	2110	1	611-8735
1 g - 2 kg	15	6110	1	611-8736
1 g - 5 kg	16	11110	1	611-8737
1 g - 10 kg	17	21110	1	611-8738

CALIBRATION WEIGHTS, CLASS F1

Weights made from anti-magnetic, polished stainless steel. Suitable for medium resolution precision electronic balances. Weights have adjustment cavities for weights of more than 20 g.

- Wire weights up to 500 mg in cobalt alloy
- Identification number guarantees traceability for weights from 1 g upwards
- Laser engraving improves legibility of the markings
- Available with or without COFRAC certificate

Conform to OILM R111 recommendations.

All weights from 1 mg to 20 kg are available with or without COFRAC certificate - please visit **vwr.com** or contact your local Avantor sales office. A range of sets of weights are also available - please search for product 'Calibration weight sets, Class F1'.

Weight	Tolerance (± mg)	Pk	Cat. No.
F1 weights in plastic cases with certificate			
1 mg	0,020	1	**611-8231**
2 mg	0,020	1	**611-8232**
5 mg	0,020	1	**611-8233**
10 mg	0,025	1	**611-8234**
20 mg	0,03	1	**611-8235**
50 mg	0,04	1	**611-8236**
100 mg	0,05	1	**611-8237**
200 mg	0,06	1	**611-8238**
500 mg	0,08	1	**611-8239**
1 g	0,10	1	**611-8240**
2 g	0,12	1	**611-8241**
5 g	0,15	1	**611-8242**
10 g	0,20	1	**611-8243**
20 g	0,25	1	**611-8244**
50 g	0,30	1	**611-8245**
100 g	0,50	1	**611-8246**
200 g	1,0	1	**611-8247**
500 g	2,5	1	**611-8248**
1 kg	5	1	**611-8249**
2 kg	10	1	**611-8250**
5 kg	25	1	**611-8251**
10 kg	50	1	**611-8252**
20 kg	100	1	**611-8094**
F1 weights in wooden boxes with certificate			
500 g	2,5	1	**611-8040**
1 kg	5	1	**611-8041**
2 kg	10	1	**611-8042**
5 kg	25	1	**611-8049**
10 kg	50	1	**611-8058**
20 kg	100	1	**611-8071**
50 kg	250	1	**611-8093**

Weight	Tolerance (± mg)	Pk	Cat. No.
F1 weights in plastic cases without certificate			
1 mg	0,020	1	**611-8201**
2 mg	0,020	1	**611-8202**
5 mg	0,020	1	**611-8203**
10 mg	0,025	1	**611-8204**
20 mg	0,03	1	**611-8205**
50 mg	0,04	1	**611-8206**
100 mg	0,05	1	**611-8207**
200 mg	0,06	1	**611-8208**
500 mg	0,08	1	**611-8209**
1 g	0,10	1	**611-8210**
2 g	0,12	1	**611-8211**
5 g	0,16	1	**611-8212**
10 g	0,20	1	**611-8213**
20 g	0,25	1	**611-8214**
50 g	0,30	1	**611-8215**
100 g	0,50	1	**611-8216**
200 g	1,0	1	**611-8217**
500 g	2,5	1	**611-8218**
1 kg	5	1	**611-8219**
2 kg	10	1	**611-8220**
5 kg	25	1	**611-8221**
10 kg	50	1	**611-8222**
20 kg	100	1	**611-8039**
F1 weights in wooden boxes without certificate			
500 g	2,5	1	**611-8028**
1 kg	2,5	1	**611-8029**
2 kg	10	1	**611-8033**
5 kg	25	1	**611-8035**
10 kg	50	1	**611-8036**
20 kg	100	1	**611-8037**
50 kg	150	1	**611-8038**

CALIBRATION WEIGHT SETS, CLASS F1

Weights made from anti-magnetic, polished stainless steel. Suitable for medium resolution, precision electronic balances. Weights of more than 20 g have adjustment cavities.

- Wire weights up to 500 mg in cobalt alloy
- Identification number guarantees traceability for weights from 1 g upwards
- Laser engraving improves legibility of the markings
- Available with or without COFRAC certificate

Conform to OILM R111 recommendations.

All weight sets listed in the 'set contents' table are available with or without COFRAC certificate - please visit **vwr.com** or contact your local Avantor sales office. Weights are also available individually - please search for product 'Calibration weights, Class F1'.

Set		Weights included											
		1 mg	2 mg	5 mg	10 mg	20 mg	50 mg	100 mg	200 mg	500 mg			
1 - 500 mg		1	2	1	1	2	1	1	2	1			
	Includes 1 - 500 mg set +	1 g	2 g	5 g	10 g	20 g	50 g	100 g	200 g	500 g	1 kg	2 kg	5 kg	10 kg
1 mg - 100 g	1	1	2	1	1	2	1	1						
1 mg - 200 g	1	1	2	1	1	2	1	1	2					
1 mg - 500 g	1	1	2	1	1	2	1	1	2	1				
1 mg - 1 kg	1	1	2	1	1	2	1	1	2	1	1			
1 mg - 2 kg	1	1	2	1	1	2	1	1	2	1	1	2		
1 mg - 5 kg	1	1	2	1	1	2	1	1	2	1	1	2	1	
1 mg - 10 kg	1	1	2	1	1	2	1	1	2	1	1	2	1	1
1 g - 100 g		1	2	1	1	2	1	1						
1 g - 200 g		1	2	1	1	2	1	1	2					
1 g - 500 g		1	2	1	1	2	1	1	2	1				
1 g - 1 kg		1	2	1	1	2	1	1	2	1	1			
1 g - 2 kg		1	2	1	1	2	1	1	2	1	1	2		
1 g - 5 kg		1	2	1	1	2	1	1	2	1	1	2	1	
1 g - 10 kg		1	2	1	1	2	1	1	2	1	1	2	1	1

Weight set	No. of weights	Total weight (g)	Pk	Cat. No.
F1 weight sets in wooden boxes with certificate				
1 mg - 500 mg	12	1,11	1	611-8632
1 mg - 50 g	20	111,11	1	611-8633
1 mg - 100 g	21	211,11	1	611-8634
1 mg - 200 g	23	611,11	1	611-8635
1 mg - 500 g	24	1111,11	1	611-8636
1 mg - 1 kg	25	2111,11	1	611-8637
1 mg - 2 kg	27	6111,11	1	611-8638
1 mg - 5 kg	28	11111,11	1	611-8639
1 mg - 10 kg	29	21111,11	1	611-8640
1 g - 50 g	8	110	1	611-8641
1 g - 100 g	9	210	1	611-8642
1 g - 200 g	11	610	1	611-8643
1 g - 500 g	12	1110	1	611-8644
1 g - 1 kg	13	2110	1	611-8645
1 g - 2 kg	15	6110	1	611-8646
1 g - 5 kg	16	11110	1	611-8647
1 g - 10 kg	17	21110	1	611-8648
F1 weight sets in plastic cases with certificate				
1 mg - 500 mg	12	1,11	1	611-8461
1 mg - 100 g	21	211,11	1	611-8462
1 mg - 200 g	23	611,11	1	611-8463
1 mg - 500 g	24	1111,11	1	611-8464
1 mg - 2 kg	27	6111,11	1	611-8649
1 mg - 5 kg	28	11111,11	1	611-8650
1 g - 100 g	9	210	1	611-8465
1 g - 200 g	11	610	1	611-8466

Weight set	No. of weights	Total weight (g)	Pk	Cat. No.
1 g - 500 g	12	1110	1	611-8467
1 g - 2 kg	15	6110	1	611-8651
1 g - 5 kg	16	11110	1	611-8652
F1 weight sets in wooden boxes without certificate				
1 mg - 500 mg	12	1,11	1	611-8602
1 mg - 50 g	20	111,11	1	611-8603
1 mg - 100 g	21	211,11	1	611-8292
1 mg - 200 g	23	611,11	1	611-8604
1 mg - 500 g	24	1111,11	1	611-8605
1 mg - 1 kg	25	2111,11	1	611-8606
1 mg - 2 kg	27	6111,11	1	611-8607
1 mg - 5 kg	28	11111,11	1	611-8608
1 mg - 10 kg	29	21111,11	1	611-8609
1 g - 50 g	8	110	1	611-8610
1 g - 100 g	9	210	1	611-8611
1 g - 200 g	11	610	1	611-8612
1 g - 500 g	12	1110	1	611-8613
1 g - 1 kg	13	2110	1	611-8614
1 g - 2 kg	15	6110	1	611-8615
1 g - 5 kg	16	11110	1	611-8616
1 g - 10 kg	17	21110	1	611-8617
F1 weight sets in plastic cases without certificate				
1 mg - 2 kg	27	6111,11	1	611-8618
1 mg - 5 kg	28	11111,11	1	611-8619
1 g - 2 kg	15	6110	1	611-8620
1 g - 5 kg	16	11110	1	611-8621

CALIBRATION WEIGHTS, CLASS F1, CALBOX, CERTIFIED

An economical range of calibration sets, with only three stainless steel weights, to meet routine calibration requirements of precision and analytical balances.

- Individual serial number and calibration certificate
- Each weight, from 1 g upwards, has a unique identification number for traceability
- Laser engraving improves legibility of the markings

Weights supplied in modern aluminium case with tweezers and balance brush.

Weight set	No. of weights	Type	Pk	Cat. No.
200 mg; 5 g; 50 g	3	With certificate	1	**611-2428**
200 mg; 10 g; 100 g	3	With certificate	1	**611-2429**
200 mg; 20 g; 200 g	3	With certificate	1	**611-2430**
200 mg; 50 g; 500 g	3	With certificate	1	**611-2432**
2 g; 20 g; 200 g	3	With certificate	1	**611-2431**

Weight set	No. of weights	Type	Pk	Cat. No.
2 g; 50 g; 500 g	3	With certificate	1	**611-2433**
2 g; 100 g; 1 kg	3	With certificate	1	**611-2434**
20 g; 100 g; 1 kg	3	With certificate	1	**611-2435**
20 g; 200 g; 2 kg	3	With certificate	1	**611-2436**
20 g; 500 g; 5 kg	3	With certificate	1	**611-2437**

CALIBRATION WEIGHTS, CLASS F2

Stainless steel Class F2 weights for users who require moderate levels of tolerance values in their calibration and day-to-day weighing.

- Wire weights up to 500 mg in cobalt alloy
- Identification number guarantees traceability for weights from 1 g upwards
- Laser engraving improves legibility of the markings
- Available with or without COFRAC certificate

Conform to OILM R111 recommendations.

All weights from 1 mg to 20 kg are available with or without COFRAC certificate - please visit **vwr.com** or contact your local Avantor sales office. A range of sets of weights are also available - please search for product 'Calibration weight sets, Class F2'.

Weight	Tolerance (± mg)	Pk	Cat. No.
F2 weights in plastic cases with certificate			
1 mg	0,06	1	**611-8179**
2 mg	0,06	1	**611-8180**
5 mg	0,06	1	**611-8181**
10 mg	0,08	1	**611-8182**
20 mg	0,10	1	**611-8183**
50 mg	0,12	1	**611-8184**
100 mg	0,16	1	**611-8185**
200 mg	0,20	1	**611-8186**
500 mg	0,25	1	**611-8187**
1 g	0,3	1	**611-8188**
2 g	0,4	1	**611-8189**
5 g	0,5	1	**611-8190**
10 g	0,6	1	**611-8195**
20 g	0,8	1	**611-8196**
50 g	1,0	1	**611-8197**
100 g	1,6	1	**611-8198**
200 g	3,0	1	**611-8199**
500 g	7,5	1	**611-8200**
1 kg	15	1	**611-8223**
2 kg	30	1	**611-8224**
5 kg	75	1	**611-8225**
10 kg	150	1	**611-8226**
20 kg	300	1	**611-8227**
F2 weights in wooden boxes with certificate			
500 g	7,5	1	**611-8172**
1 kg	15	1	**611-8173**
2 kg	30	1	**611-8174**
5 kg	75	1	**611-8175**
10 kg	150	1	**611-8176**
20 kg	300	1	**611-8177**
50 kg	750	1	**611-8178**

Weight	Tolerance (± mg)	Pk	Cat. No.
F2 weights in plastic cases without certificate			
1 mg	0,06	1	**611-8126**
2 mg	0,06	1	**611-8127**
5 mg	0,06	1	**611-8128**
10 mg	0,08	1	**611-8129**
20 mg	0,10	1	**611-8130**
50 mg	0,12	1	**611-8154**
100 mg	0,16	1	**611-8155**
200 mg	0,20	1	**611-8156**
500 mg	0,25	1	**611-8157**
1 g	0,3	1	**611-8158**
2 g	0,4	1	**611-8159**
5 g	0,5	1	**611-8160**
10 g	0,6	1	**611-8161**
20 g	0,8	1	**611-8162**
50 g	1,0	1	**611-8163**
100 g	1,6	1	**611-8164**
200 g	3,0	1	**611-8165**
500 g	7,5	1	**611-8166**
1 kg	15	1	**611-8167**
2 kg	30	1	**611-8168**
5 kg	75	1	**611-8169**
10 kg	150	1	**611-8170**
20 kg	300	1	**611-8171**
F2 weights in wooden boxes without certificate			
500 g	7,5	1	**611-8095**
1 kg	15	1	**611-8096**
2 kg	30	1	**611-8097**
5 kg	75	1	**611-8098**
10 kg	150	1	**611-8099**
20 kg	300	1	**611-8100**
50 kg	750	1	**611-8125**

CALIBRATION WEIGHT SETS, CLASS F2

Stainless steel. Wire weights up to 500 mg in cobalt alloy.

- Identification number guarantees traceability for weights from 1 g upwards
- Laser engraving improves legibility of the markings
- Available with or without COFRAC certificate

Conform to OILM R111 recommendations.

Set		Weights included												
		1 mg	2 mg	5 mg	10 mg	20 mg	50 mg	100 mg	200 mg	500 mg				
1 - 500 mg		1	2	1	1	2	1	1	2	1				
20 - 500 mg						2	1	1	2	1				
	Includes 1 - 500 mg set +	1 g	2 g	5 g	10 g	20 g	50 g	100 g	200 g	500 g	1 kg	2 kg	5 kg	10 kg
1 mg - 100 g	1	1	2	1	1	2	1	1						
1 mg - 200 g	1	1	2	1	1	2	1	1	2					
1 mg - 500 g	1	1	2	1	1	2	1	1	2	1				
1 mg - 1 kg	1	1	2	1	1	2	1	1	2	1	1			
1 mg - 2 kg	1	1	2	1	1	2	1	1	2	1	1	2		
1 mg - 5 kg	1	1	2	1	1	2	1	1	2	1	1	2	1	
1 mg - 10 kg	1	1	2	1	1	2	1	1	2	1	1	2	1	1
1 g - 100 g		1	2	1	1	2	1	1						
1 g - 200 g		1	2	1	1	2	1	1	2					
1 g - 500 g		1	2	1	1	2	1	1	2	1				
1 g - 1 kg		1	2	1	1	2	1	1	2	1	1			
1 g - 2 kg		1	2	1	1	2	1	1	2	1	1	2		
1 g - 5 kg		1	2	1	1	2	1	1	2	1	1	2	1	
1 g - 10 kg		1	2	1	1	2	1	1	2	1	1	2	1	1

Weight set	No. of weights	Total weight (g)	Pk	Cat. No.
F2 weight sets in wooden boxes with certificate				
1 mg - 500 mg	12	1,11	1	**611-8692**
1 mg - 50 g	20	111,11	1	**611-8693**
1 mg - 100 g	21	211,11	1	**611-8694**
1 mg - 200 g	23	611,11	1	**611-8695**
1 mg - 500 g	24	1111,11	1	**611-8696**
1 mg - 1 kg	25	2111,11	1	**611-8697**
1 mg - 2 kg	27	6111,11	1	**611-8698**
1 mg - 5 kg	28	11111,11	1	**611-8699**
1 mg - 10 kg	29	21111,11	1	**611-8700**
1 g - 50 g	8	110	1	**611-8701**
1 g - 100 g	9	210	1	**611-8702**
1 g - 200 g	11	610	1	**611-8703**
1 g - 500 g	12	1110	1	**611-8704**
1 g - 1 kg	13	2110	1	**611-8705**
1 g - 2 kg	15	6110	1	**611-8706**
1 g - 5 kg	16	11110	1	**611-8707**
1 g - 10 kg	17	21110	1	**611-8708**
F2 weight sets in plastic cases with certificate				
1 mg - 2 kg	27	6111,11	1	**611-8709**
1 mg - 5 kg	28	11111,11	1	**611-8710**
1 g - 2 kg	15	6110	1	**611-8711**
1 g - 5 kg	16	11110	1	**611-8712**

Weight set	No. of weights	Total weight (g)	Pk	Cat. No.
F2 weight sets in wooden boxes without certificate				
1 mg - 500 mg	12	1,11	1	**611-8662**
1 mg - 50 g	20	111,11	1	**611-8663**
1 mg - 100 g	21	211,11	1	**611-8664**
1 mg - 200 g	23	611,11	1	**611-8665**
1 mg - 500 g	24	1111,11	1	**611-8666**
1 mg - 1 kg	25	2111,11	1	**611-8667**
1 mg - 2 kg	27	6111,11	1	**611-8668**
1 mg - 5 kg	28	11111,11	1	**611-8669**
1 mg - 10 kg	29	21111,11	1	**611-8670**
1 g - 50 g	8	110	1	**611-8671**
1 g - 100 g	9	210	1	**611-8672**
1 g - 200 g	11	610	1	**611-8673**
1 g - 500 g	12	1110	1	**611-8674**
1 g - 1 kg	13	2110	1	**611-8675**
1 g - 2 kg	15	6110	1	**611-8676**
1 g - 5 kg	16	11110	1	**611-8677**
1 g - 10 kg	17	21110	1	**611-8678**
F2 weight sets in plastic cases without certificate				
1 mg - 2 kg	27	6111,11	1	**611-8679**
1 mg - 5 kg	28	11111,11	1	**611-8680**
1 g - 2 kg	15	6110	1	**611-8681**
1 g - 5 kg	16	11110	1	**611-8682**

CALIBRATION WEIGHTS, CLASS 1

Stainless steel masses adjusted to Class 1 for precise checking and adjustment of electronic balances.

- ASTM
- Individual weights are supplied without certificate.

Weight (g)	Tolerance (± mg)	Pk	Cat. No.
50	120	1	**611-8759**
100	250	1	**611-8760**
200	500	1	**611-8761**
500	1200	1	**611-8762**
1000	2500	1	**611-8763**
2000	5000	1	**611-8764**
5000	12000	1	**611-8765**
10000	25000	1	**611-8766**

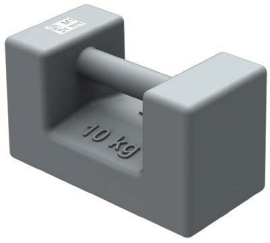
CALIBRATION WEIGHTS, CLASS M1

Weights from 1 to 50 g are monobloc weights, with larger weights having an adjusting cavity.

All weights are supplied in plastic cases.

Weight	Tolerance (± mg)	Pk	Cat. No.
Aluminium sheet weights with certificate, M1			
1 mg	0,2	1	**611-8272**
2 mg	0,2	1	**611-8273**
5 mg	0,2	1	**611-8274**
10 mg	0,25	1	**611-8275**
20 mg	0,3	1	**611-8276**
50 mg	0,4	1	**611-8277**
100 mg	0,5	1	**611-8278**
200 mg	0,6	1	**611-8279**
500 mg	0,8	1	**611-8280**
Stainless steel weights with certificate, M1			
1 g	1,0	1	**611-8281**
2 g	1,2	1	**611-8282**
5 g	1,6	1	**611-8283**
10 g	2,0	1	**611-8284**
20 g	2,5	1	**611-8285**
50 g	3,0	1	**611-8286**
100 g	5	1	**611-8287**
200 g	10	1	**611-8288**
500 g	25	1	**611-8289**
1 kg	50	1	**611-8294**
2 kg	100	1	**611-8295**
5 kg	250	1	**611-8296**
10 kg	500	1	**611-8297**

Weight	Tolerance (± mg)	Pk	Cat. No.
Aluminium sheet weights without certificate, M1			
1 mg	0,2	1	**611-8228**
2 mg	0,2	1	**611-8229**
5 mg	0,2	1	**611-8230**
10 mg	0,25	1	**611-8253**
20 mg	0,3	1	**611-8254**
50 mg	0,4	1	**611-8255**
100 mg	0,5	1	**611-8256**
200 mg	0,6	1	**611-8257**
500 mg	0,8	1	**611-8258**
Stainless steel weights without certificate, M1			
1 g	1,0	1	**611-8259**
2 g	1,2	1	**611-8260**
5 g	1,6	1	**611-8261**
10 g	2,0	1	**611-8262**
20 g	2,5	1	**611-8263**
50 g	3,0	1	**611-8264**
100 g	5	1	**611-8265**
200 g	10	1	**611-8266**
500 g	25	1	**611-8267**
1 kg	50	1	**611-8268**
2 kg	100	1	**611-8269**
5 kg	250	1	**611-8270**
10 kg	500	1	**611-8271**



BLOCK WEIGHTS, CLASS M1

Rectangular weights made from cast iron (density 7,2 g/cm^3).

– Indelible unique identification number guarantees traceability

Colour: Grey

Conforms to OILM, COFRAC accredited.

Weight (kg)	Tolerance (± mg)	Type	Pk	Cat. No.
5	250	Without certificate	1	611-8298
10	500	Without certificate	1	611-8299
20	1000	Without certificate	1	611-8300
50	2500	Without certificate	1	611-8323
5	250	With certificate	1	611-8324
10	500	With certificate	1	611-8325
20	1000	With certificate	1	611-8326
50	2500	With certificate	1	611-8327

BLOCK WEIGHTS, IRON, CLASS M2

Rectangular weights made from cast iron, permanently magnetised.

– Indelible unique identification number guarantees traceability
– Painted grey
– Adjustment cavity sealed with a lead plug

Conforms to OILM, COFRAC accredited.

Weight (kg)	Tolerance (± mg)	Pk	Cat. No.
5	750	1	611-8387
10	1600	1	611-8388
20	3000	1	611-8389
50	7500	1	611-8390
Block weights without certificate			
5	750	1	611-8383
10	1600	1	611-8384
20	3000	1	611-8385
50	7500	1	611-8386

BALANCE AND WEIGHT CLEANING KIT

Cleaning kit containing a puffer brush (lens cleaning brush), cotton cloth and pair of nitrile gloves.

In a resealable plastic bag.

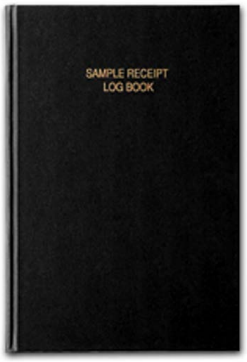
Description	Pk	Cat. No.
Cleaning kit for weights and balances	1 KIT	611-2886

SCHOOL WEIGHTS

Brass weights which are ideal for schools introducing the concepts of weights and forces.

Set	Weights included								
	1 g	2 g	5 g	10 g	20 g	50 g	100 g	200 g	500 g
500 g	1	2	1	2	1	1	2	1	
1 kg	1	2	1	2	1	1	2	1	1

Weight (g)	Tolerance	Pk	Cat. No.
Single weight			
1	0,03	1	611-1843
2	0,03	1	611-1844
5	0,03	1	611-1845
10	0,03	1	611-1846
20	0,03	1	611-1847
50	0,03	1	611-1848
100	0,03	1	611-1849
200	0,03	1	611-1850
500	0,03	1	611-1851
Set of weights in plastic case			
1 - 500		1	611-1852
1 - 1000		1	611-1853



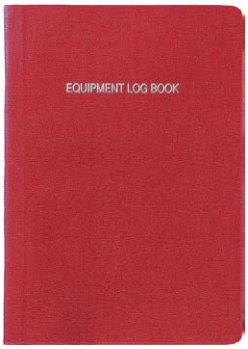
LABORATORY LOG BOOKS

Imitation leather cover with coating, for durability in laboratory environments. Acidfree, archive-safe paper (90 gsm). Used to record and log data relating to laboratory equipment, temperature, balance calibration, reagents, animal maintenance and sample receipts.

- All pages for logging documentation have specific column headings for easy data entry
- Pages sewn in sections, books have round binding so that they lay flat
- Waterproof and tough

GLP, GMP and GCP guidelines.

Description	Colour	No. of pages	Pk	Cat. No.
Log book, laboratory equipment	Red	96	1	818-0102
Log book, animal maintenance	Black	168	1	818-0103
Log book, balance calibration	Green	168	1	818-0104
Log book, reagents	Dark red	168	1	818-0105
Log book, sample receipt	Red	168	1	818-0106
Log book, temperature	White	168	1	818-0107



MINI EQUIPMENT LOG BOOKS

'FLEX' covers with coating, for durability in laboratory environments. Acid-free, archive-safe paper (90 gsm).

- Pages specifically designed for logging and recording equipment data
- Tough coated cover

Format: A5 (14,8×21 cm) or A6 (10,5×14,8 cm), 96 pages, numbered.

All books made in accordance with GLP, GMP and GCP guidelines.

Description	Colour	No. of pages	Pk	Cat. No.
Mini equipment log book, A5	Red	96	1	818-0108
Mini equipment log book, A6	Red	96	1	818-0109

Setting science in motion to create a better world

avantor™ delivered by VWR™

AUSTRIA
VWR International GmbH
Graumanngasse 7
1150 Wien
Tel.: +43 1 97 002 0
info.at@vwr.com

BELGIUM
VWR International bv
Researchpark Haasrode 2020
Geldenaaksebaan 464
3001 Leuven
Tel.: +32 (0) 16 385 011
vwr.be@vwr.com

CZECH REPUBLIC
VWR International s. r. o.
Veetee Business Park
Pražská 442
CZ - 281 67 Stříbrná Skalice
Tel.: +420 321 570 321
info.cz@vwr.com

DENMARK
VWR International A/S
Tobaksvejen 21
2860 Søborg
Tel.: +45 43 86 87 88
info.dk@vwr.com

FINLAND
VWR International Oy
Valimotie 17-19
00380 Helsinki
Tel.: +358 (0) 9 80 45 51
info.fi@vwr.com

FRANCE
VWR International S.A.S.
Immeuble Estréo
1-3 rue d'Aurion
93114 Rosny-sous-Bois cedex
Tel.: 0 825 02 30 30* (national)
Tel.: +33 (0) 1 45 14 85 00 (international)
info.fr@vwr.com
* 0,18 € TTC/min + prix appel

GERMANY
VWR International GmbH
Hilpertstraße 20a
D - 64295 Darmstadt
Tel.: 0800 702 00 07* (national)
Tel.: +49 (0) 6151 3972 0 (international)
info.de@vwr.com
*Freecall

HUNGARY
VWR International Kft.
Simon László u. 4.
4034 Debrecen
Tel.: +36 52 521130
info.hu@vwr.com

IRELAND
VWR International Ltd
Orion Business Campus
Northwest Business Park
Ballycoolin
Dublin 15
Tel.: +353 (0) 1 88 22 222
sales.ie@vwr.com

ITALY
VWR International S.r.l.
Via San Giusto 85
20153 Milano (MI)
Tel.: +39 02 3320311
info.it@vwr.com

THE NETHERLANDS
VWR International B.V.
Postbus 8198
1005 AD Amsterdam
Tel.: +31 (0) 20 4808 400
info.nl@vwr.com

NORWAY
VWR International AS
Brynsalleen 4,
0667 Oslo
Tel.: +47 22 90 00 00
info.no@vwr.com

POLAND
VWR International Sp. z o.o.
Limbowa 5
80-175 Gdansk
Tel.: +48 58 32 38 200
info.pl@vwr.com

PORTUGAL
VWR International - Material de Laboratório, Lda
Centro Empresarial de Alfragide
Rua da Indústria, nº 6
2610-088 Amadora
Tel.: +351 21 3600 770
info.pt@vwr.com

SPAIN
VWR International Eurolab S.L.U.
C/ Tecnología 5-17
A-7 Llinars Park
08450 - Llinars del Vallès
Barcelona
Tel.: +34 902 222 897
info.es@vwr.com

SWEDEN
VWR International AB
Fagerstagatan 18b
163 94 Stockholm
Tel.: +46 (0) 8 621 34 20
kundservice.se@vwr.com

SWITZERLAND
VWR International GmbH
Lerzenstrasse 16/18
8953 Dietikon
Tel.: +41 (0) 44 745 13 13
info.ch@vwr.com

UK
VWR International Ltd
Customer Service Centre
Hunter Boulevard - Magna Park
Lutterworth
Leicestershire
LE17 4XN
Tel.: +44 (0) 800 22 33 44
uksales@vwr.com

CHINA
VWR (Shanghai) Co., Ltd
Bld.No.1, No.3728 Jinke Rd,
Pudong New District
Shanghai, 201203- China
Tel.: 400 821 8006
info_china@vwr.com

INDIA
VWR Lab Products Private Limited
No.139. BDA Industrial Suburb,
6th Main, Tumkur Road, Peenya Post,
Bangalore, India – 560058
Tel.: +91 80 28078400
vwr_india@vwr.com

KOREA
Avantor Performance Materials Korea Ltd
2F ACE Gwanggyo Tower I,
Daehak 4ro 17
Yeongtong-gu Suwon,
Korea 16226
Tel.: +82 31 645 7256
saleskorea@avantorsciences.com

MIDDLE EAST & AFRICA
VWR International FZ-LLC
Office 203, DSP Lab Complex,
Dubai Science Park,
Dubai, United Arab Emirates
Tel: +971 4 5573271
Info.mea@vwr.com

SINGAPORE
VWR Singapore Pte Ltd
18 Gul Drive
Singapore 629468
Tel: +65 6505 0760
sales.sg@vwr.com

GO TO VWR.COM FOR THE LATEST NEWS, SPECIAL OFFERS AND DETAILS FROM YOUR LOCAL VWR SUPPORT TEAM

ZPROVWRI36086-EN

11/2021-MN-KS