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How to Use this Catalog

The New VWR All You Need for Analytical Chemistry: Spectroscopy Catalog lists hundreds of products from our comprehensive portfolio along with information on many services available through VWR. In this catalog you will find navigational aids to help you locate the products you need quickly and easily.

Product Organization

Sections are organized by type of analysis for easy identification.

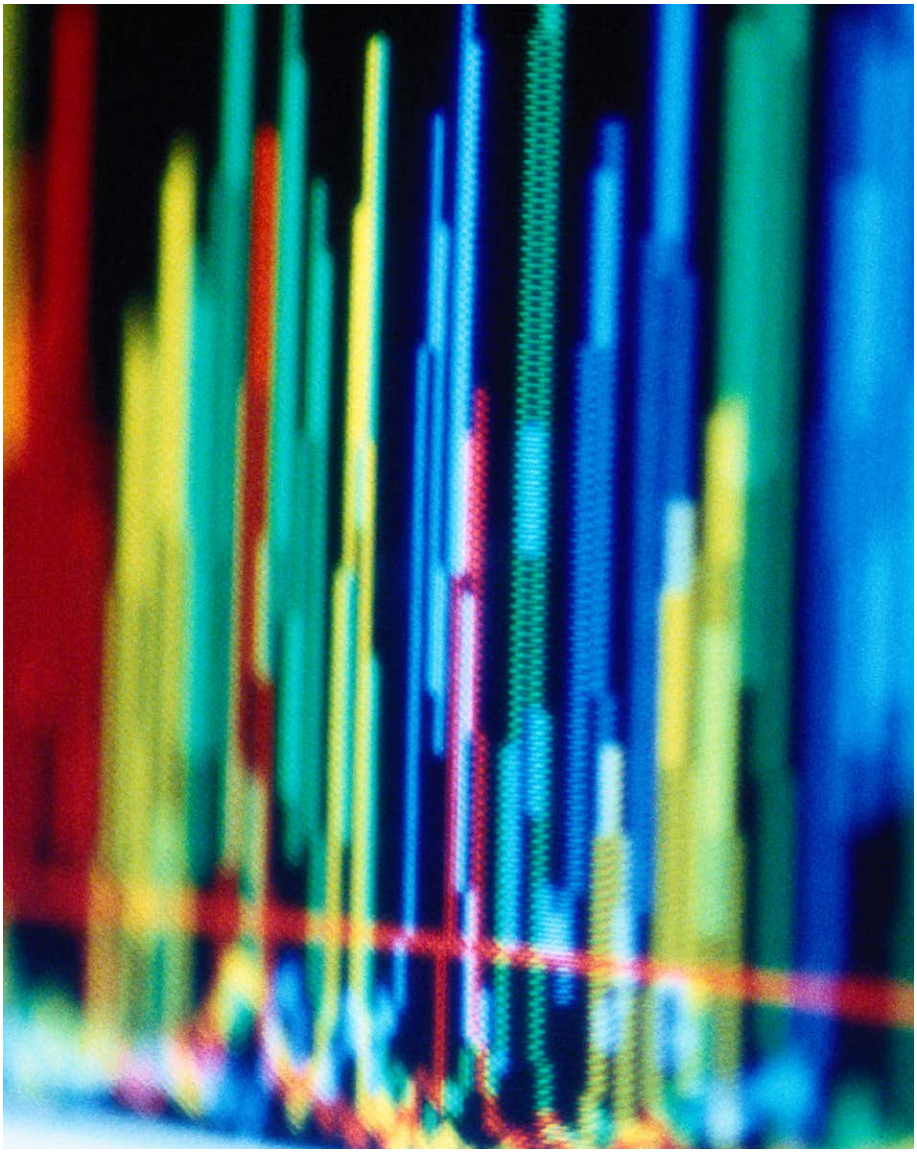
Page Headings

Section and subsection listings appear as necessary for you to refine your browsing.

ALL YOU NEED
FOR ANALYTICAL CHEMISTRY: SPECTROSCOPY

The emergence of the various types of spectroscopy as enabling technologies to establish chemical composition, appearance, and identification in a variety of material types has prompted a dramatic expansion in the use, development, and adoption of spectroscopic techniques in academia and commercial fields.

VWR can provide the necessary instruments, chemicals and equipment for all your spectroscopy applications.



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Lot: 1215070 | Use By/Exp: 08/2018
Store At/Entreposage: 15°C to 25°C
Date Opened/Ouvert:

CAS 7697-37-2 | **MW/PM** 63.01 | **Formula/e** HNO_3

Assay	67 - 70% by w/w	Manganese (Mn)	Max. 10 ppt
Aluminum (Al)	Max. 20 ppt	Mercury (Hg)	Max. 50 ppt
Antimony (Sb)	Max. 10 ppt	Molybdenum (Mo)	Max. 10 ppt
Arsenic (As)	Max. 20 ppt	Nickel (Ni)	Max. 20 ppt
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Calcium (Ca)	Max. 10 ppt	Sodium (Na)	Max. 10 ppt
Chromium (Cr)	Max. 10 ppt	Tin (Sn)	Max. 20 ppt
Cobalt (Co)	Max. 10 ppt	Titanium (Ti)	Max. 10 ppt
Copper (Cu)	Max. 10 ppt	Tungsten (W)	Max. 10 ppt
Iron (Fe)	Max. 10 ppt	Vanadium (V)	Max. 10 ppt
Lead (Pb)	Max. 10 ppt	Zinc (Zn)	Max. 10 ppt
Magnesium (Mg)	Max. 10 ppt	Go to **vwr.com** for full specifications.	

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LOT
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For Ultra trace metal analysis

DANGER – May intensify fire; oxidizer. Causes severe skin burns and eye damage. Wear protective gloves/protective clothing/eye protection/face protection. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor. Dispose of contents/containers in accordance with local, state and federal regulations.

DANGER – Peut aggraver un incendie; comburant. Provoque des graves brûlures de la peau et des graves lésions des yeux. Porter des gants de protection/des vêtements de protection/un équipement de protection des yeux/du visage. EN CAS DE CONTACT AVEC LA PEAU (ou les cheveux): Enlever immédiatement tous les vêtements contaminés. Rincer la peau à l'eau. EN CAS DE CONTACT AVEC LES YEUX: Rincer avec précaution à l'eau pendant plusieurs minutes. Enlever les lentilles de contact si la victime en porte et si elles peuvent être facilement enlevées. Continuer à rincer. Appeler immédiatement un CENTRE ANTIPOISON. Éliminer le contenu/récipient conformément aux réglements locaux, provinciaux et fédéraux.

PELIGRO – Puede agravar un incendio; comburente. Provoca graves quemaduras en la piel y lesiones oculares. Usar guantes/ropa de protección/equipo de protección para los ojos/la cara. EN CASO DE CONTACTO CON LA PIEL (o el pelo): Quitar inmediatamente toda la ropa contaminada. Enjuagar la piel con agua. EN CASO DE CONTACTO CON LOS OJOS: Enjuagar con agua cuidadosamente durante varios minutos. Quitar las lentes de contacto cuando estén presentes y pueda hacerse con facilidad. Proseguir con el lavado. Llamar inmediatamente a un CENTRO DE TOXICOLOGÍA. Deseche el contenido/envase conforme a las regulaciones locales, estatales y federales.

Hazard and precautionary numbers: H272 | H314 | P280 | P303+P361+P353 | P305+P351+P338 | P310 | P501

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NMR

DEUTERATED SOLVENTS

NMR TUBES

MagniSolv™ Acetic acid-D1 deuteration degree min. 99.5% for NMR spectroscopy

MagniSolv™ deuterated solvents provide reliable results in the NMR-spectra with extremely low residual water, excellent chemical purity and the highest isotopic enrichment.

Size	Packaging	Cat. No.
25 mL	Glass Bottle	**EM8.15035.0025**

For additional products, see **vwr.com**.

MagniSolv™ Acetic acid-D4 deuteration degree min. 99.5% for NMR spectroscopy

MagniSolv™ deuterated solvents provide:
- Reliable results in the NMR-spectra by excellent chemical purity and highest isotopic enrichment.
- Reliable deuteration degrees.
- Low residual water content.
- Determination of water content in two ways.

Size	Packaging	Cat. No.
10 x 0.75 mL	Glass Ampule	**EM8.15036.0009**
10 mL	Glass Bottle	**EM8.15036.0010**

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MagniSolv™ Acetone-D6 deuteration degree min. 99.9% for NMR spectroscopy

MagniSolv™ deuterated solvents provide:
- Reliable results in the NMR-spectra by excellent chemical purity and highest isotopic enrichment.
- Reliable deuteration degrees.
- Low residual water content.
- Determination of water content in two ways.

Size	Packaging	Cat. No.
10 x 0.5 mL	Glass Ampule	**EM1.00021.0005**
10 x 0.75 mL	Glass Ampule	**EM1.00021.0009**
10 mL	Septum-Sealed Glass Bottle	**EM1.00021.0010**
25 mL	Glass Bottle	**EM1.00021.0025**
100 mL	Glass Bottle	**EM1.00021.0100**

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MagniSolv™ Acetone-D6 deuteration degree min. 99.96% for NMR spectroscopy

MagniSolv™ deuterated solvents provide reliable results in the NMR-spectra with extremely low residual water, excellent chemical purity and the highest isotopic enrichment.

Size	Packaging	Cat. No.
10 x 0.75 mL	Glass Ampule	**EM1.11969.0009**

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MagniSolv™ Acetonitrile-D3 deuteration degree min. 99.96% for NMR spectroscopy

MagniSolv™ deuterated solvents provide reliable results in the NMR-spectra with extremely low residual water, excellent chemical purity and the highest isotopic enrichment.

Size	Packaging	Cat. No.
10 x 0.75 mL	Glass Ampule	**EM1.13753.0009**
1 mL	Glass Ampule	**EM1.13753.0001**

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MagniSolv™ Acetonitrile-D3 deuteration degree min. 99% for NMR spectroscopy

MagniSolv™ deuterated solvents provide:
- Reliable results in the NMR-spectra by excellent chemical purity and highest isotopic enrichment.
- Reliable deuteration degrees.
- Low residual water content.
- Determination of water content in two ways.

Size	Packaging	Cat. No.
10 mL	Septum-Sealed Glass Bottle	**EM1.02904.0010**

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MagniSolv™ Benzene-D6 deuteration degree min. 99.96% for NMR spectroscopy

MagniSolv™ deuterated solvents provide reliable results in the NMR-spectra with extremely low residual water, excellent chemical purity and the highest isotopic enrichment.

Size	Packaging	Cat. No.
10 x 0.75 mL	Glass Ampule	**EM1.01766.0009**
10 mL	Septum-Sealed Glass Bottle	**EM1.01766.0010**

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MagniSolv™ Benzene-D6 deuteration degree min. 99.6% for NMR spectroscopy

MagniSolv™ deuterated solvents provide:
- Reliable results in the NMR-spectra by excellent chemical purity and highest isotopic enrichment.
- Reliable deuteration degrees.
- Low residual water content.
- Determination of water content in two ways.

Size	Packaging	Cat. No.
10 x 0.75 mL	Glass Ampule	**EM1.01789.0009**
10 mL	Septum-Sealed Glass Bottle	**EM1.01789.0010**
100 mL	Glass Bottle	**EM1.01789.0100**

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MagniSolv™ tert-Butanol-D1 deuteration degree min. 99% for NMR spectroscopy

MagniSolv™ deuterated solvents provide:
- Reliable results in the NMR-spectra by excellent chemical purity and highest isotopic enrichment.
- Reliable deuteration degrees.
- Low residual water content.
- Determination of water content in two ways.

Size	Packaging	Cat. No.
25 mL	glass bottle	**EM8.15014.0025**

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MagniSolv™ Chloroform-D1 deuteration degree min. 99.96% for NMR spectroscopy

MagniSolv™ deuterated solvents provide reliable results in the NMR-spectra with extremely low residual water, excellent chemical purity and the highest isotopic enrichment.

Size	Packaging	Cat. No.
10 x 0.75 mL	Glass Ampule	EM1.02446.0009
10 mL	Septum-Sealed Glass Bottle	EM1.02446.0010
25 mL	Glass Bottle	EM1.02446.0025
100 mL	Glass Bottle	EM1.02446.0100

For additional products, see **vwr.com**.

MagniSolv™ Chloroform-D1 deuteration degree min. 99.8% for NMR spectroscopy

MagniSolv™ deuterated solvents provide reliable results in the NMR-spectra with extremely low residual water, excellent chemical purity and the highest isotopic enrichment.

Size	Packaging	Cat. No.
25 mL	Glass Bottle	EM1.02450.0025
100 mL	Glass Bottle	EM1.02450.0100
500 mL	Glass Bottle	EM1.02450.0500

For additional products, see **vwr.com**.

MagniSolv™ Chloroform-D1 deuteration degree min. 99.8% for NMR spectroscopy (stabilized with silver)

MagniSolv™ deuterated solvents provide reliable results in the NMR-spectra with extremely low residual water, excellent chemical purity and the highest isotopic enrichment.

Size	Packaging	Cat. No.
25 mL	Glass Bottle	EM1.03420.0025
100 mL	Glass Bottle	EM1.03420.0100
500 mL	Glass Bottle	EM1.03420.0500

For additional products, see **vwr.com**.

MagniSolv™ Chloroform-D1 with TMS (1 vol.%), deuteration degree min. 99.5 % for NMR spectroscopy (stabilized with silver)

MagniSolv™ deuterated solvents provide reliable results in the NMR-spectra with extremely low residual water, excellent chemical purity and the highest isotopic enrichment.

Size	Packaging	Cat. No.
25 mL	Glass Bottle	EM1.13359.0025
100 mL	Glass Bottle	EM1.13359.0100

For additional products, see **vwr.com**.

MagniSolv™ Cyclohexane-D12 deuteration degree min. 99.5% for NMR spectroscopy

MagniSolv™ deuterated solvents provide reliable results in the NMR-spectra with extremely low residual water, excellent chemical purity and the highest isotopic enrichment.

Size	Packaging	Cat. No.
10 x 0.5 mL	Glass Ampule	EM8.15024.0005
10 x 0.75 mL	Glass Ampule	EM8.15024.0009
5 mL	Glass Ampule	EM8.15024.0006

For additional products, see **vwr.com**.

MagniSolv™ Deuterium chloride 20% solution in D_2O deuteration degree min. 99.95% for NMR spectroscopy

Density ..... 1.012 g/cm3 (20 °C)
pH ..... 0.5 (H_2O, 20 °C)
Hazard Class 8
Hazard Class Description ..... Corrosive Material

Size	Packaging	Cat. No.
10 mL	Glass Ampule	EM8.15017.0010
10 mL	Glass Ampule	EM815017.0010

For additional products, see **vwr.com**.

MagniSolv™ Deuterium chloride 20% solution in D_2O deuteration degree min. 99.5% for NMR spectroscopy

Density ..... 1.013 g/cm3 (20 °C)
pH ..... 0.5 (H_2O, 20 °C)
Hazard Class 8
Hazard Class Description ..... Corrosive Material

Size	Packaging	Cat. No.
25 mL	Glass Bottle	EM8.15016.0025
25 mL	Glass Bottle	EM815016.0025

For additional products, see **vwr.com**.

MagniSolv™ Deuterium chloride 38% solution in D_2O deuteration degree min. 99.5% for NMR spectroscopy

Solubility ..... (20 °C) soluble
Melting Point ..... -40 °C
Vapor Pressure ..... 21.3 hPa (20 °C)
Density ..... 1.257 g/cm3 (20 °C)
pH ..... < - 1 (H_2O, 20 °C)
Hazard Class 8
Hazard Class Description ..... Corrosive Material

Size	Packaging	Cat. No.
10 mL	Glass Ampule	EM8.15018.0010
50 mL	Glass Ampule	EM8.15018.0050
10 mL	Glass Ampule	EM815018.0010
50 mL	Glass Ampule	EM815018.0050

For additional products, see **vwr.com**.

MagniSolv™ Deuterium oxide deuteration degree min. 99.9% for NMR spectroscopy

MagniSolv™ deuterated solvents provide:

- Reliable results in the NMR-spectra by excellent chemical purity and highest isotopic enrichment.
- Reliable deuteration degrees.
- Low residual water content.
- Determination of water content in two ways.

Size	Packaging	Cat. No.
10 x 0.75 mL	Glass Ampule	EM1.13366.0009
10 mL	Septum-Sealed Glass Bottle	EM1.13366.0010
25 mL	Glass Bottle	EM1.13366.0025
100 mL	Glass Bottle	EM1.13366.0100
500 mL	Glass Bottle	EM1.13366.0500

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MagniSolv™ Deuterium oxide deuteration degree min. 99.96% for NMR spectroscopy

MagniSolv™ deuterated solvents provide:
- Reliable results in the NMR-spectra by excellent chemical purity and highest isotopic enrichment.
- Reliable deuteration degrees.
- Low residual water content.
- Determination of water content in two ways.

Size	Packaging	Cat. No.
10 x 0.5 mL	Glass Ampule	**EM1.03428.0005**
10 x 0.75 mL	Glass Ampule	**EM1.03428.0009**
10 mL	Septum-Sealed Glass Bottle	**EM1.03428.0010**
100 mL	Glass Bottle	**EM1.03428.0100**

For additional products, see **vwr.com**.

MagniSolv™ Dichloromethane-D2 deuteration degree min. 99.8% for NMR spectroscopy

MagniSolv™ deuterated solvents provide reliable results in the NMR-spectra with extremely low residual water, excellent chemical purity and the highest isotopic enrichment.

Size	Packaging	Cat. No.
10 x 0.75 mL	Glass Ampule	**EM1.13720.0009**
10 mL	Septum-Sealed Glass Bottle	**EM1.13720.0010**

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MagniSolv™ Diethyl ether-D10 deuteration degree min. 99% for NMR spectroscopy

MagniSolv™ deuterated solvents provide:
- Reliable results in the NMR-spectra by excellent chemical purity and highest isotopic enrichment.
- Reliable deuteration degrees.
- Low residual water content.
- Determination of water content in two ways.

Size	Packaging	Cat. No.
1 mL	Glass Ampule	**EM8.15031.0001**

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MagniSolv™ N,N-Dimethylacetamide-D9 deuteration degree min. 99% for NMR spectroscopy

MagniSolv™ deuterated solvents provide reliable results in the NMR-spectra with extremely low residual water, excellent chemical purity and the highest isotopic enrichment.

Size	Packaging	Cat. No.
1 mL	Glass Ampule	**EM8.15032.0001**

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MagniSolv™ Dimethylformamide-D7 deuteration degree min. 99.5% for NMR spectroscopy

MagniSolv™ deuterated solvents provide reliable results in the NMR-spectra with extremely low residual water, excellent chemical purity and the highest isotopic enrichment.

Size	Packaging	Cat. No.
10 x 0.75 mL	Glass Ampule	**EM1.11656.0009**
1 mL	Glass Ampule	**EM1.11656.0001**

For additional products, see **vwr.com**.

MagniSolv™ Dimethyl sulfoxide-D6 deuteration degree min. 99.8% for NMR spectroscopy

MagniSolv™ deuterated solvents provide reliable results in the NMR-spectra with extremely low residual water, excellent chemical purity and the highest isotopic enrichment.

Size	Packaging	Cat. No.
10 x 0.5 mL	Glass Ampule	**EM1.03424.0005**
10 x 0.75 mL	Glass Ampule	**EM1.03424.0009**
10 mL	Septum-Sealed Glass Bottle	**EM1.03424.0010**
10 mL	Glass Bottle	**EM1.03424.0011**
25 mL	Glass Bottle	**EM1.03424.0025**
50 mL	Glass Bottle	**EM1.03424.0050**
100 mL	Glass Bottle	**EM1.03424.0100**

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MagniSolv™ Dimethyl sulfoxide-D6 deuteration degree min. 99.96% for NMR spectroscopy

MagniSolv™ deuterated solvents provide reliable results in the NMR-spectra with extremely low residual water, excellent chemical purity and the highest isotopic enrichment.

Size	Packaging	Cat. No.
10 x 0.5 mL	Glass Ampule	**EM1.03562.0005**
10 x 0.75 mL	Glass Ampule	**EM1.03562.0009**
10 mL	Septum-Sealed Glass Bottle	**EM1.03562.0010**
25 mL	Glass Bottle	**EM1.03562.0025**

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MagniSolv™ Ethanol-D1 deuteration degree min. 99.5% for NMR spectroscopy

MagniSolv™ deuterated solvents provide:
- Reliable results in the NMR-spectra by excellent chemical purity and highest isotopic enrichment.
- Reliable deuteration degrees.
- Low residual water content.
- Determination of water content in two ways.

Size	Packaging	Cat. No.
50 mL	Glass Bottle	**EM8.15037.0050**

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MagniSolv™ Formic acid-D2 deuteration degree min. 99.5% for NMR spectroscopy

MagniSolv™ deuterated solvents provide reliable results in the NMR-spectra with extremely low residual water, excellent chemical purity and the highest isotopic enrichment.

Solubility ..... (20 °C) soluble
Melting Point ..... 5.9 °C
Molar Mass ..... 48.04 g/mol
Boiling Point ..... 101 °C
Flash Point ..... 69 °C
Explosion Limit ..... 10 - 45.5 %(V)
Density ..... 1.27 g/cm3 (20 °C)
Ignition Point ..... 520 °C
Hazard Class 8
Hazard Class Description ..... Corrosive Material

Size	Packaging	Cat. No.
10 mL	Glass Ampule	**EM1.13365.0010**

For additional products, see **vwr.com**.

Magnisolv™ N-Hexane-D14 Deuteration Degree Min. 99% For Nmr Spectroscopy

Solubility ..... 0.0095 g/l (20 °C)
Melting Point ..... -94.3 °C
Molar Mass ..... 100.26 g/mol
Boiling Point ..... 69 °C (1013 hPa)
Vapor Pressure ..... 160 hPa (20 °C)
Flash Point ..... -22 °C
Explosion Limit ..... 1.0 - 8.1 %(V)
Density ..... 0.767 g/cm3 (20 °C)
pH ..... (H_2O) not applicable
Ignition Point ..... 240 °C DIN 51794
Viscosity kinematic ..... 0.50 mm2/s (20 °C)
Hazard Class 3
Hazard Class Description ..... Flammable liquid

Size	Packaging	Cat. No.
1 mL	Glass Bottle, Pre-Packed	EM8.15043.0001

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MagniSolv™ Methanol-D1 deuteration degree min. 99.5% for NMR spectroscopy

MagniSolv™ deuterated solvents provide:
- Reliable results in the NMR-spectra by excellent chemical purity and highest isotopic enrichment.
- Reliable deuteration degrees.
- Low residual water content.
- Determination of water content in two ways.

Size	Packaging	Cat. No.
50 mL	Glass Bottle	EM8.15051.0050
100 mL	Glass Bottle	EM8.15051.0100

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MagniSolv™ Methanol-D3 deuteration degree min. 99.5% for NMR spectroscopy

MagniSolv™ deuterated solvents provide:
- Reliable results in the NMR-spectra by excellent chemical purity and highest isotopic enrichment.
- Reliable deuteration degrees.
- Low residual water content.
- Determination of water content in two ways.

Size	Packaging	Cat. No.
1 mL	Glass Ampule	EM8.15052.0001
5 mL	Glass Ampule	EM8.15052.0005

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MagniSolv™ Methanol-D4 deuteration degree min. 99.8 % for NMR spectroscopy

MagniSolv™ deuterated solvents provide:
- Reliable results in the NMR-spectra by excellent chemical purity and highest isotopic enrichment.
- Reliable deuteration degrees.
- Low residual water content.
- Determination of water content in two ways.

Size	Packaging	Cat. No.
1 mL	Glass Ampule	EM1.06028.0001
10 x 0.5 mL	Glass Ampule	EM1.06028.0005
10 x 0.75 mL	Glass Ampule	EM1.06028.0009
10 mL	Septum-Sealed Glass Bottle	EM1.06028.0010
25 mL	Glass Bottle	EM1.06028.0025
100 mL	Glass Bottle	EM1.06028.0100

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MagniSolv™ Methanol-D4 deuteration degree min. 99.95% for NMR spectroscopy

MagniSolv™ deuterated solvents provide:
- Reliable results in the NMR-spectra by excellent chemical purity and highest isotopic enrichment.
- Reliable deuteration degrees.
- Low residual water content.
- Determination of water content in two ways.

Size	Packaging	Cat. No.
10 x 0.5 mL	Glass Ampule	EM1.06025.0005
10 x 0.75 mL	Glass Ampule	EM1.06025.0009

For additional products, see **vwr.com**.

MagniSolv™ Nitrobenzene-D5 deuteration degree min. 99.5% for NMR spectroscopy

A wide range of MagniSolv™ deuterated solvents with extremely low residual water, excellent chemical purity, and the highest isotopic enrichment available can satisfy the most demanding requirements of researchers. Depending on application and sensitivity of the NMR spectrometer our offer solvents with deuteration degrees between 98% and 99.96%. In case of all the water soluble deuterated standard products, water content is specified according to both Karl Fischer and NMR.

Size	Packaging	Cat. No.
10 mL	Glass Ampule	EM8.15001.0010

For additional products, see **vwr.com**.

MagniSolv™ Nitromethane-D3 deuteration degree min. 99% for NMR spectroscopy

MagniSolv™ deuterated solvents provide:
- Reliable results in the NMR-spectra by excellent chemical purity and highest isotopic enrichment.
- Reliable deuteration degrees.
- Low residual water content.
- Determination of water content in two ways.

Size	Packaging	Cat. No.
1.5 mL	Glass Ampule	EM1.02914.0002

For additional products, see **vwr.com**.

Magnisolv™ Phenol-D6 Deuteration Degree Min. 98% For Nmr Spectroscopy

MagniSolv™ deuterated solvents provide:
- Reliable results in the NMR-spectra by excellent chemical purity and highest isotopic enrichment.
- Reliable deuteration degrees.
- Low residual water content.
- Determination of water content in two ways.

Solubility ..... 84 g/l (20 °C)
Melting Point ..... 40.8 °C
Molar Mass ..... 100.15 g/mol
Bulk Density 620 kg/m3
Boiling Point ..... 181.8 °C (1013 hPa)
Vapor Pressure ..... 0.2 hPa (20 °C)
Flash Point ..... 81 °C
Explosion Limit ..... 1.3 - 9.5 %(V)
Density 1.06 g/cm3
pH ..... 5 (50 g/l, H_2O, 20 °C)
Ignition Point ..... 595 °C
Hazard Class 6.1
Hazard Class Description ..... Toxic materials

Size	Packaging	Cat. No.
5 g	Glass Ampule	EM8.15003.0005

For additional products, see **vwr.com**.

MagniSolv™ 2-Propanol-D8 deuteration degree min. 99.5% for NMR spectroscopy

MagniSolv™ deuterated solvents provide:
- Reliable results in the NMR-spectra by excellent chemical purity and highest isotopic enrichment.
- Reliable deuteration degrees.
- Low residual water content.
- Determination of water content in two ways.

Size	Packaging	Cat. No.
5 mL	Glass Ampule	**EM8.15045.0005**

For additional products, see **vwr.com**.

MagniSolv™ 2-Propanol-D1 deuteration degree min. 98% for NMR spectroscopy

MagniSolv™ deuterated solvents provide:
- Reliable results in the NMR-spectra by excellent chemical purity and highest isotopic enrichment.
- Reliable deuteration degrees.
- Low residual water content.
- Determination of water content in two ways.

Size	Packaging	Cat. No.
25 mL	Glass Bottle	**EM8.15044.0025**

For additional products, see **vwr.com**.

MagniSolv™ Pyridine-D5 deuteration degree min 99.8% for NMR spectroscopy

MagniSolv™ deuterated solvents provide:
- Reliable results in the NMR-spectra by excellent chemical purity and highest isotopic enrichment.
- Reliable deuteration degrees.
- Low residual water content.
- Determination of water content in two ways.

Size	Packaging	Cat. No.
10 x 0.75 mL	Glass Ampule	**EM1.07475.0009**
10 mL	Septum-Sealed Glass Bottle	**EM1.07475.0010**

For additional products, see **vwr.com**.

MagniSolv™ Sodiumdeuterium oxide 30% solution in D_2O deuteration degree min. 99.5% for NMR spectroscopy

Solubility ..... (20 °C) soluble
Density ..... 1.33 g/cm3 (20 °C)
pH ..... 14 (H_2O, 20 °C)
Hazard Class 8
Hazard Class Description ..... Corrosive Material

Size	Packaging	Cat. No.
25 mL	Glass Bottle	**EM8.15055.0025**
25 mL	Glass Bottle	**EM815055.0025**

For additional products, see **vwr.com**.

MagniSolv™ Tetrahydrofuran-D8 deuteration degree min 99.5% for NMR spectroscopy

MagniSolv™ deuterated solvents provide:
- Reliable results in the NMR-spectra by excellent chemical purity and highest isotopic enrichment.
- Reliable deuteration degrees.
- Low residual water content.
- Determination of water content in two ways.

Size	Packaging	Cat. No.
1 mL	Glass Ampule	**EM1.13364.0001**
10 x 0.75 mL	Glass Ampule	**EM1.13364.0009**
10 mL	Septum-Sealed Glass Bottle	**EM1.13364.0010**

For additional products, see **vwr.com**.

Magnisolv™ Toluene-D8 Deuteration Degree min. 99.5% for NMR Spectroscopy

Solubility ..... (20 °C) insoluble
Melting Point ..... -85 °C
Molar Mass ..... 100.19 g/mol
Boiling Point ..... 109 °C
Flash Point ..... 4 °C
Explosion Limit ..... 1.2 - 8.0 %(V)
Density ..... 0.94 g/cm3 (20 °C)
Ignition Point ..... 535 °C
Hazard Class 3
Hazard Class Description ..... Flammable liquid

Size	Packaging	Cat. No.
10 mL	Septum-Sealed Glass Bottle	**EM1.13368.0010**

For additional products, see **vwr.com**.

MagniSolv™ Trifluoroacetic acid-D1 deuteration degree min. 99.5% for NMR spectroscopy

MagniSolv™ deuterated solvents provide:
- Reliable results in the NMR-spectra by excellent chemical purity
- and highest isotopic enrichment.
- Reliable deuteration degrees.
- Low residual water content.
- Determination of water content in two ways.

Size	Packaging	Cat. No.
10 mL	Septum-Sealed Glass Bottle	**EM1.13363.0010**

For additional products, see **vwr.com**.

MagniSolv™ p-Xylene-D10 deuteration degree min. 99.5% for NMR spectroscopy

MagniSolv™ deuterated solvents provide:
- Reliable results in the NMR-spectra by excellent chemical purity and highest isotopic enrichment.
- Reliable deuteration degrees.
- Low residual water content.
- Determination of water content in two ways.

Size	Packaging	Cat. No.
10 mL	Glass Bottle	**EM8.15005.0010**

For additional products, see **vwr.com**.

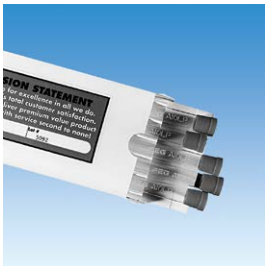
Ultra-Precision NMR Sample Tubes, 100 Mhz, Ace Glass Incorporated

Ultra-precise, accurate NMR sample tubes. Available in 17.8cm (7″) and 20.3cm (8″) lengths.

Description	Frequency	Length	O.D.	Cat. No.
Ultra-Precision NMR Sample Tubes	100 MHz	17.8 cm (7″)	4.9635±0.0065 mm	**89050-914**
Ultra-Precision NMR Sample Tubes	100 MHz	20.3 cm (8″)	4.9635±0.0065 mm	**89050-916**

For additional products, see **vwr.com**.

Ultra-Precision NMR Sample Tubes, 200 Mhz, Ace Glass Incorporated

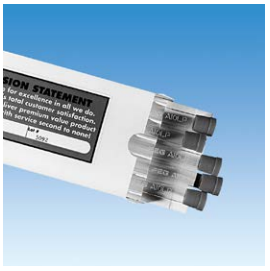


Ultra-precise, accurate NMR sample tubes. Available in 17.8 cm (7″) and 20.3 cm (8″) lengths.

Description	Frequency	Length	O.D.	Cat. No.
Ultra-Precision NMR Sample Tubes	200 MHz	17.8 cm (7″)	4.9635±0.0065 mm	**89050-920**
Ultra-Precision NMR Sample Tubes	200 MHz	20.3 cm (8″)	4.9635±0.0065 mm	**89050-922**

For additional products, see **vwr.com**.

Ultra-Precision NMR Sample Tubes, 300Mhz, Ace Glass Incorporated

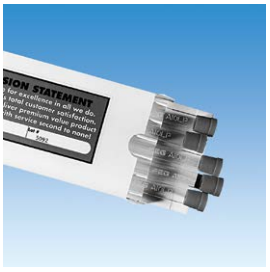


Ultra precise and accurate, borosilicate glass NMR tubes are available in 17.8cm (7″) and 20.3cm (8″) lengths with a 5mm O.D.

Description	Frequency	Length	O.D.	Cat. No.
Sample Tubes	300 MHz	17.8 cm (7″)	4.9635±0.0065 mm	**89050-926**
Sample Tubes	300 MHz	20.3 cm (8″)	4.9635±0.0065 mm	**89050-928**

For additional products, see **vwr.com**.

Ultra-Precision NMR Sample Tubes, 350 Mhz, Ace Glass Incorporated



Ultra-precise, accurate NMR sample tubes. Available in 17.8cm (7″) and 20.3cm (8″) lengths.

Description	Frequency	Length	O.D.	Cat. No.
Ultra-Precision NMR Sample Tubes	350 MHz	17.8 cm (7″)	4.9635±0.0065 mm	**89050-938**
Ultra-Precision NMR Sample Tubes	350 MHz	20.3 cm (8″)	4.9635±0.0065 mm	**89050-940**

For additional products, see **vwr.com**.

Ultra-Precision NMR Sample Tubes, 500 Mhz, Ace Glass Incorporated

Ultra-precise, accurate NMR sample tubes. Available in 17.8cm (7″) and 20.3cm (8″) lengths.

Description	Frequency	Length	O.D.	Cat. No.
Ultra-Precision NMR Sample Tubes	500 MHz	17.8 cm (7″)	4.9635±0.0065 mm	**89050-944**
Ultra-Precision NMR Sample Tubes	500 MHz	20.3 cm (8″)	4.9635±0.0065 mm	**89050-946**

For additional products, see **vwr.com**.

Thin-Walled Economy NMR Sample Tubes, Wilmad-LabGlass

Designed for routine use in all NMR spectrometers, Wilmad Economy NMR Tubes are guaranteed to fit tightly in any spinner turbine and have zero NMR background.

O.D.	5 mm (0.19″)
Wall Thickness	0.43 mm (0.0169″)

Frequency	Length	Camber	Concentricity	Cat. No.
Tubes with Caps				
100 MHz	17.8 cm (7″)	±0.08 mm (±0.003″)	±0.08 mm (±0.003″)	**13501-528**
100 MHz	20.3 cm (8″)	±0.08 mm (±0.003″)	±0.08 mm (±0.003″)	**13501-530**
600 MHz	17.8 cm (7″)	±0.004 mm (±0.00015″)	±0.004 mm (±0.00015″)	**82005-324**
600 MHz	20.3 cm (8″)	±0.004 mm (±0.00015″)	±0.004 mm (±0.00015″)	**82005-326**
400 MHz	17.8 cm (7″)	±0.0127 mm (±0.0005″)	±0.025 mm (±0.001″)	**82005-332**
400 MHz	20.3 cm (8″)	±0.0127 mm (±0.0005″)	±0.025 mm (±0.001″)	**82005-334**
300 MHz	17.8 cm (7″)	±0.0127 mm (±0.0005″)	±0.05 mm (±0.002″)	**82005-336**
300 MHz	20.3 cm (8″)	±0.0127 mm (±0.0005″)	±0.05 mm (±0.002″)	**82005-338**
200 MHz	17.8 cm (7″)	±0.025 mm (±0.001″)	±0.05 mm (±0.002″)	**82005-340**
200 MHz	20.3 cm (8″)	±0.025 mm (±0.001″)	±0.05 mm (±0.002″)	**82005-342**
100 MHz	17.8 cm (7″)	±0.05 mm (±0.002″)	±0.05 mm (±0.002″)	**82005-344**
100 MHz	20.3 cm (8″)	±0.05 mm (±0.002″)	±0.05 mm (±0.002″)	**82005-346**
Tubes without Caps				
700 MHz	17.8 cm (7″)	±0.004 mm (±0.00015″)	±0.002 mm (±0.0001″)	**82005-320**
700 MHz	20.3 cm (8″)	±0.004 mm (±0.00015″)	±0.002 mm (±0.0001″)	**82005-322**
500 MHz	17.8 cm (7″)	±0.006 mm (±0.00025″)	±0.0127 mm (±0.0005″)	**82005-328**
500 MHz	20.3 cm (8″)	±0.006 mm (±0.00025″)	±0.0127 mm (±0.0005″)	**82005-330**

For additional products, see **vwr.com**.

Thin-Walled NMR Sample Tubes, Ultra Precision, Wilmad-LabGlass

To maximize SNR, Precision NMR Tubes have minimal paramagnetic impurities that would impact shimming. Tight ID and OD tolerance as small as 0.0065mm accommodates Wilmad inserts.

Frequency	Length	O.D.	Camber	Concentricity	Wall Thickness	Cat. No.
600 MHz	17.8 cm (7″)	4.9635±0.0065 mm	0.006 mm (0.00025″)	0.013 mm (0.0005″)	0.38 mm (0.015″)	**13501-500**
600 MHz	20.3 cm (8″)	4.9635±0.0065 mm	0.006 mm (0.00025″)	0.013 mm (0.0005″)	0.38 mm (0.015″)	**13501-502**
500 MHz	17.8 cm (7″)	4.9635±0.0065 mm	0.013 mm (0.0005″)	0.025 mm (0.001″)	0.38 mm (0.015″)	**13501-504**
500 MHz	20.3 cm (8″)	4.9635±0.0065 mm	0.013 mm (0.0005″)	0.025 mm (0.001″)	0.38 mm (0.015″)	**13501-506**
400 MHz	17.8 cm (7″)	4.9635±0.0065 mm	0.025 mm (0.001″)	0.025 mm (0.001″)	0.38 mm (0.015″)	**13501-508**
400 MHz	20.3 cm (8″)	4.9635±0.0065 mm	0.025 mm (0.001″)	0.025 mm (0.001″)	0.38 mm (0.015″)	**13501-510**
350 MHz	17.8 cm (7″)	4.9635±0.0065 mm	0.013 mm (0.0005″)	0.051 mm (0.002″)	0.38 mm (0.015″)	**13501-512**
300 MHz	17.8 cm (7″)	4.9635±0.0065 mm	0.025 mm (0.001″)	0.05 mm (0.002″)	0.38 mm (0.015″)	**13501-516**
300 MHz	20.3 cm (8″)	4.9635±0.0065 mm	0.025 mm (0.001″)	0.05 mm (0.002″)	0.38 mm (0.015″)	**13501-518**
200 MHz	17.8 cm (7″)	4.9635±0.0065 mm	0.05 mm (0.002″)	0.05 mm (0.002″)	0.38 mm (0.015″)	**13501-520**
200 MHz	20.3 cm (8″)	4.9635±0.0065 mm	0.05 mm (0.002″)	0.05 mm (0.002″)	0.38 mm (0.015″)	**13501-522**
100 MHz	17.8 cm (7″)	4.9635±0.0065 mm	0.051 mm (0.002″)	0.076 mm (0.003″)	0.38 mm (0.015″)	**13501-524**
100 MHz	20.3 cm (8″)	4.9635±0.0065 mm	0.051 mm (0.002″)	0.076 mm (0.003″)	0.38 mm (0.015″)	**13501-526**
600 MHz	17.8 cm (7″)	2.9935±0.0065 mm	0.006 mm (0.0003″)	0.013 mm (0.0005″)	0.29 mm (0.011″)	**13501-532**
600 MHz	20.3 cm (8″)	2.9935±0.0065 mm	0.006 mm (0.0003″)	0.013 mm (0.0005″)	0.29 mm (0.011″)	**13501-534**
500 MHz	17.8 cm (7″)	2.9935±0.0065 mm	0.013 mm (0.0005″)	0.025 mm (0.001″)	0.29 mm (0.011″)	**13501-536**
400 MHz	17.8 cm (7″)	2.9935±0.0065 mm	0.025 mm (0.001″)	0.025 mm (0.001″)	0.29 mm (0.011″)	**13501-540**
400 MHz	20.3 cm (8″)	2.9935±0.0065 mm	0.025 mm (0.001″)	0.025 mm (0.001″)	0.29 mm (0.011″)	**13501-542**
300 MHz	17.8 cm (7″)	2.9935±0.0065 mm	0.025 mm (0.001″)	0.05 mm (0.002″)	0.29 mm (0.011″)	**13501-544**
300 MHz	20.3 cm (8″)	2.9935±0.0065 mm	0.025 mm (0.001″)	0.05 mm (0.002″)	0.29 mm (0.011″)	**13501-546**
200 MHz	17.8 cm (7″)	2.9935±0.0065 mm	0.05 mm (0.002″)	0.08 mm (0.003″)	0.29 mm (0.011″)	**14218-630**
200 MHz	20.3 cm (8″)	2.9935±0.0065 mm	0.05 mm (0.002″)	0.08 mm (0.003″)	0.29 mm (0.011″)	**14218-632**
200 MHz	22.9 cm (9″)	2.9935±0.0065 mm	0.051 mm (0.002″)	0.076 mm (0.003″)	0.29 mm (0.011″)	**14218-634**
300 MHz	22.9 cm (9″)	2.9935±0.0065 mm	0.025 mm (0.001″)	0.051 mm (0.002″)	0.29 mm (0.011″)	**14218-640**
400 MHz	22.9 cm (9″)	2.9935±0.0065 mm	0.025 mm (0.001″)	0.025 mm (0.001″)	0.29 mm (0.011″)	**14218-652**
500 MHz	22.9 cm (9″)	2.9935±0.0065 mm	0.013 mm (0.0005″)	0.025 mm (0.001″)	0.29 mm (0.011″)	**14218-658**
100 MHz	22.9 cm (9″)	4.9635±0.0065 mm	0.051 mm (0.002″)	0.076 mm (0.003″)	0.38 mm (0.015″)	**14218-716**
200 MHz	22.9 cm (9″)	4.9635±0.0065 mm	0.051 mm (0.002″)	0.051 mm (0.002″)	0.38 mm (0.015″)	**14218-726**
300 MHz	22.9 cm (9″)	4.9635±0.0065 mm	0.025 mm (0.001″)	0.051 mm (0.002″)	0.38 mm (0.015″)	**14218-740**
	20.3 cm (8″)	9.9935±0.0065 mm	0.025 mm (0.001″)	0.05 mm (0.002″)	0.46 mm (0.018″)	**14218-774**
350 MHz	22.9 cm (9″)	4.9635±0.0065 mm	0.013 mm (0.0005″)	0.051 mm (0.002″)	0.38 mm (0.015″)	**14218-956**
400 MHz	22.9 cm (9″)	4.9635±0.0065 mm	0.025 mm (0.001″)	0.025 mm (0.001″)	0.38 mm (0.015″)	**14218-962**
500 MHz	22.9 cm (9″)	4.9635±0.0065 mm	0.013 mm (0.0005″)	0.025 mm (0.001″)	0.38 mm (0.015″)	**14218-976**
600 MHz	22.9 cm (9″)	4.9635±0.0065 mm	0.006 mm (0.00025″)	0.013 mm (0.0005″)	0.38 mm (0.015″)	**14218-986**
800 MHz	17.8 cm (7″)	4.9635±0.0065 mm	0.004 mm (0.00015″)	0.004 mm (0.00015″)	0.38 mm (0.015″)	**14219-000**
800 MHz	20.3 cm (8″)	4.9635±0.0065 mm	0.004 mm (0.00015″)	0.004 mm (0.00015″)	0.38 mm (0.015″)	**14219-002**
1000 MHz	17.8 cm (7″)	4.9635±0.0065 mm	0.004 mm (0.00015″)	0.0025 mm (0.0001″)	0.38 mm (0.015″)	**14219-004**
1000 MHz	20.3 cm (8″)	4.9635±0.0065 mm	0.004 mm (0.00015″)	0.0025 mm (0.0001″)	0.38 mm (0.015″)	**14219-006**

For additional products, see **vwr.com**.

MASS SPEC

LC-MS SOLVENTS

LC-MS ACCESSORIES

Acetonitrile, HiPerSolv CHROMANORM®, for LC-MS

BDH® VWR ANALYTICAL

Assay (on anhydrous substance)	Min. 99.9 %
Acidity	Max. 0.0001 mEq/g
Alkalinity	Max. 0.0002 meq/g
Coloration	Max. 10 APHA
Density (20/4)	0.781-0.784
n 20/D	1.343-1.345
Evaporation residue	Max. 2 ppm
Water	Max. 0.02 %
Al (Aluminium)	Max. 50 ppb
Ca (Calcium)	Max. 50 ppb
Fe (Iron)	Max. 50 ppb
K (Potassium)	Max. 50 ppb
Mg (Magnesium)	Max. 10 ppb
Na (Sodium)	Max. 100 ppb
Transmittance (191 nm)	Min. 30 %
Transmittance (195 nm)	Min. 80 %
Transmittance (200 nm)	Min. 95 %
Transmittance (210 nm)	Min. 96 %
Transmittance (215 nm)	Min. 98 %
Transmittance (220 nm)	Min. 98 %
Transmittance (230 nm)	Min. 99 %
Transmittance (from 240 nm)	Min. 99 %
Fluorescence (as quinine) (254/450 nm)	Max. 1 ppb
Gradient grade (210 nm)	Max. 3 mAU
Gradient grade (254 nm)	Max. 1 mAU
Mode: ESI 200 µl pos | APCI 200 µl pos	Max. 2 ppb
Mode: ESI 200 µl neg | APCI 200 µl	Max. 20 ppb
Conforms to Reag. Ph.Eur.	Passes test

Size	Cat. No.
4 L	**BDH83640.400**

For additional products, see **vwr.com**.

LiChrosolv® Acetonitrile for LC-MS, Hypergrade

EMD MILLIPORE

Solubility	(20 °C) soluble
Melting Point	-45.7 °C
Molar Mass	41.05 g/mol
Boiling Point	81.6 °C (1013 hPa)
Vapor Pressure	97 hPa (20 °C)
Flash Point	2 °C
Refractive Index	1.34
Explosion Limit	3.0 - 17 %(V)
Density	0.786 g/cm3 (20 °C)
pH	
Ignition Point	524 °C
Viscosity kinematic	
Synonyms	ACN, Methyl cyanide, Ethyl nitrile, Cyanomethane
Hill Formula	C_2H_3N
Chemical Formula	CH_3CN

Size	Packaging	Cat. No.
1 L	Glass bottle	**EM1.00029.1000**
2.5 L	Glass bottle	**EM1.00029.2500**
30 L	—	**EM1.00029.9030**

For additional products, see **vwr.com**.

OmniSolv® LC-MS Acetonitrile

EMD MILLIPORE

Clear liquid. For use in HPLC and spectrophotometry. Filtered through a 0.2µm element for purity. UV cutoff at 190nm.

Assay (GC)	99.9% min
Color (APHA)	10APHA max
Filtered through 0.2 µm filter	To pass test
Fluorescence as quinine at 254 nm	1ppb max
Fluorescence as quinine at 365 nm	1ppb max
Form	Clear liquid
Gradient at 210 nm	2mAU max
Gradient at 254 nm	0.3mAU max
Identity (IR-spectrum)	Conforms
Metals, suitable for LC/MS	To pass test
MS purity, ESI(+), largest response as reserpine	50ppb max
MS purity, ESI(-), largest response, p-nitrophenol	50ppb max
Residue after evaporation	1ppm max
Titrable acid	1µeq/g max
Titrable base	0.5µeq/g max
UV Abs. at 200 nm	0.1AU max
UV Abs. at 210 nm	0.04AU max
UV Abs. at 220 nm	0.02AU max
UV Abs. at 230 nm	0.01AU max
UV Abs. at 240 nm	0.01AU max
UV Abs. at 250 nm	0.01AU max
UV Abs. at 270 nm	0.01AU max
UV Abs. at 400-280 nm	0.005AU max
UV Cut-off	190nm max
Water (H_2O)	0.02% max

Size	Packaging	Cat. No.
1 L	Glass Bottle	**EM-AX0156-6**
4 L	Glass Bottle	**EM-AX0156-1**

For additional products, see **vwr.com**.

LiChrosolv® Methanol for LC-MS, Hypergrade

EMD MILLIPORE

Offering a high degree of UV transmittance, low particle count, low acidity and alkalinity, and low evaporation residue level, LiChrosolv® solvents are ideal for reproducible separations. They are produced from specially selected raw materials, and undergo a number of purification steps prior to final packaging. Since separations are normally carried out under gradient conditions in analytical HPLC, Merck Millipore offer solvents in 'gradient grade' as well as 'isocratic grade'. This enables you to minimise the gradient effect of the solvent involved.

The LC-MS LiChrosolv® hypergrade quality solvents are accurately tested for LC-MS suitability, and meet all the requirements of modern LC-MS ionisation methods (ESI/APCI – positive and negative mode) with low level of ionic background and low ion suppression, they ensure high reproducibility and high ionisation efficiency.

Solubility	(20 °C) soluble
Melting Point	-98 °C
Molar Mass	32.04 g/mol
Boiling Point	64.5 °C (1013 hPa)
Vapor Pressure	128 hPa (20 °C)
Flash Point	10 °C
Refractive Index	1.33
Explosion Limit	5.5 - 44 %(V)
Density	0.792 g/cm3 (20 °C)
pH	
Ignition Point	455 °C DIN 51794
Viscosity kinematic	
Synonyms	MeOH, Hydroxymethane, Methyl alcohol, Carbinol
Hill Formula	CH_4O
Chemical Formula	CH_3OH

Size	Packaging	Cat. No.
1 L	Glass bottle	**EM1.06035.1000**
2.5 L	Glass bottle	**EM1.06035.2500**

For additional products, see **vwr.com**.

OmniSolv® LC-MS Methanol

Clear liquid. For use in HPLC, GC, and spectrophotometry. The infrared spectrum conforms to the standard. Filtered through a 0.2µm element for purity. UV cutoff at 205nm.

Assay (GC) ..... 99.9% min
Color (APHA) ..... 10 max
Filtered through 0.2 µm filter ..... To pass test
Fluorescence as quinine at 254 nm ..... 1ppb max
Fluorescence as quinine at 365 nm ..... 1ppb max
Form ..... Clear liquid
Gradient at 235 nm ..... 1mAU max
Gradient at 254 nm ..... 1mAU max
Identity (IR-spectrum) ..... Conforms
Metals, suitable for LC/MS ..... To pass test
MS purity, ESI(+), largest response as reserpine ..... 50ppb max
MS purity, ESI(-), largest response, p-nitrophenol ..... 50ppb max
Residue after evaporation ..... 1ppm max
Titrable acid ..... 0.3µeq/g max
Titrable base ..... 0.2µeq/g max
UV Abs. at 210 nm ..... 0.3AU max
UV Abs. at 220 nm ..... 0.1AU max
UV Abs. at 230 nm ..... 0.04AU max
UV Abs. at 240 nm ..... 0.03AU max
UV Abs. at 250 nm ..... 0.01AU max
UV Abs. at 270 nm ..... 0.01AU max
UV Abs. at 400-280 nm ..... 0.005AU max
UV Cut-off ..... 205nm max
Water (H_2O) ..... 0.05% max

Size	Packaging	Cat. No.
1 L	Glass Bottle	**EM-MX0486-6**
4 L	Glass Bottle	**EM-MX0486-1**

For additional products, see **vwr.com**.

Water, HiPerSolv CHROMANORM® for LC-MS

Colouration ..... Max. 5 APHA
Conductivity (25°C) (at filling) ..... Max. 1 µS/cm
Evaporation residue ..... Max. 1 ppm
Al (Aluminium) ..... Max. 50 ppb
Ca (Calcium) ..... Max. 50 ppb
Fe (Iron) ..... Max. 50 ppb
K (Potassium) ..... Max. 50 ppb
Mg (Magnesium) ..... Max. 50 ppb
Na (Sodium) ..... Max. 100 ppb
Fluorescence (as quinine) (254/450 nm) ..... Max. 1 ppb
Fluorescence (as quinine) (365/450 nm) ..... Max. 0,5 ppb
Gradient grade (210 nm) ..... Max. 5 mAU
Gradient grade (220 nm) ..... Max. 2 mAU
Gradient grade (254 nm) ..... Max. 1 mAU
Max. 2 ppb ..... Max. 2 ppb
Mode: ESI 200 µl neg | APCI 200 µl ..... Max. 20 ppb
Colony count (Ph.Eur.) ..... Max. 100 CFU/ml
TOC (at filling) ..... Max. 30 ppb

Size	Cat. No.
4 L	**BDH83645.400**

For additional products, see **vwr.com**.

OmniSolv® LC-MS Water

Clear liquid. For use in HPLC gradient analysis, GC, and spectrophotometry. Filtered through a 0.2µm element for purity.

Expiration date .....
Exp 12 months from mfg date
Filtered through 0.2 µm filter ..... To pass test
Fluorescence as quinine at 254 nm ..... 1ppb max
Fluorescence as quinine at 365 nm ..... 1ppb max
Gradient at 210 nm ..... 0.002AU max
Gradient at 254 nm ..... 0.0005AU max
Metals, suitable for LC/MS ..... To pass test
MS purity, ESI(+), largest response as reserpine ..... 50ppb max
MS purity, ESI(-), largest response, p-nitrophenol ..... 50ppb max
Residue after evaporation ..... 1ppm max
UV Abs. at 200 nm ..... 0.01AU max
UV Abs. at 210 nm ..... 0.01AU max
UV Abs. at 220 nm ..... 0.01AU max
UV Abs. at 230 nm ..... 0.01AU max
UV Abs. at 240 nm ..... 0.01AU max
UV Abs. at 250 nm ..... 0.005AU max
UV Abs. at 270 nm ..... 0.005AU max
UV Abs. at 400-280 nm ..... 0.005AU max

Size	Packaging	Cat. No.
1 L	Glass Bottle	**EM-WX0001-6**
4 L	Glass Bottle	**EM-WX0001-1**

For additional products, see **vwr.com**.

LiChrosolv® Water For Chromatography, LC-MS Grade

Offering a high degree of UV transmittance, low particle count, low acidity and alkalinity, and low evaporation residue level, LiChrosolv® solvents are ideal for reproducible separations. They are produced from specially selected raw materials, and undergo a number of purification steps prior to final packaging. Since separations are normally carried out under gradient conditions in analytical HPLC, Merck Millipore offer solvents in 'gradient grade' as well as 'isocratic grade'. This enables you to minimise the gradient effect of the solvent involved.

The LC-MS LiChrosolv® hypergrade quality solvents are accurately tested for LC-MS suitability, and meet all the requirements of modern LC-MS ionisation methods (ESI/APCI – positive and negative mode) with low level of ionic background and low ion suppression, they ensure high reproducibility and high ionisation efficiency.

Size	Packaging	Cat. No.
1 L	Glass bottle	**EM1.15333.1000**
2.5 L	Glass bottle	**EM1.15333.2500**
4 L*	Glass Bottle	**EM1.15333.4000**
10 L	Stainless Steel Barrel	**EM1.15333.9010**
30 L	Stainless Steel Barrel	**EM1.15333.9030**

*Product not available in Canada.
For additional products, see **vwr.com**.

Acrodisc® MS Syringe Filters, Pall Laboratory

Acrodiscc® MS syringe filters are available in 13 and 25mm diameters with 0.2µm rated WWPTFE membrane and HDPE housings. The filters are designed for and certified to be very low in LCMS extractables providing more accurate results to the end user. Acrodisc MS syringe filters reduce the risk of matrix effects caused by extractables, and the filters are low in protein binding providing more accuracy in protein determinations and reduced concern about analyte losses.

The 25mm Acrodisc MS is suitable for volumes > 2 mL while the 13mm Acrodisc MS is suitable for volumes > 25µL.

Ordering Information: The Acrodisc MS syringe filters come with 0.2µm rated WWPTFE membrane and HDPE housings. The 25mm diameter filter comes with 50 filters per box and the 25mm diameter filter comes with 60 filters per box. Both come with product information inserts and certificates.

Description	Diameter	Effective Filtration Area	Pore Size	Cat. No.
13 mm Acrodisc MS Syringe Filters	13 mm	1.0 cm^2	0.2 µm	**30621-078**
25 mm Acrodisc MS Syringe Filters	25 mm	3.9 cm^2	0.2 µm	**89194-420**

For additional products, see **vwr.com**.

UV/VIS

UV/VIS INSTRUMENTS

UV/VIS ACCESSORIES

UV/VIS SOLVENTS

VWR® Spectrophotometers, UV-Vis Scanning UV-3100PC and Vis V-3000-PC

Two fully scanning spectrophotometers for advanced measurements and quality control.

Reliable, robust and easy to use instruments with a range of accessories that will support the creation of a personal spectrophotometer measuring station. The application software offers all the important methods expected from a 'universal' instrument. All housed in a robust cover with a well designed optical bench.

Supplied with 4 optical glass cells, 2 quartz cells (excludes model V3000-PC), dust cover, USB cable, USB (8 GB) stick, UV-Vis analyst software for PC control and 4-position cell holder (10 mm).

Display	5" graphic LCD (320×240 pixels)
Electrical	120V
Interfaces	USB port to PC / parallel port to printer
Languages	EN, DE, ES, FR
No. of standards	200 standard curves
Optical system	Single beam, grating 1200 lines/mm, silicon photodiode detector
Photometric accuracy	≤±0,5% T or 0,005 A at 1 A
Photometric range	–0,3 to 3 A; 0 - 200% T; 0 - 9999 Conc
Photometric reproducibility	±0,2% T
Photometric stability	±0,002 A/h @ 500 nm
Results storage	200
Scan speed (nm/min)	Low, medium, high (max. 3000 nm/min)
Unit Dimensions	490 × 360 × 240 mm
Wavelength accuracy (nm)	±0,5
Wavelength repeatability (nm)	≤0,2

Description	Bandwidth	Calibration	Light Type	Wavelength	Weight	Cat. No.
V-3000PC, VIS Scanning Spectrophotometer	4	±0,002 A (320 - 1000 nm)	Tungsten Halogen, ±0,05% T at 360 nm	320 - 1100 nm	12 kg	**10037-440**
UV-3100PC, UV/VIS Scanning Spectrophotometer	2	±0,002 A (200 - 1000 nm)	Deuterium/Tungsten Halogen, Stray Light ±0,05% T @ 220, 360 nm	190 - 1100 nm	14 kg	**10037-438**

For additional products, see **vwr.com**.

VWR® Double Beam UV-Vis Spectrophotometer

A double beam spectrophotometer suitable for a wide range of applications including general research, pharmaceutical, biochemical and clinical laboratory use, new material development, and quality control.

The instrument can be used in stand-alone mode or in conjunction with a PC using the supplied UV-VIS Analyst software which then delivers more powerful data processing, expanded data collecting, and removes the limit on storage capability.

Supplied with four optical glass cells, two quartz cells, dust cover, USB cable, USB (8 GB) stick, UV-Vis analyst software for PC control and single cell holders for sample and reference.

Baseline Flatness	0,001 A (200 - 1000 nm)
Control	Internal control via keypad with optional PC control
Display	LCD 320×240 pixel
Interfaces	USB and parallel printer interface
Keyboard	Keypad
Languages	English, French, German and Spanish
Light source	Deuterium and tungsten lamps
Model	UV-6300PC
Optical system	Double beam
PC software	UV-Vis Analyst
Photometric accuracy	±0,002 A at 1 A; ≤0,3% T

Photometric range	–0,3 to 3,0 A; 0 to 200% T; 0 - 9999C
Photometric stability	0,001 A/h at 500 nm
Scan	Scan intervals: 0,1; 0,2; 0,5; 1,0 and 5,0 nm
Scan speed (nm/min)	100 - 3000
Spectral bandwidth (nm)	1
Storage capacity	200 results and 200 standard curves
Stray light	≤0,05% T at 220 and 360 nm
Wavelength accuracy (nm)	±0,3
Wavelength range (nm)	190 - 1100
Weight (kg)	26
W×D×H (mm)	590×420×260

Description	Cat. No.
UV-6300PC Spectrophotometer	**10037-442**

For additional products, see **vwr.com**.

UV5 Excellence UV/VIS Spectrophotometers, METTLER TOLEDO

UV/VIS Excellence instruments effectively optimize spectroscopic workflows. FastTrack™ Technology allows for speedy measurements of the entire spectrum all within a compact footprint. UV/VIS Excellence instruments include One Click, an easy and intuitive way to run tasks right from the terminal. A large, seven inch high-resolution terminal provides clear color representation of spectra and results at a glance. The user is always securely guided through step-by-step instructions. UV/VIS spectroscopy has never been so quick to learn and easy to use.

The UV5Nano is the micro-volume spectrophotometry specialist for life science applications. FastTrack™ UV/VIS technology makes the instrument a powerful, compact, stand alone device, which can be easily operated thanks to the One Click™ user interface. The automatic pathlength selection allows measurements over a large concentration range with only 1 µL of sample. Just pipette and measure!

Ready-to-use direct measurement applications and METTLER TOLEDO methods cover a large selection of typical measuring modes and workflows for the Life Sciences including Nucleic Acid Analysis: 260/280nm ratios (with optional background correction at 320 nm) for nucleic acid purity. Protein Analysis: Biuret, Lowry, Bradford, bicinchoic acid and trinitrobenzene sulfonate protein quantification methods. Kinetics tests such as enzyme activity. Standard cuvette or micro-volume measurements available.

Services: METTLER TOLEDO® provides several service options, including Installation and Qualification, as well as extended warrantys. To learn more about these services please search "METTLER TOLEDO® Installation and Qualification Services" in the VWR.com search field

METTLER TOLEDO® provides ISO 9001 manufacturing, nationwide ISO 9001 field service, ISO 9001 quality certification, and ISO 14001 environmental certification. CE conformity mark provides you with the assurance that our products comply with the most recent EU directives. This product is CSA certified and UL listed.

Ordering Information: Each instrument comes with a one-year manufacturer's warranty. Additional components, software, and accessories are available. Contact your VWR sales representative for more information.

Electrical	100 V–240 V, ±10%, 50/60 Hz, 0.3 A
Interfaces	RS-232, USB Host, USB Device
Photometric accuracy	±0.01A (K2Cr2O7)
Scan	1 sec. (minimal scan time)
Stray light	>2 (KCl, 198 nm) UV5, UV5Bio; >1.7 (KCl, 198 nm) UV5Nano
Wavelength accuracy (nm)	±1.0 nm
Wavelength range (nm)	190–1100 nm

Description	Cat. No.
UV5 Excellence UV/VIS Spectrophotometer	**10811-200**
UV5Bio Excellence UV/VIS Spectrophotometer	**10811-202**
UV5Nano Excellence UV/VIS Spectrophotometer	**10811-204**

For additional products, see **vwr.com**.

BioSpec-nano Small-volume UV Spectrophotometer, Shimadzu

A state-of-the-art UV-VIS Spectrophotometer for life sciences, the small-volume, completely automated BioSpec-nano features an outstanding analysis range and excellent measurement reproducibility, making it the solution for stress-free nucleic acid quantitation and protein analysis.

Key features include an ultra-small sample volumes (1µL - 2µL), automatic sample mounting, measurement and cleaning, and easy operation with "Drop-and-Click" analysis. In addition, the BioSpec-nano ensures excellent measurement reproducibility, enables photometric analysis (up to 8 wavelengths), and can be equipped with an optional 5mm pathlength cell.

UL Listed.

Ordering Information: Accessories not included.

Pathlength	0.2 mm, 0.7 mm (manual selection); 5 mm (optional)
Photometric range	0 to 1.5 Abs
Sample Volume	1 µL min. (pathlength: 0.2 mm), 2 µL min. (pathlength: 0.7 mm)
Spectral Bandwidth	3 nm
Wavelength Accuracy	±1 nm
Wavelength Range	220 to 800 nm

Description	Cat. No.
BioSpec-nano Small-volume UV Spectrophotometer	**89210-930**

For additional products, see **vwr.com**.

DR 6000EDU™ UV-VIS Spectrophotometer, Hach

The simple, easy-to-operate DR 6000EDU allows you to focus your attention on the research at hand and on your students. Optimized for education and research settings, the DR 6000EDU offers an intuitive interface that is both easy-to-teach and easy-to use, the ability to download data and analyze it on a separate computer, and built-in quality assurance so you and your students can be confident in your results.

With UV and Visible Spectrum capabilities, pre-programmed and configurable methods,

fast wavelength scanning, and integrated quality assurance software, the DR 6000EDU ensures you are ready to handle all your analytical testing needs.

cTUVus. IP20 with closed lid.

Ordering Information: One year warranty.

Compatible with	Sample Cells; Rectangular 10, 20, 30, 50 mm, 1"; round 13 mm, 16 mm, 1"; Optional 100 mm rectangular cell with additional adapter
Datalog	5000 data points (result, date, time, sample-ID, user-ID
Display	TFT 7 inch WVGA color touch
Enclosure Rating	IP20 with closed lid
H x W x D	8.5 x 19.7 x 18.1" (215 x 500 x 460 mm)
Interfaces	USB type A (2), USB type B, Etherne
Method	> 250 (preprogrammed)
Operating environment (°C)	10 at 40 °C, max. 80% relative humidity (non-condensing)
Operating Mode	Transmittance (%), absorbance and concentration (wavelength, time)
Photometric accuracy	5 mAbs at 0.0-0.5 Abs < 1% at 0.5-2.0 Abs at 546 n
Photometric Linearity	0.005 - 2 Abs ≤ 0.01 at > 2 Abs with neutral glass at 546 nm
Photometric range	± 3 Abs (measuring)
Programs	200 (user)
Reproducibility	< 0.1 nm nm (wavelength)
Scan speed (nm/min)	900 nm/min (in 1 nm steps)
Source Lamp	Tungsten (visible range), deuterium (UV range)
Spectral bandwidth (nm)	2 nm
Storage Environment	-25 to 60 °C max. 80% relative humidity (non-condensing)
Stray light	KI-solution at 220 nm < 3.3 Abs/ < 0.05
Wavelength accuracy (nm)	± 1 nm
Wavelength range (nm)	190 - 1100 nm
Wavelength resolution (nm)	0.1 nm
Wavelength selection	Automatic, based on method selectio
Weight	24.25 lbs. (11 kg)

Description	Cat. No.
DR 6000EDU™ UV-VIS Spectrophotometer	**89409-698**

For additional products, see **vwr.com**.

GENESYS™ 10S Bio UV-Vis Spectrophotometers, Thermo Scientific

Designed specifically for researchers in the fields of molecular biology, biochemistry, and other life science disciplines, these units include dedicated software to perform the most frequently used applications. The software can determine the DNA ratio and concentration from 260, 280, and 320nm measurements, as well as from a wavelength scan measurement. It will also determine DNA concentration using an entered or calculated factor. The software also features programs that will perform protein assays using Bradford, Lowry, BCA, or Biuret standard curve measurements; measure cell growth at 600nm; and calculate molecular weight, molar extinction coefficient, %GC content, concentration factor, and melting temperature using an oligo calculator and four different methods. In addition, the cell-correction feature compensates for unmatched cuvettes, and the SmartStart™ feature allows users to pre-select test methods that will appear on the boot-up screen.

These spectrophotometers also offer scanning and a full complement of standard applications software. The xenon flashlamp used in each unit is only turned on during actual measurements to extend the lamp life and lower operating costs. Each unit can measure biological samples down to 1µL in volume (with an optional nanoCell accessory). Instruments feature a backlit LCD display, on-board or USB printing, USB data storage, and can be controlled by a PC with optional VISIONlite® 5 software.

UL Listed.

Ordering Information: Each spectrophotometer comes with a one-year manufacturer's warranty, owner's manual, and a dust cover. The accessory door kit comes with a spout and four ports for circulating water around water-jacketed cells.

Dimensions	33W x 40.6D x 22.9Hcm (13 x 16 x 9")
Electrical	100–240V, 50/60Hz
Photometric Accuracy	0.5% of reading
Photometric range	–1 to 3.0 A; 0.3 to 125% T
RMS Noise	<0.001 A at 0 A; <0.002 A at 2 A
Spectral Bandwidth	1.8 nm

Stray Light	<0.1% T
Wavelength Accuracy	±1.0 nm
Wavelength Range	190–1100 nm
Wavelength Repeatability	±0.2 nm
Weight	8.6 kg (19 lbs.)

Description	Cat. No.
Bio UV-Visible, Single/Six Cell Holder	**97039-478**
Bio UV-Visible, Single/Six Cell Holder with Printer	**97039-480**

For additional products, see **vwr.com**.

VWR® Spectrosil Spectrophotometer Cells

VWR® COLLECTION

Manufactured from Spectrosil quartz for accurate readings over the entire UV range to near infrared range. Due to the fully heat-fused construction (no intermediate materials or adhesives) and careful annealing to remove any strain, there is no optical or physical distortion of the two optically polished windows. Matched cells fall well within the accepted pathlength standard of ±0.01mm. Cells exhibit a transmission tolerance within 1.5% at 200nm.

In semi-micro cells, the walls parallel to the light path are thickened, decreasing the sample chamber width to 4mm. Sub-micro cells have a Z dimension that must be matched between the cell and the instrument to be used.

Three cover types are available: flat lid, stopper, and screw cap. Flat lids and stoppers are made of polytetrafluoroethylene (PTFE). Stoppered cells feature a block fused to the top of the cell with a ground hole for the stopper, providing a more suitable seal for volatile liquids. Cells with screw caps can be used under anaerobic conditions and offer an air-tight fit. Cell **414004-054** features a closed-top polymer screw cap with a silicone rubber gasket. Cell **414004-055** features an open-top polymer screw cap with a silicone rubber septum.

Note: Not recommended for use with ultrasonic cleaning.

Ordering Information: For Spectrosil cells for use in fluorometers, see **414004-064** series. Packs of two cells are matched sets.

Description	External Dimensions	Internal Dimensions	Cover Type	Pathlength	Sample Volume	Cat. No.
Standard Rectangular	10W x 10L x 52H mm	10W x 10L mm	Screw Cap with Gasket	10 mm	3.5 mL	**414004-054**
Standard Rectangular	10W x 10L x 52H mm	10W x 10L mm	Screw Cap with Septum	10 mm	3.5 mL	**414004-055**
Standard Rectangular	12.5W x 3.5L x 45H mm	10W x 1L mm	Flat Lid	1 mm	0.35 mL	**414004-060**
Standard Rectangular	12.5W x 7.5L x 45H mm	10W x 5L mm	Flat Lid	5 mm	1.7 mL	**414004-061**
Standard Rectangular	12.5W x 12.5L x 45H mm	10W x 10L mm	Flat Lid	10 mm	3.5 mL	**414004-062**
Standard Rectangular	12.5W x 12.5L x 45H mm	10W x 10L mm	Stopper	10 mm	3.5 mL	**414004-065**
Standard Rectangular	12.5W x 12.5L x 48H mm	10W x 10L mm	Stopper	10 mm	3.5 mL	**414004-078**
Standard Rectangular	12.5W x 42.5L x 45H mm	10W x 40L mm	Two Stoppers	40 mm	14 mL	**414004-063**
Cylindrical, Short Path	12.5L x 22 dia. mm	19W x 10L mm	Stopper	10 mm	2.8 mL	**414004-071**
Cylindrical, Short Path	22.5L x 22 dia. mm	19W x 20L mm	Stopper	20 mm	5.6 mL	**414004-072**
Cylindrical, Long Path	52.5L x 22 dia. mm	19W x 50L mm	Two Stoppers	50 mm	14.1 mL	**414004-073**
Cylindrical, Long Path	102.5L x 22 dia. mm	19W x 100L mm	Two Stoppers	100 mm	28.2 mL	**414004-074**
Micro	12.5W x 12.5L x 45H mm	2W x 10L mm	Flat Lid	10 mm	0.7 mL	**414004-053**
Micro, Black Sides	12.5W x 12.5L x 25H mm	2W x 10L mm	Flat Lid	10 mm	0.3 mL	**414004-076**
Micro, Black Sides	12.5W x 12.5L x 45H mm	2W x 10L mm	Flat Lid	10 mm	0.7 mL	**414004-070**
Micro, Frosted Sides	12.5W x 12.5L x 25H mm	2W x 10L mm	Flat Lid	10 mm	0.3 mL	**414004-230**

Continued on next page

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Description	External Dimensions	Internal Dimensions	Cover Type	Pathlength	Sample Volume	Cat. No.
Micro, Frosted Sides	12.5W x 12.5L x 45H mm	2W x 10L mm	Flat Lid	10 mm	0.7 mL	**414004-229**
Semi-Micro	12.5W x 12.5L x 45H mm	4W x 10L mm	Flat Lid	10 mm	1.4 mL	**414004-068**
Semi-Micro	12.5W x 12.5L x 45H mm	4W x 10L mm	Stopper	10 mm	1.4 mL	**414004-059**
Semi-Micro, Black Sides	12.5W x 12.5L x 45H mm	4W x 10L mm	Flat Lid	10 mm	1.4 mL	**414004-069**
Sub-Micro, Black Sides, Sample chamber Z, 8.5 mm	12.5W x 12.5L x 45H mm	2W x 10L x 2.5H mm	Flat Lid	10 mm	50 µL	**414004-049**
Sub-Micro, Black Sides, Sample chamber Z, 8.5 mm	12.5W x 12.5L x 45H mm	2W x 10L x 5H mm	Flat Lid	10 mm	100 µL	**414004-051**
Sub-Micro, Black Sides, Sample chamber Z, 15 mm	12.5W x 12.5L x 45H mm	2W x 10L x 2.5H mm	Flat Lid	10 mm	50 µL	**414004-050**
Sub-Micro, Black Sides, Sample chamber Z, 15 mm	12.5W x 12.5L x 45H mm	2W x 10L x 5H mm	Flat Lid	10 mm	100 µL	**414004-052**

For additional products, see **vwr.com**.

VWR® Spectrosil Fluorometer Cells

VWR COLLECTION

- Far UV Quartz
- Wavelength Range of 170–2700 nm
- Fully Heat-Fused Construction

Standard rectangular cells manufactured from Spectrosil quartz for accurate readings over the entire UV range to near infrared range. Due to the fully heat-fused construction (no intermediate materials or adhesives) and careful annealing to remove any strain, there is no optical or physical distortion of the four optically polished windows. Cells exhibit a transmission tolerance within 1.5% at 200nm.

Lids and stoppers are made of polytetrafluoroethylene (PTFE). Cell **414004-057** features a closed-top polymer screw cap with a silicone rubber gasket. Cell **414004-058** features an open-top polymer screw cap with a silicone rubber septum.

Ordering Information: For Spectrosil cells for use in spectrophotometers, see **414004-060** series.

Interior dimensions WxDxH (mm)	10W x 10L mm
Pathlength	10 mm
Sample Volume	3.5 mL

Exterior Dimensions	Cover Type	Cat. No.
12.5W x 12.5L x 45H mm	Stopper	**414004-056**
12.5W x 12.5L x 45H mm	Flat Lid	**414004-064**
12.5W x 12.5L x 52H mm	Screw Cap	**414004-057**
12.5W x 12.5L x 52H mm	Septum Screw Cap	**414004-058**

For additional products, see **vwr.com**.

VWR® Two-Sided Disposable Plastic Cuvettes

VWR COLLECTION

Cuvettes are constructed of high-quality polymethyl methacrylate (PMMA or "acrylic") or polystyrene (PS), and provide accurate, reliable results.

Acrylic cuvettes are suitable for assays between 300nm and 900nm. Polystyrene cuvettes are ideal for routine assays between 340nm and 900nm. They are grouped by manufacturing mold cavity number to ensure the lowest variation in extinction coefficient, and are packaged in low-dust, low-scratch material.

Description	Material	Volume Range	Cat. No.
Semi-Micro	Acrylic (PMMA)	1.5–3.0 mL	**97000-590**
Semi-Micro	Polystyrene (PS)	1.5–3.0 mL	**97000-586**
Macro	Acrylic (PMMA)	2.5–4.5 mL	**97000-588**
Macro	Polystyrene (PS)	2.5–4.5 mL	**97000-584**

For additional products, see **vwr.com**.

VWR® Standard Spectrophotometer Cuvettes

VWR® Standard Cuvettes feature four optical windows that are recessed to prevent scratching.

Description	Volume	L x W x H	Pathlength	Visibility	Cat. No.
Standard Cuvette, PS Grade Polystyrene	4.5 mL	10 x 10 x 45 mm	10 mm	340-800 nm	**58017-880**
Standard Cuvette, UV Grade Polymethylmethacrylate	4.5 mL	10 x 10 x 45 mm	10 mm	280-800 nm	**58017-875**

For additional products, see **vwr.com**.

Uvasol® Acetonitrile for Spectroscopy

Accurate analytic results in UV/VIS and infrared spectroscopy depend on the use of very pure solvents for sample preparation. The Uvasol® solvents range has been specially designed for spectroscopy and other applications requiring solvents of the highest spectral purity. The refinement process allows a greater degree of security in applications and avoids misinterpretation of analytical results caused by traces of UV, IR and fluorescence contamination. Uvasol® solvents offer best UV transmittance. In all specifications the minimum transmittance for 5 typical wavelengths are identified. Furthermore the transmittance is specified in accordance with Reag. Ph Eur and ACS.

Solubility ..... (20 C) soluble
Melting Point ..... -45.7 C
Molar Mass 41.05
Boiling Point ..... 81.6 C
Vapor Pressure ..... 97 hPA
Flash Point ..... 2 C
Refractive Index 1.34
Explosion Limit ..... 3.0 - 17 %
Density 0.786 g/cm3
pH ..... (H_{20}) N/A
Ignition Point ..... 524 C
Hazard Class 3
Hazard Class Description ..... Flammable liquid

Size	Packaging	Cat. No.
1L	Glass Bottle	**EM1.00016.1000**

For additional products, see **vwr.com**.

Uvasol® Chloroform for Spectroscopy

Accurate analytic results in UV/VIS and infrared spectroscopy depend on the use of very pure solvents for sample preparation. The Uvasol® solvents range has been specially designed for spectroscopy and other applications requiring solvents of the highest spectral purity. The refinement process allows a greater degree of security in applications and avoids misinterpretation of analytical results caused by traces of UV, IR and fluorescence contamination. Uvasol® solvents offer best UV transmittance. In all specifications the minimum transmittance for 5 typical wavelengths are identified. Furthermore the transmittance is specified in accordance with Reag. Ph Eur and ACS.

Solubility ..... 8 g/l (20 °C)
Melting Point ..... -63 °C
Molar Mass ..... 119.38 g/mol
Boiling Point ..... 61 °C (1013 hPa)
Vapor Pressure ..... 211 hPa (20 °C)
Refractive Index 1.45
Density ..... 1.48 g/cm3 (20 °C)
pH ..... (H_2O) no data available
Ignition Point ..... 982 °C
Hazard Class 6.1
Hazard Class Description ..... Toxic materials

Size	Packaging	Cat. No.
2.5L	Glass Bottle	**EM1.02447.2500**

For additional products, see **vwr.com**.

Uvasol® Acetone for Spectroscopy

Accurate analytic results in UV/VIS and infrared spectroscopy depend on the use of very pure solvents for sample preparation. The Uvasol® solvents range has been specially designed for spectroscopy and other applications requiring solvents of the highest spectral purity. The refinement process allows a greater degree of security in applications and avoids misinterpretation of analytical results caused by traces of UV, IR and fluorescence contamination. Uvasol® solvents offer best UV transmittance. In all specifications the minimum transmittance for 5 typical wavelengths are identified. Furthermore the transmittance is specified in accordance with Reag. Ph Eur and ACS.

Solubility ..... (20 C) soluble
Melting Point ..... -95.4 C
Molar Mass 58.08
Boiling Point ..... 56.2 C
Vapor Pressure 233
Flash Point ..... -18 C
Refractive Index 1.35686
Explosion Limit ..... 2.6 - 12.8 %
Density 0.79 g/cm3
pH ..... 5 - 6
Ignition Point ..... 465 C
Hazard Class 3
Hazard Class Description ..... Flammable liquid

Size	Packaging	Cat. No.
500ML	Glass Bottle	**EM1.00022.0500**
2.5L	Glass Bottle	**EM1.00022.2500**

For additional products, see **vwr.com**.

Uvasol® Ethanol for Spectroscopy

Accurate analytic results in UV/VIS and infrared spectroscopy depend on the use of very pure solvents for sample preparation. The Uvasol® solvents range has been specially designed for spectroscopy and other applications requiring solvents of the highest spectral purity. The refinement process allows a greater degree of security in applications and avoids misinterpretation of analytical results caused by traces of UV, IR and fluorescence contamination. Uvasol® solvents offer best UV transmittance. In all specifications the minimum transmittance for 5 typical wavelengths are identified. Furthermore the transmittance is specified in accordance with Reag. Ph Eur and ACS.

Solubility ..... (20 °C) completely miscible
Melting Point ..... -114.5 °C
Molar Mass ..... 46.07 g/mol
Boiling Point ..... 78.3 °C (1013 hPa)
Vapor Pressure ..... 59 hPa (20 °C)
Flash Point ..... 12 °C
Refractive Index 1.36
Explosion Limit ..... 3.5 - 15 %(V)
Density ..... 0.790 - 0.793 g/cm3 (20 °C)
pH ..... 7.0 (10 g/l, H_2O, 20 °C)
Ignition Point ..... 363 °C
Hazard Class 3
Hazard Class Description ..... Flammable liquid

Size	Packaging	Cat. No.
500ML	Glass Bottle	**EM1.00980.0500**
2.5L	Glass Bottle	**EM1.00980.2500**

For additional products, see **vwr.com**.

Uvasol® N-Heptane for Spectroscopy

Accurate analytic results in UV/VIS and infrared spectroscopy depend on the use of very pure solvents for sample preparation. The Uvasol® solvents range has been specially designed for spectroscopy and other applications requiring solvents of the highest spectral purity. The refinement process allows a greater degree of security in applications and avoids misinterpretation of analytical results caused by traces of UV, IR and fluorescence contamination. Uvasol® solvents offer best UV transmittance. In all specifications the minimum transmittance for 5 typical wavelengths are identified. Furthermore the transmittance is specified in accordance with Reag. Ph Eur and ACS.

Solubility	0.05 g/l (20 °C)
Melting Point	-90.5 °C
Molar Mass	100.2 g/mol
Boiling Point	97 - 98 °C (1013 hPa)
Vapor Pressure	48 hPa (20 °C)
Flash Point	-1 °C
Refractive Index	1.3876
Explosion Limit	1 - 7 %(V)
Density	0.68 g/cm3 (20 °C)
pH	(H_2O) no data available
Ignition Point	215 °C
Saturation concentration	196 g/m3 (20 °C) Air
Hazard Class	3
Hazard Class Description	Flammable liquid

Size	Packaging	Cat. No.
500ML	Glass Bottle	**EM1.04366.0500**
2.5L	Glass Bottle	**EM1.04366.2500**

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Uvasol® N-Hexane for Spectroscopy

Accurate analytic results in UV/VIS and infrared spectroscopy depend on the use of very pure solvents for sample preparation. The Uvasol® solvents range has been specially designed for spectroscopy and other applications requiring solvents of the highest spectral purity. The refinement process allows a greater degree of security in applications and avoids misinterpretation of analytical results caused by traces of UV, IR and fluorescence contamination. Uvasol® solvents offer best UV transmittance. In all specifications the minimum transmittance for 5 typical wavelengths are identified. Furthermore the transmittance is specified in accordance with Reag. Ph Eur and ACS.

Solubility	0.0095 g/l (20 °C)
Melting Point	-94.3 °C
Molar Mass	86.18 g/mol
Boiling Point	69 °C (1013 hPa)
Vapor Pressure	160 hPa (20 °C)
Flash Point	-22 °C
Refractive Index	1.375
Explosion Limit	1.0 - 8.1 %(V)
Density	0.66 g/cm3 (20 °C)
pH	(H_2O) not applicable
Ignition Point	240 °C
Viscosity kinematic	0.50 mm2/s (20 °C)
Hazard Class	3
Hazard Class Description	Flammable liquid

Size	Packaging	Cat. No.
500ML	Glass Bottle	**EM1.04372.0500**
2.5L	Glass Bottle	**EM1.04372.2500**

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Uvasol® Isooctane for Spectroscopy

Accurate analytic results in UV/VIS and infrared spectroscopy depend on the use of very pure solvents for sample preparation. The Uvasol® solvents range has been specially designed for spectroscopy and other applications requiring solvents of the highest spectral purity. The refinement process allows a greater degree of security in applications and avoids misinterpretation of analytical results caused by traces of UV, IR and fluorescence contamination. Uvasol® solvents offer best UV transmittance. In all specifications the minimum transmittance for 5 typical wavelengths are identified. Furthermore the transmittance is specified in accordance with Reag. Ph Eur and ACS.

Solubility	0.56 mg/l (25 °C)
Melting Point	-107 °C
Molar Mass	114.23 g/mol
Boiling Point	99 °C (1013 hPa)
Vapor Pressure	51 hPa (20 °C)
Flash Point	-14 °C
Explosion Limit	1 - 5.5 %(V)
Density	0.69 g/cm3 (20 °C)
pH	(H_2O) neutral
Ignition Point	410 °C
Saturation concentration	239 g/m3 (20 °C)
Evaporation number	2.3
Hazard Class	3
Hazard Class Description	Flammable liquid

Size	Packaging	Cat. No.
500ML	Glass Bottle	**EM1.04718.0500**
2.5L	Glass Bottle	**EM1.04718.2500**

For additional products, see **vwr.com**.

Uvasol® Methanol for Spectroscopy

Accurate analytic results in UV/VIS and infrared spectroscopy depend on the use of very pure solvents for sample preparation. The Uvasol® solvents range has been specially designed for spectroscopy and other applications requiring solvents of the highest spectral purity. The refinement process allows a greater degree of security in applications and avoids misinterpretation of analytical results caused by traces of UV, IR and fluorescence contamination. Uvasol® solvents offer best UV transmittance. In all specifications the minimum transmittance for 5 typical wavelengths are identified. Furthermore the transmittance is specified in accordance with Reag. Ph Eur and ACS.

Solubility	(20 °C) soluble
Melting Point	-98 °C
Molar Mass	32.04 g/mol
Boiling Point	64.5 °C (1013 hPa)
Vapor Pressure	128 hPa (20 °C)
Flash Point	10 °C
Refractive Index	1.33
Explosion Limit	5.5 - 44 %(V)
Density	0.792 g/cm3 (20 °C)
pH	(H_2O) no data available
Ignition Point	455 °C DIN 51794
Evaporation number	6.3
Water absorption	1000 g/kg
Hazard Class	3
Hazard Class Description	Flammable liquid

Size	Packaging	Cat. No.
500ML	Glass Bottle	**EM1.06002.0500**
2.5L	Glass Bottle	**EM1.06002.2500**

For additional products, see **vwr.com**.

Uvasol® N-Pentane for Spectroscopy

Accurate analytic results in UV/VIS and infrared spectroscopy depend on the use of very pure solvents for sample preparation. The Uvasol® solvents range has been specially designed for spectroscopy and other applications requiring solvents of the highest spectral purity. The refinement process allows a greater degree of security in applications and avoids misinterpretation of analytical results caused by traces of UV, IR and fluorescence contamination. Uvasol® solvents offer best UV transmittance. In all specifications the minimum transmittance for 5 typical wavelengths are identified. Furthermore the transmittance is specified in accordance with Reag. Ph Eur and ACS.

Solubility ..... 0.04 g/l (25 °C)
Melting Point ..... -130 °C
Molar Mass ..... 72.15 g/mol
Boiling Point ..... 36 °C (1013 hPa)
Vapor Pressure ..... 570 hPa (20 °C)
Flash Point ..... -48 °C (refers to pure substance)
Refractive Index 1.358
Explosion Limit ..... 1.4 - 8 %(V)
Density ..... 0.63 g/cm3 (20 °C)
pH ..... (H_2O) no data available
Ignition Point ..... 285 °C
Hazard Class 3
Hazard Class Description ..... Flammable liquid

Size	Packaging	Cat. No.
1L	Glass Bottle	**EM1.07179.1000**

For additional products, see **vwr.com**.

Uvasol® 2-Propanol for Spectroscopy

Accurate analytic results in UV/VIS and infrared spectroscopy depend on the use of very pure solvents for sample preparation. The Uvasol® solvents range has been specially designed for spectroscopy and other applications requiring solvents of the highest spectral purity. The refinement process allows a greater degree of security in applications and avoids misinterpretation of analytical results caused by traces of UV, IR and fluorescence contamination. Uvasol® solvents offer best UV transmittance. In all specifications the minimum transmittance for 5 typical wavelengths are identified. Furthermore the transmittance is specified in accordance with Reag. Ph Eur and ACS.

Solubility ..... (20 °C) soluble
Melting Point ..... -89.5 °C
Molar Mass ..... 60.1 g/mol
Boiling Point ..... 82.4 °C (1013 hPa)
Vapor Pressure ..... 43 hPa (20 °C)
Flash Point ..... 12 °C
Refractive Index 1.378
Explosion Limit ..... 2 - 13.4 %(V)
Density ..... 0.786 g/cm3 (20 °C)
pH ..... (H_2O, 20 °C) neutral
Ignition Point ..... 425 °C
Evaporation number 11
Water absorption ..... 1000 g/kg
Hazard Class 3
Hazard Class Description ..... Flammable liquid

Size	Packaging	Cat. No.
1L	Glass Bottle	**EM1.00993.1000**
2.5L	Glass Bottle	**EM1.00993.2500**

For additional products, see **vwr.com**.

Uvasol® Toluene for Spectroscopy

Accurate analytic results in UV/VIS and infrared spectroscopy depend on the use of very pure solvents for sample preparation. The Uvasol® solvents range has been specially designed for spectroscopy and other applications requiring solvents of the highest spectral purity. The refinement process allows a greater degree of security in applications and avoids misinterpretation of analytical results caused by traces of UV, IR and fluorescence contamination. Uvasol® solvents offer best UV transmittance. In all specifications the minimum transmittance for 5 typical wavelengths are identified. Furthermore the transmittance is specified in accordance with Reag. Ph Eur and ACS.

Solubility ..... 0.52 g/l (20 °C)
Melting Point ..... -95 °C
Molar Mass ..... 92.14 g/mol
Boiling Point ..... 110.6 °C (1013 hPa)
Vapor Pressure ..... 29 hPa (20 °C)
Flash Point ..... 4 °C
Refractive Index ..... 1.4968 (20 °C)
Explosion Limit ..... 1.2 - 8 %(V)
Density ..... 0.87 g/cm3 (20 °C)
pH ..... (H_2O) not applicable
Ignition Point ..... 535 °C
Viscosity kinematic ..... 0.7 mm2/s (20 °C)
Hazard Class 3
Hazard Class Description ..... Flammable liquid

Size	Packaging	Cat. No.
1L	Glass Bottle	**EM1.08331.1000**

For additional products, see **vwr.com**.

AAS

AAS STANDARDS

MATRIX MODIFIERS

BDH® ARISTAR® Multi-Element ICP and ICP-MS Certified Reference Standards

Stock multi-element ICP and ICP-MS blends can be found grouped for stability and ease of use as well as commonly used Certified Reference Materials (CRMs) recommended by many instrument manufactures.

For the pharmaceutical industry, the range includes a line of CRMs that comply with the general chapters on elemental impurity USP <232> limits and USP<233> procedures. These multi-element CRMs are available for precious metals, oral elemental and parenteral element impurities.

These ICP and ICP-MS Certified Reference Materials (CRMs) are engineered to be stable, compatible, traceable to NIST SRMs, and are manufactured and tested under ISO Guide 34 & ISO 17025 guidelines. Certified values are based on two independent methods, uncertainties are based on detailed error budgets, and trace metallic impurities (TMI) are determined by ICP and ICP-MS for single element CRMs.

Each multi-element ICP standard ships with a Certificate of Analysis (C of A) and Safety Data Sheet (SDS) and one year expiration. Specific lot C of A's can also be found online. Most products are available in stock at the 125mL and 500mL sizes packaged in plastic LDPE bottles.

Ordering Information: Uranium is depleted. The isotopic abundance is on the certificate of analysis.

Description	Size	Matrix	Elements and Concentration	Additional Information	Cat. No.
Usp 232 Oral Elemental Impurities For ICP	125 mL	HNO_3	1.5µg/mL: As 5µg/mL: Pb 15µg/mL: Hg 25µg/mL: Cd 100µg/mL: Mo, V 500µg/mL: Ni 1000µg/mL: Cu	ICP multi-element calibration standard for USP Method 232 for oral elemental impurities with 8 elements.	**89800-548**
Usp 232 Parenteral Elemental Impurities ICP	125 mL	HNO_3	1.5µg/mL: As, Hg 2.5µg/mL: Cd 5µg/mL: Pb 10µg/mL: Mo, V 50µg/mL: Ni 100µg/mL: Cu	ICP multi-element calibration standard for USP Method 232 for parenteral elemental impurities with 8 elements.	**89800-550**
Usp 232 Precious Metals Elemental Impurities For ICP	125 mL	HCl	100µg/mL: Ir, Os, Pd, Pt, Rh, Ru	ICP multi-element calibration standard for USP Method 232 for precious metals elemental impurities with 6 elements.	**89800-552**
ICP Tuning Solution Standard	125 mL	HNO_3	10µg/mL: Ce, Co, Li, Tl, Y	ICP multi-element tuning solution standard with 5 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-554**
ICP Tuning Solution Standard	125 mL	HCl / HNO_3	5µg/mL: Mg, Mn 10µg/mL: Fe, La, P, K, Sc, Ti 50µg/mL: S	ICP multi-element tuning solution standard with 9 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-556**
ICP Calibration Standard	125 mL	HNO_3 / HCl / HF	1µg/mL: Ca 2µg/mL: Be, Li, Sr 5µg/mL: Mn, Mo, Sc, Na 10µg/mL: Ce, Cu, Eu, In, Fe, Ni, P, K, Si, Ti, V, Y, Zr 50µg/mL: S	ICP multi-element calibration standard with 22 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-558**
Quality Control Standard 7	125 mL	HNO_3	50µg/mL: Si 100µg/mL: Al, Ba, B, Ag, Na 1000µg/mL: K	ICP multi-element quality control calibration standard with 7 elements, designed from in-house second source concentrates to support your daily calibration activities.	**89800-560**
Quality Control Standard 19	125 mL	HNO_3	100µg/mL: Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, Se, Tl, Ti, V, Zn	ICP multi-element quality control calibration standard with 19 elements, designed from in-house second source concentrates to support your daily calibration activities.	**89800-562**
Quality Control Standard 21	125 mL	HNO_3	100µg/mL: Pb, Mg, Mn, Mo, Ni, Se, Tl, Ti, V, Zn, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Li, Sr	ICP multi-element quality control calibration standard with 21 elements, designed from in-house second source concentrates to support your daily calibration activities.	**89800-564**
Quality Control Standard 26	125 mL	HNO_3	50µg/mL: Si 100µg/mL: Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Mg, Mn, Ni, Ag, Na, Tl, Ti, V, Zn, Pb, Mo, Se 1000µg/mL: K	ICP multi-element quality control calibration standard with 26 elements, designed from in-house second source concentrates to support your daily calibration activities.	**89800-566**
Quality Control Standard 28	125 mL	HCl / HNO_3	50µg/mL: Si 100µg/mL: Al, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Li, Mg, Mn, Mo, Ni, Se, Ag, Na, Sr, Tl, Ti, V, Zn, Sb 1000µg/mL: K	ICP multi-element quality control calibration standard with 28 elements, designed from in-house second source concentrates to support your daily calibration activities.	**89800-568**
ICP Calibration Standard	125 mL	HNO_3	1µg/mL: Be, Sr 5µg/mL: Ba, Mn 15µg/mL: B, Fe 20µg/mL: Cd, Co, Cu, Zn 25µg/mL: Cr 50µg/mL: Ni, Ag 100µg/mL: Al 150µg/mL: Ga 200µg/mL: Bi, In, Pb 400µg/mL: Tl	ICP multi-element calibration standard with 19 elements.	**89800-570**
ICP Calibration Standard	125 mL	HNO_3	10000µg/mL: Ca, Mg, K, Na	ICP common multi-element calibration standard with 4 elements	**89800-572**
ICP Calibration Standard	125 mL	HNO_3	1000µg/mL: Ca, Mg, K, Na	ICP common multi-element calibration standard with 4 elements	**89800-574**
ICP Calibration Standard	125 mL	HNO_3	1000µg/mL: Ca, Mg, K, Al, Ba, Bi, B, Cd, Cr, Co, Cu, Ga, In, Fe, Pb, Li, Mn, Ni, Ag, Na, Sr, Tl, Zn	ICP multi-element calibration standard with 23 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-576**

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Description	Size	Matrix	Elements and Concentration	Additional Information	Cat. No.
ICP Wavelength Calibration Standard	500 mL	HCl	1µg/mL: Be, Mg, Mn, Sc, Sr, Y 2µg/mL: Ba, B, Cd, Cr, Cu, Fe, Li, Ti, Zn 5µg/mL: Hg 10µg/mL: Ca, P 20µg/mL: Al, As, Pb, Se, Na, Te 100µg/mL: K	ICP multi-element wavelength calibration standard with 26 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-578**
ICP Calibration Standard	125 mL	HNO_3	10µg/mL: Mg, K, Al, Ba, Bi, Cd, Cr, Co, Cu, Ga, Pb, Li, Mn, Mo, Ni, Rb, Ag, Na, Sr, Te, U, V, Tl 100µg/mL: As, Be, B, Fe, Se, Zn 1000µg/mL: Ca	ICP multi-element calibration standard with 30 elements.	**89800-580**
ICP Calibration Standard	125 mL	HNO_3	100µg/mL: Ca, Mg, K, Al, Ba, Be, Bi, B, Cd, Cr, Co, Cu, Ga, Fe, Pb, Li, Mn, Ni, Se, Na, Sr, Te, Tl, Zn	ICP multi-element calibration standard with 24 elements.	**89800-582**
ICP Calibration Standard - Toxic Element	125 mL	HNO_3	100µg/mL: As, Be, Cd, Pb, Ni, Se, Tl	ICP multi-element calibration standard for toxic element testing with 7 elements.	**89800-584**
ICP Calibration Standard - Surface Water	125 mL	HNO_3	10µg/L: Bi, Se, Tl 20µg/L: Be, Cd, Cr, Cu 25µg/L: Co, Pb 30µg/L: Mn 50µg/L: As, Ba, Ni, V, Zn 100µg/L: B, Fe, Mo, Sr 3000µg/L: K 8000µg/L: Na 15000µg/L: Mg 35000µg/L: Ca	ICP multi-element calibration standard for surface water testing with 23 elements.	**89800-586**
ICP Calibration Standard - Sewage Sludge	125 mL	HNO_3	10µg/mL: Cd 200µg/mL: Ni 500µg/mL: Pb 800µg/mL: Cu 900µg/mL: Cr 2500µg/mL: Zn	ICP multi-element calibration standard for sewage sludge testing with 6 elements.	**89800-588**
ICP Tuning Solution Standard	125 mL	HNO_3	10µg/mL: Ni, Ba, Be, Bi, Ce, Co, In, Pb, Li, U	ICP multi-element tuning solution standard with 10 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-590**
ICP Calibration Standard - Trace Metals	125 mL	HNO_3	25µg/mL: Cd, Se 100µg/mL: As, Be, Cr, Co, Cu, Fe, Pb, Mn, Ni, Zn 250µg/mL: V 500µg/mL: Al	ICP multi-element calibration standard for trace metals testing with 14 elements.	**89800-592**
ICP Wavelength Calibration Standard	500 mL	HCl / HNO_3 / HF	20µg/mL: As, Na, Mn, Sc, La, Li, Mo, Ni 100µg/mL: K, P, S	ICP multi-element wavelength calibration standard with 11 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-594**
ICP Calibration Standard	125 mL	HNO_3	10µg/mL: Ca, K, Fe, Li, Na	ICP multi-element calibration standard with 5 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-596**
ICP Calibration Standard - Earth Alkali	125 mL	HNO_3	1000µg/mL: Ca, Mg, Ba, Sr	ICP multi-element calibration standard for alkaline earth elemental testing with 4 elements.	**89800-598**
ICP Calibration Standard - Hcl Soluble Elements	125 mL	HCl / HNO_3 / HF	100µg/mL: Sb, Hf, Ir, Ta, Sn, Ti, Zr	ICP multi-element calibration standard for HCl soluble element testing with 7 elements.	**89800-600**
ICP Calibration Standard	125 mL	HNO_3	5µg/mL: Be, Cd 10µg/mL: Ag 20µg/mL: Cr, Fe, Mn 50µg/mL: Ba, Co, Cu, Ni 100µg/mL: Al, Sb, As, Pb, Se, Tl	ICP multi-element calibration standard with 16 elements.	**89800-602**
ICP Detection Limit Standard	125 mL	HNO_3	10µg/L: Be, Co, In, Tl, U	ICP detection limit standard with 5 elements.	**89800-604**
ICP Plasma Setup Solution	1000 mL	HNO_3 / HF	10µg/L: Ba, Cd, Ce, Cu, Ge, Pb, Mg, Rh, Sc, Tb, Tl	ICP multi-element calibration standard for plasma setup with 11 elements.	**89800-606**
ICP Calibration Standard	125 mL	HNO_3	10µg/mL: Al, As, Ba, Be, Bi, Cd, Ca, Cs, Cr, Co, Cu, Ga, In, Fe, Pb, Li, Mg, Mn, Ni, K, Rb, Se, Ag, Na, Tl, U, V, Zn, Sr	ICP multi-element calibration standard with 29 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-608**
ICP Calibration Standard	125 mL	HNO_3	200µg/L: Cd, Cu, Pb, Mg, Rh	ICP multi-element calibration standard with 5 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-610**
ICP Calibration Standard	500 mL	HNO_3	1µg/L: Ba, B, Co, Ga, In, Fe, Li, Lu, K, Rh, Sc, Na, Tl, U, Y	ICP multi-element calibration standard with 15 elements.	**89800-612**
ICP Tuning Solution	500 mL	HNO_3	50µg/mL: Al, As, Ba, Cd, Cr, Co, Cu, Pb, Mn, Mo, Ni, Se, Sr, Zn 500µg/mL: K	ICP multi-element tuning solution standard with 15 elements.	**89800-614**
ICP Calibration Standard	500 mL	HNO_3	3µg/mL: Cr 10µg/mL: Ni	ICP Common Multi-Element Standard with 2 elements	**89800-616**
ICP Calibration Standard	125 mL	HNO_3	10µg/mL: Ce, Dy, Er, Eu, Gd, Ho, La, Lu, Nd, Pr, Sm, Sc, Tb, Th, Tm, Yb, Y	ICP multi-element calibration standard with 17 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-618**
ICP Calibration Standard	125 mL	HNO_3	10µg/mL: Al, As, Ba, Be, Cd, Ca, Cs, Cr, Co, Cu, Ga, Fe, Pb, Li, Mg, Mn, Ni, K, Rb, Se, Ag, Na, Sr, Tl, U, V, Zn	ICP multi-element calibration standard with 27 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-620**
ICP Calibration Standard	125 mL	HCl / HNO_3	10µg/mL: Sb, Au, Hf, Ir, Pd, Pt, Rh, Ru, Te, Sn	ICP multi-element calibration standard with 10 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-622**
ICP Calibration Standard	125 mL	HNO_3 / HF	10µg/mL: B, Ge, Mo, Nb, P, Re, Si, S, Ta, Ti, W, Zr	ICP multi-element calibration standard with 12 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-624**

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Description	Size	Matrix	Elements and Concentration	Additional Information	Cat. No.
ICP Calibration Standard	125 mL	HNO_3	10µg/mL: Mg, Be, Bi, Ce, Co, In, Pb, Ni, U	ICP multi-element calibration standard with 9 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-626**
ICP Calibration Standard	125 mL	HNO_3	0.2µg/mL: Ca, Mg, Ba, Zn 1µg/mL: Al, Cu, Mn 5µg/mL: Ni, K 10µg/mL: P	ICP common multi-element calibration standard with 10 elements	**89800-628**
ICP Calibration Standard	125 mL	HNO_3	500µg/mL: Ca, Fe, Mg, K, Na	ICP multi-element calibration standard with 5 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-630**
ICP Calibration Standard	500 mL	HNO_3	5000µg/mL: Ca, Mg, K, Na	ICP multi-element calibration standard with 5 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-632**
ICP Calibration Standard	125 mL	HNO_3	1000µg/mL: Ca, Mg, K, Na, Fe	ICP multi-element calibration standard with 5 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-634**
ICP Calibration Standard	500 mL	HCl	100µg/mL: Au, Pd, Pt	ICP common multi-element precious metals calibration standard with 3 elements	**89800-636**
ICP Envirnomental Calibration Standard	125 mL	HNO_3	10µg/mL: Ag, Al, As, Ba, Be, Cd, Co, Cr, Cu, Mn, Mo, Ni, Pb, Sb, Se, Th, Tl, U, V, Zn 1000µg/mL: Ca, Fe, K, Mg, Na	ICP multi-element environmental calibration standard with 25 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-638**
ICP Tuning Solution 1	125 mL	HNO_3	2.5µg/mL: Y, Yb 5µg/mL: Al, Ba, Bi, Co, Cr, Cu, In, 6Li, Lu, Mn, Na, Sc, Sr, Th, Tl, U, V 10µg/mL: Mg, Ni, Pb 20µg/mL: As, Be, Cd, Zn	ICP multi-element tuning solution standard with 26 elements, designed as an alternative to solutions offered by instrument manufactures. Can be paired with ICP tuning solution 2.	**89800-640**
ICP Tuning Solution 2	125 mL	HCl	5µg/mL: Ir, Ti 10µg/mL: Ge, Mo, Pd, Ru, Sb, Sn	ICP multi-element tuning solution standard with 8 elements, designed as an alternative to solutions offered by instrument manufactures. Can be paired with ICP tuning solution 1.	**89800-642**
ICP Internal Standard	125 mL	HNO_3 / HF	10µg/mL: Bi, Ge, In, 6Li, Sc, Tb, Y	ICP multi-element internal standard with 7 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-644**
ICP Interference Check Standard	125 mL	HNO_3	1000µg/mL: Na 1200µg/mL: Al 3000µg/mL: Mg 5000µg/mL: Fe 6000µg/mL: Ca	ICP multi-element interference check standard with 5 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-646**
ICP Wavecal Standard	125 mL	HNO_3	1µg/mL: Ba, Ca 10µg/mL: La, Li, Mn, Na, Sr 50µg/mL: K	ICP multi-element wavecal standard with 8 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-648**
ICP Calibration Standard	125 mL	HNO_3 / HF	100µg/mL: Mo, Sb, Si, Sn, Ti	ICP common multi-element calibration standard with 5 elements	**89800-650**
ICP Calibration Standard	500 mL	HNO_3 / HF	10µg/mL: Mo, Sb, Sn, Ti	ICP common multi-element calibration standard with 4 elements	**89800-652**
ICP Calibration Standard	500 mL	HCl	100µg/mL: Au, Ir, Os, Pd, Pt, Re, Rh, Ru	ICP common multi-element calibration standard with 8 precious metal elements	**89800-654**
ICP Calibration Standard - Trace Metals In Water	125 mL	HNO_3	1µg/L: Ag, Te 7µg/L: Cd, Tl 12µg/L: Se 14µg/L: Be, Bi, Rb 17µg/L: Li 20µg/L: Cr, Pb 23µg/L: Cu 27µg/L: Co 38µg/L: V 39µg/L: Mn 58µg/L: Sb 60µg/L: As 62µg/L: Ni 79µg/L: Zn 98µg/L: Fe 113µg/L: Re 121µg/L: Mo 142µg/L: Al 158µg/L: B 323µg/L: Sr 544µg/L: Ba 2000µg/L: K 8000µg/L: Mg 21000µg/L: Na 32000µg/L: Ca	ICP multi-element calibration standard, designed as an alternative to NIST SRM 1643 trace metals in water with 30 elements.	**89800-656**
ICP Instrument Check Standard	125 mL	HNO_3 / HF	10µg/mL: Al, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Mn, Ni, Se, Ag, Tl, V, Zn	ICP multi-element instrument check standard with 17 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-658**
ICP Tuning Solution Standard	125 mL	HNO_3	10µg/mL: Ba, Be, Co, Pb, Tl, Ce, In, Li, Mg, Rh, U, Y	ICP multi-element tuning solution standard with 12 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-660**
ICP Tuning Solution Standard	125 mL	HNO_3	10µg/mL: Ba, Co, In, Li, Rh, U, Y, B, Ga, Fe, Lu, K, Sc, Na, Th	ICP multi-element tuning solution standard with 15 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-662**
ICP Calibration Standard	125 mL	HNO_3 / HF	100µg/mL: Ti, Sb, Mo, Sn	ICP multi-element calibration standard with 4 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-664**
ICP Calibration Standard	125 mL	HNO_3	100µg/mL: Al, As, Cd, Cr, Cu, Mn, Ni, Se, Ag, U, V, Zn, Ba, Be, Co, Pb, Tl, Th	ICP multi-element calibration standard with 18 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-666**

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Description	Size	Matrix	Elements and Concentration	Additional Information	Cat. No.
ICP Calibration Standard	125 mL	HNO_3 / HF	5µg/mL: Al, As, Ba, Cd, Cr, Co, Cu, Pb, Mn, Mo, Ni, Se, Sr, Zn 50µg/mL: K	ICP multi-element internal standard with 6 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-668**
ICP Internal Standard	125 mL	HNO_3	100µg/mL: In, Bi, 6Li, Sc, Tb, Y	ICP multi-element calibration standard with 15 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-670**
ICP Tuning Solution Standard	125 mL	HNO_3	10µg/mL: Ba, Co, In, Be, Ce, Pb, Mg, Tl, Th	ICP multi-element tuning solution standard with 9 elements, designed as an alternative to solutions offered by instrument manufactures.	**89800-672**
ICP Alkaline, Alkali Earth, Non-Transition Group Calibration Standard	125 mL	HNO_3	100µg/mL: Al, As, Ba, Be, Bi, Ca, Cs, Ga, In, Li, Mg, K, Rb, Se, Na, Sr	ICP multi-element alkaline, alkali earth, non-transition group calibration standard with 16 elements. Part of the 69 Element Group.	**82025-930**
ICP Flouride Soluble Group Calibration Standard	125 mL	HNO_3 / HF	10µg/mL: Ge, Hf, Mo, Nb, Ta, Sn, Ti, W, Zr	ICP multi-element flouride soluble group calibration standard with 9 elements. Part of the 65-Element Group.	**82026-102**
ICP Flouride Soluble Group Calibration Standard	125 mL	HNO_3 / HF	100µg/mL: Sb, B, Ge, Hf, Mo, Nb, P, Re, Si, S, Ta, Sn, Ti, W, Zr	ICP multi-element flouride soluble group calibration standard with 15 elements. Part of the 69-Element Group.	**82025-932**
ICP Complete Group Calibration Standard	125 mL	HNO_3	10µg/mL: Al, As, Ba, Be, Cd, Ca, Ce, Cr, Co, Cu, Dy, Er, Eu, Gd, Ga, Ho, Fe, La, Pb, Lu, Mg, Mn, Nd, Ni, P, K, Pr, Rb, Sm, Se, Ag, Na, Sr, S, Tl, Th, Tm, U, V, Yb, Zn, Cs, B	ICP multi-element complete group calibration standard with 43 elements. Part of the 71-Element Group.	**82026-108**
ICP Internal Element Group Calibration Standard	125 mL	HNO_3	10µg/mL: Bi, In, Sc, Tb, Y, 6Li	ICP multi-element internal element group calibration standard with 6 elements. Part of the 71-Element Group.	**82026-114**
ICP Cool Plasma Complete Group Calibration Standard	125 mL	HNO_3	10µg/mL: Al, Ca, Cs, Cr, Co, Cu, Fe, Li, Mg, Mn, Ni, K, Rb, Ag, Na, Sr, Zn	ICP multi-element cool plasma complete group calibration standard with 17 elements. Part of the 65-Element Group.	**82026-106**
ICP Hot Plasma Complete Group Calibration Standard	125 mL	HNO_3	10µg/mL: Sb, As, Ba, Be, Bi, Cd, Ga, In, Pb, Se, Tl, V, B	ICP multi-element hot plasma complete group calibration standard with 13 elements. Part of the 65-Element Group.	**82026-104**
ICP Precious Metals Group Calibration Standard	125 mL	HCl	10µg/mL: Au, Ir, Os, Pd, Pt, Re, Rh, Ru	ICP multi-element precious metals group calibration standard with 8 elements including Osmium. Part of the 71-Element Group.	**82026-112**
ICP Precious Metals Group Calibration Standard	125 mL	HCl	10µg/mL: Au, Ir, Pd, Pt, Re, Rh, Ru, Te	ICP multi-element precious metals group calibration standard with 8 elements. Part of the 65-Element Group.	**82026-100**
ICP Precious Metals Group Calibration Standard	125 mL	HCl	100µg/mL: Au, Ir, Pd, Pt, Rh, Ru	ICP multi-element precious metals group calibration standard with 6 elements. Part of the 69-Element Group.	**82025-928**
ICP Rare Earth Metals Group Calibration Standard	125 mL	HNO_3	10µg/mL: Ce, Dy, Er, Eu, Gd, Ho, La, Lu, Nd, Pr, Sm, Sc, Tb, Th, Tm, U, Yb, Y	ICP multi-element rare earth metals group calibration standard with 18 elements. Part of the 65-Element Group.	**82026-098**
ICP Rare Earth Metals Group Calibration Standard	125 mL	HNO_3	100µg/mL: Ce, Dy, Er, Eu, Gd, Ho, La, Lu, Nd, Pr, Sc, Tb, Th, Tm, U, Yb, Y, Sm	ICP multi-element rare earth metals group calibration standard with 18 elements. Part of the 69-Element Group.	**82025-926**
ICP Refractory Element Group Calibration Standard	125 mL	HNO_3 / HF	10µg/mL: Sb, Ge, Hf, Mo, Nb, Si, Ta, Te, Sn, Ti, W, Zr	ICP multi-element refractory element group calibration standard with 12 elements. Part of the 71-Element Group.	**82026-110**
ICP Transtion Metals Group Calibration Standard	125 mL	HNO_3	100µg/mL: Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Ni, Ag, Tl, V, Zn	ICP multi-element transition metals group calibration standard with 13 elements. Part of the 69-Element Group.	**82025-934**

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Certipur® Standard Solutions, EMD Millipore

Traceable to SRM from NIST.

Description	Size	pH	Density	Element	Packaging	Cat. No.
NH4Cl in H2O	500 mL	5.4 (H2O, 20°C)	0.99 g/cm3 (20°C)	Ammonium	Plastic Bottle	**EM1.19812.0500**
Sb2O3 in HCl 2 Mol/L	500 mL	0 (H2O, 20°C)	1.033 g/cm3 (20°C)	Antimony	Plastic Bottle	**EM1.70204.0500**
H3AsO4 in HNO3 0.5 Mol/L	100 mL	0.5 (H2O, 20°C)	1.013 g/cm3 (20°C)	Arsenic	Plastic Bottle	**EM1.19773.0100**
Ba(NO3)2 in HNO3 0.5 Mol/L	100 mL	0.5 (H2O, 20°C)	1.013 g/cm3 (20°C)	Barium	Plastic Bottle	**EM1.19774.0100**
Ba(NO3)2 in HNO3 0.5 Mol/L	500 mL	0.5 (H2O, 20°C)	1.013 g/cm3 (20°C)	Barium	Plastic Bottle	**EM1.19774.0500**
Bi(NO3)3 in HNO3 0.5 Mol/L	100 mL	0.5 (H2O, 20°C)	1.013 g/cm3 (20°C)	Bismuth	Plastic Bottle	**EM1.19804.0100**
Bi(NO3)3 in HNO3 0.5 Mol/L	500 mL	0.5 (H2O, 20°C)	1.013 g/cm3 (20°C)	Bismuth	Plastic Bottle	**EM1.19804.0500**
NaBr in H2O	500 mL	n/a	1.003 g/cm3 (20°C)	Bromide	Plastic Bottle	**EM1.19896.0500**
Cd(NO3)2 in HNO3 0.5 Mol/L	500 mL	0.5 (H2O, 20°C)	1.013 g/cm3 (20°C)	Cadmium	Plastic Bottle	**EM1.19777.0500**
CsNO3 in HNO3 0.5 Mol/L	100 mL	n/a	1.003 g/cm3 (20°C)	Cesium	Plastic Bottle	**EM1.70212.0100**
NaCl in H2O	500 mL	n/a	0.998 g/cm3 (20°C)	Chloride	Plastic Bottle	**EM1.19897.0500**
Cr(NO3)3 in HNO3 0.5 Mol/L	500 mL	0.5 (H2O, 20°C)	1.015 g/cm3 (20°C)	Chromium	Plastic Bottle	**EM1.19779.0500**
NaF in H2O	500 mL	6 (H2O, 20°C)	1.0 g/cm3 (20°C)	Fluoride	Plastic Bottle	**EM1.19814.0500**
H(AuCl4) in HCl 2 Mol/L	500 mL	0 (H2O, 20°C)	1.033 g/cm3 (20°C)	Gold	Plastic Bottle	**EM1.70216.0500**
LiNO3 in HNO3 0.5 Mol/L	500 mL	n/a	0.87 g/cm3 (20°C)	Lithium	Plastic Bottle	**EM1.70223.0500**
Mg(NO3)2 in HNO3 0.5 Mol/L	100 mL	0.5 (H2O, 20°C)	1.016 g/cm3 (20°C)	Magnesium	Plastic Bottle	**EM1.19788.0100**
Mg(NO3)2 in HNO3 0.5 Mol/L	500 mL	0.5 (H2O, 20°C)	1.016 g/cm3 (20°C)	Magnesium	Plastic Bottle	**EM1.19788.0500**
Hg(NO3)2 in HNO3 2 Mol/L	500 mL	0 (H2O, 20°C)	1.054 g/cm3 (20°C)	Mercury	Plastic Bottle	**EM1.70226.0500**
(NH4)6Mo7O24 in H2O	500 mL	4 (H2O, 20°C)	1.000 g/cm3 (20°C)	Molybdenum	Plastic Bottle	**EM1.70227.0500**
NaNO3 in H2O	500 mL	6 (H2O, 20°C)	1.0 g/cm3 (20°C)	Nitrate	Plastic Bottle	**EM1.19811.0500**
NaNO2 in H2O	500 mL	7 (H2O, 20°C)	1.001 g/cm3 (20°C)	Nitrite	Plastic Bottle	**EM1.19899.0500**

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Description	Size	pH	Density	Element	Packaging	Cat. No.
Pd(NO3)2 in HNO3 0.5 Mol/L	500 mL	n/a	n/a	Palladium	Plastic Bottle	**EM1.14282.0500**
KH2PO4 in H2O	500 mL	n/a	0.998 g/cm3 (20°C)	Phosphate	Plastic Bottle	**EM1.19898.0500**
KNO3 in HNO3 0.5 Mol/L	100 mL	0.5 (H2O, 20°C)	1.013 g/cm3 (20°C)	Potassium	Plastic Bottle	**EM1.70230.0100**
KNO3 in HNO3 0.5 Mol/L	500 mL	0.5 (H2O, 20°C)	1.013 g/cm3 (20°C)	Potassium	Plastic Bottle	**EM1.70230.0500**
Sc2O3 in HNO3 1 Mol/L	100 mL	n/a	1.002 g/cm3 (20°C)	Scandium	Plastic Bottle	**EM1.19513.0100**
Sc2O3 in HNO3 1 Mol/L	500 mL	n/a	1.002 g/cm3 (20°C)	Scandium	Plastic Bottle	**EM1.19513.0500**
SeO2 in HNO3 0.5 Mol/L	100 mL	0.5 (H2O, 20°C)	1.013 g/cm3 (20°C)	Selenium	Plastic Bottle	**EM1.19796.0100**
Acidic, (NH4)2SiF6 in H2O	100 mL	3.4 (H2O, 20°C)	1.0 g/cm3 (20°C)	Silicon	Plastic Bottle	**EM1.12310.0100**
Acidic, (NH4)2SiF6 in H2O	500 mL	3.4 (H2O, 20°C)	1.0 g/cm3 (20°C)	Silicon	Plastic Bottle	**EM1.12310.0500**
AgNO3 in HNO3 0.5 Mol/L	500 mL	0.5 (H2O, 20°C)	1.013 g/cm3 (20°C)	Silver	Plastic Bottle	**EM1.19797.0500**
NaNO3 in HNO3 0.5 Mol/L	100 mL	0.5 (H2O, 20°C)	1.013 g/cm3 (20°C)	Sodium	Plastic Bottle	**EM1.70238.0100**
NaNO3 in HNO3 0.5 Mol/L	500 mL	0.5 (H2O, 20°C)	1.013 g/cm3 (20°C)	Sodium	Plastic Bottle	**EM1.70238.0500**
Sr(NO3)2 in HNO3 0.5 Mol/L	100 mL	0.5 (H2O, 20°C)	1.02 g/cm3 (20°C)	Strontium	Plastic Bottle	**EM1.19799.0100**
Sr(NO3)2 in HNO3 0.5 Mol/L	500 mL	0.5 (H2O, 20°C)	1.02 g/cm3 (20°C)	Strontium	Plastic Bottle	**EM1.19799.0500**
Na2SO4 in H2O	500 mL	n/a	0.998 g/cm3 (20°C)	Sulfate	Plastic Bottle	**EM1.19813.0500**
H6TeO6 in HNO3 0.5 Mol/L	100 mL	0.5 (H2O, 20°C)	1.02 g/cm3 (20°C)	Tellurium	Plastic Bottle	**EM1.19514.0100**
TlNO3 in HNO3 0.5 Mol/L	100 mL	0.5 (H2O, 20°C)	1.02 g/cm3 (20°C)	Thallium	Plastic Bottle	**EM1.19801.0100**
TlNO3 in HNO3 0.5 Mol/L	500 mL	0.5 (H2O, 20°C)	1.02 g/cm3 (20°C)	Thallium	Plastic Bottle	**EM1.19801.0500**
SnCl4 in HCl 2 Mol/L	500 mL	0 (H2O, 20°C)	1.034 g/cm3 (20°C)	Tin	Plastic Bottle	**EM1.70242.0500**
(NH4)2TiF6 in H2O	100 mL	3.5 (H2O, 20°C)	1.0 g/cm3 (20°C)	Titanium	Plastic Bottle	**EM1.70243.0100**
(NH4)2WO4 in H2O	100 mL	6 (H2O, 20°C)	1.0 g/cm3 (20°C)	Tungsten	Plastic Bottle	**EM1.70244.0100**
(NH4)2WO4 in H2O	500 mL	6 (H2O, 20°C)	1.0 g/cm3 (20°C)	Tungsten	Plastic Bottle	**EM1.70244.0500**
NH4VO3 in HNO3 0.5 Mol/L	500 mL	0.5 (H2O, 20°C)	1.13 g/cm3 (20°C)	Vanadium	Plastic Bottle	**EM1.70245.0500**
Y(NO3)3 in HNO3 0.5 Mol/L	100 mL	0.5 (H2O, 20°C)	1.02 g/cm3 (20°C)	Yttrium	Plastic Bottle	**EM1.19809.0100**
Y(NO3)3 in HNO3 0.5 Mol/L	500 mL	0.5 (H2O, 20°C)	1.02 g/cm3 (20°C)	Yttrium	Plastic Bottle	**EM1.19809.0500**
Zn(NO3)2 in HNO3 0.5 Mol/L	100 mL	0.5 (H2O, 20°C)	1.02 g/cm3 (20°C)	Zinc	Plastic Bottle	**EM1.19806.0100**
Zn(NO3)2 in HNO3 0.5 Mol/L	500 mL	0.5 (H2O, 20°C)	1.02 g/cm3 (20°C)	Zinc	Plastic Bottle	**EM1.19806.0500**
ZrCl4 in HCl 2 Mol/L	100 mL	0.5 (H2O, 20°C)	1.034 g/cm3 (20°C)	Zirconium	Plastic Bottle	**EM1.70234.0100**

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Matrix Modifiers for Graphite Furnace AAS, EMD Millipore

Size	pH	Density	Element	Packaging	Cat. No.
50 mL	<-1 (H_2O, 20°C)	1.05 g/cm³ (20°C)	Magnesium	Plastic Bottle	**EM1.05813.0050**
50 mL	(H_2O, 25°C) Acidic	1.11 g/cm³ (20°C)	Palladium	Plastic Bottle	**EM1.07289.0050**

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ICP

ICP STANDARDS, SINGLE ELEMENT

ICP STANDARDS, MULTI ELEMENT

Certipur® ICP Single Element Standards, 10 mg/L, EMD Millipore

Traceable to standard reference material from NIST.

The quality control of ICP single-element standards is carried out by the accredited calibration laboratory according to ISO 17025.

Ordering information: Each package includes a Certificate of Analysis, with exact data on content including uncertainty budget, trace element impurities, composition, traceability, date of release and minimum shelf life.

Description	Size	pH	Density	Packaging	Cat. No.
Mercury ICP/MS Standard Supplement to Multi-Element XXI (1.09498)	100 mL	<1 (H_2O, 20°C)	1.0 g/cm³ (20°C)	Plastic Bottle	**EM1.08623.0100**
Uranium ICP Standard, Traceable to SRM from NIST, $UO_2(NO_3)_2$ in HNO_3, 2–3%	100 mL	0.5 (H_2O, 20°C)	1.012 g/cm³ (20°C)	Plastic Bottle	**EM1.70360.0100**
Thorium ICP Standard, Traceable to SRM from NIST, $Th(NO_3)_4$ in HNO_3, 2–3%	100 mL	13 (H_2O, 20°C)	1.315 g/cm³ (20°C)	Plastic Bottle	**EM1.70391.0100**

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Certipur® ICP Single Element Standards, 1000 mg/L, EMD Millipore

Traceable certified reference materials from NIST.

The quality control of ICP single-element standards is carried out by the accredited calibration laboratory according to ISO 17025.

Ordering information: Each package includes a Certificate of Analysis, with exact data on content including uncertainty budget, trace element impurities, composition, traceability, date of release and minimum shelf life.

Description	Size	pH	Density	Packaging	Cat. No.
Aluminum ICP Standard, Traceable to SRM from NIST, Al(NO3) in HNO3, 2–3%	100 mL	0.5 (H2O, 20°C)	1.017 g/cm3 (20°C)	Plastic Bottle	**EM1.70301.0100**
Barium ICP Standard, Traceable to SRM from NIST, Ba(NO3)2 in HNO3, 2–3%	100 mL	0.5 (H2O, 20°C)	1.013 g/cm3 (20°C)	Plastic Bottle	**EM1.70304.0100**
Bismuth ICP Standard, Traceable to SRM form NIST, Bi(NO3)3 in HNO3, 2–3%	100 mL	0.5 (H2O, 20°C)	1.013 g/cm3 (20°C)	Plastic Bottle	**EM1.70306.0100**
Cerium ICP Standard, Traceable to SRM from NIST, Ce(NO3)3 in HNO3, 2–3%	100 mL	0.5 (H2O, 20°C)	1.013 g/cm3 (20°C)	Plastic Bottle	**EM1.70311.0100**
Cesium ICP Standard, Traceable to SRM from NIST, CsNO3 in HNO3, 2–3%	100 mL	—	1.1 g/cm3 (20°C)	Plastic Bottle	**EM1.70310.0100**
Copper ICP Standard, Traceable to SRM from NIST, Cu(NO3)2 in HNO3, 2–3%	100 mL	0.5 (H2O, 20°C)	1.014 g/cm3 (20°C)	Plastic Bottle	**EM1.70314.0100**
Gadolinium ICP Standard, Traceable to SRM from NIST, Gd2O3 in HNO3, 2–3%	100 mL	0.5 (H2O, 20°C)	1.013 g/cm3 (20°C)	Plastic Bottle	**EM1.70318.0100**
Germanium ICP Standard, Traceable to SRM from NIST, (NH4)2GeF6 in H2O	100 mL	0.5 (H2O, 20°C)	1.000 g/cm3 (20°C)	Plastic Bottle	**EM1.70320.0100**
Indium ICP Standard, Traceable to SRM from NIST, In(NO3)3 in HNO3, 2–3%	100 mL	0.5 (H2O, 20°C)	1.014 g/cm3 (20°C)	Plastic Bottle	**EM1.70324.0100**
Iridium ICP Standard, IrCl3 in HCl, 7%	100 mL	0.5 (H2O, 20°C)	1.034 g/cm3 (20°C)	Plastic Bottle	**EM1.70325.0100**
Lanthanum ICP Standard, Traceable to SRM from NIST, La(NO3)3 in HNO3, 2–3%	100 mL	0.5 (H2O, 20°C)	1.013 g/cm3 (20°C)	Plastic Bottle	**EM1.70327.0100**
Lead ICP Standard, Traceable to SRM from NIST, Pb(NO3)2 in HNO3, 2–3%	100 mL	0.5 (H2O, 20°C)	1.02 g/cm3 (20°C)	Plastic Bottle	**EM1.70328.0100**
Lithium ICP Standard, Traceable to SRM from NIST, LiNO3 in HNO3, 2–3%	100 mL	7.5 (H2O, 20°C)	1.141 g/cm3 (20°C)	Plastic Bottle	**EM1.70329.0100**
Lutetium ICP Standard, Traceable to SRM from NIST, Lu2O3 in HNO3, 2–3%	100 mL	0.5 (H2O, 20°C)	1.013 g/cm3 (20°C)	Plastic Bottle	**EM1.70330.0100**
Magnesium ICP Standard, Traceable to SRM from NIST, Mg(NO3)2 in HNO3, 2–3%	100 mL	0.5 (H2O, 20°C)	1.016 g/cm3 (20°C)	Plastic Bottle	**EM1.70331.0100**
Niobium ICP Standard, Traceable to SRM from NIST, Pd(No3)2 in HNo3, 2–3%	100 mL	3 (H2O, 20°C)	1.000 g/cm3 (20°C)	Plastic Bottle	**EM1.70337.0100**
Platinum ICP Standard, Traceable to SRM from NIST, H2PtCl6 in HCl, 7%	100 mL	0.5 (H2O, 20°C)	1.034 g/cm3 (20°C)	Plastic Bottle	**EM1.70341.0100**
Potassium ICP Standard, Traceable to SRM from NIST, KNO3 in HNO3, 2–3%	100 mL	0.5 (H2O, 20°C)	1.013 g/cm3 (20°C)	Plastic Bottle	**EM1.70342.0100**
Praseodymium ICP Standard, Traceable to SRM from NIST, Pr(NO3)3 in HNO3, 2–3%	100 mL	0.5 (H2O, 20°C)	1.013 g/cm3 (20°C)	Plastic Bottle	**EM1.70343.0100**
Rhenium ICP Standard, Traceable to SRM from NIST, NH4ReO4 in H2O	100 mL	5 (H2O, 20°C)	1.000 g/cm3 (20°C)	Plastic Bottle	**EM1.70344.0100**
Samarium ICP Standard, Traceable to SRM from NIST, Sm2O3 in HNO3, 2–3%	100 mL	0.5 (H2O, 20°C)	1.013 g/cm3 (20°C)	Plastic Bottle	**EM1.70348.0100**
Selenium ICP Standard, Traceable to SRM from NIST, SeO2 in HNO3, 2–3%	100 mL	—	1.02 g/cm3 (20°C)	Plastic Bottle	**EM1.70350.0100**
Silicon ICP Standard, Traceable to SRM from NIST, SiO2 in NaOH, 2%	100 mL	13.5 (H2O, 20°C)	1.022 g/cm3 (20°C)	Plastic Bottle	**EM1.70365.0100**
Silver ICP Standard, Traceable to SRM from NIST, AgNO3 in HNO3, 2–3%	100 mL	0.5 (H2O, 20°C)	1.013 g/cm3 (20°C)	Plastic Bottle	**EM1.70352.0100**
Strontium ICP Standard, Traceable to SRM from NIST, Sr(NO3)2 in HNO3, 2–3%	100 mL	0.5 (H2O, 20°C)	1.013 g/cm3 (20°C)	Plastic Bottle	**EM1.70354.0100**
Sulfur ICP Standard, Traceable to SRM from NIST, H2SO4 in HNO3, 2–23%	100 mL	1.5 (H2O, 20°C)	1.000 g/cm3 (20°C)	Plastic Bottle	**EM1.70355.0100**
Terbium ICP Standard, Traceable to SRM from NIST, Tb(NO3)3 in HNO3, 2–3%	100 mL	0.5 (H2O, 20°C)	1.013 g/cm3 (20°C)	Plastic Bottle	**EM1.70358.0100**
Tin ICP Standard, Traceable to SRM from NIST, SnCl4 in HCl, 7%	100 mL	—	1.034 g/cm3 (20°C)	Plastic Bottle	**EM1.70362.0100**
Titanium ICP Standard, Traceable to SRM from NIST, (NH4)2TiF6 in H2O	100 mL	3.5 (H2O, 20°C)	1.000 g/cm3 (20°C)	Plastic Bottle	**EM1.70363.0100**
Zinc ICP Standard, Traceable to SRM from NIST, Zn(NO3)2 in HNO3, 2–3%	100 mL	0.5 (H2O, 20°C)	1.02 g/cm3 (20°C)	Plastic Bottle	**EM1.70369.0100**
Zirconium ICP Standard, Traceable to SRM from NIST, ZrCl4 in HCl, 7%	100 mL	—	1.034 g/cm3 (20°C)	Plastic Bottle	**EM1.70370.0100**

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Certipur® ICP Single Element Standards, 10000 mg/L, EMD Millipore

Traceable certified reference materials from NIST.

The quality control of ICP single-element standards is carried out by the accredited calibration laboratory according to ISO 17025.

Ordering information: Each package includes a Certificate of Analysis, with exact data on content including uncertainty budget, trace element impurities, composition, traceability, date of release and minimum shelf life.

Description	Size	pH	Density	Packaging	Cat. No.
Aluminium ICP Standard, Traceable to SRM from NIST, Al(NO3)3 in HNO3, 2–3%	100 mL	6 (H2O, 20°C)	1.002 g/cm3 (20°C)	Plastic Bottle	**EM1.70371.0100**
Calcium ICP Standard, Traceable to SRM from NIST, Ca(NO3)2 in HNO3, 2–3%	100 mL	—	—	Plastic Bottle	**EM1.70373.0100**
Chromium ICP Standard, Traceable to SRM from NIST, Cr(NO3)3 in HNO3, 2–3%	100 mL	–1 (H2O, 20°C)	1.046 g/cm3 (20°C)	Plastic Bottle	**EM1.70374.0100**
Copper ICP Standard, Traceable to SRM from NIST, Cu(NO3)2 in HNO3, 2–3%	100 mL	5.5 (H2O, 20°C)	1.093 g/cm3 (20°C)	Plastic Bottle	**EM1.70378.0100**
Iron ICP Standard, Traceable to SRM from NIST, Fe(NO3)3 in HNO3, 10%	100 mL	0.5 (H2O, 20°C)	1.082 g/cm3 (20°C)	Plastic Bottle	**EM1.70376.0100**
Magnesium ICP Standard, Traceable to SRM from NIST, Mg(NO3)2 in HNO3, 2–3%	100 mL	—	1.058 g/cm3 (20°C)	Plastic Bottle	**EM1.70379.0100**
Manganese ICP Standard, Traceable to SRM from NIST, Mn(NO3)2 in HNO3, 2–3%	100 mL	–1 (H2O, 20°C)	1.036 g/cm3 (20°C)	Plastic Bottle	**EM1.70380.0100**
Phosphorus ICP Standard, Traceable to SRM from NIST, H3PO4 in H2O	100 mL	1 (H2O, 20°C)	1.015 g/cm3 (20°C)	Plastic Bottle	**EM1.70383.0100**
Potassium ICP Standard, Traceable to SRM from NIST, KNO3 in HNO3, 2–3%	100 mL	0.5 (H2O, 20°C)	1.02 g/cm3 (20°C)	Plastic Bottle	**EM1.70377.0100**
Silicon ICP Standard, Traceable to SRM from NIST, SiO2 in NaOH, 4%	100 mL	12.5 (H2O, 20°C)	1.055 g/cm3 (20°C)	Plastic Bottle	**EM1.70386.0100**
Sodium ICP Standard, Traceable to SRM from NIST, NaNO3 in HNO3, 2–3%	100 mL	5 (H2O, 20°C)	1.000 g/cm3 (20°C)	Plastic Bottle	**EM1.70381.0100**
Sulfur ICP Standard, Traceable to SRM from NIST, H4SO4 in H2O	100 mL	–1 (H2O, 20°)	1.018 g/cm3 (20°C)	Plastic Bottle	**EM1.70385.0100**
Zinc ICP Standard, Traceable to SRM from NIST, Zn(NO3)2 in HNO3, 2–3%	100 mL	5 (H2O, 20°C)	0.999 g/cm3 (20°C)	Plastic Bottle	**EM1.70389.0100**

Certipur® Cobalt ICP standard traceable to SRM from NIST $Co(NO_3)_2$ in HNO_3 2-3%

Solubility ..... (20 °C) soluble
Density ..... 1.037 g/cm3 (20 °C)
pH ..... < - 1 (H_2O, 20 °C)
Hazard Class 8
Hazard Class Description ..... Corrosive Material

Size	Packaging	Cat. No.
100 mL	Plastic Bottle	**EM1.70375.0100**

Certipur® ICP multi-element standard solution I (19 elements in dilute nitric acid)

Solubility ..... (20 °C) soluble
Density ..... 1.02 g/cm3 (20 °C)
pH ..... 0.1 (H_2O, 20 °C)
Hazard Class 8
Hazard Class Description ..... Corrosive Material

Size	Packaging	Cat. No.
100 mL	Plastic Bottle	**EM1.15474.0100**

Certipur® Dysprosium ICP standard traceable to SRM from NIST Dy_2O_3 in HNO_3 2-3%

Solubility ..... (20 °C) soluble
Density ..... 1.012 g/cm3 (20 °C)
pH ..... 0.5 (H_2O, 20 °C)
Hazard Class 8
Hazard Class Description ..... Corrosive Material

Size	Packaging	Cat. No.
100 mL	Plastic Bottle	**EM1.70315.0100**

Certipur® Erbium ICP standard traceable to SRM from NIST Er_2O_3 in HNO_3 2-3%

Solubility ..... (20 °C) soluble
Density ..... 1.013 g/cm3 (20 °C)
pH ..... 0.5 (H_2O, 20 °C)
Hazard Class 8
Hazard Class Description ..... Corrosive Material

Size	Packaging	Cat. No.
100 mL	Plastic Bottle	**EM1.70316.0100**

Gallium standard solution, 1,000 mg/l Ga in dil. nitric acid

Size	Packaging	Cat. No.
100 mL	bottle	**EM1.70319.0100**

Certipur® Hafnium ICP standard traceable to SRM from NIST $HfOCl_2$ in HCl 7%

Solubility ..... (20 °C) not applicable
Density ..... 1.035 g/cm3 (20 °C)
pH ..... (H_2O, 20 °C)
Hazard Class 8
Hazard Class Description ..... Corrosive Material

Size	Packaging	Cat. No.
100 mL	Plastic Bottle	**EM1.70322.0100**

Certipur® Holmium ICP standard traceable to SRM from NIST HO_2O_3 in HNO_3 2-3%

Solubility ..... (20 °C) soluble
Density ..... 1.013 g/cm3 (20 °C)
pH ..... 0.5 (H_2O, 20 °C)
Hazard Class 8
Hazard Class Description ..... Corrosive Material

Size	Packaging	Cat. No.
100 mL	Plastic Bottle	EM1.70323.0100

Neodymium standard solution, 1,000 mg/l Nd in dil. nitric acid

Size	Packaging	Cat. No.
100 mL	bottle	EM1.70335.0100

Certipur® Osmium ICP standard $(NH_4)_2OsCl_6$ in HCl 7%

Solubility ..... (20 °C) not applicable
Density ..... 1.034 g/cm3 (20 °C)
pH ..... (H_2O, 20 °C)
Hazard Class 8
Hazard Class Description ..... Corrosive Material

Size	Packaging	Cat. No.
100 mL	Plastic Bottle	EM1.70338.0100

Rubidium standard solution, 1,000 mg/l Rb in dil. nitric acid

Size	Packaging	Cat. No.
100 mL	bottle	EM1.70346.0100

Certipur® Thulium ICP standard traceable to SRM from NIST $Tm(NO_3)_3$ in HNO_3 2-3%

Solubility ..... (20 °C) soluble
Density ..... 1.013 g/cm3 (20 °C)
pH ..... 0.5 (H_2O, 20 °C)
Hazard Class 8
Hazard Class Description ..... Corrosive Material

Size	Packaging	Cat. No.
100 mL	Plastic Bottle	EM1.70361.0100

Certipur® Ytterbium ICP standard traceable to SRM from NIST Yb_2O_3 in HNO_3 2-3%

Solubility ..... (20 °C) not applicable
Density ..... 1.013 g/cm3 (20 °C)
pH ..... 0.5 (H_2O, 20 °C)
Hazard Class 8
Hazard Class Description ..... Corrosive Material

Size	Packaging	Cat. No.
100 mL	Plastic Bottle	EM1.70367.0100

Certipur® Vanadium ICP standard traceable to SRM from NIST NH_4VO_3 in HNO_3 15%

Density ..... 1.031 g/cm3 (20 °C)
pH ..... (H_2O, 20 °C)
Hazard Class 8
Hazard Class Description ..... Corrosive Material

Size	Packaging	Cat. No.
100 mL	Plastic Bottle	EM1.70388.0100

Certipur® Zirconium ICP standard traceable to SRM from NIST, $ZrOCl_2$ in HCl 7%

Density ..... 1.056 g/cm3 (20 °C)
pH ..... 13 (H_2O, 20 °C)
Hazard Class 8
Hazard Class Description ..... Corrosive Material

Size	Packaging	Cat. No.
100 mL	Plastic Bottle	EM1.70390.0100

Calcium ICP Standard

Calcium ICP Standard traceable to SRM from NIST $Ca(NO_3)_2$ in HNO_3 2-3% 1000 mg/l Ca Certipur®.

Size	Packaging	Cat. No.
100 mL	Plastic Bottle	EM170308.0100

Europium ICP standard

Europium ICP standard traceable to SRM from NIST Eu_2O_3 in HNO_3 2-3% 1000 mg/l Eu Certipur®.

Size	Packaging	Cat. No.
100 mL	Plastic Bottle	EM170317.0100

Tantalum ICP standard

Tantalum ICP standard traceable to SRM from NIST $(NH_4)_2TaF_7$ in H_2O 1000 mg/l Ta Certipur®.

Size	Packaging	Cat. No.
100 mL	Plastic Bottle	EM170356.0100

Certipur® ICP Multi Element Standards, EMD Millipore

Traceable to standard reference material from NIST.

Description	Size	pH	Density	Packaging	Cat. No.
ICP Multi-Element Standard Solution X for Surface Water Testing (23 Elements in Dilute Nitric Acid)	100 mL	—	1.007 g/cm³ (20°C)	Plastic Bottle	**EM1.09493.0100**
ICP Multi-Element Standard Solution VI for ICP-MS (30 Elements in Dilute Nitric Acid)	100 mL	0.5 (H_2O, 20°C)	1.03 g/cm³ (20°C)	Plastic Bottle	**EM1.10580.0100**
ICP Multi-Element Standard Solution XVI (21 Elements in Diluted Nitric Acid)	100 mL	—	1.031 g/cm³ (20°C)	Plastic Bottle	**EM1.09487.0100**
ICP Multi-Element Standard Solution XIII (15 Elements in Diluted Nitric Acid)	100 mL	—	1.032 g/cm³ (20°C)	Plastic Bottle	**EM1.09480.0100**
ICP Multi-Element Standard Solution VIII (24 Elements in Dilute Nitric Acid)	100 mL	—	1.039 g/cm³ (20°C)	Plastic Bottle	**EM1.09492.0100**
ICP Multi-Element Standard Solution XI for Sludge Testing (7 Elements in Dilute Nitric Acid)	100 mL	—	1.045 g/cm³ (20°C)	Plastic Bottle	**EM1.09491.0100**
ICP Multi-Element Standard Solution IX (9 Elements in Dilute Nitric Acid)	100 mL	0.3 (H_2O, 20°C)	1.050 g/cm³ (20°C)	Plastic Bottle	**EM1.09494.0100**
ICP Multi-ELement Standard Solution XIV (11 Elements in Dilute Hydrochloric Acid)	500 mL	1 (H_2O, 20°C)	1.009 g/cm³ (20°C)	Plastic Bottle	**EM1.09481.0500**
ICP Multi-Element Standard Solution XXIII for Mass Calibration	500 mL	<1 (H_2O, 20°C)	1.017 g/m³ (20°C)	Plastic Bottle	**EM1.09410.0500**

Rhodium standard 10 mg/l (Rhodium(III) nitrate in nitric acid 0.5 mol/l) internal standard for ICP-MS

Solubility ..... (20 °C) soluble
Density ..... 1.02 g/cm3 (20 °C)
pH ..... 1 (H_2O, 20 °C)
Hazard Class 8
Hazard Class Description ..... Corrosive Material

Size	Packaging	Cat. No.
100 mL	Plastic Bottle	**EM1.08525.0100**

Certipur® ICP Multi element standard solution XXIV tuning solution 700 ES

Element, Specification (mg/L), Uncertainty** (mg/L), NIST Standard Reference Material

Al, 45 - 55, ±5, SRM 3101a
As, 45 - 55, ±5, SRM 3103a
Ba, 45 - 55, ±5, SRM 3104a
Cd, 45 - 55, ±5, SRM 3108
Co, 45 - 55, ±5, SRM 3113
Cr, 45 - 55, ±5, SRM 3112a
Cu, 45 - 55, ±5, SRM 3114
K, 450 - 550, ±50, SRM 3141a
Mn, 45 - 55, ±5, SRM 3132
Mo, 45 - 55, ±5, SRM 3134
Ni, 45 - 55, ±5, SRM 3136
Pb, 45 - 55, ±5, SRM 3128
Se, 45 - 55, ±5, SRM 3149
Sr, 45 - 55, ±5, SRM 3153a
Zn, 45 - 55, ±5, SRM 3168a

**The measurement uncertainty can vary depending on the primary reference material.

Solubility ..... (20 °C) soluble
Density ..... 1.005 g/cm3 (20 °C)
pH ..... 1 (H_2O, 20 °C)
Hazard Class 8
Hazard Class Description ..... Corrosive Material

Size	Packaging	Cat. No.
500 mL	Plastic Bottle	**EM1.09411.0500**

ICP Multi-Element Standard Solution XXI for MS

Size	Packaging	Cat. No.
1 pc	Cardboard Box(es)	**EM1.09498.0001**

RAMAN

INSTRUMENTS, HAND-HELD

INSTRUMENTS, PORTABLE

NanoRam Handheld RAMAN System, B&W Tek

The NanoRam is a state-of-the-art handheld RAMAN instrument for nondestructive identification and verification of materials such as APIs, excipients, intermediates and finished products. Compact and agile, the NanoRam can be used by non-technical users to rapidly identify samples in the lab, warehouse, loading dock or field, helping to eliminate quarantine areas and expedite materials through the manufacturing lifecycle. Utilizing RAMAN technology, non-contact analysis can be performed through transparent containers, all while maintaining the volume and integrity of the sample.

RAMAN spectroscopy is an approved method by the U.S. and European Pharmacopoeia, as well as the Pharmacopoeia of the People's Republic of China. It is also a well-recognized method for compliance with the PIC/S GMP guide regarding 100% identity assurance for starting materials. The NanoRam is fully compliant with all governing regulations, including 21 CFR Part 11 and Part 1040.10, and can play an integral role in cGMP compliant facilities. B&W Tek offers a wide variety of services, including assistance with method and/or new library development as well as support with IQ/OQ/PQ implementation.

Features include high-brightness touch screen display, embedded 1 and 2 dimensional barcode scanner, IP-64 dust tight and splash proof rated housing, sampling accessories for almost any environment, batch scanning option for large volume operation, intuitive software for technical and non-technical users, Wi-fi and Ethernet communication for data sync and management, and library and method transfer capabilities.

Contact your VWR Sales Representative for more information, to request a quote or set up a demo.

21CFR part 11; CDRH 1040.10; IP-64; USP Chapter 1120.

Ordering Information: The NanoRam Handheld RAMAN Spectrometer comes standard with a 24 month warranty and the following items: a power adaptor, one rechargeable battery, a point and shoot adaptor, a liquid vial holder adaptor, a bottle adaptor, a pouch for adaptors, a pack of 15mm-diameter glass vials, a pouch for the 15mm vials, a calibration cap with built-in ASTM standard polystyrene, one pair of laser safety goggles, one shaft protection cap, a stylus/pen combo for NanoRam touch screen, EU, UK and US country specific power plug adaptors, a LAN cable, and hard copies of User Manual and NanoRam ID Installation Guide. All items are packaged and shipped in a rugged carrying case.

Excitation Wavelength	785 nm
Laser Output Power	300 mW Max Adjustable in 10% Increments
Spectral Range	176 cm^{-1} to 2900 cm^{-1}
Spectral Resolution	About 9 cm^{-1} at 912 nm
Storage Temperature	-30°C to +60°C

Description	Dimensions	Includes	Weight	Cat. No.
RAMAN System				
NanoRam Handheld Raman Spectrometer Package	22 x 10 x 5 cm (8.8 x 3.9 x 2.0")		1.2 kg (2.5 lbs.)	**10121-488**
RAMAN Accessories				
Right-Angle Adaptor				**10121-490**
Point and Shoot Adaptor				**10121-492**
Liquid Vial Holder Adaptor for 15 mm Vials				**10121-494**
Bottle Adaptor				**10121-496**
Immersion Probe, 30.5 cm (12")				**10121-500**
Protective Sleeve for Immersion Probe, Pack of 25				**10121-502**
Protective Sleeve for Immersion Probe, Pack of 500				**10121-504**
Calibration Cap, Built-in ASTM Standard Polystyrene				**10121-506**
Rechargeable Lithium-Ion Battery				**10121-508**
Charging Cradle for Rechargeable Lithium-Ion Battery				**10121-510**
Laser Safety Goggles				**10121-512**
Vials, 15 mm, Borosilicate Glass				**10121-514**
Pouch for Vials, Leather				**10121-516**
Pouch for Adaptors, Leather				**10121-518**
Shoulder Bag with Accessory Pouch, Leather				**10121-520**
Stylus/Pen Combo for Touch Screen				**10121-522**
Shaft Protection Cap				**10121-524**
Rugged Carrying Case, Hard Plastic				**10121-526**
Replacement Shaft with Lens for Sampling Adaptors, 6 mm working distance				**10121-528**
Replacement Shaft with Lens for Thick Container Sampling, 10 mm working distance				**10121-530**
Power Adapter, 12V DC				**10121-532**
Power Plug Adaptor, Australia				**10121-534**
Power Plug Adaptor, European				**10121-536**
Power Plug Adaptor, United Kingdom				**10121-538**
LAN Cable				**10121-540**
Rubber Jacket, Blue				**10121-542**
Software				
NID Software		PC Software for Account Management, Test Result Review, Access to Test Reports and Audit Trail		**10121-468**
Laser Power Meter, Pen Type		Laser Power Meter, Calibrated, 5µW to 1W, Used in OQ and PQ Laser Power Measurement		**10121-470**

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Description	Dimensions	Includes	Weight	Cat. No.
Documentation and Method Development				
Calibration Certificate		Duplicate of Original Certificate		**10121-462**
One-Year Extended Warranty		Extended Factory Warranty		**10121-472**
Documentation Set		User Manual and NanoRam ID Installation Guide		**10121-474**
IQ (Installment Qualification), OQ (Operational Qualification) and PQ (Performance Qualification) Document Set		IQ, OQ and PQ documents, Bound and Serialized for Supplied Unit		**10121-476**
IQ (Installment Qualification) and OQ (Operational Qualification) Document Set		IQ and OQ documents, Bound and Serialized for Supplied Unit		**10121-478**
IQ (Installment Qualification) and OQ (Operational Qualification) Document Set		IQ and OQ documents, Plus Customer Site Implementation; Travel Expenses Not Included		**10121-480**
DQ (Design Qualification) Document		DQ - Collection of Activities That Define Functional and Operational Specs of NanoRam Based On Intended Purpose		**10121-482**
PQ (Performance Qualification) Document		PQ - Details Procedure for Verification of NanoRam Performance at User-Defined Interval		**10121-484**
Customer Site Instrument Annual Certification and Verification		Certification and Verification Performed by Trained and Certified B&W Tek Personnel; Travel Expenses Not Included		**10121-486**
Site Execution of IQ and OQ, Plus 3 Days Method Development Support		IQ and OQ Execution, Method Development for up to 3 Methods, and the Creation of up to 30 Material Libraries; Travel Expenses Not Included		**10121-544**
Identification Method Development Guidelines		Instruction for Developing and Validating Methods; Results Recorded in Method-Validation Report Form (NRRS-MVR)		**10121-546**
Method-Validation Report Form (NRS-MVR)		Sample Copy and Template for Validation of Material Identification Methods using NanoRam, Including Method Challenge Testing		**10121-548**
Identification Method Development and Validation Document Set		NanoRam Identification Method Development Guidelines and NanoRam Method-Validation Report Form (NRS-MVR)		**10121-550**
DQ, IQ, OQ and PQ Documents and Identification Method Development and Validation Document Set		DQ, IQ, OQ, and PQ documents and Site Execution of IQ and OQ; Travel Expenses Not Included		**10121-552**

i-RAMAN Plus Portable Fiber Optic RAMAN Systems, B&W Tek

The i-RAMAN Plus is an enhanced version of our award winning i-RAMAN portable RAMAN spectrometer, now powered by our innovative smart spectrometer technology. Using a high quantum efficiency CCD array detector with deeper cooling and high dynamic range, this portable RAMAN spectrometer delivers an improved signal to noise ratio for up to 30 minutes of integration time, making it possible to measure weak RAMAN signals.

The i-RAMAN Plus features the unique combination of wide spectral coverage and high resolution with configurations measuring out to 4000cm-1, enabling you to measure stretching bands around 3100cm-1. The system's small footprint, lightweight design, and low power consumption provide research grade RAMAN capabilities anywhere. The i-RAMAN Plus comes standard with a fiber optic probe, and can be used with an XYZ positioning stage probe holder, a cuvette holder, and a trial version of our proprietary BWIQ multivariate analysis software. With the i-RAMAN Plus, a high precision qualitative and quantitative RAMAN solution is at your fingertips.

To enhance the functionality of the i-RAMAN Plus for user applications there is an extensive suite of software available at additional cost including: BWID Pharma Identification Software; BWIQ Multivariate Analysis software; BWSP 21pt11 Spectroscopy Analysis Software; and BWQT-M 21pt11 Chemometrics Model Builder. Functionality can be further enhanced with the addition of the optional BAC151B RAMAN Video Microsampling System, a powerful tool designed to offer the highest level of flexibility in facilitating Raman sampling for a variety of applications. Other optional accessories include a RAMAN probe holder BAC150B and a Raman cuvette holder BCR100A.

Contact your VWR Sales Representative for more information, to request a quote or set up a demo.

CDRH 1040.10; USP Chapter 1120-Raman Systems.

Ordering Information: The i-RAMAN Plus Fiber Optic RAMAN System comes standard with a 12 month warranty and a lab grade fiber optic RAMAN Probe BAC102, one pair Laser Safety Goggles, Windows based operating software BWSpec and a trial version of BWIQ Quantitative RAMAN Analysis Software.

Description	Excitation Wavelength	Includes	Output Power	Spectral Range	Spectral Resolution	Cat. No.
RAMAN System						
i-Raman® Plus Highly Sensitive, High Resolution Fiber Optic Raman System	532 nm		50mW Max., Adjustable 0 to 100% (Laser)	175 cm^{-1} to 3300 cm^{-1}	about 3.0 cm^{-1} at 614 nm	**10122-304**
i-Raman® Plus Highly Sensitive, High Resolution Fiber Optic Raman System	785 nm		300mW Max., Adjustable 0 to 100% (Laser)	175 cm^{-1} to 3200 cm^{-1}	about 4.5 cm^{-1} at 912 nm	**10122-328**
RAMAN Accessories						
Tablet Holder		Tablet Holder for i-Raman Plus				**10121-498**
Fiberoptic Probe Assembly, 532 nm, Lab Grade, Not For Immersion		Probe with 105 mm dia. 0.22NA for Laser Excitation (FC/PC) and 200 mm dia. 0.22NA for Raman Pickup (SMA905); 1.5 m Fiber Length, 5.9 mm Working Distance				**10122-322**
Fiberoptic Probe Assembly, 785 nm, Lab Grade, Not For Immersion		Probe with 105 mm dia. 0.22NA for Laser Excitation (FC/PC) and 200 mm dia. 0.22NA for Raman Pickup (SMA905); 1.5 m Fiber Length, 5.9 mm Working Distance				**10122-324**
Fiberoptic Probe Assembly, 532 nm, Industrial Grade, Fully Immersible		Probe with 1.5 m Fiber Length , 76.2 mm SS Shaft, 5.9 mm Working Distance. Terminated with SMA905 on the spectrometer end and FC/PC on the laser end				**10122-326**
Fiberoptic Probe Assembly, 785 nm, Industrial Grade, Fully Immersible		Probe with 1.5 m Fiber Length , 76.2 mm SS Shaft, 5.9 mm Working Distance. Terminated with SMA905 on the spectrometer end and FC/PC on the laser end				**10122-330**
Fiberoptic Probe Assembly with Hand Trigger, 532 nm, Lab Grade, Not For Immersion		Probe with 105 mm dia. 0.22NA for Laser Excitation (FC/PC) and 200 mm dia. 0.22NA for Raman Pickup (SMA905); 1.5 m Fiber Length, 5.9 mm Working Distance				**10122-332**
Fiberoptic Probe Assembly with Hand Trigger, 785 nm, Lab Grade, Not For Immersion		Probe with 105 mm dia. 0.22NA for Laser Excitation (FC/PC) and 200 mm dia. 0.22NA for Raman Pickup (SMA905); 1.5 m Fiber Length, 5.9 mm Working Distance				**10122-334**
Laser Safety Goggles		Laser Safety Goggles for 532 nm, Class IIIB				**10122-364**
Laser Safety Goggles		Laser Safety Goggles for 785 nm, Class IIIB				**10122-366**
Flow Cell, Titanium		Flow Cell for Liquid or Gas Process Monitoring				**10122-368**
Flow Cell, Stainless Steel		Flow Cell for Liquid or Gas Process Monitoring				**10122-370**
Probe Holder		Probe Holder for i-RAMAN and i-RAMAN Plus; Provides Manual Coarse and Fine XYZ Adjustments				**10122-372**
Liquid Sample Cuvette Holder		Cuvette Holder for Lab Grade Probes, 9.5 mm dia.				**10122-380**
Verification Cap for Probe Assemblies		Verification Cap with Silicon Reference Material for Self-Check of System Performance				**10122-382**
Immersion Shaft for Lab Grade Probes		Stainless Steel Immersion Shaft, 316 L Body with Kalrez O-Ring Sealed Fused Silica Window; 5.0 mm Focal Distance				**10122-384**
Immersion Shaft for Lab Grade Probes		Stainless Steel Immersion Shaft, 316 L Body with Kalrez O-Ring Sealed Sapphire Window; 5.0 mm Focal Distance				**10122-386**
Replacement Shaft for Lab Grade Probes		Stainless Steel Replacement Shaft, 316 L Body with Kalrez O-Ring Sealed Fused Silica Window; 5.0 mm Focal Distance				**10122-388**
Connector Cleaner		Cleaner for SMA905 and FC/PC Terminations				**10122-406**
iPad with i-Spec Mobile Application		i-Spec Mobile Application Installed for NanoRam Demo Purchase and Remote Data Access; Not Regulatory Compliant				**10121-466**

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Description	Excitation Wavelength	Includes	Output Power	Spectral Range	Spectral Resolution	Cat. No.
RAMAN Microscopy Accessories						
Video Microscope Sampling System, 532 nm		20X Objective with 8.8 mm Working Distance, LED Illuminator and Video Camera; Provides Manual Coarse and Fine XYZ Adjustments; Accepts Standard Objectives				**10122-374**
Video Microscope Sampling System, 785 nm		20X Objective with 8.8 mm Working Distance, LED Illuminator and Video Camera; Provides Manual Coarse and Fine XYZ Adjustments; Accepts Standard Objectives				**10122-376**
Video Microscope Sampling System, 532/785 nm		20X Objective with 8.8 mm Working Distance, LED Illuminator and Video Camera; Provides Manual Coarse and Fine XYZ Adjustments				**10122-378**
Microscope Objective, 5X		Infinite-Corrected Objective, 26.1 mm Working Distance, 39.7 mm Focal Length				**10122-390**
Microscope Objective, 10X		Infinite-Corrected Objective, 20.20 mm Working Distance, 20.1 mm Focal Length				**10122-392**
Microscope Objective, 20X		Infinite-Corrected Objective, 8.8 mm Working Distance, 10 mm Focal Length				**10122-394**
Microscope Objective, 40X		Infinite-Corrected Objective, 3.89 mm Working Distance, 4.989 mm Focal Length				**10122-396**
Microscope Objective, 50X		Infinite-Corrected Objective, 3.68 mm Working Distance, 4 mm Focal Length				**10122-398**
Microscope Objective, 60X		Infinite-Corrected Objective, 3.18 mm Working Distance, 3.3 mm Focal Length				**10122-400**
Microscope Objective, 80X		Infinite-Corrected Objective, 1.25 mm Working Distance, 2.495 mm Focal Length				**10122-402**
Microscope Objective, 100X		Infinite-Corrected Objective, 0.4 mm Working Distance				**10122-404**
Microscope Adapter, 3/8"		Adaptor Compatible with any Olympus Microscope, 785 nm				**10122-408**
Microscope Adapter, 3/8"		Adaptor Compatible with any Olympus Microscope, 532 nm				**10122-410**
Software						
BWSpec Operation Software		Software for Windows 2000, 7 and 8 (32 and 64 bit) with Download Access				**10122-306**
BWID Standard Material Identification Software		Software to Rapidly Identify or Verify Materials Based on User-Built Libraries				**10122-308**
BWID Pharma Material Identification Software		Software to Rapidly Identify or Verify Materials Based on User-Built Libraries; Supports FDA 21 CFR pt 11; Provides Enhanced System Access Security, Audit Trail and System Validation				**10122-310**
BWIQ Multivariate Analysis Software		For Spectral Data Analysis, Quantitative Data Analysis and Classification Analysis with Spectra Pretreatment Methods				**10122-312**
BWSP SPECTROSCOPY Software for Manual Instrument Operation and Data Analysis, 21 CFR pt 11 Compliant		Includes Drivers, Historical Database Functions, Mathematical Manipulation, MATLAB, Symbion Script Execution and CHEMOMETRICS Execution				**10122-314**
BWQT-M CHEMOMETRICS Model Builder Software		21 CFR pt 11 Compliant; Multivariate Data Analysis for Developing Calibration Models				**10122-316**
E-grade Probe Upgrade		E-Grade Upgrade for RAMAN Probes with Cut-On Start from 65 cm-1 with Purchase of any RAMAN Probe				**10122-412**
Documentation and Method Development						
IQ (Installment Qualification) and OQ (Operational Qualification) Document Set		IQ and OQ, Plus Service Performance Testing Kit				**10122-318**
Annual Service Plan		Extended Factory Warranty; Must be purchased before expiry date of an active warranty; Includes annual system performance evaluation, calibration and quality validation				**10122-320**
Service Performance Testing Kit		Kit with Vial Holder and Set of 6 x 15 mm Borosilicate Glass Vials; For Use With BAC102				**10122-336**

COLORIMETRY

INSTRUMENTS

QUANTITATIVE TEST STRIPS

DR 900 Multiparameter Handheld Colorimeter, Hach®

The hand-held DR 900 allows quick and easy access to your most-used testing methods. This colorimeter is waterproof, dustproof and field durable. With an intuitive user interface, easy data transfer abilities, and the ability to test up to 90 of the most commonly tested water methods, the DR 900 makes water testing in harsh field environments a little less challenging.

CE marked.

Ordering Information: Includes two 1" glass sample cells marked at 10, 20 and 25 mL, two 1cm plastic sample cells, 1 x 16-mm COD/Test 'N Tube™ adapter, 4 AA alkaline batteries, printed multilingual instrument manual, instrument and procedure manuals on CD, and USB Mini to USB Cable.

Battery Life	6 months (typical) @ 5 readings a day / 5 days / week without backlight (backlight usage will decrease battery life)
Battery Requirements	4, AA size alkali cells
Data Logger	500 measured values (Result, Date, Time, Sample ID, User ID)
Detector	Silicon Photodiode
Dimensions (H x W x D)	9.1 x 3.8 x 1.9" (231 x 96 x 48 mm)
Display	Graphical display 240 x 160 pixels (Backlit)
Enclosure Rating	IP67 (vial cover closed)
Interfaces	USB type Mini IP67
Operating conditions	10 to 40°C (50 - 104 °F), max. 80 % relative humidity (non-condensing)
Operating Humidity	max 90 % relative humidity (non-condensing)
Operating Mode	Transmittance (%), Absorbance and Concentration
Operating Temperature	10 to 40 °C
Optical system	0 / 180 0 / 180 deg transmittance
Photometric accuracy	± 0.005 Abs @1.0 ABS Nominal
Photometric Linearity	± 0.002 Abs (0 - 1 Abs)
Photometric Measuring Range	0 to 2 Abs
Power supply	4 x AA size alkaline cells or 4x NiMH rechargeable Battery (external charger required)
Reproducibility	± 0.005 Abs (0 - 1 A)
Sample Cell Compatability	1 inch round or 16 mm round (with adapter)
Source Lamp	LED
Spectral Bandwidth	15 nm filter bandwidth
Storage Conditions	-30 to 60 °C (-30 to 140 °F), max. 80 % relative humidity (non-condensing)
Stray Light	< 1.0 % at 400 nm
Temperature Range	0 to 50 °C (32 to 122 °F)
User Interface Languages	English, French, German, Italian, Spanish, Portuguese, Bulgarian, Chinese, Czech, Danish, Dutch, Finnish, Greek, Hungarian, Japanese, Korean, Polish, Romanian, Russian, Slovenian, Swedish, Turkis
User Programs	Custom programming 10
Wavelength Accuracy	± 1 nm (fixed, varies with model)
Wavelength Calibration	NA
Wavelength Range	420 nm, 520 nm, 560 nm, 610 nm
Wavelength selection	Automatic
Weight	1.32 lbs. (0.6 kg) with battery

Description	Cat. No.
DR 900 Colorimeter	**89496-614**

For additional products, see **vwr.com**.

ORION® AQUAfast® IV Colorimeter, Thermo Scientific

This advanced colorimeter stores up to 189 preprogrammed methods and features a simple interface with displays for concentration, absorbance, or percent transmittance. The Auto-ID™ feature automatically identifies the species to be measured using the Auto-Test™ reagents and then selects the method, wavelength, and reaction timer. The Auto-ID™ feature also ensures the reagent is matched to the method. The Auto-Test™ reagent cuvettes are specially designed for the colorimeter and premeasured.

The colorimeter also allows custom methods using up to five data points, customized calibration, uploading of most current programs, and storage of ten custom methods in memory. A datalog of up to 100 points with time and date tags can be downloaded via the RS-232 cable. The unit is waterproof to IP67 standards, allowing immersion in water to a depth of 1m for 1 hour without any water incursion. In addition to the Auto-Test™ cuvettes, the colorimeter also accepts round cuvettes with diameters of 13, 16, and 24mm.

Ordering Information: Manufacturer's two-year warranty.

Description	Cat. No.
Colorimeter Units	
AQUAfast® IV Colorimeter	**14217-920**

For additional products, see **vwr.com**.

Arsenic Test Method: colorimetric with test strips and reagents 0.02 - 0.05 - 0.1 - 0.2 - 0.5 mg/l As 0.1 - 0.5 - 1.0 - 1.7 - 3.0 mg/l As MQuant™, EMD Millipore

Size	Packaging	Cat. No.
1 pc	Plastic Box(es)	EM1.17917.0001

For additional products, see **vwr.com**.

Chloride Test Method: Colorimetric With Test Strips (5 Reaction Zones) 500 - 1000 - 1500 - 2000 - ≥ 3000 mg/l Cl^- MQuant™, EMD Millipore

The chloride test is suitable for measuring chloride ions in all natural waters. Their concentration depends on geological factors and the general local situation.

EMD # 1.10079.0001 replaces and is identical to EMD # 10079-1

Description	Range	Chemical Method	No. of Tests	Cat. No.
Chloride Test	500-1000-1500-2000-3000 mg/l Cl	Silver Chromate	100 strips	EM1.10079.0001

For additional products, see **vwr.com**.

Chlorine Test Method: Colorimetric With Test Strips 0 - 0.5 - 1 - 2 - 5 - 10 - 20 mg/l Cl_2 MQuant™, EMD Millipore

The chlorine test is a rapid exploratory test for chlorine and is intended primarily for checking the use of chlorinated disinfectants. Chlorinated disinfectants are still in common use all over the world, their major applications being in the chlorination of drinking water and swimming pools.

EMD # 1.17925.0001 replaces and is identical to EMD # 17925-1

Description	Range	Chemical Method	No. of Tests	Cat. No.
Test with Strips	0,5-1-2-5-10-20 mg/l Cl_2	Redox reaction	75 strips	EM1.17925.0001

For additional products, see **vwr.com**.

Nitrate Test Method: Colorimetric With Test Strips 10 - 25 - 50 - 100 - 250 - 500 mg/l NO_3^- MQuant™, EMD Millipore

The nitrate test can be used for monitoring of drinking water, process water and wastewater, as well as aquarium water where limits can quickly be exceeded. It can also be used for determine nitrate in food e.g. potatoes.

EMD # 1.10020.0001 replaces and is identical to EMD # 10020-1

Description	Range	Chemical Method	No. of Tests	Cat. No.
Test with Strips	10-25-50-100-250-500 mg/l NO_3	Griess' reaction (modified)	100 strips	EM1.10020.0001

For additional products, see **vwr.com**.

Nitrite Test Method: Colorimetric With Test Strips 2 - 5 - 10 - 20 - 40 - 80 mg/l NO_2^- MQuant™, EMD Millipore

The nitrite test can be used in the analysis of water and cooling lubricants. In food analysis the test is also useful for determining nitrite in meat products, pickling solutions and brine.

EMD # 1.10007.0001 replaces and is identical to EMD # 10007-1

Description	Range	Chemical Method	No. of Tests	Cat. No.
Test with Strips	2-5-10-20-40-80 mg/l NO_2	Griess' reaction	100 strips	EM1.10007.0001

For additional products, see **vwr.com**.

Peracetic Acid Test Method: Colorimetric With Test Strips 100 - 150 - 200 - 250 - 300 - 400 - 500 mg/l MQuant™, EMD Millipore

The peracetic acid tests for higher concentrations of peracetic acid are eminently suitable for checking that the prescribed end concentration of peracetic acid-based detergents are being maintained.

EMD # 1.10001.0001 replaces and is identical to EMD # 10001-1

Description	Range	Chemical Method	No. of Tests	Cat. No.
Test with Strips	100-150-200-250-300-400-500 mg/l CH_3CO_3H	Redox reaction	100 strips	EM1.10001.0001

For additional products, see **vwr.com**.

Peroxide Test Method: Colorimetric With Test Strips 100 - 200 - 400 - 600 - 800 - 1000 mg/l H_2O_2 MQuant™, EMD Millipore

The peroxide test is suitable for checking the current concentration of diluted peroxide solutions to ensure the disinfectant effect.

EMD # 1.10337.0001 replaces and is identical to EMD # 10337-1

Description	Range	Chemical Method	No. of Tests	Cat. No.
Test with Strips	100-200-400-600-800-1000 mg/l H_2O_2	Enzymatic reaction	100 strips	EM1.10337.0001

For additional products, see **vwr.com**.

Sulfate Test Method: Colorimetric With Test Strips (4 reaction zones) 200 - 400 - 800 - 1200 - 1600 mg/l SO_4^{2-} MQuant™, EMD Millipore

The sulfate test can be used to give a rapid estimation of the sulphate ion content of drinking and industrial water, as well as of effluent discharged, for instance, from electroplating works and leather goods manufacturers.

EMD # 1.10019.0001 replaces and is identical to EMD # 10019-1

Description	Range	Chemical Method	No. of Tests	Cat. No.
Test with Strips	200-400-800-1200-1600 mg/l SO_4	Ba-thorin complex	100 strips	EM1.10019.0001

For additional products, see **vwr.com**.

REFLECTOMETRY

INSTRUMENTS

TEST STRIPS

RQflex® and RQflex® Plus 10 Reflectoquant® Reflectometers, EMD Millipore

These reflectometers are suitable for the fast determination of more than 50 parameters of Reflectoquant® test strips. Up to five different methods and 50 measurement results can be stored. In addition better sensitivity can be achieved using the RQflex® meter with the Reflectoquant® plus test strips.

Description	Cat. No.
RQflex® Plus Reflectometer	EM1.16955.0001
RQflex® Reflectometer	EM1.16970.0001
Accessories	
Data Transfer Software for Of RQflex® Reflectometers (Windows)	EM1.16998.0001
Strip Adapter for RQflex® Reflectometers	EM1.16953.0001

For additional products, see **vwr.com**.

Nitrate Test Method: Reflectometric With Test Strips 5 - 225 mg/l NO_3^- Reflectoquant®, EMD Millipore

The rapid determination of the nitrate content is of particular interest with fruit and vegetables to help decide whether a given delivery batch can be released for use in a specific product (e.g. baby foods).

EMD # 1.16971.0001 replaces and is identical to EMD # 16971-1

Description	Range	Chemical Method	No. of Tests	Cat. No.
Test with Strips	5 - 225 mg/l NO_3	Griess' reaction (modified)	50 strips	EM1.16971.0001

For additional products, see **vwr.com**.

pH Test, Reflectoquant®, EMD Millipore

In water analysis the pH value plays a very important role in how other substances behave. The test can be used for monitoring the pH value in aqueous solutions, beverages, e.g. wine, after dilution and food after sample pretreatment.

Description	Includes	Cat. No.
pH Test - pH 1.0 - 5.0	50 strips	EM1.16894.0001
pH Test - pH 4.0 - 9.0	50 strips	EM1.16996.0001

For additional products, see **vwr.com**.

Phosphate Test Method: reflectometric 0.1 - 5.0 mg/l PO_4^{3-} Reflectoquant® plus, EMD Millipore

Size	Packaging	Cat. No.
1 pc	Cardboard Box(es)	EM1.17942.0001

For additional products, see **vwr.com**.

Sulfite Test Method: Reflectometric With Test Strips 10 - 200 mg/l SO_3^{2-} Reflectoquant®, EMD Millipore

The test can be used for the determination of sulfite ions, which form a red compound in reaction with the reagents, in e. g. wastewater, boiler water and boiler feed water and food after appropriate sample pretreatment.

Description	Range	Chemical Method	No. of Tests	Cat. No.
Test with Strips	10 - 200 mg/l SO_3	Nitroprusside/Zn- hexacyanoferrate	50 strips	EM1.16987.0001

For additional products, see **vwr.com**.

Total Hardness Test Method: Reflectometric With Test Strips 0.1 - 30.0 °d Reflectoquant®, EMD Millipore

The test measures the content of salts of the alkaline earth metals calcium, magnesium, strontium and barium in groundwater and surface water, drinking water, mineral water and boiler water.

Description	Range	Chemical Method	No. of Tests	Cat. No.
Test with Strips	0,1 - 30,0 °d (1 - 300 mg/l CaO)	Phthalein complexone	50 strips	EM1.16997.0001

For additional products, see **vwr.com**.

TURBIDITY

TURBIDIMETERS

TURBIDITY STANDARDS/CALIBRATION KITS

Portable Turbidimeter, Model 2100Q, Hach

The 2100Q Portable Turbidimeter offers unsurpassed ease of use and accuracy in turbidity measurement. Only Hach offers this unique combination of advanced features and measurement innovation, giving you accurate results every time. Compliant with USEPA Method 180.1 design criteria.

Easy on-screen assisted calibration and verification. Simple data transfer. Accurate for rapidly settling samples. Convenient data logging. Optical system for precision in the field. Tungsten filament lamp light source. Selectable on/off signal averaging.

Measurement method is ratio turbidimetric determination using a primary nephelometric light scatter signal (90°) and transmitted light scatter signal. Measurement modes include Normal (Push to Read), Signal Averaging, and Rapidly Settling Turbidity. User interface languages include English, French, German, Italian, Spanish, Portuguese (BR), Portuguese (PT), Bulgarian, Chinese, Czech, Danish, Dutch, Finnish, Greek, Hungarian, Japanese, Korean, Polish, Romanian, Russian, Slovenian, Swedish, and Turkish.

CE/RoHS/WEEE. IP67 Enclosure Rating.

Ordering Information: One-year warranty. Optional USB interface. Includes instrument, case assembly, 4 AA alkaline batteries, 6 sample cells, StablCal ampule kit, silicone oil, oiling cloth, and manual.

Accuracy	± 2 % of reading plus stray light of reading plus stray light
Compatible with	25 x 60 mm round sample cells
Datalog	500 records
Dimensions	77 x 107 x 229 mm (3 x 4.2 x 9")
Display	240 x 160 pixels
Measurement units	NTU
Method	EPA Method 180.1 (regulatory)
Operating Humidity	90% (maximum)
Operating Temperature	0 to 50 °C
Pathlength	25 mm
Power Requirements	100–240VAC, 50/60Hz (with optional Power or USB+Power module)
Power supply	batteries (4, AA) or optional power supply
Range	0–1000 NTU (measuring)
Repeatability	± 1 % of reading or 0.01 NTU, whichever is greater
Resolution	0.01 NTU on lowest range
Response Time	6 s in normal reading mode
Sample volume (ml)	15 mL (0.5 oz)
Storage Environment	–40 to 60°C
Weight (kg)	0.53 kg (1.17 lbs.) without batteries

Description	Cat. No.
Portable Turbidimeter	**97049-281**

For additional products, see **vwr.com**.

2100Qis Portable Turbidimeter, Hach

- Easy on-screen assisted calibration and verification
- Simple data transfer
- Accurate for rapidly settling samples
- Convenient data logging
- Optical system for precision in the field

The Hach 2100Qis Portable Turbidimeter offers unsurpassed ease of use and accuracy in turbidity measurement. Only Hach offers this unique combination of advanced features and measurement innovation, giving you accurate results every time. Compliant with ISO 7027 design criteria. With ± 2 % of reading plus stray light accuracy.

CE/RoHS/WEEE

Ordering Information: Instrument, case assembly, 4 AA alkaline batteries, 6 sample cells, StablCal ampule kit, silicone oil, oiling cloth, manual.

Battery Requirements	4, AA
Data Logger	500 Records
Enclosure Rating	IP67
Interfaces	Optional USB
Light source	860 nm LED
Measurement Method	Ratio turbidimetric determination using a primary nephelometric light scatter signal and transmitted light scatter signal.
Measurement mode	Normal (Push to Read), Signal Averaging, Rapidly Settling Turbidity
Pathlength	25 mm
Repeatability	± 1 % of reading or 0.01 FNU , Whichever is Greater
Resolution	0.01 FNU on lowest range
Response Time	Normal Mode, 6 sec
Sample Cell Compatability	25 x 60 mm Round
Sample Requirements	15 mL (0.5 oz.)
Storage	-40 °C to 60 °C
User Interface Languages	English, French, German, Italian, Spanish, Portuguese (BR), Portuguese (PT), Bulgarian, Chinese, Czech, Danish, Dutch, Finnish, Greek, Hungarian, Japanese, Korean, Polish, Romanian, Russian, Slovenian, Swedish, Turkish

H x W x D	Measurement Range	Operating Temperature Range	Cat. No.
77 x 107 x 229 mm (3 x 4.2 x 9")	0 to 1000 FNU	0 to 50 °C	**89500-680**

For additional products, see **vwr.com**.

Portable Turbidity Meters, Turb Series

The Turb® portable turbidity meters provide the user with the choice to perform nephelometric measurements at 90° scattered light with either a IR light source or tungsten white light source.

Small, lightweight, portable turbidity meters, typically used for spot analysis in the field - especially for all applications > 1NTU.

Battery power for more than 1500 measurements

Water proof housing (IP 67 compliance) with easy to use operation

Rugged carrying case for field use

The Turb 430 Series offers portable meters, with lab option via LabStation, for all applications including drinking water testing, environmental monitoring, laboratory reference measurements and process control. They fullfill AQA requirements for data evaluation by offering calibration interval setting and GLP-compliant data export to a PC with LSdata software option. The meters measure scattered light charateristics according to the European Pharmacopoeia 5.0. Both instruments provide accurate and precise measurements at low range, eg in drinking water, without any problems.

Battery power for more than 3000 measurements

Measuring range identified automatically

Water proof housing (IP 67 compliance) with easy to use operation

Rugged carrying case for field use and LabStation LSFlex for easy lab use as optional accessories

"Turb 430 IR meets the DIN 27027/ ISO 7027 requirements.

Turb 430 T meets the US EPA 180.1 requirements."

Description	Range	Accuracy	Resolution	Weight	Cat. No.
Turb® 430 IR, 28×60 mm Cuvettes	0.01 - 1100 NTU; 0 - 1100 FNU	0.01 NTU or ±2% of measured value %	0.01/0.1/1 NTU	0.6 kg	**97043-010**

For additional products, see **vwr.com**.

StablCal® Turbidity Standards, Hach®

StablCal® Turbidity Standard for all Turbidimeters. USEPA accepted for calibration purposes. StablCal® Stabilized Formazin Turbidity Standards are true Formazin dilutions developed for use in any turbidimeter. NTU Value: 1.0.

-Precise, Pre-mixed Formazin Solutions

-Based on Formazin Primary Standards

-Enhanced Stability Saves Time and Labor

-Confidence in results

Description	Size	Cat. No.
StablCal® Turbidity Standard, 1.0 NTU	500 mL Bottle	**97026-166**
StablCal® Turbidity Standard, 10 NTU	100 mL Bottle	**97026-416**
StablCal® Turbidity Standard, 20 NTU	500 mL bottle	**97026-474**
StablCal® Turbidity Standard, 100 NTU	500 mL bottle	**97026-474**
StablCal® Turbidity Standard, 1000 NTU	500 mL bottle	**97026-454**

For additional products, see **vwr.com**.

StablCal® Turbidity Standards Calibration Kit, 2100P Portable Turbidimeter, Sealed Vials, Hach

- Precise and Pre-mixed Formazin Solutions
- Based on Formazin Primary Standards
- Enhanced Stability
- Saves Time and Labor
- Confidence in Results

StablCal® Calibration Standards Kit, for 2100P Portable Turbidimeter. USEPA accepted for calibration purposes. StablCal Stabilized Formazin Turbidity Standards are true Formazin dilutions developed for use in any turbidimeter. Kit includes Sealed Vials of <0.1, 20, 100 and 800 NTU standard.

Ordering Information: Kit includes Sealed Vials of <0.1, 20, 100 and 800 NTU standard.

Description	Concentration	Cat. No.
Calibration Kit with Sealed Vials	< 0.1, 20, 100, 800 NTU	**97009-528**
Calibration Kit with 100 mL Bottles	< 0.1, 20, 100, 800 NTU	**97009-550**

For additional products, see **vwr.com**.

Gelex Secondary Turbidity Standards Kit, 2100N, Hach

Gelex Secondary Standards Kit includes 1 sealed vial each, Stray Light Standard, 0-2 NTU, 0-20 NTU, 0-200 NTU, 200-4000 NTU.

Description	Cat. No.
Gelex Secondary Standards Kit, 2100N, Includes One Sealed Vial Each, Stray Light Standard, 0-2 NTU, 0-20.	**97027-028**

For additional products, see **vwr.com**.

Formazin Turbidity Standard 4000NTU 500 mL, Hach

Formazin Turbidity Standard 4000NTU 500ML.

Volume	Cat. No.
500 mL	**97026-594**

For additional products, see **vwr.com**.

XRF

FUSION FLUXES

SAMPLE CUPS

Spectromelt® A 10 (di-lithium tetraborate)

EMD # 1.10783.1000 replaces and is identical to EMD # 10783-3.

Solubility ..... 50 g/l (20 °C)
Melting Point ..... 930 °C
Molar Mass ..... 169.12 g/mol
Bulk Density 330 kg/m3
pH ..... 9.1 (100 g/l, H_2O, 20 °C) (slurry)

Size	Packaging	Cat. No.
1 kg	Plastic Bottle	EM1.10783.1000
5 kg	Plastic Bottle	EM1.10783.5000
25 kg	Plastic Bottle	EM1.10783.9025

For additional products, see **vwr.com**.

Spectromelt® B 10 di-Sodium tetraborate

Solubility ..... 25.6 g/l (20 °C)
Melting Point ..... 742 °C
Molar Mass ..... 201.21 g/mol
Bulk Density 700 kg/m3
Boiling Point ..... 1575 °C (decomposition)
Vapor Pressure ..... 7.3 hPa (1200 °C)
Density ..... 2.37 g/cm3 (20 °C)
pH ..... 9.2 (25 g/l, H_2O, 20 °C)

Size	Packaging	Cat. No.
1 kg	Plastic Bottle	EM1.06304.1000
5 kg	Plastic Bottle	EM1.06304.5000

For additional products, see **vwr.com**.

Spectromelt® A 12 66% di-lithium tetraborate/34% lithium metaborate

Solubility ..... 50 g/l (20 °C)
Bulk Density 1300 kg/m3
pH ..... 10 (25 g/l, H_2O, 20 °C)

Size	Packaging	Cat. No.
1 kg	Plastic Bottle	EM1.11802.1000
5 kg	Plastic Bottle	EM1.11802.5000

For additional products, see **vwr.com**.

Spectromelt® A 14 51% di-lithium tetraborate/ 27% lanthane(III) oxide/ 12% lithium metaborate/ 10% lithium fluoride

Bulk Density ..... 1000 - 1200 kg/m3
pH ..... (10 g/l, H_2O, 20 °C) alkaline

Size	Packaging	Cat. No.
1 kg	Plastic Bottle	EM1.11724.1000

For additional products, see **vwr.com**.

Spectromelt® A 100 di-Lithium tetraborate

Fusion agent for x-ray fluorescence analysis

Size	Packaging	Cat. No.
1 kg		EM1.12630.1000
5 Kg	Plastic bottle for solids	EM1.12630.5000

For additional products, see **vwr.com**.

Spectromelt® A 20 lithium metaborate

Solubility ..... (20 °C) practically insoluble
Melting Point ..... 840 °C
Molar Mass ..... 49.75 g/mol
Bulk Density 1300 kg/m3

Size	Packaging	Cat. No.
1 kg	Plastic Bottle	EM1.12996.1000

For additional products, see **vwr.com**.

Spectromelt® A 1000

Solubility ..... 50 g/l (20 °C)
Melting Point ..... 900 °C
Bulk Density 500 kg/m3
pH ..... 9.1 (100 g/l, H_2O, 20 °C) (slurry)

Size	Packaging	Cat. No.
1 kg	Plastic Bottle	EM1.13175.1000
5 kg	Plastic Bottle	EM1.13175.5000

For additional products, see **vwr.com**.

Spectromelt® C 10 Grinding and tabletting aid for X-ray fluorescence spectroscopy

Solubility ..... (20 °C) partly soluble

Size	Packaging	Cat. No.
5 kg	Plastic Bottle	EM1.13990.5000

For additional products, see **vwr.com**.

Spectromelt® A 22 lithium metaborate/ di-lithium tetraborate 22:12

Bulk Density 1100 kg/m3

Size	Packaging	Cat. No.
1 kg	Plastic Bottle	EM1.24001.1000

For additional products, see **vwr.com**.

VWR Technical Product Support

VWR Technical Product Support is your one source for all VWR product technical questions. Consisting of experienced scientists with backgrounds in your area of research, the team is committed to providing you with real-time response and proven industry solutions. For assistance, email us at **TechnicalProductSupportNA@vwr.com** or call us at **1.888.897.5463**.

XRF Sample Cup Series 1000, Chemplex®

Polyethylene sample cups are designed to eliminate trimming of extraneous thin-film sample supports and facilitate general sample preparation procedure. This is accomplished by use of a full length friction-fitting sleeve that secures and envelopes the thin-film sample support to the cell body. Available in single or double open-ended versions. Single open-ended sample cups have an overflow reservoir and a thermoplastic seal that can be optionally ruptured to equalize pressure. Double open-ended cups permit attachment of thin-film sample supports prior to sample introduction for applications in air or inert gas environments. Height: 25mm (1").

Description	Cell Capacity	O.D.	Cat. No.
Double Open-Ended XRF Sample Cups	9 mL	32 mm (1.26")	**15566-140**
Single Open-Ended XRF Sample Cups	9 mL	32 mm (1.26")	**15566-148**
Double Open-Ended XRF Sample Cups	16 mL	40 mm (1.57")	**15566-150**
Single Open-Ended XRF Sample Cups	16 mL	40 mm (1.57")	**15566-152**

For additional products, see **vwr.com**.

XRF Sample Cup Series 1300, Chemplex®

Polyethylene sample cups interconvert between sealed cells and vented units by rotating a snap-on closure. Eliminates the need to rupture a thermoplastic seal for pressure equalization purposes. Snap-on closure has overflow reservoir for collecting heat sensitive sample substances that may expand during analysis. Cell neck and snap-ring incorporate unique taper and "bead-to-indent" geometry responsible for creating and maintaining a taut wrinkle-free thin-film sample support plane during assembly. Height: 23mm (0.9").

Cell Capacity	O.D.	Cat. No.
7 mL	32 mm (1.26")	**15566-158**
12 mL	40 mm (1.57")	**15566-160**

For additional products, see **vwr.com**.

XRF Sample Cup Series 1500, Chemplex®

Polyethylene sample cups designed with double open ends. Adaptable to contain many types of sample materials in air, inert gas and evacuated conditions when used with microporous film and vented sample cup caps. Can be top sample loaded after preattaching thin-film sample supports. Consists of a cell and two identical snap-on rings. Cup caps and film sold separately. Height: 23mm (0.9")

Cell Capacity	O.D.	Cat. No.
12 mL	32 mm. (1.26")	**15566-168**
18 mL	40 mm. (1.57")	**15566-170**

For additional products, see **vwr.com**.

XRF Sample Cup Series 1900, Chemplex®

Polyethylene sample cups intended for handling large numbers of high density loose powder and non-volatile liquid samples in air or inert gas environments. Consists of a double open-ended cell, snap-on ring and collar. Cell neck and snap-on ring incorporate a tapered "bead-to-indent" geometry for clamping thin-film sample supports. Collar is used to temporarily secure a thin-film support to the cell followed by attachment with a snap-on ring. 15566-172 is for use with Oxford Lab-X analytical systems.

Cell Capacity	O.D. x H	Cat. No.
26 mL	40 x 35 mm (1.57 x 1.38")	**15566-172**
9 mL	32 x 23 mm (1.26 x 0.9")	**15566-184**
16 mL	40 x 23 mm (1.57 x 0.9")	**15566-186**

For additional products, see **vwr.com**.

XRF Sample Cup Vent Hole Punch, Chemplex®

Designed for puncturing vent holes in single closed-ended XRF Sample Cups. Consists of a spring-loaded, palm-size plunger fitted into a cylindrical body. Accepts 32, 40 and 47mm diameter XRF Sample Cups. Simply place the vent hole punch over the sample cup and gently depress plunger to establish the vent path. Aluminum fabrication.

Description	Cat. No.
XRF Sample Cup Vent Hole Punch	**15566-198**

For additional products, see **vwr.com**.

Notes

Terms and Conditions

1. Acceptance – ALL SALES ARE SUBJECT TO AND EXPRESSLY CONDITIONED UPON THE TERMS AND CONDITIONS CONTAINED HEREIN, AND UPON CUSTOMER'S ASSENT THERETO. THE TERMS AND CONDITIONS CONTAINED HEREIN WILL BE CONTROLLING, AND ANY ADDITIONAL AND/OR INCONSISTENT TERMS AND CONDITIONS SET FORTH IN ANY ACKNOWLEDGMENT, PURCHASE ORDER, OR ACCEPTANCE DOCUMENTS REQUESTED FROM AND/OR PROVIDED BY CUSTOMER ARE EXPRESSLY REJECTED. NO VARIATION OF THESE TERMS AND CONDITIONS WILL BE BINDING UPON VWR UNLESS AGREED TO IN WRITING AND SIGNED BY AN OFFICER OR OTHER AUTHORIZED REPRESENTATIVE OF VWR.

2. Specifications – Product specifications are subject to change without prior notice.

3. Delivery – Delivery of all orders will be FCA (INCOTERMS 2000). Shipping and handling fees, special packaging materials (e.g., blue ice), carrier surcharges (including fuel surcharges) and hazardous material fees imposed by government regulation will be added separately to the invoice.

4. Damaged Shipments – Please inspect your VWR shipment upon receipt. If any external damage is noticed, accept the shipment only after the driver has noted the damage on both his and your copies of the delivery receipt and you have requested an inspection by the carrier. Keep all containers and packing material for inspection. If, upon opening a shipment, you find a shortage or damage, you must request inspection by the carrier within 15 days of delivery or you will relinquish your right to make a claim. VWR International reserves the right to repair a damaged product, where applicable, before replacement or credit is determined.

5. Payment Terms - Individual invoices, net thirty (30) days from date of invoice; summary invoices, if any, will be due as agreed. Payments are to be made in freely available United States dollars, including applicable taxes, and other charges such as government imposed surcharges which VWR may be required to pay or collect with respect to the sale or transportation of the Products, or the provision of Services. Payment is considered late when it is received into VWR's lockbox after the due date, which may result in an additional service charges as described further in this section. Any payments received no later than 2.00 PM Eastern Standard Time at VWR's lockbox will be credited to Customer's account as of the date received, while payments received after 2.00 PM Eastern Standard Time will be credited to Customer's account the following business day. Delinquent accounts will be subject to a service charge on past due amounts of one and one-half percent (1 1/2%) per month (or, if less, the maximum amount permitted by law). VWR recommends payments be made by ACH method to ensure timely receipt by VWR. Payment by credit card may only be used as a prepayment method when placing orders or for past due collections. When a credit card is used to pay monies to satisfy a past due account, Customer will be charged an additional processing fee of 2.5% on the amount charged to the credit card at time of processing. Customer will provide VWR, concurrent with each payment, with remittance information in sufficient detail (to the invoice level or line level as the case may be) to allow VWR to properly apply payments or credit memos to outstanding receivable(s) on VWR's accounts receivable sub-ledger for Customer. Customer shall also include its account number with any remittance. Failure to supply VWR with such remittance detail will result in additional processing delays and may affect the credit status of pending or future Customer purchase orders. When Customer wishes to apply one or more credit memos towards a payment amount owed VWR, Customer agrees to provide VWR, on a timely basis, the specific credit memo number(s) and amount(s) to be applied, in addition to the remittance information requirements above. If Customer does not provide such information on a timely basis, VWR shall apply any such credit memos to outstanding receivables, beginning with the most-aged receivables first. Customer agrees to complete, sign and submit a standard VWR credit application to VWR's Risk Management Department located at 1230 Kennestone Circle, Marietta, Georgia 30066. Customer will provide, or make available to VWR upon request, its latest audited financial statements (or unaudited financial statements, if audits are not performed). VWR agrees to keep such information confidential and to use it exclusively to evaluate and apply a credit score or rating to Customer for extension of credit purposes or pending transactions. Furthermore, Customer agrees to inform VWR of any material adverse change in its business that would reasonably be expected (by an independent 3rd party) to negatively impact its outstanding or future payment obligations and the terms or conditions contained herein. A change shall include, but not be limited to, any change in Customer's credit rating as determined by any single major rating agency, including Standard & Poor's, Moody's, Fitch or Dominion Bond Rating Service.

6. Sales Tax – Sales taxes where applicable (local, state or federal) will be added to the invoice price.

7. Product Return Policy

(a) All returns must be authorized by VWR in order to insure proper credit. NOTE: All returns are subject to 15% restocking charge. Where credits will be issued to the Customer for authorized returns under $100, the Customer is not required to return the Product to VWR except for Product(s) delivered but not ordered (picking errors). To ensure proper credit, each Product return must include the following information:

- Customer Name and Address
- Purchase Order Number
- VWR Shipping Order Number
- Date of Invoice
- Catalog Number of Returned Item(s)
- VWR Return Authorization Number
- Reason for Return

(b) Products not authorized for return include:

- Products not in completely resaleable condition (including Products with damaged, missing or defaced labeling or packaging)
- Chemicals, reagents, diagnostics, sterile or any controlled products (unless products do not meet specification)
- Laboratory apparatus or instruments that have been used or are without the original packaging, labeling
- and operating manuals.
- Refrigerated products or other perishables
- Products purchased on a Special Order Basis
- Products not purchased from VWR
- Products with an expired shelf life or an expiration date too short for resale
- Discontinued products

(c) Each return shipment of hazardous materials must be packed and labeled in accordance with DOT regulations applying to transportation of hazardous materials. Shipping documents must also meet DOT regulations. When necessary, Customer shall include with each return shipment of equipment, a certification from an authorized representative of the company that the equipment was properly decontaminated in accordance with current regulations and other recommended guidelines. The product should be shipped to the indicated service center and the transportation charges prepaid. To ensure prompt handling, the return authorization number should be placed on the outside of the package.

8. Product and Service Warranties and Limitation of Liability

(a) VWR warrants to the original Customer only that:

i. VWR VistaVision™ microscopes are guaranteed to be free of defects in material or workmanship for three (3 years from delivery, with the exception of the electrical system, which is guaranteed to be free of defects in material or workmanship for one (1) year from delivery; VWR® sympHony® meters are guaranteed to be free of defects in material or workmanship for three (3) years from delivery; and all VWR Private Label equipment is guaranteed to be free of defects in material or workmanship for two (2) years from delivery;

ii. all VWR Private Label laboratory casework will, under normal use, be free from defects in material or workmanship for one (1) year and corrosion for three (3) years from installation date and, if VWR installs the laboratory casework, the installation labor will be guaranteed for one (1) year;

iii. All software programs are warranted in accordance with the software vendor's license agreement; iv. all other Products, branded and private label, will meet the manufacturer's specifications for a term equal to the warranty period stated in the Product manufacturer's literature or sixty (60) days, whichever is longer; and v. Services provided, if any, will be of the kind and quality designated and will be performed by qualified personnel.

vi. VWR makes no claims or warranties concerning sustainable/green products. Any claims concerning sustainable/green products, including but not limited to, any of the following: green, recycled, recyclable, reusable, refillable, renewable, biodegradable, degradable, photodegradable, compostable, carbon footprint, renewable sources, source reduced, ozone safe, ozone friendly, environmentally friendly, no CFC's, CRC-Free, are the sole claims of the manufacturer and not those of VWR.

(b) VWR HEREBY DISCLAIMS ALL OTHER WARRANTIES OR GUARANTEES WITH RESPECT TO THE SUBJECT MATTER OF THIS AGREEMENT, WHETHER STATUTORY, WRITTEN, ORAL, EXPRESS OR IMPLIED INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY, SUITABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

(c) The liability of VWR under this limited warranty does not extend to any Products which are abused, altered or misused by the Customer or any other persons or entities or which become defective or non-conforming through the actions or inaction of the Customer or any other persons or entities. A defective or non-conforming Product is defined only as a Product which is outside of the manufacturer's defined Product specifications, and shall not include Products that fail to meet any fitness of use by Customer or any unique Customer operating conditions or applications.

(d) If any Product or Service warranted hereunder proves defective or non-conforming, VWR's sole liability and Customer's sole remedy hereunder shall be for VWR, to repair or, at VWR's option, (i) replace (or reperform the Service), at no cost to Customer, any such defective or non-conforming Product with a non-defective or conforming Product (as applicable) or (ii) credit Customer's account for all amounts paid with respect to the defective or non-conforming Product or Service upon VWR's receipt of the defective or non-conforming Product. In the event of replacement, the replacement Product will be warranted for the remainder of the original warranty period or ninety (90) days, whichever is longer.

(e) If a Product should require service, contact the VWR office nearest your location for instruction (for a complete list of offices, see your VWR catalog). When the return of the Product is necessary, a return authorization number will be assigned and the Product shipped, transportation charges prepaid, to the indicated service center. To insure prompt handling, the return authorization number should be placed on the outside of the package and a detailed explanation of the defect enclosed with the Product.

(f) IN NO EVENT SHALL VWR HAVE ANY OBLIGATION OR LIABILITY FOR ANY EXEMPLARY, PUNITIVE, INCIDENTAL, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES (INCLUDING BUT NOT LIMITED TO LOSS OF PROFITS, USE OR GOODWILL), WHETHER BASED ON CONTRACT, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY, OR ANY OTHER THEORY OR FORM OF ACTION, EVEN IF SUCH PARTY HAS BEEN ADVISED OF THE POSSIBILITY THEREOF. THE TOTAL LIABILITY OF VWR (INCLUDING ITS SUBCONTRACTORS AND AGENTS), IF ANY, FOR DAMAGES RELATING TO ANY PRODUCTS SOLD UNDER THIS AGREEMENT SHALL BE LIMITED TO THE PRICE PAID FOR SUCH PRODUCT(S) AND THE TOTAL LIABILITY OF VWR (INCLUDING ITS SUBCONTRACTORS AND AGENTS), IF ANY, FOR DAMAGES RELATING TO ANY SERVICES PROVIDED UNDER THIS AGREEMENT SHALL BE LIMITED TO THE FEES PAID FOR THE SERVICE GIVING RISE TO SUCH CLAIM.

9. Export Controls – Products purchased or received under this Agreement are subject to export control laws, restrictions, regulations and orders of the United States. Customer agrees to comply with all applicable export laws, restrictions and regulations of the United States or foreign agencies or authorities, and shall not export, or transfer for the purpose of re-export, any Product to any prohibited or embargoed country or to any denied, blocked, or designated person or entity as mentioned in any such United States or foreign law or regulation. Customer represents and warrants that it is not on the Denied Persons, Specially Designated Nationals or Debarred Persons List and is not otherwise prohibited by law from purchasing the Products or services hereunder. Customer shall be responsible to obtain any license to export, re-export or import as may be required.

10. Proprietary Information – Each party (a "Recipient") shall maintain in confidence, not disclose to any third party, and not use, except for the specific purpose of performing under this Agreement, all proprietary information furnished to it by the other party (a "Discloser") or any Discloser Affiliate in connection with this Agreement, or derived from the Discloser or any Discloser Affiliate in performance of this Agreement, and shall return to the Discloser or a Discloser Affiliate, upon request, all copies (then in Recipient's possession) of documents and other tangible media furnished by or derived from Discloser or such Discloser Affiliate, respectively, in connection with the performance of this Agreement. The Recipient shall inform its employees, agents, and representatives of these obligations and shall require them to assume equivalent obligations.

11. Miscellaneous

(a) Termination - This Agreement may be terminated by either party for convenience at any time upon reasonable written notice delivered to the other party. In the event of any termination or expiration of this Agreement, Customer shall be billed immediately for Products shipped through the effective date of such termination or expiration and all custom Products purchased for Customer in VWR's inventories at such date, and Customer shall pay the invoiced amount immediately upon receipt of such invoice.

(b) Force Majeure - In the event either party is prevented in whole or in material part from performing its obligations under this Agreement solely as a result of force majeure, upon the prompt giving of notice to the other party detailing such force majeure event and its anticipated duration, the obligations of the party so prevented shall be excused during such period of delay, and such party shall take whatever reasonable steps are necessary to relieve the effect of such cause as rapidly as possible.

(c) Merger, Modification, Waiver - No amendment, modification or waiver of these terms shall be binding on either party unless reduced to writing and signed by an authorized officer of the party to be bound, and in the case of a waiver, shall be effective only in the specific instance and for the specific purpose for which given, and shall not be construed as a waiver of any subsequent breach. The failure of either party to enforce at any time or for any period of time any of the provisions of this Agreement shall not be construed as a waiver of such provisions or of the right of such party thereafter to enforce each and every such provision. No course of dealing, usage of trade or course of performance shall supplement, explain or amend any term, condition or instruction of this Agreement, or any shipment of Products hereunder.

(d) Applicable Law - This Agreement is made pursuant to, and shall be construed and enforced exclusively in accordance with, the internal laws of the Commonwealth of Pennsylvania (and United States federal law, to the extent applicable), without giving effect to otherwise applicable principles of conflicts of law.

(e) Authority to Enter Into Agreement – Each party represents and warrants that it is authorized to enter into this Agreement and that in so doing it is not in violation of the terms or conditions of any contract or other agreement to which it may be a party.

f) Assignment - This Agreement shall be binding upon and inure to the benefit of the parties hereto and their respective successors and permitted assigns and designees; provided, however, neither party shall have the right to transfer, assign or delegate its rights or obligations under this Agreement or any portion thereof without the prior written consent of the other party (except that either party may assign this Agreement to a parent, subsidiary or successor corporation without such consent).

(g) Nature of Relationship - Neither party, its employees or permitted subcontractors or agents shall, under any circumstances, be considered to be an agent, partner, joint venturer or representative of the other party.

Trademarks

VWR, forms of VWR, and the VWR logo and/or design are either registered trademarks ®, trademarks ™, or service marks SM of VWR International, LLC. in the United States and/or other countries. All other marks referenced herein are registered trademarks, trademarks, or service marks of their respective owner(s). For a complete list of trademark owners, please visit www.vwr.com.

Disclaimer and Copyright Information

Prices, product appearance and specifications are current at the time of printing, subject to change without notice. Availability for certain products may be limited by federal, state, provincial or local licensing requirements. VWR makes no claims or warranties concerning sustainable/green products. Any claims concerning sustainable/green products are the sole claims of the manufacturer and not those of VWR International, LLC. All prices are in U.S. dollars unless otherwise noted. Offers valid in USA and Canada, void where prohibited by law or company policy, while supplies last. Visit vwr.com to view our privacy policy and additional disclaimers.

EQUIPMENT MANAGEMENT
Powered by VEM Technology

A Web-based Asset Management System from VWR

VWRCATALYST offers a wide range of laboratory support services designed to save our customers time and help to improve total operating costs. These services range from centralised laboratory services to research technician activities. They all share a central theme in allowing you to recover valuable research time and increase your lab's productivity.

We can provide support exactly where you need it most - and this includes solutions to optimise equipment in your laboratory.

The Equipment Management Process

In many organisations, equipment becomes a critical asset to any researcher's work. Equipment Management means managing and monitoring equipment across the entire organisation. An Equipment Management system is part of a quality system and as a result is a crucial factor for customers to meet their compliance requirements.

VWRCATALYST has developed new software to help with this challenge; **VEM - Equipment Management System**

VEM keeps track of all equipment, but goes beyond by managing maintenance with numerous service partners. It handles work orders, spare parts as well as related documentation, warranties and service contracts.

The VWR Equipment Management solution effectively manages maintenance, calibrations, repairs, equipment inventory and numerous other regular activities. It will help to maintain equipment accountability for all assets.

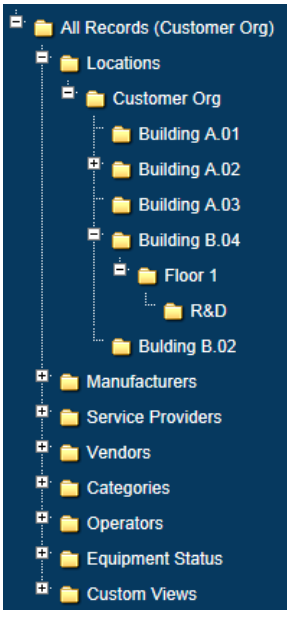
VEM is built around a centralized equipment repository which not only stores the inventory of assets but also spare part lists, consumable lists, documentation, images, SOP's, status of an asset, etc. It tracks equipment by serial number or other ID's and manages warranties, service provider and vendor information as well as service requests and work orders.

VEM constantly records service data and gives procurement managers better information to prepare for the next equipment purchase (down time, repair cost, total cost of ownership).

With a powerful built-in reporting tool, VEM keeps track of all equipment movement. Allows status tracking, documents service activities and allows vendor and service provider metrics.

Managers have **real time visibility** of equipment status and access to equipment related metrics including **total cost of ownership.**

The system features an activity-based notification and messaging system which informs users, managers and administrators about pending tasks such as due dates, pending approvals and other activities.



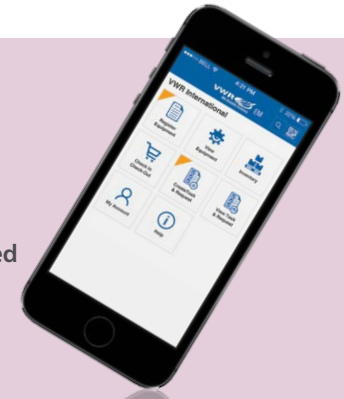
Hierarchical arrangement of equipment.

VWR® CATALYST
We Enable Science Through Services

Widget-based user-interface.

Cloud-based Services

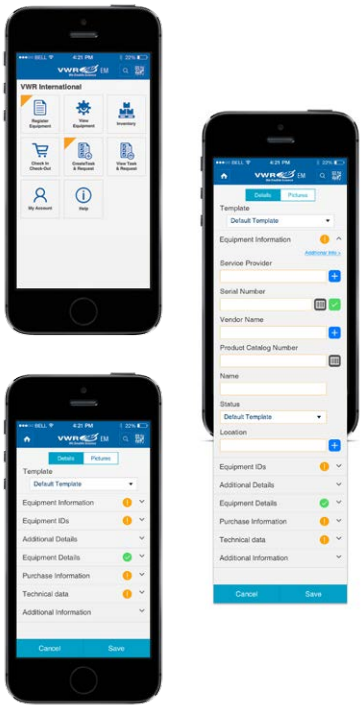
VEM delivers to the desktop. It is built using the latest and most powerful internet technologies to better support your requirements. VEM offers a modern **widget-based user-interface** that gives users access to all major functionality immediately.



Mobile Support

Extending VWR Equipment Management to mobile devices makes using the system even easier.

Registering new equipment (includes taking photos), inventory assessment, barcode scanning and creating service request directly at the equipment in the laboratory, are just a few of the many features.



Customizable to Your Needs...

A huge set of customisable features combined with numerous user-privileges will give you the right tools to address your needs.

You will benefit from one single cost effective solution to support your daily requirements, therefore minimizing training requirements.

Providing Personalized Support Based on Your Needs

At VWR, we believe that our key differentiator is our people who provide extensive process insight. Our team will work with you to get the Equipment Management process tailored to your needs. Our personalised approach allows us to provide support exactly where our customers need it the most... by providing onsite equipment management with a team of **VWR**CATALYST personnel.

Let us help you achieve your business goals through the experience we have built up through many years of complex system and process implementations. We can help you to implement and operate in the right way.

If you are interested, please contact your account manager or email **vwrcatalyst@vwr.com**. They will arrange an initial needs analysis for you.

We Enable Science Through Services

From research to production, **VWR**CATALYST can help you re-focus scientific time on initiatives that directly support the strategic mission of your company.

We Enable Science by:

- Powering productivity
- Improving quality, safety, and regulatory compliance
- Reducing total operating costs

Our services include:

- Procurement and Supply Management
- Laboratory and Production Support
- Scientific Support
- Equipment and Instrument Services
- Lean Six Sigma Process Consulting

VWR® CATALYST
We Enable Science Through Services

Laboratory Supplies Inventory Management and Software Powered by VSR+ Technology

- Gain complete visibility to all laboratory supplies and indirect materials
- Track your inventory across multiple locations
- Manage stock of any product from any supplier
- Streamline procurement, optimize inventory levels, and spend less time managing your supplies

VSR+ is a web-based warehouse and inventory management system that supports VWR products as well as third-party products from any vendor. VSR+ addresses daily situations such as low visibility of inventory, over or out-of-stock problems for critical products, time intensive ordering and replenishment of stock.

VSR+ features include:

- Barcode supported location management, goods receiving and picking system
- Suitable for VWR and non-VWR products
- Picking part pack quantities
- Billing part pack quantities (VWR products only)
- Automated order management with
  - » Re-order point mechanism
  - » Re-order quantities
  - » Automated order flows
- Standard reporting
  - » Consumption by cost center
  - » Historical by product
  - » Stock movements
  - » Inventory counts
  - » Stock value

Interfaces

VSR+ enables access to the entire list of products in your stockroom as well as to all products which are available to your organization on our website, vwr.com. A sophisticated search engine retrieves product details, real-time prices, etc. and lets you create a stockroom article, a direct order, or just browse for information.

Electronic replenishment orders utilize a live interface into VWR's ERP accompanied by order confirmations and dispatch advices received by VSR+.

Mobile Support

VSR+ supports a variety of the latest mobile scanning devices. Whatever the scale of your stockroom, a scanning solution from VWR will significantly improve your handling process. VWR offers scanning solutions using high-end mobile devices when real-time connection into the VSR+ database is required and when mobility, cost and size are factors.

Request or buy a product online or monitor and receive incoming shipments; just two of many features available from this high-end scanning solution. You can access and manage stock and transactions online as long as you have a 3G or WiFi connection.

Your Solution Starts Here

To get your solution underway, our team will work with you to document your business objectives and requirements. A needs analysis is then conducted to outline your current inventory management process, and we will develop our recommendations based on your objectives and requirements.

Following agreement on the new solution, our team will create a detailed project plan and coordinate the entire implementation from start to finish.

For more information, contact us at
1.888.793.2300 or **vwrcatalyst@vwr.com**.

vwr.com
1.800.932.5000

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