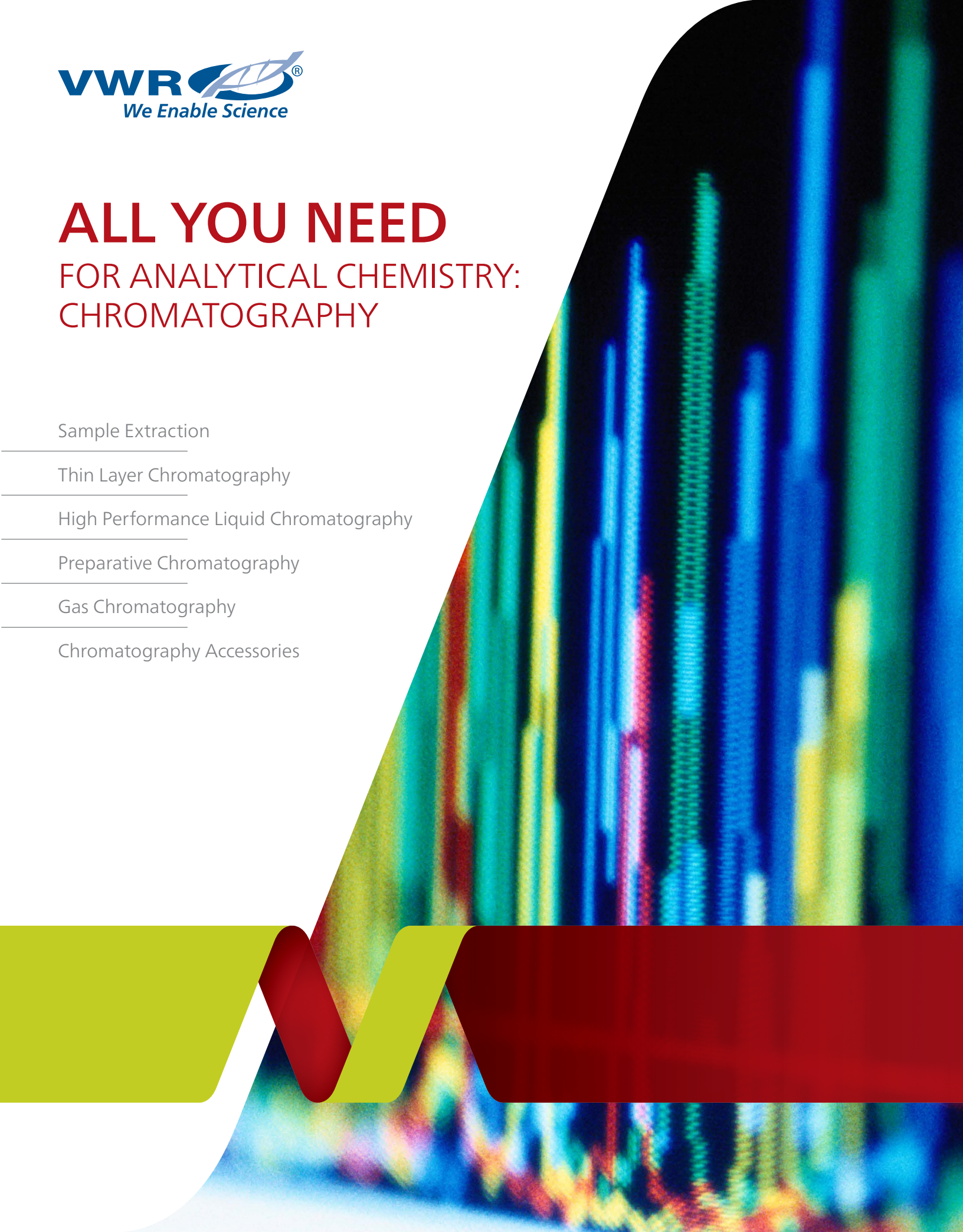
VWR®
We Enable Science

ALL YOU NEED
FOR ANALYTICAL CHEMISTRY: CHROMATOGRAPHY

- Sample Extraction
- Thin Layer Chromatography
- High Performance Liquid Chromatography
- Preparative Chromatography
- Gas Chromatography
- Chromatography Accessories



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How to Use this Catalog

The New VWR All You Need for Analytical Chemistry: Chromatography 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

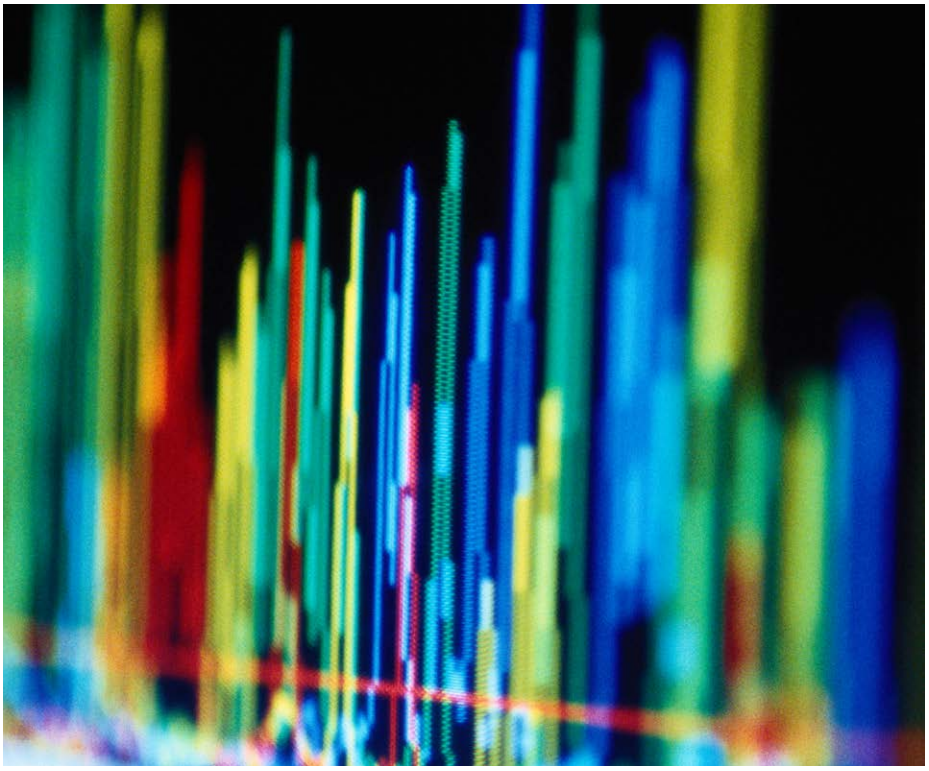
Sections are organized by analysis type for ease of navigation.

Page Headings

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

ALL YOU NEED
FOR ANALYTICAL CHEMISTRY: CHROMATOGRAPHY

VWR stands ready to fulfill your most demanding requirements for chromatography instruments, consumables, reagents, and services. From HPLC to GC, and from Flash to TLC, VWR has you covered with a comprehensive portfolio that includes systems, columns, bulk sorbents, vials, syringes, gas generators, and just about everything else you'd need to ensure that your chromatography needs are met on time, every time. VWR provides you with the products you're using, the products you'll need, from the suppliers you trust.



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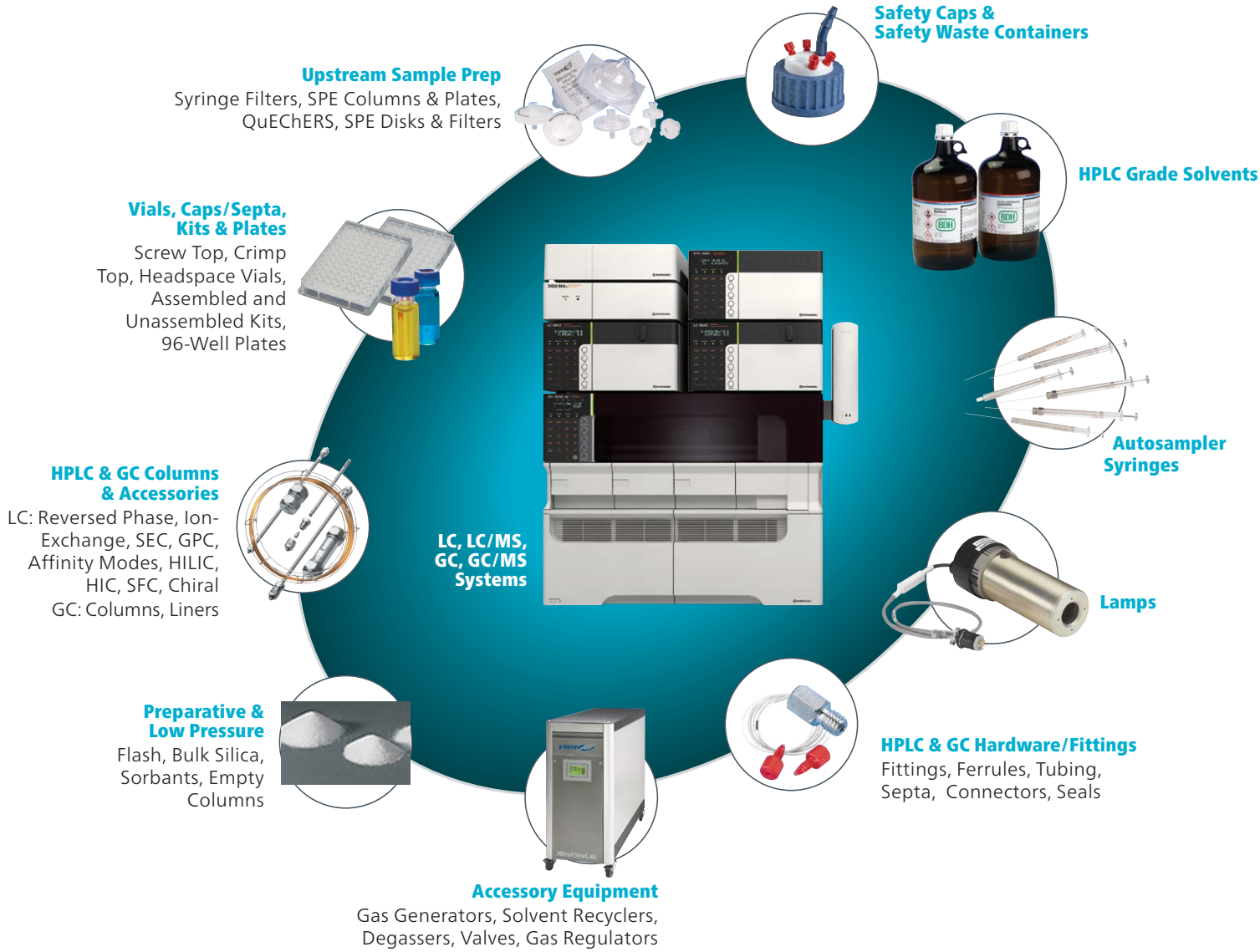
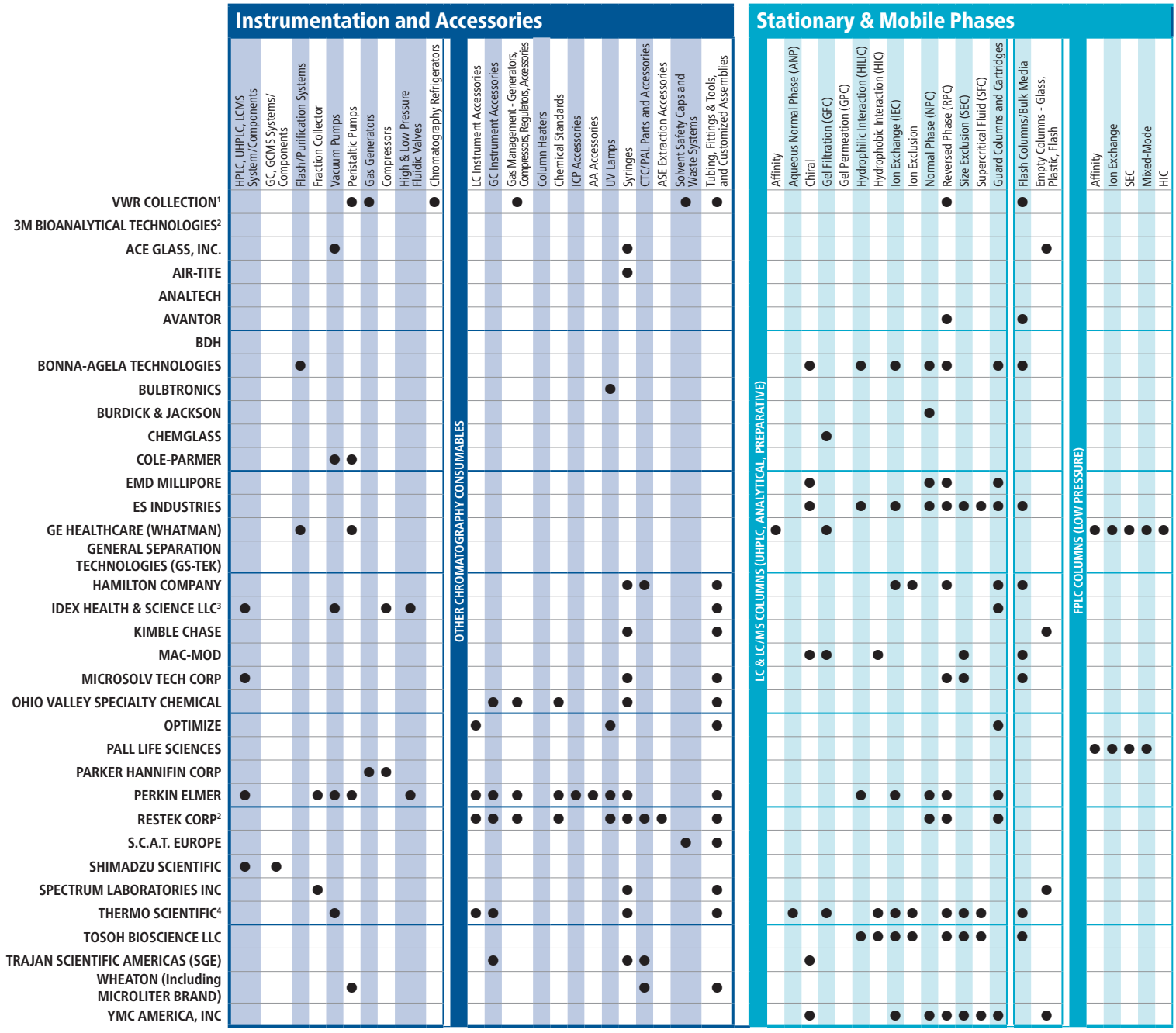
The VWR Chromatography Advantage

The products you're using, the products you'll need, the suppliers you trust!



VWR Chromatography Source Guide



[1] VWR Collection includes VWR Corporate Brand - Hichrom, ACE Equivalence™ [2]Not Available in Canada [3]Upchurch, Rheodyne, Systec, and Isolation Technologies Brands
[4]National Scientific, SUN SRi, EP Scientific, Nalge Nunc, and I-Chem Brands

Sample Preparation

Sample Handling

	GC COLUMNS		TLC		PURIFICATION BULK MEDIA						SOLVENTS			SOLID PHASE EXTRACTION (SPE COLUMNS)								FILTRATION						AUTOSAMPLER VIALS & CLOSURES										
	Capillary Columns	Packed Columns	TLC & HPTLC Plates	TLC Accessories	Conventional Silica (Irregular & Spherical)	Reversed Phase Media	Normal Phase Silica	Alumina	Ion Exchange Resin	HIC	CE and CE/MS Capillaries	HPLC Solvents	HPLC Acids & Salts	HPLC Premixed Mobile Phases	Solid Phase Extraction (SPE Columns)	Silica-based SPE Columns/ Cartridges	Polymer-Based SPE Columns/Cartridges	Specialty Phases	SPE 96 Well Plate Format	SPE Discs	QuEChERS	Micro Extraction	Filtration	In-line Filters	Syringe Filters	Syringeless Filter Vials	TFF	Membrane	Vials	Convenience Kits	LC/MS Certified Vials	Microsampling Vials	Headspace Vials	RSA Vials	TOC Vials	VOA Vials	Storage Vials	MicroPlate System & Mats	Vial Identification System	
VWR COLLECTION[1]					●																		●		●				●	●		●	●				●		
3M BIOANALYTICAL TECHNOLOGIES[2]																																							
ACE GLASS, INC.																													●				●						
AIR-TITE																																							
ANALTECH																																							
AVANTOR			●	●	●	●			●	●		●	●	●		●	●			●																		
BDH																																							
BONNA-AGELA TECHNOLOGIES			●		●	●	●	●	●			●				●	●	●	●		●				●				●										
BULBTRONICS																																							
BURDICK & JACKSON													●	●		●	●		●		●																		
CHEMGLASS																													●										
COLE-PARMER																																							
EMD MILLIPORE			●	●	●	●	●	●			●	●	●	●		●																						
ES INDUSTRIES																																							
GE HEALTHCARE (WHATMAN)				●																			●			●	●												
GENERAL SEPARATION TECHNOLOGIES (GS-TEK)																																							
HAMILTON COMPANY						●		●																●	●														
IDEX HEALTH & SCIENCE LLC[3]																																							
KIMBLE CHASE				●																									●			●				●			
MAC-MOD											●																												
MICROSOLV TECH CORP											●												●		●				●	●	●	●	●	●			●		
OHIO VALLEY SPECIALTY CHEMICAL																								●															
OPTIMIZE																																							
PALL LIFE SCIENCES																				●			●		●		●										●		
PARKER HANNIFIN CORP																																							
PERKIN ELMER																●							●		●				●		●	●							
RESTEK CORP[2]		●									●										●		●		●					●	●	●	●			●	●		
S.C.A.T. EUROPE																																							
SHIMADZU SCIENTIFIC																																							
SPECTRUM LABORATORIES INC																							●				●												
THERMO SCIENTIFIC[4]		●									●				●	●	●	●	●		●		●		●			●	●	●	●	●	●		●	●	●	●	
TOSOH BIOSCIENCE LLC																																							
TRAJAN SCIENTIFIC AMERICAS (SGE)																																							
WHEATON (Including MICROLITER BRAND)																									●				●	●		●					●		
YMC AMERICA, INC					●																																		

SAMPLE EXTRACTION

SPE CARTRIDGES & PLATES

SPE DISKS

QuEChERS

LiChrolut® Sample Preparation Unit, EMD Millipore

Use with LiChrolut® extraction columns (see **48219-231** series). Unit can run up to 12 SPE columns simultaneously with the liquid accelerated through use of a vacuum.

The optional drying unit fits on top of the sample preparation unit and directs an inert gas through each of the 12 positions to dry the column packing before eluting. Drying unit can also be used to evaporate or concentrate samples in collecting vials.

Description	Cat. No.
Sample Preparation Unit Only	**48219-224**
Drying Unit Only	**48219-226**

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

LiChrolut® Polypropylene Extraction Columns, EMD Millipore

For nonpolar extraction, choose RP-18, RP-18E (Endcapped), or CN (Cyano) columns. Typical sample matrix: aqueous buffer solution. Typical sample substances: aromatic ring systems and compounds with alkyl chains. Typical elution solvent: acetonitrile, methanol, and ethyl acetate. Endcapped cartridges have a bonded phase that is reacted with trimethylchlorosilane to cover silanols not previously reacted with the initial bonding reagent.

For polar extraction, choose CN (Cyano) or Si (Silica Gel) columns. Typical sample matrix: hexane, oils, and chlorinated hydrocarbons. Typical sample substances: hydroxyl groups, amines, and compounds with hetero-atoms (S, N, O). Typical elution solvent: methanol and 2-propanol.

For nonpolar extraction on a polymer phase, choose EN columns. Typical sample matrix: drinking water, ground water, surface water, and body fluids. Typical sample substances: polar contaminants, pesticides, phenols, explosives, anilines, and pharmaceuticals. Typical elution solvent: ethyl acetate, methanol, acetonitrile, and methanol (1:1).

For cation exchange extraction choose SCX (strong) columns. Typical sample matrix: methanolic/aqueous buffer with low ionic strength, 2 pH units under pK value of the sample substance. Typical sample substances: cations, amines, and pyrimidines. Typical elution solvent: aqueous buffer of high ionic strength (0.1mol/L), 2 pH units over pK value of the sample substance.

For mixed mode extraction, choose TSC columns. Typical sample matrix: body fluids. Typical sample substances: cationic and neutral analytes. Typical elution solvent: chloroform-acetone, NH3-ethyl-acetate, and NH3-methanol.

Phase	Capacity	Particle Size	Bed Weight	Cat. No.
Cyano	3 mL	40–63 µm	200 mg	**48219-200**
TSC (Tox Screening Cation)	3 mL	40–63 µm	300 mg	**48219-204**
RP-18E	3 mL	40–63 µm	200 mg	**48219-216**
RP-18E	3 mL	40–63 µm	500 mg	**48219-220**
RP-18	1 mL	40–63 µm	100 mg	**48219-231**
EN	3 mL	40–120 µm	200 mg	**48219-232**
RP-18	3 mL	40–63 µm	200 mg	**48219-234**
SCX (Strong Cation Exchange)	3 mL	40–63 µm	200 mg	**48219-236**
Si (Silica Gel)	3 mL	40–63 µm	200 mg	**48219-240**
SCX (Strong Cation Exchange)	3 mL	40–63 µm	500 mg	**48219-242**
RP-18	3 mL	40–63 µm	500 mg	**48219-244**
Si (Silica Gel)	3 mL	40–63 µm	500 mg	**48219-246**

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

Thermo Scientific SOLA SPE Cartridges, Thermo Scientific

Thermo Scientific™ SOLA™ cartridges provide clean, highly reproducible sample extracts with lower elution volumes due to the unique and innovative frit-less SPE design.

Phase	Capacity	Bed Weight	Cat. No.
HRP	1 mL	10 mg	**10038-916**
SCX	1 mL	10 mg	**10038-918**
SAX	1 mL	10 mg	**10038-920**
WCX	1 mL	10 mg	**10038-922**
WAX	1 mL	10 mg	**10038-924**

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

Thermo Scientific SOLA SPE Plates, Thermo Scientific

Thermo Scientific™ SOLA™ plates provide clean, highly reproducible sample extracts with lower elution volumes due to the unique and innovative frit-less SPE design.

Phase	Capacity	Cat. No.
HRP	2 mL	**10038-926**
SCX	2 mL	**10038-928**
SAX	2 mL	**10038-930**
WCX	2 mL	**10038-932**
WAX	2 mL	**10038-934**

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

Empore® Extraction Disks, 3M™

Ideal for achieving faster extractions with lower solvent usage and better sample concentrations. Disks eliminate emulsion formation and provide excellent reproducibility. Can be used for extracting semi-volatile organics, polar compounds, ionic compounds, explosives, and pesticides.

Disks are thin, particle-loaded membranes, with the particles embedded in a stable, inert matrix of PTFE fibrils.

Approved for use with numerous EPA methods, including 525.2 and 1664 for oil and grease detection.

Description	Phase	Length	Cat. No.
Oil and Grease Disks	C18 (ODS or Octadecyl)	47 mm	**55004-053**
Oil and Grease Disks	C18 (ODS or Octadecyl)	90 mm	**55004-054**
Anion-SR Disks	SDB-NH4+	47 mm	**55004-074**
Disks with Sulfonic Acid Functionality	SDB-RPS	47 mm	**55004-080**
Disks	SDB-XC	90 mm	**55004-084**
Disks	SDB-XC	47 mm	**55004-086**
Disks	C18 (ODS or Octadecyl)	90 mm	**55004-096**
Disks	C18 (ODS or Octadecyl)	47 mm	**55004-098**
Disks	Octyl (C8)	47 mm	**55004-104**

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

Q-sep® QuEChERS dSPE Tubes for Extract Cleanup, Restek

- Ready-to-use tubes, no glassware required.
- Preweighed, ultra-pure sorbents.
- Support original unbuffered, AOAC (2007.01), European (EN 15662), and mini-multiresidue QuEChERS methods.

QuEChERS methods are fast, easy, and cost-effective, and Restek Q-sep® products make QuEChERS procedures even simpler. All extraction salts, sorbents, and sample tubes are included—no specialized equipment or glassware is required. Prepare samples more efficiently with a complete line of QuEChERS supplies from Restek.

Multiple sorbents are used to extract different types of interferences.

$MgSO_4$—removes excess water

PSA—removes sugars, fatty acids, organic acids, and anthocyanine pigments

C18—removes nonpolar interferences

GCB—removes pigments, sterols, and nonpolar interferences

Material	Details	Volume	Type	Cat. No.
1,200 mg $MgSO_4$, 400 mg PSA	15 mL Centrifuge Tubes Prefilled with dSPE Materials for Cleanup (6 mL and 8 mL Extract)	15 mL	SPE Accessory	**10015-310**
1,200 mg $MgSO_4$, 400 mg PSA, 400 mg C18	15 mL Centrifuge Tubes Prefilled with dSPE Materials for Cleanup (6 mL and 8 mL Extract)	15 mL	SPE Accessory	**10015-320**
150 mg $MgSO_4$, 50 mg C18	2 mL Micro-Centrifuge Tubes Prefilled with dSPE Materials for Cleanup (1 mL Extract)	2 mL	SPE Accessory	**10015-340**
900 mg $MgSO_4$, 300 mg PSA, 300 mg C18, 45 mg GCB	15 mL Centrifuge Tubes Prefilled with dSPE Materials for Cleanup (6 mL and 8 mL Extract)	15 mL	SPE Accessory	**10015-342**
1,200 mg $MgSO_4$, 400 mg PSA, 400 mg C18, 400 mg GCB	15 mL Centrifuge Tubes Prefilled with dSPE Materials for Cleanup (6 mL and 8 mL Extract)	15 mL	SPE Accessory	**10057-972**
900 mg $MgSO_4$, 150 mg PSA	15 mL Centrifuge Tubes Prefilled with dSPE Materials for Cleanup (6 mL and 8 mL Extract)	15 mL	SPE Accessory	**10057-974**
900 mg $MgSO_4$, 150 mg PSA, 45 mg GCB	15 mL Centrifuge Tubes Prefilled with dSPE Materials for Cleanup (6 mL and 8 mL Extract)	15 mL	SPE Accessory	**10057-976**
900 mg $MgSO_4$, 150 mg PSA, 150 mg C18	15 mL Centrifuge Tubes Prefilled with dSPE Materials for Cleanup (6 mL and 8 mL Extract)	15 mL	SPE Accessory	**10057-978**
1,200 mg $MgSO_4$, 400 mg C18	15 mL Centrifuge Tubes Prefilled with dSPE Materials for Cleanup (6 mL and 8 mL Extract)	15 mL	SPE Accessory	**10057-984**
150 mg $MgSO_4$, 25 mg PSA	2 mL Micro-Centrifuge Tubes Prefilled with dSPE Materials for Cleanup (1 mL Extract)	2 mL	SPE Accessory	**10059-524**
150 mg $MgSO_4$, 25 mg PSA, 25 mg C18	2 mL Micro-Centrifuge Tubes Prefilled with dSPE Materials for Cleanup (1 mL Extract)	2 mL	SPE Accessory	**10059-526**
150 mg $MgSO_4$, 25 mg PSA, 2.5 mg GCB	2 mL Micro-Centrifuge Tubes Prefilled with dSPE Materials for Cleanup (1 mL Extract)	2 mL	SPE Accessory	**10059-528**
150 mg $MgSO_4$, 25 mg PSA, 7.5 mg GCB	2 mL Micro-Centrifuge Tubes Prefilled with dSPE Materials for Cleanup (1 mL Extract)	2 mL	SPE Accessory	**10059-530**
150 mg $MgSO_4$, 50 mg PSA, 50 mg C18, 50 mg GCB	2 mL Micro-Centrifuge Tubes Prefilled with dSPE Materials for Cleanup (1 mL Extract)	2 mL	SPE Accessory	**10059-532**
150 mg $MgSO_4$, 50 mg PSA, 50 mg C18, 7.5 mg GCB	2 mL Micro-Centrifuge Tubes Prefilled with dSPE Materials for Cleanup (1 mL Extract)	2 mL	SPE Accessory	**10803-400**
900 mg $MgSO_4$, 150 mg PSA, 15 mg GCB	15 mL Centrifuge Tubes Prefilled with dSPE Materials for Cleanup (6 mL and 8 mL Extract)	15 mL	SPE Accessory	**89207-066**

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Q-sep® 3000 Centrifuge for QuEChERS, Restek

Priced to fit your laboratory's budget, the Q-sep® 3000 centrifuge is the first centrifuge specifically designed for QuEChERS methodology. This compact, quiet, yet powerful unit spins at the 3,000 g force required by the European method.

Centrifuge includes 50 mL tube carriers (six), 50 mL conical tube inserts (six), 4-place 15 mL tube carriers (six), and 2 mL tube adaptors (24).

Voltage	Cat. No.
110V	**10015-326**
220V	**10015-328**

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HyperSep Dispersive SPE Clean-Up Products, Thermo Scientific

Convenient and effective approach for determining pesticide residues in fruit, vegetables and other foods.

Format	Sorbent	Volume	Cat. No.
Cartridge	400mg PSA on bottom, 200mg Carbon on top	6 mL	**10047-082**
Cartridge	500mg PSA on bottom, 250mg Carbon on top	6 mL	**10047-084**
Cartridge	500mg PSA on bottom, 500mg Carbon on top	6 mL	**10047-086**
Cartridge	150mg MgSO4, 50mg PSA, 50mg Carbon	6 mL	**10047-088**
Cartridge	900mg Anhydrous MgSO4, 300mg PSA	6 mL	**10047-090**
Tube	150mg MgSO4, 50mg PSA & 50mg Carbon	2 mL	**10047-072**
Tube	150mg MgSO4, 50mg PSA	2 mL	**10047-074**
Tube	150mg MgSO4, 50mg PSA & 50mg C18	2 mL	**10047-076**
Tube	900mg MgSO4, 300mg PSA & 150mg Carbon	15 mL	**10047-078**
Tube	900mg MgSO4, 300mg PSA & 150mg C18	15 mL	**10047-080**
Tube	900mg Anhydrous MgSO4, 150mg PSA	15 mL	**10047-092**
Tube	900mg MgSO4, 150mg PSA & 45mg Carbon	15 mL	**10047-094**
Tube	900mg MgSO4, 150mg PSA & 15mg Carbon	15 mL	**10047-096**
Tube	150mg MgSO4, 25mg PSA	2 mL	**10047-098**
Tube	150mg MgSO4, 25mg PSA & 25mg C18	2 mL	**10047-100**
Tube	150mg MgSO4, 25mg PSA & 2.5mg Carbon	2 mL	**10047-102**
Tube	150mg MgSO4, 25mg PSA & 7.5mg Carbon	2 mL	**10047-104**
Tube	150mg MgSO4, 50mg PSA, 50mg C18 & 50mg Carbon	2 mL	**10047-106**
Tube	1200mg MgSO4, 400mg PSA	15 mL	**10047-108**
Tube	1200mg MgSO4, 400mg PSA & 400mg C18	15 mL	**10047-110**
Tube	1200mg MgSO4, 400mg PSA, 400mg C18 & 400mg Carbon	15 mL	**10047-112**
Tube	900mg MgSO4, 150mg PSA & 150mg C18	15 mL	**10047-980**
Tube	150mg MgSO4, 50mg PSA & 50mg Carbon	15 mL	**10047-982**
Tube	150mg MgSO4, 300mg PSA & 150mg Chlorofiltr	15 mL	**10047-990**
Tube	1200mg MgSO4, 900mg PSA	15 mL	**10047-992**
Tube	150mg Anhydrous MgSO4, 50mg PSA	2 mL	**10047-994**
Tube	900mg Anhydrous MgSO4, 300mg PSA & 150mg Carbon	15 mL	**10047-998**
Tube	900mg Anhydrous MgSO4, 300mg PSA & 150mg C18	15 mL	**10048-000**
Tube	150mg MgSO4, 50mg PSA, 50mg Carbon	15 mL	**10048-010**
Tube	900mg Anhydrous MgSO4, 150mg PSA	15 mL	**10048-012**
Tube	900mg MgSO4, 150mg PSA & 45mg Carbon	15 mL	**10048-016**
Tube	900mg MgSO4, 150mg PSA & 15mg Carbon	15 mL	**10048-018**
Tube	150mg MgSO4, 25mg PSA	2 mL	**10048-020**
Tube	150mg MgSO4, 25mg PSA & 25mg C18	2 mL	**10048-022**
Tube	150mg MgSO4, 25mg PSA & 7.5mg Carbon	2 mL	**10048-024**
Tube	900mg MgSO4, 150mg PSA & 150mg C18	15 mL	**10048-026**

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THIN LAYER CHROMATOGRAPHY

TLC

HPTLC

TLC Silica Gel 60 Plates And Sheets, EMD Millipore

TLC plates are combination of Millipore silica gel 60 and a unique polymeric binder resulting in adherent and hard surface.

The resultant surface will not crack or blister and even allow writing with a pencil on the surface without risk to damage the layer.

Fluorescent Indicator	Layer Thickness	No. of Plates	Plate Size	Pore Size	Coating Material	Wettable	Cat. No.
F254	200 µm	100	50 x 200 mm	60 Å	Silica Gel	No	**EM1.05534.0001**
—	200 µm	25	200 x 200 mm	60 Å	Silica Gel	No	**EM1.05553.0001**
F254	200 µm	25	200 x 200 mm	60 Å	Silica Gel	No	**EM1.05554.0001**
F254	70 - 110 µm	25	200 x 200 mm	—	PEI Modified Cellulose	No	**EM1.05579.0001**
F254	250 µm	100	50 x 200 mm	60 Å	Silica Gel	No	**EM1.05714.0001**
F254	250 µm	25	200 x 200 mm	60 Å	Silica Gel	No	**EM1.05715.0001**
F254	250 µm	200	50 x 100 mm	60 Å	Silica Gel	No	**EM1.05719.0001**
—	250 µm	25	200 x 200 mm	60 Å	Silica Gel	No	**EM1.05721.0001**
F254	250 µm	50	100 x 200 mm	60 Å	Silica Gel	No	**EM1.05729.0001**
F254	200 µm	25	200 x 200 mm	60 Å	Silica Gel	No	**EM1.05735.0001**
F254	250 µm	100	25 x 75 mm	60 Å	Silica Gel	No	**EM1.15327.0001**
F254	250 µm	500	25 x 75 mm	60 Å	Silica Gel	No	**EM1.15341.0001**

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TLC Plates, Silica Gel 60 F254 Coated, EMD Millipore

These TLC Plates are coated in TLC silica gel 60 F254. They are glass-backed and cover almost every type of separation when combined with a suitable mobile phase.

EMD # 1.05794.0001 replaces and is identical to EMD # 15341-1.

Fluorescent Indicator	Layer Thickness	No. of Plates	Plate Size	Pore Size	Coating Material	Cat. No.
F254	250 µm	100	25 x 75 mm	60Å	Silica Gel	**EM1.05794.0001**

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

PLC Plates, EMD Millipore

PLC plates allow users to separate samples that vary greatly in size - from grams down to milligrams. Available with or without a fluorescence indicator, PLC plates has 0.5 mm thickness. They also use the same proven EMD Millipore silica-binder technology as in analytical TLC plates. To isolate the substance by extraction, users can simply scrape the spot from the layer.

Fluorescent Indicator	Layer Thickness	No. of Plates	Plate Size	Pore Size	Coating Material	Cat. No.
F254	1500 µm	12	200 x 200 mm	60 Å	Aluminium Oxide (Alox)	**EM1.05788.0001**
F254	1500 µm	12	200 x 200 mm	150 Å	Aluminium Oxide (Alox)	**EM1.05726.0001**
—	500 µm	20	200 x 200 mm	60 Å	Silica Gel	**EM1.13894.0001**
—	2000 µm	12	200 x 200 mm	60 Å	Silica Gel	**EM1.05745.0001**
F254	500 µm	20	200 x 200 mm	60 Å	Silica Gel	**EM1.05744.0001**
F254	1000 µm	15	200 x 200 mm	60 Å	Silica Gel	**EM1.13895.0001**
F254	2000 µm	12	200 x 200 mm	60 Å	Silica Gel	**EM1.05717.0001**
F254+366	2000 µm	12	200 x 200 mm	60 Å	Silica Gel	**EM1.05637.0001**
F254	1000 µm	15	200 x 200 mm	60 Å	RP-18 (C18) Modified Silica Gel	**EM1.05434.0001**

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

Thin Layer Plates And Sheets, LiChrospher® Silica Gel 60, EMD Millipore

Unique HPTLC Lichrospher® plates are the first thin layer chromatography plates based on spherical silica particles. They offer the ultimate in thin layer chromatography performance and speed enabling high throughput analysis of complex samples.

F254: Fluorescent Indicator

F254s: Acid Stable Fluorescent Indicator

Fluorescent Indicator	Layer Thickness	No. of Plates	Plate Size	Pore Size	Coating Material	Wettable	Cat. No.
F254s	200 µm	25	200 x 200 mm	60 Å	RP-18 (C18) Modified Silica Gel	No	**EM1.05586.0001**
F254	200 µm	25	200 x 100 mm	60 Å	Silica Gel	No	**EM1.15445.0001**
F254s	200 µm	25	200 x 100 mm	60 Å	RP-18 (C18) Modified Silica Gel	Yes	**EM1.05646.0001**
F254s	200 µm	25	200 x 100 mm	60 Å	Silica Gel	Yes	**EM1.05647.0001**

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

HPTLC Silica Gel 60 Plates And Sheets, EMD Millipore

HPTLC plates deliver fast and quantitative analysis of complex samples for manual or automated use.

EMD Millipore's HPTLC silica plates work three times faster than conventional TLC plates - and they're more sensitive. The particle sizes range in HPTLC is between 4-8 µm, which creates a smoother surface and a higher separation power than TLC plates.

Fluorescent Indicator	Layer Thickness	No. of Plates	Plate Size	Pore Size	Concentrating Zone	Coating Material	Wettable	Scoring	Cat. No.
—	200 µm	25	200 x 200 mm	60 Å	—	Silica Gel	No	Unscored	**EM1.05547.0001**
F254	200 µm	25	50 x 100 mm	60 Å	—	Silica Gel	No	Unscored	**EM1.05616.0001**
F254	200 µm	25	100 x 100 mm	60 Å	—	Silica Gel	No	Unscored	**EM1.05628.0001**
F254	200 µm	100	100 x 100 mm	60 Å	—	Silica Gel	No	Unscored	**EM1.05629.0001**
—	200 µm	25	100 x 100 mm	60 Å	—	Silica Gel	No	Unscored	**EM1.05631.0001**
—	200 µm	100	100 x 100 mm	60 Å	—	Silica Gel	No	Unscored	**EM1.05633.0001**
—	200 µm	50	200 x 100 mm	60 Å	—	Silica Gel	No	Unscored	**EM1.05641.0001**
F254	200 µm	50	200 x 100 mm	60 Å	—	Silica Gel	No	Unscored	**EM1.05642.0001**
—	200 µm	100	50 x 50 mm	60 Å	—	Silica Gel	No	Prescored to 50 x 50 mm	**EM1.05644.0001**
—	200 µm	50	200 x 100 mm	60 Å	25 x 200 mm	Silica Gel	No	Unscored	**EM1.13749.0001**
F254s	200 µm	25	200 x 100 mm	60 Å	—	Silica Gel	Yes	Unscored	**EM1.15552.0001**
F254s	200 µm	25	200 x 100 mm	60 Å	—	Silica Gel	No	Unscored	**EM1.15696.0001**

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

KONTES® TLC Cylindrical Developing Tanks, Kimble Chase

Cylindrical glass tanks for the development of 1 x 3" to 10 x 20cm plates. These tanks provide maximum vapor phase saturation with a minimum amount of solvent.

Description	For Plate Size	Cat. No.
Tank with Glass Lid	10 x 20 cm	**KT416170-1020**
Tank with Polyethylene Lid	1 x 3"	**KT416170-1118**
Tank with Polyethylene Lid	1 x 3"	**KT416170-1119**
Tank with Polyethylene Lid	5 x 10 cm	**KT416170-1120**
Tank with Polyethylene Lid	5 x 10 cm	**KT416170-1121**

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

KONTES® TLC Rectangular Developing Tanks, Kimble Chase

Sturdy molded glass developing tanks feature clear sides to allow unobstructed visual inspection of TLC plates up to 20 x 20cm ($7^{7}/_{8}$ x $7^{7}/_{8}$") in size. Edges are beveled to eliminate sharp edges. Tanks also have a ground bottom and top for a level surface. A raised edge along the inside bottom allows the simultaneous development of two 20 x 20cm ($7^{7}/_{8}$ x $7^{7}/_{8}$") or four 5 x 20cm (2 x $7^{7}/_{8}$") plates.

Tanks are available with a standard, nonslip, or latch style lid. The nonslip lid has a knob for easy lifting, and PTFE retainers inside prevent the lid from sliding off the tank. The latch lid holds lid firmly to the tank, creating a stable environment for developing TLC plates. The latch lid also has a knob for easy lifting and PTFE retainers inside.

Nonslip and latch tank lids are available with holes drilled for #0 rubber stoppers to facilitate the addition of reagents with minimal disruption to the environment of developing plates.

Interior dimensions WxDxH (mm)	27W x 7D x 25H cm ($10^{5}/_{8}$ x $2^{3}/_{4}$ x $9^{7}/_{8}$")
Weight with Lid	5.4 kg (11.9 lbs.)

Description	Cat. No.
Developing Tank with Standard Lid	**KT416180-0000**
Developing Tank with Nonslip Lid	**KT416185-0000**
Developing Tank with Latch Lid	**KT416190-0000**

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

TLC Sprayers and Components, EMD Millipore

Description	Details	Cat. No.
TLC Sprayer	1 Sprayer	**EM1.08540.0001**
UV Lamp for TLC	1 Lamp, 254 nm	**EM1.12537.0001**

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

TLC Reagent Sprayers, Kimble Chase

These reagent sprayers have a screw thread joint for connecting the sprayer head to the flask. The joint features a connecting cap and loosening ring for easy disconnecting in the event of reagent crystallization or residue formation. These sprayers will operate on as little as 1 psi air pressure, with optimal results at 3 to 5 psi. Sprayers are manufactured from 33 expansion, low extractable borosilicate glass, conforming to USP Type I and ASTM E438, Type I, Class A requirements.

[ST] Joint No.	Capacity	Dia. x H	Cat. No.
19/22	10 mL	22 x 155 mm	**KT422530-0010**
19/22	25 mL	40 x 147 mm	**KT422530-0025**
19/22	50 mL	50 x 174 mm	**KT422530-0050**
24/40	125 mL	65 x 204 mm	**KT422530-0125**
24/40	250 mL	85 x 229 mm	**KT422530-0250**
24/40	500 mL	105 x 273 mm	**KT422530-0500**

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

Molybdatophosphoric Acid Spray Solution for Thin-layer Chromatography

Solubility ..... (20 °C) soluble
Melting Point ..... -89 °C
Boiling Point ..... 82 °C
Flash Point ..... 17 °C (2-Propanol)
Explosion Limit ..... 2 - 13.4 %(V) (2-Propanol)
Density ..... 0.84 g/cm3 (25 °C)
Ignition Point ..... 425 °C (2-Propanol)
Hazard Class 3
Hazard Class Description ..... Flammable Liquid

Size	Packaging	Cat. No.
100 mL	Glass Bottle	**EM1.00480.0100**

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

Dragendorff's Reagent Spray Solution for Thin-layer Chromatography

Boiling Point ..... 77 °C
Density ..... 0.95 g/cm3 (20 °C)
Hazard Class 3
Hazard Class Description ..... Flammable Liquid

Size	Packaging	Cat. No.
100 mL	Glass Bottle	**EM1.02035.0100**

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

Ninhydrin Spray Solution for Thin-layer Chromatography

Solubility ..... (20 °C) soluble
Melting Point ..... -89.5 °C (2-Propanol)
Boiling Point ..... 82.4 °C (1013 hPa) (2-Propanol)
Vapor Pressure ..... 42.4 hPa (20 °C)
Flash Point ..... 12 °C (2-Propanol)
Explosion Limit ..... 2 - 13.4 %(V) (2-Propanol)
Ignition Point ..... 425 °C (2-Propanol)
Hazard Class 3
Hazard Class Description ..... Flammable Liquid

Size	Packaging	Cat. No.
100 mL	Glass Bottle	**EM1.06705.0100**

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

HPLC

Shimadzu Nexera X2 Series HPLC/UHPLC, Shimadzu

Shimadzu's Nexera X2 Series delivers superior, real-world performance across a wider application range while delivering unparalleled flexibility and reliability in HPLC/UHPLC analyses. The Nexera X2 is optimized to enable analysis at pressures up to 19,000 psi without compromising performance and data quality. Nexera X2 autosamplers provide near-zero carryover, support ultrafast analysis with the world's fastest cycle time (14 secs) and deliver excellent injection reproducibility down to 0.1 µL injection volumes. In addition, the Nexera X2 systems can be configured with a variety of solvent delivery units and column ovens to meet any laboratory workflow.

Key features include ultrahigh-throughput and clean autosampler–perfect front-end systems for all LCMS platforms, automated solvent blending and method scouting–ideal for method development, new PDA detector–offers superior sensitivity and resolution, achieving a 0.4 × 10-5 AU noise level for genuine UHPLC analysis, intelligent peak deconvolution analysis (i-PDeA) function–unique software solution to separate and accurately integrate co-eluting peaks and intelligent dynamic range extension calculator (i-DReC), which extends the dynamic range so low concentration (trace or impurity compounds) and very high concentration samples can be accurately analyzed in a single injection.

UL Listed and CSA Listed.

Ordering Information: To order, contact your VWR Sales Representative.

Description	Cat. No.
Block heater for 5 cm column, installed on the SIL-30ACMP	**10122-340**
LPGE valve for the LC-30AD pump with 180uL mixer included	**10122-342**
LPGE valve only for the LC-30AD pump. Select the appropriate mixer based on the solvent and detector type	**10122-344**
High pressure (18,000 psi) 6-position column switching valve	**10122-346**
High pressure (18,000 psi) 2-position flow switching valve	**10122-416**
2-position solvent selection valve that mounts inside the LC-30AD pump	**10122-418**
Binary inlet mixer ideal for LMCS applications with no UV detector	**10122-420**
Binary inlet mixer, for UV applications with no mobile phase modifiers	**10122-422**
Binary inlet mixer, for UV applications with formic or acetic acid modifiers	**10122-424**
Single inlet mixer for LPGE applications, PDA detectors, and mobile phases containing TFA	**10122-426**
18,000 psi, 4-40C temp controlled autosampler with 7 sec injection, 11 sec cycle time for high throughput	**10122-428**
18,000 psi, 4-40C temp controlled autosampler with dilution, reagent addition, and mixing capabilities	**10122-518**
Block heating to 150C. 15 cm max column length, dual preheater and switching valve available	**10122-520**

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

Shimadzu Prominence HPLC/UFLC/UFLCXR, Shimadzu

The modular Prominence HPLC series delivers even more accurate and reproducible data while maintaining the flexibility for which Shimadzu HPLC instrumentation is known. The modular components interact with the precision of an integrated system while allowing innumerable configurations–letting you design the system that best fits your needs.

Capable of system pressures in excess of 9500 psi (66MPa), and accompanied by the XR lineup of columns that features a choice of seven bonded phases, the Prominence UFLCXR delivers powerful high-pressure analysis–without sacrificing performance, reliability, or ruggedness. Utilizing standard components, Prominence UFLC raises total system productivity by generating high-quality, reproducible data without compromise.

Key components include SIL-20A/AC autosamplers, which deliver virtually zero carryover and a cycle time of just 10 seconds, LC-20AD/AB/AT Pumps, which provide unmatched gradient speed and precision, CBM-20A/Alite–The world's first web-based controller, the CBM enables users to setup, control, and monitor their HPLC remotely; the speed of these controllers makes them ideal for ultrafast LC, SPD-20A/AV/M20A UV/PDA Detectors, which ensure fast sampling with exceptional sensitivity and stability, RF-20A/Axs Fluorescence Detectors–The highest sensitivity levels, to meet the demanding analysis requirements of trace-level components while retaining the acquisition speeds necessary for ultrafast analysis; other detector options include ELSD, RID, and CDD.

UL Listed and CSA Listed.

Ordering Information: To order, contact your VWR Sales Representative.

Description	Cat. No.
2-Solvent selection valve for LC-20AP	**10122-338**
Compact column holder for a single prep column and 1 switching valve	**10122-348**
4-position valve that functions as a solvent selector or gradient former for the LC-20AP	**10122-360**
Inert PEEK 2-position valve for flow switching between 2 columns or 2 detectors.	**10122-452**
6-position valve for selecting from up to 6 columns	**10122-454**
Inert PEEK 6-position valve for selecting from up to 6 columns	**10122-456**
2-position valve for column/detector switching with front panel control.	**10122-458**
7-port, 6-position solvent selection valve for AT and AD pumps.	**10122-460**
4-position valve that functions as a solvent selector or gradient former. Installed in LC-20AD or LC-20AT	**10122-468**
Semi-prep pump, max flow rate is 20 mL/min	**10122-478**
Biocompatible version of the LC-10ATvp pump, max flow rate is 9.999 mL/min	**10122-488**
Stainless steel variable volume mixer, 0.5, 1.7, or 2.6 mL	**10122-492**
Stand and collecting funnels for fractions up to 1000 mL	**10122-500**
Micro flow pump 1 nL to 5 µL	**10122-502**
Standard autosampler for ambient samples. Rack options for 1 mL, 2 mL, 4 mL vials and MTP. 6000 psi	**10122-504**
Standard autosampler with 4-40C temp control. Rack options for 1 mL, 2 mL, 4 mL vials and MTP. 6000 psi	**10122-506**

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Description	Cat. No.
9,600 psi, 4-40C temp control, high-speed, low carryover autosampler	**10122-508**
High pressure pump (9500 psi) with 10 µL plungers. LPGE capable	**10122-510**
Preparative pump with max flow rate 150 mL/min. LPGE capable	**10122-516**

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

VWR® Self-Contained Nitrogen Generator

VWR COLLECTION

Self-contained membrane nitrogen generator produces LC/MS grade nitrogen with a maximum output pressure of 116psig and maximum flow capacity of 30L/min.

The membrane will not suppress corona needle discharge, unlike PSA and Hosmer technologies. Additional applications include nebulizer gases, chemical and solvent evaporation, instrument supply and purge, evaporative light scattering equipment, and sparging. Also ideal for derivatives of ESi and APCi modes.

Ambient air is filtered using an inlet suction breather filter. The purified air is delivered to a long-life low pressure air compressor, which provides an air stream to hollow fiber membranes. These membranes separate the clean air into a concentrated nitrogen retentate and oxygen-enriched permeate. Prior to exiting the system, pure nitrogen retentate is delivered to a nitrogen amplification compressor to assure proper pressure, flow, and purity to the LC/MS system.

Dimensions	70.1H x 31W x 90D cm (27 1/2 x 12 1/4 x 35 7/16")
Weight	92.5 kg (204 lbs.)

Description	Cat. No.
VWR® Self-Contained Nitrogen Generator	**97021-300**

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

VWR® Solvent Waste System

VWR COLLECTION

This solvent waste system is designed to be an affordable solution for HPLC liquid waste disposal. Each system is manufactured to safely collect waste from two HPLC machines.

This system features an activated carbon filter which traps volatile organic compounds from being released into the air. This prevents chemicals from being inhaled by lab workers and provides an easy mechanism of disposal for vapor wastes. The solvent waste system also features a closed loop design which protects against leaks and spills, improving overall lab safety.

Ordering Information: Each system includes a 4L, 5L, 10L, or 20L HDPE carboy, two 83B Versatile Caps (one open top for waste collection and one closed top for safe transport), six ports for 3.2mm (1/8") O.D. waste tubes, one port for a carbon exhaust filter, one carbon exhaust filter and plugs for unused ports. Replacement fittings and carbon exhaust filters are also available.

Description	Material	Capacity	Cap Size	Cat. No.
VWR® Solvent Waste Bottle Kit, 4L Bundle	HDPE	4 L (1.05 gal.)	80 mm	**10124-044**
VWR® Solvent Waste Carboy Kit, 5L Bundle	HDPE	5 L (1.32 gal.)	80 mm	**10124-342**
VWR® Solvent Waste Carboy Kit, 10L Bundle	HDPE	10 L (2.64 gal.)	80 mm	**10124-040**
VWR® Solvent Waste Carboy Kit, 20L Bundle	HDPE	20 L (5.28 gal.)	80 mm	**10124-042**

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

HPLC Safety Set, S.C.A.T.

This HPLC safety set can be used with any HPLC system. This set manages solvent supply and waste.

SafetyCap with air valve blocks solvent vapors, avoids underpressure, catches dust, keeps solvents clean and protects the user. SafetyWasteCap with exhaust filter blocks solvent vapors, avoids overpressure and protects the user. An indicator shows the filter status.

Description	Size	Cat. No.
HPLC Safety Set for Solvent Supply and Waste	Full Set	**10117-458**

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

SafetySet, S.C.A.T.

Solvent Safety Cap set is suitable for use with all current HPLC systems. Set comes with 4 Safety Caps and all required connectors. Unused connectors can be closed by the blind screw delivered with the set. This makes the system universally applicable, even when less connectors are needed for a time.

Description	Cat. No.
SafetySet, Standard	**10040-124**

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

Viper™ Capillary Fingertight Fittings, Stainless Steel, Thermo Scientific

Maximize liquid chromatography (LC) performance and get virtually zero-dead-volume connections to ensure optimal separations. Thermo Scientific™ Viper™ Capillary Stainless Steel Fingertight Fittings for Micro and Rapid Separation Systems are easy to use and enable fast, tool-free setup, even for the most advanced column- and valve-switching configurations. Compatible with virtually any common column and valve type, they are suitable for system pressures of up to 1250 bar (18,139 psi). Suitable for temperatures up to 120°C.

The easy-to-use fittings feature a ferrule-free fingertight design and flexible stainless-steel or biocompatible MP35N capillaries (1/32" o.d.). No tools are required. Fittings are compatible with virtually any valve and any column from any manufacturer and fit narrow connections such as 10-port valves. Enables mixed use with different designs. Available in different lengths: 65 mm and from 150 to 950 mm in 100 mm steps. Available in different inner diameters: 100 µm (0.004"), 130 µm (0.005") or 180 µm (0.007"). Use with Thermo Scientific™ Dionex™ UltiMate™ 3000 LC systems for fully integrated workflows. UltiMate 3000 XRS, RS, BioRS and SD LC systems are equipped with the Viper fingertight fitting system as a standard.

For Use With	Length	Cat. No.
UltiMate 3000 RS/XRS, UHPLC Systems and Methods	950 mm	**10067-936**
UltiMate 3000 RS/XRS, UHPLC Systems and Methods	150 mm	**10067-942**
UltiMate 3000 RS/XRS, UHPLC Systems and Methods	750 mm	**10067-944**
UltiMate 3000 RS/XRS, UHPLC Systems and Methods	350 mm	**10067-952**
UltiMate 3000 RS/XRS, UHPLC Systems and Methods	550 mm	**10067-958**
UltiMate 3000 SD, Traditional LC and LC Methods	150 mm	**10067-962**
UltiMate 3000 SD, Traditional LC and LC Methods	750 mm	**10067-966**
UltiMate 3000 RS/XRS, UHPLC Systems and Methods	750 mm	**10067-968**

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

Syringe Loading Sample Injectors, Rheodyne®

For HPLC. A seven-port rotary injector that allows both partial-filling and complete-filling techniques to be used. The injector requires a 22-gauge, 2" needle with a 90° square-cut tip, no electrotaper.

Model 7125 has a unique flat-face architecture, which uses an inert polymeric rotor seal and an alumina ceramic stator, often achieves 30,000 injections before rotor seal replacement is necessary. All connections are made with $^{1}/_{16}$" O.D. tubing. The maximum operating temperature is 80°C (176°F). The unit includes a 20µL sample loop, allowing partial loading up to 10µL.

Model 9125 is biocompatible and similar to model 7125 with the exception of the PEEK™ stator. Mobile phases that cause problems with conventional injectors can be used, such as 1M NaCl and 2M NaOH. The injector can be used for biochemical purifications, such as low-pressure soft gel chromatography as well as HPLC. Can be used as a fixed-volume loop injector. Volumes from 0.1µL to 2.5mL can be injected. The maximum operating temperature is 50°C (122°F). The unit includes a 20µL PEEK™ sample loop and Rheodyne RheFlex® fittings for all ports.

Description	Cat. No.
Model 7125	**50807-128**
Model 9125	**50807-522**

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

ACE® Equivalence™ C18 HPLC Columns, Hichrom

ACE® Equivalence C18 columns have been specifically developed as a high quality, cost effective replacement for many HPLC column brands.
Maximum recommended pH: 2 - 8.

Column Format	Column Hardware	Phase	I.D. x L	Particle Size	Pore Size	Cat. No.
Columns						
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	2.1 x 20 mm	3 µm	110 Å	**10860-752**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	2.1 x 20 mm	5 µm	110 Å	**10860-758**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	2.1 x 30 mm	5 µm	110 Å	**10860-760**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	2.1 x 30 mm	3 µm	110 Å	**10860-928**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	2.1 x 50 mm	3 µm	110 Å	**10860-676**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	2.1 x 50 mm	5 µm	110 Å	**10860-762**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	2.1 x 75 mm	3 µm	110 Å	**10860-678**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	2.1 x 75 mm	5 µm	110 Å	**10860-764**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	2.1 x 100 mm	3 µm	110 Å	**10860-680**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	2.1 x 100 mm	5 µm	110 Å	**10860-766**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	2.1 x 125 mm	3 µm	110 Å	**10860-754**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	2.1 x 125 mm	5 µm	110 Å	**10860-768**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	2.1 x 150 mm	3 µm	110 Å	**10860-756**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	2.1 x 150 mm	5 µm	110 Å	**10860-770**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	2.1 x 200 mm	5 µm	110 Å	**10860-772**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	2.1 x 250 mm	5 µm	110 Å	**10860-774**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	3.0 x 20 mm	3 µm	110 Å	**10860-720**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	3.0 x 20 mm	5 µm	110 Å	**10860-734**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	3.0 x 30 mm	3 µm	110 Å	**10860-722**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	3.0 x 30 mm	5 µm	110 Å	**10860-736**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	3.0 x 50 mm	3 µm	110 Å	**10860-724**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	3.0 x 50 mm	5 µm	110 Å	**10860-738**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	3.0 x 75 mm	3 µm	110 Å	**10860-726**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	3.0 x 75 mm	5 µm	110 Å	**10860-740**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	3.0 x 100 mm	3 µm	110 Å	**10860-728**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	3.0 x 100 mm	5 µm	110 Å	**10860-742**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	3.0 x 125 mm	3 µm	110 Å	**10860-730**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	3.0 x 125 mm	5 µm	110 Å	**10860-744**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	3.0 x 150 mm	3 µm	110 Å	**10860-732**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	3.0 x 150 mm	5 µm	110 Å	**10860-746**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	3.0 x 200 mm	5 µm	110 Å	**10860-748**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	3.0 x 250 mm	5 µm	110 Å	**10860-750**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.0 x 20 mm	5 µm	110 Å	**10860-702**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.0 x 20 mm	3 µm	110 Å	**10860-926**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.0 x 30 mm	3 µm	110 Å	**10860-690**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.0 x 30 mm	5 µm	110 Å	**10860-704**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.0 x 50 mm	3 µm	110 Å	**10860-692**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.0 x 50 mm	5 µm	110 Å	**10860-706**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.0 x 75 mm	3 µm	110 Å	**10860-694**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.0 x 75 mm	5 µm	110 Å	**10860-708**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.0 x 100 mm	3 µm	110 Å	**10860-696**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.0 x 100 mm	5 µm	110 Å	**10860-710**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.0 x 125 mm	3 µm	110 Å	**10860-698**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.0 x 125 mm	5 µm	110 Å	**10860-712**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.0 x 150 mm	3 µm	110 Å	**10860-700**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.0 x 150 mm	5 µm	110 Å	**10860-714**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.0 x 200 mm	5 µm	110 Å	**10860-716**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.0 x 250 mm	5 µm	110 Å	**10860-718**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.6 x 20 mm	5 µm	110 Å	**10860-912**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.6 x 20 mm	3 µm	110 Å	**10860-682**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.6 x 30 mm	5 µm	110 Å	**10860-914**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.6 x 30 mm	3 µm	110 Å	**10860-684**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.6 x 50 mm	3 µm	110 Å	**10829-208**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.6 x 50 mm	5 µm	110 Å	**10860-916**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.6 x 75 mm	3 µm	110 Å	**10860-686**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.6 x 75 mm	5 µm	110 Å	**10860-918**

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

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Column Format	Column Hardware	Phase	I.D. x L	Particle Size	Pore Size	Cat. No.
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.6 x 100 mm	3 µm	110 Å	**10829-210**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.6 x 100 mm	5 µm	110 Å	**10860-920**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.6 x 125 mm	3 µm	110 Å	**10860-688**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.6 x 125 mm	5 µm	110 Å	**10860-922**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.6 x 150 mm	5 µm	110 Å	**10829-196**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.6 x 150 mm	3 µm	110 Å	**10829-212**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.6 x 200 mm	5 µm	110 Å	**10860-924**
Analytical	Stainless Steel	C18 (ODS or Octadecyl)	4.6 x 250 mm	5 µm	110 Å	**10829-198**
Guard Cartridges						
ACE Equivalence C18 HPLC Guard Cartridge, 4.6 mm	—	C18 (ODS or Octadecyl)	—	3 µm	110 Å	**10829-200**
ACE Equivalence C18 HPLC Guard Cartridge, 4.6 mm	—	C18 (ODS or Octadecyl)	—	5 µm	110 Å	**10829-202**
Stand Alone Cartridge Holder	—	C18 (ODS or Octadecyl)	—	—	—	**10829-204**
Column Coupler	—	C18 (ODS or Octadecyl)	—	—	—	**10829-206**

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

HPLC Columns, Chromolith® HighResolution RP-18e, EMD Millipore

- High efficiencies at lower back pressure
- Improved peak symmetry
- Can be used for standard HPLC/UHPLC/LC-MS instruments
- Back pressure 2 times lower compared to particulate packed columns
- 30% longer column lifetime

The Chromolith® HighResolution columns offer higher efficiency and improved peak shape combined with lower back-pressure which is more than two times lower than any particulate packed column with the same dimensions.

Separation Efficiency	>140 000 N/m
Surface Area	250 m^2/g
Theoretical Plate Height	6–7 µm

Description	I.D. x L	Pore Size	Cat. No.
Chromolith® HighResolution RP-18e Column	4.6 x 25 mm	15 nm - 1.15 µm	**EM1.52020.0001**
Chromolith® HighResolution RP-18e Column	4.6 x 50 mm	15 nm - 1.15 µm	**EM1.52021.0001**
Chromolith® HighResolution RP-18e Column	4.6 x 100 mm	15 nm - 1.15 µm	**EM1.52022.0001**
Chromolith® HighResolution RP-18e Guard Column, Set of 3	4.6 x 5 mm	—	**EM1.52025.0001**

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

Purospher™ STAR HPLC Columns and Cartridges, EMD Millipore

Columns are for use with basic, neutral, metal, chelating, or any other sample format, and are ideal for the separation of difficult hydrophobic samples. Purospher™ STAR columns are designed to provide optimum results even when loaded with large or small sample volumes and are also available in a narrow-bore format (1mm). The wide pH range provides the required pH stability for 99% of the common analysis applications. These columns provide the power to separate even the most difficult of compound mixtures. With up to 150,000 plates per meter for the 3µm particle size and 100,000 plates per meter for the 5µm particle size, Purospher™ STAR columns ensure good baseline separations. Special derivatization and endcapping processes ensure long-term chemical stability, excellent retention stability, and long column lifetime. All Purospher™ STAR columns are guaranteed to provide absolutely reproducible results.

Ordering Information: All LiChroCART® cartridges require end fittings. manuCART® and LiChroCART® series end fittings and holders are available separately. Hibar® columns include end fittings. If 4 x 4 mm guard columns are to be used on 4 or 4.6 mm I.D. Hibar® Purospher™ STAR columns, the top fitting must be replaced with guard column holder designed to accommodate this size guard column. Other larger I.D. Purospher™ STAR columns include end fittings as indicated in their descriptions. Guard columns for these larger I.D. columns are also available, contact your VWR sales representative to order.

Description	Phase	I.D. x L	Particle Size	Cat. No.
Pre-Packed Columns				
Stainless Steel Hibar® Purospher™ STAR Pre-Packed Columns, Complete with End Fittings	RP-8E	4 x 125 mm	5 µm	**48219-800**
Stainless Steel Hibar® Purospher™ STAR Pre-Packed Columns, Complete with End Fittings	RP-18E	4 x 125 mm	5 µm	**48219-808**

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

SeQuant® ZIC®-HILIC HPLC Columns, EMD Millipore

The selectivity offered by ZIC®-HILIC (Hydrophilic Interaction Liquid Chromatography) is suitable for a wide variety of molecules containing hydrophilic or ionisable functional groups. This includes compounds such as carbohydrates, metabolites, acids and bases, organic and inorganic ions, metal complexes, amino acids, peptides, protein digests, plant and cell extracts, plus much more. These compounds are normally characterised by a small or negative LogP (Octanol-water partition coefficient) value and have poor retention on reversed-phase columns.

I.D. x L	Particle Size	Pore Size	Cat. No.
0.3 x 30 mm	3.5 µm	200 Å	**EM1.50489.0001**
0.3 x 150 mm	3.5 µm	200 Å	**10144-146**
1 x 150 mm	3.5 µm	200 Å	**10144-148**
2.1 x 20 mm	3.5 µm	100 Å	**89235-600**
2.1 x 50 mm	3.5 µm	100 Å	**10144-124**
2.1 x 100 mm	3.5 µm	100 Å	**10144-126**
2.1 x 100 mm	3.5 µm	200 Å	**EM1.50447.0001**
2.1 x 150 mm	3.5 µm	100 Å	**10144-128**
4.6 x 50 mm	5 µm	200 Å	**EM1.50451.0001**
1 x 5 mm	5 µm	—	**EM1.50490.0001**

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

Cogent Diamond Hydride™ TYPE-C Silica™ HPLC Columns, (100Å Pore Size), MicroSolv

These columns are bonded to nonpolar TYPE-C™ silica with a small amount of carbon on the surface, making them ideal for hydrophilic molecules, small organic acids, and carbohydrates analysis in LCMS. Amino acids are easily analyzed without the need derivatize. There is no detectable bleed, even when used with an MS-TOF. Columns produce excellent peak shape. Used in metabolomics laboratories, these columns are stable between pH 2.5 and 7.0.

Ordering Information: Guard column kits contain five guard columns with or without a holder.

Column Format	I.D. x L	Particle Size	Pore Size	Cat. No.
Capillary	1.0 x 100 mm	4 µm	100Å	**97035-038**
Capillary	1.0 x 150 mm	4 µm	100Å	**97035-044**
Capillary	1.0 x 250 mm	4 µm	100Å	**97035-050**
Capillary	1.0 x 50 mm	4 µm	100Å	**97035-030**
Analytical	2.1 x 100 mm	4 µm	100Å	**97035-040**
Analytical	2.1 x 150 mm	4 µm	100Å	**97035-046**
Analytical	2.1 x 250 mm	4 µm	100Å	**97035-052**
Analytical	2.1 x 50 mm	4 µm	100Å	**97035-032**
Analytical	2.1 x 75 mm	4 µm	100Å	**97035-134**
Analytical	3.0 x 250 mm	4 µm	100Å	**97035-054**
Analytical	3.0 x 50 mm	4 µm	100Å	**97035-034**
Analytical	4.6 x 100 mm	4 µm	100Å	**97035-036**
Analytical	4.6 x 150 mm	4 µm	100Å	**97035-042**
Analytical	4.6 x 250 mm	4 µm	100Å	**97035-048**
Analytical	4.6 x 50 mm	4 µm	100Å	**97035-028**
Analytical	4.6 x 75 mm	4 µm	100Å	**97035-056**

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

Accucore™ XL C18 4 µm HPLC Columns, Thermo Scientific

- 4 µm Solid Core Particles for All Users
- Same System, Same Method, Better Results
- Robust, Fast, and Easy To Use
- Optimum Retention of Non-Polar Compounds
- Hydrophobic Interaction Mechanism
- Separates a Broad Range of Analytes

Accucore™ XL 4µm C18 HPLC Columns provide optimum retention of non-polar analytes via a predominantly hydrophobic interaction mechanism.

Based on Core Enhanced Technology™ using 4µm solid core particles, Accucore™ XL HPLC columns allow users of conventional HPLC methods to enjoy performance far beyond that of columns packed with 5µm, 4µm, or even 3µm fully porous particles.

I.D. x L	Pore Size	Cat. No.
2.1 x 50 mm	80 Å	**10038-686**
3 x 50 mm	80 Å	**10038-684**
4.6 x 50 mm	80 Å	**10038-682**
2.1 x 100 mm	80 Å	**10038-680**
3 x 100 mm	80 Å	**10038-678**
4.6 x 100 mm	80 Å	**10038-676**
2.1 x 150 mm	80 Å	**10038-674**

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

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I.D. x L	Pore Size	Cat. No.
3 x 150 mm	80 Å	**10038-672**
4.6 x 150 mm	80 Å	**10038-670**
2.1 x 250 mm	80 Å	**10038-668**
3 x 250 mm	80 Å	**10038-666**
4.6 x 250 mm	80 Å	**10038-664**

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

ProPac WCX Cation Exchange Protein Columns, Thermo Scientific

For separations of proteins and their variants using Thermo Scientific™ ProPac SCX and WCX strong and weak cation-exchange columns, which provide exceptionally high resolution. Based on stationary phases composed of 10µm nonporous polymeric beads, these columns resolve isoforms that differ by a single charged residue. A thin, hydrophilic layer grafted to the particle core eliminates unwanted secondary interactions. The cation-exchange surface provides pH-based selectivity control and fast mass transfer for high-efficiency separation and moderate capacity.

Description	Phase	I.D. x L	Packing Material	Particle Size	Bed Weight	Cat. No.
Column	Ethylvinylbenzene/Divinylbenzene	4 x 250 mm	Lysozyne Carboxylate	10 µm	6 mg/mL	**10044-380**
Column	Ethylvinylbenzene/Divinylbenzene	4 x 50 mm	Lysozyne Carboxylate	10 µm	6 mg/mL	**10044-382**

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

Raptor™ Biphenyl LC Columns, Restek

The innovative Biphenyl is Restek's most popular LC stationary phase because it is particularly adept at separating compounds that are hard to resolve or that elute early on C18 and other phenyl chemistries.

As a result, the rugged Raptor™ Biphenyl column is extremely useful for fast separations in bioanalytical testing applications like drug and metabolite analyses, especially those that require a mass spectrometer (MS). Increasing retention of early-eluting compounds can limit ionization suppression, and the heightened selectivity helps eliminate the need for complex mobile phases that are not well-suited for MS detection.

Description	Phase	I.D. x L	Particle Size	Pore Size	Cat. No.
Raptor™ HPLC Column	Biphenyl	2.1 x 100 mm	2.7 µm	90 Å	**10060-090**
Raptor™ HPLC Column	Biphenyl	4.6 x 100 mm	2.7 µm	90 Å	**10060-092**
Raptor™ HPLC Column	Biphenyl	2.1 x 100 mm	5 µm	90 Å	**10839-674**
Raptor™ HPLC Column	Biphenyl	4.6 x 100 mm	5 µm	90 Å	**10839-676**

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

OmniSolv® Acetonitrile Gradient Grade

For spectrophotometry and chromatography. UV cutoff 189nm. Gradient controlled to remove lipophilic interferences at 254 and 210nm. Certificate of lot analysis on label.

Assay (GC)	99.9% min
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Fluorescence (as quinine base)	300ppt max
Form	Clear liquid
Gradient at 210 nm	0.002AU max
Gradient at 254 nm	0.0003AU max
Identity (IR-spectrum)	Conforms
Residue after evaporation	1ppm max
Titrable acid	8.0µeq/g max
Titrable base	0.16µeq/g max
UV Abs. at 189 nm	1.00AU max
UV Abs. at 195 nm	0.15AU max
UV Abs. at 210 nm	0.03AU max
UV Abs. at 230 nm	0.005AU max
UV Abs. at 250 nm	0.005AU max
UV Abs. at 270 nm	0.005AU max
UV Cut-off	189nm max
Water (H_2O)	0.02% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-AX0142-1**

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

Acetonitrile HPLC

Meets ACS Specifications, Meets Reagent Specifications for testing USP/NF monographs

Appearance	Clear liquid, free from particulates
Assay (GC)	99.8% min
Color (APHA)	10 max
Residue after evaporation	1ppm max
Filtered through 0.2 µm filter	To pass test
Gradient at 254 nm	0.005AU max
Infrared spectrum	Conforms to standard
Titrable acid	0.008meq/g max
Titrable base	0.0006meq/g max
UV Abs. at 190 nm	1.00AU max
UV Abs. at 220 nm	0.05AU max
UV Abs. at 254 - 400 nm	0.01AU max
UV Cut-off	190nm max
Water (H_2O)	0.10% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-AX0145-1**

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

OmniSolv® Acetonitrile, Anhydrous

Biosynthesis

Assay (GC)	99.9% min
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Fluorescence (as quinine base)	250ppt max
Form	Clear liquid
Free amine (as dimethylamine)	0.20ppm max
Gradient at 210 nm	0.003AU max
Infrared spectrum	Conforms to standard
Residue after evaporation	1ppm max
Titrable acid	0.8µeq/g max
Titrable base	0.16µeq/g max
UV Abs. at 189 nm	1.00AU max
UV Abs. at 195 nm	0.15AU max
UV Abs. at 210 nm	0.03AU max
UV Abs. at 230 nm	0.005AU max
UV Abs. at 250 nm	0.005AU max
UV Abs. at 270 nm	0.005AU max
UV Cut-off	189nm max
Water (H_2O)	10ppm max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-AX0151-1**

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

OmniSolv® Alcohol, Reagent

- Total alcohol: ~100%
- Ethyl alcohol: 89.5-91.5%
- Denaturant: 3.5-5.5% methyl alcohol and 4-6% 2-propanol

To each 100 parts of SD 3A Alcohol are added 5 parts of Isopropyl Alcohol

To each 100 parts of SD 3A Alcohol are added 5 parts of Isopropyl Alcohol.

SDA 3A includes methyl alcohol.

Assay (Ethanol)	89.5-91.5%
Assay (Isopropyl alcohol)	4.0-6.0%
Assay (Methanol)	3.5-5.5%
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Form	Clear liquid
Infrared spectrum	Conforms to standard
Residue after evaporation	4ppm max
Titrable acid	0.3µeq/g max
Titrable base	0.04µeq/g max
UV Abs. at 205 nm	1.00AU max
UV Abs. at 210 nm	0.65AU max
UV Abs. at 220 nm	0.35AU max
UV Abs. at 230 nm	0.20AU max
UV Abs. at 250 nm	0.04AU max
UV Abs. at 270 nm	0.01AU max
UV Abs. at 300 nm	0.005AU max
UV Cut-off	205nm max
Water (H_2O)	0.04% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-AX0445-1**

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

OmniSolv® Benzene

For spectrophotometry and chromatography. UV cutoff 280nm. Lot analysis on label.

Assay (GC)	99.7% min
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Form	Clear liquid
Infrared spectrum	Conforms to standard
Residue after evaporation	2ppm max
UV Abs. at 280 nm	1.00AU max
UV Abs. at 290 nm	0.15AU max
UV Abs. at 300 nm	0.05AU max
UV Abs. at 330 nm	0.01AU max
UV Abs. at 350 nm	0.005AU max
UV Cut-off	280nm max
Water (H_2O)	0.03% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-BX0212-1**

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

OmniSolv® 1-Butanol

For HPLC, spectrophotometry, and chromatography. UV cutoff 215nm. Lot analysis on label.

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-BX1777-1**

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

Chloroform, HPLC Stabilized

HPLC, Meets ACS Specifications, Meets Reagent Specifications for testing USP/NF monographs

Assay (GC)	99.8% min
Acetone and Aldehydes (about 0.005%)	To pass test
Acid and chloride	To pass test
Appearance	Clear liquid, free from particulates
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Free chlorine (Cl)	To pass test
Infrared spectrum	Conforms to standard
Lead (Pb)	0.05ppm max
Residue after evaporation	5ppm max
Suitability for dithizone tests	To pass test
UV Abs. at 245 nm	1.00AU max
UV Abs. at 255 nm	0.25AU max
UV Abs. at 260 nm	0.15AU max
UV Abs. at 270 nm	0.05AU max
UV Abs. at 290 - 400 nm	0.01AU max
UV Cut-off	245nm max
Water (H_2O)	0.05% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-CX1050-1**

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

OmniSolv® Chloroform Stabilized

For spectrophotometry, HPLC, GC, and residue analysis. Stabilized with amylene. UV cutoff 245nm. Certificate of Analysis on label.

Assay (GC)	99.9% min
Capillary ECD responsive substances (as PCNB)	2ng/L max
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Fluorescence (as quinine base)	250ppt max
Form	Clear liquid
Free chlorine (Cl)	To pass test
Identity (IR-spectrum)	Conforms
Residue after evaporation	1ppm max
Titrable acid	0.2µeq/g max
UV Abs. at 245 nm	1.00AU max
UV Abs. at 250 nm	0.30AU max
UV Abs. at 260 nm	0.04AU max
UV Abs. at 270 nm	0.005AU max
UV Abs. at 300 nm	0.005AU max
UV Cut-off	245nm max
Water (H_2O)	0.01% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-CX1054-1**

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

Chloroform, HPLC Stabilized with Ethanol

HPLC, Meets ACS Specifications, Meets Reagent Specifications for testing USP/NF monographs

Assay ($CHCl_3$ + C_2H_5OH)	99.8% min
Acetone and Aldehydes (about 0.005%)	To pass test
Acid and chloride	To pass test
Appearance	Clear liquid, free from particulates
Color (APHA)	10 max
Density at 25°C	1.471-1.476g/mL
Ethanol	0.7-1.0% (v/v)
Filtered through 0.2 µm filter	To pass test
Fluorescence (as quinine base)	1.0ppb max
Free chlorine (Cl)	To pass test
Infrared spectrum	Conforms to standard
Lead (Pb)	0.05ppm max
Refractive index (n 20/D)	1.442-1.446
Residue after evaporation	2ppm max
Substances darkened by sulfuric acid	To pass test
Suitability for dithizone tests	To pass test
UV Abs. at 245 nm	1.00AU max
UV Abs. at 255 nm	0.25AU max
UV Abs. at 260 nm	0.15AU max
UV Abs. at 270 nm	0.05AU max
UV Abs. at 290 - 400 nm	0.01AU max
UV Cut-off	244nm max
Water (H_2O)	0.01% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-CX1058-1**

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

OmniSolv® 1,2-Dichloroethane

For spectrophotometry, chromatography, and residue analysis. UV cutoff 228nm. Filtered through a 0.2µm filter. Lot analysis on label.

Assay (GC)	99.0% min
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Fluorescence (as quinine base)	500ppt max
Form	Clear liquid
Free halogens	To pass test
Infrared spectrum	Conforms
Residue after evaporation	1ppm max
Titrable acid	0.3µeq/g max
UV Abs. at 230 nm	1.00AU max
UV Abs. at 240 nm	0.30AU max
UV Abs. at 250 nm	0.10AU max
UV Abs. at 300 nm	0.005AU max
UV Abs. at 400 nm	0.005AU max
UV Cut-off	230nm max
Water (H_2O)	0.02% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-DX0796-1**

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

OmniSolv® Dichloromethane Stabilized

For spectrophotometry, gas chromatography, HPLC, and residue analysis. UV cutoff 231nm. Lot analysis on label.

Assay (GC)	99.9% min
Capillary ECD responsive substances (as PCNB)	2ng/L max
Capillary FID responsive substances (as decane)	3µg/L max
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Fluorescence (as quinine base)	500ppt max
Form	Clear liquid
Free halogens	To pass test
Identity (IR-spectrum)	Conforms
Residue after evaporation	1ppm max
Titrable acid	0.2µeq/g max
UV Abs. at 231 nm	1.00AU max
UV Abs. at 235 nm	0.40AU max
UV Abs. at 240 nm	0.20AU max
UV Abs. at 250 nm	0.01AU max
UV Abs. at 260 nm	0.005AU max
UV Cut-off	231nm max
Water (H_2O)	0.005% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-DX0831-1**

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

Dichloromethane, HPLC Stabilized

HPLC, Meets ACS Specifications, Meets Reagent Specifications for testing USP/NF monographs

Assay (GC)	99.8% min
Appearance	Clear liquid, free from particulates
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Free halogens	To pass test
Infrared spectrum	Conforms to standard
Residue after evaporation	5ppm max
Titrable acid	0.0003meq/g max
UV Abs. at 235 nm	1.00AU max
UV Abs. at 240 nm	0.35AU max
UV Abs. at 250 nm	0.10AU max
UV Abs. at 260 nm	0.04AU max
UV Abs. at 270 nm	0.01AU max
UV Abs. at 300 nm	0.01AU max
UV Abs. at 350 nm	0.01AU max
UV Cut-off	235nm max
Water (H_2O)	0.02% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-DX0838-1**

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

OmniSolv® Ether

Clear liquid. Suitable for residue analysis, HPLC, and spectrophotometry.

Size	Packaging	Cat. No.
4 L	Poly-Coated Glass Bottle	**EM-EX0182-1**

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

OmniSolv® Ethyl Acetate

For spectrophotometry, chromatography, and residue analysis. UV cutoff 254nm. Certificate of Analysis on label.

Assay (GC)	99.9% min
Capillary ECD responsive substances (as PCNB)	2ng/L max
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Fluorescence (as quinine base)	250ppt max
Form	Clear liquid
Identity (IR-spectrum)	Conforms
Residue after evaporation	1ppm max
Titrable acid	0.8µeq/g max
UV Abs. at 254 nm	1.00AU max
UV Abs. at 255 nm	0.80AU max
UV Abs. at 257 nm	0.35AU max
UV Abs. at 265 nm	0.02AU max
UV Abs. at 270 nm	0.01AU max
UV Abs. at 300 nm	0.005AU max
UV Cut-off	254nm max
Water (H_2O)	0.02% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-EX0241-1**

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

Ethyl Acetate, HPLC

HPLC, Meets ACS Specifications, Meets Reagent Specifications for testing USP/NF monographs

Assay (GC)	99.8% min
Appearance	Clear liquid, free from particulates
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Form	Liquid
Infrared spectrum	Conforms to standard
Residue after evaporation	5ppm max
Substances darkened by sulfuric acid	To pass test
Titrable acid	0.0009meq/g max
UV Abs. at 255 nm	1.00AU max
UV Abs. at 257 nm	0.50AU max
UV Abs. at 263 nm	0.10AU max
UV Abs. at 275 nm	0.05AU max
UV Abs. at 300 - 400	0.01AU max
UV Cut-off	255nm max
Water (H_2O)	0.05% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-EX0245-1**

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

OmniSolv® Ethyl Alcohol Non UV, Denatured

- Total alcohol: 99.5%
- Ethyl alcohol: 95%
- Denaturant: 100 volumes SD Alcohol #1 (100 volumes ethanol, 5 volumes methanol)

100 volumes SD Alcohol #1 (100 volumes ethanol, 5 volumes methanol)

Capillary ECD responsive substances (as PCNB)	5ng/L max
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Form	Clear liquid
Infrared spectrum	Conforms to standard
Water (H_2O)	0.5% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-EX0278-1**

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

Ethyl Alcohol, Pure, 190 Proof

Ethyl Alcohol, 190 Proof HPLC. Suitable for multiple applications, these reagents meet or exceed ACS specifications.

Assay (GC)	94.9-96.0%
Color (APHA)	10APHA max.
Form	Clear Liquid
Methanol Content (CH_3OH)	0.1 max.
Residue after evaporation	0.001% max.
Solubility in water	Passes test
Substances darkened by sulfuric acid	Passes test
Substances reducing permanganate (as O)	Passes test
Titrable base	0.0002meg/g max
Titrable acid	0.0005meg/g max
UV abs. at 210nm	0.4 AU max.
UV abs. at 220nm	0.25AU max.
UV abs. at 230nm	0.15AU max.
UV abs. at 240nm	0.05AU max.
UV abs. at 270-400nm	0.01AU max.
Water (H_2O)	6.20-7.64% wt.

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EMD-EX0290-1**

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

OmniSolv® Heptane

Meets Reagent Specifications for testing USP/NF monographs

Assay (n-heptane)	99.0% min
Assay (saturated C_7 hydrocarbons)	99.9% min
Boiling range	94.5-99.0°C
Capillary ECD responsive substances (as PCNB)	5ng/L max
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Fluorescence (as quinine base)	250ppt max
Form	Clear liquid
Infrared spectrum	Conforms to standard
Residue after evaporation	1ppm max
UV Abs. at 197 nm	1.00AU max
UV Abs. at 200 nm	0.50AU max
UV Abs. at 210 nm	0.25AU max
UV Abs. at 220 nm	0.10AU max
UV Abs. at 230 nm	0.05AU max
UV Abs. at 250 nm	0.01AU max
UV Abs. at 260 nm	0.01AU max
UV Abs. at 270 nm	0.005AU max
UV Abs. at 300 nm	0.005AU max
UV Cut-off	197nm max
Water (H_2O)	0.01% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-HX0078-1**

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

Hexanes, 98.5%, HPLC Grade

HPLC, Meets ACS Specifications, Meets Reagent Specifications for testing USP/NF monographs

Assay (n-hexane)	Report
Assay (total hexane isomers + methylcyclopentane)	98.5% min
Appearance	Clear liquid, free from particulates
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Infrared spectrum	Conforms
Residue after evaporation	5ppm max
Sulfur compounds (as S)	0.005% max
Thiophene	To pass test
UV Abs. at 200 nm	1.00AU max
UV Abs. at 210 nm	0.30AU max
UV Abs. at 220 nm	0.20AU max
UV Abs. at 230 nm	0.10AU max
UV Abs. at 240 nm	0.04AU max
UV Abs. at 250 nm	0.02AU max
UV Abs. at 270 nm	0.01AU max
UV Abs. at 300 nm	0.01AU max
UV Abs. at 350 nm	0.01AU max
UV Cut-off	200nm max
Water (H_2O)	0.01% max
Water-soluble titrable acid	0.0003meq/g max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-HX0290-1**

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

n-Hexane 95%

HPLC, Meets Reagent Specifications for testing USP/NF monographs

Appearance	Clear liquid, free from particulates
Color (APHA)	10 max
Residue after evaporation	5ppm max
Infrared spectrum	Conforms
Assay (n-hexane)	95% min
Sulfur compounds (as S)	0.005% max
Thiophene	To pass test
Water-soluble titrable acid	0.0003meq/g max
Assay (total hexane isomers + methylcyclopentane)	99.0% min
UV Abs. at 200nm	1.0AU max
UV Abs. at 210 nm	0.30AU max
UV Abs. at 220 nm	0.10AU max
UV Abs. at 230 nm	0.05AU max
UV Abs. at 240 nm	0.04AU max
UV Abs. at 250 nm	0.02AU max
UV Abs. at 270 nm	0.01AU max
UV Abs. at 300 nm	0.01AU max
UV Abs. at 350 nm	0.01AU max
UV Cut-off	200nm max
Water (H_2O)	0.01% max

Size	Packaging	Cat. No.
4 L	PTFE Bottle	**EM-HX0291-1**

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OmniSolv® n-Hexane 95%

Suitable for spectrophotometry, HPLC, and gas chromatography and residue analysis. UV cutoff 195nm. Certificate of Analysis on label.

Assay (n-hexane)	95% min
Boiling range	66.1-69.4°C
Capillary ECD responsive substances (as PCNB)	5ng/L max
Capillary FID responsive substances (as decane)	3µg/L max
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Fluorescence (as quinine base)	250ppt max
Form	Clear liquid
Infrared spectrum	Conforms to standard
Residue after evaporation	1ppm max
UV Abs. at 195 nm	1.00AU max
UV Abs. at 200 nm	0.50AU max
UV Abs. at 210 nm	0.20AU max
UV Abs. at 220 nm	0.05AU max
UV Abs. at 230 nm	0.05AU max
UV Abs. at 250 nm	0.01AU max
UV Abs. at 280 nm	0.005AU max
UV Cut-off	195nm max
Water (H_2O)	0.01% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-HX0295-1**

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OmniSolv® Hexanes 98.5%

Suitable for spectrophotometry, HPLC and gas chromatography, and residue analysis. UV cutoff 195nm. For neat, nitrogen-purged hexane in a 1cm cell versus water, absorbance is 0.20 to 0.005 between 210nm and 280nm. Certificate of Analysis on label.

Assay (total aliphatic hydrocarbons <C_8)	99.8% min
Assay (total hexane isomers + methylcyclopentane)	98.5 min
Boiling range	66.1-69.4°C
Capillary ECD responsive substances (as PCNB)	5ng/L max
Capillary FID responsive substances (as decane)	3µg/L max
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Fluorescence (as quinine base)	250ppt max
Form	Clear liquid
Identity (IR-spectrum)	Conforms
Residue after evaporation	1ppm max
UV Abs. at 195 nm	1.00AU max
UV Abs. at 200 nm	0.50AU max
UV Abs. at 210 nm	0.20AU max
UV Abs. at 220 nm	0.05AU max
UV Abs. at 230 nm	0.05AU max
UV Abs. at 250 nm	0.01AU max
UV Abs. at 280 nm	0.005AU max
UV Cut-off	195nm max
Water (H_2O)	0.01% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-HX0296-1**

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

OmniSolv® Isopropyl Alcohol

Suitable for spectrophotometry, HPLC, GC, and residue analysis. UV cutoff at 204nm. Filtered to remove particulate matter. Certificate of Analysis on label.

Assay (GC)	99.9% min
Capillary ECD responsive substances (as PCNB)	2ng/L max
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Fluorescence (as quinine base)	250ppt max
Form	Clear liquid
Identity (IR-spectrum)	Conforms
Residue after evaporation	1ppm max
Titrable acid	0.2µeq/g max
UV Abs. at 204 nm	1.00AU max
UV Abs. at 205 nm	0.80AU max
UV Abs. at 210 nm	0.35AU max
UV Abs. at 220 nm	0.10AU max
UV Abs. at 230 nm	0.05AU max
UV Abs. at 240 nm	0.02AU max
UV Abs. at 260 nm	0.005AU max
UV Abs. at 300 nm	0.005AU max
UV Cut-off	204nm max
Water (H_2O)	0.05% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-PX1834-1**

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Isopropyl Alcohol HPLC

HPLC, Meets ACS Specifications, Meets Reagent Specifications for testing USP/NF monographs

Assay (GC)	99.8% min
Appearance	Clear liquid, free from particulates
Carbonyl compounds (acetone or propionaldehyde)	0.002% max
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Infrared spectrum	Conforms to standard
Residue after evaporation	5ppm max
Solubility in water	To pass test
Titrable acid	0.0001meq/g max
Titrable base	0.0001meq/g max
UV Abs. at 210 nm	1.00AU max
UV Abs. at 220 nm	0.40AU max
UV Abs. at 230 nm	0.20AU max
UV Abs. at 245 nm	0.08AU max
UV Abs. at 260 nm	0.04AU max
UV Abs. at 275 nm	0.03AU max
UV Abs. at 300 nm	0.02AU max
UV Abs. at 350 nm	0.01AU max
UV Cut-off	210nm max
Water (H_2O)	0.10% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-PX1838-1**

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Methanol HPLC

HPLC, Meets ACS Specifications, Meets Reagent Specifications for testing USP/NF monographs

Assay (GC)	99.8% min
Appearance	Clear liquid free from particulates
Carbonyl comps (acetone,formaldehyde,acetaldehyde)	0.001% max
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Gradient at 254 nm	0.005AU max
Identity (IR-spectrum)	Conforms
Residue after evaporation	2ppm max
Solubility in water	To pass test
Substances darkened by sulfuric acid	To pass test
Substances reducing permanganate	To pass test
Titrable acid	0.0003meq/g max
Titrable base	0.0002meq/g max
UV Abs. at 205 nm	1.00AU max
UV Abs. at 210 nm	0.80AU max
UV Abs. at 220 nm	0.40AU max
UV Abs. at 230 nm	0.20AU max
UV Abs. at 240 nm	0.10AU max
UV Abs. at 260 nm	0.04AU max
UV Abs. at 280 nm	0.01AU max
UV Abs. at 300 nm	0.01AU max
UV Abs. at 350 nm	0.01AU max
UV Cut-off	205nm max
Water (H_2O)	0.05% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-MX0475-1**

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OmniSolv® Methanol Gradient Grade

Suitable for use in spectrophometry and HPLC and gas chromatography. Gradient controlled for absence of lipophilic interferences at 254 and 235nm. UV cutoff 203nm. Certificate of Analysis on label.

Assay (GC)	99.9% min
Acetone	10ppm max
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Fluorescence (as quinine base)	250ppt max
Form	Clear liquid
Gradient at 235 nm	0.001AU max
Gradient at 254 nm	0.001AU max
Identity (IR-spectrum)	Conforms
Residue after evaporation	1ppm max
Titrable acid	0.3µeq/g max
Titrable base	0.2µeq/g max
UV Abs. at 203 nm	1.00AU max
UV Abs. at 205 nm	0.80AU max
UV Abs. at 210 nm	0.25AU max
UV Abs. at 220 nm	0.10AU max
UV Abs. at 230 nm	0.03AU max
UV Abs. at 250 nm	0.01AU max
UV Abs. at 260 nm	0.005AU max
UV Abs. at 300 nm	0.005AU max
UV Cut-off	203nm max
Water (H_2O)	0.05% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-MX0488-1**

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

OmniSolv® Methylsulfoxide

Clear liquid. For HPLC, gas chromatography, and spectrophotometry. The infrared spectrum conforms to the standard. Filtered through a 0.2µm element. UV cutoff 263nm. Soluble in water. Certificate of Analysis on label.

Assay (GC)	99.9% min
Color (APHA)	10 max
Residue after evaporation	5ppm max
Filtered through 0.2 µm filter	To pass test
Form	Clear liquid
Infrared spectrum	Conforms to standard
UV Abs. at 263 nm	1.000AU max
UV Abs. at 270 nm	0.400AU max
UV Abs. at 275 nm	0.250AU max
UV Abs. at 280 nm	0.200AU max
UV Abs. at 335 nm	0.020AU max
UV Abs. at 350-400 nm	0.010AU max
Water (H_2O)	0.05% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-MX1456-1**

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

OmniSolv® Pentane

For spectrophotometry, chromatography, and residue analysis. UV cutoff 190nm.

Assay (n-Pentane)	98% min
Assay (total C_5 isomers)	99.9% min
Capillary ECD responsive substances (as PCNB)	10ng/L max
Form	Clear liquid
Refractive index (n 20/D)	1.3570-1.3580
Residue after evaporation	1mg/L max
UV Abs. at 190 nm	1.00AU max
UV Abs. at 200 nm	0.600AU max
UV Abs. at 250 nm	0.010AU max
UV Abs. at 300 nm	0.005AU max
UV Abs. at 400 nm	0.005AU max
Water (H_2O)	0.01% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-PX0167-1**

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

OmniSolv® Petroleum Ether Non UV

Boiling range	35-60°C
Capillary ECD responsive substances (as PCNB)	2ng/L max
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Form	Clear liquid
Infrared spectrum	Conforms to standard
Residue after evaporation	1ppm max
Titrable acid	0.2µeq/g max
Water (H_2O)	0.01% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-PX0424-1**

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

OmniSolv® n-Propyl Alcohol

Suitable for HPLC and gas chromatography and spectrophotometry. UV cutoff 210nm. Filtered to remove particulate matter. Lot analysis on label.

Assay (GC)	99.5% min
Aldehydes	0.01% max
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Fluorescence (as quinine base)	200ppt max
Form	Clear liquid
Infrared spectrum	Conforms to standard
Residue after evaporation	1ppm max
Titrable acid	0.2µeq/g max
UV Abs. at 210 nm	1.00AU max
UV Abs. at 220 nm	0.50AU max
UV Abs. at 230 nm	0.25AU max
UV Abs. at 250 nm	0.05AU max
UV Abs. at 300 nm	0.005AU max
UV Cut-off	210nm max
Water (H_2O)	0.05% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-PX1824-1**

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

OmniSolv® Pyridine

Suitable for spectrophotometry and HPLC and GC. UV cutoff at 330nm. Filtered to remove particulate matter. Lot analysis on label.

Assay (GC)	99.0% min
Color (APHA) at time of manufacture	10 max
Filtered through 0.2 µm filter	To pass test
Form	Clear liquid
Infrared spectrum	Conforms to standard
Residue after evaporation	4ppm max
UV Abs. at 330 nm	1.00AU max
UV Abs. at 340 nm	0.30AU max
UV Abs. at 350 nm	0.10AU max
UV Abs. at 400 nm	0.01AU max
UV Cut-off	330nm max
Water (H_2O)	0.05% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-PX2014-1**

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

OmniSolv® Tetrahydrofuran, No Stabilizer

Meets Reagent Specifications for testing USP/NF monographs

Expiration date	Exp 12 months from mfg date
Assay (GC)	99.9% min
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Form	Clear liquid
Identity (IR-spectrum)	Conforms
Peroxide (as H_2O_2)*	0.02% max
Residue after evaporation	2ppm max
Titrable acid	0.8µeq/g max
UV Abs. at 212 nm	1.00AU max
UV Abs. at 225 nm	0.50AU max
UV Abs. at 250 nm	0.10AU max
UV Abs. at 300 nm	0.005AU max
UV Cut-off	212nm max
Water (H_2O)	0.02% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-TX0279-1**

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

OmniSolv® Tetrahydrofuran Non-UV

Stabilized with 250ppm BHT (butylated hydroxytoluene; 2,6-di-tert-butyl-p-cresol). For chromatography. Can be used for HPLC non-UV applications using refractive index and visible wavelength detectors.

Assay (GC)	99.9% min
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Form	Clear liquid
Identity (IR-spectrum)	Conforms
Peroxide (as H_2O_2)	0.01% max
Stabilizer (BHT)	0.0140-0.0310%
Titrable acid	1.0µeq/g max
Water (H_2O)	0.03% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-TX0282-1**

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

For more HPLC Solvent choices, see pages 34-36.

OmniSolv® Toluene

For spectrophotometry, HPLC, gas chromatography, and residue analysis. Filtered through a 0.2µm filter. UV cutoff 285nm. Lot analysis on label.

Assay (Toluene)	99.9% min
Capillary ECD responsive substances (as PCNB)	5ng/L max
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Form	Clear liquid
Infrared spectrum	Conforms to standard
Residue after evaporation	3ppm max
UV Abs. at 285 nm	1.00AU max
UV Abs. at 286 nm	0.70AU max
UV Abs. at 288 nm	0.40AU max
UV Abs. at 300 nm	0.10AU max
UV Abs. at 350 nm	0.01AU max
UV Cut-off	285nm max
Water (H_2O)	0.02% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-TX0737-1**

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

OmniSolv® Water, Gradient Grade

Meets reagent specifications for testing USP/NF monographs.

Molar Mass	18.02
Expiration Date	12 months from manufacture date
Color (APHA)	10 max
Filtered Through 0.2 µm Filter	To pass test
Fluorescence (as Quinine Base)	100 ppt max
Gradient at 210 nm	0.002 AU max
Gradient at 254 nm	0.0005 AU max
Odor	Odorless
Residue After Evaporation	1 ppm max
Specific Conductance	2 µmho/cm max
Total Purgeable Organics	5 ppb max
UV Abs. at 190 nm	0.010 AU max
UV Abs. at 200 nm	0.010 AU max
UV Abs. at 210 nm	0.010 AU max
UV Abs. at 220 nm	0.010 AU max
UV Abs. at 230 nm	0.010 AU max
UV Abs. at 240 nm	0.010 AU max
UV Abs. at 250 nm	0.005 AU max
UV Abs. at 280 nm	0.005 AU max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-WX0004-1**

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

Water, HPLC Grade

Molar Mass	18.02
Appearance	Clear liquid, free from particulates
Color (APHA)	10 max
Residue after evaporation	2 ppm max
Expiration date	12 months from manufacture date
Filtered Through 0.2 µm Filter	To pass test
Fluorescence (as Quinine Base)	150 ppt max
Gradient at 210 nm	0.002 AU max
Gradient at 254 nm	0.0005 AU max
Odor	To pass test
UV Abs. at 190 nm	0.01 AU max
UV Abs. at 210 nm	0.01 AU max
UV Abs. at 250 nm	0.005 AU max
UV Abs. at 280 nm	0.005 AU max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-WX0008-1**

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PREPARATIVE CHROMATOGRAPHY

FLASH

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LC SOLVENTS

Flash Chromatography Columns (60Å Pore Size), Agela Technologies

Silica-based columns are made with high purity analytical grade silica and are suitable for most flash chromatography systems. Special surface modification greatly reduces over-activity of the silica surface, which reduces tailing of compounds and ensures high recovery and good reproducibility. The unique HILIC columns allow the purification of highly polar compounds which are not suitable for bare silica or ODS columns.

Length	Packing Material	Particle Size	Bed Weight	Cat. No.
69.2 mm	Silica (CS)	40 to 60 µm	4 g	**97006-634**
86 mm	Silica (CS)	40 to 60 µm	12 g	**97006-636**
112 mm	Silica (CS)	40 to 60 µm	20 g	**97006-638**
138.6 mm	Silica (CS)	40 to 60 µm	40 g	**97006-640**
208 mm	Silica (CS)	40 to 60 µm	80 g	**97006-642**
235 mm	Silica (CS)	40 to 60 µm	120 g	**97006-644**
240 mm	Silica (CS)	40 to 60 µm	330 g	**97006-646**
280 mm	Silica (CS)	40 to 60 µm	1.5 kg	**97006-650**
420 mm	Silica (CS)	40 to 60 µm	2.5 kg	**97006-652**
700 mm	Silica (CS)	40 to 60 µm	5 kg	**97006-654**
69.2 mm	Silica (CM)	40 to 60 µm	4 g	**97009-734**
69.2 mm	Silica (NH2)	40 to 60 µm	4 g	**97009-736**
69.2 mm	Silica (ODS)	40 to 60 µm	4 g	**97009-738**
69.2 mm	Silica (HILIC)	40 to 60 µm	4 g	**97009-740**
86 mm	Silica (CM)	40 to 60 µm	12 g	**97009-744**
86 mm	Silica (NH2)	40 to 60 µm	12 g	**97009-746**
86 mm	Silica (ODS)	40 to 60 µm	12 g	**97009-748**
240 mm	Silica (ODS)	40 to 60 µm	330 g	**97009-750**
86 mm	Silica (HILIC)	40 to 60 µm	12 g	**97009-752**
240 mm	Silica (HILIC)	40 to 60 µm	330 g	**97009-754**
138.6 mm	Silica (CM)	40 to 60 µm	40 g	**97009-800**
208 mm	Silica (CM)	40 to 60 µm	80 g	**97009-802**
138.6 mm	Silica (NH2)	40 to 60 µm	40 g	**97009-804**
208 mm	Silica (NH2)	40 to 60 µm	80 g	**97009-806**
138.6 mm	Silica (ODS)	40 to 60 µm	40 g	**97009-808**
208 mm	Silica (ODS)	40 to 60 µm	80 g	**97009-810**
138.6 mm	Silica (HILIC)	40 to 60 µm	40 g	**97009-812**
208 mm	Silica (HILIC)	40 to 60 µm	80 g	**97009-814**
112 mm	Silica (CM)	40 to 60 µm	20 g	**97009-816**
112 mm	Silica (NH2)	40 to 60 µm	20 g	**97009-818**
112 mm	Silica (ODS)	40 to 60 µm	20 g	**97009-820**
112 mm	Silica (HILIC)	40 to 60 µm	20 g	**97009-822**
235 mm	Silica (CM)	40 to 60 µm	120 g	**97009-830**
235 mm	Silica (NH2)	40 to 60 µm	120 g	**97009-832**
235 mm	Silica (ODS)	40 to 60 µm	120 g	**97009-834**
235 mm	Silica (HILIC)	40 to 60 µm	120 g	**97009-836**

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

Quick Drying Cartridges for Flash Chromatography, Agela Technologies

These cartridges provide quick drying of organic synthesis mixture and are ideal for sample cleanup. Cartridges are packed with $MgSO_4$ embedded in diatomite.

Bed Weight	Cat. No.
200 mg	**97109-410**
500 mg	**97109-412**
1 g	**97109-414**
2.5 g	**97109-416**

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

VWR® Silica Gel, High Purity, 50 µm

Packing is ultra pure grade silica, specially washed with acid and DI water; narrow particle size and water content control. Water Content is 3.0 - 5.0%. For flash chromatography.

pH	Average Pore Size	Color	Particle Size	Sorbent Weight	Surface Area	Cat. No.
6.3-7.2	60Å	White	40-60 µm	1 kg	480 m2/g	**89306-346**
6.3-7.2	60Å	White	40-60 µm	25 kg	480 m2/g	**89306-350**

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

VWR® Silica Gel, Bulk Common Purity, 50 µm

Common pure grade silica, narrow particle size and water content control. Water Content is 3.0-5.0%. For flash chromatography.

pH	Average Pore Size	Color	Particle Size	Sorbent Weight	Surface Area	Cat. No.
6.3-7.2	60Å	White	40-60 µm	5 kg	480 m2/g	**89306-342**
6.3-7.2	60Å	White	40-60 µm	25 kg	480 m2/g	**89306-344**

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

VWR® Bulk Flash C18, 50 µm

Flash C18-Silica bulk sorbent. Carbon loading is 15~17%. For flash chromatography.

Average Pore Size	Color	Particle Size	Sorbent Weight	Surface Area	Cat. No.
60Å	White	40-60 µm	1000 g	480 m2/g	**89306-354**
60Å	White	40-60 µm	100 g	480 m2/g	**89306-352**

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

VWR® Silica Gel, High Purity, 80 µm

Packing is ultra pure grade silica, specially washed with acid and DI water; narrow particle size and water content control. Water Content is 3.0 - 5.0%. For flash chromatography.

pH	Average Pore Size	Color	Particle Size	Sorbent Weight	Surface Area	Cat. No.
6.3-7.2	60Å	White	70-90 µm	5 kg	484 m2/g	**89306-336**
6.3-7.2	60Å	White	70-90 µm	25 kg	484 m2/g	**89306-338**

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

VWR® Silica Gel, Bulk Common Purity, 80 µm

Common, pure grade silica gel for flash chromatography has narrow particle size and water content control. Water content is 3.0-5.0%.

pH	Average Pore Size	Color	Particle Size	Sorbent Weight	Surface Area	Cat. No.
6.3-7.2	60Å	White	70-90 µm	1 kg	480m2/g	**89306-328**
6.3-7.2	60Å	White	70-90 µm	5 kg	480m²/g	**89306-330**
6.3-7.2	60Å	White	70-90 µm	25 kg	480m2/g	**89306-332**

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

KONTES® CHROMAFLEX™ Chromatography Columns, Kimble Chase

Ideal for medium pressure chromatography with either aqueous or organic mobile phases. These threaded columns feature PTFE shielded O-rings that form positive, leak-free seals. The solvents contact only the PTFE and borosilicate glass. The 10cm I.D. columns are tapered at both ends, enabling them to utilize the end fittings of 4.8cm I.D. columns. Recommended for RCRA SW-846 Methods.

Packing reservoirs are threaded for easy mounting on columns. They are designed for use as buffer reservoirs in gravity flow chromatography or for packing gel slurry into columns (reservoir capacity matches the volume of gel required to pack the longest column in that diameter.

Flow adapters allow easy adjustment of column bed volume and offer improved column performance and chromatogram resolution. Flow adapters are constructed with PTFE eluant cannula, acetal body, PTFE/propylene O-ring seal, and 20µm polyethylene bed support.

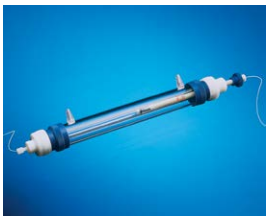
A PTFE bed support is required when flow adapter is used with aggressive organic solvents, PTFE bed supports include 20µm PTFE bed support, 40 mesh PTFE support screen, and PTFE retainer ring.

Ordering Information: Each column comes with a polyethylene bed support and 1/4"-28 PTFE end fittings.

Description	Format	Capacity	I.D. x L	Cat. No.
Column with Tapered Ends	Preparative	7670 mL	10 x 1000 mm	**KT420830-1040**
Column	Preparative	2170 mL	48 x 1200 mm	**KT420830-1220**
Column	Preparative	12 mL	10 x 150 mm	**KT420830-1500**
Column	Preparative	74 mL	25 x 150 mm	**KT420830-1510**
Column with Tapered Ends	Preparative	820 mL	10 x 150 mm	**KT420830-1540**
Column	Preparative	24 mL	10 x 300 mm	**KT420830-3000**
Column	Preparative	147 mL	25 x 300 mm	**KT420830-3010**
Column	Preparative	543 mL	48 x 300 mm	**KT420830-3020**
Column	Preparative	47 mL	10 x 600 mm	**KT420830-6000**
Column	Preparative	294 mL	25 x 600 mm	**KT420830-6010**
Column	Preparative	1085 mL	48 x 600 mm	**KT420830-6020**

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

KONTES® CHROMAFLEX™ Safety/Water-Jacketed Chromatography Columns, Kimble Chase



For medium pressure chromatography with either aqueous or organic mobile phases. These threaded borosilicate glass columns feature an acrylic water jacket that provides thermal control of temperature-sensitive chromatographic separations and acts as a safety shield.

Flow adapters allow easy adjustment of column bed volume and offer improved column performance and chromatogram resolution. Flow adapters are constructed with PTFE eluant cannula, acetal body, PTFE/propylene O-ring seal, and 20µm polyethylene bed support.

A PTFE bed support is required when flow adapter is used with aggressive organic solvents, PTFE bed supports include 20µm PTFE bed support, 40 mesh PTFE support screen, and PTFE retainer ring.

Ordering Information: Each column is supplied with a 20µm polyethylene bed support and 1/4"-28 fittings.

Description	Format	Capacity	I.D. x L	Cat. No.
Column	Preparative	2170 mL	48 x 1200 mm	**KT420870-1220**
Column	Preparative	12 mL	10 x 150 mm	**KT420870-1500**
Column	Preparative	74 mL	25 x 150 mm	**KT420870-1510**
Column	Preparative	24 mL	10 x 300 mm	**KT420870-3000**
Column	Preparative	147 mL	25 x 300 mm	**KT420870-3010**
Column	Preparative	543 mL	48 x 300 mm	**KT420870-3020**
Column	Preparative	47 mL	10 x 600 mm	**KT420870-6000**
Column	Preparative	294 mL	25 x 600 mm	**KT420870-6010**
Column	Preparative	1086 mL	48 x 600 mm	**KT420870-6020**

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

Disposable Empty Columns for Sample Preparation, Agela Technologies

Open fritted columns are ideal for sample filtration and include polyethylene frit and polypropylene tube. Solid sample loading columns feature screw caps. They are ideal for solid sample loading on flash columns. Solid sample loading columns require piston seals with corresponding volume. Solid sample loading columns and piston seals include polyethylene frit.

Description	Capacity	Particle Size	Cat. No.
Capped Solid Sample Loading Empty Columns	10 mL	20 µm	**97009-824**
Capped Solid Sample Loading Empty Columns	30 mL	21 µm	**97009-826**
Capped Solid Sample Loading Empty Columns	50 mL	22 µm	**97009-828**

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

Acetonitrile, HiPerSolv CHROMANORM® Super gradient for HPLC

From the exclusive family of high-quality, competitively-priced BDH Chemicals — high purity solvents for HPLC applications. These solvents are manufactured at a state of the art European ISO 9001/ISO 14001 solvent production facilities and feature an unparalleled combination of performance and price for even the most demanding liquid chromatography applications

Assay	Min. 99.9 %
Solution (100 g/L)	Neutral
Acidity	Max. 0.0008 meq/g
Alkalinity	Max. 0.0006 meq/g
Coloration	Max. 10 APHA
n 20/D	1.343 to 1.345
Evaporation Residue	Max. 2 ppm
Water	Max. 30 ppm
Absorbance (200 nm)	Max. 0.10
Transmittance (190 nm)	Min. 10 %
Transmittance (195 nm)	Min. 80 %
Transmittance (200 nm)	Min. 95 %
Transmittance (210 nm)	Min. 96 %
Transmittance (220 nm)	Min. 97 %
Transmittance (230 nm)	Min. 98 %
Transmittance (240 nm)	Min. 99 %
Transmittance (250 nm)	Min. 99 %
Transmittance (240 to 420 nm)	Min. 99 %
Fluorescence (as quinine) (254 nm)	Max. 1 ppb
Gradient grade (210 nm)	Max. 10 mAU
Conforms to ACS	Passes Test
Conforms to ACS (HPLC/UV)	Passes Test
Conforms to Reag. Ph.Eur.	Passes Test
Conforms to USP	Passes Test

Size	Packaging	Cat. No.
1 L	Amber Glass Bottle with 45 mm Neck	**BDH83639.100E**
4 L	Amber Glass Bottle	**BDH83639.400**
5 L	Aluminum Bottle	**BDH83639.500**

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

Dichloromethane HiPerSolv CHROMANORM® for HPLC, Stabilized

From the exclusive family of high-quality, competitively-priced BDH Chemicals — high purity solvents for HPLC applications. These solvents are manufactured at a state of the art European ISO 9001/ISO 14001 solvent production facilities and feature an unparalleled combination of performance and price for even the most demanding liquid chromatography applications.

Stabilized with ±0.002% 2-methyl-2-butene.

Assay (GC)	Min. 99.8 %
Water	Max. 0.05 %
Non-volatile residue	Max. 0.001 %
Acidity	Max. 0.0005 meq/g
Alkalinity	Max. 0.0002 meq/g
Transmittance (240 nm)	Min. 50 %
Transmittance (245 nm)	Min. 80 %
Transmittance (260 nm)	Min. 98 %

Size	Packaging	Cat. No.
1 L	Amber Glass Bottle with 45 mm Neck	**BDH23373.100E**
4 L	Amber Glass Bottle	**BDH23373.400**

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

N,N-Dimethylformamide HiPerSolv CHROMANORM® for HPLC

Assay (by GC-FID) ..... Min. 99.9 %
Water (by KF coulometry) ..... Max. 0.02 %
Nonvolatile Residue ..... Max. 0.0005 %
Acidity ..... Max. 0.0005 meq/g
Alkalinity ..... Max. 0.0002 meq/g
Transmittance (270 nm) ..... Min. 10 %
Transmittance (275 nm) ..... Min. 50 %
Transmittance (290 nm) ..... Min. 80 %
Transmittance (300 nm) ..... Min. 90 %
Transmittance (330 nm) ..... Min. 98 %

Size	Packaging	Cat. No.
1 L	Amber Glass Bottle	BDH83634.100
4 L	Amber Glass Bottle	BDH83634.400

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

Ethyl Acetate, HiPerSolv CHROMANORM® for HPLC

Assay ..... Min. 99.8 %
Acidity ..... Max. 0.0005 meq/g
Alkalinity ..... Max. 0.0002 meq/g
Evaporation Residue ..... Max. 5 ppm
Water ..... Max. 0.1 %
Transmittance (260 nm) ..... Min. 70 %
Transmittance (270 nm) ..... Min. 90 %
Transmittance (300 nm) ..... Min. 96 %

Size	Packaging	Cat. No.
1 L	Amber Glass Bottle	BDH83621.1
4 L	Amber Glass Bottle	BDH83621.400

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

n-Heptane, HiPerSolv CHROMANORM® for HPLC

Assay (on anhydrous substance) ..... Min. 99 %
Acidity ..... Max. 0.0005 meq/g
Alkalinity ..... Max. 0.0002 meq/g
Evaporation Residue ..... Max. 10 ppm
Water ..... Max. 100 ppm
Transmittance (210 nm) ..... Min. 50 %
Transmittance (220 nm) ..... Min. 80 %
Transmittance (245 nm) ..... Min. 98 %

Size	Packaging	Cat. No.
1 L	Amber Glass Bottle	BDH24539.100
4 L	Amber Glass Bottle	BDH24539.400

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

n-Hexane, 97%, HiPerSolv CHROMANORM® for HPLC

From the exclusive family of high-quality, competitively-priced BDH Chemicals — high purity solvents for HPLC applications. These solvents are manufactured at a state of the art European ISO 9001/ISO 14001 solvent production facilities and feature an unparalleled combination of performance and price for even the most demanding liquid chromatography applications.

Assay (GC) ..... Min. 97 %
Water ..... Max. 0.005 %
Non-volatile residue ..... Max. 0.0005 %
Acidity ..... Max. 0.0003 meq/g
Alkalinity ..... Max. 0.0002 meq/g
Transmittance (210 nm) ..... Min. 50 %
Transmittance (220 nm) ..... Min. 80 %
Transmittance (245 nm) ..... Min. 98 %

Size	Packaging	Cat. No.
1 L	Amber Glass Bottle	BDH24575.100E
4 L	Amber Glass Bottle	BDH24575.400

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

Isopropyl Alcohol, HiPerSolv CHROMANORM® for HPLC

From the exclusive family of high-quality, competitively-priced BDH Chemicals — high purity solvents for HPLC applications. These solvents are manufactured at a state of the art European ISO 9001/ISO 14001 solvent production facilities and feature an unparalleled combination of performance and price for even the most demanding liquid chromatography applications.

Assay (GC) ..... Min. 99.8 %
Water ..... Max. 0.1 %
Non-volatile residue ..... Max. 0.0005 %
Acidity ..... Max. 0.0005 meq/g
Alkalinity ..... Max. 0.0002 meq/g
Transmittance (220 nm) ..... Min. 50 %
Transmittance (230 nm) ..... Min. 80 %
Transmittance (250 nm) ..... Min. 98 %

Size	Packaging	Cat. No.
1 L	Amber Glass Bottle	BDH20880.100
1 L	Amber Glass Bottle with 45 mm Neck	BDH20880.100E
4 L	Amber Glass Bottle	BDH20880.400

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

Methanol, HiPerSolv CHROMANORM® gradient for HPLC

From the exclusive family of high-quality, competitively-priced BDH Chemicals — high purity solvents for HPLC applications. These solvents are manufactured at a state of the art European ISO 9001/ISO 14001 solvent production facilities and feature an unparalleled combination of performance and price for even the most demanding liquid chromatography applications.

Assay (on anhydrous substance) ..... Min. 99.8 %
Acidity ..... Max. 0.0003 meq/g
Alkalinity ..... Max. 0.0002 meq/g
Evaporation residue ..... Max. 5 ppm
Water ..... Max. 0.03 %
Transmittance (220 nm) ..... Min. 50 %
Transmittance (235 nm) ..... Min. 80 %
Transmittance (260 nm) ..... Min. 98 %

Size	Packaging	Cat. No.
1 L	Amber Glass Bottle with 45 mm Neck	BDH20864.100E
4 L	Amber Glass Bottle	BDH20864.400
5 L	Aluminum Bottle	BDH20864.500

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

Tetrahydrofuran, HiPerSolv CHROMANORM® for HPLC

Not stabilized.

Assay (by GC-FID) (Corrected for Water) ..... Min. 99.70%
Water (by KF coulometry) ..... Max. 0.1000%
Residue after evaporation ..... Max. 0.0005%
Acidity ..... Max. 0.0005 meq/g
Transmittance at 230 nm ..... Min. 40%
Transmittance at 240 nm ..... Min. 60%
Transmittance at 250 nm ..... Min. 70%
Transmittance at 260 nm ..... Min. 80%
Transmittance at 280 nm ..... Min. 96%
Transmittance at 300 nm ..... Min. 98%

Size	Packaging	Cat. No.
1 L	Amber Glass Bottle	**BDH28559.100**
4 L	Amber Glass Bottle	**BDH28559.400**

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

Toluene, HiPerSolv CHROMANORM® for HPLC

Assay (GC) ..... Min. 99.8 %
Acidity ..... Max. 0.0005 meq/g
Alkalinity ..... Max. 0.0002 meq/g
Evaporation residue ..... Max. 5 ppm
Water ..... Max. 0.05 %
Transmittance (300 nm) ..... Min. 70 %
Transmittance (310 nm) ..... Min. 80 %
Transmittance (330 nm) ..... Min. 95 %
Transmittance (350 nm) ..... Min. 98 %
Conforms to BDH 15295 ..... Passes test

Size	Packaging	Cat. No.
1 L	Amber Glass Bottle	**BDH83625.100**
4 L	Amber Glass Bottle	**BDH83625.400**

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

Water, HiPerSolv CHROMANORM® for HPLC

From the exclusive family of high-quality, competitively-priced BDH Chemicals — high purity solvents for HPLC applications. These solvents are manufactured at a state of the art European ISO 9001/ISO 14001 solvent production facilities and feature an unparalleled combination of performance and price for even the most demanding liquid chromatography applications.

Filtered at 0.2 µm ..... Passes Test
Coloration ..... Max. 10 APHA
Evaporation Residue ..... Max. 1 ppm
Spec. Conductivity (25°C) (at filling) ..... Max. 1 µS/cm
Total Organic Carbon (TOC) ..... Max. 10 ppb
Absorbance (200 nm) ..... Max. 0.01
Absorbance (210 nm) ..... Max. 0.01
Absorbance (220 nm) ..... Max. 0.01
Absorbance (240 nm) ..... Max. 0.01
Absorbance (254 nm) ..... Max. 0.005
Absorbance (280 nm) ..... Max. 0.005
Absorbance (300 nm) ..... Max. 0.005
Fluorescence (as quinine) (254 nm) ..... Max. 1 ppb
Fluorescence (as quinine) (365 nm) ..... Max. 0.5 ppb
Gradient Grade (210 nm) ..... Max. 5 mAU
Gradient Grade (254 nm) ..... Max. 1 mAU

Size	Packaging	Cat. No.
1 L	Amber Glass Bottle	**BDH23595.100**
1 L	Amber Glass Bottle with 45 mm Neck	**BDH23595.100E**
4 L	Amber Glass Bottle	**BDH23595.400**

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

For more HPLC Solvent choices, see pages 23-30.

GAS CHROMATOGRAPHY

GC SYSTEMS

GC COLUMNS

GC SOLVENTS

GC-2010 Plus Gas Chromatograph, Shimadzu

Out of the box, the GC-2010 Plus is ready to perform high-speed GC utilizing the latest in ultra narrow-bore capillary columns. The fourth generation Advanced Flow Controller delivers up to 1200 mL/min, 140 psi of pressure and supports split ratios of 9999:1. The GC oven is capable of 20 temperature program ramps and hold steps, and features rapid cooling: 300º C to 50º C <3.5 minutes. In addition, the GC-2010 Plus features best-in-class detectors to meet increasing sensitivity demands for trace-level analysis, long-term stability of peak retention times, and excellent precision, even when using highly volatile solvents. Advanced Flow Technology accessories enable application-specific configurations.

Ordering Information: Installation included.

Description	Cat. No.
GC-2010 Plus Gas Chromatograph	**89217-154**

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

GCMS-QP2010 SE Gas Chromatograph Mass Spectrometer, Shimadzu

An advanced standard model, the GCMS-QP2010SE combines the benefits of economy, simple operation and enhanced performance for enhanced productivity and sample throughput. The GCMS-QP2010SE has a mass range of 1.5-1000 AMU and will accept a maximum column flow of 4 ml/min. This system scans up 10,000 AMU per second, and can measure 1pg of OFN (Octafluoronaphthalene) at over 200/1 RMS in scan mode. Front ion source access and ease of maintenance are standard on all Shimadzu GCMS Systems. The GC-2010 includes one Split/Splitless injection port with AFC-2010 (Advanced Flow Control) that provides pressure up to 970kpa and flow up to 1200mL per minute. The AFC provides control of all parameters related to the injection port including constant column linear velocity, split ratio, total flow, column flow, and septum purge flow. The oven supports 20 temperature programming steps.

GCMSsolution software contains many wizard driven features including Scan/SIM acquisition (FASST), automated creation of SIM acquisition parameters (COAST), and automated retention time updating based upon retention index (AART).

Ordering Information: Installation included.

	Cat. No.
GCMS-QP2010 SE Gas Chromatograph Mass Spectrometer	**89217-158**

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

GCMS-QP2010 Ultra Gas Chromatograph Mass Spectrometer (EI Package), Shimadzu

Shimadzu's most advanced gas chromatograph mass spectrometer, the GCMS-QP2010 Ultra features best-in-class scan speed and sensitivity, making this the perfect instrument for Fast GC or comprehensive GC/MS (GCxGCMSq) analyses. This package includes a GC-2010 Plus gas chromatograph and QP-2010 Ultra quadrupole mass spectrometer with dual inlet differential vacuum system 179L/sec + 185L/sec for He. Key features include maximum scan speed of 20,000 µ/sec (achieved with patented technology), a mass range of 1.5-1090, and a newly developed "Ecology mode" that significantly reduces power and carrier gas consumption. This system can measure 1pg of OFN (Octafluoronaphthalene) at over 500/1 RMS in scan mode. Front ion source access and ease of maintenance are standard on all Shimadzu GCMS Systems. The GC-2010 is a state-of-the-art Gas Chromatograph giving unsurpassed performance and reliability. This GC includes one Split/Splitless injection port with AFC. The AFC (Advanced Flow Control) provides control of all parameters related to the injection port including split ratio and septum purge flow. The oven supports 20 temperature programming steps and delivers rapid oven cool-down–from 350° to 50° in 2.7 minutes.

GCMSsolution software contains many wizard driven features including Scan/SIM acquisition (FASST), automated creation of SIM acquisition parameters (COAST), and automated retention time updating based upon retention index (AART).

Ordering Information: Installation included.

	Cat. No.
GCMS-QP2010 Ultra Gas Chromatograph Mass Spectrometer	**89217-160**

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

SilTite™ FingerTite GC Ferrule Systems, SGE

SilTite FingerTite is a GC ferrule system that has been designed to be installed only with the force of you fingers, delivering an easy, leak and maintenance free seal.

These ferrules are for use with MS, high throughput laboratories. Starter kits are available for Agilent, PerkinElmer, Shimadzu, Thermo Scientific and Varian/Bruker MC-MS systems.

RoHS compliant per Directive 2011/65/EU.

Ordering Information: Each starter kit includes all the parts necessary to convert one GC system (one injector and one detector) to the SilTite FingerTite system. In addition there are 5 SilTite FingerTite nuts, one packet (10 ferrules) of 0.4 mm ID SilTite FingerTite ferrules (suitable for installing 0.1 - 0.25 mm ID capillary columns) and a ferrule install tool which allows you to seat the ferrule in the correct position on the capillary column.

Description	For Use With	Cat. No.
Starter Kits		
SilTite™ FingerTite Starter Kit	Agilent Capillary/FID	**89232-154**
SilTite™ FingerTite Starter Kit	Agilent INJ/FID	**97051-946**
SilTite™ FingerTite Starter Kit	Agilent INJ/MS	**97051-948**

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

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Description	For Use With	Cat. No.
SilTite™ FingerTite Starter Kit	PerkinElmer INJ/FID	89232-182
SilTite™ FingerTite Starter Kit	PerkinElmer INJ/MS	89232-188
SilTite™ FingerTite Starter Kit	Shimadzu 17A INJ/FID	97051-954
SilTite™ FingerTite Starter Kit	Shimadzu 17A INJ/MS	97051-956
SilTite™ FingerTite Starter Kit	Shimadzu 2010 INJ/FID	97051-950
SilTite™ FingerTite Starter Kit	Shimadzu 2010 INJ/MS	97051-952
SilTite™ FingerTite Starter Kit	Thermo INJ/DSQ/DSQII (not for Thermo 1300)	89232-168
SilTite™ FingerTite Starter Kit	Thermo INJ/FID (not for Thermo 1300)	89232-160
SilTite™ FingerTite Starter Kit	Thermo INJ/ISQ (not for Thermo 1300)	89232-166
SilTite™ FingerTite Starter Kit	Varian/Bruker INJ/FID	89232-170
SilTite™ FingerTite Starter Kit	Varian/Bruker INJ/MS (not for 220, 1200, 2000 or 4000 MS Systems)	89232-176

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

Ferrules for Agilent 5890,6890 and 6850 Instruments, Thermo Scientific

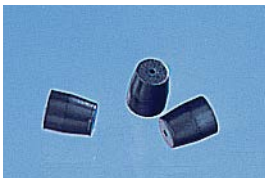
Wide range of choices for a wide range of instruments and applications.

Description	Material	Cat. No.
SilTite Kit for Agilent MS Detectors	SilTite Metal	10055-082
SilTite Kit for Agilent MS Detectors	SilTite Metal	10055-084
Replacement Ferrules	SilTite Metal	10055-088
Replacement Ferrules	SilTite Metal	10055-090
Replacement Ferrules	SilTite Metal	10055-092
SilTite Kit for TRACE 1300 / Agilent SSL Injectors	SilTite Metal	10055-098
SilTite Kit for TRACE 1300 / Agilent SSL Injectors	SilTite Metal	10055-100
SilTite Kit for TRACE 1300 / Agilent SSL Injectors	SilTite Metal	10055-102
Ferrules for TRACE 1300 / Agilent SSL Injectors and non-MS Detectors	15% Graphite/85% Vespel	10055-142
Ferrules for TRACE 1300 / Agilent SSL Injectors and non-MS Detectors	15% Graphite/85% Vespel	10055-144
Ferrules for TRACE 1300 / Agilent SSL Injectors and non-MS Detectors	15% Graphite/85% Vespel	10055-156
Ferrules for Agilent MS Detectors	15% Graphite/85% Vespel	10055-158
Ferrules for Thermo Scientific TRACE Cold On-Column Injectors	15% Graphite/85% Vespel	10055-740
Ferrules for Agilent Injectors and non-MS Detectors	100% Graphite	10055-778
Ferrules for Agilent Injectors and non-MS Detectors	100% Graphite	10055-780
Ferrules for TRACE 1300 / Agilent Injectors and non-MS Detectors	100% Graphite	10055-910
Ferrules for TRACE 1300 / Agilent Injectors and non-MS Detectors	100% Graphite	10055-912

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

Graphite and Vespel®/Graphite Ferrules, Restek

Graphite ferrules are made from highly compressed ribbon that will not crack or split under torque. They are preconditioned to eliminate out-gassing, and contain no binders that can off-gas or adsorb analytes. High-purity, high-density graphite ferrules are stable to 450°C (842°F). Vespel®/graphite (60%/40%) ferrules seal easily with minimal torque, are reusable, and are preferred for vacuum and high-pressure uses. Vespel®/graphite ferrules are stable to 400°C (752°F).



Description	Column I.D.	Ferrule I.D.	Cat. No.
Graphite Ferrules	0.32 mm	0.5 mm	RK20201
Graphite Ferrules	0.45/0.53 mm	0.8 mm	RK20202
Standard Graphite Ferrules for 1/4" O.D. Tubing		1/4"	RK20210
Vespel®/Graphite Ferrules	0.18/0.25/0.28 mm	0.4 mm	RK20211
Vespel®/Graphite Ferrules	0.32 mm	0.5 mm	RK20212
Vespel®/Graphite Ferrules	0.45/0.53 mm	0.8 mm	RK20213
Compact Graphite Ferrules for HP Capillary Injection Ports	0.25/0.28 mm	0.4 mm	RK20251
Compact Graphite Ferrules for HP Capillary Injection Ports	0.45/0.53 mm	0.8 mm	RK20252
Compact Graphite Ferrules for HP Capillary Injection Ports	0.45/0.53 mm	0.8 mm	RK20253

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

Injection Port Liners for Agilent Instruments, Thermo Scientific

Highly deactivated and produced to exacting tolerances to ensure a high degree of reproducibility.

Description	Format	I.D. x L	O.D.	Cat. No.
Split/Splitless FocusLiner	Analytical	4 x 78.5 mm	6.3 mm	**10055-328**
Split/Splitless FocusLiner	Analytical	4 x 78.5 mm	6.3 mm	**10055-330**
Split Straight with Wool	Analytical	4 x 78.5 mm	6.3 mm	**10055-332**
Split/Splitless FAST FocusLiner	Analytical	2.3 x 78.5 mm	6.3 mm	**10055-334**
Split Straight	Analytical	4 x 78.5 mm	6.3 mm	**10055-336**
Split/Splitless, Recessed Gooseneck, Wool	Analytical	4 x 78.5 mm	6.3 mm	**10055-338**
Split/Splitless FocusLiner, Single Taper, Wool	Analytical	4 x 78.5 mm	6.3 mm	**10055-340**
Split/Splitless FocusLiner, Single Taper, Wool	Analytical	4 x 78.5 mm	6.3 mm	**10055-342**
Direct Straight	Analytical	4 x 78.5 mm	6.3 mm	**10055-344**
Split/Splitless, Single Taper	Analytical	4 x 78.5 mm	6.3 mm	**10055-346**
Split/Splitless, Double Taper	Analytical	4 x 78.5 mm	6.3 mm	**10055-348**
Splitless, Single Taper, Wool	Analytical	4 x 78.5 mm	6.3 mm	**10055-352**
Cyclo/Single Gooseneck	Analytical	5.2 x 78.5 mm	6.3 mm	**10055-354**
Single Gooseneck	Analytical	5.2 x 78.5 mm	6.3 mm	**10055-356**
Cyclosplitter	Analytical	5.2 x 78.5 mm	6.3 mm	**10055-358**
Split/Splitless, Wool	Analytical	5.2 x 78.5 mm	6.3 mm	**10055-360**
Split Straight with Wool	Analytical	4 x 78.5 mm	6.3 mm	**10055-362**
Splitless Straight with Wool	Analytical	2 x 78.5 mm	6.3 mm	**10055-364**
Split/Splitless FAST FocusLiner	Analytical	2.3 x 78.5 mm	6.3 mm	**10055-366**
Split Straight	Analytical	4 x 78.5 mm	6.3 mm	**10055-368**
Splitless with Recessed Gooseneck	Analytical	2 x 78.5 mm	6.3 mm	**10055-372**
Split/Splitless, Single Taper	Analytical	4 x 78.5 mm	6.3 mm	**10055-376**
Split/Splitless, Double Taper	Analytical	4 x 78.5 mm	6.3 mm	**10055-378**
Split/Splitless FAST FocusLiner, Single Taper, Wool	Analytical	2.3 x 78.5 mm	6.3 mm	**10055-380**
Split/Splitless Mixed Pack	Analytical	4 x 78.5 mm	6.3 mm	**10055-382**

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

Inlet Liner ConnecTite™, SGE

The SGE inlet liner range aims to make it simple for all gas chromatographers to select the correct liner. Choosing the right inlet liner and injection parameters can increase peak areas and reduce detection limits by up to 300 %. Liners are easy to choose. They are color coded by geometry to simplify your selection. Liners are easy to use, containing o-rings. These liners will give you confidence in your analysis with certified deactivation.

ConnecTite liners facilitate maximum transfer of sample to the GC column and inhibit sample degradation by reducing contact with hot metal components inside the inlet. A hole in the liner body maintains gas flows in systems equipped with electronic pressure control. ConnecTite liners with a hole near the bottom are ideal for analyses where early eluting compounds may be affected by a tailing solvent peak. ConnecTite liners with a hole at the top improve analyses of aqueous samples. ConnecTite liners with a hole at the top are also ideal for analyses where compounds of interest elute away from the solvent peak. Liners are low bleed.

ConnecTite liners are recommended for use in trace level analysis, direct injection, active compounds and aqueous samples or injection modes.

RoHS compliant per Directive 2011/65/EU

Ordering Information: ConnecTite available for Agilent, PerkinElmer, Shimadzu 2010, Thermo Scientific, and Bruker/Varian 1075/1077 injectors.

Description	Format	For Use With	I.D. x L	Cat. No.
Standard Liner	Analytical	Agilent 5890/6850/6890/7890/HP4890	4 x 78.5 mm	**89205-574**
Top Hole Liner	Analytical	Agilent 5890/6850/6890/7890/HP4890	4 x 78.5 mm	**89205-578**
Bottom Hole Liner	Analytical	Agilent 5890/6850/6890/7890/HP4890	4 x 78.5 mm	**89205-582**
Standard Liner	Analytical	Shimadzu 2010	4 x 78.5 mm	**89205-586**
Top Hole Liner	Analytical	Shimadzu 2010	3.4 x 95 mm	**89205-588**
Top Hole Liner	Analytical	Shimadzu 2010	3.4 x 95 mm	**89205-590**
Bottom Hole Liner	Analytical	Shimadzu 2010	3.4 x 95 mm	**89205-592**
Bottom Hole Liner	Analytical	Shimadzu 2010	3.4 x 95 mm	**89205-594**
Standard Liner	Analytical	THERMO Trace/Focus	5 x 105 mm	**89205-596**
Standard Liner	Analytical	THERMO Trace/Focus	3.4 x 95 mm	**89205-598**
Top Hole Liner	Analytical	THERMO Trace/Focus	5 x 105 mm	**89205-600**
Top Hole Liner	Analytical	THERMO Trace/Focus	5 x 105 mm	**89205-602**
Bottom Hole Liner	Analytical	THERMO Trace/Focus	5 x 105 mm	**89205-604**
Bottom Hole Liner	Analytical	THERMO Trace/Focus	5 x 105 mm	**89205-606**

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

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Description	Format	For Use With	I.D. x L	Cat. No.
Standard Liner	Analytical	PerkinElmer, Autosystem/Clarus500	4 x 92 mm	**89205-610**
Top Hole Liner	Analytical	PerkinElmer, Autosystem/Clarus500	4 x 92 mm	**89205-614**
Bottom Hole Liner	Analytical	PerkinElmer, Autosystem/Clarus500	4 x 92 mm	**89205-616**
Bottom Hole Liner	Analytical	PerkinElmer, Autosystem/Clarus500	4 x 92 mm	**89205-618**
Standard Liner	Analytical	BRUKER 1075/1077	4 x 72 mm	**89205-620**
Standard Liner	Analytical	BRUKER 1075/1077	4 x 72 mm	**89205-622**
Top Hole Liner	Analytical	BRUKER 1075/1077	4 x 72 mm	**89205-624**
Top Hole Liner	Analytical	BRUKER 1075/1077	4 x 72 mm	**89205-626**
Bottom Hole Liner	Analytical	BRUKER 1075/1077	4 x 72 mm	**89205-628**

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

Drilled Uniliner® Liners for Agilent GCs, Restek

Drilled Uniliner liners permit direct injections in EPC-equipped GC systems. Designed for Agilent GCs with 0.25, 0.32, and 0.53mm column I.D. Liners with a hole near the top are ideal for aqueous injections, as well as for the analysis of specific compounds that tend to elute away from the solvent peak. Liners with a hole near the bottom are ideal for the analysis of specific compounds that could be affected by a tailing solvent peak.

Description	Format	I.D. x L	Cat. No.
Liner with Bottom Hole	Analytical	4 x 78.5 mm	**RK20771**
Siltek®-Deactivated Liner with Top Hole	Analytical	4 x 78.5 mm	**RK21055-214.5**
Liner with Top Hole	Analytical	4 x 78.5 mm	**RK21055**

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

Inlet Seals, Restek

For Agilent 5890/6890 split/splitless injection ports. Made from a special grade of stainless steel, which is softer and deforms easily to make a completely leakproof seal. Column lifetime can be increased because oxygen cannot permeate into the carrier gas. Detector noise is also reduced with high sensitivity detectors.

Stainless steel seals should be used for normal analysis. For reduced breakdown and adsorption of active compounds, gold-plated or Silcosteel™-treated seals should be used. The gold surface offers increased inertness over stainless steel. Silcosteel™-treated seals offer inertness similar to that of a fused silica capillary column.

Note: Due to the deformation of the seating surface, reusing inlet seals is not recommended.

Description	I.D.	Cat. No.
Stainless Steel Inlet Seals	1.2 mm	**RK20391**
Gold-Plated Inlet Seals	1.2 mm	**RK21306**
Gold-Plated Inlet Seals	0.8 mm	**RK21317**
Gold-Plated Inlet Seals	0.8 mm	**RK21318**
Silcosteel™-Treated Inlet Seals	0.8 mm	**RK21320**

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

Thermo Scientific Septa, Thermo Scientific

A wide range to cover most applications.

Description	Format	Cat. No.
BTO Septa	9 mm	**10056-080**
BTO Septa	11.5 mm	**10056-070**
BTO Septa	12.7 mm	**10056-068**
BTO Septa	12.7 mm	**10056-082**
BTO Septa	17 mm	**10056-066**
TR-Green Septa	9 mm	**10056-090**
TR-Green Septa	11.5 mm	**10056-088**
TR-Green Septa	12.7 mm	**10056-086**
TR-Green Septa	17 mm	**10056-084**

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

Premium Non-Stick BTO® Septa, Restek

These premium, non-stick septa are usable to 400°C inlet temperature. The new plasma coating eliminates sticking in the injection port. Precision molding ensures consistent, accurate fit. Septa feature a partial pre-drilled CenterGuide design. Each batch is GC-FID Tested. Septa are packaged in ultra-clean blister packs. They are preconditioned and ready to use.

Description	Cat. No.
CenterGuide Septa, 5 mm	10058-012
CenterGuide Septa, 9 mm	10058-014
CenterGuide Septa, 9 mm	10058-016
CenterGuide Septa, 9.5 mm	10058-018
CenterGuide Septa, 9.5 mm	10058-020
CenterGuide Septa, 10 mm	10058-022
CenterGuide Septa, 10 mm	10058-024
CenterGuide Septa, 11 mm	10058-026
CenterGuide Septa, 11 mm	10058-028
CenterGuide Septa, 11.5 mm	10058-030
CenterGuide Septa, 11.5 mm	10058-032
CenterGuide Septa, 12.7 mm	10058-034
CenterGuide Septa, 12.7 mm	10058-036
CenterGuide Septa, 17 mm	10058-038
CenterGuide Septa, 17 mm	10058-040
Shimadzu Plug	10058-042
Shimadzu Plug	10058-044

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

VWR® Hydrogen Generators

VWR® Hydrogen Generators can operate continuously or be set to supply only as much hydrogen as needed for applications such as GC, ELCD, and AED.

Generators are designed to produce hydrogen gas at a purity of 99.9995% or greater and only require 30.5cm² (1sq.ft.) of bench space. The hydrogen gas is produced by electrolytic dissociation of water before passing through a desiccant cartridge. Safety features include low-water audible alarms to indicate when the reservoir needs to be refilled and automatic shutdown to protect the equipment. Low maintenance systems eliminate inconvenient extended downtime.

Dimensions	Flow Capacity	Weight	Cat. No.
33W x 38.1D x 35.6H cm (13 x 15 x 14")	100 cc/min.	18.1 kg (40 lbs.)	97001-250
30W x 33D x 58H cm (12 x 12 x 22")	150 cc/min.	26 kg (58 lbs.)	89209-862
33W x 38.1D x 35.6H cm (13 x 15 x 14")	165 cc/min.	18.1 kg (40 lbs.)	97001-252
30W x 33D x 58H cm (12 x 12 x 22")	300 cc/min.	26 kg (58 lbs.)	89209-864
33W x 38.1D x 35.6H cm (13 x 15 x 14")	260 cc/min.	18.1 kg (40 lbs.)	97001-254
33W x 38.1D x 35.6H cm (13 x 15 x 14")	510 cc/min.	18.1 kg (40 lbs.)	97001-256

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

VWR® Zero Air Generators

- Eliminate Dangerous Gas Cylinders from Lab
- Recommended and Used by Major GC and Column Manufacturers

Systems produce UHP zero air with a purity level below 0.05ppm total hydrocarbon content from a compressed air supply. The air generated can be used as support gas for total hydrocarbon analyzers, as nebulizer and exhaust pump gas for LC/MS instruments, or as oxidants/support gas for GC with FID, FPD, and NPD detectors. The generators are engineered for easy installation, operation, and long-term performance. All that is required for installation is a standard compressed air line and an electrical outlet.

Dimensions	Flow Capacity	Weight	Cat. No.
24.8W x 14.6D x 30.5H cm (9 3/4 x 5 3/4 x 12")	7.0 L/min.	5 kg (11 lbs.)	26000-024
24.8W x 14.6D x 30.5H cm (9 3/4 x 5 3/4 x 12")	18.0 L/min.	5 kg (11 lbs.)	26000-026
24.8W x 14.6D x 30.5H cm (9 3/4 x 5 3/4 x 12")	30.0 L/min.	5 kg (11 lbs.)	26000-028
25W x 8D x 30H cm (10 x 3 x 12")	1.0 L/min.	3 kg (7 lbs.)	89237-564
25.4W x 7.62D x 30.5H cm (10 x 3 x 12")	3.5 L/min.	3.2 kg (7 lbs.)	89237-566

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

Velocity-1 GC Columns, PerkinElmer®

General purpose columns feature a highly versatile phase that is extremely rugged, and exhibit a long column lifetime and high operating temperatures. Ideal for the analysis of non-polar petrochemical samples, such as detailed hydrocarbon analysis, hydrocarbon gases, petroleum oxygenates, petroleum aromatics, fuels, waxes, oils, sulfur compounds, mercaptans, and carbon disulfide. Excellent phase for solvents, chemicals, flavors, fragrances, essential oils, air toxins, chlorofluorocarbons, arson analysis, pesticides, and hydrocarbons. Phase composition: 100% dimethyl polysiloxane.

Excellent for standard daily test applications. Combine quality and affordability with reproducible results. Feature excellent results for theoretical plates, selectivity, and tailing factor tests, as well as a robust column cage and low baseline noise.

These fused silica columns yield exceptional performance for general GC applications without the cost associated with GC/MS analysis. An enhanced, stringent manufacturing process limits peak characteristic variations from column-to-column and lot-to-lot.

Format	I.D. x L	Film Thickness	Cat. No.
Capillary	0.25 mm x 15 m	1.00 ?m	**97054-278**
Capillary	0.25 mm x 30 m	0.25 ?m	**97054-282**
Capillary	0.32 mm x 30 m	0.25 ?m	**97054-294**
Capillary	0.25 mm x 15 m	0.25 ?m	**97054-296**
Capillary	0.25 mm x 60 m	0.25 ?m	**97054-298**
Capillary	0.32 mm x 30 m	1.00 ?m	**97054-300**
Capillary	0.25 mm x 30 m	1.00 ?m	**97054-304**
Capillary	0.32 mm x 60 m	1.00 ?m	**97054-306**
Capillary	0.25 mm x 60 m	1.00 ?m	**97054-314**
Capillary	0.32 mm x 30 m	3.00 ?m	**97054-316**

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

Velocity-Wax GC Columns, PerkinElmer®

Ideal for intermediate- to high-polarity compounds. General GC applications include essential oils, polar industrial chemicals, and alcohol mixtures. Phase composition: polyethylene glycol.

Excellent for standard daily test applications. Combine quality and affordability with reproducible results. Feature excellent results for theoretical plates, selectivity, and tailing factor tests, as well as a robust column cage and low baseline noise.

These fused silica columns yield exceptional performance for general GC applications without the cost associated with GC/MS analysis. An enhanced, stringent manufacturing process provides rugged durability and extended lifetimes, and limits peak characteristic variations from column-to-column and lot-to-lot.

Format	I.D. x L	Film Thickness	Cat. No.
Capillary	0.32 mm x 30 m	0.25 ?m	**97054-286**
Capillary	0.25 mm x 30 m	0.25 ?m	**97054-288**
Capillary	0.32 mm x 30 m	0.50 ?m	**97054-292**
Capillary	0.53 mm x 30 m	1.00 ?m	**97054-302**

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

Rtx®-1301 GC Columns, Restek

General-purpose columns designed for use with residual solvents, alcohols, oxygenates, and volatile organic compounds. The cyanosilicone bonded stationary phase offers low bleeds, long lifetimes, and increased inertness. Polymer is fully characterized to ensure long-term reproducibility, column to column consistency, and low bleed even with sensitive detectors such as ECDs and MSDs. Equivalent to USP G43 phase.

Phase composition: 6% cyanopropylphenyl/94% dimethyl polysiloxane.

Description	I.D. x L	Film Thickness	Cat. No.
Rtx-1301 GC Column	0.25 mm x 30 m	0.25 µm	**10058-376**
Rtx-1301 GC Column	0.25 mm x 60 m	1.40 µm	**10803-098**
Rtx-1301 GC Column	0.32 mm x 30 m	1.80 µm	**10803-100**
Rtx-1301 GC Column	0.25 mm x 15 m	0.50 µm	**10803-182**
Rtx-1301 GC Column	0.25 mm x 15 m	0.25 µm	**10849-764**
Rtx-1301 GC Column	0.53 mm x 50 m	0.50 µm	**10850-226**
Rtx-1301 GC Column	0.32 mm x 60 m	1.80 µm	**10850-502**
Rtx-1301 GC Column	0.25 mm x 15 m	0.25 µm	**RK16020**
Rtx-1301 GC Column	0.32 mm x 15 m	0.25 µm	**RK16021**
Rtx-1301 GC Column	0.53 mm x 15 m	0.25 µm	**RK16022**
Rtx-1301 GC Column	0.25 mm x 30 m	0.25 µm	**RK16023**
Rtx-1301 GC Column	0.32 mm x 30 m	0.25 µm	**RK16024**
Rtx-1301 GC Column	0.53 mm x 30 m	0.25 µm	**RK16025**
Rtx-1301 GC Column	0.25 mm x 60 m	0.25 µm	**RK16026**
Rtx-1301 GC Column	0.32 mm x 60 m	0.25 µm	**RK16027**

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

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Description	I.D. x L	Film Thickness	Cat. No.
Rtx-1301 GC Column	0.53 mm x 60 m	0.25 µm	**RK16028**
Rtx-1301 GC Column	0.25 mm x 15 m	0.50 µm	**RK16035**
Rtx-1301 GC Column	0.32 mm x 15 m	0.50 µm	**RK16036**
Rtx-1301 GC Column	0.53 mm x 15 m	0.50 µm	**RK16037**
Rtx-1301 GC Column	0.25 mm x 30 m	0.50 µm	**RK16038**
Rtx-1301 GC Column	0.32 mm x 30 m	0.50 µm	**RK16039**
Rtx-1301 GC Column	0.53 mm x 30 m	0.50 µm	**RK16040**
Rtx-1301 GC Column	0.25 mm x 60 m	0.50 µm	**RK16041**
Rtx-1301 GC Column	0.32 mm x 60 m	0.50 µm	**RK16042**
Rtx-1301 GC Column	0.25 mm x 15 m	1.00 µm	**RK16050**
Rtx-1301 GC Column	0.32 mm x 15 m	1.00 µm	**RK16051**
Rtx-1301 GC Column	0.53 mm x 15 m	1.00 µm	**RK16052**
Rtx-1301 GC Column	0.25 mm x 30 m	1.00 µm	**RK16053**
Rtx-1301 GC Column	0.32 mm x 30 m	1.00 µm	**RK16054**
Rtx-1301 GC Column	0.53 mm x 30 m	1.00 µm	**RK16055**
Rtx-1301 GC Column	0.25 mm x 60 m	1.00 µm	**RK16056**
Rtx-1301 GC Column	0.32 mm x 60 m	1.00 µm	**RK16057**
Rtx-1301 GC Column	0.53 mm x 60 m	1.00 µm	**RK16058**
Rtx-1301 GC Column	0.32 mm x 15 m	1.50 µm	**RK16066**
Rtx-1301 GC Column	0.53 mm x 15 m	1.50 µm	**RK16067**
Rtx-1301 GC Column	0.32 mm x 30 m	1.50 µm	**RK16069**
Rtx-1301 GC Column	0.53 mm x 30 m	1.5 µm	**RK16070**
Rtx-1301 GC Column	0.32 mm x 60 m	1.5 µm	**RK16072**
Rtx-1301 GC Column	0.53 mm x 60 m	1.5 µm	**RK16073**
Rtx-1301 GC Column	0.53 mm x 75 m	3.00 µm	**RK16076**
Rtx-1301 GC Column	0.53 mm x 15 m	3.00 µm	**RK16082**
Rtx-1301 GC Column with 5 m Integra-Guard™ column	0.53 mm x 30 m	3.00 µm	**RK16085-126**
Rtx-1301 GC Column	0.53 mm x 30 m	3.00 µm	**RK16085**
Rtx-1301 GC Column	0.53 mm x 60 m	3.00 µm	**RK16088**
Rtx-1301 GC Column	0.53 mm x 105 m	3.00 µm	**RK16091**

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

HT8 GC Capillary Column, SGE Analytical Science

More than five decades of innovative phase technologies and unique fused silica production capabilities, together provide end-to-end separation solutions for all applications.

For use with PCB congener analyses, nitro-substituted aromatics, polynuclear aromatic hydrocarbons and pesticides/herbicides.

RoHS compliant per Directive 2011/65/EU

Ordering Information: These columns do not have any suitable replacements; they are unique ultra high temperature columns.

Format	Material	Phase	I.D. x L	Film Thickness	Cat. No.
Analytical	Fused Silica	HT8	0.1 mm x 10 m	0.1 µm	**14226-014**

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

TraceGOLD GC Columns with SafeGuard, Thermo Scientific

Extend your column lifetime without compromising performance. SafeGuard is an integrated guard on the GC Column.

Description	Format	I.D. x L	Film Thickness	Cat. No.
TG-WaxMS (Polyethylene Glycol (PEG))	Capillary	0.25 mm x 30 m	0.25 µm	**10055-730**
TG-WaxMS (Polyethylene Glycol (PEG))	Capillary	0.32 mm x 30 m	0.25 µm	**10056-388**
TG-5SilMS (Similar to 5% Phenyl Methylpolysiloxane)	Capillary	0.25 mm x 15 m	0.15 µm	**10056-426**
TG-5SilMS (Similar to 5% Phenyl Methylpolysiloxane)	Capillary	0.25 mm x 30 m	0.25 µm	**10056-604**
TG-5SilMS (Similar to 5% Phenyl Methylpolysiloxane)	Capillary	0.25 mm x 30 m	0.25 µm	**10056-606**
TG-5SilMS (Similar to 5% Phenyl Methylpolysiloxane)	Capillary	0.25 mm x 30 m	0.5 µm	**10056-616**
TG-5MS (5% Phenyl Methylpolysiloxane)	Capillary	0.25 mm x 30 m	0.1 µm	**10056-676**
TG-5MS (5% Phenyl Methylpolysiloxane)	Capillary	0.25 mm x 15 m	0.25 µm	**10056-680**
TG-5MS (5% Phenyl Methylpolysiloxane)	Capillary	0.25 mm x 30 m	0.25 µm	**10056-688**
TG-5MS (5% Phenyl Methylpolysiloxane)	Capillary	0.32 mm x 30 m	0.25 µm	**10056-692**
TG-5MS (5% Phenyl Methylpolysiloxane)	Capillary	0.25 mm x 30 m	0.5 µm	**10056-708**
TG-5MS (5% Phenyl Methylpolysiloxane)	Capillary	0.18 mm x 20 m	0.18 µm	**10056-746**
TG-1MS (100% Dimethyl Polysiloxane)	Capillary	0.25 mm x 30 m	0.25 µm	**10056-758**
TG-1MS (100% Dimethyl Polysiloxane)	Capillary	0.53 mm x 30 m	1 µm	**10056-800**

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

OmniSolv® Acetonitrile Non UV, For GC

For GC and residue analysis. Not optically transparent in the UV region. Certificate of Analysis on label.

Assay (GC) ..... 99.9% min
Capillary ECD responsive substances (as PCNB) ..... 2ng/L max
Color (APHA) ..... 10 max
Filtered through 0.2 µm filter ..... To pass test
Form ..... Clear liquid
Infrared spectrum ..... Conforms to standard
Residue after evaporation ..... 1ppm max
Titrable acid ..... 8.3µeq/g max
Titrable base ..... 0.6µeq/g max
Water (H_2O) ..... 0.10% max

Size	Packaging	Cat. No.
1 L	Glass Bottle	**EM-AX0155-6**
4 L	Glass Bottle	**EM-AX0155-1**

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

OmniSolv® HR-GC Acetone

For chromatography, residue analysis, and spectrophotometry. Filtered through 0.2µm filter. Lot analysis and chromatograms on label.

Impurities by Capillary GC:

Assay (GC) ..... 99.7% min
Appearance ..... Clear liquid, free from particulates
Cap. ECD responsive substances as PCNB (peak) ..... 2ng/L max
Cap. ECD responsive substances as PCNB (total) ..... 50ng/L max
Cap. FID responsive substances as decane (peak) ..... 1µg/L max
Cap. FID responsive substances as decane (total) ..... 10µg/L max
Color (APHA) ..... 5 max
Filtered through 0.2 µm filter ..... To pass test
Residue after evaporation ..... 1ppm max
Titrable acid ..... 0.3µeq/g max
Water (H_2O) ..... 0.5% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-AX0110-1**

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

OmniSolv® Dichloromethane, Stabilized, HR-GC Grade Stabilized

For high resolution gas chromatography. Lot analysis and chromatograms on label.

Assay (by GC) ..... 99.9% min.

Size	Packaging	Cat. No.
4 L	Glass Bottle	**EM-DX0837-1**

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

OmniSolv® p-Dioxane

For spectrophotometry and chromatography. UV cutoff 215nm. Certificate of Analysis on label.

Expiration date ..... Exp 12 months from mfg date
Assay (GC) ..... 99.9% min
Boiling range ..... 101-102°C
Filtered through 0.2 µm filter ..... To pass test
Peroxide (as H_2O_2) ..... 2mg/L max
Refractive index (n 20/D) 1.4206-1.4226
Residue after evaporation ..... 1mg/L max
UV Abs. at 215 nm ..... 1.00AU max
UV Abs. at 250 nm ..... 0.300AU max
UV Abs. at 300 nm ..... 0.020AU max
UV Abs. at 350 nm ..... 0.005AU max
UV Abs. at 400 nm ..... 0.005AU max
UV Cut-off ..... 215nm max
Water (H_2O) ..... 0.05% max

Size	Packaging	Cat. No.
1 L	Glass Bottle	**EM-DX2091-6**
4 L	Glass Bottle	**EM-DX2091-1**

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

OmniSolv® HR-GC Hexanes 98.5%

For high resolution gas chromatography. Purity based on n-hexane and saturated C6 hydrocarbons. Lot analysis and chromatograms on label.

Assay (n-hexane)	Report
Assay (total aliphatic hydrocarbons <C_8)	99.9% min
Assay (total hexane isomers + methylcyclopentane)	98.5% min
Appearance	Clear liquid, free from particulates
Cap. ECD responsive substances as PCNB (peak)	2ng/L max
Cap. ECD responsive substances as PCNB (total)	20ng/L max
Cap. FID responsive substances as decane (peak)	1µg/L max
Cap. FID responsive substances as decane (total)	10µg/L max
Color (APHA)	5 max
Filtered through 0.2 µm filter	To pass test
Infrared spectrum	Conforms
Residue after evaporation	1ppm max
Titrable acid	0.2µeq/g max
Water (H_2O)	0.01% max

Size	Packaging	Cat. No.
4 L	Glass Bottle	EM-HX0297-1

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

OmniSolv® Hexanes 98.5%, for GC Analyses, Non-UV

For gas chromatography and residue analysis. Not optically transparent in the UV region. Purity based on n-hexane and saturated C6 hydrocarbons. Lot analysis on label.

Assay (n-hexane)	Report
Assay (total aliphatic hydrocarbons <C_8)	99.8% min
Assay (total hexane isomers + methylcyclopentane)	98.5% min
Boiling range	66.1-69.4°C
Capillary ECD responsive substances (as PCNB)	2ng/L max
Capillary FID responsive substances (as decane)	3µg/L max
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Form	Clear liquid
Infrared spectrum	Conforms
Residue after evaporation	1ppm max
Water (H_2O)	0.01% max

Size	Packaging	Cat. No.
1 L	Glass Bottle	EM-HX0298-6
4 L	Glass Bottle	EM-HX0298-1

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

OmniSolv® Methanol, for Purge & Trap

For use in the preparation of volatile organic standards.

Assay (GC)	99.9% min
Color (APHA)	10 max
Form	Clear liquid
Titrable acid	0.0003meq/g max
Titrable base	0.0002meq/g max
Volatile impurities (P&T) Methyl ethyl ketone	0.1ppm max
Volatile impurities (P&T) other organics	0.05ppm max

Size	Packaging	Cat. No.
1 L	Glass Bottle	EM-MX0482-6

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

OmniSolv® Methanol, Pesticide Residue Grade

Tested for use in gas chromatography and residue analysis.

Assay (GC)	99.5% min
Aldehydes and ketones	10ppm max
Cap. ECD responsive substances as PCNB (peak)	5ng/L max
Cap. ECD responsive substances as PCNB (total)	50ng/L max
Cap. FID responsive substances as decane (peak)	2µg/L max
Cap. FID responsive substances as decane (total)	20µg/L max
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Form	Clear liquid
Infrared spectrum	Conforms to standard
Residue after evaporation	1ppm max
Titrable acid	0.3µeq/g max
Water (H_2O)	0.05% max

Size	Packaging	Cat. No.
1 L	Glass Bottle	EM-MX0484-6
4 L	Glass Bottle	EM-MX0484-1

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

OmniSolv® HR-GC Methanol

Tested for use in high resolution gas chromatography. Chromatograms supplied with each bottle.

Appearance	Clear liquid, free from particulates
Assay (GC)	99.9% min
Cap. ECD responsive substances as PCNB (peak)	2ng/L max
Cap. ECD responsive substances as PCNB (total)	20ng/L max
Cap. FID responsive substances as decane (peak)	1µg/L max
Cap. FID responsive substances as decane (total)	10µg/L max
Color (APHA)	5 max
Residue after evaporation	1ppm max
Filtered through 0.2 µm filter	To pass test
Formaldehyde (HCHO)	1ppm max
Infrared spectrum	Conforms to standard
Titrable acid	0.2µeq/g max
Water (H_2O)	0.05% max

Size	Packaging	Cat. No.
1 L	Glass Bottle	EM-MX0480-6
4 L	Glass Bottle	EM-MX0480-1

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

OmniSolv® 1-Methyl-2-Pyrrolidone

Suitable for spectrophotometry and GC. Actual Lot Analysis on label. UV cutoff 285nm.

Assay (GC)	99.7% min
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Form	Clear liquid
Infrared spectrum	Conforms to standard
Residue after ignition	5ppm max
Titrable base	1µeq/g max
UV Abs. at 270 nm	1.00AU max
UV Abs. at 300 nm	0.20AU max
UV Abs. at 325 nm	0.10AU max
UV Abs. at 350 nm	0.03AU max
UV Abs. at 400 nm	0.005AU max
UV Cut-off	270nm max
Water (H_2O)	0.08% max

Size	Packaging	Cat. No.
500 mL	Glass Bottle	EM-MX1390-4
4 L	Glass Bottle	EM-MX1390-1

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

OmniSolv® 2,2,4-Trimethylpentane

EMD MILLIPORE

Suitable for spectrophotometry, chromatography, and residue analysis. UV cutoff 200nm. Certificate of analysis on label.

Assay (GC)	99.5% min
Capillary ECD responsive substances (as PCNB)	5ng/L max
Color (APHA)	10 max
Filtered through 0.2 µm filter	To pass test
Fluorescence (as quinine base)	250ppt max
Form	Clear liquid
Infrared spectrum	Conforms to standard
Residue after evaporation	1ppm max
UV Abs. at 200 nm	1.00AU max
UV Abs. at 220 nm	0.05AU max
UV Abs. at 230 nm	0.02AU max
UV Abs. at 250 nm	0.005AU max
UV Abs. at 270 nm	0.005AU max
UV Abs. at 300 nm	0.005AU max
UV Cut-off	200nm max
Water (H_2O)	0.01% max

Size	Packaging	Cat. No.
1 L	Glass Bottle	**EM-TX1389-6**
4 L	Glass Bottle	**EM-TX1389-1**
4 L	Poly-Coated Glass Bottle	**EM-TX1389P-1**

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

Acetone for Trace GC Analysis

Honeywell
Burdick & Jackson™

B&J GC2 Solvents are developed for trace analysis at or below the part-per-billion level, using capillary gas chromatography. Each lot is performance tested to meet demanding GC specifications.

Samples of every B&J GC2 solvent are concentrated 1000-fold and tested by temperature-programmed capillary GC-FID. This analysis detects both low-boiling and high-boiling molecules, anything eluting from toluene through diesel fuel and other semi-volatile compounds of environmental interest.

Features:

Less than 1 ppb trace contamination for semi-volatiles with a molecular weight greater than toluene (92).

Ideal for EPA protocols

Actual lot chromatograms available upon request

Electron capture GC: No residue peaks greater than two ng/L as lindane.

Flame ionization GC: No peaks greater than one ng/mL, having a retention time of greater than diacetone alcohol, on a crossbonded 5% diphenyl/95% dimethyl polysiloxane capillary column for a splitless injection of a 1000-fold sample concentrate after exchange into hexane.

Water by Karl Fischer Titration	0.5% Max.
GC Analysis (excluding water)	99.9% Min.
Residue	1 mg/L Max.
Refractive Index (20°C)	1.3583 Min. to 1.3589 Max.
Flame Ionization GC	1 ppb Max.
Electron Capture GC	2 ppt
(as lindane)	Passes Test
(as nonane)	Passes Test

Size	Packaging	Cat. No.
4 L	Glass Bottle	**BJGC010-4**

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

Chloroform for Trace GC Analysis Stabilized

Honeywell
Burdick & Jackson™

For trace analysis at or below the part per billion level. Ideal for EPA protocols.

Water by Karl Fisher Titration	0.02% Max.
GC Analysis	99.9% Min.
Acidity (as HCl)	1 mg/L Max.
Residue	1 mg/L Max.
Refractive Index (20°C)	1.4454 Min. to 1.4464 Max.
Flame Ionization GC (as nonane)	1 ppb Max.
Chloride	10 mg/L Max.
Electron Capture GC (as lindane)	2 ppt
GC_{049}	Passes Test

Size	Packaging	Cat. No.
4 L	Glass Bottle	**BJGC049-4**

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

Dichloromethane for Trace GC Analysis Stabilized

Honeywell
Burdick & Jackson™

For trace analysis at or below the part per billion level. Ideal for EPA protocols.

Water by Karl Fischer Titration	0.02% Max.
GC Analysis	99.9% Min.
Acidity (as HCl)	1 mg/L Max.
Residue	1 mg/L Max.
Flame Ionization GC (as nonane)	1 ppb Max.
Refractive Index (20°C)	1.4236 Min. to 1.4246 Max.
Chloride	10 mg/L Max.
Electron Capture GC (as lindane)	2 ppt

Size	Packaging	Cat. No.
4 L	Glass Bottle	**BJGC299-4**

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

Hexane for Trace GC Analysis

Honeywell
Burdick & Jackson™

For trace analysis at or below the part per billion level. Ideal for EPA protocols.

Water by Karl Fischer Titration	0.01% Max.
GC Analysis (n-Hexane)	95% Min.
GC Analysis (total C_6 isomers)	99.9% Min.
Residue	1 mg/L Max.
Flame Ionization GC	1 ppb Max.
Electron Capture GC	2 ppt
(as lindane)	Passes Test
(as nonane)	Passes Test

Size	Packaging	Cat. No.
4 L	Glass Bottle	**BJGC215-4**

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

Methanol, B&J Brand® for Purge & Trap GC Analysis

Honeywell
Burdick & Jackson™

For analysis of trace volatile organic compounds using purge and trap methods.

Suitable for EPA Method 8260B.

Minimal UV contaminants, high GC purity, low water content, outstanding lot-to-lot consistency.

GC Analysis	99.9% Min.
RI (20°C), actual value	Passes Test
Water by KF	Passes Test

Size	Packaging	Cat. No.
235 mL	Glass Bottle	**BJ232-235**
1 L	Glass Bottle	**BJ232-1L**

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

Methanol for Trace GC Analysis

Honeywell
Burdick & Jackson™

For trace analysis at or below the part per billion level. Ideal for EPA protocols.

Water by Karl Fischer Titration	0.1% Max.
GC Analysis	99.9% Min.
Residue	1 mg/L Max.
Refractive Index (20°C)	1.3280 Min. to 1.3288 Max.
Flame Ionization GC	1 ppb Max.
Electron Capture GC	2 ppt
(as lindane)	Passes Test
(as nonane)	Passes Test

Size	Packaging	Cat. No.
4 L	Glass Bottle	**BJGC230-4**

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

Petroleum Ether for Trace GC Analysis

Honeywell
Burdick & Jackson™

For trace analysis at or below the part per billion level. Ideal for EPA protocols.

Water by Karl Fischer Titration	0.01% Max.
GC Analysis (total C_5 and C_6 isomers)	99% Min.
Residue	1 mg/L Max.
Flame Ionization (as nonane)	1 ppb Max.
Refractive Index (20°C)	1.3600 Min. to 1.37 Max.
Electron Capture GC (as lindane)	2 ng/L

Size	Packaging	Cat. No.
4 L	Glass Bottle	**BJGC317-4**

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

CHROMATOGRAPHY ACCESSORIES

VWR® 9-425 Screw-Thread Vials

Vials are specifically designed with a crimp cap profile for robotic arm autosamplers but have easy-to-use screw-thread caps. Vials are manufactured from Type 1 borosilicate glass and have a maximum fill volume of 1.8mL.

Ideal for use with Agilent® 7673 and 1100 autosamplers, as well as all other 12x32mm vial format autosampler units. Certified vial kits are tested and certified to meet or exceed up to 9 critical performance parameters; certificate enclosed with kit.

Kits include preassembled polypropylene screw closures with your choice of PTFE/red rubber, PTFE/silicone/PTFE, or PTFE/silicone septa. Preassembled kits are supplied in one-compartment trays. Unassembled kits are supplied in two-compartment benchtop storage trays. Loose caps and inserts come packaged in poly bags.

Description	Capacity	O.D. x L	Bottom Style	Cap Color	Cap Size	Cap Type	Color	Septa Type	Cat. No.
Vials									
Screw Thread Glass Vials	2 mL	12 x 32 mm	Flat Bottom	—	—	—	Clear	—	**46610-722**
Screw Thread Glass Vials with ID Patch	2 mL	12 x 32 mm	Flat Bottom	—	—	—	Clear	—	**46610-724**
Screw Thread Glass Vials with ID Patch	2 mL	12 x 32 mm	Flat Bottom	—	—	—	Amber	—	**46610-726**
Graduated Polypropylene Vials	2 mL	12 x 32 mm	Flat Bottom	—	—	—	Natural	—	**89524-188**
Polypropylene Vials	400 µL	12 x 32 mm	Conical	—	—	—	Natural	—	**89524-190**
Convenience Kits									
Convenience Kit, Screw Thread Glass Vials	2 mL	12 x 32 mm	—	Black	9-425	Polypropylene	Clear	Red PTFE/White Silicone	**66009-854**
Convenience Kit, Screw Thread Glass Vials	2 mL	12 x 32 mm	—	Black	9-425	Polypropylene	Clear	Ivory PTFE/Red Rubber	**66009-858**
Convenience Kit, Screw Thread Glass Vials	2 mL	12 x 32 mm	—	Black	9-425	Polypropylene	Clear	Red PTFE/White Silicone/Red PTFE	**66009-862**
Convenience Kit, Screw Thread Glass Vials	2 mL	12 x 32 mm	—	Blue	9-425	Polypropylene	Clear	Ivory PTFE/Red Rubber	**89239-024**
Convenience Kit, Screw Thread Glass Vials	2 mL	12 x 32 mm	—	Blue	9-425	Polypropylene	Clear	Red PTFE/White Silicone	**89239-026**
Convenience Kit, Screw Thread Glass Vials	2 mL	12 x 32 mm	—	Blue	9-425	Polypropylene	Clear	Blue PTFE/White Silicone, Pre-Slit	**89239-028**
Preassembled Vial Kits									
Pre-Assembled Vial Kit, Screw Thread Glass Vials	2 mL	12 x 32 mm	—	Black	9-425	Polypropylene	Clear	Red PTFE/White Silicone	**66009-852**
Pre-Assembled Vial Kit, Screw Thread Glass Vials	2 mL	12 x 32 mm	—	Black	9-425	Polypropylene	Clear	Ivory PTFE/Red Rubber	**66009-856**
Pre-Assembled Vial Kit, Screw Thread Glass Vials	2 mL	12 x 32 mm	—	Black	9-425	Polypropylene	Clear	Red PTFE/White Silicone/Red PTFE	**66009-860**
Pre-Assembled Vial Kit, Screw Thread Glass Vials	2 mL	12 x 32 mm	—	Blue	9-425	Polypropylene	Clear	Ivory PTFE/Red Rubber	**89239-030**
Certified Convenience Kits									
Convenience Kit, Certified, Screw Thread Glass Vials with ID Patch	2 mL	12 x 32 mm	—	Black	9-425	Polypropylene	Clear	Bonded Red PTFE/White Silicone	**82030-970**
Convenience Kit, Certified, Screw Thread Glass Vials with ID Patch	2 mL	12 x 32 mm	—	Gray	9-425	Polypropylene	Clear	Bonded Clear PTFE/Clear Silicone, Pre-Slit	**82030-972**
Convenience Kit, Certified, Screw Thread Glass Vials with ID Patch	2 mL	12 x 32 mm	—	Black	9-425	Polypropylene	Amber	Bonded Red PTFE/White Silicone	**82030-974**
Convenience Kit, Certified, Screw Thread Glass Vials with ID Patch	2 mL	12 x 32 mm	—	Gray	9-425	Polypropylene	Amber	Bonded Clear PTFE/Clear Silicone, Pre-Slit	**82030-976**
Caps									
Screw Caps	—	—	—	Black	9-425	Polypropylene		Ivory PTFE/Red Rubber	**46610-708**
Screw Caps	—	—	—	Black	9-425	Polypropylene		PTFE/Silicone/PTFE	**46610-710**
Screw Caps	—	—	—	Black	9-425	Polypropylene		Red PTFE/White Silicone	**46610-712**
Screw Caps	—	—	—	Black	9-425	Polypropylene		Red PTFE/White Silicone, Pre-Slit	**82028-424**
Screw Caps	—	—	—	Blue	9-425	Polypropylene		Ivory PTFE/Red Rubber	**89239-016**
Screw Caps	—	—	—	Blue	9-425	Polypropylene		Red PTFE/White Silicone/Red PTFE	**89239-018**
Screw Caps	—	—	—	Blue	9-425	Polypropylene		Red PTFE/White Silicone	**89239-020**
Screw Caps	—	—	—	Blue	9-425	Polypropylene		Blue PTFE/White Silicone, Pre-Slit	**89239-022**

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

VWR® Vials and Closures Convenience Kits for Shimadzu HPLC Autosamplers

These convenience kits are compatible with Shimadzu™ Prominence HPLC Systems and Nexera X2 UHPLC/HPLC Systems. They come complete with vials and closures.

Featuring a soft durometer silicone septa for optimal needle penetration and recommended for Shimadzu Autosamplers. These kits offer the extra quality assurance that time after time the vials and closures will perform at a superior level.

Ordering Information: Kit includes 100 vials and 100 caps with pre-assembled septa. Reusable two-compartment trays protect vials and closures while keeping matching supplies together. Clear trays make it easy to keep track of available supplies without opening containers.

Capacity	2 mL
O.D. x L	12 x 32 mm

Description	Cap Size	Cap Type	Color	Septa Type	Cat. No.
Convenience Kit, with Patch	9-425	Blue PP	Clear	PTFE/Soft Durometer Silicone	**89523-478**
Convenience Kit, with Patch	9-425	Blue PP	Amber	PTFE/Soft Durometer Silicone	**89523-480**
Convenience Kit, Clear Vials with Patch	10-425	Black PP	Clear	Red PTFE/White Silicone, Soft	**89523-482**
Convenience Kit, Amber Vials with Patch	10-425	Black PP	Amber	Red PTFE/White Silicone, Soft	**89523-484**

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

VWR® 11 mm Standard Opening Crimp-Top Vials

VWR COLLECTION

Standard opening crimp-top vials have a maximum fill volume of 1.8 mL and are manufactured from inert, 33 expansion borosilicate glass. Inserts are made of borosilicate glass or polypropylene.

Vials are fully compatible with Agilent® 7673 and 1100 series autosamplers. Aluminum seals measure 11 mm. Vials are provided in clear-pack trays.

Description	Capacity	O.D. x L	Bottom Style	Cap Color	Color	Seal Size	Cat. No.
Vials							
Clear Vial	2 mL	12 x 32 mm	Flat Bottom	—	—	—	**66020-953**
Clear Vial with ID Patch	2 mL	12 x 32 mm	Flat Bottom	—	—	—	**82028-402**
Amber Vial with ID Patch	2 mL	12 x 32 mm	Flat Bottom	—	—	—	**82028-404**
Seals							
Aluminum Seal with Red PTFE/Synthetic White Silicone Septa	—	—	—	Silver	—	11 mm	**46610-714**
Aluminum Seal with Red PTFE/White Silicone/Red PTFE Septa	—	—	—	Silver	—	11 mm	**46610-716**
Aluminum Seal with Clear PTFE/Natural Red Rubber Septa	—	—	—	Silver	—	11 mm	**46610-744**
Aluminum Seal with Clear PTFE/Synthetic Red Rubber Septa	—	—	—	Silver	—	11 mm	**46610-754**
Inserts							
Conical Glass Insert with Poly-Support Spring	200 µL	—	Pulled Point	—	Clear	—	**46610-702**
Conical Glass Insert with Poly-Support Spring	375 µL	—	Conical	—	Clear	—	**46610-762**
Standard Conical Glass Insert	200 µL	—	Pulled Point	—	Clear	—	**82028-446**
Standard Flat-Bottom Glass Insert	250 µL	—	Flat Bottom	—	Clear	—	**82028-448**
Conical Insert with Poly-Support Spring	325 µL	—	Conical	—	Polypropylene	—	**82028-450**
Standard Conical Glass Insert	400 µL	—	Pulled Point	—	Clear	—	**82028-452**
Standard Flat-Bottom Glass Insert	500 µL	—	Flat Bottom	—	Clear	—	**82028-454**

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

VWR® 11 mm Wide Opening Crimp-Top Vials

VWR COLLECTION

Wide opening vials feature 40% larger neck opening than standard opening vials, for easier access and reduced needle damage. The maximum fill volume is 1.8 mL.

Vials are manufactured from 33 expansion borosilicate glass. Select amber vials for light-sensitive samples. Use 11mm aluminum seals. Provided in clear-pack trays.

Description	Capacity	Bottom Style	Cap Color	Seal Type	Septa Type	Cat. No.
Clear Vial	2 mL	Flat Bottom	—	—	—	**66010-539**
Amber Vial with ID Patch	2 mL	Flat Bottom	—	—	—	**46610-742**
Clear Vial with ID Patch	2 mL	Flat Bottom	—	—	—	**46610-740**
Unassembled Vial Kit with Clear Vials	2 mL	—	Silver	Aluminum	Seal 2000 PTFE/Red Rubber	**66009-864**
Unassembled Vial Kit with Clear Vials	2 mL	—	Silver	Aluminum	Clear PTFE/Red Rubber	**66009-850**
Unassembled Vial Kit with Clear Vials	2 mL	—	Silver	Aluminum	Tan PTFE/Silicone	**66009-870**
Unassembled Vial Kit with Clear Vials	2 mL	—	Silver	Aluminum	PTFE/Silicone/PTFE	**66009-866**

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

VWR® Versatile 11 mm Dual Crimp-Top/Snap-Cap Vials

VWR COLLECTION

Vials feature a versatile neck that allows closure by either snap-cap seals or aluminum crimp seals. Vials have 40% wider openings than standard vials to reduce risk of needle damage. Manufactured from clear or amber borosilicate glass or polypropylene.

Ordering Information: Vials do not come with caps. Caps are available separately. Convenience kits include 2 mL vials and unassembled snap caps.

Description	Capacity	O.D. x L	Bottom Style	Cap Color	Cap Size	Cap Type	Glass	Septa Type	Cat. No.
Vials									
Snap-Cap Vials	2 mL	12 x 32 mm	Flat Bottom	—	—	—	Clear	—	**66009-822**
Crimp-Top Vials with Fused Insert	500 µL	12 x 32 mm	Fused Conical	—	—	—	Clear	—	**82028-408**
Crimp-Top Vials with Fused Insert	500 µL	12 x 32 mm	Fused Conical	—	—	—	Amber	—	**82028-410**
Snap-Cap Vials	475 µL	12 x 32 mm	Conical Base	—	—	—	Polypropylene	—	**82028-412**
Snap-Cap Vials with ID Patch	2 mL	12 x 32 mm	Flat Bottom	—	—	—	Clear	—	**82028-414**
Snap-Cap Vials	2 mL	12 x 32 mm	Flat Bottom	—	—	—	Amber	—	**82028-416**
Convenience Kits									
Convenience Kit with Snap-Cap Vials	2 mL	12 x 32 mm	Flat Bottom	—	11 mm	Polyethylene	Clear	Clear PTFE/Red Rubber	**66009-868**
Convenience Kit with Snap-Cap Vials	2 mL	12 x 32 mm	Flat Bottom	—	11 mm	Polyethylene	Clear	Clear PTFE/White Silicone	**66009-872**
Caps									
Snap Caps	—	—	—	Clear	11 mm	Polyethylene	—	Clear PTFE/Synthetic Red Rubber	**46610-718**
Snap Caps	—	—	—	Clear	11 mm	Polyethylene	—	Red PTFE/White Silicone	**46610-720**
Snap Caps	—	—	—	Clear	11 mm	Polyethylene	—	Blue PTFE/White Silicone, Pre-Slit	**82028-418**
Snap Caps	—	—	—	Blue	11 mm	Polyethylene	—	Clear PTFE/Synthetic Red Rubber	**89239-010**
Snap Caps	—	—	—	Blue	11 mm	Polyethylene	—	Red PTFE/White Silicone	**89239-012**
Snap Caps	—	—	—	Blue	11 mm	Polyethylene	—	Blue PTFE/White Silicone, Pre-Slit	**89239-014**

Description	Cat. No.
Accessories	
Aluminum Seal with Red PTFE/Synthetic White Silicone Septa	**46610-714**
Aluminum Seal with Red PTFE/White Silicone/Red PTFE Septa	**46610-716**
Aluminum Seal with Clear PTFE/Natural Red Rubber Septa	**46610-744**
Aluminum Seal with Clear PTFE/Synthetic Red Rubber Septa	**46610-754**

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

VWR® Shell Vials

VWR COLLECTION

Designed for use in Alcott or Waters® autosamplers. The clear snap-plug closures can be pierced with standard autosampler syringes without vacuum formation. Manufactured from borosilicate glass. Vials and snap-plug closures packed separately. Provided in clear-pack trays.

For Use With	O.D. x L	Bottom Style	Glass	Cat. No.
Waters Autosamplers	8 x 40 mm	Flat Bottom	Clear	**66015-702**

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

VWR® 18 mm Screw-Thread Headspace Vials and Caps

These headspace vials are suitable for use with all common autosamplers.

The 18mm caps for these vials are magnetic and silver with various colored septas.

VWR® COLLECTION

Description	Capacity	Color	Septa Thickness	Septa Type	Cat. No.
Vials					
Glass Screw-Thread Vials	10 mL	Clear	—	—	**10119-906**
Glass Screw-Thread Vials	10 mL	Amber	—	—	**10119-908**
Glass Screw-Thread Vials	20 mL	Clear	—	—	**10119-902**
Glass Screw-Thread Vials	20 mL	Amber	—	—	**10119-904**
Caps					
Magnetic Screw Cap 45A	—	—	1.3 mm	White Silicone/Red PTFE	**10119-914**
Magnetic Screw Cap 45A	—	—	1.3 mm	Blue Silicone/White PTFE	**10119-916**
Magnetic Screw Cap 55A	—	—	1.5 mm	White Silicone/Blue PTFE	**10119-910**
Magnetic Screw Cap 55A, Star Slit	—	—	1.5 mm	White Silicone/Red PTFE, Star Slit	**10119-918**
Magnetic Screw Cap 55A	—	—	1.6 mm	Red Butyl/Grey PTFE	**10119-912**

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

VWR® 4 mL Screw-Thread Vials

VWR® COLLECTION

Designed for use with Waters® WISP® (48-position) and Shimadzu™ autosamplers. Caps have a central hole measuring 8.5 mm and a septa, ND13.

- 13-425 thread finish
- ID vials feature write-on patch with graduation for convenient sample identification
- Superior quality borosilicate glass

Description	Capacity	O.D. x L	Cap Color	Cap Size	Cap Type	Color	Septa Type	Cat. No.
Vials								
Screw-Thread Vials	4 mL	15 x 45 mm	—	—	—	Clear	—	**66010-562**
Screw-Thread Vials with Marking Spot	4 mL	15 x 45 mm	—	—	—	Clear	—	**82028-438**
Screw-Thread Vials with Marking Spot	4 mL	15 x 45 mm	—	—	—	Amber	—	**82028-440**
Preassembled Vial Kits								
Screw Thread Vials with Caps	4 mL	15 x 45 mm	Black	13-425	Polypropylene	Clear	Red PTFE/White Silicone	**66009-876**
Screw Thread Vials with Caps	4 mL	15 x 45 mm	Black	13-425	Polypropylene	Clear	Red PTFE/White Silicone	**66009-880**
Caps								
Open-Top Screw Cap	—	—	Black	13-425	Polypropylene	—	Red PTFE/White Silicone	**46610-706**
Open-Top Screw Cap	—	—	White	13-425	Polypropylene	—	Blue PTFE/White Silicone, Pre-Slit	**82028-442**
Open-Top Screw Cap	—	—	Black	13-425	Phenolic	—	Red PTFE/White Silicone	**82028-444**

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

Virtuoso™ Vial Identification System, Thermo Scientific

The Virtuoso Vial Identification System is an error-free alternative to manual vial labeling that turns a necessary chore into a value-added component within a laboratory workflow. With advanced labeling capabilities, the Virtuoso system ensures accurate vial identification and reliable data, and it increases laboratory productivity. Use the system's touch screen and network capabilities to transfer text, graphics, barcodes, and logos directly onto your vials.

Ordering Information: Convenience Kits include 100 vials and 100 caps. Accessories are available separately.

Description	Capacity	Cap Size	Cap Type	Septa Type	Cat. No.
Vial Identification System					
Virtuoso™ Vial Identification System	—	—	—	—	**10061-024**
Caps Only					
Virtuoso Crimp Top, Clear Glass	2 mL	11 mm	Crimp Top with V-Patch	—	**10081-052**
Virtuoso Snap Top, Clear Glass	2 mL	11 mm	Snap-it Top with V-Patch	—	**10081-054**
Vials Only					
Virtuoso SureStop Screw Thread Vial, Amber Glass	2 mL	9 mm	—	—	**10081-050**
Virtuoso SureStop Screw Thread Vial, Clear Glass	2 mL	9 mm	—	—	**10081-048**
Convenience Kits					
Virtuoso SureStop Convenience Kit, Clear Glass	2 mL	9 mm	Screw Thread with V-Patch	Red PTFE/White Sillicone/Red PTFE	**10081-056**
Virtuoso SureStop Convenience Kit, Clear Glass	2 mL	9 mm	Screw Thread with V-Patch	Ivory PTFE/Red Rubber	**10081-058**
Virtuoso SureStop Convenience Kit, Clear Glass	2 mL	9 mm	Screw Thread with V-Patch	Red PTFE/White Sillicone	**10081-116**

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

Fused-Insert Vials, Screw Caps w/ Pre-Slit Septa, MicroSolv™

MADE WITH RSA GLASS
RSA Reduced Surface Activity Glass

These vials have a Small Volume Insert installed and permanently "fused" in. These vials/inserts are available for Snap/Crimp Top, 9mm Screw Top Vials. The ultimate in convenience when using small volumes. These vials have screw caps with fitted PTFE/Silicone septa.

Cap Size	9 - 245
Material	Borosilicate Glass
O.D. x L	12 x 32 mm
Volume	300 µl

Description	Cap Color	Cat. No.
Easy Purchase Pack, AQ Brand, with vials w/write on patch, caps w/ bonded septa, and wide tip glass inserts	Blue	**89220-070**
Easy Purchase Pack, AQ Brand, with vials w/write on patch, AQR caps w/ fitted septa, and wide tip glass inserts	Light Blue	**89220-128**
Vials, write on, w/ fused inserts	—	**97052-668**
Easy Purchase Pack, with vials, caps w/ bonded septa, and fused glass inserts	Blue	**97057-792**

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

VWR® 96-Well Polypropylene Plates

VWR COLLECTION

VWR® 96-Well Polypropylene Plates are manufactured in a variety of sizes and well formats to meet the demanding requirements of modern laboratory applications.

These virgin polypropylene microplates offer a variety of sample volumes that are uniform dimensionally so that all covers, whether round or square, fit interchangeably on other round or square well microplates. This reduces the number of covers needed for most laboratories. There are shallow well microplates with flat, round, and conical bottoms for volumes up to 350µL. The medium well microplate has a round bottom for volumes up to 500µL. The deep well microplates are available in round well with round bottoms for volumes up to 1.0mL and square well with either a conical or round bottom for volumes up to 2.0mL.

All items are sold in packs of ten microplates.

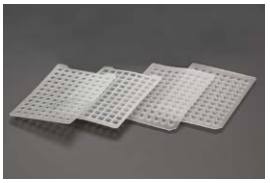
Description	Well Volume	Color	Well Shape	Cat. No.
Shallow Well Microplate	350 µL	Natural	Flat Bottom	**89237-504**
Shallow Well Microplate	350 µL	Natural	Round Bottom	**89237-506**
Shallow Well Microplate	350 µL	Natural	Conical Bottom	**89237-508**
Medium Well Microplate	500 µL	Natural	Round Bottom	**89237-510**
Deep Well Microplate	1.3 mL	Natural	Round Bottom	**89237-514**
Deep Well Microplate	350 µL	Natural	Conical Bottom	**89237-516**
Deep Well Microplate	1.0 mL	Natural	Conical Bottom	**89237-518**
Deep Well Microplate	2.0 mL	Natural	Conical Bottom	**89237-522**
Deep Well Microplate	2.0 mL	Natural	Round Bottom	**89237-526**

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

VWR® Covers for 96-Well Plates

VWR® Covers for 96-Well Plates are offered in either Ethylene Vinyl Acetate or Silicone with a sprayed-on Teflon barrier.

The EVA microplate covers are designed to stabilize samples during transport from one workstation to another with the option of a thicker cover for seal strength that is not piercible or a thinner version that is piercible by most autosampler needles. The Silicone covers are available in two thicknesses, both of which are available either pre-cut or non-cut for resealability. All round well and square well covers fit all round well and square well microplates in the VWR Collection. All items are sold in packs of ten covers.



Description	Color	Well Shape	Cat. No.
EVA Microplate Cover	Natural	Round Well	**89237-528**
EVA Microplate Cover	Natural	Round Well	**89237-530**
EVA Microplate Cover	Natural	Square Well	**89237-534**
Silicone Microplate Cover, Thin, Pre-cut	Natural	Round Well	**89237-546**
Silicone Microplate Cover, Thin, Pre-cut	Natural	Square Well	**89237-540**
Silicone Microplate Cover, Thin, Non-cut	Natural	Round Well	**89237-544**
Silicone Microplate Cover, Thin, Non-cut	Natural	Square Well	**89237-548**
Silicone Microplate Cover, Thick, Non-cut	Natural	Square Well	**89237-538**

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

U-2D™ 96-Well Plate Sample Control System, MicroSolv

The U-2D™ (Universal-2 Dimensional) 96-Well Plate System offer users unprecedented sample management control compared to current glass-lined or plastic well plates for sample prep or chromatography. The patent pending design allows users to remove the "Rack" containing Advanced Quality™ precision glass inserts from the plastic base. This permits improved viewing of the samples in the inserts, and allows users to return the rack to the base if desired.

If a problem is found with the fill or the sample, users can easily push the insert from the bottom to remove it from the rack. These inserts can then be placed it into any of MicroSolv's 9mm screw top autosampler vials for safe storage, transport, a second chromatography dimension, or to another instrument platform. Inserts for U-2D™ Plates work in 9mm autosampler vials, allowing liquid samples with very small volumes to be stored and injected into an instrument with minimal evaporation or sample loss due to the "residual volume", or adsorption to the insert walls.

Description	Cat. No.
D™ Plate System Easy Purchase Packs	
U-2D™ Rack with 96 350µL Inserts Preloaded, Base, and Plug-Style Non-Slit Silicone Sealing Mat, AQ™ Brand	**10002-798**
U-2D™ Rack with 96 350µL Inserts Preloaded, Base, and Preslit Plug-Style Sealing Mat, AQ™ Brand	**10002-802**
U-2D™ Rack with 96 350µL Deactivated Silanized Inserts Preloaded, Base, and Plug-Style Non-Slit Silicone Sealing Mat, AQ™ Brand	**10002-796**
U-2D™ Rack with 96 350µL Deactivated Silanized Inserts Preloaded, Base, and Preslit Plug-Style Sealing Mat, AQ™ Brand	**10002-800**

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

Microliter™ and Gastight® Agilent 7673, 7683, 7693 and 6850 ALS GC Syringes, Hamilton

Hamilton Company offers the most comprehensive selection of standard and custom syringes in the industry. Each is manufactured to achieve the highest level of accuracy and precision possible.

These syringes are designed to work with Agilent 7673, 7683, 7693 and 6850 Automatic Liquid Sampler (ALS) gas chromatography (GC) autosamplers. Syringes in this category are either 700 and 7000 series Microliter™ or 1700 series Gastight® syringes. Microliter™ syringes have a stainless steel plunger that is hand fitted to the glass barrel and are designed for liquid sampling. Gastight® syringes have a PTFE plunger tip that creates tight connection between the syringe barrel and plunger allowing for liquid or gas sampling. The flowpath for Microliter™ syringes includes SST and Borosilicate glass; Gastight® syringes include SST, Borosilicate glass, and PTFE.

Syringe Terminations:

Cemented Needle (N)- For low volume syringes, the needles are cemented into the glass syringe barrel at a point corresponding to the zero graduation mark. With this termination, dead volume is limited to the internal volume of the needle. Not autoclavable. Needle gauge is determined by the syringe volume and are not user-selectable.

Removable Needle (RN)- The needles are removable and are a Hamilton-specific design. The design allows the needles to seat precisely at the zero graduation mark of the syringe. Users can select the needle gauge, length, and point style to optimize the syringe for custom applications. Additionally, this termination allows for a removable needle without increasing the dead volume of the syringe and is ideal when there is a risk of the needle clogging. Autoclavable when disassembled. Repeated autoclaving will shorten syringe life.

Knurled Hub (KH)- Removable plunger/needle assembly, knurled hub is used exclusively on the 7000 series syringes.

Needle Point Styles:

Point Style 2 - Sharp, beveled, curved, non-coring needle point recommended for septum penetration. Available gauges: 23s or 26s.

Point Style AS - Special conical style needle point used on autosampler syringes the non-coring needle point is recommended for septum penetration. Available gauges: 23s, 26s, 23s-26s.

Ordering Information: If you are looking for a needle or gauge that is available but not listed here, please call VWR to place a special order by phone.

Barrel Outer Diameter	0.260 inches (6.60 mm)
Gas Sterilizable	Yes
Minimum Temperature	10 °C / 50 °F
Needle Length	1.71 inch (43.4 mm)

Description	Gauge	Volume	Standard Needle Dead Volume	Point Style	Cat. No.
Microliter™ Cemented Needle Syringes					
Model 701 N Agilent Syringe	23s gauge	10 µL	0.46 µL	AS	**60373-953**
Model 1701 N Agilent Syringe	23s-26s gauge	5 µL	0.46 µL	AS	**60373-409**
Model 701 N Agilent Syringe	23s-26s gauge	10 µL	0.46 µL	AS	**60373-956**
Microliter™ Knurled Hub Needle Syringes					
Model 7000.5 KH Agilent Syringe	23 gauge	0.5 µL	0 µL	AS	**25500-808**
Model 7000.5 KH Agilent Syringe	26 gauge	0.5 µL	0 µL	AS	**25500-800**
Gastight® Removable Needle Syringes					
Model 1701 Small RN Agilent Syringe	23s gauge	10 µL	0.46 µL	AS	**60376-178**
Model 1701 Small RN Agilent Syringe	23s-26s gauge	10 µL	0.46 µL	AS	**60376-180**

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

700 Series MICROLITER® Syringes, Hamilton

The 700 series syringe is the original hand-fitted Hamilton syringe. The stainless steel plunger is manufactured to fit the glass barrel with a tolerance smaller than 100 millionths of an inch, resulting in unsurpassed syringe life. This series of syringes is ideal for dispensing volumes from 0.5 –500µL. Each syringe is manufactured to achieve the highest level of accuracy and precision possible. Fluid path is SST and borosilicate glass. A variety of different terminations and needle options are available.

Syringe Terminations:

Cemented needles (N) for low volume syringes feature the needles cemented into the glass syringe barrel at a point corresponding to the zero graduation mark. With this termination, dead volume is limited to the internal volume of the needle. Not autoclavable. Needle gauge is determined by the syringe volume and are not user-selectable. Syringe **60373-775** features a special cemented needle (SN) with a termination that is the same as a cemented needle termination, except it allows for a variety of user-defined gauges, lengths, and point styles to be attached. Not autoclavable.

Removable needles (RN) are a Hamilton-specific design. This design allows the needles to seat precisely at the zero graduation mark of the syringe. Users can select the needle gauge, length, and point style to optimize the syringe for custom applications. This termination also allows for a removable needle without increasing the dead volume of the syringe, and is ideal when there is a risk of the needle clogging. Autoclavable when disassembled. Repeated autoclaving will shorten syringe life.

Luer Tip (LT) needles are removable and fit over a ground glass hub which is tapered in the shape of a male luer. This termination will accept most hypodermic needles but was designed specifically for use with Hamilton Kel-F® needles. This termination increases the dead volume in the syringe, which may not be appropriate for some applications. Autoclavable when disassembled to 115°C (239°F).

Needle Point Styles:

Point style 2 is a sharp, beveled, curved, non-coring needle point recommended for septum penetration.

Point style 3 is a blunt needle point for use with HPLC injection valves and sample pipetting.

Point style 5 is a conical needle with side port for penetration of septa, thin-gauged vinyls, and plastics without coring.

Point Style AS is a special conical style needle point used on autosampler syringes. The non-coring needle point is recommended for septum penetration.

Ordering Information: For additional available needle points, lengths, or gauges, please contact your VWR representative.

Minimum Temperature	10°C (50°F)
Needle Length	50.8 mm (2")

Description	Gauge	Volume	Point Style	Cat. No.
Cemented Needle Syringes				
Model 75 N Syringe	26s	5 µL	2	**60373-370**
Model 701 N Syringe	26s	10 µL	2	**60372-025**
Removable Needle Syringes				
Model 725 Large RN Syringe	22s	250 µL	2	**60373-593**
Model 701 Small RN Syringe	26s	10 µL	2	**60373-470**

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

Gastight® 1700 Series Syringes, Hamilton

These syringes are the Gastight® version of the original 700 series syringes and are ideal for dispensing volumes from 1µL up to 500µL.

Gastight® syringes are ideal for dispensing both liquids and gases and have a precision-machined PTFE plunger tip which creates a leak-free seal. With the tight fit, the tip essentially wipes the interior of the syringe barrel free of sample. This feature is particularly useful with heterogeneous samples as it reduces the chance that a deposit will occur and cause the plunger to freeze. Fluid path includes SST, borosilicate glass, and PTFE. Syringes are gas sterilizable.

A variety of different terminations and needle point styles are available. Terminations include cemented needle, removable needle, luer tip, and PTFE luer lock.

Syringe Terminations:

Cemented needles for low volume syringes are cemented into the glass syringe barrel at a point corresponding to the zero graduation mark. With this termination, dead volume is limited to the internal volume of the needle. Not autoclavable. Needle gauge is determined by the syringe volume and are not user-selectable.

Removable needles are a Hamilton-specific design. The design allows the needles to seat precisely at the zero graduation mark of the syringe. Users can select the needle gauge, length, and point style to optimize the syringe for custom applications. This termination allows for a removable needle without increasing the dead volume of the syringe and is ideal when there is a risk of the needle clogging. Autoclavable when disassembled. Repeated autoclaving will shorten syringe life.

Luer tip needles are removable and fit over a ground glass hub which is tapered in the shape of a male luer. This termination will accept most hypodermic needles but was designed specifically for use with Hamilton Kel-F needles. This termination also increases the dead volume in the syringe, which may not be appropriate for some applications. Autoclavable to 115°C when disassembled.

PTFE luer lock termination has a PTFE, male Luer taper with nickelplated brass locking hub for use with Kel-F needles, metal hub needles, and universal connectors. It is also used with Hamilton diluters/dispensers, OEM applications, and manual operations. The version with slots is used during the attachment to some instruments but does not effect the connection to needles. Not autoclavable (25mL and greater syringes).

Needle Point Styles:

Point style 2 is a sharp, beveled, curved, non-coring needle point recommended for septum penetration.

Point style 3 is a blunt needle point for use with HPLC injection valves and for sample pipetting.

Point style 5 is a conical needle with side port for penetration of septa, thin-gauged vinyls and plastics without coring.

Description	Gauge	Volume	Needle Length	Maximum Pressure	Point Style	Cat. No.
Cemented Needle Syringes						
Model 1710 N Syringe	22s	100 µL	50.8 mm (2")	—	2	**60376-252**
Removable Needle Syringes						
Model 1702 Small RN Syringe	22s	25 µL	50.8 mm (2")	—	2	**60376-183**
Model 1725 Large RN Syringe	22s	250 µL	50.8 mm (2")	—	2	**60375-442**
Luer Tip Syringes without Needle						
Model 1725 LT Syringe	—	250 µL	—	—	—	**60376-060**
PTFE Luer-Lock Syringes without Needle						
Model 1750 TLL Syringe	—	500 µL	—	48.3 bar (700 psig)	—	**60375-464**

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

GC Autosampler Syringes, CTC, SGE

SGE has been making precision chromatography syringes for over 40 years. Our comprehensive range of GC autosampler syringes are designed and tested to meet critical autosampler specifications.

Features and Benefits: Unique plunger design minimizes bending and seizing, and the cone tip needle point style has been developed specifically to withstand multiple fast septum injections.

Metal plungers are individually fitted to the syringe glass barrel for a perfect "feel", optimized life with minimal carry over, a liquid tight seal between the barrel and plunger and excellent performance.

PTFE tipped replaceable plunger syringes reduce the risk of plunger seizing when working with dirty samples, reducing instrument downtime, and minimizing the risk of instrument shutdown during the processing of large batches of samples.

For NanoVolume Syringes, the accuracy and reproducibility is ± 2 % (displaced volume); temperature range is 5-70°C. For Fixed Needle Syringes, the accuracy and reproducibility is ± 1 % (displaced volume); temperature range is 5-70°C. For Removable Needle Syringes, the accuracy and reproducibility is ± 1 % (displaced volume); temperature range is 5-120°C.

RoHS compliant per Directive 2011/65/EU.

Ordering Information: Wide range of fixed needle and removable needle options available. PTFE tipped replaceable plunger versions are available for use with gas and headspace samples.

Description	Volume	Needle Gauge	Tip Style	Cat. No.
Syringe, 10ul, fixed needle, 0.63mm needle OD (23 gauge), 50mm needle length, cone tip, for CTC autosampler	10 µL	23 gauge	Cone	**60361-142**
Syringe, 25µL Fixed Needle CTC/Thermo Syringe with gas tight plunger & 5cm 0.63mm OD (23 gauge), Cone Tipped Needle	25 µL	23 gauge	Cone	**60361-156**
Syringe, 100µL Fixed Needle CTC/Thermo Syringe with gas tight plunger & 5cm 0.63mm OD (23 gauge), Cone Tipped Needle	100 µL	23 gauge	Cone	**14225-318**

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

Agilent® GC Autosampler Syringes, SGE

Syringes are designed for use with Agilent autosampler models 7673, 7683, 7693A and 6850ALS. Needles have a cone-shaped point style which was specifically developed to withstand multi-injection demands of autosamplers.

Syringes feature Diamond Syringe Technology, with improved solvent resistance, great temperature ranges, increased operational smoothness, and longer syringe life. Cycle life is up to ten times that of similar syringes. New level of accuracy due to reduced carryover and no risk of adhesive contamination. Color coded by volume for easy identification of installed syringes. Packaged in 100% recyclable materials.

Tapered dual gauge needles taper from an O.D. of 0.63mm to 0.47mm to offer the strength of a 23-gauge needle with the performance and on-column capabilities of a 26-gauge needle.

RoHS compliant per Directive 2011/65/EU.

Description	Gauge	Volume	O.D.	Cat. No.
Fixed Needle Syringes, Tapered Dual Gauge	23/26	5 µL	0.63/0.47 mm	**60362-720**

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

GC Syringes for Agilent Instruments, Thermo Scientific

GC Autosampler syringes for use with Agilent GC instruments. Available in a range of volumes from 5 to 10µL.

Description	Gauge	Volume	Needle Length	Needle Type	Tip Style	Packaging	Cat. No.
Syringe 5µL for Agilent GC Autosampler	23	5 µL	42 mm	Fixed	Cone	1/pk.	**10055-192**
Syringe 5µL for Agilent GC Autosampler	23	5 µL	42 mm	Fixed	Cone	6/pk.	**10055-194**
Syringe 5µL for Agilent GC Autosampler	23-26s	5 µL	42 mm	Fixed	Cone	1/pk.	**10055-196**
Syringe 5µL for Agilent GC Autosampler	23-26s	5 µL	42 mm	Fixed	Cone	6/pk.	**10055-198**
Syringe 10µL for Agilent GC Autosampler	23	10 µL	42 mm	Fixed	Cone	1/pk.	**10055-212**
Syringe 10µL for Agilent GC Autosampler	23	10 µL	42 mm	Fixed	Cone	6/pk.	**10055-214**
Syringe 10µL for Agilent GC Autosampler	23	10 µL	42 mm	Removable	Cone	6/pk.	**10055-216**
Syringe 10µL for Agilent GC Autosampler	23-26s	10 µL	42 mm	Fixed	Cone	1/pk.	**10055-218**
Syringe 10µL for Agilent GC Autosampler	23-26s	10 µL	42 mm	Fixed	Cone	6/pk.	**10055-220**
Syringe 10µL for Agilent GC Autosampler, Gas Tight	23-26	10 µL	42 mm	Removable	Cone	1/pk.	**10057-474**
Syringe 10µL for Agilent GC Autosampler, Gas Tight	23-26	10 µL	42 mm	Removable	Cone	6/pk.	**10057-476**

CTC/LEAP PAL Technologies LC Autosampler Syringes, Hamilton

Hamilton offers 21 quality syringe options, S-Line, C-Line and X-Type, for the CTC/Leap LC/HTC/HTS Pal, and 2 quality syringe options for the CTC/Leap A200S HPLC Autosampler.

Hamilton maintains a large catalog of replacement syringes for the most popular HPLC autosamplers. Our syringes are handmade with an unmatched attention to detail. The manufacturing process and quality assurance procedures ensure that every syringe we sell will provide superior accuracy and precision as well as cycle life. Choose the sub category that is associated with your autosampler manufacturer to find the syringes available for your instrument.

Syringes in this category are either 700 series Microliter™ or 1700 and 1000 series Gastight® syringes. Microliter™ syringes have a stainless steel plunger that is hand fitted to the glass barrel and are designed for liquid sampling. Gastight® syringes have a PTFE plunger tip that creates tight connection between the syringe barrel and plunger allowing for liquid or gas sampling.

Compatibility:

Hamilton C-Line and X-Type syringes are specially designed for the CTC LC PAL, HTC PAL, HTS PAL HTX PAL, PAL HTC-xt, PAL HTS-xt and PAL HTX-xt extended autosamplers sold under the following brands:

AB Sciex, Agilent, Alpha M.O.S., Antek, Bruker, Dionex, GE, Gerstel, GL Sciences, Lauda, LEAP Technologies, MicroCal, MPS, Perichrom, Perkin Elmer, Shimadzu, Sotax, Thermo Scientific, Waters and Zoex.

C-Line Syringe Terminations:

Cemented Needle (N)- For low volume syringes, the needles are cemented into the glass syringe barrel at a point corresponding to the zero graduation mark. With this termination, dead volume is limited to the internal volume of the needle. Not autoclavable. Needle gauge is determined by the syringe volume and is not user-selectable.

Removable Needle (RN)- The needles are removable and are a Hamilton-specific design. The design allows the needles to seat precisely at the zero graduation mark of the syringe. Users can select the needle gauge, length, and point style to optimize the syringe for custom applications. Additionally, this termination allows for a removable needle without increasing the dead volume of the syringe and is ideal when there is a risk of the needle clogging. Autoclavable when disassembled. Repeated autoclaving will shorten syringe life.

Luer Tip Cemented Needle (LTN)- For mid volume syringes the needles are cemented into the glass syringe barrel at a point corresponding to the zero graduation mark. With this termination, dead volume is limited to the internal volume of the needle. Not autoclavable. Needle gauge is determined by the syringe volume and are not user-selectable.

Fixed Needle (FN) - This termination is found on CTC chromatography syringes. The unique design features a direct attachment of the needle to the barrel and eliminates contact between the sample solvent and the adhesive reducing carryover.

Needle Point Style:

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Autoclavable	No
Gas Sterilizable	Yes
Maximum Temperature	50 °C / 122 °F
Minimum Temperature	20 °C / 68 °F
Needle Length	2 inch (51 mm)
Point Style	3

Description	Gauge	Volume	Standard Needle Dead Volume	Termination	Cat. No.
Gastight® 1000 Series Syringes					
Model 1001 LTN CTC Syringe	22 gauge	1 mL	6.81 µL	LTN	**89173-256**
Gastight® 1700 Series Syringes					
Model 1710N CTC Slimline Syringe	22 gauge	100 µL	6.81 µL	N	**21492-556**
Model 1710 N CTC Slimline Syringe	22s gauge	100 µL	1.13 µL	N	**60376-040**
Microliter™ 700 Series Syringe					
Model 701 N CTC Slimline Syringe	22s gauge	10 µL	1.13 µL	N	**89173-248**
X-Type Syringes					
Model 1710 FN CTC X-Type Syringe, Gastight®	22 gauge	100 µL	6.81 µL	FN	**89368-698**
Model 1710 FN CTC X-Type Syringe, Gastight®	22s gauge	100 µL	6.81 µL	FN	**89368-700**

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

LC Autosampler Syringes, CTC, SGE

SGE has been making precision chromatography syringes for over 50 years. Our range of HPLC autosampler syringes are designed and tested to meet critical autosampler specifications.

Features and Benefits–Unique plunger design minimizes bending and seizing.

Metal plungers are individually fitted to the syringe glass barrel for a perfect "feel", optimized life with minimal carry over, a liquid tight seal between the barrel and plunger and excellent performance.

PTFE tipped replaceable plunger syringes reduce the risk of plunger seizing when working with dirty samples, reducing instrument down-time, and minimizing the risk of instrument shutdown during the processing of large batches of samples.

Accuracy and Reproducibility is ± 1 % (displaced volume). Temperature Range is 5-70 °C Fixed Needle, 5-120 °C Removable Needle.

RoHS compliant per Directive 2011/65/EU.

Ordering Information: Range of fixed needle and removable needle options available. PTFE tipped replaceable plunger versions also available.

Gauge	22 gauge
Needle Length	5.1 cm
Tip	LC

Description	Volume	Cat. No.
Syringe, 10ul, fixed needle, 51mm needle length, 0.72mm needle OD (22 gauge), blundt tip, for CTC autosampler	10 µL	**89238-036**
Syringe, 25µL Fixed Needle CTC Syringe with gas tight plunger and 5.1cm 0.72mm OD (22 gauge), LC Needle (8mm OD barrel)	25 µL	**89238-040**
Syringe, 50µL Fixed Needle CTC Syringe with gas tight plunger and 5.1cm 0.72mm OD (22 gauge), LC Needle	50 µL	**14233-484**
Syringe, 100µL Fixed Needle CTC Syringe with gas tight plunger and 5.1cm 0.72mm OD (22 gauge), LC Needle	100 µL	**89238-046**
Syringe, 100µL Fixed Needle CTC Syringe with gas tight plunger and 5.1cm 0.72mm OD (22 gauge), (0.4mm ID) LC Needle	100 µL	**89238-048**
Syringe, 100µL Fixed Needle CTC/Thermo Syringe with gas tight plunger and 5.1cm 0.72mm OD (22 gauge), LC needle	100 µL	**14225-316**
Syringe, 100µL Removable Needle CTC/Thermo Syringe with gas tight plunger and 5.1cm 0.72mm OD (22 gauge), LC needle	100 µL	**60362-198**
Syringe, 250µL Fixed Needle CTC Syringe with gas tight plunger and 5.1cm 0.72mm OD (22 gauge), (0.4mm ID) LC Needle	250 µL	**60362-204**
Syringe, 500µL Fixed Needle CTC Syringe with gas tight plunger and 5.1cm 0.72mm OD (22 gauge), (0.4mm ID) LC Needle	500 µL	**89238-052**

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

VWR® Syringe Filters

Polypropylene, nylon, and PTFE membranes are ideal for sample preparation and small volume chemical filtration.

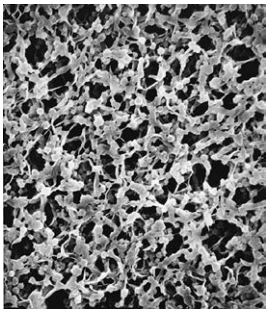
Syringe filters with cellulose acetate or polyethersulfone membranes are ideal for sterile filtration of buffers, tissue culture media or additives, and other biologicals. The polyethersulfone membrane offers high flow rates. Nonsterile syringe filters are excellent for HPLC applications. Each filter has a female Luer-lock inlet and a male slip Luer outlet.

Note: PTFE membrane is hydrophobic and not intended for use with aqueous solutions.

Ordering Information: Nylon membrane filters **89041-306** are bulk packed in bags of 1000, four bags to a case.

Description	Diameter	Membrane Material	Pore Size	Sterility	Cat. No.
Syringe Filters with Polypropylene Housing	13 mm	PTFE	0.45 µm	Nonsterile	**28145-493**
Syringe Filters with Polypropylene Housing	25 mm	Nylon	0.2 µm	Nonsterile	**28145-487**
Syringe Filters with Polypropylene Housing	25 mm	Nylon	0.45 µm	Nonsterile	**28145-489**
Syringe Filters with Polypropylene Housing	25 mm	Nylon	0.45 µm	Nonsterile	**89041-306**
Syringe Filters with Polypropylene Housing	25 mm	Polypropylene	0.2 µm	Nonsterile	**28145-483**
Syringe Filters with Polypropylene Housing	25 mm	Polypropylene	0.45 µm	Nonsterile	**28145-485**
Syringe Filters with Polypropylene Housing	25 mm	PTFE	0.2 µm	Nonsterile	**28145-495**
Syringe Filters with Polypropylene Housing	25 mm	PTFE	0.45 µm	Nonsterile	**28145-497**

FP Vericel® PVDF Membrane Filters, Pall Laboratory



Useful for HPLC sample preparation, mobile phase filtration/degassing, and solvent filtration. HPLC certified for low levels of UV-absorbing extractables.

Hydrophilic polyvinylidene fluoride membrane requires no prewetting for aqueous filtration. Plain white surface. Autoclavable.

Offers excellent chemical compatibility, even with aggressive acids and alcohols. Not recommended for acetone, DMF, DMSO, or bases >6N.

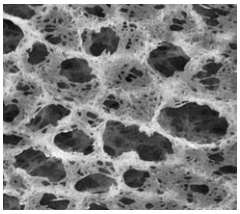
Diameter	Pore Size	Cat. No.
25 mm	0.45 µm	**28149-816**
47 mm	0.45 µm	**28149-827**
13 mm	0.2 µm	**28149-908**
25 mm	0.2 µm	**28149-909**
47 mm	0.2 µm	**28149-929**
13 mm	0.45 µm	**28149-935**

GH Polypro (GHP) Membrane Disc Filters, Pall Laboratory

All-purpose, universal hydrophilic polypropylene membrane with maximum chemical compatibility when filtering both aqueous solutions and aggressive solvents. Low protein binding of GH Polypro membrane provides high recovery of critical proteinaceous samples. HPLC certified to assure that the filter will not add artifacts to analysis.

Diameter	Pore Size	Cat. No.
47 mm	0.2 µm	**28140-037**
50 mm	0.45 µm	**28140-160**
90 mm	0.45 µm	**28140-162**
50 mm	0.2 µm	**28140-164**
13 mm	0.45 µm	**28140-166**
25 mm	0.45 µm	**28143-014**
47 mm	0.45 µm	**28143-288**
25 mm	0.2 µm	**87003-808**

Nylaflo® Membrane Disc Filters, Pall Laboratory



Useful for a wide range of both aqueous and solvent-based applications. Hydrophilic nylon filters offer excellent chemical compatibility with esters, bases, and alcohols. Not recommended for acids >1N or halogenated solvents.

Naturally wettable to aqueous solutions. HPLC certified for low levels of UV-absorbing extractables.

Diameter	Pore Size	Cat. No.
13 mm	0.2 µm	**28140-006**
25 mm	0.2 µm	**28140-028**
47 mm	0.2 µm	**28140-040**
90 mm	0.2 µm	**28140-041**
142 mm	0.2 µm	**28140-042**
13 mm	0.45 µm	**28140-108**
25 mm	0.45 µm	**28140-120**
47 mm	0.45 µm	**28140-141**
90 mm	0.45 µm	**28140-044**
142 mm	0.45 µm	**28140-143**

VWR® Series Glass Door Chromatography Refrigerators with Natural Refrigerants

VWR COLLECTION

The VWR® Glass Door Chromatography Refrigerators are purpose built for scientific and medical applications.

Units feature a digital microprocessor temperature controller, allowing for the precise temperature management necessary for critical samples and supplies. A forced air directional refrigeration system provides superior temperature uniformity and recovery after door openings. An automatic cycle-defrost design prevents product damaging temperature spikes.

The all new TempTech-100 temperature display and alarm module offers industry leading product security with a monitoring and alarm system that is 100% independent of the temperature controller. Real-time sample simulated temperatures are constantly displayed and supported by audible/visual high and low temperature alarms, along with power outage and sensor error alarms. Remote alarm dry contacts and an access port are provided to simplify connections to existing facility monitoring systems. Height does not include 10.2cm (4) for casters.

Environmentally friendly, natural hydrocarbon (HC) refrigerants (not containing hydrofluorocarbons) vastly reduce global-warming potential (GWP) while meeting new EPA/SNAP mandates and UL, ASHRAE compliance guidelines.

UL/C-UL listed.

Units are supplied with a three-year parts and labor warranty, plus an additional two-year compressor parts warranty.

Electrical	Volume	Exterior Dimensions	Defrost	Door Type	No. of Shelves	Shipping Weight	Cat. No.
115V, 60 Hz, 5.4 Amps	538 L (19 cu. ft.)	71W x 68.7D x 200H cm (28 x 27 1/16 x 78 5/8")	Cycle	1 Swing Glass	4 Adjustable	156 kg (345 lbs.)	**10819-298**
115V, 60 Hz, 5.4 Amps	651 L (23 cu. ft.)	71W x 81.4D x 200H cm (28 x 32 1/16 x 78 5/8")	Cycle	1 Swing Glass	4 Adjustable	154 kg (340 lbs.)	**10819-300**
115V, 60 Hz, 5.4 Amps	736 L (26 cu. ft.)	78.7W x 81.4D x 200H cm (31 x 32 1/16 x 78 5/8")	Cycle	1 Swing Glass	4 Adjustable	161 kg (355 lbs.)	**10819-302**
115V, 60 Hz, 6.2 Amps	934 L (33 cu. ft.)	102.8W x 84.7D x 200H cm (40½ x 33 3/8 x 78 5/8")	Cycle	2 Sliding Glass	8 Adjustable	186 kg (410 lbs.)	**10819-304**
115V, 60 Hz, 6.2 Amps	991 L (35 cu. ft.)	102.8W x 81.4D x 200H cm (40½ x 32 1/16 x 78 5/8")	Cycle	2 Swing Glass	8 Adjustable	186 kg (410 lbs.)	**10819-306**
115V, 60 Hz, 9.6 Amps	1331 L (47 cu. ft.)	140W x 86.5D x 200H cm (55⅛ x 34 1/16 x 78 5/8")	Cycle	2 Sliding Glass	8 Adjustable	222 kg (490 lbs.)	**10819-308**
115V, 60 Hz, 8.5 Amps	1388 L (49 cu. ft.)	140W x 81.4D x 200H cm (55⅛ x 32 1/16 x 78 5/8")	Cycle	2 Swing Glass	8 Adjustable	213 kg (470 lbs.)	**10819-310**
115V, 60 Hz, 8.5 Amps	1954 L (69 cu. ft.)	201W x 86.5D x 200H cm (79⅛ x 34 1/16 x 78 5/8")	Cycle	3 Sliding Glass	12 Adjustable	309 kg (682 lbs.)	**10819-312**
115V, 60 Hz, 8.5 Amps	2039 L (72 cu. ft.)	201W x 81.4D x 200H cm (79⅛ x 32 1/16 x 78 5/8")	Cycle	3 Swing Glass	12 Adjustable	307 kg (677 lbs.)	**10819-314**

For additional products, visit **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.

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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.

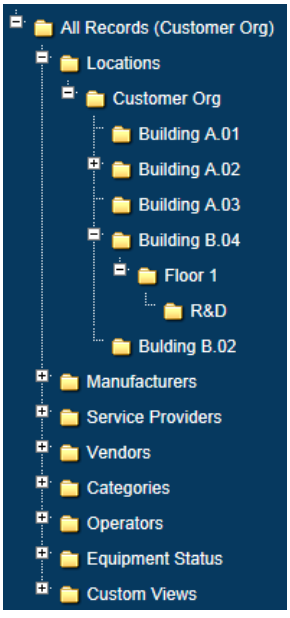
VEM is built around a centralized equipment repository which not only stores the inventory of assets but also spare part lists, consumable lists, documentation, images, SOP's, status of an asset, etc. It tracks equipment by serial number or other ID's and manages warranties, service provider and vendor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



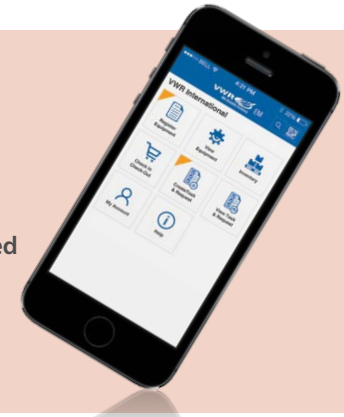
Hierarchical arrangement of equipment.

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

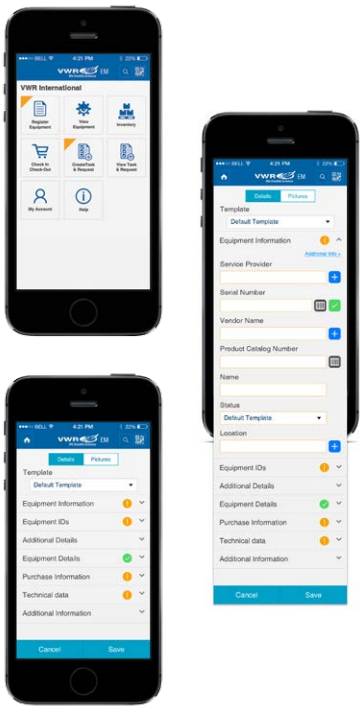
Extending VWR Equipment Management to mobile devices makes using the system even easier.

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

Chromatography and Mass Spectroscopy Installation, Qualification, Repair, Preventive Maintenance, and Service Contracts

VWRCATALYST helps you maintain the accuracy and efficiency of your chromatography and spectroscopy instruments. Through a network of highly qualified service providers, we deliver solutions that fit your needs for these valuable laboratory assets. Our services are customized for a variety of equipment brands to support all manufacturers.

- HPLC
- UPLC
- GC
- Mass Spectrometer

Installation

Chromatography and spectroscopy equipment and instrumentation engineers ensure your new or existing equipment is installed and operating according to manufacturer specifications.

Qualification

Utilizing GMP level protocols, your new or existing chromatography and spectroscopy instrumentation and equipment can be qualified into your organization's quality management system. Conducting an IQ/OQ/PQ on your asset ensures it complies with your needs and ensures the unit's performance will meet expectations.

Repair, Preventive Maintenance, and Full Service Contracts

Our service providers are experts on various brands of chromatography and mass spectroscopy equipment. Utilizing OEM parts, we are able to offer Full Service Contracts, OEM mandated preventive maintenance service, and emergency repair and diagnosis.

To request a quote, contact us at
1.888.793.2300 or **vwrcatalyst@vwr.com**.

vwr.com
1.800.932.5000

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