

How to measure pH  
in TRIS-containing  
samples  
**Pages 6-7**

Alcohol in % v/v,  
w/w, or proof  
**Pages 10-11**



# We have your industrial chemical solutions

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Whether you employ the most sophisticated, modern, high-performance analytical instrumentation or classical wet chemistry techniques, VWR, part of Avantor, is proud to bring you an impressive portfolio of reagents, chemicals, and consumables that you use every day in spectroscopy, electrochemistry, and chromatography.



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## SAMPLING



### solutions for precision

#### VWR® HIGH-PERFORMANCE SINGLE CHANNEL PIPETTORS

- Exclusive volume lock mechanism
- Lightweight design
- Low pipetting forces
- Outstanding precision and accuracy
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Description	Volume, µL	Cat. No.	Each
Single-Channel Pipettor	0.2 – 2	76169-274	409.43
High Performance Starter Kit	10, 100, 1000	76169-262	1069.96



### solutions for every day use

#### VWR® DISPOSABLE CULTURE TUBES

- Resistant to chemical attack and weathering
- Contents will not leach out and contaminate solutions
- High heat tolerance
- Uniform dimensions
- Convenient dispensing packages



O.D. x L, mm	Overflow Volume, mL	Cat. No.	Case of
6 x 50	0.75	47729-566	2000/ 408.16
10 x 75	3	47729-568	1000/ 97.27
12 x 75	5	47729-570	1000/ 112.20
13 x 100	9	47729-572	1000/ 133.18
15 x 85	10	47729-574	1000/ 196.84
16 x 125	18	47729-578	1000/ 218.22
18 x 150	28	47729-583	500/ 174.07
20 x 150	34	47729-584	500/ 292.87

Visit [vwr.com](http://vwr.com) to find additional options.



### solutions for every day use

#### VWR® TRACECLEAN® WIDE MOUTH PACKERS

Type III (soda-lime) glass packers are available with solid-top or open-top caps.



Quality-Assured® (QA) packers follow EPA cleaning procedures listed in the OSWER Directive 9240.0-05A "Specifications and Guidance for Contaminant-Free Sample Containers." They also include a Certificate of Analysis in every case and bar codes with lot number and individual container number for complete traceability.

Capacity, mL (oz.)	Cap Size	Cap Type	Cat. No.	Case of
120 (4)	38-400	Solid-Top	89094-050	24/ 143.59
250 (8.5)	45-400	Solid-Top	89094-052	24/ 159.86
500 (16.9)	53-400	Solid-Top	89094-054	12/ 87.75
946 (32)	53-400	Open-Top	89093-966	12/ 116.74
946 (32)	53-400	Solid-Top	89094-056	12/ 105.68



### solutions for every day use

#### VWR® BOROSILICATE GLASS VIALS

- Borosilicate glass fabrication
- Cap is flush to vial shoulder
- Black phenolic molded screw cap
- Polyvinyl-faced pulp liner
- Short form style



Capacity, mL	O.D. x H, mm	Cap Size	Cat. No.	Pack of 144
1.85	12 x 35	8-425	66011-020	98.95
3.7	15 x 45	13-425	66011-041	156.43
5.55	16 x 50	13-425	66011-063	87.32
7.39	17 x 60	15-425	66011-085	82.07
11.1	19 x 65	15-425	66011-100	90.52
14.79	21 x 70	18-400	66011-121	186.00



## solutions for precision

### VWR® DISPOSABLE TRANSFER PIPETS

- Will not shatter or break
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- Nontoxic and inert
- No bulb to insert or remove
- Uniform drop size



Description	Capacity, mL	Sterility	Packaging	Cat. No.	Pack of 500
Thin Stem	1.5	Nonsterile	Bulk	16001-172	59.30
Thin Stem	1.5	Sterile	Individually Wrapped	414004-024	102.27
Thin Stem	1.5	Sterile	20 per Bag	414004-025	97.01
Small Bulb	3	Nonsterile	Bulk	16001-176	60.43
Small Bulb	3	Nonsterile	Bulk	414004-017	59.33
Large Bulb	5	Nonsterile	Bulk	16001-180	63.54

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### VWR® VERSATILE 11MM DUAL CRIMP-TOP/SNAP-CAP VIALS

Vials feature a versatile neck that allows closure by either snap-cap seals or aluminum crimp seals.

- 40% wider opening than standard vials
- Reduced needle damage



Description	Capacity	Bottom Style	Color	Cat. No.	Pack of	Case of
Snap-Cap	2 mL	Flat	Clear	66009-822	10/ 28.79	1000/ 204.08
Snap-Cap	2 mL	Flat	Amber	82028-416	-	1000/ 279.51
Snap-Cap	475 µL	Conical	Poly	82028-412	-	1000/ 249.80
Snap-Cap, ID Patch	2 mL	Flat	Clear	82028-414	-	1000/ 275.48
Crimp/Snap, Fused Insert	350 µL	Fused Conical	Clear	10803-890	100/ 112.28	-
Crimp-Top, Fused Insert	500 µL	Fused Conical	Amber	82028-410	100/ 150.96	-
Crimp-Top, Fused Insert	500 µL	Fused Conical	Clear	82028-408	100/ 145.41	-

O.D. x L: 12 x 32mm



## solutions for every day use

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- Ideal for the sampling of powder, granules, and pastes
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Certifications: production, assembling, and packaging according to cleanroom Class 7 (10,000). Complies with food and FDA guidelines.

Capacity, mL	Length, cm	Cat. No.	Pack of 100
2.5	12.7	10819-503	49.52
10	17	10819-505	49.83



## solutions for every day use

### VWR® DIPPERS

- Sample most aggressive media confidently
- Long steel shaft (60 cm)
- Encapsulated in PTFE for rigidity

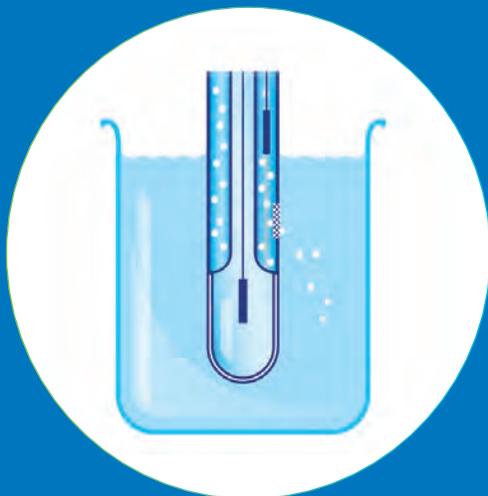
Dippers are supplied with one shaft; additional shafts (89026-222) are available to extend length.



Capacity, mL (oz.)	Body Dia., mm	Cat. No.	Each
100 (3.33)	54	89026-080	301.78
250 (8.33)	66	89026-082	357.61
500 (16.7)	80	89026-084	404.66

# How to measure pH in TRIS-containing samples

By METTLER TOLEDO



**FIGURE 1:** Reference and measuring sensor combined in a 2-in-1 sensor.



**FIGURE 2:** Left to right: clean junction (white "dot") in front of a black temperature probe

## SUMMARY

TRIS buffers, which are often present in biological samples, can cause challenges in pH measurement. The interaction between classic electrolyte solutions and the key components of the TRIS base leads to junction blockage and shortened sensor lifespan. Selection of the appropriate reference system can allow improved sensor accuracy and extended lifetime.

## THE STANDARD SILVER / SILVER CHLORIDE REFERENCE SYSTEM

Any pH measurement requires two electrodes: a glass sensing electrode and a reference electrode. Commonly, pH sensors in use today are so-called 2-in-1 sensors, meaning that both the sensing and reference electrodes are housed in the same sensor.

The most commonly used reference system in pH measurement is silver/silver chloride. A conventional silver/silver chloride reference system is comprised of a silver wire coated with silver chloride and a reference electrolyte which is in contact with the solution of interest through a junction.

For this construction, it is important that the reference electrolyte

be saturated with silver chloride, so that the silver chloride is not depleted and stripped from the wire. In order to maintain a constant potential, the silver chloride must not be depleted, and the junction must allow the flow of ion-rich electrolyte into the sample.

## THE CHALLENGE OF MEASURING TRIS-CONTAINING SAMPLES

Ordinary silver chloride sensors cannot be used for measuring TRIS samples. Many compounds are known to bind with silver ions to create large molecules or precipitates. In fact, silver chloride itself is one such precipitate, with limited solubility in aqueous solutions. Another such compound is formed between silver ions and TRIS molecules, commonly found in biological buffers.

Silver ions in a standard reference electrolyte solution flow into the sample of interest. If that sample contains a TRIS buffer, those two species will meet to form a stable, precipitating complex. Unfortunately, the point where this precipitate forms is typically the reference junction, which is a small ceramic frit with microscopic pores. This precipitation reaction clogs the pores in the junction, preventing electrolyte from flowing out. Once this

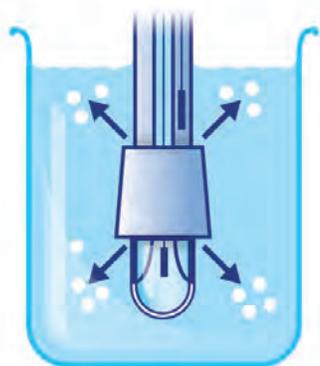


FIGURE 3: METTLER TOLEDO InLab® Science PRO-ISM sleeve junction

process occurs, the interface between the sample solution and the reference system is eliminated, and the reference system can no longer generate a constant potential. This introduces unstable and erroneous pH readings.

#### HOW TO MEASURE TRIS-CONTAINING SAMPLES

One way to prevent the loss of sensor performance due to silver precipitation reactions is to explore alternative junctions. Although it will not prevent the precipitation reaction from occurring, a junction that does not consist of small pores will not be susceptible to clogging.

One such junction is the sleeve junction. This junction consists of a relatively large hole that is covered by a ground glass or plastic sleeve. The sleeve can be moved to regulate the flow of electrolyte. It can also be easily cleaned, which will remove any contamination by silver precipitates.

Alternatives to the ceramic fritted junction are not always feasible, however. For instance, micro sensors used to measure small sample volumes are too small to have useful sleeve junctions. Alternative junctions may also add to the cost of a pH sensor due to the difficulties in manufacturing of such sensors.

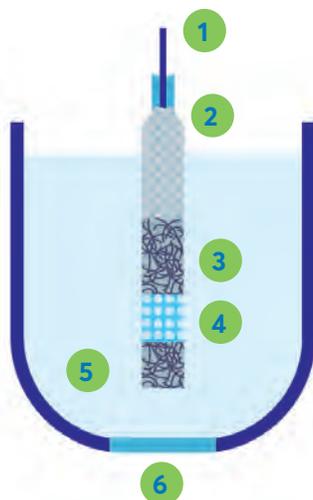


FIGURE 4: Schematic construction of the ARGENTHAL system

- 1 Silver wire coated with AgCl
- 2 Ag/AgCl cartridge (ARGENTHAL™)
- 3 Glass wool
- 4 Silver ion trap
- 5 Silver ion free reference electrolyte
- 6 Junction (ceramic fit)

#### THE ARGENTHAL™ REFERENCE SYSTEM

An improvement to the classic silver/silver chloride reference system is METTLER TOLEDO's ARGENTHAL system. Like classical reference systems, it consists of a silver wire coated with silver chloride and a reference electrolyte. However, the ARGENTHAL system also contains a small cartridge filled with silver chloride particles that provide silver ions for the reference system. The ARGENTHAL system comes in combination with a silver ion barrier, which prevents silver from migrating into the electrolyte. The cartridge will last for the life of the sensor.

Since the ARGENTHAL's silver chloride cartridge provides silver ions to the reference system, the reference electrolyte is no longer required to contain silver chloride. The result is that silver ions are no longer released into the sample. Risk of silver-TRIS complexes clogging the junction is eliminated.

The majority of METTLER TOLEDO sensors employ the ARGENTHAL reference system. Standard sized sensors (InLab Routine Pro-ISM), those with sleeve diaphragms (InLab Science Pro-ISM), and micro sensors (InLab Micro Pro-ISM) are available for life sciences applications.

solutions for research &amp; analysis



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Using certified standards

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- Available either as colorless or colored solutions
- Traceable to NIST Standard Reference Materials
- Store at room temperature



pH Value	Color	pH Accuracy	Traceable to N.I.S.T. (SRM) No.	Cat. No.	Each
1	Colorless	±0.01	185, 186	BDH5004-20L	253.41
2	Colorless	±0.01	185, 186	BDH5012-20L	253.18
3	Colorless	±0.01	185, 186	BDH5000-20L	307.01
4	Red	±0.01	185,186	BDH0198-20L	222.03
4	Colorless	±0.01	185, 186	BDH5028-20L	198.58
5	Colorless	±0.01	185, 186	BDH5036-20L	210.60
6.86	Colorless	±0.01	185, 186	BDH5042-20L	227.44

pH Value	Color	pH Accuracy	Traceable to N.I.S.T. (SRM) No.	Cat. No.	Each
7	Yellow	±0.01	186,191	BDH0194-20L	258.26
7	Colorless	±0.01	186, 191, 192	BDH5056-20L	285.71
9.18	Colorless	±0.01	186, 191, 192	BDH5068-20L	227.24
10	Blue	±0.01	186,191	BDH0190-20L	216.56
10	Colorless	±0.01	186, 191, 192	BDH5082-20L	285.71
12	Colorless	±0.02	186, 191, 192	BDH5090-20L	255.63
12.45	Colorless	±0.02	186, 191, 192	BDH5096-20L	422.48

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- Onsite management of inventory, safety, and disposal

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Description	Size	Cat. No.	Each	Case of
Acetonitrile ≥99.8% for HPLC	4 L	EM-AX0145-1	329.40	4/ 1221.63
Acetonitrile ≥99.9%, OmniSolv® Gradient Grade for HPLC	4 L	EM-AX0142-1	374.37	4/ 1370.92
Acetonitrile ≥99.9%, OmniSolv LC-MS for LC-MS	4 L	EM-AX0156-1	489.51	4/ 1785.25
Methanol ≥99.8% for HPLC	4 L	EM-MX0475-1	128.05	4/ 480.46
Methanol ≥99.9%, OmniSolv, Gradient Grade for HPLC	4 L	EM-MX0488-1	148.14	4/ 550.40
Methanol ≥99.9%, OmniSolv LC-MS for LC-MS	4 L	EM-MX0486-1	472.66	4/ 1142.07
MColorpHast™ pH-Indicator Strips, Universal Indicator, Range 0 - 14	600 Strips	EM1.09535.0007	150.39	-

# Alcohol in % v/v, w/w, or proof

By METTLER TOLEDO

Determination of alcohol (ethanol) concentration via density measurement is widely used in different industries and for many purposes. Alcohol concentration measurement is done to check its purity during production of ethanol or bioethanol, to identify incoming goods directly on the truck or in a laboratory, or to determine the alcohol concentration in spirits, rice wine, etc., for quality control purposes.

However, one restriction applies to alcohol concentration measurement with a handheld density meter: it is only valid for ethanol/water mixtures. Therefore, it is only possible to measure the alcohol concentration of samples such as distilled spirits and not samples such as wine, liqueur, alcopops, etc., which contain a mixture of alcohol, sugar, and more.

With the METTLER TOLEDO Density2Go handheld density meters, alcohol concentration measurements are simple. By pressing a button, the sample is automatically drawn into the measuring cell. The result is displayed in alcohol concentration or strength and is compensated to 20°C or 60°F. Limits can be defined and pass/fail acceptances are shown on the display. Alcohol concentration can be expressed in the following units:

- % v/v 20 °C
- % v/v 60 °F
- Ethanol in % w/w
- Proof (US) 60 °F
- Proof (IP) 60 °F

## SAMPLES AND TEST STANDARDS

- 99.8% v/v ethanol at 23.1 °C (indoor)
- 96.0% v/v ethanol at 23.1 °C (indoor)
- 96.0% v/v ethanol at 10.2 °C (outdoor)
- Water standard for verification



## INSTRUMENTS AND ACCESSORIES

- Densito (30330857)
- Protective cover (30330860)
- Water standards (51325005)

## MEASUREMENT PROCEDURE

All three samples were measured at room temperature. To verify the accuracy of the Densito, a water standard was measured with the test method.

The samples were filled automatically using the built-in sample pump. For accurate results, fill the samples twice into the cell and measure the second filling. Each measurement was performed using the following units: % v/v 20°C, % v/v 60°F, % w/w, Proof (US) 60°F, and Proof (IP) 60°F.

## MEASUREMENT PARAMETERS

Fill speed: medium, filling: 2 times measurement, reliability: medium

## RESULTS

Ethanol	Result	Standard Deviation
99.8% v/v at 23.1°C Indoor	99.8% v/v 20 °C	0.04
	99.8% v/v 60 °F	0.04
	99.6% w/w	0.07
	199.5% Proof US 60 °F	0.09
	174.8% Proof IP 60 °F	0.08
96% v/v at 23.1°C Indoor	96.2% v/v 20 °C	0.00
	96.2% v/v 60 °F	0.03
	94.2% w/w	0.05
	192.4% Proof US 60 °F	0.07
	168.6% Proof IP 60 °F	0.07
At 10.2°C Outdoor	96.3% v/v 20 °C	0.10
	96.2% v/v 60 °F	0.10
	94.3% w/w	0.14
	192.6% Proof US 60 °F	0.21
	168.7% Proof IP 60 °F	0.17

**TABLE 1:** Mean results and standard deviation(s) for the different sample series (n=6). The deviation for the outdoor measurement are higher because instrument and sample temperature are different.



## BAKER ANALYZED® VOLUMETRIC SOLUTIONS

- 1L narrow mouth polyethylene bottles
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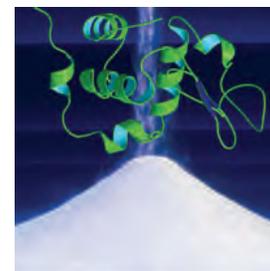
Description	Cat. No.	Each	Case of 6
Sodium Hydroxide 1 N	JT5635-2	52.78	230.34
Hydrochloric Acid 1 N	JT5620-2	67.77	283.20



## BULK VYDAC® CHROMATOGRAPHY SILICA

Vydac® silica is excellent for biopurifications and proven in applications for protein, peptide, and oligonucleotide separations.

- Completely scalable – VWR provides Vydac resins in pre-packed columns through to ton quantities
- High recovery of peptides and proteins
- Available in a wide range of bonding chemistries



Description	Pore Size	Particle Size, µm	Size	Cat. No.	Each
Unbonded	300 Å	20 – 30	25 g	76210-872	312.35
Diphenyl Bonding	300 Å	20 – 30	25 g	76210-882	681.35
C4 Bonding	300 Å	20 – 30	25 g	76210-878	681.35
C18 Bonding	300 Å	20 – 30	25 g	76210-880	681.35
C18 Bonding	150 Å	10	1 kg	76210-874	4667.22
C18 Bonding	150 Å	20	1 kg	76210-876	4667.22



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Description	Dimensions, in.	Cat. No.	Each
3' with Stand, 10" Sash	42.3 x 31.2 x 63.7	89413-124	11,829.00
4' with Stand, 10" Sash	54.3 x 31.2 x 63.7	89413-128	13,361.00
5' with Stand, 10" Sash	66.3 x 31.2 x 63.7	89413-132	15,052.00
6' with Stand, 10" Sash	78.3 x 31.2 x 63.7	89413-136	16,496.00

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- Digital 132 x 64 LED display
- Continuous product temperature display
- 3 sensor system: 1 product, 1 air, 1 coil

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Description	Cat. No.	Each
Stability Chamber	10714-188	25,908.13
Stability Chamber, with Humidity	10714-212	35,750.94

Volume: 80 cu. ft.



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- All electrical components are housed externally and sealed per NFPA and OSHA guidelines
- Not intended for common labs

Description	Volume, L (cu. ft.)	No. of Shelves	Defrost	Cat. No.	Each
Hazardous Location Refrigerator	481 (17)	1 Adj./2 Fixed	Cycle	10819-770	5306.84
Hazardous Location Refrigerator	566 (20)	1 Adj./3 Fixed	Cycle	10819-772	6126.50
Hazardous Location Refrigerator	850 (30)	5 Adj.	Cycle	10819-774	9347.28
Hazardous Location Refrigerator/Freezer Combo	850 (30)	3 Adj.	Manual	10819-776	11,486.33
Hazardous Location Freezer	396 (14)	3 Fixed	Manual	10819-910	4718.27
Hazardous Location Freezer	481 (17)	3 Fixed	Manual	10819-912	5113.88
Hazardous Location Freezer	566 (20)	4 Fixed	Manual	10819-914	5333.37
Hazardous Location Freezer	850 (30)	4 Fixed	Manual	10819-916	9494.42



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for storing  
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volatile  
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- Complies with OSHA, CDC, and ADA requirements

Description	Size	Cat. No.	Price
AquaHol Sanitizer	500 mL	68400-440	Cs. 6/ 282.28
VWR Touch-Free Dispenser	–	89128-812	FREE

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Description	Size, in.	Cat. No.	Each
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3-Tier Utility Cart	24 x 36	97005-790	1574.00

Free cart must be equal to or lesser value than the purchased cart.

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## solutions for research & analysis



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## solutions for protection



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20-Piece free Kit



76049-204

US ONLY

FREE  
FIRST  
AID KIT

Description	Cat. No.	Each
10-Person First Aid Kit, Plastic, ANSI A	76049-204	31.58
25-Person First Aid Kit, Plastic, ANSI A+, Type III	76049-036	42.69
25-Person First Aid Kit, Metal, ANSI A, Type III	76049-034	65.51
50-Person First Aid Kit, Plastic, ANSI A+, Type III	76049-054	54.97
50-Person First Aid Kit, Metal, ANSI A+, Type III	76049-038	79.53
20-Piece Personal First Aid Kit	—	FREE

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### PROTECT YOUR BREATHING ZONE

**GET A FREE SOLVENT SENSOR (75784-660), OR GET \$366 OFF A FORMALDEHYDE SENSOR (76202-592)!**

Buy a Captair Smart Ductless Fume Hood – then choose which offer you would like to take advantage of. Hoods are specifically designed to safely protect users when handling Isoflurane, Formaldehyde, Acetonitrile, and other harmful chemicals that pose an inhalation risk.



\$366  
VALUE

Ductless Fume Hood	Dimensions, L x D x H, in.	No. Carbon Filters Req.*	Cat. No.	Each
Captair Smart 391 w/Solvent Sensor	38 x 21½ x 34	1	MP3912101	4970.00
Captair Smart 391 w/Formaldehyde Sensor	38 x 21½ x 34	1	MP3912102	5695.00
Captair Smart 392 w/Solvent Sensor	38 x 26¼ x 41	2	MP3922101	6686.00
Captair Smart 392 w/Formaldehyde Sensor	38 x 26¼ x 41	2	MP3922102	7411.00

\*Add an additional layer of filters for a Class I ductless fume hood.

No redemption required, simply use these special MP catalog numbers. They are available for a limited time, must be used at time of purchase, and may be ordered via the "ORDER ENTRY" link on [vwr.com](http://vwr.com). (Promotional part numbers cannot be found via search on [vwr.com](http://vwr.com).) For assistance with ordering, contact VWR Customer Service or 800 932 5000. Promo code 5397. Offer expires 12.31.2019.

## High-purity chemicals dollar match offer



**BUY BETWEEN \$250 AND \$1000 OF AVANTOR HIGH-PURITY CHEMICALS AND GET AN EQUAL AMOUNT FREE!**

VALUE UP TO \$1,000!

Avantor's J.T.Baker® and Macron Fine Chemicals™ brand products set the standard for analytical transparency and efficiency in the world's most demanding laboratory applications.

Order products between May 1, 2018 - December 31, 2019. For more information and to redeem, visit [vwr.com/promotions](http://vwr.com/promotions) and search Promo Code 5241 before January 31, 2020.



### ANALYTICAL INSTRUMENT & BALANCE REBATES

**CASH IN ON EXCELLENCE WITH METTLER TOLEDO**

### METTLER TOLEDO

UP TO \$400 VALUE



#### \$400 Rebate

- Excellence Balances (XPR)
- Benchtop Density Meters and Refractometers
- Melting Point Excellence (MP50/MP70)
- Compact Titrators (GS/VS/CS)
- UV/VIS Spectrophotometers



#### \$200 Rebate

- MS-TS Balances
- EasyPlus Titrators
- HC103 Moisture Analyzer

#### \$300 Rebate

- Excellence Balances (XSR)



Visit [vwr.com/promotions](http://vwr.com/promotions) and search Promo Code 4011 for promotion terms and redemption details. Offer expires 12.31.2019.

solutions for protection



# VWR® basic protection industrial garments and accessories

This product line can be used for a variety of areas including industrial, food and beverage, production, and visitors. It's an excellent basic barrier with a wide choice of color options to use in color coding. Ideal for everything from mitigating risk in a food safety program, to managing critical control points or differentiating various production areas.

- Economical, disposable garments designed for mitigating food contamination risk
- First line barrier made from lightweight, breathable fabric
- Color coding facilitates management of critical control points

## VWR® BASIC PROTECTION INDUSTRIAL COVERALLS

- Lightweight basic barrier
- Tapered collar
- Snap front



Size	S	M	L	XL	2X	3X	4X
Body (A)	66"	67"	68"	69"	70"	71"	72"
Chest (B)	25"	26"	27"	28"	29"	30"	31"
Leg (C)	28"	29"	30"	30"	31½"	32½"	33"

Size	Cat. No.	Case of 25
<b>White</b>		
Small	75874-030	46.13
Medium	75874-032	46.13
Large	75874-034	48.46
X-Large	75874-036	48.46
<b>Blue</b>		
Small	75874-044	46.13
Medium	75874-254	46.13
Large	75874-256	48.46
X-Large	75874-258	48.46

Size	Cat. No.	Case of 25
<b>Green</b>		
Small	75874-266	46.13
Medium	75874-268	46.13
Large	75874-270	48.46
X-Large	75874-272	48.46
<b>Red</b>		
Small	75874-280	46.13
Medium	75874-282	46.13
Large	75874-284	48.46
X-Large	75874-286	48.46

## VWR® BASIC PROTECTION INDUSTRIAL BOUFFANT CAPS

- Non-woven durable fabric
- Single-use barrier

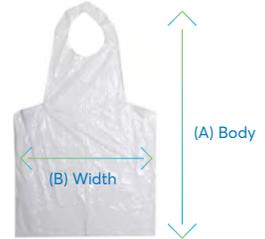


Size	Color	Dia., Relaxed/Stretched, in.	Cat. No.	Case of 1,000
<b>Pleated Bouffant Caps</b>				
Small	White	8/21	76008-514	30.20
Large	White	8 ½/24	76008-516	35.90
Small	Blue	8/21	76008-518	30.20
Large	Blue	8 ½/24	76008-520	35.90
Small	Green	8/21	76008-530	30.20
Large	Green	8 ½/24	76008-532	35.90
Small	Red	8/21	76008-522	30.20
Large	Red	8 ½/24	76008-524	35.90
Small	Yellow	8/21	76008-526	30.20
Large	Yellow	8 ½/24	76008-528	35.90

Traditional fit options also available on [vwr.com](http://vwr.com).

## VWR® BASIC PROTECTION INDUSTRIAL APRONS

- Fluid-impervious polyethylene
- Easy to don



Size	Universal
Body (A)	47 ¼"
Width (B)	27 ½"

Color	Cat. No.	Case of 1,000
White	76008-556	116.43
Blue	76008-558	116.43

## VWR® BASIC PROTECTION INDUSTRIAL CPE SHOE COVERS

- Durable
- Two color options



Size	Universal
Length (A)	16"
Height (B)	6"

Color	Cat. No.	Case of 1,000
White	76008-560	46.35
Blue	76008-562	46.35



# New technologies for industrial hand protection



## SUPRENO™ SE POWDER-FREE NITRILE GLOVES

### STURDY COVERAGE FOR DEMANDING APPLICATIONS

- Durable, heavy-duty coverage nitrile exam gloves SU-690
- Advanced barrier protection against contaminants due to its lower acceptable pinhole rates
- 0.65 limit for pinholes help set a new standard Acceptance Quality for protection
- Textured fingers allow for reliable grip in wet and dry conditions
- Interior polymer coating makes gloves easy to don



## MICROFLEX® 93-260 GLOVES THINNEST CHEMICAL RESISTANT SYNTHETIC COMPOSITE DISPOSABLE GLOVE

- Tough chemical protection with unparalleled comfort
- Innovative three-layer design for superior protection against harsh chemicals including acids, solvents, and bases
- Thin mil construction provides enhanced tactility and dexterity
- Extra soft material and ergonomic design for outstanding fit, feel, and flexibility for longer wear-time
- Lower acceptable pinhole rate (0.65 AQL) and extended cuff for reliable protection against hazardous substances
- Silicone-free formulation and processing ensure better product protection



## MICROFLEX® 93-850 ULTIMATE BARRIER DISPOSABLE NITRILE GLOVE HIGHER LEVEL OF PROTECTION AGAINST HARMFUL EXPOSURES

- Made with TNT™ Chemical Splash Resistance Technology, for soft durable protection against a wide range of chemicals
- Ultimate barrier significantly reduces risk of harmful exposures and rips/tears
- 2X more durable than leading brands
- 2X more chemical splash protection than leading brands<sup>†</sup> due to breakthrough polymer bonding technique\*
- Highest known standard for barrier quality and consistency (low 0.40 AQL)\*

Specifications

Color	Blue
Length	24.5 cm (9 5/8")
Thickness	7.9 mil (finger)

Specifications

Color	Green exterior, blue interior
Length	30 cm (11 13/16")
Thickness	7.8 mil

Specifications

Color	Green
Length	240 mm (9.5")
Thickness	7.5 mil (finger)

Size	Cat. No.	Pack of 100	Case of 1,000
X-Small	32916-668	39.16	323.94
Small	32916-660	39.16	323.94
Medium	32916-662	39.16	323.94
Large	32916-664	39.16	323.94
X-Large	32916-666	39.16	323.94

Size	Cat. No.	Box of 50	Case of 500
5.5 - 6	75832-934	37.04	321.65
6.5 - 7	75832-936	37.04	321.65
7.5 - 8	75832-938	37.04	321.65
8.5 - 9	75832-940	37.04	321.65
9.5 - 10	75832-942	37.04	321.65
10.5 - 11	75832-944	37.04	321.65

Glove Size	Cat. No.	Box of	Case of
X-Small	76169-908	100/ 27.63	1000/ 238.72
Small	76169-910	100/ 27.63	1000/ 238.72
Medium	76169-912	100/ 27.63	1000/ 238.72
Large	76169-914	100/ 27.63	1000/ 238.72
X-Large	76169-806	100/ 27.63	1000/ 238.72
2X-Large	76169-808	90/ 27.63	900/ 238.72

<sup>†</sup>**Warning:** No glove provides complete protection against all chemicals. Users must test the gloves against the particular chemicals and environment in which they will be used.

\*Microflex 93-850 0.40 AQL is lower than the AQL of other known industrial and medical grade disposable gloves.

# Industrial strength barrier protection

Visit  
[VWR.COM/  
SUPERMAXAURELIA](http://VWR.COM/SUPERMAXAURELIA)  
for more  
information  
and sizes!

**AURELIA GLOVES**

- 7.0 mil, patented MAX Grip™ texture
- High visibility orange color
- Excellent puncture resistance
- Superior chemical resistance and tensile strength
- Tested and approved for Fentanyl resistance per ASTM D6978-05 Standards

Working with tools, machinery, and harsh chemicals can be tough on you and your hands. Aurelia Gloves industrial series was designed to provide first-rate comfort & protection for industry professionals – even for the toughest jobs.

Size	Length, cm	Thickness	Color	Cat. No.	Pack of 100	Case of 1,000
<b>Aurelia® Ignite™ Nitrile</b>						
Medium	24	7 mil	Orange	76302-756	24.98	238.86
<b>Aurelia® Robust™ Plus Extended Cuff Nitrile</b>						
Medium	30.5	5 mil	Blue	75999-298	18.49	184.84
Large	30.5	5 mil	Blue	75999-300	18.49	184.84
Large	24	7 mil	Orange	76302-758	24.98	238.86
<b>Aurelia® Bold™ Black Nitrile</b>						
Medium	24	-	Black	75997-464	13.99	125.60
Large	24	-	Black	75997-466	13.99	125.60



# DriTek™ – drier hands, less waste, greater comfort



**DRITEK™ GLOVES**

DriTek sweat management layer is engineered to wick away sweat, keeping your hands safe and comfortable, so you can keep going.

- **Megaman®**: ANSI level three abrasion resistance and MiTek precision manufacturing for a comfortable fit that lasts up to three times longer than conventional nitrile gloves.
- **Hydrex®**: Combines DriTek with excellent wet and dry grip and full touchscreen compatibility.
- **Aloetuff®**: Combines DriTek sweat management, MilTek precision manufacturing, and ACTiValoe skin conditioning formula to protect and heal as you work.

Glove Size	Length, mm	Thickness	Color	Cat. No.	Box of 50	Case of 500
<b>Megaman Nitrile DriTek Extended-Cuff Powder-Free Industrial</b>						
Medium	28	8.5 mil	Black	76051-210	22.27	213.81
Large	28	8.5 mil	Black	76051-212	22.27	213.81
<b>Hydrex Nitrile DriTek Powder-Free Exam</b>						
Medium	24.2	6.1 mil	Blue	76051-002	17.95	172.32
Large	24.2	6.1 mil	Blue	76051-004	17.95	172.32
<b>Aloetuff Nitrile DriTek ACTiValoe® Extended-Cuff Powder-Free Industrial</b>						
Medium	28	8.5 mil	Green	76050-948	22.05	211.70
Large	28	8.5 mil	Green	76050-950	22.05	211.70



Skin Health  
Alliance  
**APPROVED**



# DuPont Personal Protection has you covered across a variety of industries and applications



ProShield® 50 MPF garment provides a barrier against a variety of non-hazardous aerosols, liquids, and dry particles.

DuPont™ ProShield® 50 Coveralls with Respirator Hood

Size	Chest Size, in.	Inseam, in.	Sleeve, in.	Cat. No.	Case of 25
S	21 ½	26 ½	31 ¼	76187-480	120.98
M	23 ½	26 ½	32 ¼	76187-478	120.98
L	25 ¼	27 ½	33 ¼	76187-476	120.98
XL	27	28 ¼	35	76187-482	120.98
2X	28 ¾	28 ¾	36 ¼	76187-346	120.98
3X	30 ½	29 ¼	37 ½	76187-348	128.25
4X	32 ¼	29 ¼	37 ½	76187-350	138.48
5X	34	29 ¾	40 ½	76187-352	149.55
6X	35 ¼	29 ¾	40 ½	76187-474	161.53

Color: white



Tyvek® 800J combines resistance to low-concentration, water-based chemicals with the comfort, protection and durability of Tyvek®.

DuPont™ Tyvek® 800J Coveralls with Protective Hood

Size	Chest Size, in.	Inseam, in.	Sleeve, in.	Cat. No.	Case of 25
S	22	31 ½	33 ¾	10809-151	315.38
M	24	31 ¾	34 ¾	10809-131	315.38
L	26	32 ¼	35 ½	10809-133	315.38
XL	28	33	37	10809-135	315.38
XXL	30	33 ½	38 ¼	10809-137	334.26
3XL	32	34 ¼	39 ¾	10809-155	361.22
4XL	34 1/2	34 ¼	40 ¾	75854-084	389.87
5XL	36 1/2	34 ¼	41 ¾	75854-086	420.86
6XL	38 1/2	35	43	75854-088	454.67
7XL	40 1/2	35 ¾	44 ¾	75854-090	490.78

Color: white



Tychem® 2000 SFR provides an effective barrier against a range of chemicals, as well as secondary flame resistance when worn over primary FR garments.

DuPont™ Tychem® 2000 SFR Protective Coveralls

Size	Cat. No.	Case of 4
S	76202-702	183.24
M	76202-704	183.24
L	76202-706	183.24
XL	76202-708	183.24
2X	76202-710	194.24
3X	76202-712	205.90
4X	76202-714	222.37
5X	76202-716	240.16
6X	76202-718	259.38
7X	76202-720	280.11

Color: green

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These specific products are not available in Canada. Please contact your VWR sales representative to learn about easy access to similar options available in your region.

solutions for protection

# Safely transport acids, alkalis, and solvents



## VWR® BOTTLE TOTE™ SAFETY CARRIERS

Small carriers can accommodate 500mL (16.9 oz.) or 1L (33.8 oz.) bottles. The large carriers can accommodate 2.5L (84.5 oz.) or 4L (135 oz.) bottles. Centering ring in base assures a 2.54 cm (1") clearance between bottle and wall of carrier.

- High degree of tensile strength
- Molded-in handle gives a comfortable grip
- Can be used in temperatures from -45 to 110°C (-49 to 230°F) and can be steam sterilized



Size	Diameter, cm (in.)	Color	Cat. No.	Each
Small	11.4 (4½)	Red	56608-972	77.21
Small	11.4 (4½)	Black	56608-982	77.21
Large	19.1 (7½)	Red	56608-970	125.34
Large	19.1 (7½)	White	56608-975	126.69
Large	19.1 (7½)	Black	56608-980	115.99

# Upgrade your pipetting with unbeatable prices!



- Lightest and smallest electronic pipette (100g)
- Certificate of accredited 3-point calibration (Picus NxT)
- Enhanced DC-motor concept takes Picus a step beyond, providing outstanding performance
- Perfectly balanced and comfortable to hold
- Unique Sartorius Optilock system provides flexibility for volume adjustment and locking
- Adjustable and fixed volume mechanical pipettes – durable feel for heavier use

UP TO 40% SAVINGS

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solutions for research & analysis



**VWR® ION CHROMATOGRAPHY (IC) POLYVIALS FOR DIONEX AUTOSAMPLERS**

- Ion chromatography analysis of environmental, water/wastewater, pharmaceutical, and research samples
- Filter caps provide in-line filtration
- Made of high-grade polypropylene



IC Conical Tube Vials for Metrohm-Peak® Autosamplers are also available; visit [vwr.com](http://vwr.com).

Capacity, mL	For Use With	Cap Type	Cat. No.	Pack of
7	Dionex AS-50/AS-AP	Pierceable Polyethylene	10571-308	250/ 166.41
5	Dionex AS-40/AS-DV	40–60 µm Porous Filter	10571-344	250/ 141.98
0.5	Dionex AS-40/AS-DV	40–60 µm Porous Filter	10571-348	250/ 141.98
5	Dionex AS-40/AS-DV	Sample Pack	10799-706	10/ 8.20
5	Dionex AS-40/AS-DV	Cap - No Filter	10571-346	250/ 94.11

**BARNSTEAD B-PURE™ CARTRIDGE WATER PURIFICATION SYSTEM**

- Thermo Scientific™ B-Pure Water Purification System is customizable for all pretreatment or deionization needs
- Modular design provides the ability to add additional holders as needed
- Quarter-turn, quick-release canisters make cartridge changes easy



Description	Output	Cat. No.	Each
Single Holder	4 L/min	26302-448	621.13
Half-Size Holder	2 L/min	26302-253	607.24
Double Holder System	120V, 4 L/min	26302-250	3119.39
Double Holder System	50k Ohm, 4 L/min	82002-642	1660.73

CORNING

Clear, sterile collection bottle pre-dosed with sodium thiosulfate

**CORNING® GOSSELIN™ WATER SAMPLE COLLECTION BOTTLE**

Meets water sample collection requirements of the United States EPA and Health Canada. Pre-dosed with pentahydrated sodium thiosulfate, bottle provides enhanced stabilization of chlorinated water. The 160mg/L dosage is in accordance with the 22nd edition of the Standard Method published by the American Public Health Association (APHA), the American Water Works Association (AWWA), and the Water Environment Federation (WEF). Neutralize up to 15mg/L of free chlorine in water samples.

- Shrinkwrapped in packs of 24 bottles; sterile (SAL 10<sup>-3</sup>)
- Lightweight PET is transparent and break resistant
- Powdered sodium thiosulfate is easier to dissolve than tablets
- Labeled with lot number, expiration date, and sodium thiosulfate dosage



Wide neck for **EASIER** sample collection

Description	Material	Capacity	Cap Type	Cat. No.	Case of 144
Corning Gosselin Water Sampling Bottles	PET Bottle/HDPE Cap	250 mL	Easy-grip, Tamper-evident	76293-224	159.00

solutions for your space



# Protect both lab personnel and cabinet contents

## VWR® SAFETY CABINETS FOR FLAMMABLES

- Fully welded, 18-gauge double-wall construction for fire protection with 1½" insulating air space
- Upper/lower diametrically opposed side vents
- Ground connector on lower right side
- Environmentally friendly, electrostatically applied powder-coat finish

Shop **VWR.COM** for blue safety cabinets for corrosives



Door Type	Dimensions, D x H x W, in.	No. of Shelves	Cat. No.	Each
<b>30 Gallon Flammable Storage</b>				
Bi-Fold	18 x 44 x 43	1	89522-618	1712.00
Manual	18 x 44 x 43	1	89522-620	1190.00
Self Close	18 x 44 x 43	1	89522-616	1383.00
<b>45 Gallon Flammable Storage</b>				
Bi-Fold	18 x 65 x 43	2	89522-624	1859.00
Manual	18 x 65 x 43	2	89522-626	1443.00
Self Close	18 x 65 x 43	2	89522-622	1714.00

Door Type	Dimensions, D x H x W, in.	No. of Shelves	Cat. No.	Each
<b>60 Gallon Flammable Storage</b>				
Bi-Fold	34 x 65 x 34	2	89522-630	2483.00
Manual	34 x 65 x 34	2	89522-632	1732.00
Self Close	34 x 65 x 34	2	89522-628	2029.00
<b>90 Gallon Flammable Storage</b>				
Bi-Fold	34 x 65 x 43	2	89522-636	2848.00
Manual	34 x 65 x 43	2	89522-638	2037.00
Self Close	34 x 65 x 43	2	89522-634	2354.00



solutions for your space

## VWR® CONTOUR™ DELUXE LAB CHAIRS

Chairs feature a 26" diameter composite base with casters, pneumatic seat-height adjustment, backrest tilt, contoured-foam cushion seat, 2" casters, and a large backrest with kidney support.



Material	Seat Height, in.	Height Style	Cat. No.	Each
Cloth	17-22	Desk	97056-545	541.00
Cloth	21-28	Medium Bench	97056-547	649.00
Cloth	21-31	High Bench	97056-549	657.00
Vinyl	17-22	Desk Height	80086-417	457.00
Vinyl	21-28	Medium Bench	80086-419	557.00
Vinyl	21-31	High Bench	80086-421	564.00



solutions for your space

## VWR® STANDARD SERIES FREE STANDING UNDERCOUNTER REFRIGERATOR AND FREEZER

- For general-purpose applications where precise temperature control, maintenance, and alarms are not necessary
- 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



Description	Volume, cu. ft.	Temperature Range	Cat. No.	Each
Freestanding Refrigerator	5	1 to 10°C	10819-650	879.77
Freestanding Freezer	4	-25 to -15°C	10819-894	781.77



# MetroMax i™ Top-Track™ High-Density Storage System

The Top-Track system maximizes the usable storage area in a given space.

System components feature all-polymer construction that is ideal for high-moisture applications with a lifetime manufacturer's warranty against corrosion and rust.

For the required MetroMax i™ shelves, see **82003-204** series. Additional accessories such as shelf dividers, stackable ledges, tray slides, label holders, and more are also available. Contact your VWR sales representative for more information.

Visit  
**VWR.COM** for  
specifications



Description	For Use With (Shelf Width, in.)	Cat. No.	Each
Mobile Unit Kits, Chrome-Plated Casters	18	83009-658	645.00
Mobile Unit Kits, Chrome-Plated Casters	24	83009-662	676.00
Mobile Unit Kits, Stainless Steel Casters	24	83009-664	1095.00
Mobile Unit Kits, Stainless Steel Casters	18	83009-660	1062.00
Stationary End Unit Kits	18	83009-654	1259.00
Stationary End Unit Kits	24	83009-656	1291.00
Stationary Intermediate Unit Kits	24	83009-652	775.00
Stationary Intermediate Unit Kits	18	83009-650	749.00

These specific products are not available in Canada. Please contact your VWR sales representative to learn about easy access to similar options available in your region.

# FOCUS: INDUSTRIAL VOLUME 1 ISSUE 1

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