

Laboratory Solutions



Laboratory Solutions

- pH Buffers
- Maintenance Solutions
- Conductivity Standards
- Solutions for ORP
- Dissolved Oxygen Tablets
- Solutions for ISE



Solutions for Calibration & Care

Comprehensive Range of Indispensable Media

Find it at eu.fishersci.com

 **fisher scientific**
part of Thermo Fisher Scientific

Genie in a Bottle

A Full Pack of Competence

The determination of pH, conductivity, ion concentration, redox potential and dissolved oxygen are common analyses in most laboratories. The measurement accuracy highly depends on the quality and handling of the solutions used for sensor calibration and maintenance. METTLER TOLEDO takes pride in a long tradition of producing complete measurement systems, including a comprehensive range of top quality solutions.

Top sellers for the most common use



All METTLER TOLEDO calibration and cleaning solutions are available in handy bottles. If larger quantities are required, then our 6-packs are the right choice. Electrolyte bottles come with special caps that make refilling your electrode a child's play.

Sachets for improved ease of use



Using our easy-to-handle sachets guarantees fresh solution for every calibration, bringing contamination risks to a minimum. Rely on METTLER TOLEDO's expertise and extensive offering to meet your specific needs.

Maximum traceability and compliance



To guarantee maximum traceability, an individual test certificate is created for every calibration solution. Furthermore, to support compliance with regulations, all SDS (Safety Data Sheet) and labels contain information according to GHS (Globally Harmonized System) in local languages. Simply download all required documents from our online database: www.mt.com/buffer



Good Electrochemistry Practice™ for calibration solutions

Various factors can affect the results of your pH, redox, conductivity, dissolved oxygen or ion measurements. The following tips shall help you optimize the use of calibration solutions after opening and while in use in the laboratory. Please note that the quality of a solution is only guaranteed for unopened bottles or sachets that have not yet expired.

- Use fresh calibration solutions to minimize the measurement uncertainty and thus optimize the quality of your results.
- Sachets ensure a fresh solution for every calibration.
- Freshly-opened, unexpired bottles also offer fresh calibration solutions if they are kept tightly sealed after use.
- Note the date of first opening of the calibration solution directly on the bottle.
- Ensure that the beakers used for calibration are clean. Rinse them with a small amount of fresh solution before performing the calibration.
- Clean your sensors properly prior to calibration and do not calibrate directly in the original bottle.
- Ensure that the exposure of the solution to the surrounding air is minimal, especially when using low conductivity standards or alkaline pH buffers.
- Use any dispensed calibration solution promptly and dispose of it after use.
- Never pour dispensed calibration solution back into the original bottle.
- Discard calibration solutions that have reached their expiry date or may be contaminated.
- Store calibration solutions at ambient temperatures (20–25°C) and avoid direct sunlight.

► www.mt.com/GEP

pH Measurement Accuracy Starts with a Proper Calibration

pH measurements are only as accurate as the buffer solutions used for sensor calibration. METTLER TOLEDO offers a selection of quality pH buffers to match your specific requirements. No matter if you look for traceable technical buffers or buffers that are certified by an accredited body, you will find the right solution. Maximum accuracy is guaranteed with our NIST/DIN buffers!

Reliable all-rounders: Technical pH buffers



All METTLER TOLEDO's pH buffers are traceable to certified reference buffer solutions according to IUPAC recommendations 2002. The quality inspection certificate, available for every bottle and sachet, guarantees the stated values and traceability.

Measured according to ISO/IEC 17025: DAkkS certified buffers



The pH value of METTLER TOLEDO's certified buffers is verified according to ISO/IEC 17025 by a DAkkS (Deutsche Akkreditierungsstelle, German Accreditation Body) accredited laboratory. They are therefore the perfect choice for regulated industries.

Top Accuracy: NIST/DIN buffers



The NIST/DIN pH buffers are manufactured according to DIN/ISO 19266. They are specified to three decimal places, e.g. 9.180, offering the lowest possible uncertainty. A detailed test certificate is available for every bottle and guarantees the stated values and traceability.



pH Buffers

	pH value at 25 °C	Order number 250 mL	Order number 6 × 250 mL	Order number 30 sachets 20 mL
Technical pH buffer solutions	2.00	51350002	51350016	30111134
	4.01	51350004	51350018	51302069
	5.00	30464188		
	7.00	51350006	51350020	51302047
	8.00	30464189		
	9.21	51350008	51350022	51302070
	10.00	51350010	51350024	
	10.01			51302079
	11.00	51350012	51350026	30111135
	Rainbow bottles I (3 × 2 bottles 250 mL 4.01 / 7.00 / 9.21)		30095312	
	Rainbow bottles II (3 × 2 bottles 250 mL 4.01 / 7.00 / 10.00)		30095313	
	Rainbow sachets I (3 × 10 sachets 20 mL 4.01 / 7.00 / 9.21)			51302068
	Rainbow sachets II (3 × 10 sachets 20 mL 4.01 / 7.00 / 10.01)			51302080
DAkkS certified pH buffer solutions	4.01	51350032	51350042	
	7.00	51350034	51350044	
	9.21	51350036	51350046	
	10.00	51350038	51350048	
NIST/DIN pH buffer solutions	1.679	30458274		
	4.006	51350052		30111136
	6.865	51350054		30111137
	9.180	51350056		30111138
	10.012	51350058		30111139
	12.454	30464127		

Optimal Care For Hard-Working pH Electrodes

The pH electrode is the main actor of the measurement, requiring, therefore, special care and attention. METTLER TOLEDO provides the necessary maintenance solutions. For an easy start the All-in-One kits offer an optimal selection of solutions for calibration and maintenance. Your electrode is always ready for whatever sample comes its way.

The right electrolyte for every application



Thanks to the ARGENTHAL™ reference system most METTLER TOLEDO pH sensors are filled with 3 mol/L KCl electrolyte solution. There is no longer a risk of contaminating your samples with silver ions. For measurements in non-aqueous samples or samples with low ionic strength a special bridge electrolyte is needed. Always make sure that your sensor is completely filled with clean electrolyte solution.

Maintenance solutions for peace of mind



Whenever rinsing with deionized water is not sufficient, a special cleaning solution can be used to remove sample residues. Depending on the contamination, Pepsin-HCl or Thiourea is recommended. The InLab® storage solution provides optimal conditions for sensors during the time between measurements, be it short- or long-term storage. Find more helpful maintenance tips on www.electrodes.net

Good Electrochemistry Practice™ for repeatable results



In order to obtain repeatable results and to prolong the lifetime of your electrode, it is critical to do regular maintenance. Good Electrochemistry Practice™ guides you through the whole product life cycle to achieve those goals. METTLER TOLEDO offers various tools to support your routine operations, e.g. pH troubleshooters, GEP Webinars, GEP Risk Check and much more. Other useful information is available on www.mt.com/GEP



Electrolytes for reference electrodes

	Order number 25 mL	Order number 250 mL	Order number 6 × 250 mL	Order number 6 × 30 mL
KCl solution 3 mol/L for ARGENTHAL™ reference systems	51343180	51350072	51350080	
KCl solution 3 mol/L, AgCl saturated, for Ag/AgCl reference systems	51343184	51350074	51350082	
KCl solution 1 mol/L Bridge electrolyte	51343181			
KNO ₃ solution 1 mol/L Bridge electrolyte	51343182	51350078	51350086	
FRISCOLYT-B®, for measurement at low temperature and for media with organic compounds (oil, proteins etc.)	51343185	51350076	51350084	
LiCl Solution 1 mol/L in ethanol, for measurement in non-aqueous media				51350088

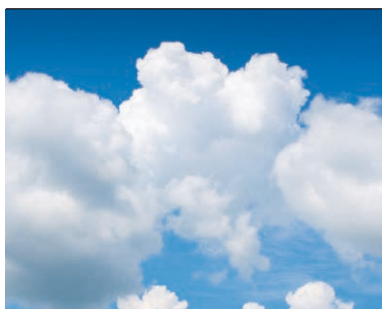
Maintenance solutions

	Order number 250 mL	Order number 6 × 250 mL	Order number 25 mL
Pepsin-HCl for cleaning junctions with protein contamination. Treatment time about 1 h.	51350100	30045061	
Thiourea solution for cleaning junctions with silver sulfide contamination. Treatment until discoloration.	51350102	30045062	
Reactivation solution for regeneration of glass electrodes. Treatment time about 1 min.			51350104
InLab® storage solution for pH and ORP electrodes	30111142		
pH All-in-One Kit I (pH buffer 4.01 / 7.00 / 9.21, 3 mol/L KCl, pepsin solution, storage solution)		30095314	
pH All-in-One Kit II (pH buffer 4.01 / 7.00 / 10.00, 3 mol/L KCl, pepsin solution, storage solution)		30095315	

Conductivity Standards and More

It's all About Correct Handling

Depending on the type of sensor, conductivity standards are used for calibration or verification. Low conductivity standards require special handling and are mostly used for verification purposes. To determine a cell constant, standards of higher conductivity should be used. Conductivity standards are available in sachets to guarantee freshness for every calibration as well as maximum ease of use.



Low conductivity standards – the influence of air

Conductivity standards are directly affected by the presence of carbon dioxide (CO₂) when in contact with air. Because of this, the lower conductivity standards have a limited lifespan. Measurements of samples with conductivity lower than 10 µS/cm need a special procedure, such as protection with inert gas or the usage of a flow cell. These standards are only intended for verification and not for calibration.



Temperature dependence

A slight change in temperature usually has a big impact on the conductivity value of a standard solution. A table on every bottle label indicates the conductivity values at the most common measurement temperatures. During calibration the meter automatically refers to this table for temperature compensation. If possible, calibration and measurements should be performed at the same temperature.

Conductivity standards	Order number 250 mL	Order number 6 × 250 mL	Order number 10 sachets 20 mL	Order number 30 sachets 20 mL
1.3 µS/cm (single-use check solution)*	30090847			
5 µS/cm**	30094617			
10 µS/cm	51300169		30111141	
84 µS/cm	51302153		30111140	
500 µS/cm	51300170			
1413 µS/cm	51350092	51350096		51302049
12.88 mS/cm	51350094	51350098		51302050

*Maximum storage: 1 month

**Maximum storage: 3 months



Redox Buffer Solutions and Tablets for Dissolved Oxygen Sensors



Redox buffer solutions for verification purposes

Redox buffer solutions are used for verification of all common redox sensors. They are not used for calibration purposes. Similarly to other solutions they are temperature-dependent. It is therefore important to know the temperature of the buffer at the time of measurement. A table on every bottle label indicates redox values at different temperatures.



Zero oxygen tablets

Zero oxygen tablets make the preparation of a solution with zero oxygen content very easy. This solution can be used for calibration, verification or conditioning purposes if measurements are performed at low dissolved oxygen levels.

Redox buffer solutions	E (Ag/AgCl) 25 °C	Order number 250 mL	Order number 6 × 250 mL	Order number 6 × 30 mL
	220 mV, pH 7 ($U_H = 427$ mV)	51350060	51350062	
	468 mV, pH 0.1 ($U_H = 675$ mV)			51350064

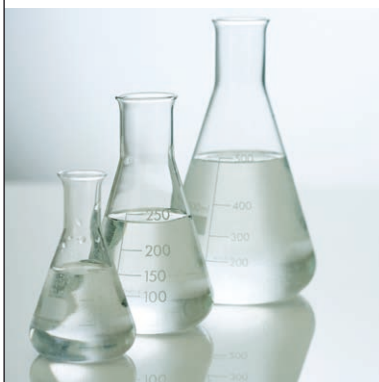
DO Accessories	Order number
Zero oxygen tablets (20 pcs.)	51300140

Solutions for Ion-Selective Electrodes

The Proper Mix for Accurate Results

Measuring with ion-selective electrodes (ISE) is the easiest and most affordable way to determine ion concentration. However, ISEs require careful handling and the use of the correct solutions. METTLER TOLEDO offers a broad portfolio to ensure successful ion measurements.

Ready to use ion calibration standards



High accuracy ion calibration standards can be ordered at concentrations of 10, 100 and 1000 mg/L (ppm). If a lower concentration is needed, it can easily be prepared with a serial dilution, as explained in the electrode manual.

Ionic Strength Adjustors for high repeatability



In all analytical procedures using an ISE, the correct amount of ISA (Ionic Strength Adjustor) must be added to all samples and standards prior to measurement or calibration. This solution ensures that samples and standards have similar and constant ionic strength. Instructions for type and amount of ISA can be found in the manual of every ISE.

Electrolytes for any application



It is important to fill the reference electrode of every ISE with the recommended electrolyte solution. The correct electrolyte will minimize junction potentials and provide optimum temperature and response time. The electrolyte must be refilled or replaced regularly in order to maintain good electrode performance. For more information please refer to the electrode manual.



Solutions for perfectION™ combined ISE

Reference electrolyte solutions	Order number 5 × 60 mL
Ion Electrolyte A (calcium, fluoride, sulfide)	51344750
Ion Electrolyte B (chloride, cyanide, lead, silver/sulfide)	51344751
Ion Electrolyte C (silver)	51344752
Ion Electrolyte D (copper, iodide)	51344753
Ion Electrolyte E (potassium)	51344754
Ion Electrolyte F (nitrate)	51344755

ISA solutions	Order number 475 mL	Order number 3790 mL
ISA solid state ISE (chloride, copper, iodide, silver)	51344760	
Calcium ISA	51344761	
Potassium ISA	51344762	
Nitrate ISA	51344763	
Nitrate ISS (for suppressing interference)	51344764	
Fluoride TISAB II with CDTA		51344765
Fluoride TISAB III with CDTA (concentrate)	51344766	

Solutions for DX series ISE half-cells

Bridge electrolyte	Order number 25 mL	Order number 250 mL	Order number 6 × 250 mL
1 mol/L KNO ₃	51343182	51350078	51350086
3 mol/L KCl	51343180	51350072	51350080
1 mol/L KCl	51343181		

ISA solutions

TISAB 3, for fluoride determinations	51350106
0.9 mol/L Al ₂ (SO ₄) ₃	51350108

Ion calibration standards

	Order number 500 mL 1000 mg/L	Order number 500 mL 100 mg/L	Order number 500 mL 10 mg/L
Silver ISE standard solution	51344770		
Calcium ISE standard solution	51344771	30090855	30090856
Chloride ISE standard solution	51344772	30090853	30090854
Cyanide ISE standard solution	51344773		
Copper ISE standard solution	51344774		
Fluoride ISE standard solution	51344775	30090851	30090852
Iodide ISE standard solution	51344776		
Potassium ISE standard solution	51344777		
Sodium ISE standard solution	51344778	30090857	30090858
Ammonium ISE standard solution	30090859	30090860	
Nitrate ISE standard solution	51344779		
Lead ISE standard solution	51344780		
Sulfide ISE standard solution	51344781		

Comprehensive Product Offering from METTLER TOLEDO



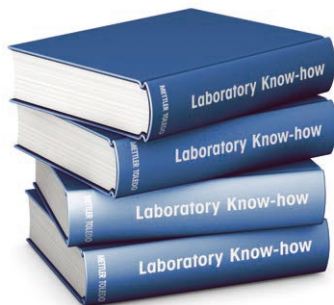
Benchtop and Portable Meters

User-friendly and intuitive single or multichannel instruments for high precision and solid compliance.



Sensors

High quality sensors covering a wide range of applications and measurement parameters.



Expertise Library

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