

# DURACAL pH BUFFERS



**Certified Buffer Solutions**



**HAMILTON**   
THE MEASURE OF EXCELLENCE™

# DURACAL pH Buffers: Certified by an external accreditation

## Can you trust your buffer solution?

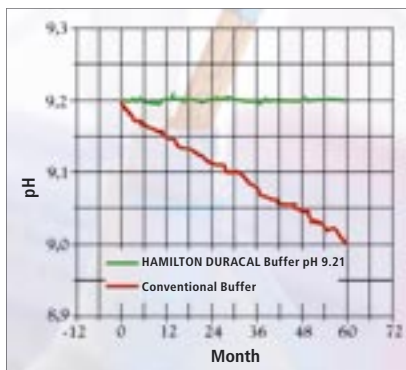
GMP, GLP, ISO 9001, EN 45000, Calibration, Verification, Traceability, Certification from an accredited organization: Key words that are increasingly important. The calibration of pH and Redox electrodes has never been easy. All calibration procedures assume that the labeled values of the calibration buffers are correct. But buffer values can change over time and so can your results.

A complete range of patented buffer solutions, provides never before achieved pH stability. Hamilton guarantees DURACAL pH buffers for 5 years after the date of manufacture. The pH 9.21 and pH 10.01 buffers are even stable in air. See the diagram below for details. High buffering capacity provides rapid, stable calibration. Preservatives are added to prevent microbial and mold growth.

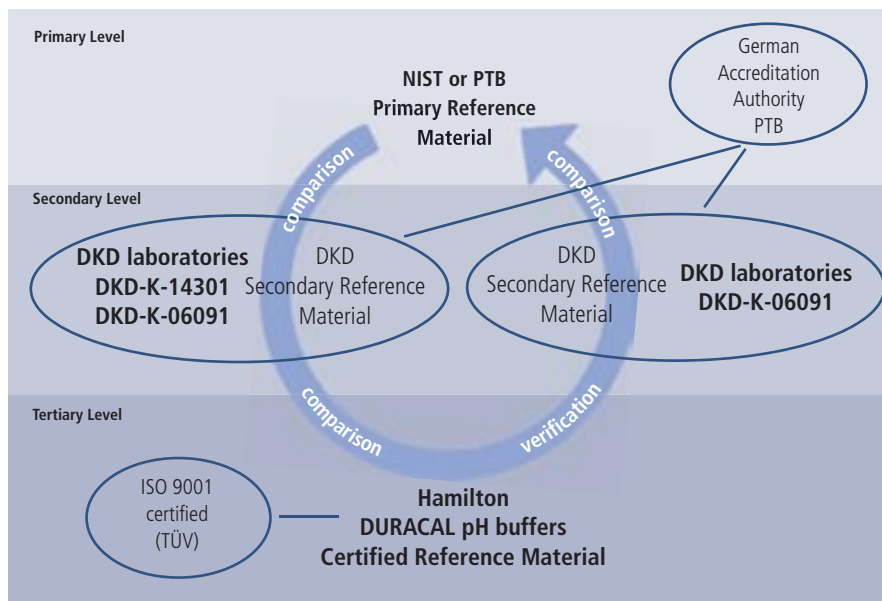
## Traceability

An important issue for the production of Certified Reference Material is to ensure the traceability through an unbroken chain of comparisons to reference material of the highest metrological quality (Primary Reference Material).

**Closed Loop Traceability:** Unlike other manufacturers where only a top-down traceability is applied, Hamilton is working with a circular or closed loop traceability. The closed loop traceability ensures the users of Hamilton DURACAL buffer a unique reliability!



DURACAL: 5 years stable buffers



Traceability scheme for the determination of the pH value of the DURACAL buffers

**Top-down traceability:** At Hamilton, the pH value of DURACAL buffers is determined by comparison against two Secondary Reference Buffer Solutions. These are purchased from accredited suppliers for Secondary Reference Materials. The solutions themselves are compared against Primary Reference Solutions from PTB<sup>1)</sup> or NIST<sup>2)</sup>.

**Bottom-up traceability:** To ensure the highest possible accuracy and full reliability of the pH value, a representative number of samples from every single production lot is sent to a German DKD<sup>3)</sup> laboratory (DKD-K-06901) for an external, independent and impartial verification. In this laboratory, the DURACAL samples are compared against Secondary Reference Solutions from DKD-K-06901.

The Secondary Reference Solutions are of course compared against Primary Reference Solutions from PTB. At this stage, the loop is closed: the PTB Primary Reference Solution is the starting and ending point of the traceability loop. DKD provides Hamilton with a calibration certificate for every DURACAL production lot.

1) PTB  
Physikalisch Technische Bundesanstalt,  
Braunschweig, Germany

2) NIST  
National Institute of Standards and Technology,  
Gaithersburg MD, USA

3) DKD  
Deutscher Kalibrierdienst DKD-K-06901,  
Zentrum für Messen und Kalibrieren GmbH,  
Wolfen, Germany

# Accredited laboratory for highest reliability

## Easy handling for professional use:



Step 1: open bottle



Step 2: fill chamber



Step 3: calibrate



Step 4: dispose

## Features

- Convenient 250 mL and 500 mL plastic bottle with built-in calibration compartment
- Economical, since only about 20 mL of buffer is used per calibration
- Actual value is determined by a DKD laboratory, accredited for pH measurement
- First class certificate with traceability to international standards
- Certificates available at <http://www.hamiltoncompany.com/cert>
- Expiration date on the bottle
- Immune to micro-organisms

## Available packages

- 250 mL
- 500 mL
- 3 x 500 mL
- 5 L
- 10 L
- 1000 L



250 and 500 mL



5 Liter tank



10 Liter tank



Label includes expiration date, batch number and actual value





**HAMILTON**  
THE MEASURE OF EXCELLENCE™

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**Quality Hamilton Products:**

Laboratory Electrodes  
DURACAL™ pH Buffer  
Conductivity Sensors  
Conductivity Standards  
Dissolved Oxygen Sensors  
Armatures  
MICROLITER™ Syringes  
GASTIGHT® Syringes  
Instrument Syringes  
SoftGrip™ Pipettes  
Miniature Valves

**Laboratory Automation for:**

Drug Discovery  
Genomics  
Proteomics  
Forensics  
In Vitro Diagnostics

<http://www.hamiltoncompany.com>

Support: [sensors@hamilton.ch](mailto:sensors@hamilton.ch)

pH Value	Accuracy	Stability (Months)	Certificate	Package	Part #
1.09	± 0.02	60	Hamilton	500 mL	238 271
1.68	± 0.02	60	Hamilton	500 mL	238 272
2.00	± 0.02	60	Hamilton	500 mL	238 273
3.06	± 0.02	60	Hamilton	500 mL	238 274
4.01	± 0.01 / ± 0.02	18 / 60	DKD	250 mL	238 317
4.01	± 0.01 / ± 0.02	18 / 60	DKD	500 mL	238 217
4.01	± 0.01 / ± 0.02	18 / 60	DKD	3 x 500 mL	238 917
4.01	± 0.01 / ± 0.02	18 / 60	DKD	5 L	238 332
4.01	± 0.01 / ± 0.02	18 / 60	DKD	10 L	238 194
4.01	± 0.01 / ± 0.02	18 / 60	DKD	1000 L	238 895
5.00	± 0.02	60	Hamilton	500 mL	238 275
6.00	± 0.02	60	Hamilton	500 mL	238 276
7.00	± 0.01 / ± 0.02	18 / 60	DKD	250 mL	238 318
7.00	± 0.01 / ± 0.02	18 / 60	DKD	500 mL	238 218
7.00	± 0.01 / ± 0.02	18 / 60	DKD	3 x 500 mL	238 918
7.00	± 0.01 / ± 0.02	18 / 60	DKD	5 L	238 333
7.00	± 0.01 / ± 0.02	18 / 60	DKD	10 L	238 188
7.00	± 0.01 / ± 0.02	18 / 60	DKD	1000 L	238 896
8.00	± 0.02	60	Hamilton	500 mL	238 277
9.21	± 0.02	60	DKD	250 mL	238 319
9.21	± 0.02	60	DKD	500 mL	238 219
9.21	± 0.02	60	DKD	3 x 500 mL	238 919
9.21	± 0.02	60	DKD	10 L	238 216
9.21	± 0.02	60	DKD	1000 L	238 897
10.01	± 0.02	60	DKD	250 mL	238 321
10.01	± 0.02	60	DKD	500 mL	238 223
10.01	± 0.02	60	DKD	3 x 500 mL	238 923
10.01	± 0.02	60	DKD	10 L	238 187
10.01	± 0.02	60	DKD	1000 L	238 898
11.00	± 0.05	24	Hamilton	500 mL	238 278
12.00	± 0.05	24	Hamilton	500 mL	238 279
4.01/7.00/9.21	± 0.02	60	DKD	500 mL, mixed	238 922
4.01/7.00/10.01	± 0.02	60	DKD	500 mL, mixed	238 924

Redox Value	Accuracy	Stability (Months)	Certificate	Package	Part #
475 mV	± 5 mV	24	no	250 mL	238 322
475 mV	± 5 mV	24	no	500 mL	238 227
271 mV	± 5 mV	24	no	500 mL	238 228