ACCREDITED
A2LA Certificate No. 1750.02
Reference Material Producer

CERTIFICATE OF ANALYSIS
Complies with ISO 17034, ISO Guide 31, ISO Guide 35, and ISO 9001
TRACEABLE® CERTIFIED REFERENCE MATERIAL

This certificate indicates traceability to standards provided by (NIST) National Institute of Standards and Technology and/or a National Standards Laboratory.

Certificate No. : 4958-12956328

Description : Buffer 10.012 pH Blue 1 Liter

Catalog Number : 00651-40, **Lot : CC743417**

Certificate Date : 29 Dec 2021 **Expiration Date : 29 Dec 2023**

Certified Value : 10.010 pH **U: ±0.011 pH (k=2) at 25°C**

Certification measurements are performed under ISO 17034, A2LA accreditation no. 1750.02. They are traceable to recognized national and international standards via an unbroken chain of comparisons. pH is defined as the negative logarithm of the hydrogen ion activity.

MEASUREMENT: Minimum twelve (12) 100 ml samples were measured from this lot. The pH of each sample was determined using a pH meter and electrode.

UNCERTAINTY: The certified value is given as the average of the measured samples. The reported expanded uncertainty (U) is determined from the measurement variation from sample to sample, change due to shelf life, and uncertainty of the measurement process. The value of uncertainty is multiplied by k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%. Uncertainty is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement".

METHOD: The certified reference material is produced and analyzed by Control Company. The certified reference material is comprised of deionized water, 0.025 mol/kg H2O sodium hydrogen carbonate, and 0.025 mol/kg H2O sodium carbonate.

Issue Date : 29 Dec 2021

Marisa Elms, Technical Manager

Nicol Rodriguez, Quality Manager

Traceability: Standards and Equipment Used

Description	Serial Number	Due Date	Traceable Reference
pH/Ion Meter	658R067-N023		
pH Reference Material 10.000	E1408721	11 Jul 2024	087-21
Digital Thermometer	102008443	16 Jul 2022	4000-12458260
pH Electrode	15293-F18		

Laboratory Environment Conditions: 44.00%RH 25.0°C 1008mBar

CONTROL COMPANY 12554 Galveston RD Suite B230 Webster TX USA 77598
Phone 281 482-1714 Fax 281 482-9448 sales@control3.com www.traceable.com

ACCREDITED
A2LA Certificate No. 1750.02
Reference Material Producer

CERTIFICATE OF ANALYSIS
Complies with ISO 17034, ISO Guide 31, ISO Guide 35, and ISO 9001
TRACEABLE® CERTIFIED REFERENCE MATERIAL

Note: PACKAGING: This reference material is available in a 500 mL bottle, 120 mL One-Shot™, 1 L bottle, and 3.8 L bottle.

INTENDED USE: The certified reference material is intended for the calibration of pH meters and electrodes used for pH measurement, for the validation of analytical methods, and for the preparation of working reference standards.

INSTRUCTIONS FOR USE: Open for a minimum period of time, quickly extract the sample. Remove a sample size of 100 ml. Return the cap to the sample. Rinse the electrode in a small amount of the certified reference material and discard. Sample should be stirred while being measured. Discard the reference material sample after use. Reference materials which have been opened are not protected from growth. Discard the reference material bottle of One-Shot™ under the following circumstances: if the expiration date is past due, or if any color, turbidity, or visible microbiological growth become evident. pH buffers are sensitive to temperature. For measurements at a temperature other than 25°C, refer to the temperature correction table provided (reference page 3 of this certificate).

HOMOGENEITY: Minimum twelve (12) 100 ml samples were selected for analytical control. Results from different samples showed no statistically differences, nor was there any correlation between values obtained and the bottling sequence. Bottle-to-bottle (One-Shot™ to One-Shot™) variations of the samples measured are included as a part of the calculated measurement uncertainty stated on page 1 of this certificate. A minimum sample size of 100 ml should be used to maintain the certified value and the associated statement of uncertainty.

STABILITY STUDY: The expiration date stated on page 1 indicates the period of time over which the certified reference material stored under environmentally controlled and monitored conditions in an unused and unopened package remains within the specified uncertainty range. Stability tests take place at six month intervals over the certification period of the certified reference material. Each test, two (2) 100 ml samples are taken from each of three (3) bottles and then measured to study stability over time. The most significant contributor to instability is carbon dioxide absorption. The long-term stability of the certified reference material over the certification period is included in the uncertainty calculation.

EXPIRATION DATE: The date after which a certified reference material should be discarded.

STORAGE: Store below 40°C and above 4°C.

SHIPPING: Ship below 50°C and above 4°C.

MAINTENANCE OF CERTIFICATION: Control Company monitors representative samples from this lot over the period of its certification. If a change occurs that affects the certification before the expiration date, Control Company posts amended certificate(s) at www.traceable.com\cmupdate.htm.

MSDS INFORMATION: Please refer to the Material Safety Data sheet for information regarding this certified reference material at https://traceable.com/safety-data-sheets. Use only the first four digits of the certificate number to locate the MSDS.

QUALITY STANDARD DOCUMENTATION:
ISO 17034:2016 General Requirements for the Competence of Reference Material Producers, accredited A2LA Certificate Number 1750.02.
ISO Guide 31:2015 Reference Materials – Contents of Certificates, Labels and accompanying documentation.
ISO Guide 35:2006 Certification of Reference Materials – General and Statistical Principals.
ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories, accredited A2LA Certificate Number 1750.01.
ANSI/NCSL Z540-1: 1994 Calibration Laboratories and Measuring and Test Equipment-General Requirements.
ISO 9001:2015 Quality Management System Requirements - DNV GL Certificate Number CERT-01805-2006-AQ-HOU-RvA.

CONTROL COMPANY 12554 Galveston RD Suite B230 Webster TX USA 77598
Phone 281 482-1714 Fax 281 482-9448 sales@control3.com www.traceable.com

LOT: CC743417

CERTIFICATE OF ANALYSIS
Complies with ISO 17034, ISO Guide 31, ISO Guide 35, and ISO 9001
TRACEABLE® CERTIFIED REFERENCE MATERIAL

Temperature Correction Information:

Use the chart below only for making absolute measurements. That is, measurements without any automatic temperature correction (temperature coefficient set to 0).

Temperature Correction Chart in micromhos/cm

°C	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
18	10.082	10.081	10.080	10.079	10.078	10.077	10.075	10.074	10.073	10.072
19	10.071	10.070	10.069	10.068	10.067	10.066	10.065	10.064	10.063	10.061
20	10.060	10.059	10.058	10.057	10.056	10.055	10.054	10.053	10.052	10.051
21	10.050	10.049	10.048	10.047	10.046	10.045	10.044	10.043	10.042	10.041
22	10.040	10.039	10.038	10.037	10.036	10.035	10.034	10.033	10.032	10.031
23	10.030	10.029	10.028	10.027	10.026	10.025	10.024	10.023	10.022	10.021
24	10.020	10.019	10.018	10.017	10.016	10.015	10.014	10.013	10.012	10.011
25	10.01	10.009	10.008	10.007	10.006	10.005	10.004	10.003	10.002	10.001
26	10.000	9.999	9.999	9.998	9.997	9.996	9.995	9.994	9.993	9.992
27	9.991	9.990	9.989	9.988	9.987	9.987	9.986	9.985	9.984	9.983
28	9.982	9.981	9.980	9.979	9.978	9.977	9.977	9.976	9.975	9.974

The above data are derived values based upon IUPAC data (Pure and Applied Chemistry 74, 2169-2200) and data/algorithm obtained using a temperature controlled calibration bath.

Shown on the chart is temperature (in the far left column) in whole degrees. Shown across the top row is temperature in tenths of a degree. Using a thermometer, measure the temperature of this certified reference material. Locate the measured temperature in whole numbers on the far left column. Follow across the row to the temperature in tenths of a degree. At the intersection is the certified reference material value at that specific temperature. Standardize the meter using that value.

Example: Measured temperature is 24.5°C. Find 24°C in the far left column, find the row 0.5°C. Where 24°C and 0.5°C intersect, read the value in pH.

CONTROL COMPANY 12554 Galveston RD Suite B230 Webster TX USA 77598
Phone 281 482-1714 Fax 281 482-9448 sales@control3.com www.traceable.com

LOT: CC743417