



CERTIFICATE OF ANALYSIS

Complies with ISO Guide 34, ISO Guide 31,
ISO Guide 35, and ISO 9001



TRACEABLE® CERTIFIED REFERENCE MATERIAL

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

Certificate No.: 4289-8148369
Description: pH Standard
Catalog Number: 06664264, 11794256 **Lot:** CC481211
Certificate Date: November 29, 2016 **Expiration Date:** November 29, 2018
Certified Value: 10.008 pH U = ±0.011 pH (k=2) at 25°C

Certification measurements are performed under ISO Guide 34, 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: 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 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.

Aaron Judice, Technical Manager

Nicol Rodriguez, Quality Manager

Traceability: Standards and Equipment Used

Description	Serial Number	Cal Due Date	Traceable Reference
Reference Material 9.9971 pH	E1409815	10/14/18	098-15
pH/Ion-Meter TC-241	658R067-N023		
pH Electrode	15293-F18		
Digital Thermometer	102008443	2/19/17	4000-7437656
Laboratory environment conditions: 23.0 °C 49 %RH 1,004 mb(hPa)			

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Control Company is an ISO Guide 34:2009 Certified Reference Material (CRM) Producer Accredited by American Association for Laboratory Accreditation (A2LA Certificate No. 1750.02). This certificate fulfills the requirements of ISO Guide 31:2000 (Reference Materials-Contents of Certificates and Labels), ISO Guide 34:2009 "Quality System Guidelines for the Production of Reference Materials", and ISO Guide 35:2006 "Certification of Reference Materials-General and Statistical Principals". Control Company is an ISO/IEC 17025:2005 Calibration Laboratory Accredited by American Association for Laboratory Accreditation (A2LA Certificate No. 1750.01). Control Company is ISO 9001:2008 Certified by DNV GL (Certificate No. CERT-01805-2006-AQ-HOU-RvA). TRACEABLE® is a registered trademark of Control 3 Inc.



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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).

pH Temperature Chart for this Lot

	0.0°C	0.1°C	0.2°C	0.3°C	0.4°C	0.5°C	0.6°C	0.7°C	0.8°C	0.9°C
18°C	10.080	10.079	10.078	10.077	10.076	10.074	10.073	10.072	10.071	10.070
19°C	10.069	10.068	10.067	10.066	10.065	10.064	10.063	10.062	10.061	10.059
20°C	10.058	10.057	10.056	10.055	10.054	10.053	10.052	10.051	10.050	10.049
21°C	10.048	10.047	10.046	10.045	10.044	10.043	10.042	10.041	10.040	10.039
22°C	10.038	10.037	10.036	10.035	10.034	10.033	10.032	10.031	10.030	10.029
23°C	10.028	10.027	10.026	10.025	10.024	10.023	10.022	10.021	10.020	10.019
24°C	10.018	10.017	10.016	10.015	10.014	10.013	10.012	10.011	10.010	10.009
25°C	10.008	10.007	10.006	10.005	10.004	10.003	10.002	10.001	10.000	9.999
26°C	9.998	9.997	9.997	9.996	9.995	9.994	9.993	9.992	9.991	9.990
27°C	9.989	9.988	9.987	9.986	9.985	9.985	9.984	9.983	9.982	9.981
28°C	9.980	9.979	9.978	9.977	9.976	9.976	9.975	9.974	9.973	9.972

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.

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