



CERTIFICATE OF ANALYSIS
Complies with ISO 17034, ISO Guide 31,
ISO Guide 35, and ISO 9001

1665



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. : 4287-9251281

Description : Buffer 4.005 pH

Catalog Number : 06664262,11774256

Lot : CC546364

Certificate Date : 22 Feb 2018

Expiration Date : 22 Feb 2020

Certified Value : 4.000 pH

U: ±0.012 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, 0.050 mol/kg H₂O potassium hydrogen phthalate, and germicide.

Aaron Justice, 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 4.0000	E1107516	13 Sep 2019	075-16
Digital Thermometer	102008443	22 Feb 2019	4000-9250399
pH Electrode	15293-F18		

Laboratory Environment Conditions: 45.00%RH 24.40°C 1017mBar

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

Control Company is an ISO 17034:2016 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 31:2015 (Reference Materials – Contents of Certificates and Labels), ISO 17034:2016 "Quality System Guidelines for the Production of Reference Materials", and ISO Guide 35:2006 "Certification of Reference Materials – General and Statistical Principles". 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 9001:2015 certified by DNV GL (Certificate No. CERT-01805-2006 -AQ-HOU-RvA). Traceable® is a registered trademark of Control 3 Inc.



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	3.994	3.994	3.994	3.995	3.995	3.995	3.995	3.995	3.995	3.995
19	3.995	3.995	3.995	3.995	3.995	3.995	3.995	3.995	3.995	3.996
20	3.996	3.996	3.996	3.996	3.996	3.996	3.996	3.996	3.996	3.996
21	3.996	3.996	3.996	3.997	3.997	3.997	3.997	3.997	3.997	3.997
22	3.997	3.997	3.997	3.997	3.997	3.998	3.998	3.998	3.998	3.998
23	3.998	3.998	3.998	3.998	3.998	3.998	3.998	3.999	3.999	3.999
24	3.999	3.999	3.999	3.999	3.999	3.999	3.999	4.000	4.000	4.000
25	4	4.000	4.000	4.000	4.000	4.000	4.000	4.001	4.001	4.001
26	4.001	4.001	4.001	4.001	4.001	4.001	4.001	4.002	4.002	4.002
27	4.002	4.002	4.002	4.002	4.002	4.003	4.003	4.003	4.003	4.003
28	4.003	4.003	4.003	4.003	4.004	4.004	4.004	4.004	4.004	4.004

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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