

Hamilton Conductivity Standards

Long-term stability and accuracy

For measurements in the low conductivity range stable and reliable calibration standards have been completely lacking up to now. Since a conductivity standard is not a buffer solution, the lower the value of the conductivity standard, the greater the effect of entry of CO₂ or contamination. Hamilton is the first manufacturer to offer patented conductivity standards of 1.3 and 5 $\mu\text{S}/\text{cm}$ with a certified accuracy of $\pm 1\%$ and a lifetime of 1 and 3 years, respectively. The procedure for determining conductivity was developed in collaboration with DFM¹. Many metrological institutes choose Hamilton standards because of their unprecedented stability and independent verification by PTB. During an interlaboratory test among prestigious European metrological institutes (PTB, DFM, DAkkS³) Hamilton standards were used as measurement solutions.



Hamilton is Different

Hamilton offers conductivity standards whose stability of $\pm 1\%$ is guaranteed over a lifetime of up to 3 years. They can be used repeatedly under the condition that the bottle is not left open for more than 1 hour in total.

A representative number of bottles from every batch are measured by DFM. Their value is recorded on the calibration certificate and on every bottle. DFM enjoys the highest prestige in Europe in the area of electrolytic conductivity and is equipped with an absolute measurement cell that was developed in collaboration with NIST, and is accredited by the Danish accreditation agency DANAK to a conductivity of 0.9 $\mu\text{S}/\text{cm}$. DFM and NIST⁴ have made comparisons of their measurement uncertainty and have confirmed in a series of scientific publications that the measurement accuracy is in each case the

same. Because no primary standards exist in the low conductivity range, measurements depend on absolute measurement cells which trace electrical conductivity back to the SI units: meter and volt. Testing of Hamilton standards is thus carried out on the most precise measurement apparatus in the world, and certified accordingly.



- 1) DFM: Danish Institute of Fundamental Metrology, Denmark
- 2) PTB: Physikalisch-Technische Bundesanstalt, Braunschweig
- 3) DAkkS: Deutsche Akkreditierungsstelle
- 4) NIST: National Institute of Standards and Technology, Gaithersburg MD, USA

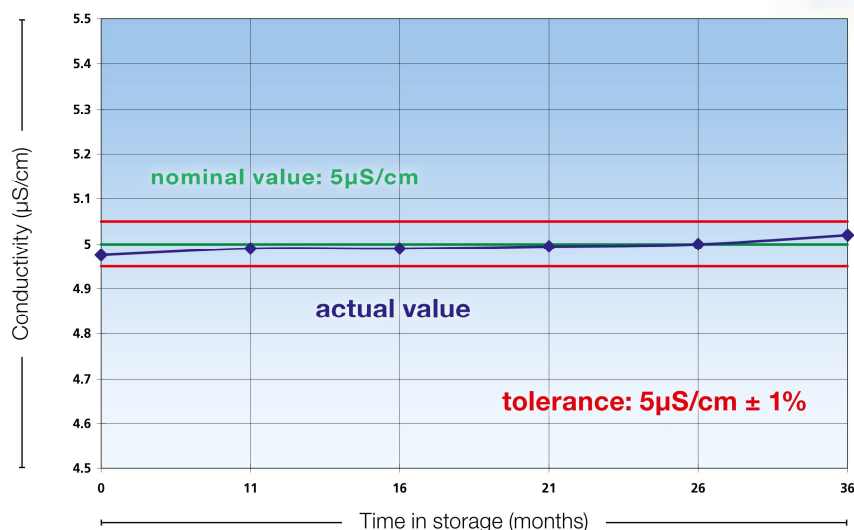


Unique advantages:

- ▶ Remains stable for a minimum of 1 year for 1.3 $\mu\text{S}/\text{cm}$, and up to 3 years for all other values
- ▶ Certificate with calibration document from DFM (available at www.hamiltoncompany.com)
- ▶ Expiration date shown on every bottle
- ▶ Bottles are permitted to stay open for a total of 60 minutes

Stability of the Hamilton 5 $\mu\text{S}/\text{cm}$ Conductivity Standard over 36 months

Check measurement by PTB²



Value at 25°C	Accuracy	Stability*	Certificate From	Packaging Unit	Volume	Ref
1.3 $\mu\text{S}/\text{cm}$	$\pm 1\%$	12	DFM	Glass bottle	300 mL	238973
5 $\mu\text{S}/\text{cm}$	$\pm 1\%$	36	DFM	Glass bottle	300 mL	238926
15 $\mu\text{S}/\text{cm}$	$\pm 1\%$	36	DFM	Glass bottle	300 mL	238927
84 $\mu\text{S}/\text{cm}$	$\pm 1\%$	18	DFM	Calpack bottle	500 mL	238984
100 $\mu\text{S}/\text{cm}$	$\pm 1\%$	36	DFM	Glass bottle	300 mL	238934
147 $\mu\text{S}/\text{cm}$	$\pm 1\%$	18	DFM	Calpack bottle	500 mL	238985
706 $\mu\text{S}/\text{cm}$	$\pm 2\%$	36	Hamilton	Glass bottle	300 mL	238929
1413 $\mu\text{S}/\text{cm}$	$\pm 1\%$	36	DFM	Glass bottle	300 mL	238928
1413 $\mu\text{S}/\text{cm}$	$\pm 1\%$	18	DFM	Calpack bottle	500 mL	238986
12880 $\mu\text{S}/\text{cm}$	$\pm 1\%$	18	DFM	Calpack bottle	500 mL	238988
100 mS/cm	$\pm 1\%$	36	Hamilton	Glass bottle	300 mL	238935

* In months