



DSR Temperature Standardization to Satisfy Accreditation Requirements

Binder ETG
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John Casola

What's the problem

- › AMRL accreditation audit requirements are asking for more/different documentation to satisfy their inspection requirements.
- › The effects will create a financial cost to every accredited lab. Could also cause a timing problem due to the work required.

AASHTO Procedure

- › *Electronic Thermometer*—Incorporating a resistive detector (Note 3) with an accuracy of $\pm 0.05^{\circ}\text{C}$ and a resolution of 0.01°C . The electronic thermometer shall be standardized at least once per year using a NIST–traceable reference standard in accordance with ASTM E77.



Requirement for reference standards in R 18:

- › The calibration certificates shall include estimates of measurement 'uncertainty'.
- › To achieve requires conformance to **ISO17025**

Test Points

Seq.	Description	Nominal	Tolerance	Unit Measure	As Found	As Left	Uncertainty
1	TEMPERATURE	4.00	4.05 3.95	°C	3.99	3.99	0.015°C
2	TEMPERATURE	7.00	7.05 6.95	°C	6.98	6.98	0.015°C
3	TEMPERATURE	10.00	10.05 9.95	°C	9.98	9.98	0.015°C
4	TEMPERATURE	13.00	13.05 12.95	°C	12.98	12.98	0.015°C
5	TEMPERATURE	16.00	16.05 15.95	°C	15.98	15.98	0.015°C
6	TEMPERATURE	19.00	19.05 18.95	°C	18.98	18.98	0.015°C
7	TEMPERATURE	22.00	22.05 21.95	°C	21.97	21.97	0.015°C
8	TEMPERATURE	25.00	25.05 24.95	°C	24.97	24.97	0.015°C
9	TEMPERATURE	28.00	28.05 27.95	°C	27.97	27.97	0.015°C
10	TEMPERATURE	31.00	31.05 30.95	°C	30.98	30.98	0.016°C
11	TEMPERATURE	34.00	34.05 33.95	°C	33.97	33.97	0.016°C
12	TEMPERATURE	46.00	46.05 45.95	°C	45.99	45.99	0.017°C
16	TEMPERATURE	70.00	70.05 69.95	°C	69.98	69.98	0.017°C
17	TEMPERATURE	76.00	76.05 75.95	°C	75.99	75.99	0.018°C
18	TEMPERATURE	82.00	82.05 81.95	°C	81.99	81.99	0.018°C

In Summary; what's required

- › Accreditation requires the sensor used to standardize the DSR temperature to conform to ISO 17025
- › Every specified temperature requires calibration for actual temperature
- › Every specified temperature requires uncertainty within tolerance

Specifically this means: *for example*

- › A new Cannon sensor with its current documentation of calibration **is not acceptable.**
- › The new Cannon sensor must be matched to an in compliance Ohm meter for standardization.
- › Any sensor used to standardize or calibrate the DSR must comply to be acceptable for use.

A Comment & A Question

- › As a result of the need of individual uncertainties for each temperature significantly complicates the process, takes significantly more time and requires much more effort.

A Comment & A Question

- › Is the impact worth the costs on a process that currently (historically) works?