Thermodynamic Quantities

Humidity Measurements

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Do not ship instruments or standards to the mailing address listed below. Contact the technical staff for the shipping address.

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NIST's best claim is -70 Dew-point, and at a fee of >US$11,000!!!

Service ID Number	Description of Services	Fee ($)
36010C	Dew–Point Hygrometers (+25 ºC to –15 ºC)	5907
36020C	Dew–Point Hygrometers (–70 ºC to –15 ºC)	11199
36030C	Electric Hygrometers	At Cost
36040C	Electrolytic Hygrometers	At Cost
36050C	Aspirated Hygrometers	At Cost
36060C	Pneumatic Bridge Hygrometers	At Cost
36070S	Special Tests of Humidity	At Cost

Fees are subject to change without notice.

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Hygrometers (36010C–36060C)

NIST provides calibration services for a wide variety of humidity–measuring instruments. Calibrations are performed by subjecting the instrument under test to atmospheres of known moisture content produced by the NIST two-pressure humidity generator.

Table 6.5 illustrates typical NIST uncertainties for measurement of humidity standards with atmospheric air at atmospheric pressures.

The NIST humidity generator□

□

produces saturated vapour□

□

at a known temperature!□

□

□

This saturated vapour is observed with an optical hygrometer, □

□

which detects a dewpoint at a specific temperature. □

□

Consequently, it claims its traceability to the temperature of detection.□

□

□

This method does not relate its output directly to a mass of water, □

□

and Dewpoint is not an S.I. unit of measurement.

Special Tests of Humidity (36070S)

Tests for response time, hysteresis, and stability can be provided upon request.

Table 6.5. NIST Two–Pressure Humidity Generator, Mark 2, Range and Uncertainty

Humidity Parameter	Range	Expanded Uncertainty
Mixing ratio, r_w (g water vapor/kg dry air)	$0.0015 \leq r_w < 0.005$	1.5 % of value
	$0.005 \leq r_w < 0.1$	1.0 % of value
	$0.1 \leq r_w < 0.3$	0.5 % of value
	$0.3 \leq r_w < 515$	0.3 % of value
Volume ratio, V (X 10^{-6})	$3 \leq V < 10$	1.5 % of value
	$10 \leq V < 170$	1.0 % of value
	$170 \leq V < 500$	0.5 % of value
	$500 \leq V < 820\ 000$	0.3 % of value
Dew point temperature, T_d (°C)	$-70 \leq T_d < -35$	0.1 °C
	$-35 \leq T_d < +40$	0.04 °C
Relative humidity, RH (%) at test chamber temperature, T_c (°C) of:	$-55 \leq T_c < -40$	3–98 1.5 %
	$-40 \leq T_c < -20$	3–98 0.8 %
	$-20 \leq T_c < 0$	3–98 0.2 %

	$0 \leq T_c < +40$	3–98 0.2 %

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References—Humidity Measurements

The New NIST Low Frost-Point Humidity Generator, G. E. Scace, P. H. Huang, J. T. Hodges, D. A. Olson and J. R. Whetstone, presented at the 1997 NCSL Workshop and Symp., Atlanta, GA (1997).

Thermodynamic Properties of Moist Air Containing 1000 to 5000 PPMv of Water Vapor, P. H. Huang, NISTIR 5241, 43–51 (Apr. 1993).

NIST Calibration Services for Humidity Measurement, P. H. Huang, NISTIR 4677–A (Superseding NISTIR 4677, Oct. 1991).

National Basis of Accuracy in Humidity Measurements, S. Hasegawa, ISA Trans. **25** (3), 15–24, 1986.

The NBS Two–Pressure Humidity Generator, Mark 2, S. Hasegawa and J. W. Little, J. Res. Nat. Bur. Stand. (U.S.), **81A** (1), 81–88 (Jan.–Feb. 1977).

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----- Original Message -----
From: Peter Huang <mailto:phuang@nist.gov>
To: paul.ninzatti@manalytical.com
Sent: Tuesday, November 28, 2006 8:22 PM
Subject: FW: Calibrations - Moisture Analyzer

Dear Paul,

We provide calibrations of various hygrometer, but not mass traceability. If your hygrometer is calibrated by NIST, it is then traceable to the NIST standard. In order to know if we can calibrate your hygrometer, please let me know the type of your instrument and the manufacturer.

Best regards,

Peter Huang
NIST

NIST themselves confirm that they DO NOT offer moisture calibrations with mass traceability!

-----Original Message-----
From: Arnold, Tracy [mailto:tarnold@NIST.GOV]
Sent: Monday, November 27, 2006 8:22 AM
To: Peter Huang
Cc: Calibrations
Subject: FW: Calibrations - Moisture Analyzer

Peter,

Can you advise and let this customer know.

Thanks,

Tracy

From: Paul Ninzatti [mailto:paul.ninzatti@manalytical.com]
Posted At: Monday, November 27, 2006 8:01 AM
Posted To: Calibrations
Conversation: Calibrations - Moisture Analyzer
Subject: Calibrations - Moisture Analyzer

Dear Madame/Sir,
I am looking for some information on certified NIST moisture Standard calibrations for hygrometers. Calibration points of interest (0.5ppm(V), 2.5ppm(V), 7.5ppm(V), 120ppm(V)) all at atmospheric pressure.
1. Mass Traceability
2.Price

Please forward me any appropriate information.

I look forward to your reply

Best Regards,
Paul Ninzatti