Designation: E 337 – 02

Standard Test Method for Measuring Humidity with a Psychrometer (the Measurement of Wet- and Dry-Bulb Temperatures)[1]

This standard is issued under the fixed designation E 337; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 *General*:

1.1.1 This test method covers the determination of the humidity of atmospheric air by means of wet- and dry-bulb temperature readings.

1.1.2 This test method is applicable for meteorological measurements at the earth's surface, for the purpose of the testing of materials, and for the determination of the relative humidity of most standard atmospheres and test atmospheres.

1.1.3 This test method is also applicable when the temperature of the wet bulb only is required. In this case, the instrument comprises a wet-bulb thermometer only.

1.1.4 Relative humidity (RH) does not denote a unit. Uncertainties in the relative humidity are expressed in the form $RH \pm rh$ %, which means that the relative humidity is expected to lie in the range $(RH - rh)$ % to $(RH + rh)$ %, where RH is the observed relative humidity. All uncertainties are at the 95 % confidence level.

1.2 *Method A—Psychrometer Ventilated by Aspiration:*

1.2.1 This method incorporates the psychrometer ventilated by aspiration. The aspirated psychrometer is more accurate than the sling (whirling) psychrometer (see Method B), and it offers advantages in regard to the space which it requires, the possibility of using alternative types of thermometers (for example, electrical), easier shielding of thermometer bulbs from extraneous radiation, accidental breakage, and convenience.

1.2.2 This method is applicable within the ambient temperature range 5 to 80°C, wet-bulb temperatures not lower than 1°C, and restricted to ambient pressures not differing from standard atmospheric pressure by more than 30 %.

1.3 *Method B—Psychrometer Ventilated by Whirling (Sling Psychrometer):*

1.3.1 This method incorporates the psychrometer ventilated by whirling (sling psychrometer).

1.3.2 This method is applicable within the ambient temperature range 5 to 50°C, wet-bulb temperatures not lower than 1°C and restricted to ambient pressures not differing from standard atmospheric pressure by more than 30 %.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* (For more specific safety precautionary statements, see 8.1 and 15.1.)

2. Referenced Documents

2.1 *ASTM Standards:*

D 861 Practice for Use of the Tex System to Designate Linear Density of Fibers, Yarn Intermediates, and Yarns[2]

D 1193 Specification for Reagent Water[3]

D 1356 Terminology Relating to Sampling and Analysis of Atmospheres[4]

D 1357 Practice for Planning the Sampling of the Ambient Atmosphere[4]

D 3631 Test Methods for Measuring Surface Atmospheric Pressure[4]

D 4230 Test Method of Measuring Humidity with Cooled-Surface Condensation (Dew-Point) Hygrometer[4]

E 1 Specification for ASTM Thermometers[5]

E 380 Practice for Use of the International System of Units (SI) (the Modernized Metric System)[6]

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of humidity terms used in this test method, refer to Terminology D 4023.

3.1.2 For definitions of other terms in this test method, refer to Terminology D 1356.

3.2 *Definitions of Terms Specific to This Standard:*

[1] This test method is under the jurisdiction of ASTM Committee D22 on Sampling and Analysis of Atmospheres and is the direct responsibility of Subcommittee D22.11 on Meteorology.

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[2] *Annual Book of ASTM Standards*, Vol 07.01.

[3] *Annual Book of ASTM Standards*, Vol 11.01.

[4] *Annual Book of ASTM Standards*, Vol 11.03.

[5] *Annual Book of ASTM Standards*, Vol 14.03.

[6] *Annual Book of ASTM Standards*, Vol 14.02. (Excerpts in all other volumes.)

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