



Procedures for High Humidity Test

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. This procedure describes two options of high humidity testing (water fog and wet-bottom) which are typically used to evaluate the influence of high humidity environments to coated substrates. This influence is usually measured by testing physical and mechanical properties before and after exposure.

1.2 Applicability. Not applicable.

1.3 Remarks. Not applicable.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

ASTM B117 ASTM D1193 ISO 6270-2

2.2 GM Standards/Specifications.

None

2.3 Additional References.

- Product or Material Specifications.
- Subsystem Technical Specifications.
- Component Technical Specification.
- Part Drawings.

3 Resources

3.1 Facilities. Not applicable.

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.2 Equipment.

3.2.1 Option A: Water Fog. The apparatus for fogging humidity exposure shall consist of:

3.2.1.1 A fog/environmental chamber.

3.2.1.2 Suitable water supply conforming to ASTM D1193 Type IV.

3.2.1.3 A supply of suitably conditioned compressed air.

3.2.1.4 One or more atomizing nozzles.

3.2.1.5 Provisions for heating the chamber and the necessary means of control (refer to ASTM B117, Appendix X.1 for further details regarding the construction of the apparatus).

3.2.2 Option B: Wet Bottom. The apparatus shall consist of the chamber design as defined in ISO 6270-2 Section 5.1, Climatic Chamber.

Note: During “wet-bottom” generated humidity cycles, insure that visible water droplets are found on the samples to verify proper wetness.

3.3 Test Vehicle/Test Piece. Test specimen preparation shall be per the applicable product or material specification, or per agreement between the requester and the test analyst.

3.4 Test Time. Not applicable.

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Not applicable.

4 Procedure

4.1 Preparation. Humidity test environment and duration of test shall be per the applicable product or material specification, or per agreement between the requester and tester.

4.2 Conditions.

4.2.1 Environmental Conditions. The apparatus for humidity exposure shall be installed in a room with an ambient atmosphere where room temperature is $23\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ and $< 75\%$ relative humidity (RH).

4.2.2 Test Conditions. Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

4.3 Instructions.

4.3.1 Option A: Water Fog. Test temperature and humidity within the exposure zone shall be:

- Temperature: $38\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$
- Humidity: $\sim 100\%$ RH

4.3.2 Option B: Wet-Bottom. Test temperature and humidity within the exposure zone shall be:

- Temperature: $40\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$
- Humidity: $\sim 100\%$ RH

5 Data

5.1 Calculations. Not applicable.

5.2 Interpretation of Results. Evaluations (pre-test and post-test), rating methods, and acceptance criteria shall be specified within engineering documentation which includes: Material Specifications, Subsystem Technical Specifications, Component Technical Specification, and Part Drawings.

5.3 Test Documentation. Test documentation must include Type of used equipment (Option A or B).

5.3.1 Option A: Fogging. Basic test information to include sample identification, hours of duration, results of evaluation and any other pertinent information should be included in the report. Additionally, the following parameters shall be monitored and recorded on a daily basis (weekends and holidays are exceptions):

5.3.1.1 The temperature within the exposure zone $38\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$.

5.3.1.2 The fog collection rate, based on 80 cm^2 of horizontal test area (1.0 mL to 3.0 mL per hour). At least two collectors per atomizing tower shall be placed in the exposure zone and shall be distributed to provide a representative measure of the fog collection rates throughout the chamber.

5.3.1.3 The humidifying tower temperature and pressure. These parameters shall be adjusted as needed to produce the specified operating conditions.

5.3.2 Option B: Non-Fogging. Basic test information to include sample identification, hours of duration, results of evaluation and any other pertinent information should be included in the report.

6 Safety

This standard may involve hazardous materials, operations, and equipment. This standard does not propose to address all the safety problems 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.