

## STANDARDS ASSOCIATION OF AUSTRALIA

## Australian Standard

## METHODS OF TEST FOR METALLIC AND RELATED COATINGS

## PART 3—CORROSION AND RELATED PROPERTY TESTS

---

# AS 2331.3.8—1982

## HUMIDITY TEST—24 h CYCLE, DAMP HEAT

---

**1 SCOPE.** This standard sets out the method for assessing the suitability of inorganic and organic coatings for use in or to be stored under conditions of high humidity.

**NOTES:**

1. The method does not specify the type of test item, the number of cycles or the assessment criteria. Such details are normally specified in the product standard or determined by agreement between contracting parties.
2. Results obtained from the test should not be regarded as having a direct correlation with all environments in which items may be exposed or the relative corrosion resistance of different coatings.

**2 APPLICATION.** The method is suitable for assessing the effects of combined high humidity and temperature fluctuations on different types of coatings.

**3 PRINCIPLE.** Coatings are exposed to controlled conditions of humidity and condensation by heating and cooling.

Corrosion or deterioration of the coating and/or of the substrate is used to assess the quality of the coating against the conditions of the test.

**4 APPARATUS.** The following apparatus is required:

- (a) *Humidity cabinet.* The humidity cabinet and accessories shall be made of, or lined with material resistant to the test temperature and to corrosion by water.

Materials of construction shall not affect the results of the test.

The shape of the upper parts of the cabinet shall be such that drops of condensed water do not drop onto test pieces.

- (b) *Test piece supports.* Test pieces shall be made of inert non-metallic material such as ceramic, glass, plastics or suitably coated wood.

Material used for suspending test pieces shall be made of synthetic fibre, cotton thread or other inert insulating material. Metallic supports shall not be used.

- (c) *Humidity equipment.* A cabinet fitted with air circulation, wet and dry bulb controlling thermometers and means to maintain a relative humidity of not less than 95 percent at a temperature of  $55 \pm 2^\circ\text{C}$ .

The controlling elements shall be placed, either within the cabinet at a distance of not less than 100 mm from the walls, or within a water jacket surrounding the cabinet. The controlling elements

shall be so positioned as to be capable of being read from outside the cabinet.

**5 PREPARATION OF TEST PIECES AND/OR TEST SPECIMENS.**

**5.1 General.** The number and type of test pieces or test specimens, their shape and dimensions shall be selected according to the product standard.

**NOTES:**

1. When not specified, details concerning test pieces or test specimens are subject to agreement between the purchaser and the supplier.
2. Test pieces may be the product items or a section cut from a larger item. Test specimens may be prepared by coating separate pieces of the same metal and/or profile, as the product items they represent, under essentially the same processing conditions as the product items.
3. For the purpose of this test, the term test specimen is synonymous with test piece.

Where test pieces are cut from a larger coated item, the cutting shall be carried out in such a way that the coating is not damaged in the area adjacent to the cut. Unless otherwise specified, cut edges shall be adequately protected with a suitable medium which is stable under the conditions of the test, e.g. paint, wax or adhesive tape.

Test pieces shall be thoroughly cleaned before testing. The cleaning method shall be appropriate for the nature of the surface and on any contaminant present. Cleaning shall not include the use of any abrasives or solvents which can attack the surface of the test piece.

Care shall be taken to ensure that test pieces are not recontaminated by excessive or careless handling after cleaning.

**6 PROCEDURE.** Test pieces shall be tested as follows:

- (a) Position test pieces in the humidity chamber at ambient temperature ( $25 \pm 10^\circ\text{C}$ ) and heat to  $55 \pm 2^\circ\text{C}$  within a period of 1.5 h to 2.5 h. During the heating period maintain the relative humidity between 80 percent and 100 percent with condensation occurring on the test pieces.
- (b) Maintain at  $55 \pm 2^\circ\text{C}$  for 16 h total excursion. Periodic variation, within the range of  $53^\circ\text{C}$  to  $57^\circ\text{C}$ , shall occur at least four times per hour. During this period maintain the relative humidity between 95 percent and 100 percent.