

**SHORT AND LONG TERM ENVIRONMENTAL TESTING****Application**

This procedure is used to determine the dimensional stability, function and visual/tactile performance of a component after undergoing short term cyclic and/or long term heat exposure testing.

Apparatus and Materials Required**Environmental Cabinet**

Capable of maintaining controlled temperature and humidity conditions to $\pm 1^\circ\text{C}$ and $\pm 2\%$ relative humidity.

Oven

As described in ASTM D573

Chemicals, materials, parts, and equipment referenced in this document must be used and handled properly. Each party is responsible for determining proper use and handling in its facilities.

Sample Preparation

All parts shall be fully trimmed including all components packaged in the environment (eg. speakers, hardware, wiring, etc.) and assembled onto actual or representative production support foundations. This includes not only all attaching points, but also any boundary conditions that may restrict movement, unless otherwise specified by the responsible PD Engineer. The retention methods, attachments, and supporting garnish moldings (if any), shall be the same as proposed for production.

Measurement Location

1. Every twenty centimeters and at the points of greatest movement between the twenty centimeter marks along the part's outside edges and internal openings or as defined by PD Engineering. Some parts may have specific measurement locations required by PD Engineering, which will override the 20 cm required. Part specific measurement locations to be signed off by PD Engineering prior to test.
2. The "significant characteristics locations" specified on the engineering drawing.
3. Unique requirements will be noted in the applicable performance specification.

Measurement Technique

The movement at each measurement point shall be recorded in two directions: (1) in the x/y plane from the observers view, and (2) in the z-dimension direction into or out of the x/y plane from the observers view. The observer's view shall remain consistent always viewing from the front side of the part. Room temperature is defined as $23 \pm 2^\circ\text{C}$. If pre-evaluation or evaluation are performed outside of the room temperature range, record the temperature of the room in the test report.

Date	Action	Revisions	Rev. 02
2018 07 27	Revised	See Summary of Revisions	L. Rabideau, NA
2018 01 19	Revised	Added additional time/temperature for floor consoles	L. Schmalz, NA
2016 07 08	Released		I. Sinclair, NA



Procedure A: Short Term Heat, Humidity and Cold Cycle

1. Visually evaluate the part before the test. Note any defects on the component prior to testing.
2. Measure the part and record the data at all specified locations at room temperature before cycling on the production support foundation or test fixture. Any visual defects/imperfections must be noted in the test report and signed off by PD Engineering for compliance.
3. Use test chambers with automated programmable test cycles for the listed test conditions below.

Note that stages do not include ramp times to transition from level to level. Each specimen can have different size, geometry, density, etc. which impacts ramp times; therefore, each transition period will vary in length of time.

4. Program the chamber as follows:

5 h at -30 +/- 2 °C
30 min at 23 +/- 2 °C and 50% R.H.
5 h at XX* +/- 2 °C
30 min at 23 +/- 2 °C and 50% R.H.
2 h at 50 +/- 2 °C and 95 +/- 5% R.H.
30 min at 23 +/- 2 °C and 50% R.H.
5 h at -30 +/- 2 °C
30 min at 23 +/- 2 °C and 50% R.H.
5 h at XX* +/- 2 °C

XX* = The temperature identified by vehicle location in the material or performance specification. If not stated then use Table 1.

5. Evaluate per evaluation method.

Procedure B: Long Term Heat Exposure/Sun Load

1. Visually evaluate the part before the test. Note any defects on the component prior to testing.
2. Measure the part and record the data at all specified locations at room temperature before testing on the production support foundation or test fixture. Any visual defects/imperfections must be noted in the test report, and signed off by PD Engineering for compliance.

Program the chamber for given temperature and time using the temperature identified in the material or performance specification and time from Table 1. (Use the temperature from Table 1 if not stated in the material or performance specification.)

3. Evaluate per evaluation method.