This document is an overview only. To access the full procedure, please visit the ISTA store at www.ista.org.
ISTA 2 Series Partial Simulation Performance Test Procedure

OVERVIEW OF PROCEDURE 2C

Test Procedure 2C is a partial simulation test for individual packaged furniture products (Case Goods). Although the traditional furniture definition of case goods is for hard goods and not upholstered furniture, it can be used for any furniture transported in a container.

- It can be used to evaluate the performance of a packaged-product.
- It can be used to compare relative performance of package and product design alternatives.
- It should be considered for the evaluation of packaged-products intended for international distribution.
- The package and product are considered together and not separately.
- Some conditions of transit, such as moisture, pressure or unusual handling, may not be covered.

Other ISTA Procedures may be appropriate for different conditions or to meet different objectives.

Specific suggestions:
- Consider ISTA General Simulation Performance Test Procedure 3A or 3E.

Refer to Guidelines for Selecting and Using ISTA Procedures and Projects for additional information.
OVERVIEW OF PROCEDURE 2C

Test Procedure 2C covers testing of individual packaged-products of furniture (Case Goods) for shipment.

The shipper shall determine the following prior to testing:
- what constitutes damage to the product and
- what damage tolerance level is allowable, if any, and
- the correct methodology to determine product condition at the conclusion of the test and
- the acceptable package condition at the conclusion of the test.

For additional information on this determination process refer to Guidelines for Selecting and Using ISTA Procedures and Projects.

Samples should be the untested actual package and product, but if one or both are not available, the substitutes shall be as identical as possible to actual items.

Number of samples required:
One sample is required for the tests in this procedure.

Replicate Testing Recommended:
To permit an adequate determination of representative performance of the packaged-product, ISTA:
- Requires the procedure to be performed one time, but
- Recommends performing the procedure five or more times using new samples with each test.

NOTE:
Packages that have already been subjected to the rigors of transportation cannot be assumed to represent standard conditions. In order to insure testing in perfect condition, products and packages shipped to certified laboratories for testing must be:
- over-packaged for shipment to the laboratory or
- repackaged in new packaging at the laboratory.

The tests shall be performed on each test sample in the sequence indicated in the following table:

<table>
<thead>
<tr>
<th>Sequence #</th>
<th>Test Category</th>
<th>Test Type</th>
<th>Test Level</th>
<th>For ISTA Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Atmospheric Preconditioning</td>
<td>Temperature and Humidity</td>
<td>Ambient</td>
<td>Required</td>
</tr>
<tr>
<td>2</td>
<td>Atmospheric Conditioning</td>
<td>Controlled Temperature and Humidity</td>
<td>Temperature and Humidity chosen from chart</td>
<td>Optional</td>
</tr>
<tr>
<td>4</td>
<td>Shock (Alternative methods allowed – select one test type)</td>
<td>Drop</td>
<td>Height varies with packaged-product weight and Distribution Channel</td>
<td>Required</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Exception One and Two Incline-Impact (Conbur)</td>
<td>Impact Velocity varies with packaged-product weight</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Horizontal Impact</td>
<td>Impact Velocity varies with packaged-product weight</td>
</tr>
</tbody>
</table>
OVERVIEW OF PROCEDURE 2C

Atmospheric Preconditioning:
- Temperature recording apparatus complying with the apparatus section of ASTM D 4332.
- Humidity recording apparatus complying with the apparatus section of ASTM D 4332.

Equipment required for Optional Atmospheric Conditioning
- Chamber and Control apparatus complying with the apparatus section of ASTM D 4332.

Vibration Under Dynamic Load Test:
- Random Vibration Test System complying with the apparatus section of ASTM D 4728.
- Top-Load apparatus of one, two or four separate loading systems

The following alternatives are acceptable for the equipment required for the Shock Test:

<table>
<thead>
<tr>
<th>Type of Shock Test</th>
<th>Equipment</th>
<th>In compliance with the apparatus section of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drop Test</td>
<td>Free fall drop tester</td>
<td>ASTM D 5276</td>
</tr>
<tr>
<td>Vertical Shock Test</td>
<td>Shock test machine</td>
<td>ASTM D 5487</td>
</tr>
<tr>
<td>Incline Test</td>
<td>Incline-impact tester (conbur)</td>
<td>ASTM D 880</td>
</tr>
<tr>
<td>Horizontal Test</td>
<td>Horizontal impact test system</td>
<td>ASTM D 4003</td>
</tr>
<tr>
<td>Rotational Edge Test</td>
<td>Rotational drop</td>
<td>ASTM D 6179</td>
</tr>
</tbody>
</table>