This document is an overview only. To access the full procedure, please visit the ISTA store at www.ista.org.
ISTA, Distributing Confidence, Worldwide™

ISTA® 6-Series Member Performance Tests are protocols created by ISTA members to suit their own particular purposes and applications. This 6-AMAZON.COM test was developed by ISTA in cooperation with Amazon.com, and is designed as a General Simulation protocol. General Simulation tests
- Challenge the capability of the package and product to withstand transport hazards, **but**
- Utilize general simulation of actual transport hazards, **and**
- Do not necessarily comply with carrier packaging regulations.

When properly executed, ISTA procedures will provide tangible benefits of:
- Product to market time reduction
- Confidence in product launch
- Reduction in damage and product loss
- Balanced distribution costs
- Customer satisfaction contributing to increased market share

There are three sections to this procedure: **Overview, Testing, and Reporting**
- **Overview** provides general knowledge required before testing **and**
- **Testing** presents the specific instructions to do laboratory testing **and**
- **Reporting** indicates what data shall be recorded to submit a test report.

Two systems of weights and measures are presented in ISTA test procedures: English system (Inch-Pound) or SI (Metric). Inch-Pound units are shown first followed by the Metric units in parentheses; there may be exceptions in some tables (when shown separately).

Familiarity with the following units and symbols used in this document is required:

<table>
<thead>
<tr>
<th>For measuring</th>
<th>English units and symbols</th>
<th>Metric units and symbols</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>pounds (lb)</td>
<td>kilograms (kg) or grams (gm)</td>
</tr>
<tr>
<td>Force</td>
<td>pounds force (lbf)</td>
<td>newtons (N)</td>
</tr>
<tr>
<td>Distance</td>
<td>feet (ft) or inches (in)</td>
<td>meters (m) or millimeters (mm)</td>
</tr>
<tr>
<td>Velocity</td>
<td>inches per second (in/sec)</td>
<td>meters per second (m/sec) or millimeters per second (mm/sec)</td>
</tr>
<tr>
<td>Volume</td>
<td>cubic inches (in³)</td>
<td>cubic centimeters (cm³) or cubic meters (m³)</td>
</tr>
<tr>
<td>Density</td>
<td>pounds per cubic inch (lb/in³)</td>
<td>kilograms per cubic meter (kg/m³)</td>
</tr>
<tr>
<td>Temperature</td>
<td>Fahrenheit (°F)</td>
<td>Celsius (°C)</td>
</tr>
</tbody>
</table>

- Either system may be used as the unit of measure, **but**
- The units chosen shall be used consistently throughout the procedure.
- Units are typically converted to two significant figures **and**
- Not exact equivalents.

**VERY IMPORTANT:**
The entire document shall be read and understood before proceeding with a test.

*Notes Regarding ISTA “Projects” and “Procedures”*
- ISTA® 6-AMAZON.COM is currently an ISTA “Project”, first released in October 2014. New ISTA test protocols are given the designation “Project” during their implementation phase. After a minimum one-year period and required evaluation, a “Project” will either be adopted as an established “Procedure”, revised and kept as a “Project” for another period of time, or be dropped. Therefore, a “Project” is potentially subject to greater and more frequent revision than a “Procedure”.
- ISTA members may use either Procedures or Projects for package certification.
- Comments regarding this Project and its use are encouraged and welcome. Please contact ista@ista.org.
OVERVIEW OF PROJECT 6-AMAZON.COM-SIOC

Project 6-AMAZON.COM is a general simulation test for “Ships In Own Container” (SIOC) packaged-products shipped through Amazon’s distribution system to final customer destinations. This testing protocol has been developed by combining data from previous studies of transportation environments, relevant testing protocols, Amazon Fulfillment Center environment visual observations, and customer feedback.

This test is for packaged-products shipped by Vendors to Amazon.com Fulfillment Centers and delivered to final customer destinations via Parcel or Less-Than-Truckload (LTL) outbound shipment methods. It challenges the capability of both package and product to withstand transport hazards normally encountered during handling and transportation. Amazon.com Vendors with items intended to utilize Ships In Own Container (SIOC) are encouraged to use this test to understand the protective performance of their packaging.

Project 6-AMAZON.COM has been created by Amazon.com with help from industry experts in both the packaging and transportation industries. This test is currently in the Project phase (pilot stage) and will be improved upon if/where needed using feedback from industry experts and users of the test. It is requested that you share feedback and other data from any testing conducted using this test including number of tests conducted, failure/success rate, types of failures, test performance compared to real world comparison, and any other helpful data points. Please share your feedback with package-testing@amazon.com Amazon.com will share this data with ISTA in an effort to improve the effectiveness of the test protocol.

Project 6-AMAZON.COM is appropriate for eight (8) different types of packaged-products designated Types A through H below. The different types are a combination of four (4) packaged-product criteria: Amazon.com Outbound Shipment Method, Amazon.com Fulfillment Center Handling Method, Packaged-Product Weight, and Product Category. See Definitions below for an explanation of packaged-product types and other terms used in this document.

Packaged-Product Test Types

- **Type A:**
  - Shipment Method: Parcel Delivery of Individual Packaged-Products
  - Handling Method: Standard Handling Method
  - Weight & Dimensions: Less than 50 lb (23 kg) & Girth equal to or less than 165” (4.19 m)

- **Type B:**
  - Shipment Method: Parcel Delivery of Individual Packaged-Products
  - Handling Method: Standard Handling Method
  - Weight & Dimensions: 50 lb (23 kg) to Less than 100 lb (45 kg) & Girth equal to or less than 165” (4.19 m)

- **Type C:**
  - Shipment Method: Parcel Delivery of Individual Packaged-Products
  - Handling Method: Standard Handling Method
  - Weight & Dimensions: 100 lb (45 kg) or Greater & Girth equal to or less than 165” (4.19 m)

- **Type D:**
  - Shipment Method: Less-Than-Truckload (LTL) Delivery of Individual Packaged-Products
  - Handling Method: Standard Handling Method
  - Weight & Dimensions: Less than 100 lb (45 kg) or Girth greater than 165” (4.19 m)

- **Type E:**
  - Shipment Method: Less-Than-Truckload (LTL) Delivery of Individual Packaged-Products
  - Handling Method: Standard Handling Method
  - Weight & Dimensions: 100 lb (45 kg) or Greater or Girth greater than 165” (4.19 m)

- **Type F:**
  - Shipment Method: Less-Than-Truckload (LTL) Delivery of Individual Packaged-Products
  - Handling Method: Pallet Handling Method
  - Weight & Dimensions: N/A & N/A

- **Type G:** TV/Monitor
  - Product Category: TV/Monitor
  - Shipment Method: Parcel Delivery of Individual Packaged-Products
  - Handling Method: Standard Handling Method
  - Weight & Dimensions: Less than 150 lb (68 kg) & Girth equal to or less than 165” (4.19 m)

- **Type H:** TV/Monitor
  - Product Category: TV/Monitor
  - Shipment Method: Less-Than-Truckload (LTL) Delivery of Individual Packaged-Products
  - Handling Method: Standard Handling Method
  - Weight & Dimensions: 150 lb (68 kg) or Greater or Girth greater than 165” (4.19 m)
OVERVIEW OF PROJECT 6-AMAZON.COM-SIOC

Packaged-Product Criteria
- **Amazon.com Outbound Shipment Method:**
  - Parcel Delivery of Individual Packaged-Products
  - Less-Than-Truckload (LTL) Delivery of Individual Packaged-Products
    - Packaged-Product Weight Greater than 150 lb or
    - Any Packaged-Product Dimension Greater than 108 inches or
    - Packaged-Product Girth Greater than 165 inches (4.19 m) (Girth = Length + 2 * (Width + Height)) or
    - Palletized Packaged-Product or
    - Special Delivery Requirement by Amazon
- **Amazon.com Fulfillment Center (FC) Handling Method:**
  - Standard Handling Method (Floor Loaded) – Individual packaged-products that are received at Amazon.com Fulfillment Center with no pallet or with multiple packaged products on a single pallet and are intended to ship to the end consumer without a pallet.
  - Pallet Handling Method - Individual packaged-products that are received at Amazon.com Fulfillment Center on its own individual pallet and is intended to ship to the end consumer on a pallet.
- **Weight of Packaged-Product:**
  - Less than 50 lb (23 kg)
  - 50 lb (23 kg) to Less than 100 lb (45 kg)
  - 100 lb (45 kg) or Greater
- **Product Category:**
  - TV/Monitor - Any package which contains as a primary product a TV or a Monitor. This product category has been identified due to unique product attributes and inherent areas of fragility, in combination with distinct handling practices.

Definitions
- **Parcel Delivery.**
  - Any individual packaged-product shipped by Amazon.com to the consumer via a Parcel delivery system such as UPS, FedEx, etc. *(including elongated and flat packaged-product)*
- **Less than Truckload (LTL) Standard Packaged-Product**
  - Any packaged-product shipped by Amazon.com to the consumer via an LTL delivery system *(including elongated and flat packaged-product)* that is not palletized or skidded
- **Less than Truckload (LTL) Palletized Packaged-Product**
  - Any packaged-product shipped by Amazon.com to the consumer via an LTL delivery system *(including elongated and flat packaged-product)* that is individually palletized or skidded
- **Standard and Custom Pallet.** A standard pallet is a design which is in wide industry use, with published specifications, quality, and applications, used within those specifications and in a typical application. Standard pallets have information, provided by their manufacturers or distributors, available on the internet. A custom pallet is one designed for a specific product or narrow range of products, and with its design and performance characteristics not widely known or published.
- **Elongated Packaged-Product**
  - A packaged-product where the longest dimension is 36 in (910 mm) or greater and both of the other dimensions are each 20 percent or less of the longest dimension
- **Flat Packaged-Product**
  - A packaged-product where the shortest dimension is 8 in (200 mm) or less and the next longest dimension is four (4) or more times larger than the shortest dimension, and the volume is 800 in³ (13,000 cm³) or greater

**NOTE:** If a packaged-product is both Elongated and Flat in accordance with the above definitions, it should be tested as Elongated.

- **Non-Rigid Containers** are defined as having one or more of the following characteristics:
  - the outer package may offer insufficient protection from concentrated low-level impacts or
  - the design has large unsupported spans of outer packaging material or
  - the outer package utilizes a stretch- or shrink-wrap design, a thin-flute or light grade corrugated board, a paper wrap or similar lightweight material only, etc. or
  - the outer package wall is in direct contact with the product
- **TV/Monitor**
  - Any packaged-product which contains a TV or Monitor regardless of packaging type, dimensions or weight.

**NOTE:** If a packaged-product is defined as both Flat and TV/Monitor or both as Standard and TV/Monitor, in accordance with the above definitions, it should be tested as TV/Monitor.
OVERVIEW OF PROJECT 6-AMAZON.COM-SIOC

General

- Testing can be used to evaluate the protective performance of a packaged-product related to vibrations, shocks and other stresses normally encountered during handling and transportation in the Amazon.com distribution system.
- 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 or Projects may be appropriate for different conditions or to meet different objectives.

Refer to Guidelines for Selecting and Using ISTA Test Procedures and Projects for additional information.

NOTE:

Hazardous Material (Dangerous Goods) packaging that passes this test procedure may not meet international, national or other regulatory requirements for the transport of Hazardous Materials (Dangerous Goods). This test is not a substitute for United Nations and/or any other required test standards for the transport of Hazardous Materials (Dangerous Goods), but may be used as an additional test in conjunction with them.

Project 6-AMAZON.COM covers the testing of packaged-products prepared for shipment via Amazon.com’s Ships In Own Container (SIOC) distribution system to North America destinations. In this system, packaged-products are typically shipped from the manufacturer or producer to an Amazon.com fulfillment center, and then to the Consumer. Various types of handling may occur in the fulfillment centers, including manual, forklift, clamp truck, etc.

The shipper, manufacturer, Amazon.com and/or other stakeholders shall determine the following prior to testing, to permit the determination of pass or fail at the conclusion of the tests:

- 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 these determinations refer to Guidelines for Selecting and Using ISTA Test Procedures and Projects.

The shipper, manufacturer, Amazon.com or other stakeholders shall also provide information regarding the initial shipment configuration, approved container loading diagram, details of shipment and configurations within the distribution system, typical atmospheric conditions, etc. as required to determine proper testing parameters.

Both products and packages should be as close as possible to actual production items. Pre-production prototypes such as hand-made samples, CAD-generated one-of-a-kind or short run samples, etc. are usually not sufficiently representative of production items to yield meaningful test results. It may be appropriate to conduct preliminary tests of a product and package early in the development cycle, but final official testing should be performed with actual production items.

For fragile items, five samples are required for this test procedure. Fragile items are defined as items that easily break or could leak during the distribution process. This includes any item containing:

- Glass / Ceramic / Porcelain / Clay
- Liquids / Semi-liquids / Solids that can become liquid at high temperatures (above 70 degrees Fahrenheit)

When multiple identical samples are tested, all samples must pass all tests.

For non-fragile items, one sample is required for this test procedure. If the sample is a palletized or a unitized load and this is the intended configuration for shipment to the end consumer, then this is constituted a single packaged-product.

TV/Monitors are considered Non-Fragile items. Establishment of a TV/Monitor test type, reduces test variability and in turn allows for greater repeatability through fewer samples.

To permit an adequate determination of representative performance of the packaged-product, ISTA:

- Requires the test procedure, with the required number of samples, to be performed one time, but
- Recommends performing the entire test procedure five or more times using new samples for each test.
**OVERVIEW OF PROJECT 6-AMAZON.COM-SIOC**

Refer to *Guidelines for Selecting and Using ISTA Test Procedures and Projects* for additional information.

**NOTE:** In order to ensure testing in perfect condition, products and packages shipped to an ISTA Certified Laboratory for testing shall be:
- Adequately over-packaged for shipment or
- Repackaged in new packaging at the laboratory.

**NOTE:** Any pallet or skid used in this procedure should be of a type and condition which is typical of what is in actual field use for the packaged-product being tested.

**NOTE:** It is important to thoroughly document the configuration, materials, and construction of the tested product and package. Significant variations in performance can sometimes be caused by seemingly insignificant differences. Photo documentation is strongly recommended to supplement detailed written descriptions.

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

### Type A - Parcel Delivery of Individual Packaged-Products Less Than 50 lb (23 kg)

<table>
<thead>
<tr>
<th>Sequence Number</th>
<th>Test Category</th>
<th>Test Type</th>
<th>Test Level</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Atmospheric Preconditioning</td>
<td>Temperature and Humidity</td>
<td>Lab ambient, 12 hours</td>
<td>Required</td>
</tr>
<tr>
<td></td>
<td>TEST BLOCK 1</td>
<td></td>
<td></td>
<td></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></td>
<td>TEST BLOCK 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Shock</td>
<td>Free-Fall Drop</td>
<td>9 Drops - height varies with packaged-product weight</td>
<td>Required</td>
</tr>
<tr>
<td></td>
<td>TEST BLOCK 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Vibration</td>
<td>Random With and Without Top Load</td>
<td>Overall Grms levels of 0.53 and 0.46</td>
<td>Required</td>
</tr>
<tr>
<td></td>
<td>TEST BLOCK 12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Shock</td>
<td>Free-Fall Drop</td>
<td>8 Drops - height varies with packaged-product weight. Includes drop on hazard</td>
<td>Required</td>
</tr>
<tr>
<td></td>
<td>TEST BLOCK 15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Shock</td>
<td>Rotational Edge Drop</td>
<td>9 in (230 mm)</td>
<td>Required for Elongated and Flat Packages</td>
</tr>
<tr>
<td></td>
<td>TEST BLOCK 21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Shock</td>
<td>Full Rotational Flat Drop</td>
<td>Varies with packaged-product dimensions</td>
<td>Required for Elongated and Flat Packages</td>
</tr>
<tr>
<td></td>
<td>TEST BLOCK 22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Shock</td>
<td>Bridge Impact</td>
<td>Hazard Box dropped 16 in (400 mm)</td>
<td>Required for Elongated Packages Only</td>
</tr>
<tr>
<td></td>
<td>TEST BLOCK 23</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Shock</td>
<td>Concentrated Edge Impact</td>
<td>Hazard Box dropped 16 in (400 mm)</td>
<td>Required for Flat Packages Only</td>
</tr>
<tr>
<td></td>
<td>TEST BLOCK 24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Integrity</td>
<td>Leak Test</td>
<td>8 hours</td>
<td>Required for Liquids ONLY</td>
</tr>
<tr>
<td></td>
<td>TEST BLOCK 25</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# OVERVIEW OF PROJECT 6-AMAZON.COM-SIOC

**Type B - Parcel Delivery of Individual Packaged-Products 50 lb (23 kg) to Less Than 100 lb (45 kg)**

<table>
<thead>
<tr>
<th>Sequence Number</th>
<th>Test Category</th>
<th>Test Type</th>
<th>Test Level</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Atmospheric Preconditioning</td>
<td>Temperature and Humidity</td>
<td>Lab ambient, 12 hours</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 table</td>
<td>Optional</td>
</tr>
<tr>
<td>3</td>
<td>Shock</td>
<td>Free-Fall Drop</td>
<td>9 Drops - height varies with packaged-product weight</td>
<td>Required</td>
</tr>
<tr>
<td>4</td>
<td>Shock</td>
<td>Tip/Tip Over</td>
<td>Use a 22 degree tip angle</td>
<td>Required for packages ≥ 48 in. (1.2 m) tall and any one base dimension &lt; ½ the height; or for packages ≥ 30 in. (760 mm) tall and with a center of gravity vertical location &gt; ½ the package height</td>
</tr>
<tr>
<td>5</td>
<td>Compression, Horizontal</td>
<td>Clamping Simulation</td>
<td>Calculated from formula</td>
<td>Required</td>
</tr>
<tr>
<td>6</td>
<td>Compression, Vertical</td>
<td>Test in the intended shipping orientation or most stable orientation</td>
<td>Calculated from formula</td>
<td>Required</td>
</tr>
<tr>
<td>7</td>
<td>Vibration</td>
<td>Random With and Without Top Load</td>
<td>Overall Grms levels of 0.53 and 0.46</td>
<td>Required</td>
</tr>
<tr>
<td>8</td>
<td>Shock</td>
<td>Free-Fall Drop</td>
<td>8 Drops - height varies with packaged-product weight. Includes drop on hazard</td>
<td>Required</td>
</tr>
<tr>
<td>9</td>
<td>Shock</td>
<td>Rotational Edge Drop</td>
<td>9 in (230 mm)</td>
<td>Required for Elongated and Packages</td>
</tr>
<tr>
<td>10</td>
<td>Shock</td>
<td>Full Rotational Flat Drop</td>
<td>Varies with packaged-product dimensions</td>
<td>Required for Elongated and Flat Packages</td>
</tr>
<tr>
<td>11</td>
<td>Shock</td>
<td>Bridge Impact</td>
<td>Hazard Box dropped 16 in (400 mm)</td>
<td>Required for Elongated Packages Only</td>
</tr>
<tr>
<td>12</td>
<td>Shock</td>
<td>Concentrated Edge Impact</td>
<td>Hazard Box dropped 16 in (400 mm)</td>
<td>Required for Flat Packages Only</td>
</tr>
<tr>
<td>13</td>
<td>Integrity</td>
<td>Leak Test</td>
<td>8 hours</td>
<td>Required for Liquids ONLY</td>
</tr>
</tbody>
</table>
# OVERVIEW OF PROJECT 6-AMAZON.COM-SIOC

## Type C - Parcel Delivery of Individual Packaged-Products 100 lb (45 kg) or Greater

**Note:** Parcel Delivery has a weight limitation of 150 lb (68 kg)

<table>
<thead>
<tr>
<th>Sequence Number</th>
<th>Test Category</th>
<th>Test Type</th>
<th>Test Level</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Atmospheric Preconditioning TEST BLOCK 1</td>
<td>Temperature and Humidity</td>
<td>Lab ambient, 12 hours</td>
<td>Required</td>
</tr>
<tr>
<td>2</td>
<td>Atmospheric Conditioning TEST BLOCK 1</td>
<td>Controlled Temperature and Humidity</td>
<td>Temperature and humidity chosen from chart</td>
<td>Optional</td>
</tr>
<tr>
<td>3</td>
<td>Shock TEST BLOCK 3</td>
<td>Tip/Tip Over</td>
<td>Use a 22 degree tip angle</td>
<td>Required for packages ≥48 in. (1.2 m) tall and any one base dimension &lt; ⅓ the height; <strong>or</strong> for packages ≥ 30 in. (760 mm) tall and with a center of gravity vertical location &gt; ⅓ the package height</td>
</tr>
<tr>
<td>4</td>
<td>Shock TEST BLOCK 5</td>
<td>Rotational FLAT Drop</td>
<td>9 in (230 mm)</td>
<td>Required</td>
</tr>
<tr>
<td>5</td>
<td>Shock TEST BLOCK 6</td>
<td>Rotational EDGE Drop</td>
<td>9 in (230 mm)</td>
<td>Required</td>
</tr>
<tr>
<td>6</td>
<td>Shock TEST BLOCK 8</td>
<td>Inclined or Horizontal Impact</td>
<td>48 in/sec (4 ft/sec) (1.2 m/sec) impact velocity or velocity change</td>
<td>Required</td>
</tr>
<tr>
<td>7</td>
<td>Compression, Horizontal TEST BLOCK 9</td>
<td>Clamping Simulation</td>
<td>Calculated from formula</td>
<td>Required</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Clamp in multiple orientations as directed</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Compression, Vertical TEST BLOCK 10</td>
<td>Test in the intended shipping orientation or most stable orientation</td>
<td>Calculated from formula</td>
<td>Required</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Maintain force for 1 hour</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Vibration TEST BLOCK 12</td>
<td>Random With and Without Top Load</td>
<td>Overall Grms levels of 0.53 and 0.46</td>
<td>Required</td>
</tr>
<tr>
<td>10</td>
<td>Shock TEST BLOCK 20</td>
<td>Inclined or Horizontal Impact</td>
<td>48 in/sec (4 ft/sec) (1.2 m/sec) impact velocity or velocity change</td>
<td>Required</td>
</tr>
<tr>
<td>11</td>
<td>Shock TEST BLOCK 21</td>
<td>Rotational Edge Drop</td>
<td>9 in (230 mm)</td>
<td>Required for Elongated and Flat Packages</td>
</tr>
<tr>
<td>12</td>
<td>Shock TEST BLOCK 22</td>
<td>Full Rotational Flat Drop</td>
<td>Varies with packaged-product dimensions</td>
<td>Required for Elongated and Flat Packages</td>
</tr>
<tr>
<td>13</td>
<td>Shock TEST BLOCK 23</td>
<td>Bridge Impact</td>
<td>Hazard Box dropped 16 in (400 mm)</td>
<td>Required for Elongated Packages Only</td>
</tr>
<tr>
<td>14</td>
<td>Shock TEST BLOCK 24</td>
<td>Concentrated Edge Impact</td>
<td>Hazard Box dropped 16 in (400 mm)</td>
<td>Required for Flat Packages Only</td>
</tr>
</tbody>
</table>
## Overview of Project 6 - Amazon.com-SIOC

**Type D - LTL Delivery of Individual Packaged-Products Less Than 100 lb (45 kg)**

<table>
<thead>
<tr>
<th>Sequence Number</th>
<th>Test Category</th>
<th>Test Type</th>
<th>Test Level</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Atmospheric Preconditioning</td>
<td>Temperature and Humidity</td>
<td>Lab ambient, 12 hours</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 table</td>
<td>Optional</td>
</tr>
<tr>
<td>3</td>
<td>Shock</td>
<td>Tip/Tip Over</td>
<td>Use a 22 degree tip angle</td>
<td>Required for packages ≥48 in. (1.2 m) tall and any one base dimension &lt; ½ the height; or for packages ≥ 30 in. (760 mm) tall and with a center of gravity vertical location &gt; ½ the package height</td>
</tr>
<tr>
<td>4</td>
<td>Shock</td>
<td>Free-Fall Drop</td>
<td>6 drops – 18 in (460 mm) max</td>
<td>Required</td>
</tr>
<tr>
<td>5</td>
<td>Compression, Horizontal</td>
<td>Clamping Simulation</td>
<td>Calculated from formula</td>
<td>Required</td>
</tr>
<tr>
<td></td>
<td>TEST BLOCK 9</td>
<td></td>
<td>Clamp in multiple orientations as directed</td>
<td>For any of the 2 axes with a width dimension ≥ 24 in (610 mm) and &lt; 75 in (1905 mm)</td>
</tr>
<tr>
<td>6</td>
<td>Compression, Vertical</td>
<td>Test in the intended shipping orientation or most stable orientation</td>
<td>Calculated from formula</td>
<td>Required</td>
</tr>
<tr>
<td></td>
<td>TEST BLOCK 10</td>
<td></td>
<td>Maintain force for 1 hour</td>
<td>Machine, or weights &amp; load spreader</td>
</tr>
<tr>
<td>7</td>
<td>Vertical Vibration</td>
<td>Random With Top Load</td>
<td>Overall Grms level of 0.54</td>
<td>Required</td>
</tr>
<tr>
<td>8</td>
<td>Shock</td>
<td>Free-Fall Drop</td>
<td>6 drops – 32 in (810 mm) max</td>
<td>Required</td>
</tr>
<tr>
<td>9</td>
<td>Shock</td>
<td>Full Rotational Flat Drop</td>
<td>Varies with packaged-product dimensions</td>
<td>Required for Elongated and Flat Packages</td>
</tr>
<tr>
<td>10</td>
<td>Shock</td>
<td>Bridge Impact</td>
<td>Hazard Box dropped 16 in (400 mm)</td>
<td>Required for Elongated Packages Only</td>
</tr>
<tr>
<td>11</td>
<td>Shock</td>
<td>Concentrated Edge Impact</td>
<td>Hazard Box dropped 16 in (400 mm)</td>
<td>Required for Flat Packages Only</td>
</tr>
</tbody>
</table>
## OVERVIEW OF PROJECT 6-AMAZON.COM-SIOC

### Type E - LTL Delivery of Individual Packaged-Products 100 lb (45 kg) or Greater

<table>
<thead>
<tr>
<th>Sequence Number</th>
<th>Test Category</th>
<th>Test Type</th>
<th>Test Level</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Atmospheric Preconditioning</td>
<td>Temperature and Humidity</td>
<td>Lab ambient, 12 hours</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 table</td>
<td>Optional</td>
</tr>
<tr>
<td>3</td>
<td>Shock</td>
<td>Tip/Tip Over</td>
<td>Use a 22 degree tip angle</td>
<td>Required for packages ≥48 in. (1.2 m) tall and any one base dimension &lt; ½ the height; or for packages ≥ 30 in. (760 mm) tall and with a center of gravity vertical location &gt; ½ the package height</td>
</tr>
<tr>
<td>4</td>
<td>Shock</td>
<td>Rotational FLAT Drop</td>
<td>9 in (230 mm)</td>
<td>Required</td>
</tr>
<tr>
<td>5</td>
<td>Shock</td>
<td>Rotational EDGE Drop</td>
<td>9 in (230 mm)</td>
<td>Required</td>
</tr>
<tr>
<td>6</td>
<td>Shock</td>
<td>Inclined or Horizontal Impact</td>
<td>48 in/sec (4 ft/sec) (1.2 m/sec) impact velocity or velocity change</td>
<td>Required</td>
</tr>
<tr>
<td>7</td>
<td>Compression, Horizontal</td>
<td>Clamping Simulation</td>
<td>Calculated from formula</td>
<td>Required For any of the 2 axes with a width dimension ≥ 24 in (610mm) and &lt; 75 in (1905 mm)</td>
</tr>
<tr>
<td>8</td>
<td>Compression, Vertical</td>
<td>Test in the intended shipping orientation or most stable orientation</td>
<td>Calculated from formula</td>
<td>Required</td>
</tr>
<tr>
<td>9</td>
<td>Vertical Vibration</td>
<td>Random With Top Load</td>
<td>Overall Grms level of 0.54</td>
<td>Required</td>
</tr>
<tr>
<td>10</td>
<td>Shock</td>
<td>Inclined or Horizontal Impact</td>
<td>48 in/sec (4 ft/sec) (1.2 m/sec) impact velocity or velocity change</td>
<td>Required</td>
</tr>
<tr>
<td>11</td>
<td>Shock</td>
<td>Bridge Impact</td>
<td>Hazard Box dropped 16 in (400 mm)</td>
<td>Required for Elongated Packages Only</td>
</tr>
<tr>
<td>12</td>
<td>Shock</td>
<td>Concentrated Edge Impact</td>
<td>Hazard Box dropped 16 in (400 mm)</td>
<td>Required for Flat Packages Only</td>
</tr>
</tbody>
</table>
### OVERVIEW OF PROJECT 6-AMAZON.COM-SIOC

#### Type F - LTL Delivery of Individual Palletized Packaged-Products

<table>
<thead>
<tr>
<th>Sequence Number</th>
<th>Test Category</th>
<th>Test Type</th>
<th>Test Level</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Atmospheric Preconditioning</td>
<td>Temperature and Humidity</td>
<td>Lab ambient, 12 hours</td>
<td>Required</td>
</tr>
<tr>
<td>2</td>
<td>Atmospheric Conditioning</td>
<td>Temperature and Humidity</td>
<td>Temperature and humidity chosen from chart</td>
<td>Optional</td>
</tr>
<tr>
<td>3</td>
<td>Shock</td>
<td>Tip/Tip Over</td>
<td>Use a 22 degree tip angle</td>
<td>Required for packages ≥48 in. (1.2 m) tall and any one base dimension &lt; ½ the height; or for packages ≥ 30 in. (760 mm) tall and with a center of gravity vertical location &gt; ½ the package height</td>
</tr>
<tr>
<td>4</td>
<td>Shock</td>
<td>Rotational FLAT Drop</td>
<td>9 in (230 mm)</td>
<td>Required</td>
</tr>
<tr>
<td>5</td>
<td>Shock</td>
<td>Rotational EDGE Drop</td>
<td>9 in (230 mm)</td>
<td>Required</td>
</tr>
<tr>
<td>6</td>
<td>Shock</td>
<td>Rotational CORNER Drop</td>
<td>9 in (230 mm)</td>
<td>Required</td>
</tr>
<tr>
<td>7</td>
<td>Shock</td>
<td>Inclined or Horizontal Impact</td>
<td>48 in/sec (4 ft/sec) (1.2 m/sec) impact velocity or velocity change</td>
<td>Required</td>
</tr>
<tr>
<td>8</td>
<td>Compression, Vertical</td>
<td>Top-to-Bottom Pallet on top</td>
<td>Calculated from formula</td>
<td>Required Machine or weights and load spreader</td>
</tr>
<tr>
<td>9</td>
<td>Shock</td>
<td>Fork Lift Simulation</td>
<td>Flat Push and Rotate tests, Elevated Push and Pull tests</td>
<td>Required</td>
</tr>
<tr>
<td>10</td>
<td>Vertical Vibration</td>
<td>Random With Top Load</td>
<td>Overall Grms level of 0.54</td>
<td>Required</td>
</tr>
<tr>
<td>11</td>
<td>Shock</td>
<td>Rotational FLAT Drop</td>
<td>9 in (230 mm)</td>
<td>Required</td>
</tr>
<tr>
<td>12</td>
<td>Shock</td>
<td>Rotational EDGE Drop</td>
<td>9 in (230 mm)</td>
<td>Required</td>
</tr>
<tr>
<td>13</td>
<td>Shock</td>
<td>Rotational CORNER Drop</td>
<td>9 in (230 mm)</td>
<td>Required</td>
</tr>
<tr>
<td>14</td>
<td>Shock</td>
<td>Inclined or Horizontal Impact</td>
<td>48 in/sec (4 ft/sec) (1.2 m/sec) impact velocity or velocity change</td>
<td>Required</td>
</tr>
<tr>
<td>15</td>
<td>Shock</td>
<td>Concentrated Edge Impact</td>
<td>Hazard box dropped 16 in (410 mm)</td>
<td>Required for Flat Packages Only</td>
</tr>
</tbody>
</table>
### OVERVIEW OF PROJECT 6-AMAZON.COM-SIOC

**Type G – Parcel Delivery of Individual Packaged TV/Monitor Less Than 150 lbs (68 kg) AND Girth Less Than 165 inch (4.19 m)**

*Note: Girth is a measurement of the packaged-product Length + 2 * (Width + Height). See Preface for more information.*

<table>
<thead>
<tr>
<th>Sequence Number</th>
<th>Test Category</th>
<th>Test Type</th>
<th>Test Level</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Atmospheric Preconditioning</td>
<td>Temperature and Humidity</td>
<td>Lab ambient, 12 hours</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 table</td>
<td>Optional</td>
</tr>
<tr>
<td>3</td>
<td>Shock</td>
<td>Free-Fall Drop</td>
<td>9 Drops - height varies with packaged-product weight</td>
<td>Required- Do not catch packaged items</td>
</tr>
<tr>
<td>4</td>
<td>Compression, Horizontal</td>
<td>Clamping Simulation</td>
<td>Calculated from formula</td>
<td>Required</td>
</tr>
<tr>
<td></td>
<td>TEST BLOCK 9</td>
<td></td>
<td>Clamp in multiple orientations as directed</td>
<td>For any of the 2 axes with a width dimension ≥ 24 in (610mm) and &lt; 75 in (1905 mm)</td>
</tr>
<tr>
<td>5</td>
<td>Compression, Vertical</td>
<td>Test in the intended shipping orientation</td>
<td>Calculated from formula</td>
<td>Required</td>
</tr>
<tr>
<td></td>
<td>TEST BLOCK 10</td>
<td></td>
<td>Maintain force for 1 hour</td>
<td>Machine, or weights &amp; load spreader</td>
</tr>
<tr>
<td>6</td>
<td>Vibration</td>
<td>Random With and Without Top Load</td>
<td>Overall Grms levels of 0.53 and 0.46</td>
<td>Required</td>
</tr>
<tr>
<td></td>
<td>TEST BLOCK 12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Shock</td>
<td>Inclined or Horizontal Impact</td>
<td>48 in/sec (4 ft/sec) (1.2 m/sec) impact velocity or velocity change</td>
<td>Required for packages =&gt;100 lbs (45 kg)</td>
</tr>
<tr>
<td></td>
<td>TEST BLOCK 20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Shock</td>
<td>Free-Fall Drop</td>
<td>8 Drops - height varies with packaged-product weight. Includes drop on hazard</td>
<td>Required- Do not catch packaged items</td>
</tr>
<tr>
<td></td>
<td>TEST BLOCK 15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Shock</td>
<td>Concentrated Edge Impact</td>
<td>Hazard Box dropped 16 in (400 mm)</td>
<td>Required</td>
</tr>
<tr>
<td></td>
<td>TEST BLOCK 24</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## OVERVIEW OF PROJECT 6-AMAZON.COM-SIOC

**Type H - LTL Delivery of Individual Packaged TV/Monitor Greater Than 150 lbs (68 kg) OR Girth Greater Than 165 inch (4.19 m)**

*Note: Girth is a measurement of the packaged-product Length + 2 * (Width + Height). See Preface for more information.*

<table>
<thead>
<tr>
<th>Sequence Number</th>
<th>Test Category</th>
<th>Test Type</th>
<th>Test Level</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Atmospheric Preconditioning</td>
<td>Temperature and Humidity</td>
<td>Lab ambient, 12 hours</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 table</td>
<td>Optional</td>
</tr>
<tr>
<td>3</td>
<td>Shock</td>
<td>Tip/Tip Over</td>
<td>Use a 22 degree tip angle</td>
<td>Required for packages ≥48 in. (1.2 m) tall and any one base dimension &lt; ½ the height; or for packages ≥ 30 in. (760 mm) tall and with a center of gravity vertical location &gt; ½ the package height</td>
</tr>
<tr>
<td>4</td>
<td>Shock</td>
<td>Free-Fall Drop</td>
<td>6 drops – 18 in (460 mm) max</td>
<td>Required for packages =&lt; 100 lbs (45 kg) - Do not catch packaged items</td>
</tr>
<tr>
<td>5</td>
<td>Shock</td>
<td>Rotational FLAT Drop</td>
<td>9 in (230 mm)</td>
<td>Required</td>
</tr>
<tr>
<td>6</td>
<td>Shock</td>
<td>Rotational EDGE Drop</td>
<td>9 in (230 mm)</td>
<td>Required</td>
</tr>
<tr>
<td>7</td>
<td>Shock</td>
<td>Inclined or Horizontal Impact</td>
<td>48 in/sec (4 ft/sec) (1.2 m/sec) impact velocity or velocity change</td>
<td>Required for packages &gt;= 100 lbs (45 kg)</td>
</tr>
<tr>
<td>8</td>
<td>Compression, Horizontal</td>
<td>Clamping Simulation</td>
<td>Calculated from formula Clamp in multiple orientations as directed</td>
<td>Required for any of the 2 axes with a width dimension ≥ 24 in (610mm) and &lt; 75 in (1905 mm)</td>
</tr>
<tr>
<td>9</td>
<td>Compression, Vertical</td>
<td>Test in the intended shipping orientation</td>
<td>Calculated from formula Maintain force for 1 hour</td>
<td>Required Machine, or weights &amp; load spreader</td>
</tr>
<tr>
<td>10</td>
<td>Vertical Vibration</td>
<td>Random With Top Load</td>
<td>Overall Grms level of 0.54</td>
<td>Required</td>
</tr>
<tr>
<td>11</td>
<td>Shock</td>
<td>Free-Fall Drop</td>
<td>6 drops – 32 in (810 mm) max</td>
<td>Required for packages =&lt; 100 lbs (45 kg) - Do not catch packaged items</td>
</tr>
<tr>
<td>10</td>
<td>Shock</td>
<td>Inclined or Horizontal Impact</td>
<td>48 in/sec (4 ft/sec) (1.2 m/sec) impact velocity or velocity change</td>
<td>Required for packages &gt;= 100 lbs (45 kg)</td>
</tr>
<tr>
<td>12</td>
<td>Shock</td>
<td>Full Rotational Flat Drop</td>
<td>Varies with packaged-product dimensions</td>
<td>Required</td>
</tr>
<tr>
<td>13</td>
<td>Shock</td>
<td>Concentrated Edge Impact</td>
<td>Hazard Box dropped 16 in (400 mm)</td>
<td>Required- Hazard Box to be dropped to the screen side</td>
</tr>
</tbody>
</table>
### EQUIPMENT REQUIRED FOR PROJECT 6-AMAZON.COM-SIOC

**Atmospheric Pre-Conditioning and Conditioning:**
- Humidity recorder complying with the apparatus section of ASTM D 4332 or ISO 2233.
- Temperature recorder complying with the apparatus section of ASTM D 4332 or ISO 2233.

**Controlled Temperature and Humidity:**
- Chamber and Control apparatus complying with the apparatus section of ASTM D 4332 or ISO 2233.

<table>
<thead>
<tr>
<th>Type of Shock Test</th>
<th>Type of Equipment</th>
<th>Equipment Requirements</th>
<th>Additional Required Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free-Fall Drop Tests</td>
<td>Free-fall drop tester</td>
<td>Compliance with the apparatus sections of ASTM D 5276 or ISO 2248.</td>
<td></td>
</tr>
<tr>
<td>Tip/Tipover Tests</td>
<td></td>
<td>ASTM D 6179 or ISO 2876</td>
<td></td>
</tr>
<tr>
<td>Rotational Flat Drop Tests</td>
<td></td>
<td>Compliance with the apparatus sections of ASTM D 6179 or ISO 2876.</td>
<td></td>
</tr>
<tr>
<td>Full Rotational Drops</td>
<td></td>
<td>ASTM D 6179 or ISO 2876</td>
<td></td>
</tr>
<tr>
<td>Rotational Edge and Corner Drop Tests</td>
<td>Support Block</td>
<td>Compliance with the apparatus sections of ASTM D 6179 or ISO 2876.</td>
<td><strong>Support block</strong></td>
</tr>
<tr>
<td>Inclined or Horizontal Impact Tests (Alternates)</td>
<td>Inclined</td>
<td>Compliance with the apparatus sections of ASTM D 880 or ASTM D 4003 or ISO 2244.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Horizontal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concentrated Edge Impact Tests</td>
<td>Free-fall drop tester with edge hazard box</td>
<td>Drop tester in compliance with the apparatus sections of ASTM D 5276 or ISO 2248.</td>
<td><strong>Concentrated Edge Hazard Box</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12 x 12 x 12 in (305 x 305 x 305 mm) wood box with a total weight of 9 lb (4.1 kg). Any required ballast weight should be dense flowable material in a bag or bags, held in place with suitable void fill. The impact edge of the box shall be covered with angle iron.</td>
</tr>
</tbody>
</table>
EQUIPMENT REQUIRED FOR PROJECT 6-AMAZON.COM-SIOC

Bridge Impact Tests
Free-fall drop tester with edge hazard box
Compliance with the apparatus section of ASTM D 5265, with the exception of the Hazard Box (Impactor).

Concentrated Edge Hazard Box and Support Blocks
See above for description of the Concentrated Edge Hazard Box. Support blocks (2 ea) shall be 3.5 to 4.0 in (90 to 100 mm) in height and width and at least 8 in (200 mm) longer than the longest package dimension to be supported.

Drop Onto Hazard
Free-fall drop tester and hazard box
Hazard Block
See below.

Hazard Block
The block shall be made of hardwood or metal. The height shall be to 1 in (20 to 25 mm) and the width shall be 6 in (150 mm). The length be at least 8 in (200 mm) longer than the longest package dimension will impact. The long top edges of the block shall be rounded to a radius equal to the height of the block.

### Type of Compression Test
<table>
<thead>
<tr>
<th>Type of Equipment</th>
<th>Equipment Requirements</th>
<th>Additional Required Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical Compression (Top-to-Bottom)</td>
<td>Compression Test Machine</td>
<td>Compliance with the apparatus section of ASTM D 642 - Fixed or Swivel Platen Acceptable.</td>
</tr>
<tr>
<td>Vertical Compression (Top-to-Bottom) (Alternate)</td>
<td>Weight(s) &amp; Load Spreader</td>
<td>The Load spreader must be larger than the top face of the test item, and shall be sufficiently rigid to apply a uniform compression force.</td>
</tr>
<tr>
<td>Horizontal Compression (Clamping Simulation)</td>
<td>Clamp Tester</td>
<td>Platens must be larger than the side dimensions of the test item, and with an opening sufficient to accommodate the test item. The desired compression must be achieved with minimum overshoot.</td>
</tr>
</tbody>
</table>

ISTA 6-AMAZON.COM 2018 - Page 14 of 52
© 2018 International Safe Transit Association. All rights Reserved.
### Equipment Required for Project 6-Amazon.com-SIOC

<table>
<thead>
<tr>
<th>Type of Vibration Test</th>
<th>Type of Equipment</th>
<th>Equipment Requirements</th>
<th>Additional Required Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal Compression (Clamping Simulation) (Alternative)</td>
<td>Compression Test Machine</td>
<td>Compliance with the apparatus section of ASTM D 642 - Fixed Platen Only.</td>
<td>Rigid load applicator (such as a 3/4&quot;[19 mm] piece of plywood or a plate of steel) that is larger than the test sample face to be tested on the compression test machine.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of Vibration Test</th>
<th>Type of Equipment</th>
<th>Equipment Requirements</th>
<th>Additional Required Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical Vibration</td>
<td>Random Vibration Test System</td>
<td>Compliance with the apparatus section of ASTM D 4728 or ISO 13355</td>
<td>Means must be provided to maintain proper alignment of the test item and any top load apparatus, and to prevent the test item from moving off the vibration system’s platform, without restricting vertical motion of the test item or apparatus.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of Test</th>
<th>Type of Equipment</th>
<th>Equipment Requirements</th>
<th>Additional Required Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fork Lift Handling</td>
<td>Fork Lift Truck</td>
<td>A fork lift truck of sufficient capacity to handle the test specimens and complying with the apparatus sections of ASTM D 6055 or ISO 10531.</td>
<td></td>
</tr>
</tbody>
</table>

The Top Load Apparatus required for the vibration testing of Type A, Type B, Type C, and Type G packaged-products is detailed below:

- A fiberboard box, or other container, of sufficient strength and ability to hold a load spreader (such as a 3/4" piece of plywood or a plate of steel that is the same length and width as the inside dimensions of the load apparatus) and required weight for each axis and

- The length and width dimensions of the Top-Load package or apparatus which will be applied to the test specimen shall each be a minimum of 50 mm (2 in) longer than each of the two dimensions of the test specimen’s top face when positioned for testing [i.e., a minimum of 25 mm (1 in) overhang on each side] but

- The length and width dimensions of the Top-Load package or apparatus may each be longer by a maximum of 150 mm (6 in) than each of the two dimensions of the test specimen’s top face when positioned for testing [i.e., a maximum of 75 mm (3 in) overhang on each side] and

- Some means of adding additional weight so that the Top-Load (TL) is distributed evenly over the entire inside face area of the Top-Load apparatus that will apply the Top-Load to the entire top face of the test specimen when it’s positioned for testing and

- Adequate void fill that shall securely hold the weight in place to prevent the weight from moving or bouncing within the top-load apparatus (it is also required to use stretch wrap around the test specimen and the top-load apparatus to prevent the top-load apparatus from bouncing on top of the test specimen) and

- The top-load apparatus shall never be smaller than the test face; the calculated weight must cover the entire surface of the test face during the testing.
The **Top Load Apparatus** required for the vibration testing of **Type D, Type E, Type F** and **Type H** packaged-products is detailed below.

- **The Top Load Apparatus** is described and shown below, and includes:
  - A sturdy fiberboard box or similar container with a height of 9 in (230 mm), and with a minimum 0.75 in (20 mm) thick plywood load spreader covering the entire inside bottom surface.
  - Some means of adding additional weight as required so that the top load is distributed evenly over the entire inside bottom face area of the top load apparatus.
  - Adequate void fill to securely hold the weight in place to prevent it from moving or bouncing within the top load apparatus.
  - Bottom face dimensions (length and width) which are at least 2 in (50 mm) larger than the top face dimensions of the test item to which it is applied [for a minimum overhang of 1 in (25 mm) on each side], but must not be greater than 6 in (150 mm) larger than the top face dimensions of the test item [for a maximum of 3 in (76 mm) overhang on each side].

- **The Top Load Apparatus** must be divided into 2 separate equal portions if one of the top face dimensions of the test item exceeds 18 in (460 mm), and into 4 separate equal portions if both of the top face dimensions of the test item exceed 18 in (460 mm).

The Top Load is to simulate the effects of 6 lb/ft³ (0.0035 lb/in³) (96 kg/m³) of assorted freight on top of a **Floor-Loaded** packaged-product in a truck-trailer or ocean container with an inside height of 108 in (2.7 m). This load density has been determined by empirical testing which resulted in correlation between damage in the test lab and damage in the field.

- Means must be provided to maintain proper alignment of the Top Load Apparatus on the test item (column stack fixtures, stretch wrap around the test specimen and the top load apparatus, etc.), without restricting the vertical motion of the top load apparatus and the test specimen.