



ISTA 3 Series  
General  
Simulation  
Performance  
Test  
Procedure

VERSION  
DATE

Last  
TECHNICAL  
Change:  
FEBRUARY  
2008

Last  
EDITORIAL  
Change:  
JANUARY  
2014

For complete  
listing of  
Procedure  
Changes and  
Version Dates  
go to  
[www.ista.org](http://www.ista.org)

### ISTA, Distributing Confidence, Worldwide™

ISTA 3 Series tests are advanced tests and are designed to:

- 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 damages 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 to ISTA.

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

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

For measuring	Metric units and symbols	English units and symbols
Weight	kilograms (kg) or grams (gm)	pounds (lb)
Distance	meters (m) or millimeters (mm)	feet (ft) or inches (in)
Volume	Cubic centimeters (cm <sup>3</sup> )	Cubic inches (in <sup>3</sup> )
Density	kilograms per cubic meter (kg/m <sup>3</sup> )	pounds per cubic inch (lb/in <sup>3</sup> )
Temperature	Centigrade (°C)	Fahrenheit (°F)
Absolute Pressure	Kilopascal (kPa)	Pounds per square inch (psi)

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

**NOTE:**

In other ISTA Test Procedures 68 kilograms is used as the conversion from 150 pounds. In 3A, 70 kilograms and 150 pounds are used because it's a common dividing point found in parcel delivery systems from countries that use either metric (SI) or English (inch-pounds) units of measure.

**VERY IMPORTANT:**

The entire document shall be read and understood before proceeding with a test.

## Preface

Test Procedure 3A is a general simulation test for individual packaged-products shipped through a parcel delivery system. The test is appropriate for four different types of packages commonly distributed as individual packages, either by air or ground. The types include standard, small, flat and elongated packages. 3A includes an optional test combining Random Vibration Under Low Pressure (simulated high altitude). This tests the container's (whether primary package or transport package) ability to hold a seal or closure and the retention of contents (liquid, powder or gas) without leaking.

**STANDARD** packaged-products shall be defined as any packaged-product that does not meet any of the definitions below for a small, flat or elongated packaged-product. A Standard packaged-product may be packages such as traditional fiberboard cartons, as well as plastic, wooden or cylindrical containers. Examples shown below:



**SMALL** packaged-products shall be defined as any packaged-product where the:

- volume is less than 13,000 cm<sup>3</sup> (800 in<sup>3</sup>), **and**
- longest dimension is 350 mm (14 in) or less **and**
- weight is 4.5 kg (10 lb) or less.
- Example shown below:



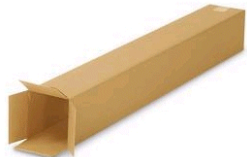
**FLAT** packaged-products shall be defined as any packaged-product where the:

- shortest dimension is 200 mm (8 in) or less **and**
- next longest dimension is four (4) or more times larger than the shortest dimension, **and**
- volume is 13,000 cm<sup>3</sup> (800 in<sup>3</sup>) or greater.
- Example shown below:



**ELONGATED** packaged-products shall be defined as any packaged-product where the:

- longest dimension is 900 mm (36 in) or greater **and**
- both of the package's other dimensions are each 20 percent or less of that of the longest dimension.
- Example shown below:



**NOTE:**

If a packaged-product is both Flat and Elongated, the package should be tested as Elongated.

Preface  
Continued

- 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 a parcel delivery system.
- Test levels are based on general data and may not represent any specific 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 may be appropriate for different conditions or to meet different objectives.

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

**NOTE:**

Hazardous material packaging that passes this test procedure may not meet international, national or other regulatory requirements for the transport of hazardous materials. **This test is not a substitute** for United Nations and/or any other required test standards for the transport of hazardous materials, but should be used as an additional test in conjunction with them.

Scope

Test Procedure 3A covers testing of individual packaged-products weighing 70 kilograms (150 pounds) or less when prepared for shipment via a parcel delivery carrier.

Product  
Damage  
Tolerance and  
Package  
Degradation  
Allowance

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

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

One sample is required for this test procedure.

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.

Refer to *Guidelines for Selecting and Using ISTA Procedures and Projects* for additional information on statistical sampling.

**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:**

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.

Basis Weight

**Basis Weights of Corrugated Board**

When the outer package is a corrugated box, it is strongly recommended that the basis weights of the papers/paperboards used to make the box be determined and documented. If the nominal basis weights change, even if the board is rated for the same performance, a retest is appropriate.

Refer to *Guidelines for Selecting and Using ISTA Procedures and Projects* for additional information on documentation and basis weight determination.