



ISTA 3 Series
General
Simulation
Performance
Test
PROCEDURE

VERSION
DATE
Last
TECHNICAL
Change:
NOVEMBER
2012

Last
EDITORIAL
Change:
JANUARY
2013

For complete
listing of
Procedure
Changes and
Version Dates
go to
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 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 to ISTA.

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:

| For measuring | English units and symbols | Metric units and symbols |
|---------------|---|--|
| Weight | pounds (lb) | kilograms (kg) or grams (gm) |
| Distance | feet (ft) or inches (in) | meters (m) or millimeters (mm) |
| Volume | Cubic inches (in ³) | Cubic centimeters (cm ³) |
| Density | pounds per cubic inch (lb/in ³) | kilograms per cubic meter (kg/m ³) |
| Temperature | Fahrenheit (°F) | Celsius (°C) |

- 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.

VERY IMPORTANT:

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

Preface

Procedure 3B is a general simulation test for packaged-products shipped through a motor carrier (truck) delivery system, where different types of packaged-products, often from different shippers and intended for different ultimate destinations, are mixed in the same load. This type of shipment is called LTL (Less-Than-Truckload). Procedure 3B is appropriate for four different types of packages commonly distributed in LTL shipments as described below:

Package Types

- **Standard**, 200 lb (91 kg) or less, including elongated and flat packages
- **Standard**, over 200 lb (91 kg), including elongated and flat packages
- **Cylindrical**, including elongated cylinders
- **Palletized or Skidded** – Individual container, bulk container, or unitized load on or incorporating a base or platform which allows the entry of lift truck forks

Definitions

- **Elongated Package or Cylinder**
 - A **Standard** or **Cylindrical** package where the longest dimension is 36 in (910 mm) or greater **and**
 - both of the package's other dimensions (or the cylinder's diameter) are each 20 percent or less of the longest dimension
- **Flat Package**
 - A **Standard** package 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
- **Non-Rigid Container**
 - Any **Standard** (regardless of weight) or **Palletized or Skidded** container where 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, uses a thin-flute or light grade corrugated board, uses a paper wrap or similar lightweight material only, etc. **or**
 - the outer package wall is in direct contact with the product

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

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 a Less-Than-Truckload (LTL) 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 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 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 may be used as an additional test in conjunction with them.

Scope

Procedure 3B covers the testing of packaged-products prepared for shipment via a Less-Than-Truckload (LTL) delivery system carrier. LTL is defined as motor carrier (truck) shipment, where different types of packaged-products, often from different shippers and intended for different ultimate destinations, are mixed in the same load.

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 these determinations refer to *Guidelines for Selecting and Using ISTA Test 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 a new sample for each test.

Refer to *Guidelines for Selecting and Using ISTA Test 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: 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.

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.