

ISTA 3 Series  
General  
Simulation  
Performance  
Test  
Procedure

VERSION  
DATE

Last

TECHNICAL  
Change:  
JANUARY  
2008

Last

EDITORIAL  
Change:  
JANUARY  
2010

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

Preface

## ISTA, Distributing Confidence, Worldwide™

ISTA 3 Series tests are advanced tests.

- They challenge the capability of the package and product to withstand transport hazards, **but**
- They use general simulation of actual transport hazards, **and**
- They do not necessarily comply with carrier packaging regulations.

When properly applied, ISTA procedures will provide tangible benefits of:

- Shortened packaged development time and confidence in product launch
- Protection of products and profits with reduced damage and product loss
- Economically balanced distribution costs
- Customer satisfaction and continued business.

There are three sections: Overview, Testing and Report

- **Overview** provides the general knowledge required before going into the testing laboratory **and**
- **Testing** presents the specific instructions to do the testing in the laboratory **and**
- **Report** 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. They are the English system (Inch-Pound) and the international system SI (Metric). Inch-Pound units are shown first with Metric units in brackets, except in some tables where they are shown separately.

- 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.**

## OVERVIEW OF PROCEDURE 3F

Test Procedure 3F is a general simulation test for packaged-products that are shipped as an individual package from a distribution center to a retail outlet.

- It can be used to evaluate the protective performance of packaged-products related to vibrations, shocks and other stresses normally encountered during handling and transportation.
- The test levels are based on general data and may not represent any specific retail 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.

Specific suggestions:

- To test unitized loads of this packaged-product being transported to the distribution center, use ISTA Test Procedure 3E.

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

## Scope

Test Procedure 3F covers testing of individual packaged-products weighing 100 lb (45 kg) or less shipped as part of a non-unitized load from a distribution center (DC) to a retail facility.

Product Damage  
Tolerance and  
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 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:

Six samples are 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.

## Test Sequence

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

Sequence #	Test Category	Test Type	Test Level	For ISTA Certification
1	Atmospheric Preconditioning	Temperature and Humidity	Ambient	Required
2	Atmospheric Conditioning	Controlled Temperature and Humidity	Temperature and Humidity chosen from chart	Optional
3	Shock	Drop	12 and 30 in (310 and 760 mm)	Required
4	Compression	Machine	Calculated or maximum Test Force	Required
5	Vibration	Random	Overall G <sub>rms</sub> level of 0.54	Required
6	Shock	Drop	18 and 24 in (460 and 610 mm)	Required

Equipment  
Required  
Atmospheric  
Conditioning

## Atmospheric Conditioning:

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

**Optional Atmospheric Conditioning**

Chamber and Control apparatus complying with the apparatus section of ASTM D 4332.

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Equipment  
Required  
Shock

## Free Fall Drop Test:

- Free Fall Drop Test System complying with of the apparatus section of ASTM D 5276.
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Equipment  
Required  
Compression

## Apply and Release Compression Test:

- Compression Test System complying with the apparatus section of ASTM D 642, "Fixed-Platen Testing Machine" requirements.
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Equipment  
Required  
Vibration

## Random Vibration Test:

- Random Vibration Test System complying with the apparatus section of ASTM D 4728.