

ISTA 7 Series
Development
Test
Procedure

ISTA, Distributing Confidence, Worldwide™

ISTA 7 Series tests are package development tests.

- Test elements may come from ISTA Series 1, 2 or 3 tests, **and**
- They may or may not evaluate the protection afforded packaged-products.

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.

VERSION
DATE

Last

TECHNICAL
Change:
JANUARY
2008

Two systems of weights and measures are presented in ISTA test procedures. They are the English system (Inch-Pound) and the international system (Metric). Inch-Pound units are shown first with Metric units in brackets, except in some tables where they are shown separately. In the case of temperatures, °C is shown first and °F is in brackets.

- 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.

Last
EDITORIAL
Change:
JANUARY
2010

VERY IMPORTANT:

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

For complete
listing of
Procedure
Changes and
Version Dates
go to
www.ista.org

Preface

OVERVIEW FOR PROJECT 7A

Test Project 7A is a developmental test for open reusable transport packages.

- It can be used for the development of transport package systems made of any material.
- It can be used for the development of knock-down (KD) or Nestable/Stackable style containers.
- It can be used to compare relative performance of two or more container designs.
- It is not intended to evaluate the protection afforded packaged-products.
- Only the container is considered.

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

Specific Suggestions:

- For closed reusable transport containers, use ISTA Developmental Test Procedure 7B and not 7A.
- For reusable intermediate bulk containers, use ISTA Developmental Test Procedure 7C and not 7A.

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

Scope

Test Project 7A covers testing of open reusable transport containers capable of holding a load of up to 60 lb (27 kg) or less when prepared for shipment on a pallet and handled individually at both ends of distribution. This test procedure confines its testing activities to the reusable container only and no product is tested.

Product Damage
Tolerance and
Package
Degradation
Allowance

Damage shall be determined to have taken place if, at any time during the testing, the ability to reuse the container in a safe and damage free condition is threatened because of:

- cracks beginning to appear anywhere on the container **and/or**
- failure of any hinge or latch on the container.

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

Samples

Samples shall be the untested actual containers.

Number of samples required:

There is not a predetermined total number of samples required because the number of samples necessary to perform the palletized load tests are will change with the dimensions of the containers, the pallet size and the loading pattern used.

A minimum sample size of three shall be tested for the following tests:

- erected container yield strength
- knocked-down or nested container yield strength
- double stacked container yield strength

A minimum sample size of two shall be tested for the following test:

- optional tensile test on handles

A sample size of one shall be tested for all other tests

Replicate Testing Recommended:

To permit an adequate determination of representative performance of the container, ISTA:

- Requires the procedure to be performed one time, **but**
- Recommends performing the procedure three 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

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 | Ambient Temperature and Humidity | Ambient temperature and humidity 6 hrs. prior to test | Required |
| 2 | Atmospheric Conditioning | Controlled Temperature and Humidity | Temperature and humidity selected from Chart | Optional |
| 3 | Compression | Machine – Erected Container Yield Strength | Peak force to failure | Required |
| 4 | Compression | Machine – Knock-Down Container Yield Strength | Peak force to failure | Required if Container can be Knocked-Down |
| 5 | Compression | Machine – Nested Container Yield Strength | Peak force to failure | Required if Container cannot be Knocked-Down and is Nestable |
| 6 | Compression | Machine – Triple Stacked Container Yield Strength | Peak force to failure | Required |
| 7 | Compression | Machine – Palletized Load Yield Strength | Peak force to failure | Required |
| 8 | Compression | Machine – Erected Container with Product Yield Strength | Peak force to failure | Required |
| 9 | Shock | Drop | 30 in (760 mm) | Required |
| 10 | Atmospheric Conditioning | Controlled Temperature | 32°F ±4° (0°C ±2°C) | Required |
| 11 | Shock | Drop | 30 in (760 mm) | Required |
| 12 | Uncategorized | Machine - Tensile Test on Locking Mechanism | Peak force to open | Optional if Container can be Knocked-Down |

Equipment
Required
Atmospheric
Conditioning

Atmospheric Conditioning:

- Temperature recording apparatus complying with the apparatus section of ASTM D 4332.
- If the container is being designed to transport frozen foods, then an apparatus capable of Frozen Storage 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.
 - Humidity recording apparatus complying with of the apparatus section of ASTM D 4332.
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Equipment
Required
Compression

Apply and Release Compression Test:

- Fixed-Platen Compression Test System complying with the apparatus section of ASTM D 642.
- A clock or watch that tells the time of day in minutes.
- Two standard sized GMA (Grocery Manufacturers Association) or European Sized Block or Stringer style pallets.

NOTE:

The pallet style may be either block or stringer, however ISTA recommends the use of a block pallet due its current preference in the grocery industry.

NOTE:

The test values reached in the Palletized Load Yield Test will be different between a block pallet and a stringer pallet because of the difference in perimeter loading on the top layer of containers.

Equipment
Required
Shock

Equipment required for the Free Fall Drop Test:

- Free Fall Drop Test System complying with of the apparatus section of ASTM D 5276.
 - A sufficient supply of simulated product to fill all container samples tested in for shock.
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Equipment
Required
Tensile

Equipment required for the Optional Tensile Test:

- Tensile Tester complying with the paragraphs 5.1.1-5.1.4 of the apparatus section of ASTM D 828.