

T 801 om-06

SUGGESTED METHOD – 1944
OFFICIAL STANDARD – 1971
OFFICIAL TEST METHOD – 1983
REVISED – 1988
REVISED – 1994
REVISED – 2002
REAFFIRMED – 2006
©2006 TAPPI

The information and data contained in this document were prepared by a technical committee of the Association. The committee and the Association assume no liability or responsibility in connection with the use of such information or data, including but not limited to any liability under patent, copyright, or trade secret laws. The user is responsible for determining that this document is the most recent edition published.

CAUTION:

This Test Method may include safety precautions which are believed to be appropriate at the time of publication of the method. The intent of these is to alert the user of the method to safety issues related to such use. The user is responsible for determining that the safety precautions are complete and are appropriate to their use of the method, and for ensuring that suitable safety practices have not changed since publication of the method. This method may require the use, disposal, or both, of chemicals which may present serious health hazards to humans. Procedures for the handling of such substances are set forth on Material Safety Data Sheets which must be developed by all manufacturers and importers of potentially hazardous chemicals and maintained by all distributors of potentially hazardous chemicals. Prior to the use of this method, the user must determine whether any of the chemicals to be used or disposed of are potentially hazardous and, if so, must follow strictly the procedures specified by both the manufacturer, as well as local, state, and federal authorities for safe use and disposal of these chemicals.

Impact resistance of fiberboard shipping containers

1. Scope

1.1 The purpose of this method is to provide comparative qualitative information on the impact behavior of containers or their contents or both. The data obtained are not meant to be exact and quantitative because of the test variables involved and the diverse nature and characteristics of the endpoints. The method describes three procedures for making inclined impact tests on loaded fiberboard shipping containers as follows.

1.1.1 Procedure A, to determine the ability of a container to withstand impact stresses.

1.1.2 Procedure B, to determine the ability of a container or interior packing, or both, to provide protection of the contents when subjected to impact stresses.

1.1.3 Procedure C, to simulate the types of shock pulses experienced by lading in rail car switching, with the use of a rigid bulkhead on the front edge of the dolly, and programming techniques. Procedure C may also be used to simulate compressive forces experienced by lading during rail car switching with the use of backloading.

1.2 The procedures prescribed in this method are particularly suitable for testing large containers or loaded containers, having a gross mass greater than 45 kg (100 lb).

2. Significance

2.1 Each procedure is primarily useful within a laboratory, in comparing different designs of containers of the same size and carrying the same load.

2.2 The inclined plane impact test has been found useful in laboratory simulation of shocks such as might be encountered in handling and transportation.

3. Apparatus

3.1 *Inclined plane impact tester* (Figs. 1 and 2), consisting of a two-rail track inclined $10 \pm 1^\circ$ from the horizontal, a backstop affixed at a $90^\circ (\pm \frac{1}{2}^\circ)$ angle to the track and a minimum four-wheel dolly or rolling platform (1).

Approved by the Standard Specific Interest Group for this Test Method



Documents
Document Sharing Hub

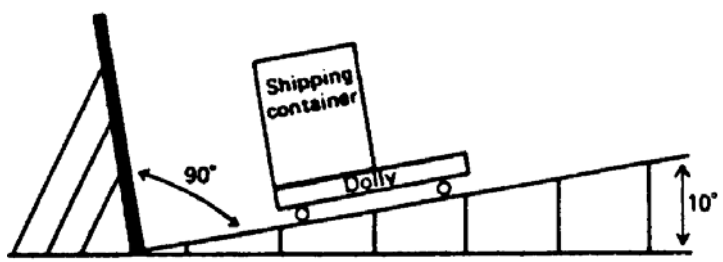


Fig. 1. Incline Impact test apparatus for Procedures A and B.

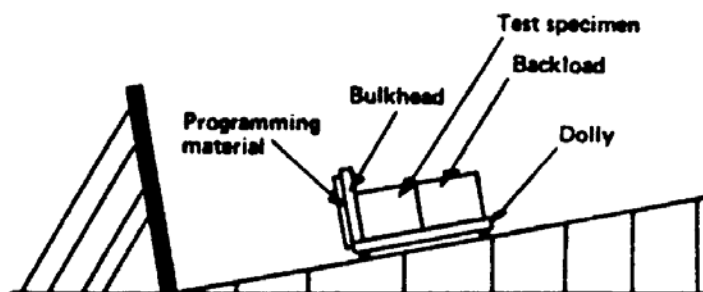


Fig. 2. Incline Impact test apparatus for Procedure C.

3.1.1 *The track.* The length of the track may vary depending upon space limitations and the user's needs. Impact velocity varies with the square root of the length of the run because the incline angle is fixed. The incline is provided with a manual pneumatic, hydraulic, or a motor-driven chain or cable for raising the dolly and a device for releasing the dolly at predetermined distances up the incline. The incline is graduated in convenient increments, such as 25 mm (1 in.). The track must be straight, free of bumps or obstructions, and must be kept clean.

3.1.2 *The backstop*

3.1.2.1 The backstop shall be constructed solidly and braced or ballasted with a resulting mass at least 50 times the max test article mass to prevent movement when impacted. The track assembly and the backstop shall be firmly bolted to the floor so that neither portion has any significant motion relative to the other portion.

3.1.2.2 A metal clad backstop is preferred; however, if it is faced with wood, Group 4 woods as established by the U.S. Forest Products Laboratory (2) (beech, birch, hackberry, hard maple, hickory, oak, pecan, rock elm, or white ash) must be used.

3.1.2.3 The surface or facing of the backstop should be free of projections or irregularities such as bolts, nail heads, gouges, abrasions, warping, buckling, or splits, which may affect the test results.

3.1.2.4 The backstop shall be of sufficient size to permit full contact with the container being tested.

3.1.2.5 The backstop may, if desired, be equipped so that removable hazards, such as boards or timbers, may be added for special tests.

3.1.3 *The dolly*

3.1.3.1 The dolly wheels must roll freely and straight on the track and be smooth and well lubricated.

3.1.3.2 The surface of the dolly floor is made from renewable Group 4 woods or Group 4 plywood, as specified in 3.1.2, or may (preferably) have a steel floor, for greater durability and ease in maintaining a surface free of irregularities.

3.1.3.3 The dolly should be of sufficient size to fully support the container being tested.

3.1.3.4 *Dolly bulkhead* (Fig. 2) (used for Procedure C only). The dolly shall be fitted with a bulkhead at a 90° angle to the dolly top surface. The bulkhead shall be so fitted that upon release the bulkhead impacts first on the