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An American National Standard

Standard Test Method for Treestand Repetitive Loading Capability[1]

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1. Scope

1.1 This test method covers the procedures for determining the capability of climbing and ladder treestands and tripods to withstand repeated loading relative to the manufacturer's rated capacity.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

F2124 Practice for Testing Treestand Ladder, Tripod Stand and Climbing Stick Load Capacity

3. Terminology

3.1 The terminology and definitions in the referenced documents are applicable to this practice.

3.2 *Definitions:*

3.2.1 *backbar or V-bar*—the adjustable component of a climbing treestand or handclimber that engages the tree to provide support. The backbar may be rigid or flexible.

3.2.2 *climbing treestand*—a treestand that provides both the means to ascend the tree, and allow the user to remain at a desired elevation.

3.2.3 *handclimber, or climbing aid*—a device to assist climbing with a climbing treestand. A structure that allows the user to support his weight when lifting a climbing treestand with his legs.

3.2.4 *ladder treestand*—a treestand that is secured to the tree at the elevation where the platform is located. (The ladder treestand can be secured to the tree at other locations and has steps that are used to reach the platform or hunting position.)

3.2.5 *non-climbing, fixed position or hang-on treestand*—a treestand that is secured to the tree at the elevation where it is used. (The user usually ascends the tree by some means and then lifts the treestand to the desired position and secures it for use.)

3.2.6 *platform*—the horizontal structural area of a treestand on which the user stands or places his feet, or both.

3.2.7 *treestand*—a device designed to be affixed to a tree or its branches so as to permit an individual to sit or stand thereon for the purpose of attaining an elevated position from which to observe, photograph or hunt.

3.2.8 *two person treestand*—a ladder or hang-on treestand designed and marketed for use by two persons simultaneously.

4. Summary of Test Method

4.1 A treestand is mounted so that its platform is perpendicular to a rigid wood or metal pole when the rate load capacity is applied parallel to the mounting pole. The load is applied vertically and is guided so that it is applied at the locations applied when ascending or descending a tree on the treestand. In the case of a ladder treestand or tripod, the load is applied to the rungs of the ladder or tripod. The test subject is noted after a certain number of loading cycles, by means of a thorough visual inspection, to determine if any structural damage such as yielding or cracking, or both, has occurred.

4.2 Stand up-sit down two-piece climbers—both seat and foot sections may be tested at the same time.

5. Significance and Use

5.1 This test method is intended for quality assurance and production control purposes with recognition that individual usage will vary considerably. This test method is not intended to be an independent material or product-acceptance test.

6. Apparatus

6.1 A rigid, round wood or metal pole, preferably vertical, is used to mount the subject product such that pole deflection is minimized.

[1] This test method is under the jurisdiction of ASTM Committee F08 on Sports Equipment, Playing Surfaces, and Facilitiesand is the direct responsibility of Subcommittee F08.18 on Treestands.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

6.1.1 The mounting pole diameter shall be 10 ± 1 in. (254 ± 25.4 mm).

6.2 The load shall be applied using either calibrated weights or a mechanical device in conjunction with a calibrated load cell.

6.2.1 The use of calibrated weights requires that weight placement be accurate to assure that the load application centroid is coincident with the boundaries defined and meets the requirements as given in 6.3. Caution should be exercised for operator protection with the use of weights in case of slippage or premature failure.

6.2.2 The use of a mechanical device such as a tensile testing machine or hydraulic power, in combination with pulleys, fulcrums or bearing to redirect forces, requires the use of a calibrated load cell attached adjacent to the test subject to account for friction losses.

6.3 The application of the load shall be at a point on the platform area that is the geometric centroid of the test subjects load placement area while ascending or descending a tree. The application of the load on a ladder treestand shall be at a point on the rung area which is the geometric center.

6.3.1 The load shall be applied to the test subject over a 100 $in.^2$ (0.065 m^2) area for climbing treestands and over a 25 $in.^2$ (0.016 m^2) area for ladder treestands by either: (*1*) controlled application of calibrated weights, or (*2*) as described in 6.2.2, to a flat rectangular steel plate 10 in. (254 mm) wide by 10 in. (254 mm) long and a minimum of ½ in. (12.7 mm) thick for climbing treestands and 5 in. (127 mm) wide by 5 in. (127 mm) long for ladder treestands and a minimum of ½ in. (12.7 mm) thick on top of the test subject. The edges of the load plate adjacent to the test subject shall be deburred with 0.015/0.030 in. (0.381/0.762 mm) radius to reduce damage to the test subject by sharp corners. The load shall be applied at a velocity no more than ½ ft/s (9.144 m/min).

6.3.2 A ¼ –in. (6.350–mm) thick 90 durometer rubber sheet may be placed between the test subject and the load plate and shall be, at a minimum, at least equal in size and symmetrical to the load plate (to prevent the metal load plate from directly contacting the test subject).

NOTE 1—If load guidance is required, fabrication and attachment of any necessary guide bars to this load plate by welding must assure that the plate remain flat and free of distortion.

6.3.3 The load plate shall be positioned on the test subject with its center as close to the point as given in 6.3 as possible, yet maintaining the 100 $in.^2$ (0.065 m^2) or 25 $in.^2$ (0.016 m^2) respective contact area. A centerline of the load plate must be parallel to the major axis (axis of symmetry) of the test subject.

7. Procedure

7.1 Read instructions accompanying the test subject to ascertain the proper procedure for use and mounting and secure the test subject to the mounting pole such that the platform (plane of the platform) is perpendicular to the mounting pole. If necessary, use minimum auxiliary temporary means to maintain the subject in the correct position during set-up. (Frictional forces, without a load on the subject, may not be sufficient in some cases for the subject to remain in position). A small band on the mounting pole may by necessary.

7.2 By geometric means, determine the location of the load application points as given in 6.3 and mark accordingly.

7.3 Determine if the test subject will deflect sufficiently during the test to allow the load plate or weight to slip or shift. If so, provide auxiliary means such as clamps or stops to eliminate sideways movement of the load plate to protect operators.

7.4 The load (calibrated weight) shall be equal to the test subject's rated capacity (except as noted within Section 6.1.6 of Practice F2124). For example, a test subject with a rated capacity of 300 lbs (136.1 kg) shall be tested using a load of 300 lbs (136.1 kg).

7.5 The load shall be applied for a minimum time of one second and then removed completely. The repetitive frequency of load application and removal shall be no more than 30 cycles/min, that is, the load is applied and then removed within no less than 2 s (to avoid heating).

7.6 The repetitive loading shall be 10 000 cycles for climbing treestands. This testing based on a person using a stand two times a day (10 cycles up, 10 cycles down each time) for 25 days each year for 10 years. The number of repetitive loading cycles for ladder and tripod stands shall be the number of steps multiplied by 500 (based on usage of cycles up and down with each use, 25 days per year for 10 years). Testing on ladder and tripod stands shall be performed on one step with the test subject assembled and in-place against the test pole (when applicable). The step shall be chosen at a location approximately two-thirds of the total assembled vertical height. For ladder treestands and tripods capable of supporting two persons, the number of repetitive loading cycles shall be the number of steps multiplied by 1000 to account for two persons climbing.

7.7 Periodic checks at the end of each 3000 cycles shall be made and a note shall be made if the test subject, or load application apparatus, moves (shifts) from its initial equilibrium position on the mounting pile, whether the test subject continues to support the applied load, and in general whether any changes have occurred during the test.

7.8 A thorough inspection shall be made and noted to identify any and all yielding, cracking or other permanent deformation as a result of the repetitive loading.

8. Report

8.1 Recording of results shall include the following:

8.1.1 Identification of test subject model, manufacturer, and rated capacity.

8.1.2 Photograph of test subject.

8.1.3 Photograph of test set-up (three views: side, top, and end).

8.1.4 Verification of calibration.

8.1.5 Date of test.

8.1.6 If movement (shifting) has been detected as given in 7.7, a description shall be recorded.

8.1.7 A description and detailed (close-up) photographs of any and all permanent deformation that has been observed and noted as given in 7.8 shall be recorded.

8.1.8 A note shall be recorded whether the test subject remained free of defects.

8.2 *Pass-Fail Criterion:*

8.2.1 Any cracking or other structural defects noted shall be a cause for failure of the repetitive load test.

8.2.2 If a treestand fails this test the stand and a copy of the test data shall be returned to the manufacturer.

9. Precision and Bias

9.1 No statement is made about either the precision or bias of Test Method F2128 for measuring load capacity since the result merely states whether there is conformance to the criteria for success specified in the procedure.

10. Keywords

10.1 backbar; climbing aid; platform; treestand

APPENDIX

(Nonmandatory Information)

X1. Additional Information

X1.1 This standard is provided for use by manufacturers of treestands and testing companies. Criteria has been developed for certification of treestands and this standard is an integral part of the certification. However, a treestand conforming to this standard alone does not constitute certification and those manufacturers desiring certification must meet all applicable standards as a minimum requirement.