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An American National Standard

Standard Test Method for Load Capacity of Treestand Seats[1]

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1. Scope

1.1 This test method covers the determination of the static load capacity of treestand seats in terms of a factor of safety relative to the manufacturers 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 to determine the applicability of regulatory limitations prior to use.*

2. Terminology

2.1 *Definitions:*

2.1.1 *backbar or V-bar, n*—adjustable component of a climbing treestand or hand climber that engages the tree to provide support.

2.1.2 *climbing stick, n—(1)* a device to assist climbing a tree primarily to a fixed position treestand. *(2)* a structure that is secured to the tree and allows the user to support his weight and climb to the desired height on the tree.

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

2.1.4 *hand climber or climbing aid, n—(1)* a device to assist climbing with a climbing treestand. *(2)* a structure that allows the user to support his weight when lifting a climbing treestand with his legs.

2.1.5 *ladder treestand, n*—treestand that is secured to the tree at the elevation where the platform is located.

2.1.5.1 *Discussion*—The ladder treestand may be secured to the tree at other locations and has steps that are used to reach the platform or hunting position.

2.1.6 *non-climbing, fixed position or hang-on treestand, n*—treestand that is secured to the tree at the elevation where it is used.

2.1.6.1 *Discussion*—The user usually ascends the tree by some means and then lifts the treestand to the desired position and secures it for use.

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

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

2.1.9 *treestand seat, n*—the portion or area of a treestand on which the user sits.

2.1.10 *tripod or tower stand, n*—a tripod or tower stand (free standing platform) is constructed to be self-supporting and is not required to be secured to a tree.

3. Summary of Test Method

3.1 A treestand is mounted so that its platform is perpendicular or slightly above horizontal to a rigid wood or metal pole when the rated load is applied parallel to the mounting pole. The treestand seat frame is equipped with deflection measurement devices. The ladder and tripod do not require deflection measurements to be taken. The load is applied incrementally and recordings are made of the load and deflection at each increment until yielding or permanent deflection occurs, or until 1½ × (2× for two piece stand/sit climbing treestands) the rated load is applied.

4. Significance and Use

4.1 This test method is intended for quality assurance and production control purposes.

5. Apparatus

5.1 A rigid, round, wood or metal pole, preferably vertical, is used to mount the subject (except tripod) treestand product such that pole deflection is minimized.

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

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

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

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5.2.1 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 given in 5.4. Caution should be exercised for operator protection with the use of weights in case of slippage or premature failure.

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

5.3 Calibrated deflection measuring devices (such as dial indicators or optical laser) shall be used to measure movement of the test subject under load. The accuracy of the measuring devices shall be within .010 in. (0.25 mm) and repeatable within .005 in. (0.13 mm). The devices shall measure movement parallel to the direction of the applied load and shall be mounted in such a manner as to eliminate deflection of the test apparatus and be placed, as a minimum, as follows:

5.3.1 There shall be at least two measurements taken at the load, one on each side and 6 in. (152.4 mm) from the center of load application.

5.3.2 A deflection measurement shall be taken at two points furthest from the mounting pole, one on each side symmetrical with the test subject.

5.3.3 A deflection measurement shall be taken at two points 6 in. (152.4 mm) from the mounting pole, one on each side symmetrical with the test subject.

5.4 The application of the load shall be at the centroid of the treestand seat area over a 100 $in.^2$ (645.16 cm^2) area by means of 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. The edges of the load plate adjacent to the test subject shall be deburred .015/.030 in. radius (0.381/0.762 mm) to reduce damage to the test subject by sharp edges. Likewise, the four corners of the load plate should have approximately .25 in. radius (6.35 mm) to reduce damage.

NOTE 1—Load attachment structure must be secured to this load plate; therefore, fabrication by welding must assure that the plate remain flat and free of distortion.

6. Procedure

6.1 Read instructions accompanying the test subject to ascertain the proper procedure for use and mounting and secure the test subject to the mounting pole (except tripods) 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 be necessary).

6.2 By geometric means, determine the location of the centroid of the seat area and mark accordingly. Place the load plate centerline coincident with the centroid of the seat.

6.3 Determine if the test subject will deflect sufficiently during the test to allow the load plate to slip or shift. If so, provide auxiliary means such as clamps or stops to eliminate sideways movement of the load plate. The load must be applied as given in 5.4 and must be continuously applied in the vertical direction throughout the entire test.

6.4 Locate and mount deflection measurement devices, or reference points using optical laser, as given in 5.3.

6.5 The initial load for beginning the test shall be one-fourth of the test subjects' rated capacity. For example, a test subject with a rated capacity of 400 lbs (181.44 kg) shall begin the test at a load of 100 lbs (45.36 kg). Loads shall be increased by 25 % increments up to the test subjects' rated capacity, after which the load shall be increased as appropriate to 125 %, 150 %, and so forth, lb increments. After the load meets or exceeds the rated capacity, it shall be returned to zero and checked for yielding.

6.6 At each load value equal to or exceeding the rated capacity (test point) the load and all deflection measurements shall be recorded. The load shall then be removed and the deflection measurements re-recorded. A note shall be made of any measurement that does not return to within .200 in. (5.08 mm) of its initial value. After the load is removed, all deflection measurements shall be checked, and the test subject visually inspected for permanent deformations by yielding.

6.7 The load shall incrementally increase until it is determined that: (*1*) a minimum for 150 % (200 % for two piece stand/sit climbing treestands) of the rated load capacity has been applied, or (*2*) permanent deformation (yielding) has occurred for treestands with integral seats (supported on the standing platform).

6.7.1 For two piece (stand/sit) climbing treestands or ladder stands with movable non-rigid platforms (seats such as mesh, slings or similar) that can be slid forward or backward during normal use, two separate tests shall be conducted with the load applied to the centroid of the non-rigid platform. The first test shall be conducted with the load applied to the centroid of the non-rigid platform with the non-rigid platform (seat) located in its normal position, typically in the center of the supporting structure. The second test shall be conducted with the load applied along the centroid of the supporting structure furthest from the test pole, which by design must be capable of directly supporting the user's weight during normal use. (For example, the horizontal framing member of a treestand where the user must support his weight during normal stand up/sit down climbing procedures.) For this second case, a rigid steel bar should be used to distribute the load over a 16-in. (406.4-mm) wide area of the supporting structure.

7. Report

7.1 Deflection readings shall be discarded only when a calibration change is discovered after readings have been made or when improper operator techniques can be cited.

7.2 Recording of results shall include the following:

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

7.2.2 Photograph of test subject.

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

7.2.4 Load and deflection measurements at all test points.

7.2.5 Verification of calibration.

7.2.6 Date of test.

7.3 *Determination of Factor of Safety:*

7.3.1 When yielding or permanent deformation has been reached as given in 6.7, the corresponding load in pounds shall be noted as the yield load.

7.3.2 The factor of safety shall be calculated by dividing the manufacturers rated capacity of the test subject into the resulting yield load. For example, rated capacity 300 lb (136.08 kg), yield load 480 lbf (2135.15 N); therefore, the factor of safety is 480/300 (217.72/136.08 kg) or 1.60 (usually noted as 1.60 SF).

7.4 *Pass-Fail Criterion*—A treestand seat is considered failed if it cannot support: (*1*) a minimum of 1.5× its rated load capacity without yielding or permanent deformation for treestands with integral seats (supported on the standing platform), or (*2*) a minimum of 2× its rated load capacity without yielding or permanent deformation for two piece (stand/sit) climbing treestands or ladder stands with movable non-rigid platforms. The deflection measurements can be used as an indication of permanent deformation, but shall not be used as pass-fail criterion.

8. Precision and Bias

8.1 No statement is made about either the precision or bias of this test method for measuring load capacity, since the result merely states whether there is conformance to the criteria for success specified in the procedure.

9. Keywords

9.1 backbar; platform; treestand; tripod

APPENDIX

(Nonmandatory Information)

X1. ADDITIONAL INFORMATION

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

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