Designation: F 1772 – 99

An American National Standard

Standard Specification for Climbing Harnesses[1]

This standard is issued under the fixed designation F 1772; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers climbing harnesses for use in the sports of rock, ice, and snow climbing. It establishes requirements for the testing, performance, and marking of climbing harnesses and for the instructions that are supplied with them.

1.2 This specification may contain test methods that do not entirely simulate real-life climbing situations. The test methods are designed to give reproducible results in a laboratory and, thereby, a means for product comparison.

1.3 Three types of harnesses are covered by this specification: full body harnesses, sit harnesses, and chest harnesses.

1.4 *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.*

1.5 The values stated in SI units are to be regarded as the standard.

2. Referenced Documents

2.1 *ASTM Standards:*

E 4 Practices for Force Verification of Testing Machines[2]

F 1775 Specification for Labeling of Climbing and Mountaineering Equipment[3]

F 1773 Terminology Relating to Climbing and Mountaineering Equipment and Practices[3]

2.2 *Other Standard:*

International Union of Alpine Associations (Union Internationale d'Associations d'Alpinisme (UIAA)) Standard for Full Body Harnesses

3. Terminology

3.1 Definitions—Terms defined in Terminology F 1773 shall be applicable to this specification.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *adjusting device, n*—any device that allows adjustment to be made to the harness to the requirements of the wearer.

3.2.2 *belay/rappel loop, n*—a loop intended for attaching a belaying or rappelling device to the harness using a carabiner.

3.2.3 *belt, n*—the part of the harness that is around the waist.

3.2.4 *buckle, n*—a connector used for attaching webbing segments together.

3.2.5 *load-bearing parts, n*—parts of the harness that transmit load during testing in accordance with Section 11.

3.2.6 *nonload-bearing parts, n*—other parts of the harness.

3.2.7 *rope attachment points, n*—parts of the harness intended for the attachment of the climbing rope.

3.2.8 *performance rating for a harness, n*—a pass/fail designation indicating if the harness has passed all required tests presented in this specification.

4. Summary of Specification

4.1 Representative samples of climbing harnesses are tested for minimum strength.

5. Significance and Use

5.1 The strength of climbing harnesses is one of the properties used to evaluate their suitability for climbing.

5.2 Marking and instructions aid in the selection and use of climbing harnesses.

6. Performance Requirements

6.1 During each of the tests described in Section 11, no load-bearing part shall break completely. In addition, the harness shall not be released from the torso.

6.2 The webbing in all buckles and adjusting devices shall slip no more than 20 mm.

6.3 If there are multiple independent rope attachment points, the tests shall be repeated using a new sample as defined in 8.1, for each combination of rope attachment points specified in the manufacturer's instructions.

6.4 If the harness has a belay/rappel loop, the test described in 12.3 shall be repeated using a new sample as defined in 8.1, with the belay/rappel loop as the load attachment point. No

[1] This specification is under the jurisdiction of ASTM Committee F-8 on Sports Equipment, Surfaces, and Facilitiesand is the direct responsibility of Subcommittee F08.21on Climbing and Mountaineering.

Current edition approved Feb. 10, 1999. Published April 1999. Originally published as F 1772 - 97. Last previous edition F 1772 - 97.

[2] *Annual Book of ASTM Standards,* Vol 03.02.

[3] *Annual Book of ASTM Standards,* Vol 15.07.

load-bearing part shall break completely nor shall the harness be released from the torso.

7. Apparatus

7.1 *Body Shaped Torso* (see Fig. 1),

7.2 *Tensile Test Machine,* used to apply loads to the harness, and

7.3 *Load Cell,* for measuring the tensile force applied to the harness.

8. Sampling, Test Specimens, and Test Units

8.1 Harness test specimens shall be new and in unused condition, selected randomly from a production lot of a given model of harness. They shall conform in all respects to the manufacturer's specifications for the model to be tested and shall be the proper size to fit the test torso.

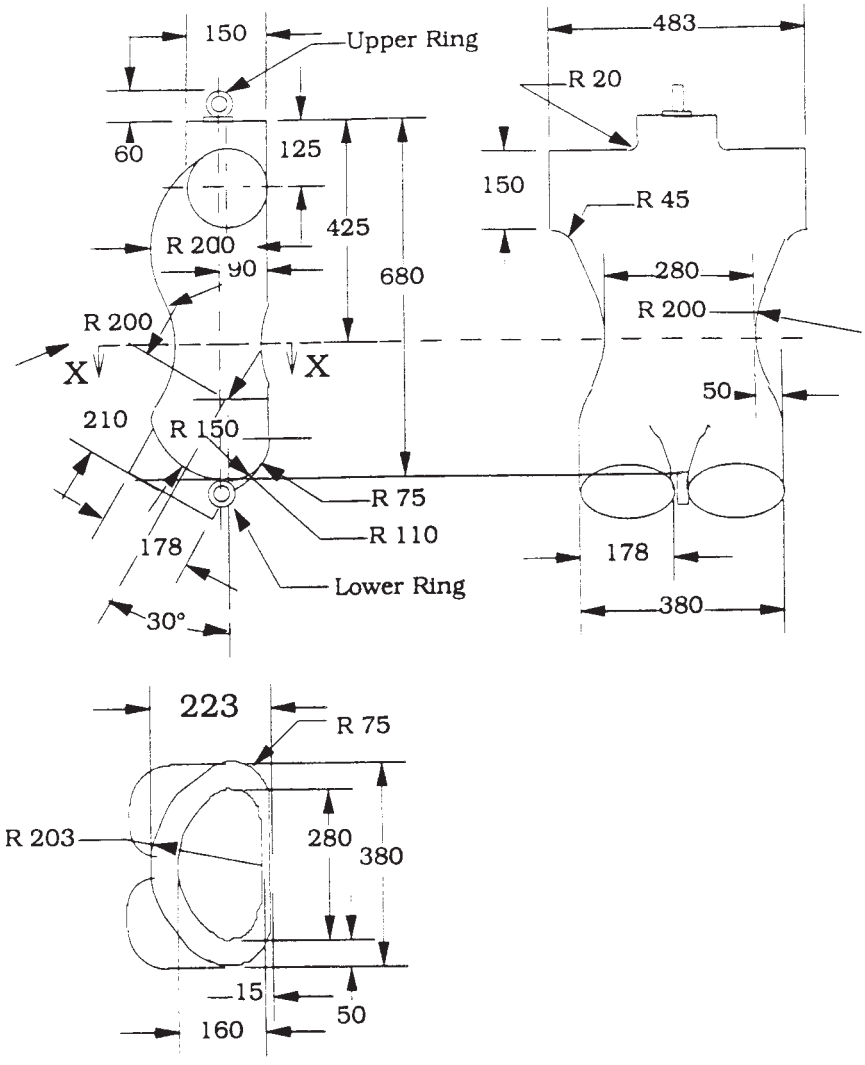
9. Calibration and Standardization

9.1 Test equipment is to be in compliance with Practices E 4 and other requirements specific to the equipment.

10. Conditioning

10.1 Tests may be completed under ambient conditions. In cases of dispute, harness samples will be conditioned in accordance with 10.2.

10.2 The harness samples are first dried in an atmosphere with a relative humidity of less than 10 % for a period of 24 h. Then they are placed in an atmosphere of 50 ± 5 % relative humidity, 20 ± 2°C for a period of 72 h. Tests may then be done outside the conditioning room, but the temperature shall be 23 ± 5°C. The tests shall begin within 5 min of removal from conditioning and be completed within 4 h.



NOTE 1—All linear dimensions are in millimetres, ±5 mm.
NOTE 2—The dimensions are those of a torso developed by the UIAA for testing harnesses.
NOTE 3—Waist circumference at X-X is 850 mm.

FIG. 1 Outline of the Torso

11. Harnesses

11.1 *Full Body Harnesses*:

11.1.1 The harness shall be put on a test torso and attached with a rope to the test machine in accordance with the manufacturer's instructions for use.

11.1.2 *Upright Position of the Torso*:

11.1.2.1 The harness shall be loaded up to 800 ± 10 N in the upright position of the torso. Under this load, adjust the torso and harness so that the rope attachment points are approximately symmetric about the vertical axis of the torso.

11.1.2.2 With the torso in an upright position, a tensile force shall be applied to the lower ring, increasing to 16 + 0.3/−0 kN over a period of 2 ± 0.25 min. This tensile force shall be held for 1 ± 0.25 min, and the tension then shall be completely released over a maximum of 1 min. The tensile force shall be reapplied and increased to 16 + 0.3/−0 kN as before and held for 3 ± 0.25 min before release.

11.1.3 *Head-Down Position of the Torso*—With the torso in a head-down position, a tensile force shall be applied to the upper ring, increasing to 10 + 0.2/−0 kN over a period of 2 ± 0.25 min. This tensile force shall be held for 1 ± 0.25 min, and the tension then shall be completely released over a maximum of 1 min. The tensile force shall be reapplied and increased to 10 + 0.3/−0 kN as before and held for 3 ± 0.25 min before release.

11.2 *Sit Harnesses*:

11.2.1 The harness shall be put on a test torso and attached with a rope to the test machine in accordance with the manufacturer's instructions for use.

11.2.2 *Upright Position of the Torso*:

11.2.2.1 The harness shall be loaded up to 800 ± 10 N in the upright position of the torso. Under this load, adjust the torso and harness so that the rope attachment points are approximately symmetric about the vertical axis of the torso.

11.2.2.2 With the torso in an upright position, a tensile force shall be applied to the lower ring, increasing to 16 + 0.3/−0 kN over a period of 2 ± 0.25 min. This tensile force shall be held for 1 ± 0.25 min, and the tension then shall be completely released over a maximum of 1 min. The tensile force shall be reapplied and increased to 16 + 0.3/−0 kN as before and held for 3 ± 0.25 min before release.

11.2.3 Sit harnesses are to be tested in accordance with either 11.2.4 or 11.2.5.

11.2.4 *Buckle Test*:

11.2.4.1 The belt is attached between two nonrotating cylindrical pins of 30 ± 10-mm diameter. See Fig. 2.

11.2.4.2 A tensile force shall be applied increasing gradually to 1 + 0.1/−0 kN over a period of 1 ± 0.25 min. Mark the webbing at the outer edge of the buckle. The tensile force shall be increased to 10 + 0.2/−0 kN over a period of 2 ± 0.25 min. This tensile force shall be held for 3 ± 0.25 min. Mark the webbing at the outer edge of the buckle. The tension then shall be completely released over a maximum of 1 min. Unfasten the buckle and measure the distance between the two marks.

11.2.5 *Horizontal Position of the Torso*:

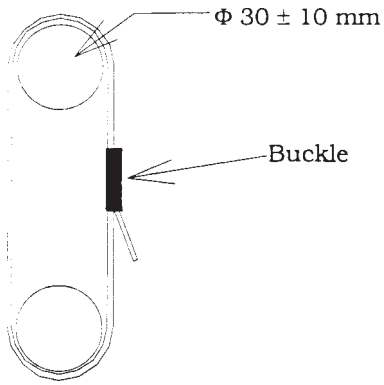


FIG. 2 Buckle Test

11.2.5.1 The tensile force shall be applied in the plane of symmetry of the torso and normal to its axis (see Fig. 3). The torso rings or support slings may be used to hold the torso as indicated.

11.2.5.2 With the torso in a horizontal position, a tensile force shall be applied increasing gradually to 1 + 0.1/−0 kN over a period of 1 ± 0.25 min. Mark the webbing at the outer edge of the buckle. The tensile force shall be increased to 10 + 0.2/−0 kN over a period of 2 ± 0.25 min. This tensile force shall be held for 3 ± 0.25 min. Mark the webbing at the outer edge of the buckle. The tension then shall be completely released over a maximum of 1 min. Unfasten the buckle and measure the distance between the two marks.

11.3 *Chest Harnesses*:

11.3.1 The harness shall be put on a test torso and attached with a rope to the test machine in accordance with the manufacturer's instructions for use.

11.3.2 The harness shall be loaded up to 800 ± 10 N in the head-down position of the torso. Under this load, adjust the torso and harness so that the rope attachment points are approximately symmetric about the vertical axis of the torso.

11.3.3 With the torso in a head-down position, a tensile force shall be applied to the upper ring, increasing to 10 + 0.2/−0 kN over a period of 2 ± 0.25 min. This tensile force shall be held for 1 ± 0.25 min, and the tension then shall be completely released over a maximum of 1 min. The tensile force shall be reapplied and increased to 10 + 0.3/−0 kN as before and held for 3 ± 0.25 min before release.

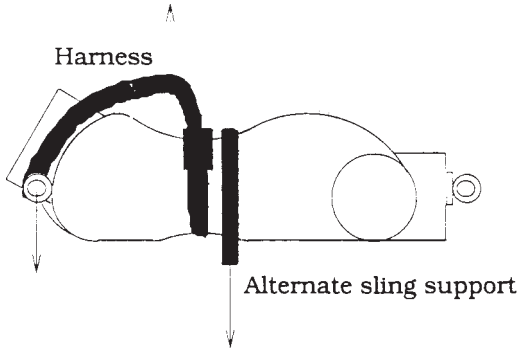


FIG. 3 Torso Support for Horizontal Position of the Torso

12. Report

12.1 Report the following information:

12.1.1 The name of the harness manufacturer;

12.1.2 The model of harness tested;

12.1.3 The date and location of the tests;

12.1.4 The name(s) of personnel conducting the tests; and

12.1.5 The results observed.

13. Harness Marking

13.1 Markings and instructions shall conform to Specification F 1775.

13.2 In addition, the following information shall be affixed durably to the harness:

13.2.1 The location(s) and method of rope attachments;

13.2.2 The location(s) and method of rappel and belay device attachments; and

13.2.3 The method of properly using buckles and adjusting devices.

14. Keywords

14.1 climbing harness; climbing and mountaineering equipment; harness