



Designation: F780 – 93a (Reapproved 2006)

# Standard Test Method for Linear Deformation and Breaking Strength of Alpine Skis<sup>1</sup>

This standard is issued under the fixed designation F780; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This test method covers the determination of linear deformation load and breaking load for Alpine skis.<sup>2</sup>

1.2 This test method is applicable to all Alpine skis.

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:*<sup>3</sup>

D2240 Test Method for Rubber Property—Durometer Hardness

F472 Terminology for Geometry of Alpine Skis

## 3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *breaking load ( $F_B$ )*—the maximum load applied in accordance with Sections 6 and 7 (that is, the maximum load which the ski can sustain).

3.1.2 *deformation load ( $F_D$ )*—the load applied in accordance with Section 6 that causes a permanent deformation of 1 mm at the load application point of the ski.

## 4. Significance and Use

4.1 This test method provides information concerning the resistance of a ski to permanent bending and an indication of its basic strength. It is not intended to evaluate the data with regard to the quality of the ski.

## 5. Apparatus

5.1 This test method shall be conducted on a device (see Fig. 1) equipped with adjustable supports, a load ( $F$ ) applica-

tion system ( $I$ ) with a range of at least 20 000 N and reading accuracy of  $\pm 50$  N, and with an instrument (2) for reading bending deformation ( $d$ ) with an accuracy of 0.01 mm. The system must have a controlled deflection rate. A standard universal tension/compression testing machine with X – Y recorder (3) is typical of such a system.

5.2 The test method is made with the ski in its normal horizontal position, and the overhanging portions of the ski are left free to deflect.

5.3 The test system shall be set up in accordance with Fig. 1 (Section A) with a 250-mm distance between supports and one support made with a 25-mm diameter, low-friction roller at point of contact with the ski. The end support shall be so designed as to have a hinged clamp which prohibits linear displacement, yet permits rotation about the support. The load is applied through a plate as shown in Fig. 1 (Section B), 25 mm wide and of length equal to or slightly greater than the width of the ski, made up of a steel plate (5) and a hard rubber ( $95 \pm 5$  Shore A durometer; see Test Method D2240) layer (4). The plate must be free to rotate under loading ram.

## 6. Determination of Load Application Point

6.1 In order to obtain comparable values, the test shall be conducted at the load application point with a separation between the supports of  $250 \pm 0.5$  mm. Determine the load application point by moving the ski in a longitudinal direction on the supports until a deflection is obtained under a load of  $600 \pm 5$  N in accordance with the table shown below:

Ski Length, $L_N$ , mm (see Terminology F472)	Deflection, mm	Tolerance, mm
$1700 \leq L_N$	2	0.03
$1400 \leq L_N < 1700$	4	0.03
$1000 \leq L_N < 1400$	6	0.03
$0750 \leq L_N < 1000$	8	0.03

## 7. Procedure

7.1 Condition the ski for 24 h minimum at a temperature of  $23 \pm 5^\circ\text{C}$ . Place the ski as shown in Fig. 1, and set up the system to apply the load midway between the supports. The stiffness of the ski at point of loading must be within the 3 % tolerance under a load of  $600 \pm 5$  N; noncomparable information will result otherwise. Load the ski at a rate sufficient to increase the deflection by  $25 \pm 5$  mm/min, until the load deflection curve changes to a negative slope indicating failure of the ski.

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee F27 on Snow Skiing and is the direct responsibility of F27.30 on Skis and Boots.

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<sup>2</sup> This test method is meant to conform in all meaningful ways to the ISO standard ISO/DIS 6265, available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

<sup>3</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.