



Standard Practice for Fitting Athletic Footwear¹

This standard is issued under the fixed designation F 539; 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 practice covers a practical method for fitting athletic footwear. This practice is applicable to the following general flexible types of footwear: baseball, basketball, football, jogging, and tennis.

1.2 There are as many variations in shoe forms and materials available to users as there are variations in the anatomy of the user's feet. Shoe forms are different due to manufacturer's materials, type of construction, and also the type of activity anticipated in its end use.

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. Terminology

2.1 Definitions:

2.1.1 *end use, n*—the use for which the footwear is intended.

2.1.2 *last, n*—a block or form shaped like a person's foot, used by shoemakers in building or repairing shoes and boots.

2.1.3 *ill-fitting*—a term descriptive of footwear that is either too loose or tight on the foot for its intended purpose or protection thereof.

2.1.4 *fitting stool*—a low stool, generally having a forward projection, the top of which recedes at an approximate angle of 30° and is utilized for the fitting of shoes.

3. Significance and Use

3.1 Ill-fitting shoes can cause discomfort, but more importantly, prolonged use causes disfiguration of the bone structure, bunions, corns, callouses, and finally fatigue, often leading to serious accidents.

4. Apparatus

4.1 *Measuring Device*,² suitable for performing the measurements described in this practice.

¹ This practice is under the jurisdiction of ASTM Committee F-8 on Sports Equipment, Surfaces, and Facilities and is the direct responsibility of Subcommittee F08.54 on Footwear.

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² An acceptable measuring device is available from the Brannock Device Co., 509 East Fayette St., Syracuse, NY 13202.

5. Measurement Procedure

5.1 The user shall be in a sitting position during measurement of the foot.

5.2 To measure the right foot, hold the measuring device so that the fitter can read the words "right heel" which appear just in front of the heel cup. Thus, the fitter will place the heel of the user's right foot in the right-heel cup of the device.

5.2.1 To measure the left foot, hold the device so the fitter can read the words "left heel"; thus, the fitter will place the heel of the user's left foot in the left-heel cup of the device (see Fig. 1).

5.3 Set the measuring device for operation by moving all parts to position as shown (Fig. 1).

NOTE 1—Move the width bar out and push the pointer back to the end of its slot.

5.4 Placement of Measuring Device:

5.4.1 If no fitting stool is used, place the measuring device on the floor, adjust the position of the device directly below the knee so that a right angle exists between the leg and foot (see Fig. 2).

5.4.2 If a fitting stool is available, place the measuring device on the face of the fitting stool; then place the foot on the device with the heel firmly in the heel cup. Then, move the fitting stool toward the user so that the leg and foot form a right angle with the measuring device (see Fig. 3).

NOTE 2—**Caution:** Do not measure the foot while the user is standing. The device is calibrated to compensate for expansion of the foot if the footwear is properly fitted.

5.5 Remove the user's present footwear one at a time and conveniently place aside just prior to measuring the user's foot. During measurement, the user should be wearing an appropriate pair of socks, preferably absorbent.

5.6 *Determination of Ball-to-Heel Length (Arch Length)*—Place the thumb over the ball joint of the foot as shown in Fig. 4 and move the pointer so that the inner curved side of the pointer fits around the ball joint of the foot and the two high ribs of the pointer come in contact with the thumb as shown in Fig. 4. When the pointer is in proper adjustment, the low middle rib (marked A in Fig. 4) will be touching the bone on the side of the foot (marked B in Fig. 4). This may be checked with the index finger. Read the size indicated by the pointer as the arch length.

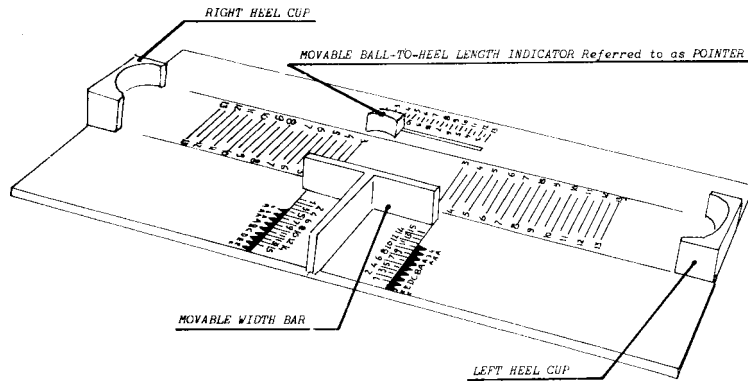


FIG. 1 Measuring Device

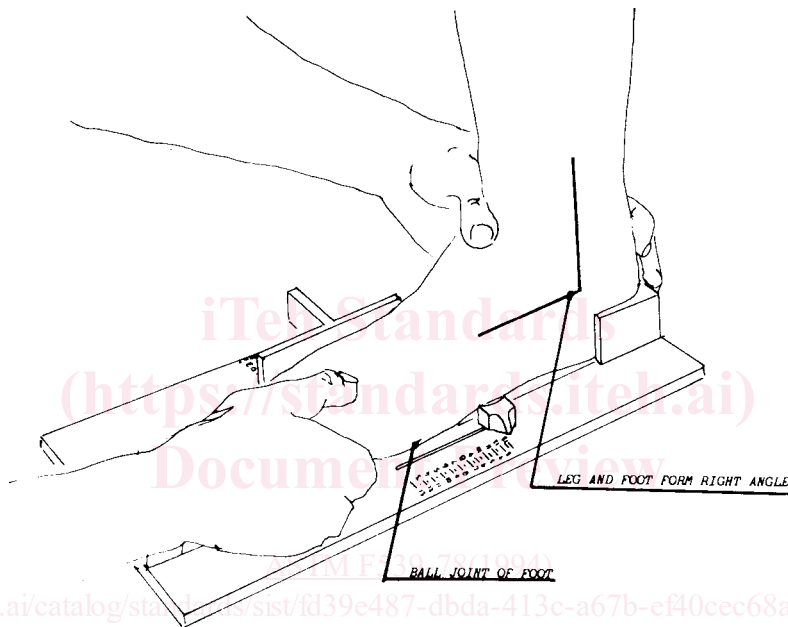


FIG. 2 Use of Measuring Device Without Fitting Stool

NOTE 3—The arch length of the foot being measured in Fig. 4 is $8\frac{1}{2}$.

5.7 *Determination of Toe-to-Heel Length (Toe Length)*—Look straight down over the end of the toes (make sure the sock is pulled tightly over the toes and press the toes down so that they lie flat against the base of the device) and read the size indicated as the toe length (see Fig. 5).

5.8 *Determination of Measured Foot Length in Terms of Shoe Size*—Compare the arch length with the toe length and fit as follows:

5.8.1 If the arch length and toe length measurements are the same, the reading is the correct shoe size (see Table 1).

5.8.2 If the arch length and toe length measurements differ, the shoe size should correspond to the larger of the two measurements as follows (see also Table 1):

5.8.2.1 If the toe length is longer than the arch length, then the correct shoe size is equivalent to the toe length.

NOTE 4—When taking measurements, always be sure the pointer is correctly placed.

5.8.2.2 If the arch length is a half size longer than the toe length, the correct shoe size is equivalent to the arch length measurement (see Note 4).

5.9 *Determination of Width*—Determine the width by firmly pushing the width bar to the edge of the foot, but do not squeeze the foot. Select the number on the width bar that is the same as the length size previously determined. Follow down this line and observe which width area it touches, or comes nearest (see Fig. 6). If it comes between width marks, choose the wider width for a thick foot, or the narrower width for a thin foot. If the foot is extremely fleshy or has a very high instep, it may be necessary to fit the foot to an additional width wider. If the foot is extremely thin, compress the foot slightly with the width bar and take the reading while holding the bar in this position.

5.10 To measure the opposite foot, reverse the device end for end, so that the other foot is in the correct heel cup. Follow the procedures in 5.5-5.9.

6. Observation and Interpretation of Fitting Problems

6.1 Observe signs in the user's present worn footwear for specific problems illustrated in 6.2-6.6.

6.2 Observation of Sweat Lines:

6.2.1 The sweat line inside of the shoe indicates how the ball of the foot sets in the shoe.

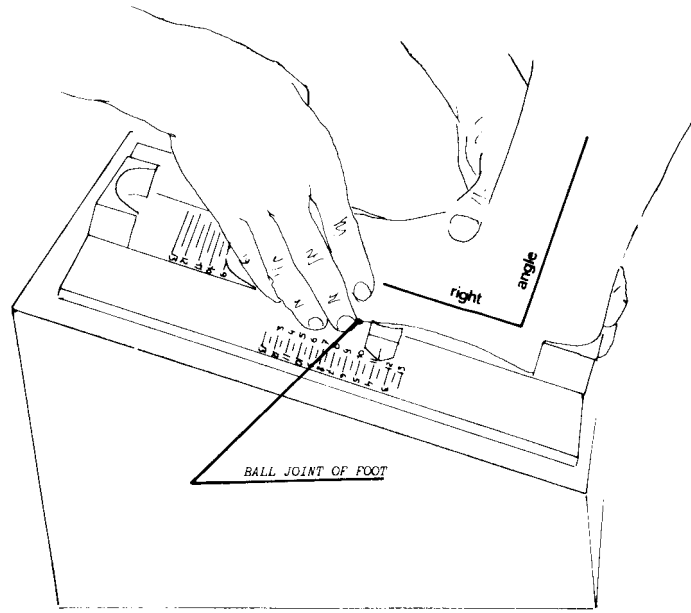


FIG. 3 Use of Measuring Device with Fitting Stool

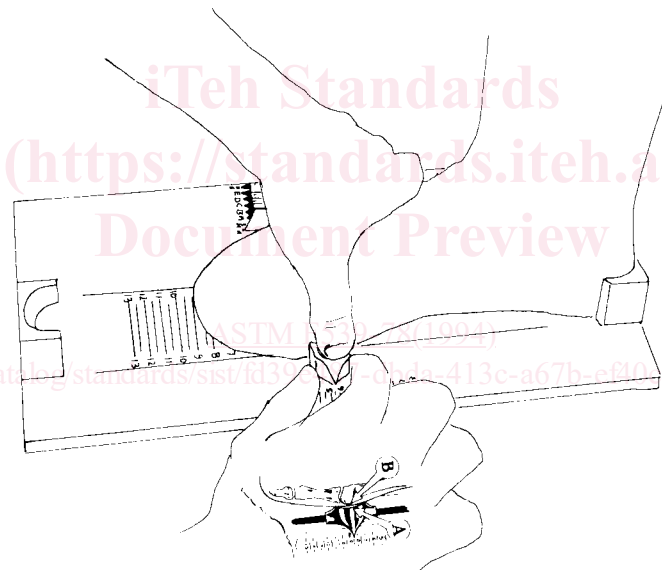


FIG. 4 Measurement of Arch Length

6.2.2 The sweat line indicates the amount of weight that is carried through the arch of the foot.

6.2.3 The sweat line shows where the toes come in contact with the shoe and reveals if the little toe has had enough room.

6.3 *Indications of Short Shoes:*

6.3.1 Longitudinal folds in the leather on the outside of the shoe under the interlongitudinal arch indicate a shoe that is too short for the foot.

6.3.2 Wear lines on the outsole of the shoe show where the ball of the foot is during wear; and if these wear lines are beyond the wide part of the shoe, the shoe should be longer.

6.3.3 A shoe that wears over the outsole to the outside is an indication that the shoe is too short.

6.3.4 A shoe that is pushed out of shape over the little toe is a sign of short shoes.

6.3.5 A shoe in which the counter and upper is run over in

the heel indicates that the shoe is too short for the foot.

6.3.6 An indentation of the toe end of the upper on the inside by the end of the big toe may be caused by a shoe that is too short for the foot (see also 6.5.1).

6.4 *Indications of Long Shoes:*

6.4.1 Excessively turned up toes, with pronounced wrinkles across the vamp, may be caused by a shoe that is too long.

6.4.2 Gaping quarters at the top may be caused by a shoe that is too large or a person who may have a weak arch. In such cases, the shoe should be fitted shorter.

6.4.3 If the counter is run over on either side of the heel, the shoe is too large for the foot; or this situation may indicate a foot problem such as weak ankles or flat feet.

6.5 *Observation of Improper Width Fit:*

6.5.1 An indentation of the toe end of the upper on the inside by the end of the big toe may be caused by a shoe that