

# Assessment of the Resistance of Air Dry Insole Leathers to Heat with Special Reference to the Direct Moulded and the Injection Moulded Process of Footwear Construction

## 1 Scope

- 1.1 The method is intended for testing whether insole leathers are damaged by heat under conditions similar to those they encounter in the Direct Moulded and Injection Moulded Sole process of footwear construction, but it may be suitable for testing other leathers as well.
- 1.2 In the method two alternative loads are specified, the choice of which depends on whether high or low working pressures will be employed upon the leather during the moulding process.
- 1.3 Two different pairs of temperature settings are also specified corresponding to those of:
  - 1.3.1 Unheated lasts (as used with solid rubber, whether the rubber is heated or not).
  - 1.3.2 Heated lasts (used with microcellular rubber).

## 2 Principles of the method

A specimen of the leather is pressed between heated flat platens on a press, under conditions that do not prevent thermal shrinkage. If the shrinkage of the specimen is not excessive, the specimen is examined for heat damage (see 9.1).

## 3 Apparatus used for pressing and heating the specimens

- 3.1 The press used must have means for measuring the loads applied, with errors not exceeding  $\pm 10\%$  (see 9.2).
- 3.2 The platens must have flat smooth surfaces not less than 150 mm square (see 9.3).
- 3.3 The heating temperature control of the platens must permit them to be heated independently to any temperatures from room temperature to 200 °C, and permit the working area to be controlled at the specified temperature by manual or automatic control with errors not exceeding  $\pm 3$  °C. All parts of the working areas must be at the specified temperatures with tolerances of  $\pm 3$  °C, except for a brief period when the surfaces of the platens are cooled by the specimen itself (see 9.4 and 9.5).
- 3.4 The heaters and their platens must make good thermal contact.
- 3.5 A rectangular piece of silicone rubber 150 mm x 100 mm x  $3 \pm 0.1$  mm thick and hardness  $65 \pm 5^\circ$  International Rubber Hardness and thermal conductivity  $7.0 \times 10^{-4} \pm 1.0 \times 10^{-4}$  cal.degC<sup>-1</sup>.cm<sup>-1</sup>.sec<sup>-1</sup>. (Note: A

suitable compound formulation is given for such a silicone rubber in 9.11.)

#### 4 Temperatures, loads and durations of pressing (see 9.6)

- 4.1 Apply a load of either 1500 or 600 kg according as the leather is intended for use in a manufacturing process employing high or low pressures.
- 4.2 For measurements intended to simulate the conditions of *unheated lasts* use temperatures of  $75 \pm 3^{\circ}\text{C}$  and  $150 \pm 3^{\circ}\text{C}$  for the upper and lower platens respectively.
- 4.3 For measurements intended to simulate the conditions of *heated lasts* use temperatures of  $100 \pm 3^{\circ}\text{C}$  and  $140 \pm 3^{\circ}\text{C}$  for the upper and lower platens respectively.
- 4.4 Maintain the load at the specified value for a period of 10 minutes.

#### 5 Preparation of specimen

- 5.1 Unless otherwise specified, the grain surface of the leather is to be lightly buffed, as described below, before the specimens are cut out. For already buffed leathers and splits, no such buffing is required.
- 5.2 The specimen required for test of a bend, or shoulder, consists of a rectangle of length and breadth 100 mm and 50 mm, cut from the Official Sampling Position SLP 2 (IUP/2) with the longer side of the rectangle parallel to the backbone for bend or belly leather, but perpendicular to the backbone for shoulder leather. A similar specimen is required for a test on a cut insole, but the longer sides are to be cut parallel to the length of the insole.
- 5.3 Condition the piece of leather at  $20 \pm 2^{\circ}\text{C}$  and relative humidity  $65 \pm 2\%$  for at least 3 hours and weigh. Buff its grain surface with grade 100 carborundum abrasive paper as uniformly as possible until  $4 \pm 1\%$  by weight of the leather has been removed.
- 5.4 Then condition the specimen in accordance with SLP 3 (IUP/3). Other methods of conditioning may be specified however (see 9.1).
- 5.5 Before pressing the specimen, use a scale graduated in mm to measure each of the four sides of the previously conditioned leather specimen on both the grain and flesh sides to the nearest 0.2 mm and calculate the sum  $S_1$  of the widths and the sum  $S_2$  of the lengths.

#### 6 Procedure for pressing

- 6.1 With the platens separated by about 50 mm, heat the platens to equilibrium at the prescribed temperatures.
- 6.2 Place the leather specimen flesh side down centrally on the silicone rubber sheet and transfer both to the centre of the working area of