

Debenhams Test Method PD17 – Surface Flash

Purpose

To assess the behaviour of fabrics in wear, when brushed over a naked flame.

Reference

This method is based on the draft version of the revised BS 4569.

Apparatus/ Materials

- BS 4569:1983 Burner with existing traverse mechanism and times for 2 +/-0.25 seconds traverse over 300mm of the burner.

The burner should be adjusted so that:

- The flame height is 50mm (measured from the burner outlet to the tip of the flame), using the flame height gauge
- The distance between the burner outlet and the specimen face is 5mm as measured with a calibrated end cap.

- Butane gas supply as described in BS 4569:1983.

- Pin frame, measuring 760mm x 340mm.

- Projecting from and at right angles to the frame, 20 pins are set in 13mm from the edge, these pins are arranged with 1 at each corner, 2 across the top and bottom and 6 down each side, equidistantly placed.
- Each pin is 8.5mm +/-0.5mm long and 2.0 +/-0.5mm in diameter, tapering to a point. The pin frame is fixed and located in the same position as and replacing the non-combustible back plate as shown in BS 4569:1983 fig.1.
- The frame should have a removable cover plate to conceal the cut edges of the specimen during testing. The cover plate has 3mm diameter holes spaced to fit over the pins on the frame. This must be clamped in position on all 3 sides, top and two sides.

- Trip Thread of 20-25dtex polyester. Attach the threads to timer mechanisms at 150mm, 300mm and 600mm from the burner, incorporating micro switches.

- Flame height gauge - "C" shaped with exactly 50mm between the points.

PLEASE NOTE: the device specified in BS 5438:1976 "Flammability" of textile fabrics when subjected to a small igniting flame applied to the face of vertically orientated specimens is suitable.

Test method

- Using an appropriately sized template, cut two specimens each measuring 800mm x 370mm with the longer direction parallel to the length direction of the fabric / garment. Mark the pin positions on the fabric before cutting out the pieces.

- Condition the samples for a minimum of 24 hours at 65% +/- 4% relative humidity and at a temperature of 20°C +/-2°C.

- Raise the pile of the fabric by shaking* the specimen once by holding the short edge to which the pile is pointing.

*This should be a sharp shake so that the fabric cracks like a whip.

*This will ensure all loose cut loops are removed.

4. Position a specimen with the pile downwards on the pin frame and place the cover plate over the fabric edge and pins. Without stretching the specimens, ensure that it is as flat as possible on the bottom row of pins, secure the cover plate in position using the clips.

5. Adjust the distance of the pin frame and/or burner so that the surface of the specimen is 5mm from the burner outlet when it is in the traverse position. The burner end cap should just brush the surface hairs of the fabric. This must be checked for each fabric quality and sample being tested.

6. Attach three trip threads across the sample to a suitable timer mechanism at distances of 150mm, 300mm and 600mm, from the burner. Ensure the thread is horizontal by locating it in the grooves on the cover plate.

PLEASE NOTE: The thread is very weak and cannot be pulled to tension. Use a double thread from the microswitch to the clamp.

7. Start the test by allowing the burner to drop into the horizontal position and simultaneously depress the "timer" button. The burner will traverse the fabric.

8. Observe the effect on the specimen for 15 seconds after the traverse of the burner and where appropriate, the time to sever the trip threads.

9. Repeat steps (1) to (8) inclusive with the second sample, but reverse the direction of the pile.

Grading

Grade the effect on each specimen as follows:

Grade 5	Surface flash did not occur
Grade 4	Surface flash in wake of burning
Grade 3	Surface flash extended above the level of burning
Grade 2	Surface flash spread all over sample
Grade 1	Surface flash ignited sample

Results

For each specimen, report:

- The pile direction.
- The visual assessment.
- Times to sever the 150mm, 300mm and 600mm trip threads.