

British Standard Method for

Cleansing and wetting procedures for use in the assessment of the effect of cleansing and wetting on the flammability of textile fabrics and fabric assemblies

Modes opératoires de nettoyage et d'humectage utilisés pour évaluer l'effet de ces opérations sur l'inflammabilité des supports et tissus textiles

Reinigungs- und Benetzungsverfahren zur Beurteilung der Reinigungs- und Netz Wirkung auf die Entflammbarkeit von textilen Flächengebilden und textilen Konstruktionen

Foreword

This British Standard has been prepared under the direction of the Textiles and Clothing Standards Policy Committee and forms a revision of BS 5651 : 1978, which will be withdrawn on a date to be announced. BS 5651 : 1978 is referred to in the Nightwear (Safety) Regulations 1985 and the Furniture and Furnishings (Fire Safety) Regulations 1988 and will not be withdrawn until those Regulations are revised.

NOTE. Upon publication of this revision, BSI Sales Department will respond to purchase orders for BS 5651 by supplying copies of the 1989 edition. Copies of the 1978 edition may be obtained by quoting the number 'BS 5651/78'.

This British Standard provides a series of laboratory procedures for cleansing and wetting textile materials. These laboratory procedures are designed to simulate cleansing methods used in practice and hence assessment of their effects on the flammability of the materials indicates the possible changes in flammability performance to be expected when materials are wetted or cleansed. It is intended that this British Standard be used in conjunction with BS 5438, which gives test methods for flammability, but it may also be used when some other method of test for flammability is employed.

Several basic procedures are given which vary in their severity. The selection of the appropriate procedure will depend largely on the end uses of the material and particularly on the method of cleansing likely to be used.

The basic procedures are:

- (a) a water soaking procedure, applicable to fabrics which are not normally washed or dry cleaned but which might be subjected to wetting or spot cleaning;
- (b) a dry cleaning procedure;
- (c) a domestic washing procedure;
- (d) a commercial laundry procedure;
- (e) a disinfecting laundry procedure, for fabrics which are washed in commercial or hospital laundries under high temperature disinfection conditions;
- (f) a cleaning/flexing procedure, for fabric end uses such as tentage and tarpaulins.

The choice of procedure is also determined to some extent by the properties of the fabric or fabric assembly.

Alternative procedures, using reduced mechanical action and temperature or reduced chemical action, are provided for washing fabrics such as wool or certain low melting point acrylic or chlorofibres, which shrink excessively during the normal washing procedure. Thus a total of eight separate procedures is given, covering a wide range of cleansing and wetting treatments suitable for different fabric/end use combinations. The number of cycles specified for the dry cleaning and washing methods represents a compromise between the needs to reproduce actual use conditions and to enable the test to be completed within a reasonable time. In certain circumstances it may be necessary to specify the use of fewer or more test cycles, e.g. some nonwovens will require fewer cycles, whilst products subject to DHSS performance specifications are likely to require more.

It is possible to test a particular type of fabric and to establish its general pattern of behaviour after all the different procedures, but it is not practical to test production lots or small quantities of fabric by more than one procedure. Performance standards for different end uses should therefore specify certain minimum levels of flammability performance after a single appropriate

procedure. They should also specify the use of labelling to indicate which test procedure has been employed, any other suitable cleansing process, and any cleansing processes which may produce a significant impairment of the flammability properties.

The flammability properties of fabrics may be affected by combinations of such factors as high wash temperatures, bleaching agents, hard water, and soap based products. These changes in flammability properties are sometimes due to deposits of agents on the fabric rather than to removal of the flame retardant components. As effects of deposits are highly dependent on the particular wash conditions used, it is not possible to specify a standard procedure to predict them and steps should be taken to minimize the likelihood of their occurrences in practice. The water hardness specified (160 mg/L) in the domestic washing procedure is sufficient to detect possible adverse interaction between hard water and any flame retardant. Additional physical deposits may occur when much harder water is used, but no attempt is made to predict their likely effects, since these have been found to be very inconsistent. In general, the harder the water, the higher the level of deposition and the greater the detrimental effect on the flammability properties of fabrics.

It has to be realized, however, that water with much higher hardness levels than the 160 mg/L specified are commonly found in the United Kingdom. There may be small reductions in the flammability performance especially of fabrics with 'add on' finishes when these are washed in such hard water, but it has not been found possible to devise a reliable and consistent procedure leading to a meaningful measure of this reduction. On fabrics examined so far, such a reduction, even at the highest level, has been shown not to lead to a performance as hazardous as would have been encountered had the fabrics not been treated with an appropriate finish. This interaction means that these procedures do not necessarily accurately predict the flammability performance of fabrics after domestic washing in very hard water (320 mg/L). Additionally, no account is taken in any of these procedures of the effect of use between wetting or cleansing which is known in certain instances to affect flammability performance.

There are many fabrics available which are made from fibres whose properties are accepted as being unaffected by continued cleansing and wetting. If it is likely that fabrics used in particular end uses for which specifications are being prepared may be produced from such fibres (e.g. pure finish polyamide, polyester or modacrylic), then the performance specification may exclude specific and closely defined fibres from assessment after treatment by the procedures which have been shown to have no effect.

The major changes introduced by the revision are:

- (a) the ECE reference detergent has been included as an alternative to the IEC reference detergent;
- (b) the amount of detergent used has been reduced in the laundry procedures to reduce the amount of foaming;
- (c) the commercial laundry procedure 60 has been deleted.

At the time of publication of this British Standard, no corresponding international standard existed.

Compliance with a British Standard does not of itself confer immunity from legal obligations.