

METHODS OF TEST FOR DUST IN FILLING MATERIALS

BS 3400 : 1967

THIS BRITISH STANDARD, having been approved by the Bedding Industry Standards Committee, was published under the authority of the General Council on 31st May, 1967.

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The Institution desires to call attention to the fact that this British Standard does not purport to include all the necessary provisions of a contract.

In order to keep abreast of progress in the industries concerned, British Standards are subject to periodical review. Suggestions for improvements will be recorded and in due course brought to the notice of the committees charged with the revision of the standards to which they refer.

A complete list of British Standards, numbering over 4000, fully indexed and with a note of the contents of each, will be found in the British Standards Yearbook. The BS Yearbook may be consulted in many public libraries and similar institutions.

This standard makes reference to the following British Standards:

BS 410. Test sieves.

BS 506. Methanol.

BS 509. Acetone.

BS 1780. Bourdon tube pressure and vacuum gauges.

BS 2005. Glossary of terms for fillings for bedding, upholstery, and other domestic articles.

British Standards are revised, when necessary, by the issue either of amendment slips or of revised editions. It is important that users of British Standards should ascertain that they are in possession of the latest amendments or editions.

The following BSI references relate to the work on this standard:
Committee reference BDM/6 Draft for comment 66/28400

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CO-OPERATING ORGANIZATIONS

The Bedding Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and industrial organizations:

- Furnishing Spring Makers' Federation
- Institute of Iron and Steel Wire Manufacturers
- *Ministry of Defence, Army Department
- Ministry of Health
- *Ministry of Public Building and Works
- *National Association of Retail Furnishers
- *National Bedding Federation
- *National Union of Furniture Trade Operatives
- Ticking Group
- *Women's Advisory Committee of the BSI
- Representatives of filling materials manufacturers

The Government departments and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

- Association of Public Analysts
- Association of Public Health Inspectors
- British Cotton Waste Association
- British Furniture Manufacturers' Federated Associations
- British Furniture Trades Confederation
- British Man-made Fibres Federation
- British Toy Manufacturers' Association Ltd.
- Drapers Chamber of Trade
- Furniture Industry Research Association
- Household Textiles Association
- Manchester Chamber of Commerce Testing House and Laboratory
- Ministry of Technology, Laboratory of the Government Chemist
- National Curled Woollen Flock Manufacturers' Association
- National Feather Purifiers Association
- National Fillings Trades Association
- Society for Analytical Chemistry
- Society of Medical Officers of Health
- Waste Trade Federation
- West of England Washed Flock Manufacturers' Association

BRITISH STANDARD METHODS OF TEST FOR DUST IN FILLING MATERIALS

FOREWORD

This British Standard was prepared in order to provide methods of test which can be used, when required, to make comparative assessments of the dust indices of fillings, or as a check test to verify the effectiveness or relative efficiency of dust extraction plant. This revised edition brings the arrangement for sampling, test apparatus and test procedures into line with British Standard filling tests in the revised appendices to BS 1425* issued in Supplement No. 1 1966.

It is necessary to emphasize that the test is intended only to provide a measure of a *dust index*, i.e. a representative indication of the dust content and not a complete measure of the precise dust content of a material. This fact does not invalidate the dust index as a means of verifying the effectiveness of dust extraction, because the use of the test procedures described in this standard has been found quite adequate for comparative tests on two samples of the same material processed in different plants, or processed by the same plant at different times. But it does mean that the test should not be used as a criterion for comparing the complete dust properties of two different classes of filling material.

Two types of test procedure are described. One of these consists of the agitation of a sample by an air stream under controlled conditions, and measurement of the released particles which are carried by the air stream through one test sieve and deposited on another test sieve. The other uses a procedure for extraction of a sample with a washing fluid under controlled conditions, and measurement of the weight of that part of the extracted matter which is insoluble.

The choice of which of the two methods to use depends on the type of filling. Generally, the first method will be found suitable for all those fillings that can readily be made airborne under the defined conditions without becoming statically electrified, and the second method will be suitable for most other materials.

Although differing in technical detail, the two methods have the following broad features in common:

a. They both imply a definition of dust as comprising particles of all sizes below a certain maximum and above a very small minimum, the particles being of both fibrous and mineral nature.

b. Both methods involve agitation as the means of releasing the particles from the mass of the filling sample, but in the first method this agitation is

*BS 1425, 'Cleanliness of fillings and stuffings for bedding, upholstery, toys and other domestic articles', Supplement No. 1 (1966), Appendices.

wholly pneumatic and therefore a dry process, whereas in the second method it is hydraulic and therefore a wet process.

c. Thereafter, the two methods proceed by stages in which the separated particles are collected from the extracting medium (air or fluid) and, directly or indirectly, weighed; thus the dust index is expressed in terms of an actual quantitative determination. For separating the selected particles from the carrying medium both methods use the same mesh of metal sieve; thus this mesh size is the main factor which determines the maximum size of particle which shall count as dust. After passing through this sieve the particles are collected, in one case on a second metal sieve of the finest practicable mesh and in the other on a filter paper.

NOTE. Where metric equivalents are stated the figures in British units are to be regarded as the standard. The metric conversions are approximate. More accurate conversions should be based on the tables in BS 350, 'Conversion factors and tables'.

METHODS

1. GENERAL

1.1 SCOPE

This British Standard specifies two types of test procedure for the assessment of the dust index of filling materials used for the manufacture of bedding, upholstery, toys and similar articles. Comparative figures, obtained by either of these methods, for the dust index for any one type of filling may be used for assessing the effectiveness of dust extraction during processing of separate samples of similar material. For comparisons between two distinct types of filling material, neither dust index test alone is recommended as sufficient in itself, as the nature of the materials and the nature of the extract obtained have to be taken into account.

1.2 DEFINITIONS

For the purposes of this British Standard the definitions given in BS 2005* apply.

1.3 CHOICE OF METHOD

This British Standard provides two methods of test. The choice of which method shall be used may be dictated by particular circumstances, but for hair, coarse vegetable fibres, and hair/fibre mixtures only Method 2 shall be used.

1.4 SAMPLING

For the purposes of the tests specified in Sections 2 and 3, a gross sample of not less than 1 lb (0.45 kg) (or ½ lb, 0.23 kg, in the case of feathers, down and man-made fibres) shall be taken in the manner described in Appendix A.

*BS 2005, 'Glossary of terms for fillings for bedding, upholstery, and other domestic articles'.

From the gross sample, representative test specimens of the appropriate weight as shown below (weighed to an accuracy of ± 0.05 g) shall be prepared in the manner described in Appendix A.

	Size of sample	
	Method 1 (see Section 2)	Method 2 (see Section 3)
	grammes	grammes
Washed flock	25	—
Woollen mixture felt	25	—
Woollen felt	25	—
New jute	25	—
Woollen flock	25	—
Cotton, felt, flock, mill puffs, etc.	50	—
Kapok, etc.	25	—
Hair	—	25
Vegetable fibre (coir, sizal mexican, etc.)	—	12.5
Hair/fibre mixtures	—	12.5
Feathers and down	25	12.5
Wool	25	—
Man-made fibres	25	25
Straw, used wood-wool, etc.	50	25
Clippings or crumb of foam rubber or plastics materials	50	25

2. METHOD 1. DUST INDEX TEST (DRY METHOD)

2.1 ATMOSPHERIC CONDITIONS

This test should be carried out in a test room at a temperature of not less than 60°F (15.5°C) and a relative humidity of 40–70 %. The atmospheric conditions should be verified before commencing the test, and if the room cannot be adjusted to come within these wide limits, e.g. by opening windows, or warming the room in cold weather, the test should not be carried out until more suitable weather conditions prevail.

2.2 APPARATUS

(1) *A dust index apparatus** with dimensions conforming to Figs. 1 and 2 and as described in Appendix B, which shall be certified initially and checked annually for accuracy by an approved testing authority.

It is essential to keep the apparatus dry and free from oil, wax and other impeding matter by the appropriate use of non-corrosive solvents.

*Details of the arrangements under which this apparatus can be made or obtained are available on application to the British Standards Institution.