BRITISH STANDARD

**BS 4088-1.1:
1994**

*Incorporating
Amendment No. 1*

Carpet cleaning products —

Part 1: Methods of sampling and test —

Section 1.1 General methods for formulations used in liquid form

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Chemicals Standards Policy Committee (CIC/-) to Technical Committee CIC/35, upon which the following bodies were represented:

British Aerosol Manufacturers' Association
British Association for Chemical Specialities
British Carpet Manufacturers' Association Ltd.
British Institute of Cleaning Science
Carpet Cleaners' Association
Consumer Policy Committee of BSI
Cosmetic, Toiletry and Perfumery Association Limited
Industrial Cleaning Machine Manufacturers' Association (Beama Ltd.)
International Wool Secretariat
National Health Services
Soap and Detergent Industry Association
Society of Dyers and Colourists
Textile Institute
WIRA

This British Standard, having been prepared under the direction of the Chemicals Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on 15 February 1994

The following BSI references relate to the work on this standard:
Committee reference CIC/35
Draft for comment 93/503064 DC

ISBN 0 580 22733 2

Amendments issued since publication

Amd. No.	Date	Comments
8691	July 1995	Indicated by a sideline in the margin

Contents

Foreword

This Section of BS 4088-1 has been prepared under the direction of the Chemicals Standards Policy Committee. Together with BS 4088-2 it supersedes BS 4088:1981 which is withdrawn.

The revision of BS 4088, which is intended for the use of manufacturers and users of carpet cleaning products, is being published as follows.

— *Part 1: Methods of sampling and test;*

— *Section 1.1: General methods for formulations used in liquid form;*

— *Part 2: Specification for high-foam formulations used in liquid form.*

The completed revision of BS 4088 differs from the 1981 edition principally in the following respects.

a) Requirements and test methods for optical brightening agents and for the effect on carpet backing have been omitted.

b) Requirements and test methods for alkalinity and fastness to light have been added.

It is intended to extend the standard to include further Parts specifying requirements and methods of test for other types of carpet cleaning product.

This Section of BS 4088 describes methods of sampling and test and should not be used or quoted as a specification defining the characteristics of a product. Reference to this Section should indicate that the methods of test used are in accordance with BS 4088-1.1:1994.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This Section of BS 4088 describes methods of sampling and test for carpet cleaning formulations (hereafter generally referred to as “the product”) used in liquid form.

These methods apply generally to high-foam and low-foam formulations, either at working strength or as supplied. They may also apply to other products such as aerosol formulations and certain detergent powders, provided that they are capable of being fully dispersed in water.

NOTE High-foam formulations are often referred to as “shampoos” because of their property of foam formation.

2 Normative references

This Section of BS 4088 incorporates, by reference, provisions from specific editions of other publications. These normative references are cited at the appropriate points in the text and the publications are listed on the inside back cover. Subsequent amendments to, or revisions of, any of these publications apply to this Section of BS 4088 only when incorporated in it by updating or revision.

3 Definition

For the purposes of this Section of BS 4088, the following definition applies.

working strength

the strength produced by diluting the product in water in accordance with the instructions for use recommended by the manufacturer

4 Sampling and preparation of the test sample

4.1 Sampling

A representative sample of the product of not less than 1 kg shall be taken. The sample shall be placed in a clean, dry and airtight labelled bottle. Care shall be taken to avoid any risk of contamination of the contents during sampling.

If the sample is to be taken from several containers, the following shall apply.

a) Each container shall have homogeneous contents, prepared by agitation.

b) The same proportion, by mass, shall be taken from each container.

c) If the containers comprise a batch, the number of containers sampled shall be not lower than the cube root of the number of containers in the batch.

NOTE It is preferable that any container should not have been opened previously.

4.2 Preparation of the test sample

4.2.1 *Product as supplied*

Agitate the sample (**4.1**) to ensure that it is homogeneous and carefully pour into a clean, dry, labelled glass bottle a portion sufficient for the series of tests planned. Stopper or seal to avoid contamination or evaporation during storage.

4.2.2 *Product diluted to working strength*

Agitate the sample (**4.1**) to ensure that it is homogeneous. Depending on the amount of test sample required, carefully pour the product into a clean, dry, labelled glass container and dilute to working strength in accordance with the manufacturer’s instructions using water conforming to grade 3 of BS 3978:1987. Mix well. Stopper and seal to avoid contamination or evaporation during storage.

Do not store for a period longer than 4 weeks.

5 Reference shampoo

NOTE The test methods described in clauses **7** and **12** are based on the comparison of the product under test with a reference shampoo. The reference shampoo is prepared in accordance with **5.4**.

5.1 Reagents

5.1.1 *General*

Only reagents of recognized analytical grade and water conforming to grade 3 of BS 3978:1987 shall be used.

5.1.2 *Sodium dodecyl sulfate*

5.1.3 *Dodecanoic monoisopropanolamide*

5.2 Apparatus

Ordinary laboratory apparatus.

5.3 Procedure

Dissolve 10 g of the sodium dodecyl sulfate (**5.1.2**) and 2 g of the dodecanoic monoisopropanolamide (**5.1.3**) in 500 ml of water in a clean, dry, labelled glass container and heat to 65 °C to complete dissolution. Dilute to 1 000 ml with water. Check that the pH value is between 6.0 and 8.0, when determined in accordance with clause **9**.

Stopper and seal to avoid contamination or evaporation during storage.

This solution is at working strength and shall only be used without further dilution.

6 Determination of oxidizing and reducing agents

6.1 Oxidizing agents

6.1.1 ***Principle***

Potassium iodide is added to an acidified solution of the product and, in the presence of an oxidizing agent, iodine is liberated to give a yellow or yellow-brown colour or a blue colour with the addition of starch solution.

6.1.2 ***Reagents***

6.1.2.1 *General*

Only reagents of a recognized analytical grade and water conforming to grade 3 of BS 3978:1987 shall be used.

6.1.2.2 *Sulfuric acid solution,* approximately 100 g/l.

6.1.2.3 *Potassium iodide,* solid.

6.1.2.4 *Starch indicator solution,* 10 % (*m*/*m*), freshly prepared.

6.1.3 ***Apparatus***

Ordinary laboratory apparatus.

6.1.4 ***Procedure***

6.1.4.1 *Test portion*

Transfer 1 g ± 0.1 g of the product as supplied (**4.2.1**) to a 100 ml beaker.

6.1.4.2 *Determination*

Dissolve the test portion (**6.1.4.1**) in 50 ml of water and acidify with 1 ml ± 0.5 ml of the sulfuric acid solution (**6.1.2.2**). Add about 0.5 g of the potassium iodide (**6.1.2.3**) and shake the solution.

Observe whether any yellow or yellow-brown colour develops, indicating the presence of an oxidizing agent.

If no colour develops, add four drops of the starch indicator solution (**6.1.2.4**) and observe whether any blue colour develops, indicating the presence of an oxidizing agent.

6.1.5 ***Expression of results***

Record the presence or absence of an oxidizing agent.

6.2 Reducing agents

6.2.1 ***Principle***

A solution of the product is acidified, heated and, in the presence of a reducing agent, potassium permanganate solution is decolorized.

6.2.2 ***Reagents***

6.2.2.1 *General*

Only reagents of a recognized analytical grade and water conforming to grade 3 of BS 3978:1987 shall be used.

6.2.2.2 *Sulfuric acid solution,* approximately 100 g/l.

6.2.2.3 *Potassium permanganate solution,* 3 g/l.

6.2.3 ***Apparatus***

6.2.3.1 *Ordinary laboratory apparatus*

6.2.3.2 *Boiling tube,* 150 mm × 25 mm.

6.2.3.3 *Heating bath,* capable of being maintained at 100 °C ± 1 °C.

6.2.3.4 *Cork/polyethylene tube assembly* (see Figure 1), consisting of two corks, one a correct, easy fit for the mouth of the boiling tube, and the other a very easy sliding fit for the interior. Both corks shall be bored to take a 3 mm internal diameter polyethylene tube, 150 mm long, which is split for 12 mm at the lower end. The corks shall be positioned on the tube so that when the upper (correct fit) cork is inserted in the mouth of the boiling tube, the lower end of the polyethylene tube is about 25 mm to 40 mm above the surface of the liquid.

NOTE The lower (sliding fit) cork facilitates insertion of the tube without the latter touching the sides of the boiling tube.

6.2.3.5 *Glass fibre filter paper,* cut into segments of radius 6 mm to 9 mm and arc 12mm to 15 mm.

NOTE Whatman grade “GFA” has been found to be suitable.

6.2.4 ***Procedure***

6.2.4.1 *Test portion*

Remove the cork/polyethylene tube assembly (**6.2.3.4**) from the boiling tube (**6.2.3.2**). Transfer 10 ml of the test sample as supplied (**4.2.1**) to the boiling tube.

6.2.4.2 *Determination*

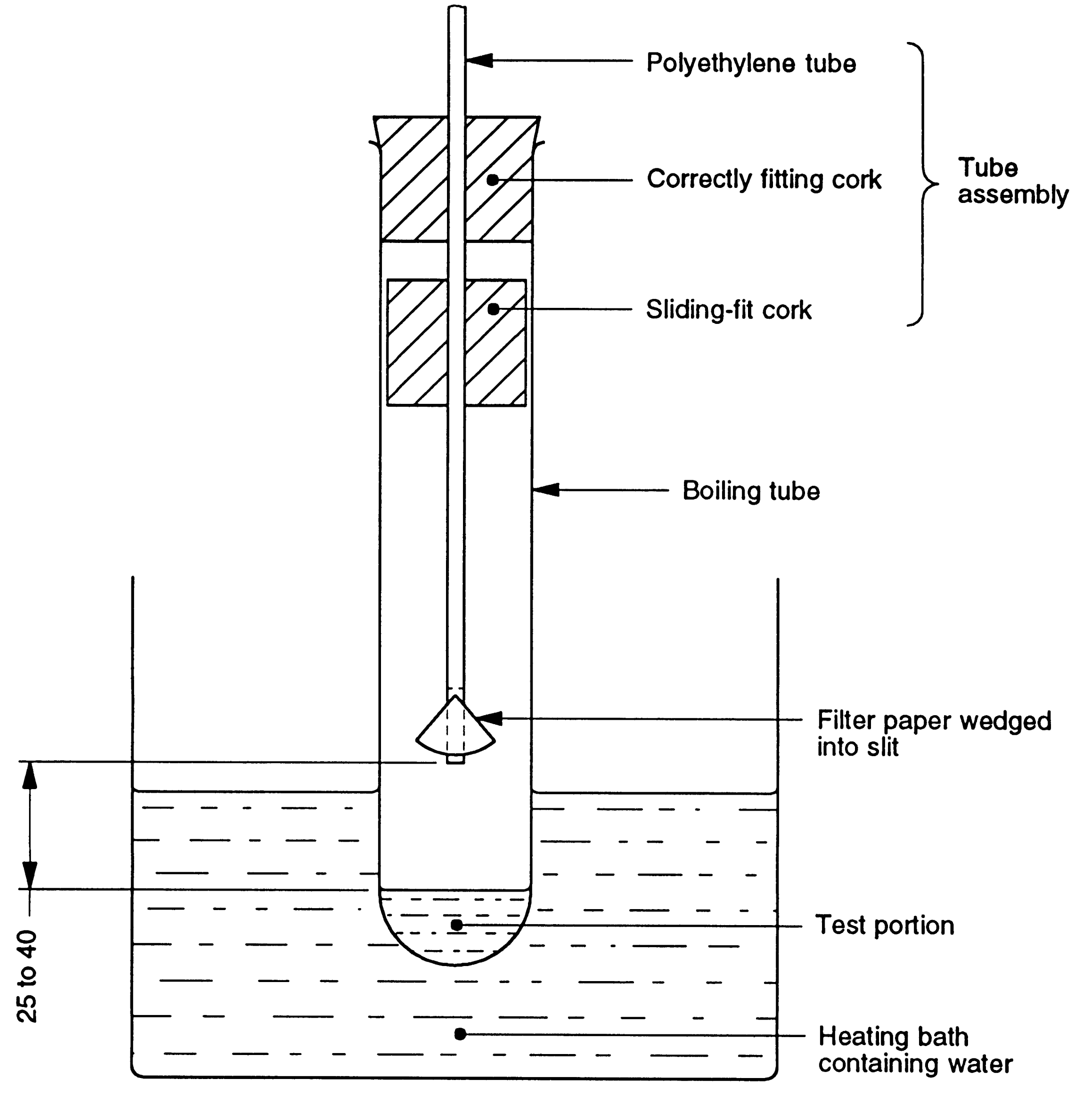
Add 4 ml of the sulfuric acid solution (**6.2.2.2**) to the test portion (**6.2.4.1**). Position a piece of the filter paper (**6.2.3.5**) in the fork end of the polyethylene tube, dip the paper into the potassium permanganate solution (**6.2.2.3**), fit the tube assembly into the boiling tube, then immerse it in the heating bath (**6.2.3.3**) maintained at 100 °C ± 1 °C, and heat it for 5 min.

Observe whether there is a complete loss of colour of the potassium permanganate, indicating the presence of a reducing agent in the product.

NOTE Formation of a brown colour is not to be regarded as loss of colour.

6.2.5 ***Expression of result***

Record the presence or absence of a reducing agent.



Dimensions are in millimetres.

Figure 1 — Location of apparatus and test portion for detection of reducing agents

7 Determination of fastness to light

7.1 Principle

One sample of multifibre strip is immersed in the product at working strength and another in the reference shampoo. After drying, the fastness of the strips to light is determined by the xenon arc test.

7.2 Materials

Multifibre strip, comprising six textile fibres.

NOTE A suitable multifibre strip is obtainable from the Society of Dyers and Colourists, PO Box 244, Bradford, Yorkshire BD1 2JB.

7.3 Apparatus

Use the apparatus described in BS EN 20105-B02:1993.

7.4 Procedure

7.4.1 *Test portion*

Pour a sufficient volume of the product diluted to working strength (**4.2.2**) into a dish to give a depth of 20 mm.

7.4.2 ***Determination***

Immerse one multifibre strip (**7.2**) in the test portion (**7.4.1**) and another strip in a dish prepared likewise, containing the reference shampoo (see clause **5**). Once the strips have been thoroughly wetted, remove them and allow to dry. Expose the strips, together with a set of blue wool standards (number 2 to number 6) to a xenon arc lamp as described in BS EN 20105-B02:1993. Continue the exposure until there is perceptible change in colour of the blue wool standard number 6.

7.5 Assessment of results

Assess the change in colour of each of the six fibres on both strips as described in BS EN 20105-B02:1993. Record, for each case, whether fibres which were wetted by the product at working strength have faded more or less than those wetted by the reference shampoo.

8 Determination of colour fastness

8.1 Principle

Specimens of standard dyed wool carpet are immersed at 37 °C, under pressure, in contact with undyed fabrics of cotton and wool in the product at working strength and in water. The material is separated, dried and assessed for staining and colour changes using a colour measurement device.

8.2 Reagent

Water, conforming to grade 3 of BS 3978:1987 and maintained at 37 °C ± 2 °C before use.

8.3 Materials

8.3.1 *Four wool carpet pieces,* two of each dyed with an 8 % (*m*/*m*) solution of each of the following dyes[1]:

a) C.I. acid violet 7;

b) C.I. acid red 14.

8.3.2 *Two sets of undyed fabric patterns of cotton and wool,* each 40 mm × 50 mm, sufficient in number to make the composite specimens for the test and provide blanks for colour measurement comparison (see **8.7**).

8.3.3 *Composite specimens for test,* prepared by cutting out a 40 mm × 100 mm length of each of the dyed carpet pieces (**8.3.1**) and covering fully with both of the undyed fabric patterns (**8.3.2**).

8.4 Apparatus

8.4.1 *Ordinary laboratory apparatus*

8.4.2 *Four flat-bottomed dishes,* 100 mm × 150 mm × 50 mm deep.

8.4.3 *Four smooth glass or plastics plates,* 115 mm × 60 mm × 0.3 mm thick.

8.4.4 *Four weights,* about 5 kg each, maintained at 37 °C ± 2 °C before use.

8.4.5 *Oven,* capable of being maintained at 37 °C ± 2 °C.

8.4.6 *Colour measurement device,* calibrated and capable of measuring changes in colour in accordance with the CIELAB 1986 system [1].

8.5 Procedure

8.5.1 ***Test portion***

Prepare 2 l of the product diluted to working strength (**4.2.2**) and maintained at 37 °C ± 2 °C before use.

8.5.2 ***Determination***

8.5.2.1 Place one of the composite specimens (**8.3.3**) into one of the correspondingly marked flat-bottomed dishes (**8.4.2**) and pour over the specimen a quantity of the test portion (**8.5.1**) sufficient to give a liquid to material ratio of 10 : 1 by volume. Ensure that the specimen is thoroughly wetted by the product and lies flat.

NOTE Wetting of undyed fabrics can be facilitated by working the cloth with the flattened end of a glass rod while it is immersed in the solution.

Cover the specimen with one of the glass plates (**8.4.3**), press with fingers to remove air bubbles and place one of the weights (**8.4.4**) on top of the plate. Stand the dish and contents in the oven (**8.4.5**), maintained at 37 °C ± 2 °C, for 15 min.

Remove the weight, pour off the product without removing the plate, replace the weight, and stand in the oven for a further period of 1.5 h at 37 °C ± 2 °C.

Remove the weight and glass plate, open out the composite specimen and allow the carpet pieces and the stained fabrics to dry on a clean, non-absorbent surface, at a temperature between 15 °C and 60 °C.

8.5.2.2 Carry out the procedure given in **8.5.2.1** for all composite specimens of both dyeings, in one series with the product being tested at its working strength and in another series with water.

8.6 Validation of results

Any procedure which gives rise to blotchy or irregular staining in that area of the fabric to be measured shall be treated as invalid (see **8.7**). If valid results are not obtained, the procedure (**8.5**) shall be repeated using new specimens (**8.3**).

NOTE This validation is expected to ensure that the area of fabric measured is representative of the general degree of staining observed.

---

[1] Obtainable from The Society of Dyers and Colourists, PO Box 244, Bradford, Yorkshire, BD1 2JB.

8.7 Measurement

Fold once each pattern of stained fabric (see **8.5.2**) and a blank pattern of unstained fabric (**8.3.2**) and measure the difference in colour between the stained fabrics and the blank, operating the colour measurement device (**8.4.6**) in accordance with the instrument manufacturer's instructions.

NOTE Folding of the fabric serves to reduce background interference in the colour measurement.

Calculate the colour difference, ΔE, due to colour bleeding, for both sets of dyed carpet pieces.

8.8 Expression of results

Record the colour difference, ΔE, expressed to one decimal place.

9 Determination of pH

9.1 Principle

The pH of the product is determined at 20 °C as supplied or after dilution of the product to working strength.

9.2 Reagents

9.2.1 *General*

Only reagents of recognized analytical grade and water conforming to grade 3 of BS 3978:1987 shall be used.

9.2.2 *Three buffer solutions,* of pH values 4.0, 7.0 and 9.0, respectively to standardize the pH meter over the required range.

9.3 Apparatus

9.3.1 *Ordinary laboratory apparatus*

9.3.2 *pH meter,* with glass and calomel electrode assembly, conforming to BS 2586:1979 and BS 3145:1978; capable of discriminating to 0.05 pH units.

The pH meter shall be calibrated using the three buffer solutions (**9.2.2**). The probe shall be cleaned by thoroughly rinsing in water before and after each test until the indicated pH value changes by no more than 0.05 units in 5 min. The calibration shall be carried out at the start of each session with periodical checks during the course of each test (e.g. after every 1 h to 2 h).

9.3.3 *Tall-form beakers,* of 100 ml capacity.

9.3.4 *Water bath,* (optional) capable of being controlled at 20 °C ± 2 °C.

9.4 Procedure

9.4.1 ***Test portion***

Prepare 1 l of the product as supplied (**4.3.1**) or diluted to working strength (**4.3.2**) and maintain at 20 °C ± 2 °C.

9.4.2 ***Determination***

Decant about 50 ml of the test portion (**9.4.1**) into a beaker (**9.3.3**) and maintain at 20 °C ± 2 °C, using the water bath (**9.3.4**) if necessary. Using the pH meter (**9.3.2**) with the electrode assembly at a depth of 10 mm and with gentle stirring, determine the pH value, as the steady value obtained furthest from a value of 7.0.

NOTE This pH value is often referred to as the "extreme steady value".

9.5 Expression of results

Express the results to the nearest 0.1 pH unit.

Report the pH of the test sample as follows.

pH of x at 20 °C = Y

where

x is the product, as supplied or at working strength;

Y is the pH of the test portion, recorded to the nearest 0.1 pH unit.

10 Determination of alkalinity

10.1 Principle

The neutralization of the product at working strength by titration with acid is observed using a pH meter.

10.2 Reagents

10.2.1 *General*

Only reagents of recognized analytical grade and water conforming to grade 3 of BS 3978:1987 shall be used.

10.2.2 *Hydrochloric acid,* standard volumetric solution, c(HCl) = 0.10 mol/l.

10.3 Apparatus

10.3.1 *Ordinary laboratory apparatus*

10.3.2 *Burette,* of 25 ml capacity, conforming to class A of BS 846:1985.

10.3.3 *pH meter,* as described in **9.3.2**.

10.3.4 *Magnetic stirrer*

10.4 Procedure

10.4.1 ***Test portion***

Prepare 1 l of the product diluted to working strength (**4.2.2**).

10.4.2 ***Determination***

Into a 250 ml beaker place the stirrer (**10.3.4**), a 100 ml aliquot portion of the test portion (**10.4.1**) and the probe of the pH meter (**10.3.3**). Activate the stirrer (**10.3.4**) and select a setting which just produces a vortex at the centre of the surface of the test portion.

Record the initial pH value and add successive 0.5 ml portions of the hydrochloric acid solution (**10.2.2**) from the burette (**10.3.2**) until the pH drops below 7.0. Record the pH after each addition.

NOTE If the titration value is very low it may be advisable to repeat the titration, but this time by adding 0.2 ml portions of titrant over the region which spans the pH range between 8 and 6. This will allow a more accurate estimation of the volume of acid required to bring the solution to pH 7.0.

10.4.3 ***Titration curve***

Combine the data from the titration (see **10.4.2**) by plotting the pH values as a function of the volume of acid added, in millilitres, and read off the volume of the hydrochloric acid solution (**10.2.2**) required to reduce the pH value to 7.0.

10.5 Expression of results

The alkalinity, expressed in micromoles, is given by the following expression.

$$\frac{100 \times T}{1\,000}$$

where

100 is the volume of the test portion titrated, (in millilitres) (see **10.4.2**);

T is the estimated volume of the hydrochloric acid solution required to neutralize the test portion (in millilitres), (see **10.4.3**).

Report the result to one decimal place.

11 Determination of resistance to resoiling

11.1 Principle

Specimens of carpet, made with two different pile fibres, are pre-cleaned with the products at working strength and with water, and soiled; the comparative levels of soiling are determined.

11.2 Reagent

Water, conforming to grade 3 of BS 3978:1987.

11.3 Specimens

The specimens shall be two cut pile carpets pieces, one made with wool (or a minimum of 80 % wool, i.e. "wool-rich") and one with nylon carpet pile yarn, of a size large enough for carrying out a soiling test (see **11.4.2**). The specimens shall:

a) be a uniform cream colour, nominally having a lightness of not less than 60 CIE 1976 lightness (L*) units;

b) have a colour variation within the specimen of no more than 2 CIE 1976 lightness (L*) units;

c) have a pile height above the backing of 7.5 mm ± 0.5 mm;

d) have a pile density of 0.11 g/cm^3 ± 0.01 g/cm^3 and

e) be free from any contamination which may affect the soiling of the specimens.

11.4 Apparatus

11.4.1 *Airless spraying device,* which can be pressurized to 2 bar[2], fitted with a suitable nozzle which produces a fan-shaped spraying pattern.

11.4.2 *Means of soiling carpets in a uniform manner,* e.g. a suitable rapid soiling machine for textile floor-coverings, or a floor soiling site.

11.4.3 *Colour measurement device* (**8.4.6**), or a standardized means of viewing textile materials, e.g. a viewing cabinet.

11.4.4 *Vacuum cleaner,* canister type, fitted with a smooth suction head and rated at 1 000 W.

11.5 Atmosphere for conditioning and testing

All carpet samples shall be conditioned in, and the soiling tests carried out in, the standard atmosphere for testing textile materials, as specified in BS 1051:1992, i.e. a relative humidity of 65 % ± 2 % r.h. and a temperature of 20 °C ± 2 °C.

11.6 Procedure

11.6.1 ***Test portion***

Prepare 2 l of the product at working strength (**4.2.2**).

11.6.2 ***Determination***

11.6.2.1 Place the wool and nylon carpet specimens (**11.3**) on a suitable non-absorbent surface and apply the test portion (**11.6.1**) evenly using the spraying device (**11.4.1**) and spraying at the rate of 1 000 g/m^2, to be verified by weighing. Dry the specimens at room temperature or heat them in an oven at a temperature not exceeding 70 °C, until dry.

Repeat this spraying and drying procedure.

NOTE The combined treatment represents the quantity of products which would have been applied in four cleaning operations.

11.6.2.2 Repeat the above procedure (**11.6.2.1**) on two further carpet specimens (**11.3**), but using water only. Condition the four specimens in the conditioning atmosphere (**11.5**) for at least 24 h, or weigh at intervals of 1 h until two successive weighings show a difference of less than 0.1 g.

---

[2] 1 bar = 10^5 N/m^2 = 10^5 Pa.

11.6.2.3 Clean all specimens using the vacuum cleaner (**11.4.4**). Pass the suction head four times over each specimen, i.e. twice backwards and twice forwards, using 50 % overlap on each pass.

Carry out the soiling tests on the treated specimens in a uniform manner (**11.4.2**).

Vacuum clean all specimens and align the pile using a straight-edged ruler.

11.7 Assessment

Compare the results of the soiling tests carried out on the specimens treated with the product, with those treated with water, using the colour measurement device or the viewing cabinet (**11.4.3**).

Express the colour differences measured in ΔL or ΔE [1], or the difference in level of soiling observed as "the same", "less than", or "greater than", when describing the level of soiling of the specimens treated with the product, compared to those treated with water.

12 Determination of cleaning performance

12.1 Principle

Specimens of presoiled carpet are cleaned by a manual shampooing method under laboratory conditions, with the reference shampoo and the product diluted to working strength. The results of the two products are compared visually and, where available, with a colour measurement device.

12.2 Apparatus

12.2.1 *Carpet* (**11.3**), soiled using the chosen method (**11.4.2**).

12.2.2 *Soft-bristled scrubbing brush*

12.2.3 *Trigger spray,* of 500 ml capacity capable of producing a fine mist.

12.2.4 *Top pan balance,* with a resolution of 0.1 g.

12.2.5 *Colour measurement device* (**8.4.6**), or viewing cabinet.

12.2.6 *Vacuum cleaner,* canister type, fitted with a smooth suction head and rated at 1 000 W.

12.3 Reagents

12.3.1 *Water,* conforming to grade 3 of BS 3978:1987.

12.3.2 *Reference shampoo* (see clause **5**).

12.4 Procedure

12.4.1 *Test portion*

Prepare 2 l of the product diluted to working strength (**4.2.2**).

12.4.2 *Determination*

Carry out the determination in duplicate.

Measure out a 300 mm × 300 mm square of the presoiled carpet. If a colour measurement device is available measure the reflectance of the presoiled carpet in a number of areas of the carpet using a suitable template. Place the carpet on the balance and spray evenly with the solution under test, until 100 g ± 5 g of the solution is on the carpet.

Gently clean the surface of the carpet with the soft brush. Use three linear passes of the brush over each section of carpet. Repeat the brushing action at right angles to the original direction. Align the pile in one direction by flattening it evenly with a straight-edged ruler.

Allow the carpet samples to dry thoroughly for two days before assessment.

Repeat the procedure using the reference shampoo.

Clean the specimens, using the vacuum cleaner (**12.2.6**). Pass the suction head four times over each specimen, i.e. twice backwards and twice forwards, using 50 % overlap on each pass.

Align the pile of the carpet using a straight-edged ruler.

12.5 Assessment

Compare the carpets cleaned with the test product and the reference shampoo visually using the colour measurement device or viewing cabinet (**12.2.5**).

NOTE If a colour measurement device is used, lightness values should be taken and the results should be compared with the reflectance readings of the carpet when soiled and expressed as ΔL [1].

Express the colour difference whether measured visually or by reflectance meter as "better than", "the same as" or "less than" the reference shampoo.

13 Test reports

A test report shall be prepared for each method (see clauses **3** to **11**) and shall include the following information:

a) a complete identification of the sample;

b) a reference to this British Standard and the relevant clause number, i.e. clause .. of BS 4088-1.1:1994;

c) the results, expressed in accordance with the clause;

d) any unusual features noted during the operation of the method;

e) any operation not included in the appropriate clause of this standard or in the British Standards referred to, or regarded as optional.

blank

List of references (see clause **2**)

Normative references

BSI publications

BRITISH STANDARDS INSTITUTION, London

BS 846:1985, *Specification for burettes.*

BS 1051:1992, *Glossary of terms relating to the mass determination of textiles.*

BS 2586:1979, *Specification for glass and reference electrodes for the measurement of pH.*

BS 3145:1978, *Specification for laboratory pH meters.*

BS 3978:1973, *Specification for water for laboratory use.*

BS EN 20105, *Textiles — Tests for colour fastness.*

BS EN 20105-B02:1993, *Colour fastness to artificial light (xenon arc fading lamp test).*

Other reference

[1] COMMISSION INTERNATIONAL D'ÉCLAIRAGE, Vienna, *Colorimetry, official recommendation*, 2nd ed., CIE publication 15.2, TC 1.3, 1986.

BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover.
Tel: 020 8996 9000. Fax: 020 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: 020 8996 9001. Fax: 020 8996 7001.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre.
Tel: 020 8996 7111. Fax: 020 8996 7048.

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration.
Tel: 020 8996 7002. Fax: 020 8996 7001.

Copyright

BSI
389 Chiswick High Road
London
W4 4AL