INTERNATIONAL STANDARD

IEC 60335-2-11

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Household and similar electrical appliances – Safety –

Part 2-11: Particular requirements for tumble dryers

Appareils électrodomestiques et analogues – Sécurité –

Partie 2-11: Règles particulières pour les sèche-linge à tambour

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-11: Particular requirements for tumble dryers

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

This part of International Standard IEC 60335 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances.

This consolidated version of IEC 60335-2-11 is based on the sixth edition (2002) [documents 61/2097/FDIS and 61/2128/RVD] and its amendment 1 (2003) [documents 61/2274/FDIS and 61/2324/RVD].

It bears the edition number 6.1.

A vertical line in the margin shows where the base publication has been modified by amendment 1.

This part 2 is to be used in conjunction with the latest edition of IEC 60335-1 and its amendments. It was established on the basis of the fourth edition (2001) of that standard.

NOTE 1 When "Part 1" is mentioned in this standard, it refers to IEC 60335-1.

This part 2 supplements or modifies the corresponding clauses of IEC 60335-1, so as to convert that publication into the IEC standard: Safety requirements for electric tumble dryers.

When a particular subclause of Part 1 is not mentioned in this part 2, that subclause applies as far as is reasonable. When this standard states "addition", "modification" or "replacement", the relevant text in Part 1 is to be adapted accordingly.

NOTE 2 The following numbering system is used:

- subclauses, tables and figures that are numbered starting from 101 are additional to those in Part 1;
- unless notes are in a new subclause or involve notes in Part 1, they are numbered starting from 101, including those in a replaced clause or subclause;
- additional annexes are lettered AA, BB, etc.

NOTE 3 The following print types are used:

- requirements: in roman type;
- *test specifications: in italic type;*
- notes: in small roman type.

Words in **bold** in the text are defined in Clause 3. When a definition concerns an adjective, the adjective and associated noun are also in bold.

The committee has decided that the contents of the base publication and its amendments will remain unchanged until 2005. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

The following differences exist in the countries indicated below.

- 3.1.9: The textile material has different dimensions (USA).
- 6.2: Tumble dryers are not required to be IPX4 (USA).
- 7.1: An instruction concerning cleaning the lint trap is to be marked on the dryer in letters not less than 8 mm high and is to be conspicuous when the dryer door is open (Australia, New Zealand).
- 7.12: Actual articles of clothing can be specified instead and warnings are required to be marked on the appliance regarding the use of chemicals for cleaning (USA).
- 11.2: The test condition is different (USA).
- 11.7: This test is continued until steady conditions are established and different criteria are used to determine when steady conditions are reached (USA).
- 19.4: The test is different (USA).
- 19.9: A running overload test is carried out on automatically controlled tumble dryers (USA).
- 20.101: The requirement is applicable to door openings with a dimension exceeding 20 cm (Norway).
- 20.102: When considering accessibility to rotating drums, the maximum drum volume is 60 dm^3 and the maximum door opening is 20 cm (USA).
- 20.103: This test is not carried out (USA).
- 22.104: The test is different (USA).
- 27.1: Earthing terminals and contacts are allowed to be electrically connected to the neutral conductor of a tumble dryer (USA)

INTRODUCTION

It has been assumed in the drafting of this International Standard that the execution of its provisions is entrusted to appropriately qualified and experienced persons.

This standard recognizes the internationally accepted level of protection against hazards such as electrical, mechanical, thermal, fire and radiation of appliances when operated as in normal use taking into account the manufacturer's instructions. It also covers abnormal situations that can be expected in practice.

This standard takes into account the requirements of IEC 60364 as far as possible so that there is compatibility with the wiring rules when the appliance is connected to the supply mains. However, national wiring rules may differ.

If an appliance within the scope of this standard also incorporates functions that are covered by another part 2 of IEC 60335, the relevant part 2 is applied to each function separately, as far as is reasonable. If applicable, the influence of one function on the other is taken into account.

This standard is a product family standard dealing with the safety of appliances and takes precedence over horizontal and generic standards covering the same subject.

An appliance that complies with the text of this standard will not necessarily be considered to comply with the safety principles of the standard if, when examined and tested, it is found to have other features which impair the level of safety covered by these requirements.

An appliance employing materials or having forms of construction differing from those detailed in the requirements of this standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be considered to comply with the standard.

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-11: Particular requirements for tumble dryers

1 Scope

This clause of Part 1 is replaced by the following.

This International Standard deals with the safety of electric **tumble dryers** intended for household and similar purposes, their **rated voltage** being not more than 250 V for single-phase appliances and 480 V for other appliances.

NOTE 101 This standard applies to the drying function of washing machines having a drying cycle.

Appliances not intended for normal household use but which nevertheless may be a source of danger to the public, such as appliances intended to be used by laymen in shops, in light industry and on farms are within the scope of this standard.

NOTE 102 Examples of such appliances are **tumble dryers** for communal use in blocks of flats or in launderettes.

As far as is practicable, this standard deals with the common hazards presented by appliances that are encountered by all persons in and around the home. However, in general, it does not take into account

- the use of appliances by young children or infirm persons without supervision;
- playing with the appliance by young children.

NOTE 103 Attention is drawn to the fact that

- for appliances intended to be used in vehicles or on board ships or aircraft, additional requirements may be necessary;
- in many countries additional requirements are specified by the national health authorities, the national authorities responsible for the protection of labour, the national water supply authorities and similar authorities.

NOTE 104 This standard does not apply to

- appliances intended exclusively for industrial purposes;
- appliances intended to be used in locations where special conditions prevail, such as the presence of a corrosive or explosive atmosphere (dust, vapour or gas).

2 Normative references

This clause of Part 1 is applicable.

3 Definitions

This clause of Part 1 is applicable except as follows.

3.1.9 *Replacement:*

normal operation
operation of the appliance under the following conditions

The appliance is operated filled with textile material having a mass in the dry condition equal to the maximum load stated in the instructions.

The textile material consists of pre-washed double-hemmed cotton sheets having dimensions approximately 70 cm × 70 cm and a specific mass between 140 g/m^2 and 175 g/m^2 in the dry

condition. The textile material is soaked with water having a temperature of 25 °C ± 5 °C and a mass equal to that of the textile material.

If the drying function can automatically follow the washing function in a washing machine, the appliance is not separately loaded. The appliance is operated with the maximum quantity of textile material stated in the instructions for the combined washing-drying cycle.

NOTE 101 Cotton having a water content not exceeding 10 % is considered to be in the dry condition.
Cotton conditioned for 24 h in still air, having a temperature of 20 °C ± 2 °C, a relative humidity between 60 % and 70 % and a pressure between 860 mbar and 1 060 mbar, will contain approximately 7 % water.

3.101
tumble dryer
appliance in which textile material is dried by tumbling in a rotating drum through which heated air is blown

3.102
condensation-type tumble dryer
tumble dryer in which the air used for the drying process is dehumidified by cooling

4 General requirement

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable.

6 Classification

This clause of Part 1 is applicable except as follows.

6.2 *Addition:*

Appliances shall be at least IPX4.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.6 Addition:

[symbol 5036 of IEC 60417-1] dangerous voltage

[symbol 5041 of IEC 60417-1] caution, hot surface

7.10 *Addition:*

If the **off position** is only indicated by letters, the word "off" shall be used.

7.12 *Addition:*

The instructions for use shall state

- the maximum mass of dry textile material in kilograms to be used in the appliance;
- that the tumble dryer is not to be used if industrial chemicals have been used for cleaning;
- that the lint trap has to be cleaned frequently, if applicable;
- that lint must not to be allowed to accumulate around the tumble dryer (not applicable for appliances intended to be vented to the exterior of the building);
- that adequate ventilation has to be provided to avoid the back flow of gases into the room from appliances burning other fuels, including open fires.

NOTE 101 This instruction is not required if the **tumble dryer** discharges the air into the room.

If symbols 5036 or 5041 of IEC 60417-1 are used, their meaning shall be explained.

7.12.1 *Addition:*

The installation instructions shall state

- for **condensation-type tumble dryers** intended to be connected to the water mains
  - that the appliance is to be connected to the water mains using a new hose-set and old hose-sets should not be reused;

NOTE 101 This instruction is not required if the hose is permanently attached to the appliance.

  - the maximum permissible inlet water pressure, in megapascals;
  - the minimum permissible inlet water pressure, in megapascals, if this is necessary for correct operation of the appliance;
- for appliances with ventilation openings in the base, that a carpet must not obstruct the openings;
- that exhaust air must not be discharged into a flue which is used for exhausting fumes from appliances burning gas or other fuels.

NOTE 102 This instruction is not required if the **tumble dryer** discharges the air into the room.

- that the appliance must not be installed behind a lockable door, a sliding door or a door with a hinge on the opposite side to that of the tumble dryer.

If the installation instructions state that the **tumble dryer** can be placed on top of a washing machine, they shall state which washing machines are suitable. Instructions shall be given for the assembly of the **tumble dryer** and washing machine. The instructions shall state how to obtain any fixing attachments required, unless they are supplied with the appliance.

7.14 *Addition:*

The height of symbol 5036 of IEC 60417-1 shall be at least 5 mm and the height of symbol 5041 shall be at least 15 mm.

Compliance is checked by measurement.

7.101 The enclosure of magnetic valves, and similar components incorporated in external hoses for direct connection to the water mains, shall be marked with symbol 5036 of IEC 60417-1 if their **working voltage** exceeds **extra-low voltage.**

NOTE This symbol is a warning sign and the rules of ISO 3864 apply.

Compliance is checked by inspection.

7.102 The rear surface, other than that of **fixed appliances**, shall be marked with symbol 5041 of IEC 60417-1 if its temperature rise exceeds the limits specified in 11.8 for **accessible front surfaces**.

NOTE This symbol is a warning sign and the rules of ISO 3864 apply.

Compliance is checked by inspection.

8 Protection against access to live parts

This clause of Part 1 is applicable.

9 Starting of motor-operated appliances

This clause of Part 1 is not applicable.

10 Power input and current

This clause of Part 1 is applicable.

11 Heating

This clause of Part 1 is applicable except as follows.

11.2 *Addition:*

Lint traps are cleaned and then 50 % of the area of the filter is blocked.

11.3 *Addition:*

*Temperature rises of the **accessible front surface** are measured using the probe of Figure 101. The probe is applied with a force of 4 N ± 1 N to the surface in such a way that the best possible contact between the probe and the surface is ensured.*

NOTE 101 Any measuring instrument giving the same results as the probe may be used.

11.7 *Replacement:*

Appliances incorporating a timer, a humidity sensing control or other time-limiting control are operated in cycles. Each cycle comprises an operating period having a duration equal to the maximum time that can be provided by the control and a rest period of 4 min during which the appliance is reloaded.

The test may be ended if the temperature rise of any part does not exceed the value determined during the preceding cycle by more than 8 K.

Appliances having a combined washing-drying cycle are operated with the drying programme resulting in the highest temperature rise.

Other appliances are operated continuously until steady conditions are established.

11.8 *Addition:*

*The temperature rises of the **accessible front surface** shall not exceed the following values:*

– *metal and painted metal parts*	*60 K*
– *vitreous-enamelled metal parts*	*65 K*
– *glass and ceramic parts*	*65 K*
– *plastic parts having a thickness exceeding 0,3 mm*	*80 K*

The temperature rise limit of 80 K also applies to plastic material having a metal finish of thickness less than 0,1 mm.

NOTE 101 When the thickness of the plastic coating does not exceed 0,3 mm, the temperature rise limits of the supporting material applies.

The temperature rises are measured with the door closed.

12 Void

13 Leakage current and electric strength at operating temperature

This clause of Part 1 is applicable except as follows.

13.2 *Modification:*

*For **stationary class I appliances,** the leakage current shall not exceed 3,5 mA, or 1 mA/kW **rated power input** with a limit of 5 mA, whichever is higher.*

14 Transient overvoltages

This clause of Part 1 is applicable.

15 Moisture resistance

This clause of Part 1 is applicable except as follows.

15.1 *Addition:*

Magnetic valves and similar components incorporated in external hoses for connection to the water mains are subjected to the test specified for IPX7 appliances.

15.2 *Modification:*

*The test is carried out with the drum filled with wet textile material as specified for **normal operation**, the mass of the water, however, being approximately 1,5 times the mass of the dry textile material.*

*Appliances intended to be connected to the water mains are operated with the outlet of the condensation circuit blocked. The inlet valve is held open and the filling continued for 1 min after first evidence of overflow or for 5 min after a **protective device** operates to stop the flow. Doors are opened but interlocks are not forced.*

For appliances having a working surface, 0,5 l of water containing approximately 1 % NaCl and 0,6 % of rinsing agent, as specified in Annex AA, is poured over the top of the appliance, the controls being placed in the on position. The controls are then operated through their working range, this operation being repeated after a period of 5 min.

The appliance shall then withstand the electric strength test of 16.3 and inspection shall show that there is no trace of water on insulation that could result in a reduction of ***clearances*** *and* ***creepage distances*** *below the values specified in Clause 29.*

16 Leakage current and electric strength

This clause of Part 1 is applicable except as follows.

16.2 *Modification:*

For ***stationary class I appliances,*** *the leakage current shall not exceed 1 mA, or 1 mA/kW* ***rated power input*** *with a limit of 5 mA, whichever is higher.*

17 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

18 Endurance

This clause of Part 1 is not applicable.

19 Abnormal operation

This clause of Part 1 is applicable except as follows.

19.1 *Modification:*

Instead of being subjected to the tests of 19.2 and 19.3, appliances are subjected to the tests of 19.101 and 19.102, as applicable.

Addition:

If operation without water is a more unfavourable condition for appliances connected to the water mains, the tests are carried out with the water valve closed. This valve is not closed after the appliance has started to operate.

19.4 *Replacement:*

The appliance is operated under the conditions specified in Clause 11 but with dry textile material. Controls that limit the temperature during the test of Clause 11 and all ***self-resetting thermal cut-outs*** *that protect the heating elements are short-circuited simultaneously. The test is terminated at the end of the maximum period allowed by a timer.*

For ***condensation-type tumble dryers****, the test is repeated, but with 75 % of the air outlet of the condenser blocked. The test is then carried out again with the air outlet fully blocked.*

19.9 Not applicable.

19.13 *Addition:*

The textile material shall not ignite and shall show no charring or glowing.

NOTE 101 Light-brown colouring of the textile material or slight emission of smoke is ignored.

19.101 *The appliance is operated under the conditions specified in Clause 11 but with dry textile material and the drum belt removed. The duration of the test is 90 min or for the maximum period allowed by a timer.*

If air circulation is likely to be prevented due to a fault condition, the test is repeated but with the drum belt in position and with the air circulation stopped.

NOTE Care is to be taken to ensure that the textile material is tumbling properly by reducing the load if necessary.

If both of these conditions are likely to occur simultaneously, the tests are combined.

19.102 *Appliances that permit test probe C of IEC 61032 to gain access to spaces containing **live parts** located below holes in the drum are tested for short circuit conditions. The short circuit is applied at the most unfavourable place between **live parts** and between **live parts** and other metal parts, if such a short circuit can be made by a pin having a diameter of approximately 1 mm and any length up to 50 mm. The appliance is operated as specified in Clause 11 but with dry textile material.*

19.103 There shall be no risk of fire due to textile material coming into contact with a lamp cover.

Compliance is checked by the following test.

*Ten layers of cheesecloth are placed over the lamp cover. The appliance is supplied at **rated voltage** with the door open until steady conditions are established. The temperature rise of the cover shall not exceed 150 K.*

20 Stability and mechanical hazards

This clause of Part 1 is applicable except as follows.

20.1 *Modification:*

The test with the angle of inclination increased to 15° is not carried out.

20.101 It shall not be possible to open the door while the appliance is operating unless an interlock is provided that disconnects the motor before the door opening exceeds 75 mm. It shall not be possible to start the motor while the door opening exceeds 75 mm. For appliances with a door opening having a dimension exceeding 200 mm and a drum having a volume exceeding 60 dm^3, it shall not be possible to start the motor until a separate means which controls the movement of the drum is operated manually.

*Compliance is checked by inspection, by measurement and by manual test, the appliance being supplied at **rated voltage** and operating under **normal operation**.*

If means to prevent the door opening incorporates a coil or similar component to lock the door in the closed position, the component is energized and de-energized 6 000 times, six times a minute or at the rate imposed by the construction of the appliance if this is lower.

The locking means and its components shall be fit for further use.

NOTE The door is opened and closed during the test if this is necessary for the mechanical operation of the interlock.

20.102 For appliances with a door opening having a dimension exceeding 200 mm and a drum having a volume exceeding 60 dm^3, it shall be possible to open the door from the inside with a force not exceeding 70 N.

NOTE 1 This requirement does not apply to washing machines having a drying function.

NOTE 2 If the appliance is supplied with a decorative door, the test is carried out with this door closed.

Compliance is checked by inspection, by measurement and by applying a force of 70 N perpendicular to the plane of the door at a point furthest from the hinges.

NOTE The force may be applied to the outside of the door.

20.103 Appliances with horizontally hinged doors shall have adequate stability when the open door is subjected to a load.

Compliance is checked by the following test.

The empty appliance is placed on a horizontal surface and a mass of 23 kg applied to the centre of the open door. The appliance shall not tilt and the door and hinges shall not be damaged to such an extent that compliance with this standard is impaired.

NOTE 1 **Built-in appliances** and top-loading appliances are not subjected to this test.

NOTE 2 The test is carried out with the **tumble dryer** placed on a horizontal surface, even if it can be stacked on top of a washing machine.

21 Mechanical strength

This clause of Part 1 is applicable.

22 Construction

This clause of Part 1 is applicable except as follows.

22.101 Heating elements shall be located or guarded so that they cannot be contacted by textile material.

Compliance is checked by inspection.

22.102 Interlocks shall be constructed so that unexpected operation of the appliance is unlikely to occur while the door is open.

Compliance is checked by inspection and by attempting to release the interlock by means of test probe B of IEC 61032.

22.103 **Condensation-type tumble dryers** intended to be connected to the water mains shall withstand the water pressure expected in normal use.

Compliance is checked by connecting the appliance to a water supply having a static pressure equal to twice the maximum permissible inlet water pressure or 1,2 MPa, whichever is higher, for a period of 5 min.

There shall be no leakage from any part, including the inlet water hose.

22.104 If the instructions state that the **tumble dryer** can be placed on top of a washing machine this shall be possible without the **tumble dryer** tilting or falling.

Compliance is checked by inspection and by the following test.

*The washing machine and **tumble dryer** are assembled together in accordance with the instructions. The combination is placed in the most unfavourable orientation on a surface that is inclined at 5° to the horizontal. Each appliance is supplied at **rated voltage** and operated under **normal operation** in turn.*

*The appliances shall not tilt and the **tumble dryer** shall not fall off the washing machine.*

23 Internal wiring

This clause of Part 1 is applicable except as follows.

23.101 The insulation and sheath of internal wiring for the supply of magnetic valves and similar components incorporated in external hoses shall be at least equivalent to light polyvinyl chloride sheathed flexible cord (code designation 60227 IEC 52).

Compliance is checked by inspection.

NOTE The mechanical characteristics specified in IEC 60227 are not checked.

24 Components

This clause of Part 1 is applicable except as follows.

24.1.4 *Addition:*

The number of cycles of operation for programmers is 3 000.

24.101 **Thermal cut-outs** incorporated in **tumble dryers** for compliance with 19.4 shall not be self-resetting.

Compliance is checked by inspection.

25 Supply connection and external flexible cords

This clause of Part 1 is applicable.

26 Terminals for external conductors

This clause of Part 1 is applicable.

27 Provision for earthing

This clause of Part 1 is applicable.

28 Screws and connections

This clause of Part 1 is applicable.

29 Clearances, creepage distances and solid insulation

This clause of Part 1 is applicable except as follows.

29.2 *Addition:*

The microenvironment is pollution degree 3, and the insulation shall have a CTI of not less than 250, unless the insulation is enclosed or located so that it is unlikely to be exposed to pollution due to condensation produced by the appliance during normal use

30 Resistance to heat and fire

This clause of Part 1 is applicable except as follows.

30.2.2 Not applicable.

30.101 Non-metallic materials in close proximity to heating elements and on which lint could accumulate shall be resistant to spread of fire. This requirement also applies to parts on which burning lint could fall.

Compliance is checked by subjecting non-metallic surfaces located within 75 mm of the heating element to the needle-flame test of Annex E. The test is also applied to surfaces located directly below the heating element. However, parts shielded by a barrier that meets the needle-flame test are not tested.

NOTE It is considered that burning lint will not fall through a barrier with openings having a dimension less than 3 mm.

The needle-flame test is not carried out on

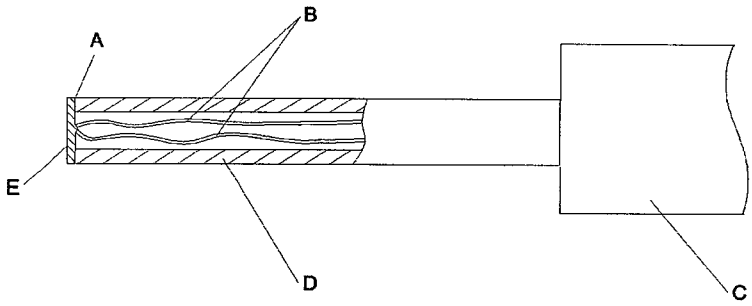
- *material classified as V-0 or V-1 according to IEC 60695-11-10, provided that the test sample was no thicker than the relevant part;*
- *rotating parts of fans;*
- *small parts as defined in IEC 60695-2-11.*

31 Resistance to rusting

This clause of Part 1 is applicable.

32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.



IEC 807/02

Key

A Adhesive

B Thermocouple wires 0,3 mm diameter to IEC 60584-1 Type K (chrome alumel)

C Handle arrangement permitting a contact force of 4 N ± 1 N

D Polycarbonate tube: inside diameter 3 mm, outside diameter 5 mm

E Tinned copper disc: 5 mm diameter, 0,5 mm thick

NOTE The contact face of the disc is to be flat.

Figure 101 – Probe for measuring surface temperatures

Annexes

The annexes of Part 1 are applicable except as follows.

Annex AA
(normative)

Rinsing agent

The composition of the rinsing agent is as follows.

Substance	Parts by mass %
Plurafac LF 221[1)]	15,0
Cumene sulfonate (40 % solution)	11,5
Citric acid (anhydrous)	3,0
Deionized water	70,5

The rinsing agent has the following properties:

- viscosity, 17 mPa·s;
- pH, 2,2 (1 % in water).

NOTE 1 Any commercially available rinsing agent may be used, but if there is any doubt with regards to the test results, this composition is to be used.

NOTE 2 The composition of the rinsing agent is extracted from IEC 60436.

1) Plurafac LF 221 is the trade name of a product supplied by BASF. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by IEC of this product.

Bibliography

The bibliography of Part 1 is applicable except as follows.

Addition:

IEC 60436, *Methods for measuring the performance of dishwashers*

IEC 61770, *Electric appliances connected to the water mains – Avoidance of backsiphonage and failure of hose-sets*

ISO 3864, *Safety colours and safety signs*

BSI

BS 1214 : 1977

UDC 621.798.151 : 677.13.074.162.3

Specification for

Hessian sandbags and rot-proofed hessian sandbags

Spécification des sacs à terre en hessian et des sacs à terre en hessian résistants à la putréfaction

Spezifikation für fäulnisbeständige und sonstige Sandsacke aus Rupfen

British Standards Institution

Gr 3

BS 1214 : 1977

Contents

Foreword

This standard was originally published in 1941 as BS/ARP 57 : it was revised and issued as BS 1214 in 1945 and again revised in 1959.

The standard specifies three different qualities of sandbags, referred to as types A, B and C as follows.

Type A. Made from 275 g/m^2 hessian which can be of medium quality. This quality could include non-standardized imported hessian.

Type B. Made from 275 g/m^2 hessian which has to be of good quality. This quality is similar to that normally produced in the Dundee area.

Type C. Made from 305 g/m^2 hessian of a quality such as that specified in Indian Standards Institution IS 2818 Type 1, but of suitable width.

The limits of conformity laid down are based on investigations by the industry and are believed to be concordant with good practice.

The present edition includes methods of sampling and make-up of bags. The proofing requirements have been related to BS 2087.

In order that bags can be made to the specified dimensions it is important to appreciate that rot-proofing can affect the dimensions of the fabric. If the treatment is to be applied to the fabric after the bags have been made up, due allowance should be made for this.

British Standard Specification for

Hessian sandbags and rot-proofed hessian sandbags

1. Scope

This British Standard specifies fabric and making-up requirements for 36 cm x 84 cm hessian sandbags. The bags may be supplied unproofed or rot-proofed, at the option of the purchaser. A choice of rot-proofing processes to be used at the discretion of the purchaser is also given.

2. References

The titles of standards publications referred to in this standard are listed on the inside back cover.

3. Hessian fabric (proofed or unproofed)

3.1 Sampling. The sample shall consist of 10 bags chosen at random from each lot of 10 000 bags or part thereof.

3.2 Requirements. The fabric may be produced with conventional selvedges, non-conventional selvedges or one selvedge of each type.

When tested by the methods shown, the mass per unit area, threads per 10 cm and cloth breaking strength shall be as shown in tables 1, 2 and 3.

The pH value of the aqueous extract, when determined as specified in BS 3266, shall be 4.5 to 8.0 in all cases.

Table 1. Type A fabric

Property	Nominal value	Test method	Specification		Comments
			Unproofed min.	Proofed min.	
Mass per unit area (g/m^2)	275	BS 2471	245	245	
Threads per 10 cm		BS 2862 but			
Warp	43	quote the result as	40	41	
Weft	43	threads per 10 cm	36	38	
Cloth breaking strength (N/50 mm specimen width)		BS 2576			
Warp			525	525	Average of 10 breaks (1 per bag)
Weft			350	350	Average of 10 breaks (1 per bag)

Table 2. Type B fabric

Property	Nominal value	Test method	Specification		Comments
			Unproofed min.	Proofed min.	
Mass per unit area (g/m^2)	275	BS 2471	260	260	
Threads per 10 cm		BS 2862 but			
Warp	44	quote the result as	43	44	
Weft	43	threads per 10 cm	41	43	
Cloth breaking strength (N/50 mm specimen width)		BS 2576			
Warp			550	550	Average of 10 breaks (1 per bag)
Weft			500	500	Average of 10 breaks (1 per bag)

Table 3. Type C fabric

Property	Nominal value	Test method	Specification		Comments
			Unproofed min.	Proofed min.	
Mass per unit area (g/m^2)	305	BS 2471	275	275	
Threads per 10 cm		BS 2862 but			
Warp	47	quote the result as	45	46	
Weft	47	threads per 10 cm	45	47	
Cloth breaking strength (N/50 mm specimen width)		BS 2576			
Warp			550	550	Average of 10 breaks (1 per bag)
Weft			590	590	Average of 10 breaks (1 per bag)

4. Making up and dimensions of bags

4.1 Seaming. The bags may be made up with the warp in either the length or width direction of the bag at the discretion of the manufacturer.

All bags shall be sewn side and bottom with the stitch described as type 401 in BS 3870 : 1965 using 74 tex x 3 cotton thread. A man-made fibre sewing thread of equivalent strength and durability may be used subject to the agreement of the purchaser. All bags shall be sewn with an outside seam, shall be unturned and shall have a 7.5 cm feint or vent at the mouth of the bag; the bags shall be sewn in one of the following ways, as appropriate.

(a) Through four folds of cloth where there are two raw edges or patent selvedges together, to form an M seam described in BS 3870 : 1965 as seam type SSc-1.

(b) Through three folds of cloth where there is one raw edge or patent selvedge, and one real selvedge together to form an N seam described in BS 3870 : 1965 as seam type SSb-1.

(c) Through two folds of cloth where there are two real selvedges together, to form a plain seam described in BS 3870 : 1965 as seam type SSa-1.

4.2 Stitch density

4.2.1 The average number of stitches per 10 cm shall be not less than 14 when measured in accordance with **4.2.2.**

4.2.2 Count the number of stitches over a length of 10 cm on each side and bottom seam of 5 bags selected at random from the sample (see **3.1**). Space the measurements so that both seams are adequately assessed.

4.3 Sewing twines. When tested by the method given in BS 1932 : Part 1, the average value of the breaking strength of the sewing twine shall be not less than 22 N.

4.4 Dimensions

4.4.1 *Length.* Fold the bag in half, from side to side, and measure the length from the mouth to the stitching, along the fold so formed. The average length of 10 bags shall be not less than 82.5 cm.

4.4.2 *Width.* Fold the bag in half, from top to bottom, and measure the width from the folded side to the stitching, along the fold so formed. The average width of 10 bags shall be not less than 35 cm.

4.5 Tying string. The tying string shall be 60 cm long and made of 413 tex x 5 jute yarn. It shall be secured in the seam stitching and shall be sewn in 2.5 cm from the bottom of the vent. The string shall be knotted to prevent withdrawal.

5. Rot-proofing requirements

5.1 General. Where rot-proofing is required, use one of the following processes described in **5.2** to **5.5** at the option of the purchaser. The processes may be applied to ready-sewn bags, or they may be applied in the piece, prior to cutting and sewing. In the latter case, both seaming twine and tying string will also require rot-proofing by one of the methods to the appropriate chemical limits, if natural fibres are used.

5.2 Cuprammonium process. The copper content of the treated textile shall be that described in BS 2087 as the 'normal' amount.

5.3 Copper naphthenate process. The copper content of the treated textile shall be not less than 0.8 % nor more than 1.5 % when calculated as Cu using the method specified in BS 2087.

5.4 Pentachlorophenyl laurate (PCPL) process. The pentachlorophenyl laurate content of the treated textile shall be that described in BS 2087 as the 'normal' amount.

5.5 Tar oil process. The phenol content of the treated textile shall be that described in BS 2087 as the 'heavy' amount.

Standards publications referred to

BS 1932 Methods of testing the strength of yarns from packages
Part 1 Determination of breaking load and extension
BS 2087 Preservative textile treatments
BS 2471 Methods of test for the mass per unit length and per unit area of woven or knitted fabrics
BS 2576 Methods for the determination of breaking load and extension of strips of woven textile fabric
BS 2862 Methods for the determination of the number of threads per centimetre in woven fabrics
BS 3266 Methods for the determination of conductivity, pH, water-soluble matter, chloride and sulphate in aqueous extracts of textile materials
BS 3870 Schedule of stitches, seams and stitchings

BS 1214 : 1977

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Contract requirements
Attention is drawn to the fact that this British Standard does not purport to include all the necessary provisions of a contract.

Revision of British Standards
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 FBT/2 Draft for comment 76/35560 DC

Cooperating organizations

The Fibres, Yarns and Fabrics Standards Committee, under whose direction this British Standard was prepared, consists of representatives from the following Government departments and scientific, industrial and consumer organizations.

*Association of Jute Spinners and Manufacturers
British Man-made Fibres Federation
British Railways Board
British Textile Employers' Association
Central Council of the Irish Linen Industry
Consumer Standards Advisory Committee of BSI
Department of Industry
International Wool Secretariat
Knitting Industries Federation Ltd.
Manchester Chamber of Commerce and Industry
*Ministry of Defence
Narrow Fabrics Federation
Retail Trading Standards Association
Textile Institute
Warp Knitters' Association
Wool Textile Delegation

The 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.

Cotton Silk and Man-made Fibres Research Association
Jute Sack and Bag Manufacturers' Association
Lambeg Industrial Research Association
National Association of British and Irish Millers Ltd.
United Kingdom Jute Goods Association
Wira

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