BS EN 50571:2013

BSI Standards Publication

Household and similar electrical appliances — Safety —

Particular requirements for commercial electric washing machines

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National foreword

This British Standard is the UK implementation of EN 50571:2013.

The UK participation in its preparation was entrusted to Technical Committee CPL/61, Safety of household and similar electrical appliances.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Sicherheit elektrischer Geräte für den Hausgebrauch und ähnliche Zwecke - Besondere Anforderungen für elektrische Waschmaschinen für den gewerblichen Gebrauch

CENELEC

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Foreword

This document (EN 50571:2013) has been prepared by CLC/TC 61 "Safety of household and similar electrical appliances".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2014-06-10
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2016-06-10

EN 50571:2013 is to be read in conjunction with EN 60335-1:2012 and its amendments, which is referred to in this text as “Part 1”. This standard supplements or modifies the corresponding clauses of Part 1 as indicated in the text.

NOTE 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.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s) see informative Annex ZZ, which is an integral part of this document.

Introduction

This European Standard has been prepared to provide a means of conforming to essential safety requirements of the Machinery Directive 2006/42/EC. Other requirements and other EU Directives may be applicable to the machines within the scope of this standard.

This standard is a product family standard dealing with the safety of commercial electric **washing machines** and takes precedence over horizontal and generic standards covering the same subject.

This standard recognises the level of protection against hazards such as electrical, mechanical, thermal, fire and radiation of commercial electric **washing machines** when operated as in normal use taking into account the manufacturer's instructions. It also covers any reasonably foreseeable misuse of the machinery and takes into account the way in which electromagnetic phenomena can affect the safe operation of commercial electric **washing machines**.

A commercial electric **washing machine** 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 that impair the level of safety covered by these requirements.

This standard takes into account the requirements of HD 60364-1 as far as possible so that there is compatibility with the wiring rules when the machinery is connected to the supply mains. However, national wiring rules may differ.

1 Scope

This clause of Part 1 is replaced by the following:

This European Standard deals with the safety of electrical operated **washing machines** intended to be used by trained users in e.g. hotels, hospitals, factories, in light industry and on farms. It also covers **washing machines** declared for commercial use in **public areas** and operated by lay persons e.g. in laundrettes, communal laundry rooms. Their rated voltage being not more than 250 V for single phase and 480 V for others**.**

This standard also covers **washing machine**s making use of other energy sources. It does not cover requirements for these other energy sources or compressed air. However the influence of these other energy sources on the machines is covered.

These **washing machines** are designed to be connected to hot and/or cold water supply.

Washing machines making use of steam or hot water for heating purposes are also within the scope of this standard.

This standard deals with the common hazards presented by **washing machines** that are encountered by all persons. However, in general, it does not take into account:

a) persons (including children) whose:

   1) physical, sensory or mental capabilities, or

   2) lack of experience and knowledge,

   prevents them from using the **washing machine** safely without supervision or instruction;

b) children playing with the **washing machine.**

Attention is drawn to the fact that:

– for commercial electric **washing machines** 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,

– for commercial electric **washing machines** having a drying function, EN 50570 (commercial electric tumble dryers) is also applicable.

This European Standard does not apply to:

c) industrial laundry machinery (EN ISO 10472-2),

d) **washing machines** intended to be used in locations where special conditions prevail, such as the presence of a corrosive or explosive atmosphere (dust, vapour or gas).

For the purpose of this standard, the term “appliance” is to be read as “**washing machine** intended for commercial use.

2 Normative references

This clause of Part 1 is applicable except as follows:

Addition:

EN 60204-1:2006/A1:2009, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2005/A1:2008)*

EN 60335-1:2012, *Household and similar electrical appliances — Safety — Part 1: General requirements (IEC 60335-1:2010, modified)*

EN 60704-1:2010 *Household and similar electrical appliances — Test code for the determination of airborne acoustical noise — Part 1: General requirements (IEC 60704-1:2010)*

EN 60730-2-12:2006, *Automatic electrical controls for household and similar use — Part 2-12: Particular requirements for electrically operated door locks (IEC 60730-2-12:2005, modified)*

EN ISO 3744, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane (ISO 3744)*

EN ISO 3746, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane (ISO 3746)*

EN ISO 4871, *Acoustics — Declaration and verification of noise emission values of machinery and equipment (ISO 4871)*

EN ISO 9614-2, *Acoustics — Determination of sound power levels of noise sources using sound intensity — Part 2: Measurement by scanning (ISO 9614-2)*

EN ISO 11201, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections (ISO 11201)*

EN ISO 11203, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions from the sound power level (ISO 11203)*

EN ISO 11688-1, *Acoustics — Recommended practice for the design of low-noise machinery and equipment — Part 1: Planning (ISO/TR 11688-1)*

ISO 1817, *Rubber, vulcanized or thermoplastic — Determination of the effect of liquids*

Replace the reference to EN 62233 by:

EN 62233:2008, *Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure (IEC 62233:2005, modified)*

3 Terms and definitions

This clause of Part 1 is applicable except as follows:

3.1.9
normal operation

Addition:

the appliance is filled with textile material having a mass in the dry condition equal to the maximum mass stated in the instructions, and with the maximum quantity of water for which it is constructed. However, if the power input or current is higher when only 50 % of the textile material is used, the appliance is operated with this load instead

The temperature of the water is:

– *65 °C ± 5 °C for appliances without heating elements,*

– *15 °C ± 5 °C for other appliances,*

– *15 °C ± 5 °C for appliances without heating elements and intended for connection to the cold water supply only.*

If the appliance does not incorporate a programmer, the water is heated to 90 °C ± 5 °C or as high as the construction will allow if lower, before starting the first washing period.

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/m² and 175 g/m² in the dry condition.

For impeller type appliances, if the textile material does not move properly during operation,

– *the quantity of textile material may be reduced until the maximum power input of the motor is attained, or*

– *a textile material comprising pre-washed double-hemmed cotton sheets, having dimensions of approximately 90 cm x 90 cm and a mass between 90 g/m² and 110 g/m² in the dry condition, may be used.*

However, for impeller type appliances, in case of doubt, the test should be carried out using the reduced quantity of textile material.

Addition:

3.1.101
washing machine
appliances for cleaning and rinsing of textiles using water which may also have a means of extracting excess water from the textiles

3.1.102
agitator washing machine
appliance in which the textiles are substantially immersed in the washing water, the mechanical action being produced by a device moving about or along its vertical axis with a reciprocating motion (an agitator). This device usually extends above the maximum water level

3.1.103
horizontal drum washing machine
appliance in which the textiles are placed in a horizontal or inclined drum and partially immersed in the washing water, the mechanical action being produced by rotation of the drum about its axis, the movement being either continuous or periodically reversed

3.1.104
impeller washing machine
appliance in which the textiles are substantially immersed in the washing water, the mechanical action being produced by a device rotating about its axis continuously or reversing after a number of revolutions (an impeller). The uppermost point of this device is substantially below the minimum water level

3.1.105
washer-dryer
appliance which includes also a means for drying the textiles, usually by heating and tumbling

3.1.106
spin extraction
water-extracting function by which water is removed from textiles by centrifugal force. This is usually included as a function of an appliance

3.1.107
guard
part of the appliance specifically designed to provide protection by means of a physical barrier

3.1.108
operator
person or persons installing, operating, adjusting, maintaining, cleaning, repairing or moving appliances

3.1.109
workstation
place, as defined in the instructions of the relevant appliance, where the **operator** has to be in attendance to operate, or to adjust, or to control the appliance

Note 1 to entry: Example is the location where the **operator** loads the appliance.

3.1.110
public area
area in which the general public including children can enter

Note 1 to entry: Examples are launderettes, communal laundry rooms.

4 General requirement

This clause of Part 1 is applicable except as follows.

Replace the first paragraph with the following:

Appliances shall be constructed so that they function safely as to cause no danger to persons or surroundings during normal use, even in the event of carelessness, and during installation, adjusting, maintenance, cleaning, repairing or transportation.

5 General conditions for the tests

This clause of Part 1 is applicable except as follows:

5.2 *Addition:*

The second and third sentence of the requirement are not applicable.

5.3 *Addition:*

The test of 15.101 is carried out before the test of 15.3.

The relevant tests of 21.101 and 21.102 are carried out before the test of Clause 18. The test of 22.104 is carried out after the test of Clause 18.

5.7 *Addition:*

Doubt is considered to exist if the temperature of the water is within 6 K of the boiling point and the difference between the temperature rise of the relevant part and the limit specified does not exceed 25 K minus the room temperature.

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:

7.1 *Addition:*

Appliances shall be marked in addition with:

– business name, and full address of the manufacturer and, where applicable, his authorised representative,

– model or type reference, serial number if any and production year,

NOTE 101 Production year is the year when the production process is completed. The production year can be a part of the serial number.

– designation of the appliance;

NOTE 102 The designation may be a combination of letters and/or numbers and shall enable to identify the appliance as specified in the instructions.

– the water supply pressure or range of pressures, in kilopascals (kPa), for appliances intended to be connected to a water supply, unless this is indicated in the instruction sheet,

– the maximum permissible steam supply pressure, in kilopascals (kPa), unless this is indicated in the instruction sheet,

– the maximum permissible hot water supply pressure, in kilopascals (kPa), unless this is indicated in the instruction sheet,
– the maximum permissible water, steam and hot water supply temperatures in degrees Celsius, unless this is indicated in the instruction sheet.

Appliances without automatic water level control shall be marked with the maximum water level.

Appliances not intended for connection to the hot water supply and not provided with heating elements shall be marked with the substance of the following:

CAUTION: Do not connect to the hot water supply.

7.10 *Addition:*

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

7.12 *Replace the first sentence in the requirement of Part 1 with the following:*

Instructions shall be provided with the appliance so that the appliance can be used safely.

The instructions shall contain at least the following information:

– the business name and full address of the manufacturer and, where applicable, his authorised representative;
– model or type reference of the appliance as marked on the appliance itself, except for the serial number;
– the designation of the appliance together with its explanation in case it is given by a combination of letters and/or numbers; the designation shall enable the identification of the appliance as specified in the instructions;
– the general description of the appliance, when needed due to the complexity of the appliance;
– specific precautions if required during installation, operation, adjusting, user maintenance, cleaning, repairing or moving;
– when needed drawings, diagrams, descriptions and explanations necessary for the safe use and user maintenance of the appliance;
– the possible reasonably foreseeable misuse and, whenever relevant, a warning against the effects it may have on the safe use of the appliance.

The manufactures shall declare if the appliance is also intended to be used in **public areas**. If the appliance is not suitable for use in **public areas** the instruction shall include the substance of the following warning:

CAUTION This appliance shall not be installed where the public has access

The front cover of the instructions shall include the substance of the following warning:

CAUTION Read the instructions before using the appliance.

This wording may be replaced by symbols ISO 7000-0434 and ISO 7000-0790.

If symbols ISO 7000-0434 and ISO 7000-0790 are used, their meaning shall be explained.

The words ‘Original instructions’ shall appear on the language version(s) verified by the manufacturer or by the authorised representative.

When a translation of the original instructions has been provided by a person introducing the appliance on the market; the meaning of the sentence ‘Translation of the original instructions’ has to appear in the relevant instructions delivered with the appliance.

The instructions needed for maintenance/service to be done by specialised personnel, mandated by the manufacturer or the authorised representative, and may be supplied in only one Community language which the specialised personnel understand.

The instructions shall indicate the type and frequency of inspections and maintenance required for safe operation including the preventive maintenance measures.

The instructions shall specify the maximum mass of dry cloth in kilograms to be used in the appliance.

The instructions for not electrical heated appliances shall state that adequate ventilation has to be provided to avoid the back flow of gases into the room from appliances burning other fuels.

7.12.1 *Addition:*

For appliances having ventilation openings in the base, the installation instructions shall state that the openings shall not be obstructed by a carpet or similar.

Add the following new sub-clauses:

7.12.101 Specific instructions shall be given, when necessary as follows:

- on use, transportation, assembly, dismantling when out of service, testing or foreseeable breakdowns, if these operations have consequences on stability of the appliance in order to avoid overturning, falling or uncontrolled movements of the appliance or of its component parts. The instructions concerning the safe transportation of the packed appliance, should be stated on the package or should be delivered together with the package.
- on how to maintain adequate mechanical stability when in use, during transportation, assembly, dismantling, scrapping and any other action involving the appliance;
- on the operating method to be followed in the event of accident or breakdown; if a blockage is likely to occur the operating method to safely unblock the appliance.

Compliance is checked by inspection.

7.12.102 Information shall be given that only authorised spare parts shall be used in the event of failure.

Compliance is checked by inspection.

7.12.103 The instructions shall include a noise emission declaration as indicated in Annex CC.

This includes

- the A-weighted emission sound pressure level at **workstations**, where this exceeds 70 dB(A). If the A-weighted emission sound pressure level is below 70 dB, no value need be given, but the instructions shall state that the A-weighted emission sound pressure level is below 70 dB,
- the A-weighted sound power level emitted by the appliance, where the A-weighted emission sound pressure level at **workstations** exceeds 80 dB(A).

Compliance is checked by inspection.

7.12.104 The instructions shall give information on the detergents or other liquids that may be used. It shall also give information about particular chemical substances which shall not be used.

Compliance is checked by inspection.

7.12.105 The instructions shall include a warning that the appliance shall be disconnected from its power source during service and when replacing parts and, if that the removal of the plug is foreseen, it shall be clearly indicated that the removal of the plug has to be such that an **operator** can check from any of the points to which he has access that the plug remains removed.

If this is not possible, due to the construction of the appliance or its installation, a disconnection with a locking system in the isolated position shall be provided.

Compliance is checked by inspection.

7.15 *Addition*:

The caution relating to connection to the hot water supply shall be on the appliance at its point of attachment to the water supply.

8 Protection against access to live parts

This clause of Part 1 is applicable except as follows:

8.1.1 *For* appliances *intended to be installed in* ***public areas*** *replace the third paragraph by the following:*

Test probe B and probe 18 of EN 61032 are applied without appreciable force, the appliance being in every possible position, except that appliances normally used on the floor and having a mass exceeding 40 kg are not tilted. Through openings, the test probe is applied to any depth that the probe will permit and is rotated or angled before, during and after insertion to any position. If the opening does not allow the entry of the probe, the force on the probe in the straight position is increased to 20 N when probe B is used or 10 N when probe 18 is used. If the probe then enters the opening, the test is repeated with the probe in the angled position. However when using test probe 18 the appliance shall be fully assembled as in normal operation without any parts removed; parts that are intended to be removed for user maintenance shall not be removed.

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 except as follows:

10.1 *Addition:*

The selected representative period is the period, such as filling with water, washing, rinsing, water extraction, spinning or braking, during which the power input is the highest.

10.2 *Addition:*

The selected representative period is the period, such as filling with water, washing, rinsing, water extraction, spinning or braking, during which the power input is the highest.

11 Heating

This clause of Part 1 is applicable except as follows:

11.3 *Addition:*

Temperature rises of the flat accessible surfaces 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.

11.7 *Replacement:*

Appliances incorporating a programmer are operated for three cycles with the programme that results in highest temperature rises, with a rest period of 4 min between cycles.

Other appliances *are operated for three cycles, with a rest period of 4 min between cycles. Each cycle consists of the following operations:*

- *for appliances without means for water extraction,* — *washing;*
- *for appliances having a single drum for washing and water extraction,* — *washing followed by water extraction;*
- *for appliances having separate drums for washing and water extraction that cannot be used simultaneously,* — *washing and water extraction separated by an additional 4 min rest period;*
- *for appliances having separate drums for washing and water extraction that can be used simultaneously,* — *washing together with water extraction so that the operations terminate simultaneously;*

– *for appliances having a single drum for washing, water extraction and drying*

• *that allow the same quantity of textile material to be washed and dried in the drum,*	*washing followed by water extraction, followed by drying;*
• *that, according to the instructions, only allow a portion of the washed textile material to be dried in the drum,*	*washing followed by water extraction followed by two drying periods, with an additional rest period of 4 min before each drying period. In this case only two cycles of operation are carried out.*

For appliances *incorporating a timer, the washing period, the water extraction period and the drying period are equal to the maximum period allowed by the timer.*

For appliances *without a timer,*

a) the washing period has a duration of:

1) 6 min, for appliances of the continuously rotating impeller type,

2) 18 min, for appliances of the agitator type,

3) 25 min, for appliances of the drum type, unless a longer period is stated in the instructions;

b) the water extraction period has a duration of 5 min.

The rest period, including any braking time, has a duration of 4 min.

After the specified sequence of operation, discharge pumps that are driven by a separate motor and switched on and off manually, are subjected to three operating periods separated by rest periods of 4 min. Each operating period is equal to 1,5 times the period necessary to empty the appliance when filled to the maximum normal water level. The outlet of the water discharge pipe is 900 mm above the floor.

11.8 *Modification:*

For appliances used in ***public areas*** *replace in Table 3 the row "External enclosure of* ***motor-operated appliances****, except handles held in normal use" and the relevant temperature value with the following:*

Table 3 — Maximum normal temperature rises

Surface [a]	***Temperature rise*** *K*		
	Surfaces of appliances situated not more than 850 mm above the floor after installation		***Surfaces situated more than 850 mm above the floor after installation***
	Front surfaces	***Other surfaces***	
Bare metal	*40*	*45*	*45*
Coated metal [b]	*45*	*55*	*55*
Glass and ceramic	*55*	*60*	*60*
Plastic and plastic coating > 0,3 mm [c]	*60*	*65*	*65*

[a] When the thickness of plastic coating does not exceed 0,3 mm, the temperature rise limits of coated metal or glass and ceramic apply.

[b] Metal is considered coated when a coating having a minimum thickness of 80 µm made by enamel or non substantially plastic coating is used.

[c] The temperature rise limit applies also for plastic material having a metal finish of thickness less than 0,1 mm.

Add the following new subclause:

11. 101

Temperature rises are not measured

– on the underside of appliances intended to be used on a floor,

– on the rear surface of appliances which, according to the instructions, shall be placed against a wall.

12 Void

13 Leakage current and electric strength at operating temperature

This clause of Part 1 is applicable except as follows:

13.2 *Modification:*

Instead of the permissible leakage current for **stationary class I appliances**, the following applies:

– for cord and plug connected appliances — 1 mA per kW rated power input of the appliance with a maximum of 10 mA;

– for other appliances — 1 mA per kW rated power input of the appliance with no maximum.

14 Transient overvoltages

This clause of Part 1 is applicable.

15 Moisture resistance

This clause of Part 1 is applicable except as follows.

15.2 *Replacement:*

Appliances shall be constructed so that spillage of liquid in normal use does not affect their electrical insulation even if an inlet valve fails to close.

Compliance is checked by the following test.

Appliances *with **type X attachment**, except those having a specially prepared cord, are fitted with the*

lightest permissible type of flexible cord of the smallest cross-sectional area specified in Table 13.

Appliances *intended to be filled with water by the user are completely filled with water containing approximately 1 % NaCl. A further quantity of this solution equal to 15 % of the capacity of the appliance or 0,25 l, whichever is greater, is poured in steadily over a period of 1 min.*

Other appliances *are operated until the maximum water level is reached, and 5 g of the detergent specified in Annex AA is added for each litre of water in the* appliances*. The inlet valve is held open and the filling continued for 15 min after first evidence of overflow or until the inflow is automatically stopped by other means.*

For appliances *that are loaded from the front, the door is then opened if this can be achieved manually and without damage to the door interlock system.*

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.*

Addition:

15.101 Appliances shall be constructed so that foaming does not affect electrical insulation.

Compliance is checked by the following test that is carried out immediately after that of 15.2.

The appliance *is operated under the conditions specified in Clause 11 but for one complete cycle with the programme that results in the longest period of operation. Twice the quantity of detergent necessary for normal washing is added, the composition of which is specified in Annex AA.*

For appliances *incorporating a detergent dispenser, the solution is added manually at the point in the cycle when it would normally be dispensed automatically. For other appliances the solution is added before starting the cycle.*

The appliance shall then withstand the electric strength test of 16.3.

The appliance is kept in a test room having a normal atmosphere for 24 h before being subjected to the test of 15.3.

16 Leakage current and electric strength

This clause of Part 1 is applicable except as follows:

16.2 *Modification*:

Instead of the permissible leakage current for **stationary class I appliances**, the following applies:

– for cord and plug connected appliances	1 mA per kW rated power input of the appliance with a maximum of 10 mA;
– for other appliances	1 mA per kW rated power input of the appliance with no maximum.

17 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

18 Endurance

This clause of Part 1 is applicable except as follows:

Addition:

18.101 Appliances shall be constructed so that the lid or door interlock withstands the stresses to which it may be exposed in normal use.

Compliance is checked by the following tests.

Manually operated lids and doors:

The lid or door is opened as in normal use and the force applied to the handle, or actuating means of the release mechanism, is measured. The force required to close the lid or door is also measured.

The lid or door is then subjected to 50 000 cycles of opening and closing. For the first 30 000 cycles, the appliance is supplied at ***rated voltage*** *and operated so that the interlock mechanism is energised and de-energised each cycle. For the last 20 000 cycles, the appliance is not connected to the supply mains. For* appliances *having a drying function, the total number of cycles is increased to 55 000, the first 40 000 cycles being carried out with the interlock mechanism energised and de-energised each cycle.*

If the interlock complies with EN 60730-2-12, the appliance is not connected to the supply mains during this test. If the interlock operates more than once during ***normal operation****, it is operated for this number of times during each cycle.*

Lids are opened each time by approximately 45^{o} and doors by 90^{o}, the speed of opening being approximately 1,5 m/s. The force applied to open the lid or door is twice the measured opening force, with a minimum of 50 N and a maximum of 200 N.

Doors are closed at a speed of approximately 1,5 m/s, the force applied being five times the measured closing force, with a minimum of 50 N and a maximum of 200 N. Lids are allowed to close under their own weight but if they fail to latch, a force of five times the measured closing force is applied, with a minimum of 50 N and a maximum of 200 N.

Power driven lids and doors:

The lid or door is subjected to 50 000 cycles of opening and closing, the appliance is supplied at ***rated voltage*** *and operated so that the interlock mechanism is energised and de-energised each cycle*

After the tests, compliance with the relevant requirements of 20.103 to 20.105 shall not be impaired.

19 Abnormal operation

This clause of Part 1 is applicable except as follows:

19.1 *Addition:*

For appliances incorporating a programmer or a timer, the tests of 19.2 and 19.3 are replaced by the test of 19.101.

The test of 19.7 is not carried out on motors driving moving parts of an oscillating agitator.

Appliances not intended for connection to the hot water supply and not provided with heating elements are also subjected to the test of 19.102.

19.2 *Addition:*

Restricted heat dissipation is obtained without water in the appliance or with just sufficient water to cover the heating elements, whichever is the more unfavourable.

19.7 *Addition:*

Appliances without a programmer or timer are operated for 5 min.

19.9 Not applicable.

19.11.4.8 *Replace the second paragraph in the requirement by:*

The appliance shall continue to operate, without causing any hazard to the user, from the same point in its operating cycle at which the voltage fluctuation occurred, or a manual operation shall be required to restart it.

19.13 *Addition:*

The textile material shall not ignite and shall not show any charring or glowing.

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

During the tests of 19.101 and 19.102, the temperature of windings shall not exceed the values specified in Table 8.

The appliance shall comply with the appropriate requirements of 20.103 to 20.105 if it can still be operated.

Addition:

19.101 *The appliance is supplied at* ***rated voltage*** *and operated under* ***normal operation****. Any fault condition or unexpected operation that may be applied in normal use is introduced.*

The fault conditions and unexpected operations to be applied are:

a) the programmer stopping in any position;

b) disconnection and reconnection of one or more phases of the supply during any part of the programme;

c) open-circuiting or short-circuiting of components;

d) failure of a magnetic valve;

e) failure or blocking the mechanical parts of a water-level switch. This fault condition is not applied if:
   1) the cross-sectional area of the tube supplying the air chamber is greater than 500 mm^2 with a minimum dimension of 10 mm,
   2) the outlet of the chamber is at least 20 mm above the highest water level, and
   3) the tube connecting the air chamber to the water-level switch is fixed so that there is no likelihood of bending or pinching;

f) puncture of the capillary tube of a thermostat.

If operation without water in the appliance *is a more unfavourable condition for starting any programme, the tests with that programme are carried out with the water valve closed. This valve is not closed after the programme has started to operate.*

NOTE The fault condition with:

– the automatic filling device held open is covered by 15.2,

– thermal controls short-circuited is covered by 19.4,

– motor capacitors short-circuited or open-circuited is covered by 19.7,

– the failure of door interlocks is covered by 24.1.4.

19.102 Appliances not intended for connection to the hot water supply and not provided with heating elements are operated under the conditions of Clause 11, except that they are supplied at rated voltage and filled with water at a temperature of 65 °C ± 5 °C.

20 Stability and mechanical hazards

This clause of Part 1 is applicable except as follows:

20.1 Addition:

The appliance is empty or filled as specified for **normal operation**, whichever is more unfavourable. Doors and lids are closed and any castors turned to the most unfavourable position.

20.2 *Modification*:

Dangerous moving transmission parts shall be safeguarded either by design or **guards**. When **guards** are used, they shall be fixed **guards** or interlocking movable **guards**.

NOTE 101 Parts of the enclosure can fulfil the guarding function.

Interlocking movable **guards** (e.g. the door of a washing machine) shall be used where frequent access is required.

Addition:

20.101 The appliance together with its delivery packaging shall have adequate stability during

transportation, assembly, dismantling, scrapping. It shall be constructed in such a way that overturning is prevented; if possible by designing inbuilt stability, e.g. the basepoint of the centre of gravity shall lie within the polygon of support.

If necessary, appropriate instructions shall be made by the manufacturer.

NOTE EN ISO 4180:2010 gives guidance.

20.102 Appliances shall not be adversely affected by an unbalanced load.

Compliance is checked by the following test.

The appliance is placed on a horizontal support and a load having a mass of 0,2 kg or 10 % of the maximum mass of the cloth specified in the instructions, whichever is greater, is fixed to the inside wall of the drum half-way along its length.

*The appliance is supplied at **rated voltage** and operated during the water extraction period.*

The test is carried out four times, the load being moved each time through an angle of 90° around the wall of the drum.

The appliance *shall not overturn and the drum shall not hit other parts except the enclosure. After the test, the appliance shall be fit for further use.*

20.103 Appliances shall be interlocked so that they can only be operated when the door or lid is in the closed position.

Compliance is checked by inspection and by applying a force not exceeding 5 N by the means of

- *test probe B of EN 61032 is applied in order to try and release any interlock that is needed to comply with the requirement. The interlock shall not release,*

- *for appliances used in **Public Areas** test probe 18 of EN 61032 is applied in order to try and release any interlock that is needed to comply with the requirement. The interlock shall not release.*

20.104 It shall not be possible to open the lid or door of the appliance until the drum, impeller or agitator has stopped.

Compliance is checked by the following test:

The appliance *is supplied at* **rated voltage** *and operated empty or filled as specified for **normal operation**, whichever is more unfavourable. An opening force equal to 10 times the measured opening force as determined in 22.104 with a minimum of 50 N is applied to the lid or door in an attempt to open it.*

It shall not be possible to open the lid or door until the drum, impeller or agitator has stopped.

NOTE Damage to handles is ignored.

20.105 It shall not be possible to start the motor of the drum 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 energised and de-energised 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.

20.106 For appliances used in **public areas** which may be operated by lay persons and which have a manually operated door having an opening with a dimension exceeding 200 mm and a drum having a volume exceeding 60 dm^3 or a distances in the centre exceeding 350 mm from the inner surface of the closed door it shall be possible to open from the inside a closed door not in locked state with a force not exceeding 70 N.

Compliance is checked by inspection, by measurement and by applying a force of 70 N perpendicular to the plane of the closed door (not locked) at a point furthest from the hinges.

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

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

This requirement is not applicable, if the force necessary to close the door is more than 140 N or if to close the door turning of any knobs or levers is necessary.

The force of 140 N is applied perpendicular to the plane of the door at a point furthest from the hinges.

20.107 For appliances not used in public areas and having loading or unloading function where the appliance tilts backwards or forward, the drum door is opened manually or automatic and the drum slowly rotates to decant the washed load. The drum speed shall not exceed 60 rpm, if unloading function is activated manually then a two handed operation is required.

Compliance is checked by the following test:

The appliance is supplied at **rated voltage** *and operated empty or filled as specified for* ***normal operation****, whichever is more unfavourable. The drum speed shall not exceed 60 rpm.*

20.108 For appliances not used in **public areas** and having automatic loading or unloading function where the appliance tilts backwards or forwards, the drum door is opened automatically and the drum slowly rotates to decant the washed load. Interlocking guards shall be provided to ensure the **operator** is not in the working area of the appliance. The drum speed shall not exceed 60 rpm.

Compliance is checked by the following test:

The appliance is supplied at ***rated voltage*** *and operated empty or filled as specified for* ***normal operation****, whichever is more unfavourable. The drum speed shall not exceed 60 rpm and it shall not be possible for the* ***operator*** *to enter the working area while the appliance is operating.*

21 Mechanical strength

This clause of Part 1 is applicable except as follows:

21.1 *Replace the requirement with the following:*

Appliances and their components and fittings shall have adequate mechanical strength and be constructed to withstand such rough handling that may be expected in normal use, during transportation, assembly, dismantling, scrapping and any other action involving the appliance.

To modify the first sentence of the testing specifications as follows: Compliance is checked by verifying the instruction and by applying blows to the appliance in accordance with test Ehb of EN 60068-2-75, the spring hammer test.

Addition:

21.101 Lids and doors shall have adequate mechanical strength.

Compliance is checked by the test of 21.101.1 for lids and 21.101.2 for doors.

21.101.1 *A rubber hemisphere having a diameter of 70 mm and a hardness between 40 IHRD and 50 IHRD is fixed to a cylinder having a mass of 20 kg and dropped from a height of 100 mm onto the centre of the lid.*

The test is carried out three times, after which the lid shall not be damaged to such an extent that moving parts become accessible.

21.101.2 *A vertically downwards force of 150 N is applied in the most unfavourable position to the door while it is open at an angle of* $90^{o} \pm 5^{o}$*. The force is maintained for 1 min.*

After the test, the appliance *shall not be damaged or deformed to such an extent that compliance with 20.103 to 20.105 is impaired.*

21.102 Lids shall have adequate resistance to distortion.

Compliance is checked by the following test.

A force of 50 N is applied to the open lid in the most unfavourable direction and position.

The test is carried out three times, after which the hinges shall not have worked loose and the appliance *shall not be damaged or deformed to such an extent that compliance with 20.103 to 20.105 is impaired.*

21.103 Hot water or steam that may be emitted during intended use, i. e. opening of a cover by a single manual operation or a ventilation opening, shall not give rise to any hazard.

Compliance is checked by inspection.

21.104 Fluid/gas/steam-containing parts of equipment which in normal use have both of the following characteristics shall not cause a hazard through rupture or leakage:

a) a product of pressure and volume greater than 200 kPa x l;

b) a pressure above 2 MPa.

NOTE Such equipment includes fluid-pressure-actuated equipment employing flexible bellows, diaphragms, Bourdon tubes, etc. and equipment such as flowmeters that are connected to process pressures rated at or above 2 MPa.

Compliance is checked by inspection and by performing the hydrostatic tests of EN 61010:2010, G.2.

22 Construction

This clause of Part 1 is applicable except as follows.

22.6 *Modification to the requirement:*

The requirement relating to leakage from containers, hoses, couplings and similar parts of the appliance is not applicable to parts that withstand the ageing test specified in Annex BB.

Modification to the test specification:

Instead of coloured water, a solution composed of 5 g of the detergent specified in Annex AA per litre of distilled water is used.

Addition:

22.101 Appliances shall be constructed so that when the water level is above the lower edge of the door opening, it shall not be possible to open the door by a simple action while the appliance is operating.

Compliance is checked by inspection and by manual test.

22.102 Appliances shall be constructed so that textile material cannot come into contact with heating elements.

Compliance is checked by inspection.

22.103 Appliances shall be constructed so that during normal use filter compartments cannot be opened by a simple action if this results in an outflow of water having a temperature exceeding 50 °C.

This requirement is not applicable to appliances fitted with filter compartment covers that are

– interlocked,
– opened by means of a key,
– opened by two separate actions such as pushing and turning, or
– opened by rotating by more than 180°.

Compliance is checked by inspection and by manual test. If the filter compartment can be opened, any flow of water shall not exceed 0,5 l/min.

22.104 Lid and door interlocks required for compliance with Clause 20 shall be constructed so that they cannot be forced open in normal use.

Compliance is checked by the following test.

The lid or door is opened as in normal use and the force applied to the handle, or actuating means of the release mechanism, is measured.

The lid and door is closed. The appliance *is supplied at rated voltage and operated for a sufficient period for the interlock to be energised. An attempt is then made to open the lid or door as in normal use. The force applied is gradually increased to five times the measured opening force, with a minimum of 50 N and a maximum of 200 N, over a period of 5 s.*

The test is carried out 300 times at a rate of approximately six times per minute.

The force is then increased to 10 times the measured opening force, with a minimum of 50 N. It shall not be possible to open the lid or door.

NOTE Damage to handles is ignored.

22.105 Any mechanical release mechanism intended to open the loading door after a failure shall only be accessible by using a **tool**.

Compliance is checked by inspection.

22.106 Where the weight, size or shape prevents appliances from being moved manually, they shall be fitted with attachments for lifting gear or be designed so they can be fitted with such attachments, or be shaped in such a way that standard lifting gear can easily be used.

Appliances to be moved manually shall be constructed or shall be equipped so that they can be moved easily and safely.

Compliance is checked by inspection.

22.107 In case of wireless/remote control the appliance shall automatically stop in a fail safe condition when corrupted signals are received or the communication is interrupted for a longer period of time than defined by the related safety routines.

Compliance is checked by tests according to the standards of the used communication technology.

22.108 The fixing systems of fixed **guards** which prevent access to dangerous moving transmission parts shall only be removable with the use of tools.

If such **guards** have to be removed for routine cleaning or maintenance their fixing systems shall remain attached to the fixed **guards** or to the appliance after removal. Where possible, **guards** shall be incapable of remaining in place without their fixings.

The requirement in the above paragraph does not apply if, after removal of the screws, or if the component is incorrectly repositioned, the appliance becomes inoperative.

Movable **guards** shall be interlocked. The interlocking devices shall prevent the start of hazardous appliance functions until the **guards** are fixed in their position, and give a stop command whenever they are no longer closed.

Where it is possible for an **operator** to reach the danger zone before the risk due to hazardous appliance functions has ceased, movable **guards** shall be associated with a **guard** locking device in addition to an interlocking device that

— prevents the start of hazardous appliance functions until the guard is closed and locked, and

— keeps the guard closed and locked until the risk of injury from the hazardous appliance functions has ceased.

Interlocking movable **guards** shall remain attached to the appliance when open and they shall be designed and constructed in such a way that they can be adjusted only by means of an intentional action.

Compliance is checked by inspection.

Interlocking movable **guards** shall be designed in such a way that the absence or failure of one of their components prevents starting or stops the hazardous functions of the appliance

Compliance is checked by inspection and by the tests of 18.101 and 24.1.4.

After this test any defect that may be expected in normal use is applied to the interlock system, including interruption of the supply, only one defect being simulated at a time.

NOTE 1 Examples of defects are the breakage of a spring or a gravity-operated part failing to drop into position.

NOTE 2 Fault conditions applied during the tests of Clause 19 are not repeated.

After these tests the interlock system shall be fit for further use.

22.109 The appliance shall be designed and constructed in such a way that the build-up of potentially dangerous electrostatic charges is prevented. Parts of the appliances that are easily accessible during

intended use and maintenance have to be taken into account.

The insulation resistance between the accessible part and earth shall be sufficiently low so as to avoid a build up of electrostatic charge.

Compliance is checked by measuring the insulation resistance between the drum and the enclosure and between the enclosure and the drive motor rotor shaft, with a d. c. voltage of approximately 500 V applied. The measurement is made 1 min after application of the voltage.

The insulation resistance shall not exceed 1 MΩ.

22.110 The appliance shall be provided with a device to stop the function safely. Such device shall be suitable placed and readily visible. Such device shall also be capable of being locked where an **operator** is unable, from any of the points to which he has access, to check that the energy is still cut off

If the appliance is functionally directly connected with other appliances the stop of each separate part of this assembly shall stop all parts of the assembly.

Compliance is checked by inspection.

22.111 Appliances shall be designed in such a way that incorrect mounting is avoided, if this can lead to an unsafe situation. If this is not possible, information on the correct mounting shall be given directly on the part and/or the enclosure.

Compliance is checked by inspection

22.112 In case of interruption, re-establishment after an interruption or fluctuation in whatever manner of the power supply, the appliance shall not restart, however automatic restarting of the operation is allowed if the appliance may continue to operate, without causing any hazard to the **operator**, from the same point in its operating cycle at which the voltage interruption or fluctuation occurred.

Compliance is checked by inspection.

22.113 Appliances equipped with an automatic loading or unloading function shall not be used in **public areas** and shall have an emergency stop device according to EN 60204-1:2006/A1:2009.

Compliance is checked by inspection.

22.114 Appliances shall be fitted with means to isolate them from all energy sources (e.g. hot water, steam, compressed air). Such isolators shall be clearly identified. They shall be capable of being locked if reconnection could endanger persons.

Such means may be part of the fixed installation external to the appliance.

After the energy source is disconnected, it shall be possible to dissipate any energy remaining or stored in the circuits of the appliance without risk to persons.

Compliance is checked by inspection.

22.115 Controls shall be located in such a way to allow the user of the appliance to have a good view of the appliance and in particular of the door/drum system.

Compliance is checked by inspection.

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 for connection to the water mains shall be at least equivalent to light polyvinyl chloride sheathed flexible cord (code designation 60227 IEC 52).

Compliance is checked by the appropriate test.

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 10 000.

For lid or door interlocks, the number of cycles of operation declared for 6.10 and 6.11 of EN 60730-2-12:2006 shall not be less than 50 000. For appliances *that include a drying function, the minimum number of cycles of operation is increased to 55 000. If the interlock operates more than once during* ***normal operation****, the minimum number of cycles of operation is increased accordingly.*

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

Compliance is checked by inspection.

24.102 Switches complying with EN 61058-1 are not short-circuited during the tests of Clause 19. The tests of EN 61058-1 are carried out under the conditions occurring in the appliances

Lid or door interlock mechanisms which comply with EN.60730-2-12 are not subjected to the fault condition tests of 22.108

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.

27.1 *Addition*:

If the permissible leakage current exceeds 10 mA total, the appliance shall have a supplementary equipotential bonding terminal.

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 not less than 250, unless the insulation is enclosed or located so that it is unlikely to be exposed to pollution during normal use of the appliance due to

– condensation produced by the appliance,

– chemicals, such as detergent or fabric conditioner.

30 Resistance to heat and fire

This clause of Part 1 is applicable except as follows:

30.2 *Addition:*

For appliances *incorporating a programmer or a timer, 30.2.3 is applicable. For other appliances, 30.2.2 is applicable.*

31 Resistance to rusting

This clause of Part 1 is applicable.

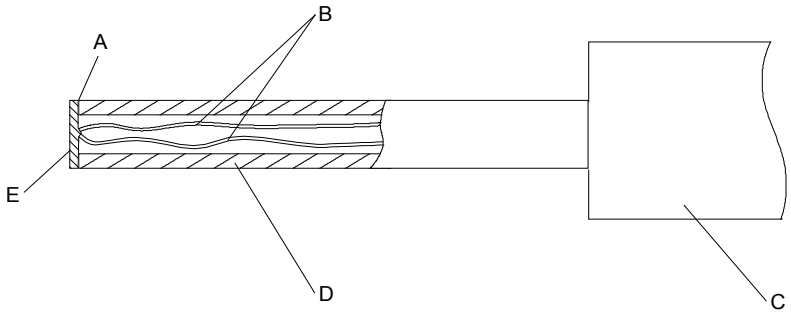
32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable except as follows:

Addition:

For the emissions of electromagnetic fields the limits of EN 62233:2008, Annex B apply.

Compliance is checked by measuring EMF according to EN 62233.



Key

A adhesive

B thermocouple wires 0,3 mm diameter to EN 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 flat.

Figure 101 — Probe for measuring surface temperatures

Annexes

The annexes of Part 1 are applicable except as follows:

Addition of the following annexes:

Annex AA
(normative)

Detergent and rinsing agent

AA.1 Detergent

The detergent specified in the instructions may be used, but if there is any doubt with regards to the test results, the composition of the detergent shall be as follows:

Table AA.1 — Composition of the detergent

Substance	Parts by mass %
Linear sodium alkyl benzene sulphonate (mean length of alkane chain $C_{11,5}$)	6,4
Ethoxylated tallow alcohol (14 EO)	2.3
Sodium soap (chain length $C_{12\ to\ 16}$: 13 % to 26 % and $C_{18\ to\ 22}$: 74 % to 87 %)	2,8
Sodium tripolyphosphate	35,0
Sodium silicate (SiO_2: 76,75 % and Na_2O: 23,25 %)	6,0
Magnesium silicate	1,5
Carboxy methyl cellulose	1,0
Ethylenediamine tetra-acetic-sodium-salt	0,2
Optical whitener for cotton (dimorpholinostilbene type)	0,2
Sodium sulphate (as accompanying substance or added)	16,8
Water	7,8
Sodium perborate tetrahydrate (supplied separately)	20,0

NOTE The composition of the detergent is extracted from EN 60456:2005.

AA.2 Rinsing agent

Any commercially available rinsing agent may be used, but if there is any doubt with regards to the test results, the composition of the rinsing agent shall be as follows:

Table AA.2 — Rinsing agent

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

The rinsing agent has the following properties:

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

NOTE The composition of the rinsing agent is extracted from EN 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 document and does not constitute an endorsement by IEC of the product named.

Annex BB
(normative)

Ageing test for elastomeric parts

The ageing test on elastomeric parts is carried out by measuring their hardness and mass before and after immersion in a solution of detergent at elevated temperature.

The test is carried out on at least three samples of each part. The samples and test procedure are as specified in ISO 1817, with the following modifications:

4 Test liquids

The liquid is obtained by dissolving 5 g of the detergent specified in Annex AA per litre of distilled water.

The total mass of the test pieces immersed shall not exceed 100 g for each litre of solution. The test pieces are completely immersed with their entire surface freely exposed to the solution. During the tests, the test pieces shall not be exposed to direct light. Test pieces of different compounds shall not be immersed in the same solution at the same time.

5 Test pieces

5.4 Conditioning

The temperature is 23 °C ± 2 °C and the relative humidity is (50 ± 5) %.

6 Immersion in the test liquid

6.1 Temperature

The solution is heated within 1 h with the test pieces immersed, to a temperature of 75^{+5}_{0} °C and maintained at this value. The solution is renewed every 24 h and heated in the same way.

To avoid undue evaporation of the solution, it is recommended to use a closed-circuit system or similar method for renewing the solution.

6.2 Duration

The test pieces are immersed for a total period of 48^{+1}_{0} h.

The test pieces are then immediately immersed in a fresh solution, which is maintained at ambient temperature. The pieces are immersed for 45 min ± 15 min.

After having been removed from the solution, the test pieces are rinsed in cold water at 15 °C ± 5 °C and then dried with blotting paper.

7 Procedure

7.2 Change in mass

The increase in mass of the test pieces shall not exceed 10 % of the value determined before immersion.

7.6 Change in hardness

The micro-test for hardness applies.

The hardness of the test pieces shall not have changed by more than 8 IRHD. Their surface shall not have become sticky and shall show no crack visible to the naked eye or any other deterioration.

Annex CC
(normative)

Emission of acoustical noise

CC.1 Noise reduction

Noise reduction for appliances is an integral part of the design process and shall be achieved by applying measures to control noise at the source, see for example EN ISO 11688-1.

The success of the applied noise reduction measures is assessed on the basis of the actual noise emission values in relation to other appliances of the same type.

CC.2 Noise test code

CC.2.1 Emission sound pressure level determination

The A-weighted emission sound pressure level shall be measured in accordance with EN 11201, grade 2. The microphone is placed at a distance of 1 m from (middle/centre) of the control board of the appliance at a height of 1,55 m ± 0,075 m.

In cases where the sound power level of washing machines is determined, EN ISO 11203 shall be applied for determining the A-weighted emission sound pressure level by following the procedure given in 6.2.3 d) with d=1m.

Measurements shall be done by time averaging over the whole duration of the program sequence selected.

CC.2.2 Sound power level determination

The A-weighted sound power level shall be measured in accordance with EN ISO 3744 or EN ISO 9614-2, grade 2. When applying EN ISO 3744 or EN ISO 9614-2 the parallelepiped measurement surface shall be used. If grade 2 cannot be applied EN ISO 3746 or EN ISO 9614-2, grade 3 shall be used. In this case the test report shall state the reasons why it was not possible to apply the grade 2 method.

Measurements shall be done by time averaging over the whole duration of the program sequence selected.

CC.2.3 Mounting and installation conditions

The tests are carried out with the appliance installed according EN 60704-1:2010, 6.5.1 or 6.5.3 or 6.5.5.

Care shall be taken that any electrical connections, piping or air ducts connected to the appliance do not significantly contribute to the noise emission of the appliance.

The installation conditions of the appliance are the same for determining both the emission sound pressure level and the sound power level.

CC.2.4 Operating conditions

The appliance is supplied at **rated voltage** and operated under **normal operation** at maximum speed during spinning function as specified in Clause 11.7 for one cycle/programm sequence generating the highest noise emission. The appliance is filled with textile material having a mass in the dry condition equal to the maximum mass stated in the instruction.

The operating conditions are the same for determining both the emission sound pressure level at the specified positions and the sound power level.

The conditions of normal operation are defined in 3.1.9

The most unfavourable program sequences causing the highest noise emission has to be investigated.

The product under test may have different program sequences if a programmer is used.

NOTE To specify detailed operating conditions is not possible.

CC.2.5 Measurement uncertainties

The total measurement uncertainty of the noise emission values determined according to this standard is depending on the standard deviation σ_{R0} given by the applied noise emission measurement method and the uncertainty associated with the instability of the operating and mounting conditions σ_{omc}. The resulting total uncertainty is then calculated from:

$$\sigma_{tot} = \sqrt{\sigma_{R0}^2 + \sigma_{omc}^2}$$

The upper bound value of σ_{R0} is about 1,5 dB for the grade 2 measurement methods dealing with the determination of the emission sound pressure level or the sound power level.

For appliances with a rather constant noise emission a value of 0,5 dB for σ_{omc} can apply. In other cases, e.g. a large influence of the arrangement of the textile material in the drum which may vary in an unpredictable manner, it is possible that a value of 2 dB may be more appropriate. Methods to determine σ_{omc} are described in the basic measurement standards.

The expanded measurement uncertainty U, in decibels, shall be calculated from $U = k\,\sigma_{tot}$, with k the coverage factor.

NOTE 1 The expanded measurement uncertainty depends on the degree of confidence that is desired. For the purpose of comparing the result with a limit value, it is appropriate to apply the coverage factor for a one-sided normal distribution. In that case, the coverage factor k = 1,6 corresponds to a 95 % confidence level. Further information is given in EN ISO 4871. Please note that the expanded measurement uncertainty U is denoted as K in EN ISO 4871.

NOTE 2 The expanded measurement uncertainty as described in this European Standard does not include the standard deviation of production which is used in EN ISO 4871 for the purpose of making a noise declaration for batches of machines.

CC.2.6 Information to be recorded

The information to be recorded covers all the technical requirements of this noise test code. Any deviations from this noise test code or from the basic standards upon which it is based are to be recorded together with the technical justification for such deviations.

CC.2.7 Information to be reported

The information to be given in the test report shall include

- the data required by the manufacturer for inclusion in the noise declaration,
- the data required by the user to verify the declared values.

Thus the following information shall be included:

- reference to the noise test code and the basic noise emission standards used;
- description of the installation and operation conditions used;
- location of the **work station(s**) and other specified positions;
- the noise emission values obtained.

The test report shall state that all requirements of the noise test code have been fulfilled, or, if this is not the case, it shall identify any unfulfilled requirements. Deviations from the requirements shall be stated and a technical justification for these deviations shall be given.

CC.2.8 Declaration and verification of noise emission values

The declaration of the noise emission values shall be made as a dual number noise emission declaration according to EN ISO 4871.

It shall declare the emission sound pressure level L_{pA} and the respective uncertainty K_{pA} and, if required, additionally the sound power level L_{WA} with its uncertainty K_{WA}.

NOTE K_{pA} and K_{WA} are expected to be 2,5 dB for grade 2 and 4 dB for grade 3 measurements.

The noise emission declaration shall state that the noise emission values have been obtained according to this noise test code. Any deviations from this noise test code or from the basic standards upon which it is based shall be clearly indicated.

Additional noise emission values may also be given in the declaration.

If undertaken, verification of the noise emission values shall be conducted according to EN ISO 4871, using the same mounting, installation and operating conditions as those used for the initial determination.

Annex ZE
(informative)

Specific additional requirements for appliances and machines intended for commercial use

This annex of Part 1 is not applicable.

Replace the Annex ZZ of Part 1 by the following new annex:

Annex ZZ
(informative)

Coverage of Essential Requirements of EU Directives

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and within its scope the standard covers all relevant essential requirements as given in Annex I of the EU Directive 2006/42/EC.

Compliance with this standard provides one means of conformity with the specified essential requirements of the Directive concerned.

WARNING - Other requirements and other EU Directives may be applicable to the products falling within the scope of this standard.

Bibliography

The bibliography of Part 1 is applicable except as follows:

Addition:

HD 384 (all parts), *Electrical installations of buildings (IEC 60364, all parts)*

EN 50242/EN 60436:2008, *Electric dishwashers for household use — Methods for measuring the performance (IEC 60436:2004, modified)*

EN 50570, *Household and similar electrical appliances — Safety — Particular requirements for commercial electric tumble dryers*

EN 60456:2005, *Clothes washing machines for household use — Methods for measuring the performance (IEC 60456:2003, modified)*

EN 60584-1, *Thermocouples — Part 1: Reference tables (IEC 60584-1)*

EN 61010-1:2010, *Safety requirements for electrical equipment for measurement, control, and laboratory use — Part 1: General requirements (IEC 61010-1:2010 + corrigendum May 2011)*

EN ISO 4180:2010, *Packaging — Complete, filled transport packages — General rules for the compilation of performance test schedules (ISO 4180:2009)*

EN ISO 10472-2, *Safety requirements for industrial laundry machinery — Part 2: Washing machines and washer-extractors (ISO 10472-2)*

EN ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 13732-1, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces (ISO 13732-1)*

HD 60364-1, *Low-voltage electrical installations — Part 1: Fundamental principles, assessment of general characteristics, definitions (IEC 60364-1)*

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