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**APPLICATION FOR LOW VOLTAGE DIRECTIVE**

**On Behalf of**

**Guangzhou DuroWelder Limited**

**PORTABLE INDUCTION HEATER**

**KIA-1.1KW Plus**

**Other models see the list on Page 3 of the report**

**Prepared for :** Guangzhou DuroWelder Limited  
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**Date of Test:** Aug.20,2023-Aug.28,2023

**Date of Report:** Aug.28,2023

**Report Number:** EZT20230828423SR



Test Report
EN60335-2-45

Household and similar electrical appliances-safety
part 1:General requirements
Part 2-45: Particular requirements for portable heating tools and similar appliances

Report reference No ..... EZT20230828423SR

Tested by (+ signature) ..... Jack Zhang



Approved by (+ signature)..... Steven

Date of issue ..... Aug.28,2023

Testing Laboratory Name ..... Shenzhen EZT Testing Technology Co., Ltd.

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Testing location ..... CBTL [ ] CCATL [ ] SMT [ ] TMP [ ]

Address ..... Same as above.

Applicant's Name ..... Guangzhou DuroWelder Limited

Address ..... No.76, Chuangyu Road, Xintang Street, Zengcheng District, Guangzhou City 511358

Standard..... EN 60335-2-45:2002 + A1:2008+A2:2012
EN 60335-1:2012+A11:2014+A13:2017+A1:2019+A14:2019+A2:2019
+A15:2021
EN 62233:2008

Test procedure ..... Test report

Procedure deviation ..... N/A

Non-standard test method ..... N/A

Test item description ..... PORTABLE INDUCTION HEATER

Manufacturer ..... Guangdong DuroPower Industries Limited

Manufacturer address ..... Durowelder Industrial Zone, Huzhen Street, Boluo District 516139, Huizhou City, China

Trade Mark ..... DuroPower, DuroWelder

Model and/or type reference ..... KIA-1.1KW Plus

Rating(s) ..... 230-240V~ 50/60Hz 1100W

Other Model..... KIA-1KW, KIA-1.2KW, DW-1KW, DW-1.1KW, DW-1.2KW, DW-1.5KW, DW-1.8KW, DW-2KW, DW-5KW, DW-7KW, DH-18KW, DH-25KW, DIH-1.5KW, DIH-1.75KW, DIH-2KW, DIH-3.5KW, DIH-5KW, DIH-15KW, SIH-3KW, SIH-4KW, KIH-15KVA, KIH-25KVA, KIH-30KVA, KIH-40KVA, KIH-60KVA, KIH-80KVA



<b>Test item particulars :</b>	
Equipment mobility .....	Portable equipment
Operating condition.....	Continuous
Tested for IT power systems .....	N/A
IT testing, phase-phase voltage (V) .....	N/A
Class of equipment .....	Class I
Protection against ingress of water .....	IP20
<b>Test case verdicts:</b>	
Test case does not apply to the test object .....	N(/A.)
Test item does meet the requirement.....	P(ass)
Test item does not meet the requirement.....	F(ail)
Testing:	
<b>Date of receipt of test item</b> :	Aug.20,2023-Aug.28,2023
Date(s) of performance of test :	Aug.28,2023



**Mark Label**

**PORTABLE INDUCTION HEATER**  
Model: KIA-1.1KWPlus  
Rated: 230-240~ 50/60Hz 1100W

Guangdong DuroPower Industries Limited  
**MADE IN CHINA**



<p><b>General remarks:</b></p> <p>"(see remark #)" refers to a remark appended to the report. "(see appended table)" refers to a table appended to the report. Throughout this report a comma is used as the decimal separator.</p> <p>The test results presented in this report relate only to the object tested.</p> <p>This report shall not be reproduced except in full without the written approval of the testing laboratory.</p> <p>When determining the test conclusion, the Measurement Uncertainty of test has been considered.</p> <p>Unless otherwise specified, test are made under normal conditions at an ambient temperature within the range of 15°C to 35°C, RH45% to 75% and an air pressure of 860mbar of 1060mbar</p>	<p>Attachment with:</p> <ol style="list-style-type: none"><li>1. EN62233:2008 Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure</li><li>2. Equipment list</li><li>3. photo documentation</li></ol>
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EN 60335-2-45			
Clause	Requirement - Test	Result - Remark	Verdict

5	GENERAL CONDITIONS FOR THE TESTS		P
	Tests performed according to Cl. 4, e.g. nature of supply, sequence of testing, etc.		P
5.2	An additional sample of a contact firelighter is required for the test of 21.102(EN60335-2-45)		N/A

6	CLASSIFICATION		P
6.1	Appliances shall be of one of the following classes with respect to protection against electric shock: class I, class II, class III.	Class I	P
	Dehornig tools shall be class II or class III(EN60335-2-45)		N/A
	Other appliance shall be class I, class II or class III(EN60335-2-45)	Class I appliance	P
6.2	Appliances shall have the appropriate degree of protection against harmful ingress of water		P

7	Marking and instructions		P
7.1	rated voltage or rated voltage range	See marking table	P
	symbol for nature of supply, unless the rated frequency is marked		P
	rated power input in watts or rated current in amperes	See marking table	P
	name, trade mark or identification mark of the manufacturer or responsible vendor	See marking table	P
	model or type reference	See marking table	P
	symbol IEC 60417-5172 (2003-02) for class II appliances only	See marking table	P
	IP number according to degree of protection against ingress of water, other than IPX0	IP20	P



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
	Contact firelighters shall be marked with the limit of insertion into the fuel (EN60335-2-45)		N/A
	Contact firelighters that are not at least IPX4 shall be marked with the substance of the following (EN60335-2-45)		N/A
	Thermoplastic conduit-welding tools shall be marked with the types of fittings with which they are to be used and with the corresponding setting. each fitting shall be marked with the type of appliance with which it is to be used and with its own type reference(EN60335-2-45)		P
7.2	Stationary appliances for multiple supply shall be marked with the substance of the following		N/A
	Before obtaining access to terminals, all supply circuits must be disconnected. This warning shall be placed in the vicinity of the terminal cover		N/A
7.3	Range of rated values correctly marked		N/A
7.4	Voltage setting clearly discernible		N/A
7.5	Marking of rated input for each rated voltage		N/A
	Marking for upper and lower limits of rated input		N/A
7.6	Correct symbols used		P
7.7	Correct connection diagram, fixed to the appliance		N/A
7.8	Not for type Z attachment:		N/A
	- marking of terminals for the neutral conductor (N)		N/A
	- marking of earthing terminals		N/A
	- marking not placed on removable parts		N/A
	- marking of terminal for single-pole protective device		N/A
7.9	Marking or placing of switches which may cause a hazard	Switches did not cause a hazard	N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
7.10	Indications of switches and regulating devices by use of figures, letters or other		P
	The figure 0 indicates only OFF position, unless no confusion with the OFF position		P
7.11	Indication for direction of adjustment of controls		N/A
7.12	Instructions for safe use provided		P
	The instructions for appliance having a separate stand and not incorporating a biased-off switch shall include the substance of the following(EN60335-2-45)		P
	WARNING: this tools must be placed on its stand when not in use(EN60335-2-45)		N/A
	The instructions for class III dehorning tools shall include the substance of the following (EN60335-2-45)		N/A
	WARNING: only use the transformer provided (EN60335-2-45)		N/A
	The instructions for heat guns and hand-held paint strippers shall include the substance of the following(EN60335-2-45)		N/A
	The instructions for firelighters shall include the substance of the following (BS EN60335-2-45)		N/A
	The instructions for thermoplastic conduit-welding tools Shall state that welding operation must not be repeated on fitting since this can result in live parts becoming accessible(EN60335-2-45)		P
7.12.1	Sufficient details for installation or maintenance supplied		P
		No connector to the water mains	N/A
7.12.2	Means for disconnection with contact separation at least 3 mm		N/A
7.12.3	Insulation in contact with parts exceeding 50 K; instruction		N/A
7.12.4	Information with regard to building-in:		N/A
	- dimensions of space		N/A
	- dimensions and position of support		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
	- ventilation openings		N/A
	- connection/interconnection plug accessible		N/A
7.12.5	Replacement cord, type X attachment		N/A
	Replacement cord, type Y attachment		N/A
	Replacement cord, type Z attachment		N/A
7.12.6	The instructions for heating appliances incorporating a non-self-resetting thermal cut-out		N/A
7.12.7	The instructions for fixed appliances shall state how the appliance is to be fixed to its support		N/A
7.12.8	The instructions for appliances connected to the water mains shall state		N/A
	the maximum inlet water pressure, in pascals		N/A
	the minimum inlet water pressure, in pascals, if this is necessary for the correct operation of the appliance		N/A
7.13	Instructions and other texts in official language		P
7.14	Marking easily legible and durable		P
7.15	Marking on a main part		P
	Marking clearly discernible from outside		P
	Stationary appliance: name or trademark and model or type reference visible after installation		P
	Indication for switches and controls in vicinity of components; not on removable parts if misleading		P
7.16	Marking of a possible replaceable thermal link or fuse link clearly visible with regard to replacing the link.		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
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8	PROTECTION AGAINST ACCESSIBILITY TO LIVE PARTS		P
8.1	Adequate protection against accidental contact with live parts		P
8.1.1	All positions; detachable parts removed		P
	Removal of lamps: protection against contact with live parts		N/A
	Use of test finger: no contact with live parts		N/A
8.1.2	Use of test pin: no contact with live parts		P
8.1.3	Use of test probe 41 : no contact with live parts of visible glowing heating elements	No visible glowing heating elements	N/A
8.1.4	Accessible part not considered live if:		N/A
	- extra-low a.c. voltage: peak values not exceeding 42,4 V		N/A
	- extra-low d.c. voltage: not exceeding 42,4 V		N/A
	- or separated from live parts by protective impedance, d.c. current not exceeding 2 mA		N/A
	- or separated from live parts by protective impedance, a.c. peak value not exceeding 0,7 mA		N/A
	- for peak value 42,4 V up to and including 450 V capacitance not exceeding 0,1 $\mu$ F		N/A
	- for peak value 450 V up to and including 15 kV capacitance not exceeding 0,1 $\mu$ F		N/A
8.1.5	Live parts of built-in appliances, fixed appliances and appliances delivered in separate units, shall be protected at least by basic insulation before installation or assembly.		N/A
	- built-in appliances		N/A
	- fixed appliances		N/A
	- separate units		N/A



EN 60335-2-45			
Clause	Requirement - Test	Result - Remark	Verdict

8.2	Class II appliances and constructions adequately protected against accidental contact with basic insulation and metal parts separated from live parts with only basic insulation		P
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10	POWER INPUT AND CURRENT		P
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10.1	Power input at rated voltage and normal operating temperature not deviating from rated input by more than shown in table; measured power input (W); rated input (W); deviation .....	(see appended table)	P
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10.2	Current at normal operating temperature not deviating from rated current by more than shown in table; measured current at rated voltage under normal operation (A); rated current (A); deviation .....		N/A
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11	HEATING		P
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11.1	No excessive temperatures in normal use		P
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11.2	Hand-held appliances are held in their normal position of use		N/A
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	With pins for insertion into socket-outlets are plugged into an appropriate wallmounted socket-outlet		N/A
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	Built-in appliances are installed in accordance with the instructions		N/A
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	Other heating appliances and other combined appliances are placed in a test corner		N/A
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**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
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	appliances normally fixed to a wall are fixed to one of the walls, as near to the other wall and floor or ceiling as is likely to occur, taking into account the instructions		N/A
	appliances normally fixed to a ceiling are fixed to the ceiling as near to the walls as is likely to occur, taking into account in the instructions		N/A
	Other motor-operated appliances are positioned as follows		N/A
	placed on a floor or table in use are placed on a horizontal support		P
	fixed to a wall are fixed to a vertical support		N/A
	fixed to a ceiling are fixed underneath a horizontal support		N/A
11.3	Temperature rises determined by thermocouples or resistance method	By thermocouples	P
11.4	Soldering guns and other appliances operation through a transformers are supplied at 1.06 time rated voltage(EN60335-2-45)		
11.5	Motor-operated appliances operated under normal operation at most unfavourable voltage between 0,94 and 1,06 times rated voltage		N/A
11.7	Operation duration corresponding to the most unfavourable conditions of normal use		P
	Contact firelighters are operated for 30min,Hot-air firelighters are operated for 10min(EN60335-2-45)		N/A
11.8	During the test, the temperature rises are monitored continuously and shall not exceed the values shown in Table 3	(see appended table)	P
	Protective devices shall not operate and sealing compound shall not flow out		P
	The temperature rise limit specified in table 3 for pure mica and tightly sintered ceramic material is increased to 600K(EN60335-2-45)		N/A

13	LEAKAGE CURRENT		P
13.1	Leakage current not excessive and electric strength adequate		P



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
	Appliances supplied by transformer are tested as motor-operated appliances(EN60335-2-45)		P
13.2	Leakage current measured by means of circuit described in Annex G		P
	Leakage current measurements		P
13.3	Electric strength test of insulation		P
	No breakdown during the test		P
15	MOISTURE RESISTANCE		P
15.1	Enclosure provides the degree of moisture protection according to classification of appliance	IP20	N/A
15.1.1	Appliance subjected to test as specified		N/A
	Withstand electric strength test specified in 16.3		N/A
	No trace of water on insulation which can result in a reduction of distances and clearances below values specified in 29.1		N/A
15.1.2	Hand-held appliance turned continuously through the most unfavourable positions during the test		N/A
	Built-in appliance installed according to the manufacturer's instruction		N/A
	Other appliances tested as specified		N/A
15.3	Humidity treatment for 48 h	93%, 25 °C, 48hrs	P
	Withstanding the test of Cl. 16		P



EN 60335-2-45			
Clause	Requirement - Test	Result - Remark	Verdict

15.101	Household film-welding appliance having a suction device shall be constructed so that suction of liquid does impair electrical insulation(EN60335-2-45)		P
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16	LEAKAGE CURRENT AND ELECTRIC STRENGTH		P
16.1	No excessive leakage current and adequate insulation and electric strength (tests 16.2 and 16.3)		P
16.2	Leakage current measurements		P
16.3	Electric strength tests (values in table 5)		P
16.101	High-voltage transformers shall have adequate internal insulation		N/A

17	OVERLOAD PROTECTION OF TRANSFORMERS AND ASSOCIATED CIRCUITS		N/A
	No excessive temperatures in transformer or associated circuits in event of short-circuits likely to occur in normal use		N/A
	Appliance supplied with 1,06 or 0,94 times rated voltage and the most unfavourable short-circuit or overload likely to occur in normal use applied		N/A
	Temperature rise of insulation of the conductors of safety extra-low voltage circuits not exceeding the relevant value specified in table 3 by more than 15 K		N/A
	Temperature of the winding not exceeding the value specified in table 6		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
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19	ABNORMAL OPERATION		P
19.1	Appliances shall be constructed so that as a result of abnormal or careless operation, the risk of fire, mechanical damage impairing safety or protection against electric shock is obviated as far as is practicable		P
	For heating guns and hot-air firelighters, compliance is also checked by the test of 19.101(EN60335-2-45)		N/A
	Electronic circuits shall be designed and applied so that a fault condition will not render the appliance unsafe with regard to electric shock, fire hazard, mechanical hazard or dangerous malfunction		P
19.2	Test of appliance with heating elements with restricted heat dissipation; test voltage (V): power input of 0.85 times rated power input :		N/A
	Appliances are operated under the condition specified in clause 11 but supplied at 0.94 times rated voltage. however, appliances in which the heating element is parts of the secondary circuit of a transformers are operated continuously for 30min unless they incorporate a biased-off-switch. in which case they are operated for 5 min firelighters are operated for 2h without adding fuel. (EN60335-2-45)		N/A
	Paint strippers incorporating integral scrapers are held horizontally in clamp over the entire length of the handle a force of 70N is exerted on the scraper edge in the direction corresponding to normal use (EN60335-2-45)		N/A
19.3	Test of 19.2 repeated; test voltage (V): power input of 1.06times rated power input (EN60335-2-45)		P
19.4	The appliance is tested under the conditions specified in Clause 11. Any control that limits the temperature during the test of Clause 11 is short-circuited		P
	Thermoplastic conduit-welding tools are operated with the fastest possible sequence of welding operations(EN60335-2-45)		P
19.5	Test of 19.4 repeated on Class 0I and I appliances with tubular sheathed or embedded heating elements. No short-circuiting, but one end of the element connected to the elements sheath		N/A
	The test repeated with reversed polarity and the other end of the heating element connected to the sheath		N/A
	The test is not carried out on appliances intended to be permanently connected to fixed wiring and on appliances where an all-pole disconnection occurs during the test of 19.4		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
19.6	Appliances with PTC heating elements are supplied at rated voltage until steady conditions with regard to power input and temperature are established	No PTC heating	N/A
19.7	Stalling test by locking the rotor if the locked rotor torque is smaller than the full load torque or locking moving parts		N/A
	Locked rotor, motor capacitors open circuited or short-circuited, if required		N/A
	Appliances with timer or controller supplied with rated voltage for each of the tests, for a period equal to the maximum period allowed		N/A
	Test period at rated voltage (s or min) or until steady state conditions established .....	Steady state conditions established	P
	Winding temperatures not exceeding limiting temperature; type of appliance; insulation class; measured temperature (°C) .....		P
19.8	Three-phase motors operated at rated voltage with one phase disconnected		N/A
19.10	Series motor operated at 1,3 times rated voltage for 1 min Parts not ejected from the appliance during test		N/A
19.11	Electronic circuits, compliance checked by evaluation of the fault conditions specified in 19.11.2 for all circuits or parts of circuits, unless they comply with the conditions specified in 19.11.1		P
19.11.1	Before applying the fault conditions a) to f) in 19.11.2, it is checked if circuits or parts of circuit meet both of the following conditions:		P
	the electronic circuit is a low-power circuit, that is, the maximum power at low-power points does not exceed 15 W according to the tests specified		N/A
	the protection against electric shock, fire hazard, mechanical hazard or dangerous malfunction in other parts of the appliance does not rely on the correct functioning of the electronic circuit		N/A
19.11.2	Fault conditions applied one at a time, the appliance operated under conditions specified in Cl. 11, but supplied at rated voltage, the duration of the tests as specified:		P
	a) short-circuit of creepage distances and clearances between live parts of different potential, if these distances are less than the values specified in 29.1, unless the relevant part is adequately encapsulated		P
	b) open circuit at the terminals of any component		P



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
	c) short-circuit of capacitors, unless they comply with EN384-14 or 14.2 of EN65		P
	d) short-circuit of any two terminals of an electronic component, other than integrated circuits. This fault condition is not applied between the circuits of an optocoupler		N/A
	e) failure of triacs in the diode mode		N/A
	f) failure of an integrated circuit. In this case the possible hazardous situations of the appliance are assessed to ensure that safety does not rely on the correct functioning of such a component		N/A
	During and after each test the following is checked:		---
	- the temperature rise of the windings do not exceed the values specified in table 6		P
	- the appliance complies with the conditions specified in 19.13		P
	- live parts not accessible to the test finger or test pin as specified in Cl. 8		P
	- any current flowing through protective impedance not exceeding the limits specified in 8.14		P
	If a conductor of a printed board becomes open circuited, the appliance is considered to have withstood the particular test, provided all three of the following conditions are met:		---
	- the material of the printed circuit board withstands the burning test of 20.1 of EN65		N/A
	- any loosened conductor does not reduce the creepage distances or clearances between live part and accessible metal parts		N/A
	- the appliance withstands the tests of 19.11.2 with open circuited conductor bridged		N/A
19.12	If the safety of the appliance for any of the fault conditions specified in 19.11.2 depends on the operation of a miniature fuse-link complying with EN127, the test is repeated, measuring the current flowing through the fuse-link; measured current (A); rated current of the fuse-link (A) .....		N/A
19.13	During the tests the appliance does not emit flames, molten metal, poisonous or ignitable gas in hazardous amounts		P
	Temperature rises not exceeding the values shown in table 7		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
	Enclosures not deformed to such an extent that compliance with Cl. 8 is impaired		P
	Appliance still operable and complying with 20.2		P
	Appliance, other than Class III, withstands the electric strength test of 16.3, however, the test voltage being:		P
	- basic insulation: 500 V		P
	- supplementary insulation: 1750 V		N/A
	- reinforced insulation: 3000 V		N/A
19.101	Heating guns and hot-air firelighters are operated as specified in clause 11 until steady condition are established. the voltage at the terminals of the motor is then reduced until the running speed of the motor is just sufficient to prevent the thermal cut out from operating, the power input to the heating element maintained at 1.15 times rated power input(EN60335-2-45)		N/A
	1V per minute, for motor having a working voltage not exceeding 30V(EN60335-2-45)		N/A
	5V per minute, for motor having a working voltage not exceeding 30V		N/A

20	STABILITY AND MECHANICAL HAZARDS		P
20.1	Adequate stability		P
	Tilting test through an angle of 10° (appliance placed on an inclined plane/horizontal plane); appliance does not overturn		P
	The test is repeated on appliances with heating elements with the angle of inclination increased to 15°. If the appliance overturns in one or more positions, it is subjected to the tests of Clause 11 in each of these overturned positions		N/A
	Hand-held appliances are subjected to the test while placed on their stands(EN60335-2-45)		P



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
20.2	Moving parts adequately arranged or enclosed as to provide protection against personal injury		P
	Protective enclosures, guards and similar parts are non-detachable		P
	Adequate mechanical strength and fixing of protective enclosures		P
	Self-resetting thermal cut-outs and overcurrent protective devices not causing a hazard, if unexpectedly reclosed		P
	Not possible to touch dangerous moving parts with test finger		P

21	MECHANICAL STRENGTH		P
	Appliance has adequate mechanical strength and is constructed as to withstand rough handling		P
	No damage after three blows applied to various parts of the enclosure, impact energy $0,5 \pm 0,04$ J		P
	If necessary, supplementary or reinforced insulation subjected to the electric strength test of 16.3		P
	If necessary, repetition of groups of three blows on a new sample		P
21.101	The supply cord of hand-held appliances is cut to length of 100mm,measure form the point where the cord, or cord guard,enters the appliances (EN60335-2-45)		P
	The appliances is drop from a height of 1m on to hardwood base having a thickness of 50mm(EN60335-2-45)		P
21.102	The handle of a new concact firelighters is held firmly between two lightly padded surface with the heating element in a horizontal plane,the firelighters is supplied at reate voltage.after 3min a mass of 4.5kg is suspended at the end of the heating element for it is straightened to its original position(EN60335-2-45)		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
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22	CONSTRUCTION		P
22.1	Appliance marked with the first numeral of the IP system: relevant requirements of EN529 are fulfilled	IP20	
22.2	Stationary appliance: means to provide all-pole disconnection from the supply provided, the following means being available:		N/A
	- a supply cord fitted with a plug		N/A
	- a switch complying with 24.3		N/A
	- a statement in the instruction sheet that a disconnection incorporated in the fixed wiring is to be provided		N/A
	- an appliance coupler		N/A
22.3	Appliance provided with pins: no undue strain on socket-outlets		P
	Applied torque not exceeding 0,25 Nm		P
	The appliance is placed in a heating cabinet for 1 h at a temperature of 70 °C±2 °C. The appliance is then removed from the heating cabinet and a pull force of 50 N is immediately applied for 1 min to each pin along their longitudinal axes		P
	When the appliance has cooled down to room temperature, the pins shall not have been displaced by more than 1 mm		P
22.4	Appliance for heating liquids and appliance causing undue vibration not provided with pins for insertion into socket-outlets		N/A
22.5	No risk of electric shock when touching the pins of the plug	.No charged capacitor	P
22.6	Electrical insulation not affected by condensing water or leaking liquid		N/A
	Electrical insulation of Class II appliances not affected in case of a hose rupture or seal leak		N/A
22.8	Electrical connections not subject to pulling during cleaning of compartments to which access can be gained without the aid of a tool, and which are likely to be cleaned in normal use	No such connections.	N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
22.9	Insulation, internal wiring, windings, commutators and slip rings not exposed to oil, grease or similar substances		P
	Adequate insulating properties of oil or grease to which insulation is exposed		N/A
22.10	Location or protection of reset buttons of non-self-resetting controls is so that accidental resetting is unlikely		N/A
22.11	Reliable fixing of non-detachable parts which provide the necessary degree of protection against electric shock, moisture or contact with moving parts		P
	Obvious locked position of snap-in devices used for fixing such parts		P
	No deterioration of the fixing properties of snap-in devices used in parts which are likely to be removed during installation or servicing		N/A
	Parts that are likely to be removed during installation or servicing are disassembled and assembled 10 times before the test is carried out		N/A
	The test is applied to all parts that are likely to be detachable whether or not they are fixed by screws, rivets or similar parts		N/A
	push force, 50 N;		P
	pull		P
	if the shape of the part is such that the fingertips cannot easily slip off, 50 N;		P
	if the projection of the part that is gripped is less than 10 mm in the direction of removal, 30 N		N/A
22.12	Handles, knobs etc. fixed in a reliable manner		N/A
	Fixing in wrong position of handles, knobs etc. indicating position of switches or similar components not possible		N/A
	Axial force 15 N applied to parts, the shape of which being so that an axial pull is unlikely to be applied		N/A
	Axial force 30 N applied to parts, the shape of which being so that an axial pull is likely to be applied		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
22.13	Unlikely that handles, when gripped as in normal use, make the operators hand touch parts having a temperature rise exceeding the value specified for handles which are held for short periods only		N/A
22.14	No ragged or sharp edges creating a hazard for the user in normal use, or during user maintenance		P
	No exposed pointed ends of self tapping screws etc., liable to be touched by the user in normal use or during user maintenance		P
22.15	Storage hooks and the like for flexible cords smooth and well rounded		P
22.16	Automatic cord reels cause no undue abrasion or damage to the sheath of the flexible cord, no breakage of conductors strands, no undue wear of contacts		N/A
	Cord reel tested with 6000 operations, as specified		N/A
	Electric strength test of 16.3, voltage of 1000 V applied		N/A
22.17	Spacers not removable from the outside by hand or by means of a screwdriver or a spanner	No such spacers	N/A
22.18	Current-carrying parts and other metal parts resistant to corrosion under normal conditions of use		P
22.19	Driving belts not used as electrical insulation	No driving belts	N/A
22.20	Direct contact between live parts and thermal insulation effectively prevented, unless material used is non-corrosive, non-hygroscopic and non-combustible		N/A
22.21	Wood, cotton, silk, ordinary paper and fibrous or hygroscopic material not used as insulation, unless impregnated	No such material.	P
22.22	Asbestos not used in the construction of the appliance	No asbestos	P
	Asbestos is used, but the liberation of dust of impregnated asbestos or of asbestos fibres into the surrounding air adequately prevented		P
22.23	Oils containing polychlorinated biphenyl (PCB) not used	No oils	P
22.26	The insulation between parts operating at safety extra-low voltage and other live parts complies with the requirements for double or reinforced insulation		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
22.27	Parts connected by protective impedance separated by double or reinforced insulation		N/A
22.28	Metal parts of Class II appliances conductively connected to gas pipes or in contact with water: separated from live parts by double or reinforced insulation		N/A
22.29	Class II appliances permanently connected to fixed wiring so constructed that the required degree of protection against electric shock is maintained after installation		N/A
22.30	Parts serving as supplementary or reinforced insulation fixed so that they cannot be removed without being seriously damaged, or		N/A
	so constructed that they cannot be replaced in an incorrect position, and so that if they are omitted, the appliance is rendered inoperable or manifestly incomplete		N/A
22.31	Creepage distances and clearances over supplementary and reinforced insulation not reduced below values specified in 29.1 as a result of wear		N/A
	Creepage distances and clearances over supplementary or reinforced insulation not reduced to less than 50% of values specified in 29.1 if wires, screws etc. becomes loose		N/A
22.32	Supplementary and reinforced insulation designed or protected against deposition of dirt or dust		N/A
	Ceramic material not tightly sintered, similar material or beads alone not used as supplementary or reinforced insulation (EN60335-1:08)		N/A
	Supplementary insulation of natural or synthetic rubber resistant to ageing, or arranged and dimensioned so that creepage distances are not reduced below values specified in 29.1		N/A
	Oxygen bomb test at 70 °C for 96 h and 16 h at room temperature		N/A
22.33	Conductive liquids which are or may become accessible in normal use are not in direct contact with live parts		N/A
	Conductive liquids are not in direct contact with basic insulation or reinforced insulation in Class II constructions		N/A
	Conductive liquids in contact with live parts, not in direct contact with reinforced insulation		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
22.34	Shafts of operating knobs, handles, levers etc. not live, unless the shaft is not accessible when the part is removed		P
22.35	Handles, levers and knobs, held or actuated in normal use, not becoming live in the event of an insulation fault		P
	Such parts being of metal, and their shafts or fixings are likely to become live in the event of an insulation fault, they are either adequately covered by insulation material, or their accessible parts are separated from their shafts or fixings by supplementary insulation		N/A
	This requirement does not apply to handles, levers and knobs on stationary appliances other than those of electrical components, provided they are either reliably connected to an earthing terminal or earthing contact, or separated from live parts by earthed metal		N/A
22.36	Handles continuously held in the hand in normal use are so constructed that when gripped as in normal use, the operators hand is not likely to touch metal parts, unless they are separated from live parts by double or reinforced insulation		N/A
22.37	Capacitors in Class II appliances not connected to accessible metal parts, unless complying with 22.42		P
	Metal casings of capacitors in Class II appliances separated from accessible metal parts by supplementary insulation, unless complying with 22.42		N/A
22.38	Capacitors not connected between the contacts of a thermal cut-out		N/A
22.39	Lampholders only used for the connection of lamps		P
22.40	Motor-operated appliances and combined appliances, intended to be moved while in operation or which have accessible moving parts, are fitted with a switch to control the motor		P
	The actuating member of this switch easily visible and accessible		P
22.41	Mercury switches mounted according to the requirement		P
22.42	Protective impedance consisting of at least two separate components		N/A
	Values specified in 8.1.4 not exceeded if any one of the components is short-circuited or open circuited		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
22.43	Appliances adjustable for different voltages, accidental changing of the setting of the voltage unlikely to occur		N/A
22.101	Hand-held appliances intended to used on a table or similar surface shall incorporate a stand or be provided with a separate stand . (EN60335-2-45)		P
22.102	Desoldering irons shall incorporate a device for collecting the solder (EN60335-2-45)		N/A
22.103	Soldering guns shall incorporate a biased –off switch (EN60335-2-45)		N/A
22.104	If a drain hold a provided in household film-welding appliances,it shall be at least 5mm in diameter or 20mm <sup>2</sup> in area with a width at least3mm (EN60335-2-45)		N/A
22.105	Thermoplastic-conduit-welding tools shall incorporate a timer that provided all pole disconnection of the welding circuit and has to be reset before a futher operation(EN60335-2-45)		N/A
22.106	Thermoplastic conduit-welding tools shall be constructed so that the connecting terminals are supplied with extra-low voltage not exceeding 24V when the appliance is operated without fittings (EN60335-2-45)		N/A
22.107	Fitting for thermoplastic conduit-welding tools shall be constructed so that at least basic insulation is provided on surface that are only accessible before the fitting is placed on the conduit(EN60335-2-45)		P
22.108	Class III dehorning tools shall be supplied with a transformers(EN60335-2-45)		N/A

23	INTERNAL WIRING		P
23.1	Wireways smooth and free from sharp edges		P
	Wires protected against contact with burrs, cooling fins etc.		P
	Wire holes in metal well rounded or provided with bushings		P
	Wiring effectively prevented from coming into contact with moving parts		P
23.2	Beads etc. on live wires cannot change their position, and are not resting on sharp edges or corners		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
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	Beads inside flexible metal conduits contained within an insulating sleeve		N/A
23.3	Electrical connections and internal conductors movable relatively to each other not exposed to undue stress		N/A
	Flexible metallic tubes not causing damage to insulation of conductors		N/A
	Open-coil springs not used		N/A
	Adequate insulating lining provided inside a coiled spring, the turns of which touch one another		N/A
	No damage after 10 000 flexings		N/A
	Electric strength test, 1000 V between live parts and metal parts		N/A
23.4	Bare internal wiring sufficiently rigid and fixed		P
23.5	The basic insulation of internal wiring withstanding the electrical stress likely to occur in normal use (EN60 335-1:08)		P
	No breakdown when a voltage of 2000 V is applied for 15 min between the conductor and metal foil wrapped around the insulation		P
23.6	Sleeving used as supplementary insulation on internal wiring retained in position by positive means		P
23.7	Only the colour combination green/yellow used for earthing conductors		N/A
23.8	Aluminium wires not used for internal wiring		P
23.9	No lead-tin soldering of stranded conductors where they are subject to contact pressure, unless		P
	clamping means so constructed that there is no risk of bad contact due to cold flow of the solder		N/A

24	COMPONENTS		P
24.1	Components comply with safety requirements in relevant EN standards (EN 60 335-1:08)		P



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
24.1.1	Capacitors likely to be subjected to the supply mains voltage and used for radio interference suppression or voltage dividing, comply with Annex ZC (EN60 335-1:08)		P
	Small lampholders: compliance with requirements for E10 lampholders		N/A
	Isolating transformers and safety isolating transformers comply with EN742		N/A
	Safety isolating transformers tested with the appliance comply with Annex ZD (EN60 335-1:08)		N/A
	Appliance couplers for IPx0 appliances: compliance with EN320		N/A
	Automatic controls: compliance with EN730, unless tested with the appliance		N/A
	Other appliance couplers: compliance with EN309		N/A
	Switches: compliance with EN1058, unless tested with the appliance (EN60 335-1:04)		N/A
24.1.2	Automatic controls complying with EN730: additional tests according to this standard and 11.3.5 to 11.3.8 and Cl. 17 of EN730 as type 1 controls, the cycles of operation being:		P
	- thermostats: 10 000		N/A
	- temperature limiters: 1000		N/A
	- self-resetting thermal cut-outs: 300		P
	- non-self-resetting thermal cut-outs: 30		N/A
	- energy regulators: 3000 (EN60 335-1:04)		N/A
	- timers: 10 000 (EN60 335-1:04)		N/A
24.1.3	For switches, the test of 17.2.7 of EN1058-1 carried out for 10000 cycles of operation (EN60 335-1:04)		P
	Switches not separately tested and found to comply with EN1058-1 under conditions covering those occurring in the appliance, comply with Annex ZE (EN60335-1:04)		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
	Switches for no-load-operation and operable only with the aid of a tool, are not subjected to the tests of Cl. 17 of EN1058-1 (EN60335-1:04)		N/A
	This applies also to switches operated by hand, and with interlock for no-load-operation (EN60 335-1:04)		N/A
	Switches without this interlock subjected to the test of 17.2.7 of EN1058-1 for 100 cycles of operation (EN60 335-1:04)		N/A
	Switch incorporated in the hand-held part of appliance not intended exclusively for household use are subjected to 50000 cycles of operated		
24.1.4	Components marked with their operating characteristics are used in the appliance in accordance with these markings		P
	Components which have to comply with other standards are tested separately, according to the relevant standard		N/A
	Components used within the limits of its marking, tested in accordance with conditions occurring in the appliance		P
	Components not marked, or not used in accordance with its marking, or no Enstandard exists, tested under the conditions occurring in the appliance		N/A
	Components not mentioned in table 3 tested as part of the appliance		P
24.5	Voltage across capacitors in series with a motor winding does not exceed 1,1 times rated voltage, when the appliance is supplied at 1,1 times rated voltage under minimum load		P
	List of components	(see appended table)	P
24.2	No switches or automatic controls in flexible cords (not required for appliances with rated power input not exceeding 25 W)		N/A
	No devices causing the protective device in the fixed wiring to operate in the event of a fault in the appliance		N/A
	No thermal cut-outs which can be reset by soldering		P
24.3	Switch intended for all-pole disconnection of stationary appliances is directly connected to the supply terminals, having a contact separation of at least 3 mm in each pole		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
24.4	Plugs and socket-outlets for heating elements and extra-low voltage circuits, not interchangeable with plugs, and		N/A
	socket-outlets or with connectors and appliance inlets complying with EN83 or EN320, respectively		N/A
24.5	Plugs and socket-outlets etc. for interconnection cords, not interchangeable with plugs and socket-outlets or connectors and appliance inlets complying with EN83 or EN320, respectively, if direct supply from the mains could give rise to a hazard		N/A
24.6	Motors connected to the supply mains and having inadequate basic insulation for the rated voltage of the appliance, comply with the requirements of Annex F		N/A
25	SUPPLY CONNECTION AND EXTERNAL FLEXIBLE CORDS		N/A
25.1	Appliance not intended for permanent connection to fixed wiring, means for connection to the supply:		N/A
	supply cord fitted with a plug		N/A
	an appliance inlet having at least the same degree of protection against moisture as required for the appliance		N/A
	- pins for insertion into socket-outlets		N/A
25.2	Appliance not provided with more than one means of connection to the supply		N/A
	Stationary appliance for multiple supply may be provided with more than one means of connection, provided electric strength test of 1250 V for 1 min between each means of connection causes no breakdown	No breakdown shall occur	N/A
25.3	Connection of supply wires for appliance intended to be permanently connected to fixed wiring possible after the appliance has been fixed to its support		N/A
	Appliance provided with a set of terminals for the connection of cables or fixed wiring, cross-sectional areas specified in 26.2		N/A
	Appliance provided with a set of terminals allowing the connection of a flexible cord		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
	Appliance provided with a set of terminals and cable entries, conduit entries, knock-outs or glands, allowing connection of appropriate type of cable or conduit		N/A
25.4	Cable and conduit entries, rated current of appliance not exceeding 16 A, dimensions according to table 8	<16A	N/A
	Introduction of conduit or cable does not affect the protection against electric shock or reduce creepage distances and clearances below values specified in 29.1		N/A
25.5	Method for assemble supply cord with the appliance:		N/A
	- type X attachment		N/A
	- type Y attachment		N/A
	- type Z attachment, if allowed in part 2		N/A
	Type X attachment: specially prepared cord		N/A
	Type X attachment not used for flat twin tinsel cord		N/A
25.6	Plugs fitted with only one flexible cord		N/A
	Supply cords of single-phase portable appliances having a rated current not exceeding 16 A, provided with a plug complying with the following Standard Sheets of EN83		N/A
	- for Class I appliances: Standard Sheet C2b, C3b or C4		N/A
	- for Class II appliances: Standard Sheet C5 or C6		N/A
25.7	Appliance supply cord not lighter than:		P
	- braided cord (245 EN51)		N/A
	- ordinary tough rubber sheathed cord (245 EN53)		N/A
	- ordinary polychloroprene sheathed flexible cord (245 EN57) (EN60 335-1:08)		N/A
	- flat twin tinsel cord (227 EN41)		N/A



EN 60335-2-45			
Clause	Requirement - Test	Result - Remark	Verdict
	- light polyvinyl chloride sheathed cord (227 EN52), appliance not exceeding 3 kg		N/A
	- ordinary polyvinyl chloride sheathed cord (227 EN53), appliance exceeding 3 kg (EN60 335-1:04)		P
	Temperature rise of external metal parts exceeding 75 K, PVC cord not used		N/A
	PVC cord used: appliance so constructed that the supply cord is not likely to touch external metal parts in normal use		N/A
	PVC supply cord appropriate for higher temperatures, type Y or type Z attachment used		N/A
25.8	Nominal cross-sectional area of supply cords according to table 9; rated current (A); cross-sectional area (mm <sup>2</sup> ) (EN60 335-1:08) .....		N/A
25.9	Supply cord not in contact with sharp points or edges		P
25.10	Green/yellow core for earthing purposes in Class I appliance		N/A
25.11	Conductors of supply cords not consolidated by lead-tin soldering where they are subject to contact pressure, unless		P
	clamping means so constructed that there is no risk of bad contacts due to cold flow of the solder		N/A
25.12	Moulding the cord to part of the enclosure does not damage the insulation of the supply cord		N/A
25.13	Inlet opening provided with a bushing, or is so constructed, that there is no risk of damage to the supply cord when introduced		P
25.13.1	Inlet bushing so shaped as to prevent damage to the supply cord		P
	Inlet bushing not detachable		P
25.13.2	At inlet openings, the insulation between the conductor of a supply cord and the enclosure of the appliance is consisting of the insulation of the conductor, and in addition:		N/A
	- for Class 0 appliances: at least one separate insulation		N/A
	- for other appliances: at least two separate insulations		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
	Only one separate insulation is required if the enclosure at the inlet opening is of insulating material		N/A
	The separate insulation consists of:		N/A
	- the sheath of a supply cord at least equivalent to that of a cord complying with EN227 or 245		N/A
	- a lining or bushing of insulating material complying with the requirements of 29.2 for supplementary insulation		N/A
25.14	Supply cords adequately protected against excessive flexing		N/A
	Flexing test; applied force (N); number of flexings :		N/A
	The test does not result in:		N/A
	- short-circuit between the conductors		N/A
	- breakage of more than 10% of the strands of any conductor		N/A
	- separation of the conductor from its terminal		N/A
	- loosening of any cord guard		N/A
	- damage, within the meaning of the standard, to the cord or the cord guard		N/A
	- broken strands piercing the insulation and becoming accessible		N/A
25.15	Conductors of the supply cord relieved from strain, twisting and abrasion by use of cord anchorages		N/A
	The cord cannot be pushed into the appliance to such an extent that the cord or internal parts of the appliance can be damaged		N/A
	Pull and torque test of supply cord, values shown in table 10: pull (N); torque (Nm) (not on automatic cord reel) .....		N/A
	Max. 2 mm displacement of the cord, and conductors not moved more than 1 mm in the terminals		N/A
	Creepage distances and clearances not reduced below values specified in 29.1		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
25.16	Cord anchorages for type X attachments so constructed and located that:		N/A
	- replacement of the cord is easily possible		N/A
	- it is clear how the relief from strain and the prevention of twisting are obtained		N/A
	- they are suitable for different types of cord		N/A
	- cord cannot touch the clamping screws of cord anchorage if these screws are accessible, unless separated from		N/A
	- accessible metal parts by supplementary insulation		N/A
	- the cord is not clamped by a metal screw which bears directly on the cord		N/A
	- at least one part of the cord anchorage securely fixed to the appliance, unless part of a specially prepared cord		N/A
	- screws which have to be operated when replacing the cord do not fix any other component, if applicable		N/A
	- if labyrinths can be bypassed the test of 25.15 is nevertheless withstood		N/A
	- for Class 0, 0I and I appliances: they are of insulating material or are provided with an insulating lining, unless a failure of the insulation of the cord does not make accessible metal parts live		N/A
	- for Class II appliances: they are of insulating material, or if of metal, they are insulated from accessible metal parts by supplementary insulation		N/A
25.17	Adequate cord anchorages for type Y and Z attachment		N/A
25.18	Cord anchorages only accessible with the aid of a tool, or		N/A
	so constructed that the cord only can be fitted with the aid of a tool		N/A
25.19	Type X attachment, glands not used as cord anchorage in portable appliances		N/A
	Tying the cord into a knot or tying the cord with string not used		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
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25.20	Conductors of the supply cord for type Y and Z attachment adequately additionally insulated		N/A
25.21	Space for supply cable for fixed wiring or supply cord for type X attachment constructed to permit checking of conductors with respect to correct positioning and connection before fitting any cover, no risk of damage, no contact with accessible metal parts if a conductor becomes loose, etc.		N/A
	For portable appliances, the uninsulated end of a conductor prevented from any contact with accessible metal parts, unless the end of the cord is such that the conductors are unlikely to slip free		N/A
25.22	Appliance inlet:		N/A
	- live parts not accessible during insertion or removal		N/A
	- connector can be inserted without difficulty		N/A
	- the appliance is not supported by the connector		N/A
	- is not for cold conditions if temperature rise of external metal parts exceeds 75 K, unless the supply cord is not likely to touch such metal parts		N/A
25.23	Interconnection cords comply with the requirements for the supply cord, except as specified		N/A
	If necessary, electric strength test of 16.3		N/A
25.24	Interconnection cords not detachable without the aid of a tool		N/A

26	TERMINALS FOR EXTERNAL CONDUCTORS		N/A
26.1.1	Appliances with type X attachment and appliances for connection to fixed wiring provided with terminals in which connection is made by means of screws, nuts or equally effective devices		N/A
	Screws and nuts serve only to clamp supply conductors, except		N/A
	internal conductors, if so arranged that they are unlikely to be displaced when fitting the supply conductors		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
26.1.2	For type X attachment soldered connections used, the conductor so positioned or fixed that reliance is not placed on soldering alone		N/A
	Soldering alone used, barriers provided, creepage distances and clearances satisfactory if the conductor becomes free		N/A
	For type Y and Z attachment: soldered, welded, crimped and similar connections used		N/A
	For Class II appliances: the conductor so positioned or fixed that reliance is not placed on soldering, welding or crimping alone		N/A
	For Class II appliances: soldering, welding or crimping alone used, barriers provided, creepage distances and clearances satisfactory if the conductor becomes free		N/A
26.2	Terminals for type X attachment and for connection to fixed wiring suitable for connection of conductors with required cross-sectional area according to table 11; rated current (A); nominal cross-sectional area (mm <sup>2</sup> ) .....		N/A
	Terminals only suitable for a specially prepared cord		N/A
26.3	Terminals for the supply cord suitable for their purpose		N/A
	Terminals with screw clamping and screwless terminals not used for flat twin tinsel cords, unless conductors ends fitted with a device suitable for screw terminals		N/A
	Pull test of 5 N to the connection		N/A
26.4	Terminals for type X attachment and those for connection to fixed wiring so fixed that when tightening or loosening the clamping means:		N/A
	- the terminal does not loosen		N/A
	- internal wiring is not subjected to stress		N/A
	- creepage distances and clearances are not reduced below the values in 29.1		N/A
26.5	Terminals for type X attachment and for connection to fixed wiring so constructed that the conductor is clamped between metal surfaces with sufficient contact pressure and without damaging the conductor		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
26.6	Terminals for type X attachment, no special preparation of conductors required, and so constructed and placed that conductors prevented from slipping out, except those with a specially prepared cord and those for connection to fixed wiring		N/A
26.7	Terminals of the pillar type constructed and located as specified		N/A
26.8	Terminals for the connection to fixed wiring located close to each other, including the earthing terminal		N/A
26.9	Terminals for type X attachment accessible after removal of a cover or part of the enclosure		N/A
26.10	Terminals not accessible without the aid of a tool		N/A
26.11	Terminals for type X attachment so located or shielded that if a wire of a stranded conductor escapes, no risk of accidental connection between live parts and accessible metal parts,		N/A
	and for Class II construction, between live parts and metal parts separated from accessible metal parts by supplementary insulation only		N/A
	Stranded conductor test, 8 mm insulation removed		N/A

27	PROVISION FOR EARTHING		P
27.1	Accessible metal parts of Class 0I and I appliances, permanently and reliably connected to an earthing terminal	Class I	P
	Earthing terminals not connected to neutral terminal		N/A
	Class 0, II and III appliance have no provision for earthing		N/A
27.2	Screw clamping terminals comply with Cl. 26		N/A
	Screwless terminals comply with EN998-2-2 (EN60335-1:08)		N/A
	Terminals used for the connection of external equipotential bonding conductors allow connection of conductors of 2,5 to 6 mm <sup>2</sup> , and		N/A
	do not provide earthing continuity between different parts of the appliance		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
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	Conductors cannot be loosened without the aid of a tool		P
	Clamping means adequately secured against accidental loosening		N/A
27.3	Earth connection "made before" and "separated after" current-carrying connections		P
	Current-carrying conductors become taut before earthing conductor, if the cord slips out of the cord anchorage		N/A
27.4	No risk of corrosion resulting from contact between metal of earthing terminal and other metal		P
	Adequate resistance to corrosion of coated or uncoated parts providing earthing continuity, other than parts of a metal frame or enclosure		P
	Parts of steel providing earthing continuity provided at the essential areas with an electroplated coating, thickness at least 5 μm		P
	Adequate protection against rusting of parts of coated or uncoated steel, only intended to provide or transmit contact pressure		P
	In case of aluminium alloys precautions taken to avoid risk of corrosion		N/A
27.5	Low resistance of connection between earthing terminal and earthed metal parts		P
	Resistance not exceeding 0,1 Ω at the specified low-resistance test	0.053Ω	P

28	SCREWS AND CONNECTIONS		P
28.1	Fixings and electrical connections withstand mechanical stresses		P
	Screws not of soft metal liable to creep, such as zinc or aluminium		P
	Diameter of screws of insulating material min. 3 mm		P
	Screws of insulating material not used for any electrical connection		P
	Screws transmitting electrical contact only screwing into metal		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
	Screws not of insulating material if their replacement by a metal screw can impair supplementary or reinforced insulation		N/A
	Type X attachment, screws to be removed for replacement of supply cord, or for users maintenance, not of insulating material if their replacement by a metal screw can impair basic insulation		N/A
	Screws and nuts transmitting contact pressure subjected to torque test as specified, applying torque as shown in table 12		P
	The test is not carried out on screws and nuts transmitting contact pressure for earthing continuity provided at least two screws or nuts are used (EN60335-1:08)		P
28.2	Contact pressure not transmitted through insulating material liable to shrink or distort, unless shrinkage or distortion compensated		N/A
	This requirement does not apply to electrical connections in circuits carrying a current not exceeding 0,5 A (EN60335-1:08)		N/A
28.3	Space-threaded (sheet metal) screws only used for the connection of current-carrying parts if they clamp these parts directly in contact with each other		N/A
	Thread-cutting (self-tapping) screws not used for electrical connection of current-carrying parts, unless generating a full form standard machine screw thread		N/A
	Thread-cutting (self-tapping) screws not used if they are likely to be operated by the user or installer unless the thread is formed by a swaging action		N/A
	Thread-cutting and space-threaded screws used provide earthing continuity:		N/A
	- it is not necessary to disturb the connection in normal use		N/A
	- two screws used for each connection		N/A
28.4	Screws and nuts making mechanical connection between different parts of the appliance, and also making electrical connection or providing earthing continuity secured against loosening		P
	Rivets for current-carrying connections subject to torsion secured against loosening		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
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29	CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH INSULATION		N/A
29.1	Creepage distances and clearances not less than specified in table 13 (EN60 335-1:04)		N/A
	Resonant voltage between the point where a winding and a capacitor are connected together and metal parts separated from live parts by basic insulation only, creepage distances and clearances not less than the values specified for the value of the voltage produced by the resonance		N/A
	Values increased by 4 mm in case of reinforced insulation when resonance voltage		N/A
29.2	Distances through insulation not less than 1,0 mm for supplementary insulation, and 2,0 mm for reinforced insulation		N/A
29.2.1	Supplementary insulation applied in thin sheet form, other than mica or similar scaly material, consists of at least two layers, each of the layers withstands the electric strength test of 16.3 for supplementary insulation		N/A
	Reinforced insulation applied in thin sheet form, other than mica or similar scaly material, consists of at least three layers, and any two of the layers together withstand the electric strength test of 16.3 for reinforced insulation		N/A
29.2.2	Supplementary or reinforced insulation inaccessible and does not exceed the maximum permissible temperature values		N/A
	Supplementary or reinforced insulation, after conditioning as specified, withstands the electric strength test as specified in 16.3, both at the oven temperature and room temperature		N/A

30	RESISTANCE TO HEAT, FIRE AND TRACKING		P
30.1	See Annex H		P
	Relevant external parts of non-metallic material		P
	Parts supporting live parts and parts providing supplementary or reinforced insulation sufficiently resistant to heat		P



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
	Ball-pressure test with a force of 20 N, diameter of impression not exceeding 2 mm		P
	External parts: at 75 °C		P
	Parts supporting live parts: at 125 °C		P
	Parts providing supplementary or reinforced insulation: temperature (°C) .....		P
30.2	Relevant parts of non-metallic material adequately resistant to ignition and spread of fire		N/A
30.2.1	Possible burning test of relevant parts according to Annex J		N/A
	Glow-wire test of Annex K made at temperature 550 °C		N/A
30.2.3	Appliances operated while unattended, possible bad-connection test according to Annex L		P
	Glow-wire test of Annex K made at 850 °C (EN60 335-1:04)		N/A
	Possible needle-flame test according to Annex M		N/A
30.2.4	Parts of non-metallic material within a distance of 50 mm from parts not withstanding the tests of 30.2.2 or 30.2.3, subjected to the needle-flame test of Annex M		N/A
30.3	Relevant insulating material have adequate resistance to tracking		N/A
	Tracking test at 175 V according to Annex N		N/A
	Tracking test at 250 V according to Annex N		N/A
	No hazard other than fire, tracking test at 175 V according to Annex N, and in addition needle-flame test of surrounding parts according to Annex M		N/A
	Possible needle-flame test of non-metallic material		N/A



EN 60335-2-45			
Clause	Requirement - Test	Result - Remark	Verdict

31	RESISTANCE TO RUSTING		N/A
	Relevant ferrous parts adequately protected against rusting		N/A

32	RADIATION, TOXICITY AND SIMILAR HAZARDS		N/A
	Appliance does not emit harmful radiation		N/A
	Appliance does not present a toxic or similar hazard		N/A
	The ozone concentration produced by ionization shall not be excessive.		N/A

4	MEASURING METHODS(EN 62233:2008) (EMF)		P
4.2	The frequency range considered is from 4-1000Hz		P
	Measuring distance (according Table 1):.....(cm)	30cm	P
	Measuring result		P
	Around (limit:40 Mt)	7.2Mt	P
	Operating conditions		P
	Couping factor	0.17	P
	Current density	2Ma/m <sup>2</sup>	P

A	ANNEX A (INFORMATIVE) ROUTINE TESTS		
	Description of routine tests to be carried out by the manufacturer		P
B	ANNEX B (NORMATIVE) APPLIANCES POWERED BY RECHARGEABLE BATTERIES		
	The following modifications to this standard are applicable for appliances powered by batteries that are recharged in the appliance		N/A
	This annex does not apply to battery chargers		N/A
3.1.9	Appliance operated under the following conditions:		--



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
	- the appliance, supplied by its fully charged battery, operated as specified in relevant part 2		N/A
	- the battery is charged, the battery being initially discharged to such an extent that the appliance cannot operate		N/A
	-if possible, the appliance is supplied from the supply mains through its battery charger, the battery being initially discharged to such an extent that the appliance cannot operate. The appliance is operated as specified in relevant part 2		N/A
	- if the appliance incorporates inductive coupling between two parts that are detachable from each other, the appliance is supplied from the supply mains with the detachable part removed		N/A
3.6.2	Part to be removed in order to discard the battery is not considered to be detachable		N/A
5.B.101	Appliances supplied from the supply mains tested as specified for motor-operated appliances		N/A
7.1	Battery compartment for batteries intended to be replaced by the user, marked with battery voltage and polarity of the terminals		N/A
	The positive terminal indicated by symbol IEC 60417-5005 and the negative terminal by symbol IEC 60417-5006		N/A
7.6	Symbols 60417-5005 and IEC 60417-5006		N/A
7.12	The instructions give information regarding charging		N/A
	The instructions for appliances incorporating batteries intended to be replaced by the user includes required information		N/A
	Details about how to remove batteries containing materials hazardous to the environment given		N/A
7.15	Markings placed on the part of the appliance connected to the supply mains		N/A
8.2	Appliances having batteries that according to the instruction may be replaced by the user need only have basic insulation between live parts and the inner surface of the battery compartment		N/A
	If the appliance can be operated without batteries, double or reinforced insulation required		N/A
11.7	The battery is charged for the period stated in the instructions or 24 h.....:		N/A
19.1	Appliances subjected to tests of 19.B.101, 19.B.102 and 19.B.103		N/A



EN 60335-2-45			
Clause	Requirement - Test	Result - Remark	Verdict
19.10	Not applicable		N/A
19.B.101	Appliances supplied at rated voltage for 168 h, the battery being continually charged		N/A
19.B.102	For appliances having batteries that can be removed without the aid of a tool, short-circuit of the terminals of the battery, the battery being fully charged,		N/A
19.B.103	Appliances having batteries replaceable by the user supplied at rated voltage under normal operation with the battery removed or in any position allowed by the construction		N/A
21.B.101	Appliances having pins for insertion into socket-outlets have adequate mechanical strength		N/A
	Part of the appliance incorporating the pins subjected to the free fall test, procedure 2, of IEC 60068-2-31, the number of falls being:		N/A
	- 100, if the mass of the part does not exceed 250 g (g) .....		N/A
	- 50, if the mass of the part exceeds 250 g.....:		N/A
	After the test, the requirements of 8.1, 15.1.1, 16.3 and clause 29 are met		N/A
22.3	Appliances having pins for insertion into socket-outlets tested as fully assembled as possible		N/A
25.13	An additional lining or bushing not required for interconnection cords in class III appliances or class III constructions operating at safety extra-low voltage not containing live parts		N/A
30.2	For parts of the appliance connected to the supply mains during the charging period, 30.2.3 applies		N/A
	For other parts, 30.2.2 applies		N/A
C	ANNEX C (NORMATIVE) AGEING TEST ON MOTORS		
	Tests, as described, carried out when doubt with regard to the temperature classification of the insulation of a motor winding		N/A
	Test conditions as specified		N/A
D	ANNEX D (NORMATIVE) THERMAL MOTOR PROTECTORS		
	Applicable to appliances having motors that incorporate thermal motor protectors necessary for compliance with the standard		N/A
	Test conditions as specified		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
E	ANNEX E (NORMATIVE) NEEDLE-FLAME TEST		
	Needle-flame test carried out in accordance with IEC 60695-11-5, with the following modifications:		--
7	Severities		--
	The duration of application of the test flame is 30 s ± 1 s		N/A
9	Test procedure		--
9.1	The specimen so arranged that the flame can be applied to a vertical or horizontal edge as shown in the examples of Figure 1		N/A
9.2	The first paragraph does not apply		N/A
	If possible, the flame is applied at least 10 mm from a corner		N/A
9.3	The test is carried out on one specimen		N/A
	If the specimen does not withstand the test, the test may be repeated on two additional specimens, both withstanding the test		N/A
11	Evaluation of test results		--
	The duration of burning not exceeding 30 s		N/A
	However, for printed circuit boards, the duration of burning not exceeding 15 s		N/A
F	ANNEX F (NORMATIVE) CAPACITORS		--
	Capacitors likely to be permanently subjected to the supply voltage, and used for radio interference suppression or voltage dividing, comply with the following clauses of IEC 60384-14, with the following modifications:		N/A
1.5	Terms and definitions		
1.5.3	Class X capacitors tested according to subclass X2		N/A
1.5.4	This subclause is applicable		N/A
1.6	Marking		--
	Items a) and b) are applicable		N/A
3.4	Approval testing		N/A
3.4.3.2	Table 3 is applicable as described		N/A
4.1	Visual examination and check of dimensions		N/A
	This subclause is applicable		N/A
4.2	Electrical tests		N/A
4.2.1	This subclause is applicable		N/A



EN 60335-2-45			
Clause	Requirement - Test	Result - Remark	Verdict
4.2.5	This subclause is applicable		N/A
4.2.5.2	Only table 11 is applicable		N/A
	Values for test A apply		N/A
	However, for capacitors in heating appliances the values for test B or C apply		N/A
4.12	Damp heat, steady state		N/A
	This subclause is applicable		N/A
	Only insulation resistance and voltage proof are checked		N/A
4.13	Impulse voltage		N/A
	This subclause is applicable		N/A
4.14	Endurance		N/A
	Subclauses 4.14.1, 4.14.3, 4.14.4 and 4.14.7 are applicable		N/A
4.14.7	Only insulation resistance and voltage proof are checked		N/A
	No visible damage		N/A
4.17	Passive flammability test		N/A
	This subclause is applicable		N/A
4.18	Active flammability test		N/A
	This subclause is applicable		N/A
G	ANNEX G (NORMATIVE) SAFETY ISOLATING TRANSFORMERS		N/A
	The following modifications to this standard are applicable for safety isolating transformers:		N/A
7	Marking and instructions		--
7.1	Transformers for specific use marked with:		N/A
	-name, trademark or identification mark of the manufacturer or responsible vendor .....		P
	-model or type reference .....		P
17	Overload protection of transformers and associated circuits		--
	Fail-safe transformers comply with subclause 15.5 of IEC 61558-1		N/A
22	Construction		--
	Subclauses 19.1 and 19.1.2 of IEC 61558-2-6 are applicable		N/A



EN 60335-2-45			
Clause	Requirement - Test	Result - Remark	Verdict
29	Clearances, creepage distances and solid insulation		--
29.1, 29.2, 29.3	The distances specified in items 2a, 2c and 3 in table 13 of IEC 61558-1 apply		P
	For insulated winding wires complying with subclause 19.12.3 of IEC 61558-1 there are no requirements for clearances or creepage distances		P
	For windings providing reinforced insulation, the distance specified in item 2c of table 13 of IEC 61558-1 is not assessed		N/A
	For safety isolating transformers subjected to periodic voltages with a frequency exceeding 30 kHz, the clearances, creepage distances and solid insulation values specified in IEC 60664-4 are applicable, if greater than the values specified in items 2a, 2c and 3 in table 13 of IEC 61558-1		N/A
H	ANNEX H (NORMATIVE) SWITCHES		N/A
	Switches comply with the following clauses of IEC 61058-1, as modified below:		--
	The tests of IEC 61058-1 carried out under the conditions occurring in the appliance		P
	Before being tested, switches are operated 20 times without load		P
8	Marking and documentation		--
	Switches are not required to be marked		P
	However, a switch that can be tested separately from the appliance marked with the manufacturer's name or trade mark and the type reference		P
13	Mechanism		--
	The tests may be carried out on a separate sample		N/A
15	Insulation resistance and dielectric strength		P
15.1	Not applicable		N/A
15.2	Not applicable		N/A
15.3	Applicable for full disconnection and micro-disconnection		P
17	Endurance		--
	Compliance is checked on three separate appliances or switches		P
	For 17.2.4.4, the number of cycles declared according to 7.1.4 is 10 000, unless		P



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
	otherwise specified in 24.1.3 of the relevant part 2 of IEC 60335 .....		N/A
	Switches for operation under no load and which can be operated only by a tool, and		N/A
	switches operated by hand that are interlocked so that they cannot be operated under load,		N/A
	are not subjected to the tests		N/A
	However, switches without this interlock are subjected to the test of 17.2.4.4 for 100 cycles of operation		N/A
	Subclauses 17.2.2 and 17.2.5.2 not applicable		N/A
	The ambient temperature during the test is that occurring in the appliance during the test of Clause 11 in IEC 60335-1		P
	The temperature rise of the terminals not more than 30 K above the temperature rise measured in clause 11 of IEC 60335-1 (K) .....	6.5K	P
20	Clearances, creepage distances, solid insulation and coatings of rigid printed board assemblies		--
	This clause is applicable to clearances and creepage distances for functional insulation, across full disconnection and micro-disconnection, as stated in table 24		P
I	ANNEX I (NORMATIVE) MOTORS HAVING BASIC INSULATION THAT IS INADEQUATE FOR THE RATED VOLTAGE OF THE APPLIANCE		--
	The following modifications to this standard are applicable for motors having basic insulation that is inadequate for the rated voltage of the appliance:		--
8	Protection against access to live parts		--
8.1	Metal parts of the motor are considered to be bare live parts		N/A
11	Heating		--
11.3	The temperature rise of the body of the motor is determined instead of the temperature rise of the windings		N/A
11.8	The temperature rise of the body of the motor, where in contact with insulating material, not exceeding values in table 3 for the relevant insulating material		N/A
16	Leakage current and electric strength		--
16.3	Insulation between live parts of the motor and its other metal parts is not subjected to the test		N/A
19	Abnormal operation		--



EN 60335-2-45			
Clause	Requirement - Test	Result - Remark	Verdict
19.1	The tests of 19.7 to 19.9 are not carried out		N/A
19.1.101	Appliance operated at rated voltage with each of the following fault conditions:		N/A
	- short circuit of the terminals of the motor, including any capacitor incorporated in the motor circuit		N/A
	- short circuit of each diode of the rectifier		N/A
	- open circuit of the supply to the motor		N/A
	- open circuit of any parallel resistor, the motor being in operation		N/A
	Only one fault simulated at a time, the tests carried out consecutively		N/A
22	Construction		--
22.1.101	For class I appliances incorporating a motor supplied by a rectifier circuit, the d.c. circuit being insulated from accessible parts of the appliance by double or reinforced insulation		N/A
	Compliance checked by the tests specified for double and reinforced insulation		N/A
J	ANNEX J (NORMATIVE) COATED PRINTED CIRCUIT BOARDS		
	Testing of protective coatings of printed circuit boards carried out in accordance with IEC 60664-3 with the following modifications:		--
5.7	Conditioning of the test specimens		--
	When production samples are used, three samples of the printed circuit board are tested		N/A
5.7.1	Cold		--
	The test is carried out at -25 °C		N/A
5.7.3	Rapid change of temperature		--
	Severity 1 is specified		N/A
5.9	Additional tests		--
	This subclause is not applicable		N/A
K	ANNEX K (NORMATIVE) OVERVOLTAGE CATEGORIES		
	The information on overvoltage categories is extracted from IEC 60664-1		P
	Overvoltage category is a numeral defining a transient overvoltage condition		P
	Equipment of overvoltage category IV is for use at the origin of the installation		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
	Equipment of overvoltage category III is equipment in fixed installations and for cases where the reliability and the availability of the equipment is subject to special requirements		N/A
	Equipment of overvoltage category II is energy consuming equipment to be supplied from the fixed installation		P
	If such equipment is subjected to special requirements with regard to reliability and availability, overvoltage category III applies		N/A
	Equipment of overvoltage category I is equipment for connection to circuits in which measures are taken to limit transient overvoltages to an appropriate low level		N/A
L	ANNEX L (INFORMATIVE) GUIDANCE FOR THE MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES		
	Information for the determination of clearances and creepage distances		P
M	ANNEX M (NORMATIVE) POLLUTION DEGREE		
	The information on pollution degrees is extracted from IEC 60664-1		P
	Pollution		--
	The microenvironment determines the effect of pollution on the insulation, taking into account the macroenvironment		P
	Means may be provided to reduce pollution at the insulation by effective enclosures or similar		P
	Minimum clearances specified where pollution may be present in the microenvironment		P
	Degrees of pollution in the microenvironment		P
	For evaluating creepage distances, the following degrees of pollution in the microenvironment are established:		--
	- pollution degree 1: no pollution or only dry, non-conductive pollution occurs. The pollution has no influence		N/A
	- pollution degree 2: only non-conductive pollution occurs, except that occasionally a temporary conductivity caused by condensation is to be expected		P
	- pollution degree 3: conductive pollution occurs or dry non-conductive pollution occurs that becomes conductive due to condensation that is to be expected		N/A



EN 60335-2-45			
Clause	Requirement - Test	Result - Remark	Verdict
	- pollution degree 4: the pollution generates persistent conductivity caused by conductive dust or by rain or snow		N/A
N	ANNEX N (NORMATIVE) PROOF TRACKING TEST		
	The proof tracking test is carried out in accordance with IEC 60112 with the following modifications:		P
7	Test apparatus		--
7.3	Test solutions		--
	Test solution A is used		P
10	Determination of proof tracking index (PTI)		--
10.1	Procedure		--
	The proof voltage is 100V, 175V, 400V or 600V ...:		P
	The test is carried out on five specimens		P
	In case of doubt, additional test with proof voltage reduced by 25V, the number of drops increased to 100		P
10.2	Report		--
	The report states if the PTI value was based on a test using 100 drops with a test voltage of (PTI-25) V		N/A
O	ANNEX O (INFORMATIVE) SELECTION AND SEQUENCE OF THE TESTS OF CLAUSE 30		
	Description of tests for determination of resistance to heat and fire		P
P	ANNEX P (INFORMATIVE) GUIDANCE FOR THE APPLICATION OF THIS STANDARD TO APPLIANCES USED IN WARM DAMP EQUABLE CLIMATES		
	Modifications applicable for class 0 and 01 appliances having a rated voltage exceeding 150V, intended to be used in countries having a warm damp equable climate and that are marked WDaE		--
	Modifications may also be applied to class 1 appliances having a rated voltage exceeding 150V, intended to be used in countries having a warm damp equable climate and that are marked WdaE, if liable to be connected to a supply mains that excludes the protective earthing conductor		--
5.7	The ambient temperature for the tests of clauses 11 and 13 is 40 +3/0 °C		N/A
7.1	The appliance marked with the letters WDaE		N/A
7.12	The instructions state that the appliance is to be supplied through a residual current device (RCD) having a rated residual operating current not exceeding 30 mA		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
	The instructions state that the appliance is considered to be suitable for use in countries having a warm damp equable climate, but may also be used in other countries		N/A
11.8	The values of Table 3 are reduced by 15 K		N/A
13.2	The leakage current for class I appliances not exceeding 0,5 mA		N/A
15.3	The value of t is 37 °C		N/A
16.2	The leakage current for class I appliances not exceeding 0,5 mA (mA):		N/A
19.13	The leakage current test of 16.2 is applied in addition to the electric strength test of 16.3		N/A
Q	ANNEX Q (INFORMATIVE) SEQUENCE OF TESTS FOR THE EVALUATION OF ELECTRONIC CIRCUITS		
	Description of tests for appliances incorporating electronic circuits		P
R	ANNEX R (NORMATIVE) SOFTWARE EVALUATION		
	Programmable electronic circuits requiring software incorporating measures to control the fault/error conditions specified in table R.1 or R.2 validated in accordance with the requirements of this annex		--
R.1	Programmable electronic circuits using software		--
	Programmable electronic circuits requiring software incorporating measures to control the fault/error conditions specified in table R.1 or R.2 constructed so that the software does not impair compliance with the requirements of this standard		
R.2	Requirements for the architecture		--
	Programmable electronic circuits requiring software incorporating measures to control the fault/error conditions specified in table R.1 or R.2 use measures to control and avoid software-related faults/errors in safety-related data and safety-related segments of the software		N/A
R.2.1.1	Programmable electronic circuits requiring software incorporating measures to control the fault/error conditions specified in table R.2 have one of the following structures:		--
	- single channel with periodic self-test and monitoring		N/A
	- dual channel (homogenous) with comparison		N/A
	- dual channel (diverse) with comparison		N/A
	Programmable electronic circuits requiring software incorporating measures to control the fault/error conditions specified in table R.1 have one of the following structures:		--
	- single channel with functional test		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
	- single channel with periodic self-test		N/A
	- dual channel without comparison		N/A
R.2.2	Measures to control faults/errors		--
R.2.2.1	When redundant memory with comparison is provided on two areas of the same component, the data in one area is stored in a different format from that in the other area		N/A
R.2.2.2	Programmable electronic circuits with functions requiring software incorporating measures to control the fault/error conditions specified in table R.2 and that use dual channel structures with comparison, have additional fault/error detection means for any fault/errors not detected by the comparison		N/A
R.2.2.3	For programmable electronic circuits with functions requiring software incorporating measures to control the fault/error conditions specified in table R.1 or R.2, means are provided for the recognition and control of errors in transmissions to external safety-related data paths		N/A
R.2.2.4	For programmable electronic circuits with functions requiring software incorporating measures to control the fault/error conditions specified in table R.1 or R.2, the programmable electronic circuits incorporate measures to address the fault/errors in safety-related segments and data indicated in table R.1 and R.2 as appropriate		N/A
R.2.2.5	For programmable electronic circuits with functions requiring software incorporating measures to control the fault/error conditions specified in table R.1 or R.2, detection of a fault/error occur before compliance with clause 19 is impaired		N/A
R.2.2.6	The software is referenced to relevant parts of the operating sequence and the associated hardware functions		N/A
R.2.2.7	Labels used for memory locations are unique		N/A
R.2.2.8	The software is protected from user alteration of safety-related segments and data		N/A
R.2.2.9	Software and safety-related hardware under its control is initialized and terminates before compliance with clause 19 is impaired		N/A
R.3	Measures to avoid errors		--
R.3.1	General		--
	For programmable electronic circuits with functions requiring software incorporating measures to control the fault/error conditions specified in table R.1 or R.2, the following measures to avoid systematic fault in the software are applied		--



EN 60335-2-45			
Clause	Requirement - Test	Result - Remark	Verdict
	Software that incorporates measures used to control the fault/error conditions specified in table R.2 is inherently acceptable for software required to control the fault/error conditions specified in table R.1		N/A
R.3.2	Specification		--
R.3.2.1	Software safety requirements:	Software Id:	N/A
	The specification of the software safety requirements includes the descriptions listed		N/A
R.3.2.2	Software architecture		--
R.3.2.2.1	The specification of the software architecture includes the aspects listed - techniques and measures to control software faults/errors (refer to R.2.2); - interactions between hardware and software; - partitioning into modules and their allocation to the specified safety functions; - hierarchy and call structure of the modules (control flow); - interrupt handling; - data flow and restrictions on data access; - architecture and storage of data; - time-based dependencies of sequences and data	Document ref. No:	N/A
R.3.2.2.2	The architecture specification is validated against the specification of the software safety requirements by static analysis		N/A
R.3.2.3	Module design and coding		N/A
R.3.2.3.1	Based on the architecture design, software is suitably refined into modules		N/A
	Software module design and coding is implemented in a way that is traceable to the software architecture and requirements		N/A
R.3.2.3.2	Software code is structured		N/A
R.3.2.3.3	Coded software is validated against the module specification by static analysis		N/A
	The module specification is validated against the architecture specification by static analysis		N/A
R.3.3.3	Software validation		N/A
	The software is validated with reference to the requirements of the software safety requirements specification		N/A
	Compliance is checked by simulation of:		N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
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	- input signals present during normal operation		N/A
	- anticipated occurrences		N/A
	- undesired conditions requiring system action		N/A

**TABLE R.1 – GENERAL FAULT/ERROR CONDITIONS**

Component <sup>1)</sup>	Fault/error	Acceptable measures <sup>2) 3)</sup>	Definitions	Document reference for applied measure	Document reference for applied test	Verdict
1 CPU 1.1 Registers	Stuck at	Functional test, or periodic self-test using either: - static memory test, or - word protection with single bit redundancy	H.2.16.5 H.2.16.6 H.2.19.6 H.2.19.8.2			N/A
1.2 VOID						N/A
1.3 Programme counter	Stuck at	Functional test, or Periodic self-test, or Independent time-slot monitoring, or Logical monitoring of the programme sequence	H.2.16.5 H.2.16.6 H.2.18.10.4 H.2.18.10.2			N/A
2 Interrupt handling and execution	No interrupt or too frequent interrupt	Functional test, or time-slot monitoring	H.2.16.5 H.2.18.10.4			N/A
3 Clock	Wrong frequency (for quartz synchronized clock: harmonics/sub-harmonics only)	Frequency monitoring, or time slot monitoring	H.2.18.10.1 H.2.18.10.4			N/A
4. Memory 4.1 Invariable memory	All single bit faults	Periodic modified checksum, or multiple checksum, or word protection with single bit redundancy	H.2.19.3.1 H.2.19.3.2 H.2.19.8.2			N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
4.2 Variable memory	DC fault	Periodic static memory test, or word protection with single bit redundancy H.2.19.6 H.2.19.8.2	N/A
4.3 Addressing (relevant to variable and invariable memory)	Stuck at	Word protection with single bit redundancy including the address H.2.19.8.2	N/A
5 Internal data path	Stuck at DC fault	Word protection with single bit redundancy Comparison of redundant CPUs by either: - reciprocal comparison - independent hardware comparator H.2.19.8.2 H.2.18.15 H.2.18.3	N/A
5.1 VOID			N/A
5.2 Addressing	Wrong address	Word protection with single bit redundancy including the address H.2.19.8.2	N/A
6 External communicat ion	Hamming distance 3	Word protection with multi-bit redundancy, or CRC – single work, or Transfer redundancy, or Protocol test H.2.19.8.1 H.2.19.4.1 H.2.18.2.2 H.2.18.14	N/A
6.1 VOID			N/A
6.2 VOID			N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
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6.3 Timing	Wrong point in time  Wrong sequence	Time-slot monitoring, or scheduled transmission Time-slot and logical monitoring, or Comparison of redundant communication channels by either: - reciprocal comparison - independent hardware comparator Logical monitoring, or time-slot monitoring, or Scheduled transmission (same options as for wrong point in time)	H.2.18.10.4 H.2.18.18 H.2.18.10.3  H.2.18.15 H.2.18.3  H.2.18.10.2 H.2.18.10.4 H.2.18.18			N/A
7 Input/output periphery	Fault conditions specified in 19.11.2	Plausibility check Comparison of redundant communication channels by either: - reciprocal comparison - independent hardware comparator	H.2.18.13  H.2.18.15 H.2.18.3			N/A
7.1 VOID						N/A
7.2 Analog I/O 7.2.1 A/D and D/A-converter	Fault conditions specified in 19.11.2	Plausibility check	H.2.18.13			N/A
7.2.2 Analog multiplexer	Wrong addressing	Plausibility check	H.2.18.13			N/A
8 VOID						N/A
9 Custom chips <sup>4)</sup> e.g. ASIC, GAL, Gate array	Any output outside the static and dynamic functional specification	Periodic self-test	H.2.16.6			N/A

NOTE A Stuck-at fault model denotes a fault model representing an open circuit or a non-varying signal level. A DC fault model denotes a stuck-at fault model incorporating short circuit between signal lines.



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

- 1) For fault/error assessment, some components are divided into their sub-functions.
- 2) For each sub-function in the table, the Table R.2 measure will cover the software fault/error.
- 3) Where more than one measure is given for a sub-function, these are alternatives.
- 4) To be divided as necessary by the manufacturer into sub-functions.



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
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**Attachment No.1: EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES**

Clause	Requirement + Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

**Attachment No.1**

7.12.Z1	The specific instructions related to the safe operation of this appliance is collated together in the front section of the user instructions		P
	The height of the characters, measured on the capital letters, is at least 3 mm		P
	These instructions are also available in an alternative format, e.g. on a website		P
8.1.1	Also test probe 18 of EN 61032 is applied		P
	The appliance being in every possible position during the test except that		P
	appliances normally used on the floor and having a mass exceeding 40 kg are not tilted		N/A
	The force on the probe in the straight position is increased to 10 N when probe 18 is used		P
	When using test probe 18 the appliance is fully assembled as in normal use without any parts removed, and		P
	parts intended to be removed for user maintenance are also not removed		P
8.2	Compliance is checked by applying the test probes of EN 61032		P
	For built-in appliances and fixed appliances, the test probe B and probe 18 of EN 61032 are applied only after installation		N/A
11.8	Footnotes to "External enclosure of motor-operated appliances" to be taken into account		N/A
15.1.2	Appliances with an automatic cord reel tested with the cord in the most unfavourable position so that the reeling of the wet cord may affect electrical insulation during operation, the cord not being dried before reeling		N/A
20.2	When using the test probe similar to test probe B with a circular stop face, the accessories and detachable covers are removed		N/A
	Test probe 18 applied with a force of 2,5N on the appliance fully assembled		N/A
24.1	Components comply with the safety requirements specified in the relevant standards as far as they reasonably apply		P
	The requirements of Clause 29 of this standard apply between live parts of components and accessible parts of the appliance.		P



EN 60335-2-45			
Clause	Requirement - Test	Result - Remark	Verdict

Attachment No.1: EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES			
Clause	Requirement + Test	Result - Remark	Verdict

**Attachment No.1**

	The requirements of 30.2 of this standard apply to parts of non-metallic material in components including parts of non-metallic material supporting current-carrying connections inside components		P
	Components that have not been previously tested or do not comply with the standard for the relevant component are tested according to the requirements of 30.2		P
	Components that have been previously tested and shown to comply with the resistance to fire requirements in the standard for the relevant component need not be retested provided that:		N
	- the severity specified in the component standard is not less than the severity specified in 30.2, and		N
	- the test report for the component states whether it complied with the standard for the relevant component with or without flame, flames not exceeding 2 s during the test are ignored		N
	Unless components have been previously tested and found to comply with the relevant standard for the number of cycles specified, they are tested in accordance with 24.1.1 to 24.1.9		N
	For components mentioned in 24.1.1 to 24.1.9, no additional tests specified in the relevant standard for the component are necessary other than those specified in 24.1.1 to 24.1.9		P
	Components that have not been separately tested and found to comply with the relevant standard, and		P
	components that are not marked or not used in accordance with their marking,		N
	are tested in accordance with the conditions occurring in the appliance, the number of samples being that required by the relevant standard		P
	Lamp holders and starter holders that have not been previously tested and found to comply with the relevant standard are tested as a part of the appliance and additionally comply with the gauging and interchangeability requirements of the relevant standard under the conditions occurring in the appliance		N
	Where the relevant standard specifies these gauging and interchangeability requirements at elevated temperatures, the temperatures measured during the tests of Clause 11 are used		P



EN 60335-2-45			
Clause	Requirement - Test	Result - Remark	Verdict

Attachment No.1: EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES			
Clause	Requirement + Test	Result - Remark	Verdict

**Attachment No.1**

	Plugs and socket-outlets and other connecting devices of interconnection cords are not interchangeable with plugs and socket-outlets listed in IEC/TR 60083 or IEC 60906-1, or		P
	with connectors and appliance inlets complying with the standard sheets of IEC 60320-1,		N
	if direct supply to these parts from the supply mains gives rise to a hazard		N
24.1.7	If the remote operation of the appliance is via a telecommunication network, the relevant standard for the telecommunication interface circuitry in the appliance is EN 41003		N
	Compliance with Clause 8 of this standard is not impaired by connecting the appliance to a device covered by EN 41003		N
24.Z1	For motor running capacitors (IEC 60252-1 type P2) with a metallic enclosure having an overpressure fuse the flame testing of internal plastic parts supporting current carrying connections as required in 30.2.2 and 30.2.3.1 is not necessary		N
25.6	Supply cords of single-phase portable appliances having a rated current not exceeding 16 A, fitted with a plug complying with the following standard sheets of IEC/TR 60083:		N
	- for Class I appliances: standard sheet C2b, C3b or C4		N
	- for Class II appliances: standard sheet C5 or C6:		N
25.7	Rubber sheathed cords (60245 IEC 53) are not suitable for appliances intended to be used outdoors or when they are liable to be exposed to significant amount of ultraviolet radiation		N
	Halogen-free thermoplastic compound sheathed supply cords have properties at least those of:		N
	<ul style="list-style-type: none"> <li>halogen-free thermoplastic compound sheathed cords (H03Z1Z1H2-F or H03Z1Z1-F), for appliances having a mass not exceeding 3 kg</li> </ul>		N
	<ul style="list-style-type: none"> <li>halogen-free thermoplastic compound sheathed cords (H05Z1Z1H2-F or H05Z1Z1-F), for other appliances</li> </ul>		N



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
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**Attachment No.1: EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES**

Clause	Requirement + Test	Result - Remark	Verdict
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**Attachment No.1**

	Cross-linked halogen-free compound sheathed supply cords have properties at least those of cross-linked halogen-free compound sheathed cords (H07ZZ-F)		N
26.11	Conductors connected by soldering are not considered to be positioned or fixed so that reliance is not placed upon the soldering alone to maintain them in position unless they are held in place near the terminals independently of the solder		N
29.3.Z1	Appliance constructed so that if there is a possibility of damaging the insulation during installation, the insulation withstands the scratch and penetration test of 21.2		N
32	Compliance regarding electromagnetic fields is checked according to EN 62233		P
Annex I, 19.1.101	The appliance is supplied at rated voltage and operated under normal operation with each of the fault conditions specified		N
	The duration of the test is as specified in 19.7		N
<b>ZA</b>	<b>ANNEX ZA (NORMATIVE) SPECIAL NATIONAL CONDITIONS</b>		<b>P</b>
	<b>Norway</b>		N
19.5	The test is also applicable to appliances intended to be permanently connected to fixed wiring		N
	<b>Norway</b>		N
22.2	The second paragraph of this subclause, dealing with single-phase, permanently connected class I appliances having heating elements, is not applicable due to the supply system		N
	<b>All CENELEC countries</b>		<b>P</b>
25.6 and 25.25	Information concerning National plug and socket-outlets is available from the CENELEC website. Normative national requirements concerning plug and socket-outlets are shown in the relevant National standard		<b>P</b>
	<b>Ireland and United Kingdom</b>		N



EN 60335-2-45			
Clause	Requirement - Test	Result - Remark	Verdict

**Attachment No.1: EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES**

Clause	Requirement + Test	Result - Remark	Verdict
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**Attachment No.1**

25.8	In the table, the lines for 10 A and 16 A are replaced by:		N
	> 10 and ≤ 13 1,25 (1,0) <sup>2</sup>		N
	> 13 and ≤ 16 1,5 (1,0) <sup>2</sup>		N
<b>ZB</b>	<b>ANNEX ZB (INFORMATIVE) A-DEVIATIONS</b>		N
	<b>Ireland</b>		N
25.6	These regulations apply to all plugs for domestic use at a voltage of not less than 200 V and in general allow only plugs complying with I.S. 401:1997, or equivalent, to be fitted to domestic appliances		N
	<b>United Kingdom</b>		N
25.6	These regulations apply to all plugs for domestic use at a voltage of not less than 200 V and in general allow only plugs to BS 1363 to be fitted to domestic appliances. It also allows plugs to BS 4573 and EN 50075 to be fitted to shavers and toothbrushes		N
<b>ZC</b>	<b>ANNEX ZC (NORMATIVE) NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS</b>		P
	A list of referenced documents in this standard		P
	Normative references to international publications with their corresponding European publications		P
<b>ZD</b>	<b>ANNEX ZD (INFORMATIVE) IEC and CENELEC CODE DESIGNATIONS FOR FLEXIBLE CORDS</b>		P
	A table with IEC and CENELEC code designations for flexible cords		P
<b>ZE</b>	<b>ANNEX ZE (INFORMATIVE) SPECIFIC ADDITIONAL REQUIREMENTS FOR APPLIANCES AND MACHINES INTENDED FOR COMMERCIAL USE</b>		N
7.1	Business name and full address of the manufacturer and, where applicable, his authorized representative.....:		N



EN 60335-2-45			
Clause	Requirement - Test	Result - Remark	Verdict

Attachment No.1: EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES			
Clause	Requirement + Test	Result - Remark	Verdict

**Attachment No.1**

	Model or type reference .....		N
	Serial number, if any .....		N
	Production year		N
	Designation of the appliance .....		N
7.12	Instructions provided with the appliance so that the appliance can be used safely		N
	The instructions contain at least the following information:		N
	- the business name and full address of the manufacturer and, where applicable, his authorized representative		N
	- model or type reference of the appliance as marked on the appliance itself, except for the serial number		N
	- the designation of the appliance together with its explanation in case it is given by a combination of letters and/or numbers		N
	- the general description of the appliance, when needed due to the complexity of the appliance		N
	- specific precautions if required during installation, operation, adjusting, user maintenance, cleaning, repairing or moving		N
	- when needed drawings, diagrams, descriptions and explanations necessary for the safe use and user maintenance of the appliance		N
	- the possible reasonably foreseeable misuse and, whenever relevant, a warning against the effects it may have on the safe use of the appliance		N
	The words "Original instructions" appear on the language version(s) verified by the manufacturer or by the authorized representative		N
	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" appear in the relevant instructions delivered with the appliance		N
	The instructions for maintenance/service to be done by specialized personnel, mandated by the manufacturer or the authorized representative may be supplied in only one Community language which the specialized personnel understand		N



EN 60335-2-45			
Clause	Requirement - Test	Result - Remark	Verdict

Attachment No.1: EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES			
Clause	Requirement + Test	Result - Remark	Verdict
<b>Attachment No.1</b>			
	Model or type reference .....		N
	Serial number, if any .....		N
	Production year		N
	Designation of the appliance .....		N
7.12	Instructions provided with the appliance so that the appliance can be used safely		N
	The instructions contain at least the following information:		N
	- the business name and full address of the manufacturer and, where applicable, his authorized representative		N
	- model or type reference of the appliance as marked on the appliance itself, except for the serial number		N
	- the designation of the appliance together with its explanation in case it is given by a combination of letters and/or numbers		N
	- the general description of the appliance, when needed due to the complexity of the appliance		N
	- specific precautions if required during installation, operation, adjusting, user maintenance, cleaning, repairing or moving		N
	- when needed drawings, diagrams, descriptions and explanations necessary for the safe use and user maintenance of the appliance		N
	- the possible reasonably foreseeable misuse and, whenever relevant, a warning against the effects it may have on the safe use of the appliance		N
	The words "Original instructions" appear on the language version(s) verified by the manufacturer or by the authorized representative		N
	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" appear in the relevant instructions delivered with the appliance		N
	The instructions for maintenance/service to be done by specialized personnel, mandated by the manufacturer or the authorized representative may be supplied in only one Community language which the specialized personnel understand		N



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
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**Attachment No.1: EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES**

Clause	Requirement + Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

**Attachment No.1**

	The instructions indicate the type and frequency of inspections and maintenance required for safe operation including the preventive maintenance measures		N
7.12.ZE1	If needed for specific appliances, the following information to be given:		N
	<ul style="list-style-type: none"> <li>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</li> </ul>		N
	<ul style="list-style-type: none"> <li>on how to maintain adequate mechanical stability when in use, during transportation, assembly, dismantling, scrapping and any other action involving the appliance</li> </ul>		N
	<ul style="list-style-type: none"> <li>on the protective measures to be taken by the user, including, where appropriate, the personal protective equipment to be provided</li> </ul>		N
	<ul style="list-style-type: none"> <li>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</li> </ul>		N
	<ul style="list-style-type: none"> <li>on the specifications on the spare parts to be used, when these affect the health and safety of the operator</li> </ul>		N
	<ul style="list-style-type: none"> <li>on airborne noise emissions, determined and declared in accordance with therelevant Part 2, which includes:</li> </ul>		N
	- the A-weighted emission sound pressure level at workstations, where this exceeds 70 dB(A).....;		N
	- where this level does not exceed 70 dB(A), this fact is indicated		N
	- the peak C-weighted instantaneous sound pressure value at workstations, where this exceeds 63 Pa (130 dB in relation to 20 µPa) .....		N
	- the A-weighted sound power level emitted by the machinery, where the A-weighted emission sound pressure level at workstations exceeds 80 dB(A).....;		N
7.12.ZE2	The instructions includes a warning to disconnect the appliance from its power source during service and when replacing parts		N



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
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**Attachment No.1: EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES**

Clause	Requirement + Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

**Attachment No.1**

	If the removal of the plug is foreseen, it is 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		N
	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 is provided		N
19.11.4.8	The appliance continues to operate, without causing any hazard to the user, from the same point in its operating cycle at which the voltage fluctuation occurred, or		N
	a manual operation is required to restart it		N
20.1	Appliances and their components and fittings have adequate mechanical stability during transportation, assembly, dismantling and any other action involving the appliance		N
20.2	Dangerous moving transmission parts safeguarded either by design or guards		N
	When guards are used, they are fixed guards, interlocking movable guards or protective devices		N
	Moving parts directly involved in the function of the appliance which cannot be made completely inaccessible fitted with:		N
	- fixed guards or interlocking movable guards preventing access to those sections of the parts that are not used in the work, and		N
	- adjustable guards restricting access to those sections of the moving parts where access is necessary		N
	Interlocking movable guards used where frequent access is required		N
21.1	Appliances and their components and fittings have adequate mechanical strength and is 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		N
22.ZE.1	For appliances provided with a seat, the seat gives adequate stability		N
	The distance between the seat and the control devices capable of being adapted to the operator		N



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
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**Attachment No.1: EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES**

Clause	Requirement + Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

**Attachment No.1**

22.ZE.2	For appliances provided with separate devices for the start and the stop functions, the stop function is unambiguously identifiable and does always override the start function		N
	For appliances provided with one device performing the start and the stop function, the stop function is unambiguously identifiable and does always override the start function		N
22.ZE.3	Appliances designed in such a way that incorrect mounting is avoided, if this can lead to an unsafe situation		N
	If this is not possible, information on the correct mounting is given directly on the part and/or the enclosure		N
22.ZE.4	Where the weight, size or shape prevents appliances from being moved manually, they are fitted with attachments for lifting gear, or		N
	so designed that they can be fitted with such attachments, or		N
	be shaped in such a way that standard lifting gear can easily be used		N
	Appliances to be moved manually are constructed or equipped so that they can be moved easily and safely		N
22.ZE.5	The fixing systems of fixed guards which prevent access to dangerous moving transmission parts only removable with the use of tools		N
	If such guards have to be removed by the user for routine cleaning or maintenance their fixing systems remain attached to the fixed guards or to the machine after removal		N
	Where possible, guards are incapable of remaining in place without their fixings		N
	This does not apply if, after removal of the screws, or if the component is incorrectly repositioned, the appliance becomes inoperative		N
	Movable guards are interlocked		N
	The interlocking devices 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		N
	Where it is possible for an operator to reach the danger zone before the risk due to hazardous appliance functions has ceased, movable guards associated with a guard locking device in addition to an interlocking device that:		N



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
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**Attachment No.1: EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES**

Clause	Requirement + Test	Result - Remark	Verdict
<b>Attachment No.1</b>			
	- prevents the start of hazardous appliance functions until the guard is closed and locked, and		N
	- keeps the guard closed and locked until the risk of injury from the hazardous appliance functions has ceased		N
	Interlocking movable guards remain attached to the appliance when open, and		N
	they are designed and constructed in such a way that they can be adjusted only by means of an intentional action		N
22.ZE.6	Interlocking movable guards designed in such a way that the absence or failure of one of their components prevents starting or stops the hazardous appliance functions		N
	The guard is opened to the extent needed to cause the interlocking to operate and is then closed, the number of operations being defined in the specific Part 2 .....		N
	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		N
	After these tests the interlock system is fit for further use		N
22.ZE.7	Adjustable guards restricting access to areas of the moving parts strictly necessary for the work are:		N
	- adjustable manually or automatically, depending on the type of work involved, and		N
	- readily adjustable without the use of tools		N
22.ZE.8	In case of interruption, re-establishment after an interruption or fluctuation in whatever manner of the power supply, the appliance does not restart		N
	However, automatic restarting of the operation is allowed if the appliance may continue to operate, without causing any hazard to the user, from the same point in its operating cycle at which the voltage interruption or fluctuation occurred		N
22.ZE.9	Appliances fitted with means to isolate them from all energy sources		N
	Such isolators are clearly identified, and		N
	they are capable of being locked if reconnection endanger persons		N



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
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**Attachment No.1: EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES**

Clause	Requirement + Test	Result - Remark	Verdict
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**Attachment No.1**

	After the energy source is disconnected, it is possible to dissipate any energy remaining or stored in the circuits of the appliance without risk to persons		N
<b>ZF</b>	<b>ANNEX ZF (INFORMATIVE) CRITERIA APPLIED FOR THE ALLOCATION OF PRODUCTS COVERED BY STANDARDS IN THE EN 60335 SERIES UNDER LVD OR MD</b>		P
	List of standards under CENELEC/TC61 with the allocation under the LVD (Low Voltage Directive) or the MD (Machinery Directive).....:		P
<b>ZG</b>	<b>ANNEX ZG (NORMATIVE) UV APPLIANCES</b>		N
	The following modifications to this standard apply to appliances having UV emitters		N
	This annex is not applicable to appliances covered by the scopes of IEC 60335-2-27, IEC 60335-2-59 or IEC 60335-2-109		N
7.12.ZG	The instructions for appliances incorporating UVC emitters include the substance of the following: WARNING — This appliance contains a UV emitter. Do not stare at the light source		N
32	For appliances incorporating UV emitters the manufacturer delivers a declaration providing evidence that the plastic material exposed to the radiation is UV resistant		N
<b>ZZA</b>	<b>ANNEX ZZ (INFORMATIVE) COVERAGE OF ESSENTIAL REQUIREMENTS OF EC DIRECTIVES</b>		P
	Relationship between this European standard and the safety objectives of Directive 2014/35/EU [2014 OJ L96] aimed to be covered		P
<b>ZZB</b>	Relationship between this European standard and the essential requirements of Directive 2006/42/EC aimed to be covered		P



EN 60335-2-45			
Clause	Requirement - Test	Result - Remark	Verdict

<b>10.1</b>	<b>TABLE: Power input deviation</b>					P
Input deviation of/at:	P rated (W)	P measured (W)	dP (W, %)	Required dP (W, %)	Remark	
230V/50Hz	1100	1085.2	-1.35%	+5% -10%	Normal work	
230V/60Hz	1100	1082.7	-1.57%	+5% -10%	Normal work	
240V/50Hz	1100	1083.6	-1.49%	+5% -10%	Normal work	
240V/60Hz	1100	1084.0	-1.45%	+5% -10%	Normal work	
Supplementary information:						

<b>10.2</b>	<b>TABLE: Current deviation</b>					N/A
Current deviation of/at:	I rated (A)	I measured (A)	dI (A, %)	Required dI (A, %)	Remark	
Supplementary information:						

<b>11.8</b>	<b>TABLE: Heating test, thermocouple measurements</b>			P
	Test voltage (V).....	240Vx1.06=243.8V		—
	.....			
	Ambient (°C) .....	T1=23.8°C T2=23.9°C		—
Thermocouple locations	Max. temperature rise measured, dT (K)	Max. temperature rise limit, dT (K)		
Power cord	10.5	50		
Ac intel	4.6	45		
Transformer winding	38.7	85 (class B)		
Transformer core	39	85 (class B)		
PCB near IC	23.1	105(T130)		
Internal wire to motor	9.4	85(T105)		
Wire connector	11.7	Cl.30		
X2 capacitor	21.5	85		



EN 60335-2-45			
Clause	Requirement - Test	Result - Remark	Verdict

Y capacitor	22.8	100
Winding of inductor(FL2)	26.6	85 (class B)
Negative ion generator	17.1	Cl.30
Plastic enclosure near motor,inside	5.1	Cl.30
Plastic enclosure near motor,outside	3.7	60
Motor cover	15.7	60
Supplementary information:		

<b>11.8</b>	<b>TABLE: Heating test, resistance method</b>					
	Test voltage (V) .....					—
	Ambient, t1 (°C) .....					—
	Ambient, t2 (°C) .....					—
	Temperature rise of winding	R1 (Ω)	R2 (Ω)	dT (K)	Max. dT (K)	Insulation class
Supplementary information:						

<b>13.2</b>	<b>TABLE: Leakage current</b>				P
	Heating appliances: 1.15 x rated input (W) .....	--			—
	Motor-operated and combined appliances: 1.06 x rated voltage (V) .....	240Vx1.06=243.8V			—
	Leakage current between	I (mA)	Max. allowed I (mA)		
	L/N parts to accessible plastic parts /switch wrapped with metal foil	0.005/0.005	0.35peak		
Supplementary information:					

<b>13.3</b>	<b>TABLE: Electric strength</b>				P
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EN 60335-2-45			
Clause	Requirement - Test	Result - Remark	Verdict

Test voltage applied between:	Voltage (V)	Breakdown (Yes/No)
L/N parts to accessible plastic parts /switch wrapped with metal foil	3000	No
Internal wire insulation to plastic case	3000	No
Internal wire to internal wire insulation	3000	No
Supplementary information:		

<b>14</b>	<b>TABLE: Transient overvoltages</b>					N/A
Clearance between:	CI (mm)	Required CI (mm)	Rated impulse voltage (V)	Impulse test voltage (V)	Flashover (Yes/No)	
Supplementary information:						

<b>16.2</b>	<b>TABLE: Leakage current</b>				P
	Single phase appliances: 1.06 x rated voltage (V) .....	240Vx1.06=243.8V			—
	Three phase appliances 1.06 x rated voltage divided by $\sqrt{3}$ (V) .....	--			—
Leakage current between		I (mA)	Max. allowed I (mA)		
Live parts to accessible plastic parts/switch wrapped with metal foil		0.005	0.25		
Supplementary information:					

<b>16.3</b>	<b>TABLE: Electric strength</b>				P
Test voltage applied between:	Voltage (V)	Breakdown (Yes/No)			
L/N parts to accessible plastic parts /switch wrapped with metal foil	3000	No			



EN 60335-2-45			
Clause	Requirement - Test	Result - Remark	Verdict

Internal wire insulation to plastic case	3000	No
Internal wire to internal wire insulation	3000	No
Supplementary information:		

<b>17</b>	<b>TABLE: Overload protection, thermocouple measurements</b>	N/A
Temperature rise of part/at:		dT (K)
		Max. dT (K)
Supplementary information:		

<b>17</b>	<b>TABLE: Overload protection, resistance method</b>	N/A
	Test voltage (V) .....	—
	Ambient, t1 (°C) .....	—
	Ambient, t2 (°C) .....	—
Temperature of winding	R1 (Ω)	R2 (Ω)
	dT (K)	T (°C)
	Max. T (°C)	
Supplementary information:		

<b>19</b>	<b>Abnormal operation conditions</b>	<b>P</b>
Operational characteristics		YES/NO
Operational conditions		
Are there electronic circuits to control the appliance operation?	YES	According to the standard description
Are there "off" or "stand-by" position?	YES	According to the standard description
The unintended operation of the appliance results in dangerous malfunction?	NO	--
Sub-clause	Operating	Test
	PEC	EMP
	Software	19.11.3
	Final	



EN 60335-2-45			
Clause	Requirement - Test	Result - Remark	Verdict

	conditions description	results description	description	19.11.4	type required	PEC	result
19.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.7	Lock motor	Pass	N/A	N/A	N/A	N/A	pass
19.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.11.2	Short circuit the electric component	No hazard	N/A	N/A	N/A	N/A	pass
19.11.4.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.10X	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Supplementary information:

<b>19.7</b>	<b>TABLE: Abnormal operation, locked rotor/moving parts</b>					P
	Test voltage (V) .....				240V	—
	Ambient, t1 (°C) .....				24.2°C	—
	Ambient, t2 (°C) .....				24.3°C	—
	Temperature of winding	R1 (Ω)	R2 (Ω)	dT (K)	T (°C)	Max. T (°C)
	Motor cover	--	--	35.1	59.4	215
	Test corner	--	--	2.0	26.3	150

Supplementary information:

<b>19.13</b>	<b>TABLE: Abnormal operation, temperature rises</b>		P
	Thermocouple locations	Max. temperature rise measured, dT (K)	Max. temperature rise limit, dT (K)
	See clause 19.7		



EN 60335-2-45			
Clause	Requirement - Test	Result - Remark	Verdict

Supplementary information:		

<b>21.1</b>	<b>TABLE: Impact resistance</b>			P
Impact per surface	Surface tested	Impact energy(J)	comments	
Three times	Plastic enclosure	0.5J	No damage	
Three times	Control enclosure	0.5J	No damage	
Supplementary information:				



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
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24.1	TABLE: Critical components information					P
Object / partNo.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity <sup>1)</sup>	
Power Cord	Ching Cheng Wire Material Co.,Ltd	H05VV-F	3G1.0mm <sup>2</sup>	DIN VDE 0620-2-1 (VDE 0620-2-1):2016-01	VDE 40004661	
Power Plug	Ching Cheng Wire Material Co.,Ltd	EL-202	AC250V 16A	DIN VDE 0620-2-1 (VDE 0620-2-1):2016-01	VDE 40004661	
Appliance connector	Ching Cheng Wire Material Co.,Ltd	EL-702	10A 250V	IEC/K60320-1	VDE 40014003	
Appliance inlet	Zhejiang LECI Electronics Co.,LTD	DB-14	10A 250V	IEC/K60320-1	VDE 40032137	
-Alt	ZHE JIANG BEI ER JIA ELECTRONIC CO LTD	ST-A01-004L	10A 250V	UL 60320-1	UL E242654	
X-Capacitor	Shenzhen Surong Capacitors Co.,Ltd.	MPX/MKP	0.1μF 280VAC	IEC/K60384-1 IEC/K60384-14	VDE 40008924	
-Alt	Shenzhen Surong Capacitors Co.,Ltd.	MPX/MKP	0.1μF 310VAC	IEC/K60384-1 IEC/K60384-14	VDE 40008924	
X-Capacitor	Shenzhen Surong Capacitors Co.,Ltd.	MPX/MKP	0.22μF 280VAC	IEC/K60384-1 IEC/K60384-14	VDE 40008924	
-Alt	Shenzhen Surong Capacitors Co.,Ltd.	MPX/MKP	0.22μF 310VAC	IEC/K60384-1 IEC/K60384-14	VDE 40008924	
-Alt	JYH HSU(JEC)ELECTRONICS LTD	MPX	0.1μF; 0.22μF; 0.47μF 310VAC	IEC/K60384-1 IEC/K60384-14	VDE 40044985	
-Alt	JYH HSU(JEC)ELECTRONICS LTD	MPX	0.1μF; 0.22μF; 0.47μF 280VAC	IEC/K60384-1 IEC/K60384-14	VDE 40044985	
X-Capacitor	Shenzhen Surong Capacitors Co.,Ltd.	MPX/MKP	0.47μF 280VAC	IEC/K60384-1 IEC/K60384-14	VDE 40008924	
Y-Capacitor	JYH HSU(JEC)ELECTRONICS LTD	JD	332M/400VAC 222M/400VAC	IEC/K60384-1 IEC/K60384-14	VDE 40038642	
-Alt	JYH HSU(JEC)ELECTRONICS LTD	JY	332M/400VAC 222M/400VAC	IEC/K60384-1 IEC/K60384-14	VDE 40038643	
Current Fuse	XC Electronics(Shenzhen) Corp. Ltd.	5F F3.15L250V	3.15A/250V	IEC/K60127-1 IEC/K60127-2	VDE 40009609	
Fuse Holder	Shin Chin Industrial Co., Ltd.	R3-11	10A 250VAC	UL	UL: E72169	



EN 60335-2-45			
Clause	Requirement - Test	Result - Remark	Verdict

-Alt	Hongju(Dongguan )Electronic&Metal Products Co.,Ltd.	FH1	AC 250V	IEC 60127	VDE 40028467
Interlock Switch	Guangdong Yushun Electric Appliance Ltd.	KW-16	16A 125/250VAC	UL 60335-1	CB: DE 2-020115 UL E335523
Relay	NINGBO HUIKE NEW ERA ELECTRICAL APPLIANCES CO.,LTD	HK4101F	3A 250V AC	EN 61810-1:2008	TUV: R50222414
PCB	GOLDENMAX INTERNATIONAL TECHNOLOGY(Z HUHAJ)LTD	FR-4	94V-0 1.6mm	UL 94	E330731
DC motor	NIDEC SHIBAURA (Zhejiang) CORP	SIC-49CVL-F154-1	DC310V	--	Teset with apliance
Positiveion high voltage generator	DONGGUAN DIT0A ENVIRONMENTAL PROTECTION TECHNOLOGY CO., LTD	JH13-D12-29	DC 12V	--	Teset with apliance
Plastic crust	CHI MEI CORPORATION	ABS	PA757	UL 746C	UL E56070

Supplementary information:

1) Provided evidence ensures the agreed level of compliance. See OD-CB2039.

<b>28.1</b>	<b>TABLE: Threaded part torque test</b>			<b>P</b>
Threaded part identification	Diameter of thread (mm)	Column number (I, II, or III)	Applied torque (Nm)	
Fixed enclosure	--	I	1.2Nm	
Fixed PCB	--	I	1.2Nm	
Supplementary information:				

<b>29.1</b>	<b>TABLE: Clearances</b>			<b>P</b>
	Overvoltage category.....			—
	.....			
	Type of insulation:			



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
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Rated impulse voltage (V):	Min. cl (mm)	Basic (mm)	Supplementary (mm)	Reinforced (mm)	Functional (mm)	Verdict / Remark
330	0,2* / 0,5 / 0,8**					
500	0,2* / 0,5 / 0,8**	--	--	--	--	N/A
800	0,2* / 0,5 / 0,8**	--	--	--	--	N/A
1 500	0,5 / 0,8** / 1,0***	--	--	--	--	N/A
2 500	1,5 / 2,0***	>2	>2	--	>2	P
4 000	3,0 / 3,5***	--	--	>3.5	--	P
6 000	5,5 / 6,0***	--	--	--	--	N/A
8 000	8,0 / 8,5***	--	--	--	--	N/A
10 000	11,0 / 11,5***	--	--	--	--	N/A

Supplementary information:

\*) For tracks on printed circuit boards if pollution degree 1 and 2

\*\*\*) For pollution degree 3

\*\*\*\*) If the construction is affected by wear, distortion, movement of the parts or during assembly

29.2	TABLE: Creepage distances, basic, supplementary and reinforced insulation										P
Working voltage (V)	Creepage distance (mm)										Verdict
	Pollution degree										
	1	2			3			Type of insulation			
		Material group			Material group						
		I	II	IIIa/IIIb	I	II	IIIa/IIIb*)	B**)	S**)	R**)	
≤50	0,18	0,6	0,85	1,2	1,5	1,7	1,9		—	—	N/A
≤50	0,18	0,6	0,85	1,2	1,5	1,7	1,9	—		—	N/A
≤50	0,36	1,2	1,7	2,4	3,0	3,4	3,8	—	—		N/A
125	0,28	0,75	1,05	1,5	1,9	2,1	2,4		—	—	N/A
125	0,28	0,75	1,05	1,5	1,9	2,1	2,4	—		—	N/A
125	0,56	1,5	2,1	3,0	3,8	4,2	4,8	—	—		N/A
250	0,56	1,25	1,8	2,5	3,2	3,6	4,0	>2.5	—	—	P
250	0,56	1,25	1,8	2,5	3,2	3,6	4,0	—	>2.5	—	P
250	1,12	2,5	3,6	5,0	6,4	7,2	8,0	—	—	>5	P



**EN 60335-2-45**

Clause	Requirement - Test								Result - Remark			Verdict
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400	1,0	2,0	2,8	4,0	5,0	5,6	6,3		—	—	N/A
400	1,0	2,0	2,8	4,0	5,0	5,6	6,3	—		—	N/A
400	2,0	4,0	5,6	8,0	10,0	11,2	12,6	—	—		N/A
500	1,3	2,5	3,6	5,0	6,3	7,1	8,0		—	—	N/A
500	1,3	2,5	3,6	5,0	6,3	7,1	8,0	—		—	N/A
500	2,6	5,0	7,2	10,0	12,6	14,2	16,0	—	—		N/A
>630 and ≤800	1,8	3,2	4,5	6,3	8,0	9,0	10,0		—	—	N/A
>630 and ≤800	1,8	3,2	4,5	6,3	8,0	9,0	10,0	—		—	N/A
>630 and ≤800	3,6	6,4	9,0	12,6	16,0	18,0	20,0	—	—		N/A
>800 and ≤1000	2,4	4,0	5,6	8,0	10,0	11,0	12,5		—	—	N/A
>800 and ≤1000	2,4	4,0	5,6	8,0	10,0	11,0	12,5	—		—	N/A
>800 and ≤1000	4,8	8,0	11,2	16,0	20,0	22,0	25,0	—	—		N/A
>1000 and ≤1250	3,2	5,0	7,1	10,0	12,5	14,0	16,0		—	—	N/A
>1000 and ≤1250	3,2	5,0	7,1	10,0	12,5	14,0	16,0	—		—	N/A
>1000 and ≤1250	6,4	10,0	14,2	20,0	25,0	28,0	32,0	—	—		N/A
>1250 and ≤1600	4,2	6,3	9,0	12,5	16,0	18,0	20,0		—	—	N/A
>1250 and ≤1600	4,2	6,3	9,0	12,5	16,0	18,0	20,0	—		—	N/A
>1250 and ≤1600	8,4	12,6	18,0	25,0	32,0	36,0	40,0	—	—		N/A
>1600 and ≤2000	5,6	8,0	11,0	16,0	20,0	22,0	25,0		—	—	N/A
>1600 and ≤2000	5,6	8,0	11,0	16,0	20,0	22,0	25,0	—		—	N/A
>1600 and ≤2000	11,2	16,0	22,0	32,0	40,0	44,0	50,0	—	—		N/A
>2000 and ≤2500	7,5	10,0	14,0	20,0	25,0	28,0	32,0		—	—	N/A
>2000 and ≤2500	7,5	10,0	14,0	20,0	25,0	28,0	32,0	—		—	N/A
>2000 and ≤2500	15,0	20,0	28,0	40,0	50,0	56,0	64,0	—	—		N/A
>2500 and ≤3200	10,0	12,5	18,0	25,0	32,0	36,0	40,0		—	—	N/A
>2500 and ≤3200	10,0	12,5	18,0	25,0	32,0	36,0	40,0	—		—	N/A



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
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>2500 and ≤3200	20,0	25,0	36,0	50,0	64,0	72,0	80,0	—	—		N/A
>3200 and ≤4000	12,5	16,0	22,0	32,0	40,0	45,0	50,0		—	—	N/A
>3200 and ≤4000	12,5	16,0	22,0	32,0	40,0	45,0	50,0	—		—	N/A
>3200 and ≤4000	25,0	32,0	44,0	64,0	80,0	90,0	100,0	—	—		N/A
>4000 and ≤5000	16,0	20,0	28,0	40,0	50,0	56,0	63,0		—	—	N/A
>4000 and ≤5000	16,0	20,0	28,0	40,0	50,0	56,0	63,0	—		—	N/A
>4000 and ≤5000	32,0	40,0	56,0	80,0	100,0	112,0	126,0	—	—		N/A
>5000 and ≤6300	20,0	25,0	36,0	50,0	63,0	71,0	80,0		—	—	N/A
>5000 and ≤6300	20,0	25,0	36,0	50,0	63,0	71,0	80,0	—		—	N/A
>5000 and ≤6300	40,0	50,0	72,0	100,0	126,0	142,0	160,0	—	—		N/A
>6300 and ≤8000	25,0	32,0	45,0	63,0	80,0	90,0	100,0		—	—	N/A
>6300 and ≤8000	25,0	32,0	45,0	63,0	80,0	90,0	100,0	—		—	N/A
>6300 and ≤8000	50,0	64,0	90,0	126,0	160,0	180,0	200,0	—	—		N/A
>8000 and ≤10000	32,0	40,0	56,0	80,0	100,0	110,0	125,0		—	—	N/A
>8000 and ≤10000	32,0	40,0	56,0	80,0	100,0	110,0	125,0	—		—	N/A
>8000 and ≤10000	64,0	80,0	112,0	160,0	200,0	220,0	250,0	—	—		N/A
>10000 and ≤12500	40,0	50,0	71,0	100,0	125,0	140,0	160,0		—	—	N/A
>10000 and ≤12500	40,0	50,0	71,0	100,0	125,0	140,0	160,0	—		—	N/A
>10000 and ≤12500	80,0	100,0	142,0	200,0	250,0	280,0	320,0	—	—		N/A

Supplementary information:

\*) Material group IIIb is allowed if the working voltage does not exceed 50 V

\*\*\*) B = Basic insulation, S = Supplementary insulation, R = Reinforced insulation

30.1	TABLE: Ball Pressure test of thermoplastics			P
Allowed impression diameter(mm)				
Object/part No./material	manufacturer	Test temperauter(°C)	Impression diameter(mm)	
PCB	See table 24.1	125°C	0.8	
Enclosure	See table 24.1	75°C	1.3	



**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
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Plastic of airoutlet grid	See table 24.1	75°C	1.4
Transformer bobbin	See table 24.1	125°C	1.0
L bobbin	See table 24.1	125°C	1.1
Close-end connector	--	125°C	0.8
Motor cover	See table 24.1	125°C	1.0
Appliance intel	See table 24.1	125°C	1.0
Appliance connector	See table 24.1	125°C	1.1
Switch knob	--	75°C	1.2
Negative ion generator	See table 24.1	125°C	1.1
Supplementary information:			





**EN 60335-2-45**

Clause	Requirement - Test	Result - Remark	Verdict
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The test specimen passed the glow wire test (GWT) with no ignition $[(t_e - t_i) \leq 2s]$ (Yes/No) .....	Yes
If no, then surrounding parts passed the needle-flame test of annex E (Yes/No) .....	No
The test specimen passed the test by virtue of most of the flaming material being withdrawn with the glow-wire (Yes/No)? .....	Yes
Ignition of the specified layer placed underneath the test specimen (Yes/No) .....	No
Supplementary information: - 550 °C GWT not relevant (or applicable) to parts of material classified at least HB40 or if relevant HBF - The GWIT pre-selection option, the 850 °C GWFI pre-selection option, and the 850 °C GWT are not relevant (or applicable) for attended appliances	

30.2/30.2.4	TABLE: Needle- flame test (NFT)				N/A
Object/ Part No./Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
--	--	--	--	--	--
--	--	--	--	--	--
Supplementary information: - NFT not relevant (or applicable) for Parts of material classified as V-0 or V-1 - NFT not relevant (or applicable) for Base material of PCBs classified as V-0 or if relevant VTM-0					

**Appendix 2 Equipment list**

Code	Name	Model/Type	S/N	Calibrated date	Next Calibration Date	Manufacture
EZT-001	Digital Multimeter	34401A	MY47043456	2022.10.20	2023.10.19	agilent
EZT-004	Push/pull gauge	NK-500	2Q10060932	2022.10.20	2023.10.19	
EZT-005	Electronic weight	DSI-861	198692	2022.10.20	2023.10.19	shangdeli
EZT-006	Insulation resistance tester	CS2676CX	1107032-009	2022.10.20	2023.10.19	changshen
EZT-007	Earthing resistance tester	YD2668-4B	4B-2307	2022.10.20	2023.10.19	Yangzi
EZT-008	HI-pot/Insulation tester	CS2672C	1108006-002	2022.10.20	2023.10.19	changshen
EZT-010	AC Voltage Regulator	TDGC2J		2022.10.20	2023.10.19	SAKO
EZT-013	AC power source	HPA-3110	3513	2022.10.20	2023.10.19	Henqiang
EZT-014	Temperature/Humidity chamber	SDJ-80L	SDJ-80J	2022.10.20	2023.10.19	Shenzhen hongjian
EZT-015	Electric oven	HK45AS	F11011008	2022.10.20	2023.10.19	Guangzhou KENTON
EZT-017	AC digital power meter	PF9901	YG100731N110 70075	2022.10.20	2023.10.19	Yuanfang
EZT-022	Leakage current tester	228	10-866030	2022.10.20	2023.10.19	simpson



EZT-023	Oscilloscope	TDS1012C-SC	C013300	2022.10.20	2023.10.19	tektronix
EZT-024	Tape measure	DK-2041		2022.10.20	2023.10.19	Proskit
EZT-025	Stop watch	TA-228		2022.10.20	2023.10.19	KTJ
EZT-026	Data acquisition/switch unit	34970A	MY44057668	2022.10.20	2023.10.19	Agilent
EZT-027	Temperature/humidity meter	VC230		2022.10.20	2023.10.19	ViCTOR
EZT-028	Torque drive	3RTD	435850B	2022.10.20	2023.10.19	TOHNICHI
EZT-033	Test finger	ZLT-I02	I021203	2022.10.20	2023.10.19	Guangzhou zhilitong
EZT-034	Test pin	ZLT-I09	I091201	2022.10.20	2023.10.19	Guangzhou zhilitong
EZT-038	Test apparatus of the mains plug	ZLT-LJ2	LJ011202	2022.10.20	2023.10.19	Guangzhou zhilitong
EZT-039	Ball pressure apparatus	ZLT-QY1	Q011202	2022.10.20	2023.10.19	Guangzhou zhilitong
EZT-040	Impact hammer	ZLT-CJ1	LJ011206	2022.10.20	2023.10.19	Guangzhou zhilitong
EZT-041	Impact hammer	ZLT-CJ1	LJ011205	2022.10.20	2023.10.19	Guangzhou zhilitong
EZT-042	Caliper rule	CD-6" CSX	500-196-20	2022.10.20	2023.10.19	MITUTOYO
EZT-044	Glow wire tester	ZRS-2	12121304	2022.10.20	2023.10.19	Guangzhou Xinna



EZT-045	Needle flame tester	ZY-2	12121311	2022.10.20	2023.10.19	Guangzhou Xinna
EZT-107	"Van der Hoofden" test head	EMF827	R21SW	2022.10.20	2023.10.19	Shenzhen HLKS
EZT-107-a	Measurement receiver	EMF827-a	R21SW	2022.10.20	2023.10.19	Shenzhen HLKS

### Appendix 3 Photo documentation

Photo 1



Photo 2



Photo 3

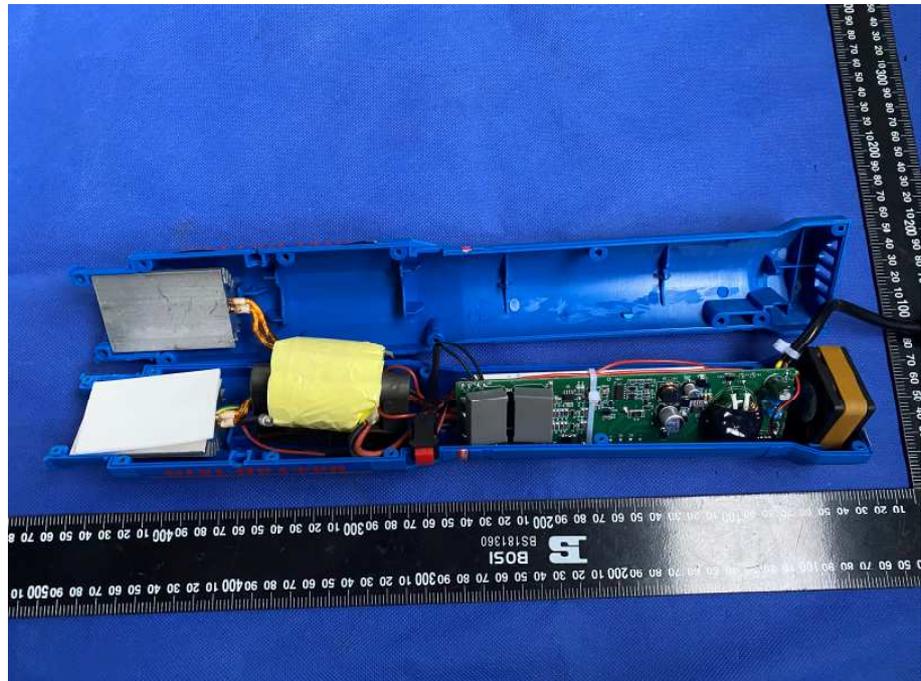


Photo 4

