	PERMANENT DOCUMENT	**ENEC 303 Annex AD**

Annex AD
to Routine Test Requirements for manufacturers
(as per Article 9 of the Agreement)

Household and similar electrical appliances covered by the EN 60335 series

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Annex AD to PD ENEC 303

Household and similar electrical appliances covered by the EN 60335 series

EN 50106 Particular requirements for routine tests

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1. ROUTINE TESTS (100 %)

1.1 Earth continuity test

For class I appliances, a current of at least 10 A derived from a source having a no-load voltage not exceeding 12 V, is passed between each of the accessible earthed metal parts and:

- the earthing pin or earthing contact of the plug
- the earthing terminal, for appliances intended to be permanently connected to fixed wiring
- the earthing pin of the appliance inlet.

The voltage drop is measured and the resistance is calculated from the current and voltage drop.

The resistance shall not exceed:

- 0.2 Ω for appliances having a supply cord
- 0.1 Ω for other appliances

NOTE 1: The test is only carried out for the duration necessary for the measurement to be performed. The test should be carried out for at least 1 second.

NOTE 2: Care is to be taken to ensure that the contact resistance between the tip of the measuring probe and the metal part under test does not influence the test results.

NOTE 3: For appliances having a long supply cord the resistance may exceed 0.2 Ω but it is not to exceed the sum of the resistance of the supply cord and 0.1 Ω.

1.2 Electric strength test

The insulation of the appliance is subjected to a voltage of substantially sinusoidal waveform having a frequency of approximately 50 Hz or 60 Hz for 1 second. The value of the test voltage and the points of application are show in the following table.

Application of test voltage on:	Test voltage V		
	Protection Class I	Protection Class II	Protection Class III
Basic insulation [1)]	1000 V	---	400 V
Double insulation [1)]	2500 V	2500 V	---
Reinforced insulation [1)]	2500 V	2500 V	---
Basic insulation [2)]	---	1000 V [3)]	---
1) Between live parts and accessible metal parts 2) Between live parts and metal parts 3) This test may be carried out on components during assembly.			

No flash over or breakdown shall occur during the tests.

NOTE 1: It may be necessary for the appliance to be in operation during the test to ensure that the test voltage is applied to all relevant insulation, for example, heating elements controlled by a relay.

The circuit used for the test incorporates a current sensing device which trips when the current exceeds 5 mA. However, it may be necessary to set the device to trip at a higher value which is not to exceed 30 mA.

NOTE 2: Tripping of the device indicates breakdown by audible or visual means.

NOTE 3: The high voltage transformer is to be capable of maintaining the specified voltage until the tripping current flows.

NOTE 4: Instead of being subjected to an AC voltage, the insulation may be subjected to a DC voltage of 1.5 times the value shown in the table. An AC voltage having a frequency up to 5 Hz is considered to be a DC voltage.

1.3 Functional test

The functioning of the appliance is checked by the inspection or an appropriate test if any malfunction could result in a hazard.

NOTE: Verifying the correct direction of rotation of motors and the appropriate operation of switches and controls are examples of checks which may be necessary.

2 RECORDS

All test results shall be kept available. The choice of support and format for reports is left to the manufacturers; separate forms (one for each equipment), or grouped according to the most suitable parameters (periods of time, model, etc.) are equally acceptable.
The only obligation is the availability of data and their immediate interpretability for all equipment leaving the production line.

For every device tested, the following data shall be filed:

- date of test
- model or type designation of the device
- serial number of the device or another identifier permitting the identification without ambiguity
- value of earthing circuit resistance with the corresponding current value (*)
- value of voltage applied during the electric strength test (*)
- quick-reference information that the whole set of tests has/has not been successful reference to test equipment used for the tests.

As an alternative to the values referred with an (*) above, the information of the accomplishment of each test (e.g. pass or fail) is permitted, if the pass/fail criteria are described elsewhere on the test report.

3. EN 60335-2-6 Particular requirements for stationary cooking ranges (hobs, ovens and similar appliances)

Replace Note 1 at clause 1.2 Electric strength test with following note:

NOTE 1: It may be necessary for the appliance to be in operation during the test to ensure that the test voltage is applied to all relevant insulation, for example, heating elements controlled by a relay.

The circuit used for the test incorporates a current sensing device which trips when the current exceeds 5 mA. However, it may be necessary to set the device to trip at a higher value which is up to 100 mA if AC is used for the test.

4. EN 60335-2-9 Particular requirements for similar portable cooking appliances

Replace note 1 at clause 1.2 Electric strength test with following note:

NOTE 1: It may be necessary for the appliance to be in operation during the test to ensure that the test voltage is applied to all relevant insulation, for example, heating elements controlled by a relay.

The circuit used for the test incorporates a current sensing device which trips when the current exceeds 5 mA. However, it may be necessary to set the device to trip at a higher value which is up to 100 mA if AC is used for the test combined microwave ovens or induction appliances.

5. EN 60335-2-15 Particular requirements for appliances heating liquids

Additional routine test (100 %)

5.1 Pressure test

Espresso coffee makers shall withstand a pressure test. The test pressure shall be twice the maximum working pressure. The test can be performed with water, air or another gas.

During the test no leakage shall occur.

If air or gas is used, the pressure has to be sufficiently high to show any leakage.

The operation of a self-resetting pressure relive device is permitted.

6. EN 60335-2-17 Particular requirements for heated blankets, pads and similar flexible heating appliances

Additional routine test (100 %)

6.1 Electric strength test

Additionally a dielectric strength test is to be performed by applying a voltage of 2500 V AC or 3750 V DC between the primary circuit and the secondary circuit.

NOTE 1: Acceptable methods of applying the test voltage are:

- *passing the flexible part between rollers;*
- *passing the flexible part on a conveyor by a metal plate;*
- *placing the flexible part between metal plates;*
- *sweeping a chain wire brush over the flexible part.*

6.2 Functional test

The functional test has to include:

- the test of the electrical resistance of the heating element
- the test to show that there is no current flow when the switch of the control device is in the OFF position.

NOTE 1: The tolerance selected is to ensure that the power input deviation of Clause 10 (60335-1) is not exceeded.

7. EN 60335-2-21 Particular requirements for storage water heaters

Additional routine test (100 %)

7.1 Pressure test

The water heater shall withstand a water pressure test performed with water, air or another gas. During the test no leakage shall occur.

When water is used, the pressure is:

- times the rated pressure for closed water heaters having a rated pressure greater than 0.6 MPa (6 bar)
- 0.7 MPa (7 bar) for other closed water heaters
- 1.1 times the rated pressure for cistern-fed water heaters
- 0.05 MPa (0.5 bar) for open-outlet water heaters
- 0.03 MPa (0.3 bar) for cistern-type water heaters

If air or gas is used, the pressure has to be sufficiently high to show any leakage.

NOTE 1: Care should be taken when testing closed water heaters with gas.

Leakage of the fluid is not to occur during the test.

8. EN 60335-2-25 Particular requirements for microwave ovens

Replace note 1 at clause 1.2 Electric strength test with following note:

NOTE 1: It may be necessary for the appliance to be in operation during the test to ensure that the test voltage is applied to all relevant insulation, for example, heating elements controlled by a relay.

The circuit used for the test incorporates a current sensing device which trips when the current exceeds 5 mA. However, it may be necessary to set the device to trip at a higher value which is up to 100 mA if AC is used for the test.

Additional routine tests (100 %)

8.1 Construction Test

The operation of the door interlock system is checked to ensure that microwave generation ceases when the door is opened.

8.2 Marking and Instructions

It is to be checked that the warnings concerning microwave energy as specified in EN 60335-2-25 are marked on the relevant covers.
It is to be checked that the appliance is provided with the instructions corresponding to it.

8.3 Microwave Leakage

The microwave oven is operated at rated voltage and with the microwave power set at the maximum. The energy flux density of microwave leakage is measured at any point approximately 50 mm from the external surface of the appliance. An appropriate load may be used. The measuring instrument is moved over the external surface of the oven to locate the points of maximum microwave leakage, particular attention being given to the door and it seals.

The microwave leakage shall not exceed 50 W/m².

9. EN 60335-2-29 Particular requirements for battery chargers

Additional routine test (100 %)

9.1 Electric strength test

Additionally a dielectric strength test is to be performed by applying a voltage of 2500 V between the primary circuit and the secondary circuit.

10. EN 60335-2-35 Particular requirements for instantaneous water heater

Additional routine test (100 %)

10.1 Pressure test

The water heater shall withstand a water pressure test performed with water, air or another gas. During the test, no water leakage shall occur.

When water is used, the pressure is:

- 0.7 MPa (7 bar) for other closed water heaters
- 1.1 times the rated pressure for cistern-fed water heaters
- 0.05 MPa (0.5 bar) for open-outlet water heaters

If air or gas is used, the pressure has to be sufficiently high to show any leakage.

NOTE 1: Care should be taken when testing closed water heaters with gas.

Leakage of the fluid is not to occur during the test.

11. EN 60335-2-40 Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers

Replace note 1 at clause 1.2 Electric strength test with following note:

NOTE 1: It may be necessary for the appliance to be in operation during the test to ensure that the test voltage is applied to all relevant insulation, for example, heating elements controlled by a relay.

The circuit used for the test incorporates a current sensing device which trips when the current exceeds 5 mA. However, it may be necessary to set the device to trip at a higher value which is up to 100 mA if AC is used for the test.

12. EN 60335-2-45 Particular requirements for portable electric heating tools and similar appliances

Additional routine test (100 %)

12.1 Electric strength test

Electrical heating tools which are provided with a safety transformer are to be subjected to an additional dielectric strength test. A voltage of 2500 V is to be applied between the primary circuit and the secondary circuit.

13. EN 60335-2-47 Particular requirements for commercial electric boiling pans

Additional routine test (100 %)

13.1 Pressure test

Each boiling pan shall be subjected to a pressure test in accordance with the details indicated on the rating plate; a test duration of 5 minutes is sufficient.