

INTERNATIONAL STANDARD

AMENDMENT 2

**Electromagnetic compatibility (EMC) –
Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker
in public low-voltage supply systems, for equipment with rated current ≤ 16 A
per phase and not subject to conditional connection**



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ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection**AMENDMENT 2****FOREWORD**

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Amendment 2 to IEC 61000-3-3:2013 has been prepared by subcommittee 77A: EMC – Low frequency phenomena, of IEC technical committee 77: Electromagnetic compatibility.

The text of this Amendment is based on the following documents:

CDV	Report on voting
77A/1075/CDV	77A/1093/RVC

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Amendment is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications/.

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- replaced by a revised edition, or
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A.1.6 Microwave ovens

Replace the text of A.1.6 with the following:

The microwave oven shall be operated with a potable water load of initially $1\,000\text{ g} \pm 50\text{ g}$ in a cylindrical borosilicate glass vessel, having a maximum material thickness of 3 mm and an outside diameter of approximately 190 mm. The load shall be placed at the centre of the load-carrying surface. The initial temperature of the water shall be between $10\text{ }^{\circ}\text{C}$ and $25\text{ }^{\circ}\text{C}$.

The tests shall be performed at the lowest power stage, the stage nearest to 50 % of the maximum power, and a third stage which is the highest adjustable power which is less than or equal to 90 % of the maximum power. The worst result shall be recorded. The microwave heating is switched on during the first 10 s of the observation period. For the highest measured power stage, the microwave heating shall be switched off after $300\text{ s} \pm 10\text{ s}$. For the other power stages, the microwave heating is switched off during the last 10 s of the observation period.

The P_{st} shall be evaluated in each case over the required 10 min.

A.5 Test conditions for refrigerators

Replace the title and text of Clause A.5 with the following:

A.5 Test conditions for refrigerators and freezers

Refrigerators shall operate continuously with the door closed. Adjust the thermostat to the mid-value of the adjusting range. The cabinet shall be empty and not heated. The measurement shall be made after a steady state has been reached. P_{st} and P_{lt} shall not be evaluated. For repeatability reasons, at least three switch-on and three switch-off events of the compressor shall be evaluated.

Refrigerators with a rated power $< 200\text{ W}$ are deemed to comply with all requirements of this document without testing.

A.10 Test conditions for hairdryers

Replace the title and text of Clause A.10 with the following:

A.10 Test conditions for hairdryers and similar hair care equipment

For hairdryers and similar hair care equipment, which are intended to be held in hand during use, P_{lt} shall not be evaluated.

If the EUT is not intended for continuous operation of at least 10 min or switches off automatically before that time, the minimum time to restart the equipment shall be included in the observation period. The measurement shall continue until the end of the 10 min interval.

For equipment that can be operated at different settings (e.g. for heat and/or airflow) the power of the EUT shall be varied by changing the settings during the 10 min observation period as described below, but without including those settings where the heating is not active.

If the user controls provide discrete settings, all settings shall be included in the observation period up to a maximum of 10 settings. The maximum and minimum power settings shall be included.

If the user controls provide instead a range in which the quantity being controlled (e.g. heat) can be varied continuously between maximum and minimum, the total range shall be divided

into 10 equally spaced steps and the corresponding settings shall be used to determine the test conditions subjected to measurement.

In any case, the 10 min observation time shall include two periods during which the EUT is switched off. The duration of each off period shall be 1 min. The remaining time (8 min) shall be equally divided between the available power levels with heating on.

NOTE For example, if a hairdryer provides the user with a combination of 5 settings with heating on, each setting will be operated for $(10-2)/5 = 1,6$ min (96 s). Multiple power settings can result from the possible combinations obtained from multiple settings of heat and airflow.

The initial switch on event and the final switch off event shall be included in the observation time. The stepping through the different levels is with decreasing heating power, starting from maximum.

A.14 Test conditions for air conditioners, dehumidifiers, heat pumps, and commercial refrigerating equipment

Replace the last paragraph with the following:

P_{st} and P_{lt} shall be evaluated using the number of cycles per hour declared by the manufacturer.

Add the following new Clauses A.16, A.17 and A.18:

A.16 Coffee machines and tea machines

Before the start of a measurement, the machine is warmed up, so that the preparation of beverages can start immediately after the start of the measurement. To achieve good repeatability of measurement it is recommended to prepare a typical beverage as warming up and then wait 30 s before starting the measurements.

For machines designed to prepare only one type of beverage, this beverage shall be prepared consecutively with an interval of 30 s between two dispensings. This means that at each end of a beverage, the operator waits 30 s before starting the next beverage.

Any rinsing process during the observation period may be evaluated as a dispensing of a beverage.

NOTE 1 Some coffee or tea machines automatically activate a rinsing process that is considered part of the normal dispensing process of the machine.

For machines designed to prepare cups of different beverages, during the 10 min measuring period for the P_{st} the three most typical beverages are prepared one after the other, with the same interval of 30 s between consecutive dispensings. The preparation of the last beverage is started, even if it cannot be finished within the measuring period. If the preparation of the three beverages is finished before the end of the measured period, the cycle of beverages is continued with the first beverage. The choice of beverages should be based on the consideration that all internal power loads are at least activated once.

NOTE 2 Typical beverages are for example coffee, cappuccino and tea.

Parameters which can have an influence on the measurement result and can be adjusted by the operator, are set to the default conditions. For the preparation of cappuccino, water may be used instead of milk. Hot water may be prepared instead of real tea. The filling temperature of water is between 10 °C and 25 °C.

For machines which are designed to prepare exclusively complete pots for a number of cups, during the 10 min measuring period for the P_{st} complete pots are prepared one after the other with a 1 min separation between consecutive pots. P_{lt} shall not be evaluated.

In any situation where it is necessary to verify the original measurement, the measuring method originally chosen shall be used in order to ensure consistency of the results.

A.17 Portable fan heaters

Fan heaters shall be evaluated continuously for 120 min. P_{st} and P_{lt} shall be evaluated.

Fan heaters providing the user with controls to select different heat settings shall be cycled according to the following steps:

- 1) one 10 min interval at maximum heat;
- 2) one 10 min interval off;
- 3) one 10 min interval at the heat setting expected to give the highest P_{st} value;
- 4) one 10 min interval off;
- 5) repeat from 1).

NOTE The above steps result in the cycle being run three times ($40 \times 3 = 120$ min).

For equipment that restarts at the latest setting, the operating condition following an off interval shall be set not later than 10 s after the EUT has been re-started.

For fan heaters which do not provide the user with multiple heat settings (i.e. the heating can be only on or off), the test conditions evaluation shall be cycled according to the following steps:

- a) one interval at maximum heat;
- b) one interval off;
- c) repeat from a).

For both procedures, the following shall also apply:

- The initial switch on event shall be included in the first 10 min interval. All other switch on events shall occur approximately 5 s before the beginning of on intervals.
- Switch off events shall occur approximately 5 s after the beginning of an off interval.

If the user is provided with controls to vary the airflow, the airflow shall be set to the highest possible setting. The setting used for testing shall be recorded in the test report.

The requirements of Annex B shall not be applied.

If the equipment makes use of a thermostat, the target temperature shall be set to allow the EUT to operate as required by the applicable test procedure and for the required time.

If the equipment complies with the requirement of this document with the heating function active, the airflow function, when operated in isolation, shall be deemed to comply without testing.

A.18 Comfort fans and similar equipment

P_{st} and P_{lt} shall be evaluated as follows.

If controls are provided to the user to operate the equipment at different airflow settings, the power of the EUT shall be varied throughout the available settings during the 2 h observation

period. If the user controls provide discrete settings, all settings shall be included in the observation period up to a maximum of 10 settings. If the user controls provide instead a range in which the airflow can be varied continuously between maximum and minimum, the total range shall be divided into 10 equally spaced steps and the corresponding settings shall be used to determine the test conditions subjected to measurement.

If only a single airflow setting is provided, this setting shall be used for the entire 2 h observation period.

The requirements of Annex B shall not be applied.

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