IEC 61000-3-2

Edition 3.0 2009-02

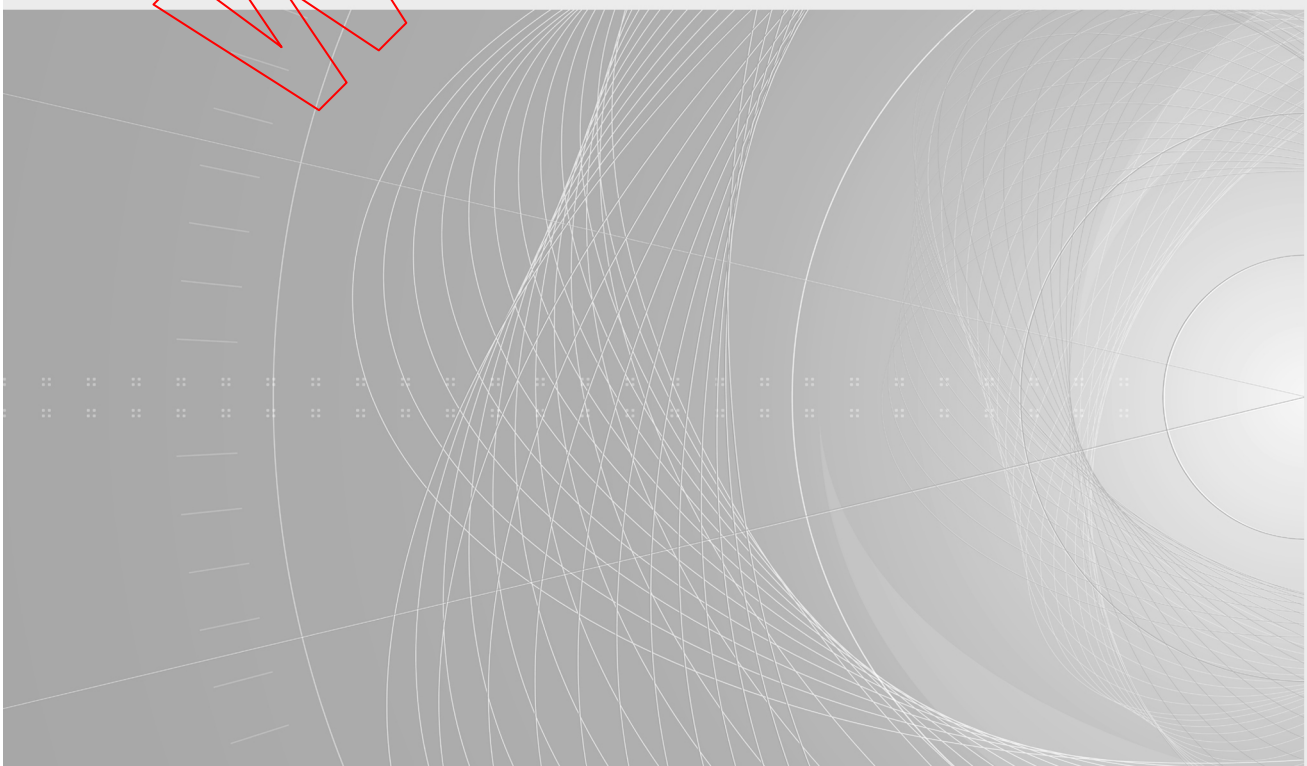
INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 2
AMENDEMENT 2

Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤16 A per phase)

Compatibilité électromagnétique (CEM) – Partie 3-2: Limites – Limites pour les émissions de courant harmonique (courant appelé par les appareils ≤16 A par phase)



IEC 61000-3-2:2005/A2:2009

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

PRICE CODE
CODE PRIX F

ICS 33.100.10

ISBN 978-2-88910-369-0

FOREWORD

This amendment has been prepared by subcommittee 77A: Low-frequency phenomena, of IEC technical committee 77: Electromagnetic compatibility.

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

FDIS	Report on voting
77A/674/FDIS	77A/677/RVD

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

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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- withdrawn,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

2 Normative references

Delete from the existing list the following standard:

IEC 60065, *Audio, video and similar electronic apparatus – Safety requirements*

Add in the existing list the following new references:

IEC 60268-1:1985, *Sound system equipment – Part 1: General*

IEC 60268-3, *Sound system equipment – Part 3: Amplifiers*

3 Definitions

Delete definitions 3.5 and 3.8.

Renumber the existing definition 3.16, as follows:

3.16
total harmonic

3.16.1
total harmonic current

Add the following new term and definition:

3.16.2
total harmonic distortion
THD
ratio of the r.m.s. value of the sum of the harmonic components (in this context harmonic current components I_h of orders 2 to 40) to the r.m.s. value of the fundamental component

$$THD = \sqrt{\sum_{h=2}^{40}\left(\frac{I_h}{I_1}\right)^2}$$

6 General requirements

Add the following text after the second paragraph, just before subclause 6.1:

A simplified test method is permitted for equipment that undergoes minor changes or updates, provided that, in previous full compliance tests, it has been shown to have current emissions below 60 % of the applicable limits and the THD of the supply current is less than 15 %. The simplified test method consists of verifying that the updated equipment has an active input power within ±20 % of that of the originally tested product, and that the THD of the supply current is less than 15 %. Products that fulfill these requirements are deemed to comply with the applicable limits, but in case of doubt the result of a full compliance test according to Clauses 6 and 7 takes precedence over this simplified method.

6.2.2 Measurement procedure

Replace the whole existing text of the fifth paragraph (the ante-penultimate paragraph) by the following new text:

In order not to use a value of power at which limits change abruptly, thus giving rise to doubt as to which limits apply, the manufacturer may specify any value which is within ±10 % of the actual measured value and use it for determining the limits for the original manufacturer's conformity assessment test. The measured and specified values of power, as defined in this clause, shall be documented in the test report.

Replace the whole existing text of the sixth paragraph (the penultimate paragraph) by the following new text:

If the value of the power found by measurement during emission tests other than the original manufacturer's conformity assessment test, measured according to the terms of this clause, is not less than 90 % nor greater than 110 % of the value for power specified by the manufacturer in the test report (see 6.2.3.5), the specified value shall be used to establish the limits. If the measured value is outside of this tolerance band around the specified value, the measured power shall be used to establish the limits.

7.3 Limits for Class C equipment

a) Active input power >25 W

Add, at the end of the third dashed item:

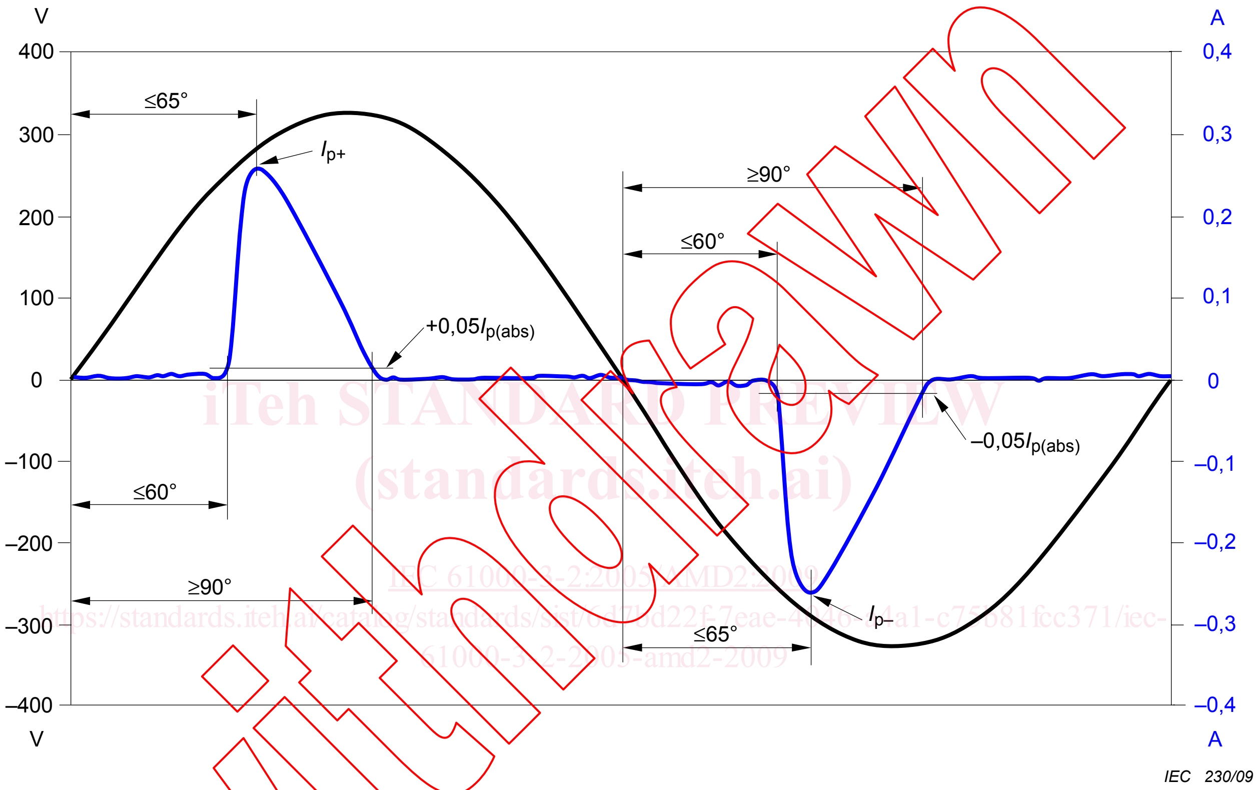
(see the last paragraph of C.5.3).

b) Active input power ≤25 W

Replace the whole existing text of the second dashed item by the following new text:

– the third harmonic current, expressed as a percentage of the fundamental current, shall not exceed 86 % and the fifth harmonic current shall not exceed 61 %. Also, the waveform of the input current shall be such that it reaches the 5 % current threshold before or at 60°, has its peak value before or at 65° and does not fall below the 5 % current threshold before 90°, referenced to any zero crossing of the fundamental supply voltage. The current threshold is 5 % of the highest absolute peak value that occurs in the measurement window, and the phase angle measurements are made on the cycle that includes this absolute peak value. See Figure 2.

Add the following new Figure 2 after Figure 1:



NOTE $I_{p(abs)}$ is the higher absolute value of I_{p+} and I_{p-}

Figure 2 – Illustration of the relative phase angle and current parameters described in 7.3 b)

Annex B – Requirements for measurement equipment

Delete the Note.

Annex C – Type test conditions

C.1 General

Add, at the end of the existing paragraph, the following new Note:

NOTE Product committees are invited to submit proposals for defined test conditions for specific products to IEC SC 77A, for inclusion in this Annex.

C.3 Test conditions for audio amplifiers

Replace the whole existing clause by the following new text:

C.3.1 Conditions

Audio amplifiers which draw a supply current which varies less than 15 % of the maximum current with input signal voltages between zero and rated source e.m.f. (as defined in IEC 60268-3) shall be tested with no input signal.

Other audio amplifiers shall be tested under the following conditions:

- rated supply voltage;
- normal position of user controls. In particular, any controls affecting the frequency response set to give the widest flat response achievable;
- input signals and loads as given in C.3.2.

C.3.2 Input signals and loads

The following test procedure applies.

a) Connect suitable resistors, equal to the rated load impedance(s), to each amplifier output for supplying loudspeakers. To monitor the output voltage waveform of the audio amplifier of a powered loudspeaker, the audio analyzer/oscilloscope is connected to internal wiring at a point representing the electrical output of the amplifier.

NOTE 1 In the case of powered loudspeakers with internal audio amplifiers, the load is the loudspeaker and associated crossover network.

b) Apply a sinusoidal signal at 1 kHz (see Note 2) to a suitable input. For multi-channel amplifiers in which the surround sound channel amplifiers cannot be alternatively used as a second set of left and right channel amplifiers, set the controls so that the surround sound channel amplifiers are supplied with signal at a level 3 dB lower than the signal applied to the left and right channels.

NOTE 2 For products not intended to reproduce 1 kHz signals, a frequency geometrically centred within the reproducing bandwidth of the amplifier is applied.

c) Adjust the input signal and/or amplifier gain control(s) so as to obtain an output signal for the left and right channels having 1 % total harmonic distortion, simultaneously. If 1 % total harmonic distortion cannot be obtained, adjust the signal voltage and/or gain controls to obtain the highest achievable power output at each output simultaneously. Confirm that the output signals of the surround sound channel amplifiers are 3 dB lower than the output signal at the outputs of the left and right channels.

d) Measure the output voltages of all channels and then readjust the input signal voltage and/or controls to obtain voltages of 0,354 ($1/\sqrt{8}$) times the voltages obtained at the end of step c) above.

e) In the case of products with provision for connection to external loudspeakers, proceed as specified in 6.2.

f) For products with internal loudspeakers and without provision for connection to external loudspeakers, note the r.m.s. output voltage of the sinusoidal signal at the output of each amplifier. Substitute the sinusoidal signal by a pink noise signal, bandwidth-limited as specified in 6.1 of IEC 60268-1. Confirm the r.m.s. value of the pink noise signal as it appears at the output of each amplifier output is equal to the r.m.s. value of the sinusoidal waveform for that channel set as in step d) above. Proceed as specified in 6.2.

C.5.2 Lamps

Replace the entire text of this subclause by the following new text:

Discharge lamps shall be aged for at least 100 h at rated voltage. Discharge lamps shall be operated for at least 15 min before a series of measurements is made. Some lamp types require a stabilization period exceeding 15 min. Information given in the relevant IEC lamp performance standard shall be observed.

During ageing, stabilization and measurement, lamps shall be installed as in normal use. Self-ballasted lamps shall be operated in cap-up position.

C.8 Test conditions for washing machines

Replace the existing text by the following:

The washing machine shall be tested during a complete laundry program incorporating the normal wash-cycle, filled with the rated load of double hemmed, pre-washed cotton cloths, size approximately 70 cm × 70 cm, dry weight from 140 g/m^2 to 175 g/m^2.

The temperature of the fill water shall be

- 65 °C ± 5 °C for washing machines without heating elements and intended for connection to a hot water supply;
- from 10 °C to 25 °C for other washing machines.

For washing machines with a programmer, the 60 °C cotton programme without pre-wash, if available, shall be used, otherwise the regular wash programme without pre-wash shall be used. If the washing machine contains heating elements which are not controlled by the programmer, the water shall be heated to 65 °C ± 5 °C before starting the first wash period.

If the washing machine contains heating elements and does not incorporate a programmer, the water shall be heated to 90 °C ± 5 °C or lower if steady conditions are established, before starting the first wash period.

C.15 Test conditions for other equipment

Delete the title and the clause.

AVANT-PROPOS

Le présent amendement a été établi par le sous-comité 77A: Phénomènes basse fréquence, du comité d'études 77 de la CEI: Compatibilité électromagnétique.

Le texte de cet amendement est issu des documents suivants:

FDIS	Rapport de vote
77A/674/FDIS	77A/677/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cet amendement.

Le comité a décidé que le contenu de cet amendement et de la publication de base ne sera pas modifié avant la date de maintenance indiquée sur le site web de la CEI sous "http://webstore.iec.ch" dans les données relatives à la publication recherchée. A cette date, la publication sera

- reconduite,
- supprimée,
- remplacée par une édition révisée, ou
- amendée.

2 Références normatives

Supprimer de la liste existante la norme suivante:

CEI 60065, *Appareils audio, vidéo et appareils électroniques analogues – Exigences de sécurité*

Ajouter dans la liste existante les nouvelles références suivantes:

CEI 60268-1:1985, *Equipements pour systèmes électroacoustiques – Partie 1: Généralités*

CEI 60268-3, *Equipements pour systèmes électroacoustiques – Partie 3: Amplificateurs*

3 Définitions

Supprimer les définitions 3.5 et 3.8.

Renuméroter la définition existante 3.16 comme suit:

3.16
harmonique total

3.16.1
courant harmonique total

Ajouter le terme et la définition suivants: