
Plošče s plazemskim prikazovalnikom - 2-4. del: Merilne metode - Vizualna kakovost: slikovni artefakti

Plasma display panels - Part 2-4: Measuring methods - Visual quality: Image artifacts

Plasmabildschirme - Teil 2-4: Messverfahren - Visuelle Qualität: Bild-Artefakte

Panneaux d'affichage à plasma - Partie 2-4: Méthodes de mesure - Qualité visuelle: Artéfacts d'image

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EUROPEAN STANDARD
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**Plasma display panels -
Part 2-4: Measuring methods -
Visual quality: Image artifacts
(IEC 61988-2-4:2011)**

Panneaux d'affichage à plasma -
Partie 2-4: Méthodes de mesure -
Qualité visuelle: Artéfacts d'image
(CEI 61988-2-4:2011)

Plasmabildschirme -
Teil 2-4: Messverfahren -
Visuelle Qualität: Bild-Artefakte
(IEC 61988-2-4:2011)

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Comité Européen de Normalisation Electrotechnique
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Foreword

The text of document 110/260/CDV, future edition 1 of IEC 61988-2-4, prepared by IEC TC 110, "Flat panel display devices", was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61988-2-4:2011.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2012-06-29
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2014-09-29

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Endorsement notice

The text of the International Standard IEC 61988-2-4:2011 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61747-6:2004 NOTE Harmonized as EN 61747-6:2004 (not modified).

IEC 61747-6-3:2011 NOTE Harmonized as EN 61747-6-3:2011 (not modified).

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Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60068-1 + corr. October	1988 1988	Environmental testing - Part 1: General and guidance	EN 60068-1 ¹⁾	1994
IEC 60107-1	1997	Methods of measurement on receivers for television broadcast transmissions - Part 1: General considerations - Measurements at radio and video frequencies	EN 60107-1	1997
IEC 61988-1	2003	Plasma display panels - Part 1: Terminology and letter symbols	EN 61988-1 ²⁾	2003
IEC 61988-2-1	2002	Plasma display panels - Part 2-1: Measuring methods - Optical	EN 61988-2-1	2002
IEC 61988-2-2	2003	Plasma display panels - Part 2-2: Measuring methods - Optoelectrical	EN 61988-2-2	2003
CIE 15	2004	Colorimetry	-	-

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¹⁾ EN 60068-1 includes A1 to IEC 60068-1 + corr. October .

²⁾ EN 61988-1 is superseded by EN 61988-1:2011, which is based on IEC 61988-1:2011.

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Plasma display panels –
Part 2-4: Measuring methods – Visual quality: Image artifacts

Panneaux d'affichage à plasma –
Partie 2-4: Méthodes de mesure – Qualité visuelle: Artéfacts d'image

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

PLASMA DISPLAY PANELS –**Part 2-4: Measuring methods –
Visual quality: Image artifacts**

FOREWORD

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International Standard IEC 61988-2-4 has been prepared by IEC technical committee 110: Flat panel display devices.

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

FDIS	Report on voting
110/260/CDV	110/297/RVC

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts in the IEC 61988 series, under the general title *Plasma display panels*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability 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.

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PLASMA DISPLAY PANELS –

Part 2-4: Measuring methods – Visual quality: Image artifacts

1 Scope

This part of IEC 61988 determines the measuring methods for characterizing the performance of plasma display panel (PDP) modules in the following areas:

- a) viewing angle;
- b) image streaking;
- c) flicker;
- d) moving picture resolution.

2 Normative references

The following referenced documents are indispensable for the application of these standards. For standards with explicit dates, only the edition cited applies. For standards references, the latest edition of the referenced standard (including any amendments) applies.

IEC 60068-1:1988, *Environmental testing – Part 1: General and guidance*

IEC 60107-1:1997, *Methods of measurement on receivers for television broadcast transmissions – Part 1: General considerations – Measurements at radio and video frequencies*

IEC 61988-1:2003, *Plasma display panels – Part 1: Terminology and letter symbols*

IEC 61988-2-1:2002, *Plasma display panels – Part 2-1: Measuring methods – Optical*

IEC 61988-2-2:2003, *Plasma display panels – Part 2-2: Measuring methods – Optoelectrical*

CIE 15:2004, *Colorimetry, 3rd Edition*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61988-1, IEC 60068-1, and IEC 60107-1, as well as the following apply.

3.1

viewing angle

angular range over which a display can be viewed with acceptable specified visual performance

NOTE This document specifies two types of viewing angle regarding the viewing direction, such as horizontal and vertical.

3.2

half luminance viewing angle

viewing angle over which the luminance is equal or higher than half of the luminance measured at the angle perpendicular to the screen

3.3**half contrast viewing angle**

viewing angle over which the contrast ratio is equal or higher than half of the contrast ratio measured at the angle perpendicular to the screen

3.4**10:1 contrast ratio viewing angle**

viewing angle over which the contrast ratio is equal or higher than 10:1

3.5**colour viewing angle**

viewing angle over which the chromaticity shift $\Delta(u',v')$ is equal or less than specified threshold value

3.6**image streaking**

variance in luminance with changing vertical or horizontal line load

3.7**flicker**

unintended but perceptible temporal periodic fluctuation in luminance

3.8**moving picture resolution**

perceived number of picture lines for moving pictures on the display screen

NOTE Moving picture resolution is not determined only by the physical pixel number of the panel (termed "addressability"), but also by the moving picture performance in terms of motion artefacts. The resolution is expressed in picture line in the document and it can be easily converted to well-known TV-line.

3.9**modulation transfer function****MTF**

ratio of the final to the initial signal amplitude as a function of spatial frequency

NOTE MTF is the magnitude part of optical transfer function (OTF).

3.10**limit resolution**

maximum number of picture lines which observer can distinguish excepting spurious resolution

NOTE See Figure 7.

3.11**spurious resolution**

phenomenon occurring at a spatial frequency higher than the limit resolution in which the observed pattern of the resolution chart is different from the original pattern

NOTE Spurious resolution is usually recognized as a change of the number of lines. For example four lines become three lines or five lines. See Figure 7.

4 Structure of measuring equipment

The system diagrams and/or operating conditions of the measuring equipment shall comply with the structure specified in each item.