

Plasma display panels —

Part 4: Climatic and mechanical testing methods

The European Standard EN 61988-4:2007 has the status of a
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National foreword

This British Standard was published by BSI. It is the UK implementation of EN 61988-4:2007. It is identical with IEC 61988-4:2007.

The UK participation in its preparation was entrusted to Technical Committee EPL/47, Semiconductors.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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**Plasma display panels -
Part 4: Climatic and mechanical testing methods
(IEC 61988-4:2007)**

Panneaux d'affichage à plasma -
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und mechanische Prüfverfahren
(IEC 61988-4:2007)

This European Standard was approved by CENELEC on 2007-05-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of document 110/107/FDIS, future edition 1 of IEC 61988-4, prepared by IEC TC 110, Flat panel display devices, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61988-4 on 2007-05-01.

The following dates were fixed:

- | | | |
|--|-------|------------|
| – latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement | (dop) | 2008-02-01 |
| – latest date by which the national standards conflicting
with the EN have to be withdrawn | (dow) | 2010-05-01 |

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61988-4:2007 was approved by CENELEC as a European Standard without any modification.

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PLASMA DISPLAY PANELS –

Part 4: Climatic and mechanical testing methods

1 Scope

This part of IEC 61988 defines test methods for evaluating environmental and mechanical endurance characteristics of plasma display modules (PDP modules).

2 Normative references

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

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

IEC 60068-2-1:1990, *Environmental testing – Part 2: Tests – Tests A: Cold*

IEC 60068-2-2:1974, *Environmental testing – Part 2: Tests – Tests B: Dry heat*

IEC 60068-2-6, *Environmental testing – Part 2: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-13, *Environmental testing – Part 2: Tests – Test M: Low air pressure*

IEC 60068-2-27:1987, *Environmental testing – Part 2: Tests – Test Ea and guidance: Shock*

IEC 60068-2-30, *Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 h + 12 h cycle)*

IEC 60068-2-78:2001, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

IEC 61747-5:1998, *Liquid crystal and solid-state display devices – Part 5: Environmental, endurance and mechanical test methods*

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

ISO 2248, *Packaging – Complete, filled transport packages – Vertical impact test by dropping*

ISO 4180-1, *Complete, filled transport packages – General rules for the compilation of performance test schedules – Part 1: General principles*

ISO 4180-2, *Complete, filled transport packages – General rules for the compilation of performance test schedules – Part 2: Quantitative data*

ISO 10531, *Packaging – Complete, filled transport packages – Stability testing of unit loads*

3 Terms, definitions and letter symbols

For the purposes of this document, most of the definitions used in this standard comply with IEC 60068-1 and IEC 61988-1. The following symbols are used in addition to those defined in IEC 61988-1.

3.1

P_{op}

air pressure at which the PDP module is operated during the tests

3.2

P_{st}

air pressure at which the PDP module is stored in a non-operating state during the tests

4 Structure of testing equipment

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

5 Standard conditions

5.1 Standard reference atmosphere

Temperature: 25 °C

Air pressure: 101,3 kPa

NOTE No requirement for relative humidity is given because correction by calculation is generally not possible.

If the parameters to be measured depend on temperature and/or pressure and the law of dependence is known, the values shall be measured in the conditions specified in 5.3 and, if necessary, be corrected by calculation to the standard reference atmospheric conditions above.

5.2 Standard atmospheric conditions for reference measurements and tests

If the parameters to be measured depend on temperature, pressure and humidity and the law of dependence is unknown, the atmospheric conditions to be specified shall be selected from the following values, as shown in Table 1.

Table 1 – Standard conditions for reference measurements and tests

Temperature °C	Relative humidity ^a % RH	Air pressure ^a kPa
20 ± 3	45 to 75	86 to 106
25 ± 3		
30 ± 3		
35 ± 3		
^a Inclusive values.		

5.3 Standard atmospheric conditions for measurement and tests

Unless otherwise specified, all tests and measurements shall be carried out under standard atmospheric conditions:

- temperature: 15 °C to 35 °C;
- relative humidity: 25 % to 85 %, where appropriate;
- air pressure: 86 kPa to 106 kPa.

The absolute humidity of the atmosphere shall not exceed 22 g/m³.

5.4 Standard atmospheric conditions for assisted drying

Where assisted drying is required before commencing a series of measurements, the conditions listed below shall be used on the PDP module for at least 2 h, unless otherwise prescribed by the relevant specification:

- temperature: (55 ± 3) °C;
- relative humidity: not exceeding 20 %;
- air pressure: 86 kPa to 106 kPa.

When the specified temperature for the dry heat test is lower than 55 °C, assisted drying shall be carried out at that lower temperature.

5.5 Recovery conditions

The recovery shall be carried out in the conditions specified in 5.3 of IEC 60068-1:

- temperature: 15 °C to 35 °C;
- relative humidity: 25 % to 75 %;
- air pressure: 86 kPa to 106 kPa.

5.6 Standard installation conditions

Unless otherwise specified in the relevant specification, stand the PDP module keeping adequate clearance to avoid airflow disturbance. The mounting structure of the PDP module shall be specified in the relevant specification.

5.7 Standard measuring conditions

The standard measuring conditions described in IEC 61988-2 shall be applied.

5.8 PDP module state

For the non-operating test, the PDP module shall be either unpacked and turned off, or as otherwise specified in the relevant specification.

For the operating test, the PDP module shall be either in the unpacked, turned off and ready-for-use state, or as otherwise specified in the relevant specification.

5.9 Operating conditions

Full screen: The signal input sets at (15 ± 1) % of white level without gamma correction or equivalent input level when gamma correction is used.

In case a different signal input is used, it shall be noted in the report.

NOTE The 15 % signal input level is a typical value for video.