

INTERNATIONAL STANDARD

Liquid crystal display devices –
Part 2: Liquid crystal display modules – Sectional specification
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LIQUID CRYSTAL DISPLAY DEVICES –**Part 2: Liquid crystal display modules –
Sectional specification**

FOREWORD

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International Standard IEC 61747-2 has been prepared by IEC technical committee 110: Electronic display devices.

This International Standard is to be used in conjunction with IEC 61747-1-1:2014.

This second edition cancels and replaces the first edition published in 1998. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) This version is applicable only for liquid crystal displays.
- b) All the references to IECQ and QC were removed in accordance with ISO/IEC Directives.
- c) The normative references were updated.

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

CDV	Report on voting
110/531/CDV	110/602/RVC

Full information on the voting for the approval of 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 61747 series, published under the general title *Liquid crystal display devices*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

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- withdrawn,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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LIQUID CRYSTAL DISPLAY DEVICES –

Part 2: Liquid crystal display modules – Sectional specification

1 Scope

This part of IEC 61747 applies to liquid crystal display modules such as the following:

- static/segment type liquid crystal display modules;
- passive matrix monochrome liquid crystal display modules;
- passive matrix colour liquid crystal display modules;
- active matrix monochrome liquid crystal display modules;
- active matrix colour liquid crystal display modules.

It gives details of the quality assessment procedures, inspection requirements, screening sequences, sampling requirements, and test and measurement procedures required for the assessment of liquid crystal display modules.

2 Normative reference

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

IEC 61747-1-1:2014, *Liquid crystal display devices – Part 1-1: Generic – Generic specification*

IEC 61747-10-1, *Liquid crystal display devices – Part 10-1: Environmental, endurance and mechanical test methods – Mechanical*

IEC 61747-10-2, *Liquid crystal display devices – Part 10-2: Environmental, endurance and mechanical test methods – Environmental and endurance*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

production line

single set of process operations including one or several of the following manufacturing phases:

- a) connection of external electronic circuit devices to cell;
- b) finishing and final electrical and optical measurements;
- c) screening (if applicable).

Note 1 to entry: Quality assessment procedures are not included in these phases.

3.2

production lot

devices of the same type, manufactured in the same production lines and passing through the same nominated process, normally within one month

4 Quality assessment procedure

4.1 Primary stage of manufacture

The quality assessment procedure is defined as outlined below.

For the purpose of this sectional specification, this stage is defined as the first process step that connects external electronic circuit devices (including separate printed circuit boards (PCB) and/or connection cables) to a liquid crystal display cell, thus converting it to a liquid crystal module.

4.2 Manufacturing process

4.2.1 General

The manufacturing process of liquid crystal display modules is classified as follows:

- a) connection of electronic circuit devices (including separate PCBs and/or connection cables): this process is the set of manufacturing process operations from the primary stage to the last step for electronic circuit device connections to the cell;
- b) finishing process and final electrical and optical measurements: this process is the final set of manufacturing process operations comprising the assembly of a bezel, external connectors/pins and integrated backlight system to the cell if required, as well as the marking for the completion as a liquid crystal display module;
- c) screening (if applicable): this phase may be part of the finishing operation(s).

4.2.2 Major changes in manufacturing process

Any change in the manufacturing process or in the technology which could affect the quality or performance of a product supplied according to an approved specification, or which could require a product to be transferred from one structural similarity group to another (see 4.4) represents a change considered as major. It is the responsibility of the designated management representative (DMR) to decide whether the change is major or not.

Any major change shall only be implemented with notification and demonstration by test evidence of quality.

Examples of major changes are:

- a) driver attachment: from two-bank to one-bank arrangement;
- b) integrated backlight system:
 - lamp position from horizontal to vertical or from top to bottom arrangement;
 - backlight-type change from electroluminescent to cold cathode fluorescent lamp;
 - light guide change from wedge to flat type;
- c) bezel material: from metal to plastic;
- d) connector change and/or pin assignment change: from type A to type B connector.

NOTE Equipment change without changing the technology is not considered as a major change.

4.3 Subcontracting

The approved manufacturer shall ensure that the subcontracted manufacturing process is either part of or a whole of the cell and/or module manufacturing process, unconditionally, including screening steps which are incorporated in them. Screening operations applied after the assembly process may also be independently subcontracted.

It shall be ensured that the DMR that is certifying the components

- has been provided with the full quality assessment and inspection documentation of any operation outside the specified geographical area. The documentation shall include the inspection records for each sample of the product which undergoes inspection;
- regularly verifies that the quality assessment and inspection is applied in accordance with the agreed requirements.

The DMR shall be provided and shall agree with the procedures for the transfer of the parts from the place of manufacture to the manufacturer within the specified geographical area which is certifying the component. Any changes in inspection requirements and manufacturing procedures shall be reported back to the DMR that is certifying the modules.

The approved manufacturer shall perform the acceptance tests prescribed by the detail specification for the components it is certifying. It can perform the acceptance tests in a facility outside the specified geographical area. Acceptance tests can be subcontracted to approved test laboratories within the specified geographical area.

4.4 Structural similarity procedures

4.4.1 General

Structural similarity procedures are intended to permit a reduction in the number of inspection lots for quality assessment that shall be tested. Therefore, in case of reassessment due to the extension of approval types or the change of the design, the testing data which was performed within the same grouping products may be used.

4.4.2 Structurally similar modules

Structurally similar modules are produced by one manufacturer, to the same design, with the same material, manufacturing process and methods. The crucial criterion for the grouping of types of modules as structurally similar is that the differences between the various types have no influence on the results of the test for which the group has been formed.

4.4.3 Test-dependent criteria for structural similarity

The test-dependent criteria for structural similarity applicable to group B (lot-by-lot inspections) and group C (periodic tests), are given in Table 1. Items a) to i) specify the interpretation of these criteria for structural similarity.

a) Cell

The material and basic design for the cell, for example passive matrix, active matrix, etc., shall be the same. The display area differences shall be within $\pm 50\%$. The pixel number differences shall be within $\pm 50\%$.

b) Electronic circuit devices including separate PCBs

The material and basic design, for example static driving, multiplex driving, direct addressing, matrix addressing, etc., shall be the same.

c) Backlight system

The material and basic design for the integrated backlight system shall be the same.

d) Bezel structure

The material and basic design for the bezel shall be the same.