

Liquid crystal display devices —

Part 5-3: Liquid crystal display devices — Glass strength and reliability measurement method

ICS 31.120; 31.260

National foreword

This Draft for Development is the UK implementation of IEC/PAS 61747-5-3:2007.

This publication is not to be regarded as a British Standard.

It is being issued in the Draft for Development series of publications and is of a provisional nature. It should be applied on this provisional basis, so that information and experience of its practical application can be obtained.

A PAS is a Technical Specification not fulfilling the requirements for a standard, but made available to the public and established in an organization operating under a given procedure.

A review of this Draft for Development will be carried out not later than three years after its publication.

Notification of the start of the review period, with a request for the submission of comments from users of this Draft for Development, will be made in an announcement in the appropriate issue of *Update Standards*. According to the replies received, the responsible BSI Committee will judge whether the validity of the PAS should be extended for a further three years or what other action should be taken and pass their comments on to the relevant international committee.

Observations which it is felt should receive attention before the official call for comments will be welcomed. These should be sent to the Secretary of the responsible BSI Technical Committee at British Standards House, 389 Chiswick High Road, London W4 4AL.

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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Glass strength and reliability
measurement method**



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INTRODUCTION

This PAS is devoted to the mechanical reliability of liquid crystal display (LCD) devices. This PAS is restricted to transmissive or reflective LCD modules using either segment, passive or active matrix and achromatic or colour-type LCDs that are equipped with their own integrated source of illumination or without their own source of illumination. Analysis and testing are performed on LCD module component glass as well as finished on LCD modules. Statistics of the mechanical strength of the modules are determined, allowing a prediction of module failure probability at a given stress level, or, for a given probability of failure, the maximum recommended safe loading stress for the module.

LIQUID CRYSTAL DISPLAY DEVICES –

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1 Scope and object

This PAS applies to commercially available liquid crystal displays (LCDs). This PAS applies to all LCD types, including transmissive, reflective or transreflective LCD modules using either segment, passive or active matrix and achromatic or colour-type LCDs that are equipped with their own integrated source of illumination or without their own source of illumination.

The object of this PAS is to establish uniform requirements for accurate and reliable measurements of the following LCD parameters, as defined herein:

- a) quasistatic strength;
- b) quasistatic fatigue.

The methods described in this PAS apply to all sizes, small and large, of LCDs.

Methods for measuring the fatigue constant are described in this PAS and are taken from the referenced literature [13-20]. The primary results are formulae for estimated allowable stress for the specified lifetime or estimated failure rate for the specified stress level. By way of an example, limited data for strength and fatigue behaviour of LCD glass are included in an informative annex to this PAS. Similarly, limited data for the static strength of LCD modules is also included and compared with that of parent glass

2 Normative references

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.

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

3 Terms and definitions

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

3.1

strength

stress at which a sample fails for a given loading condition

3.2

LCD surface strength

biaxial strength wherein surface flaws with different orientations are subjected to uniform tension during measurement [1-4]

3.3

LCD edge strength

uniaxial strength wherein edge flaws are subjected to tension during measurement [5-8]