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INTERNATIONAL STANDARD

colour inside

Flexible displays devices –
Part 6-23: Mechanical test methods – Mechanical misaligned folding test method



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FLEXIBLE DISPLAY DEVICES –

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IEC 62715-6-23 has been prepared by IEC technical committee 110: Electronic displays. It is an International Standard.

The text of this International Standard is based on the following documents:

Draft	Report on voting
110/1702/FDIS	110/1717/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 62715 series, published under the general title *Flexible display devices*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

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INTRODUCTION

The market for foldable panels has been growing steadily. The first foldable product which has foldable panel was launched in 2019 as a smartphone. Since then, many other manufacturers have released a variety of foldable smartphones. In the future, it is expected that various types of foldable products such as smartphones, tablets or laptop computers, etc. will be released continuously.

These foldable products would be folded and unfolded repeatedly by users. This means that as the period of use increases, the number of times for folding and unfolding the foldable product increases. For this reason, the mechanical robustness of the foldable panel is expected to vary depending on the duration of use and the user style (e.g. heavy users). [1][1] This document will introduce the mechanical durability test to reflect the actual usage environment. This test method can also be an important evaluation item as much as the mechanical durability test for the initial foldable panel state.

The example of an actual usage environment can be demonstrated in the below situation. As mentioned earlier, when the usage time increases, the number of folding and unfolding of the foldable product also increases. Taking smartphones as an example, users unfold the foldable product in order to use it, then fold it again to easily hold or carry it. Users repeat this action several times in a day: they unfold and fold foldable products repeatedly to receive calls, to send text messages or to search the Internet. Users often drop foldable products or bump their foldable products somewhere because they hold their smartphone almost every day.

If the users repeatedly fold and unfold the device, or if the device is subjected to shocks (such as dropping or pressing in local area), it can cause the misaligned state of the foldable product. In this document, the situation that can cause misalignment of the foldable product is limited to the state of being shocked by dropping or being pressed after repeated folding and unfolding. The test simulates all of these processes and is defined as the mechanical misaligned folding test. Therefore, this mechanical misaligned folding test consists of a cyclic folding test and a drop test.

This document introduces the measurement conditions and measurement methods of the mechanical misaligned folding test method, which is an objective mechanical durability test method that takes into consideration the actual usage environment of the foldable panel.

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1 Numbers in square brackets refer to the Bibliography.

FLEXIBLE DISPLAY DEVICES –

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1 Scope

This part of IEC 62715 specifies the standard measuring methods to evaluate the mechanical durability of foldable display modules, especially mechanical durability under the condition reflecting the actual usage environment.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 62341-6-2:2015, *Organic light emitting diode (OLED) displays – Part 6-2: Measuring methods of visual quality and ambient performance*

IEC 62715-6-1:2018, *Flexible display devices – Part 6-1: Mechanical test methods – Deformation tests*

IEC 62715-6-3, *Flexible display devices – Part 6-3: Mechanical test methods – Impact and hardness tests*

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1
foldable panel
flexible display panel which can be folded

3.2
misaligned state
situation in which the folding alignment of the foldable panel becomes abnormal as being shocked by dropping or being pressed after repeated folding and unfolding

3.3
point defect
all or part of a single subpixel, the minimum colour element, which is visibly brighter or darker than surrounding subpixels of the same colour