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Introduction

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Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	(7)
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/ Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

ASD-STAN/D 4/WG 5

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Aerospace series — Environmental testing — Durability of the displays by general usage

Luft- und Raumfahrt — Umweltprüfung — Beständigkeit der Displays bei allgemeiner Nutzung

Série aérospatiale — Essais d'environnement

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European foreword

This document is currently under preparation as committee draft by ASD-STAN/D 4/WG 5.

1 Scope

This document provides a series of testing methods to determine the resistance of the digital display during general usage in an aircraft cabin. The document applies to any passive and interactive displays. It includes also dirt affinity and cleanability.

The testing methods include the determination of the durability of touchscreen surfaces, signing pads and general displays against human fingertip and hand abrasion, fingerprint and dirt affinity under the usage by humans as may occur during everyday's operation inside an aircraft cabin. Additionally, the resistance against general abrasion, scratch and mar on the displays as well as the resistance study against the routine cleaning procedure conducted inside the aircraft is defined.

The test methods are also suitable to test the durability of a display surface against all low and high dynamic strains.

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.

EN 4860, Aerospace series — *Environmental testing — Test Xb: Abrasion of markings, letterings, surfaces and materials caused by rubbing of fingertips and hands*¹⁾

3 Terms and definitions

No terms and definitions are listed in this document.

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

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

4 General test description

4.1 General

The six tests scenarios for testing the durability of the displays in cabin interior are defined in 4.2 to 4.7.

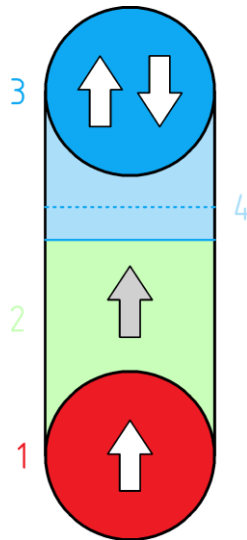
¹⁾ Published as ASD-STAN prEN 4860 by ASD-STAN: www.asd-stan.org

4.2 Fingertip and hand abrasion test

The surface under test shall be repeatedly stressed by the impact and rubbing movement of a test piston. The tip of the test piston due to its elasticity shall be deformed in such a way as to fit the surface under test. The material, hardness, roughness and shape of the piston, the movement and the angle of action shall be chosen in such a way that the pressure and friction executed by a human fingertip or by the ball of a thumb are simulated.

To obtain reproducible conditions of friction and wear, a piece of fabric shall be placed between the piston and the surface under test either as a cover of the piston or as a curtain, hanging between piston and surface. The testing fabric, depending on its specified property, can contain additional ingredients as a lubricant. Therefore, depending on the relevant specification, this fabric can either be used in a dry condition (dry test and semi dry test) or additionally wetted with a specified test liquid by means of an automatic feedthrough if the test is intended to cover the influence of fluid contamination as may occur in normal use (wet test).

Depending on the three different motions of human fingertips on the display, namely touch, swipe and zoom motions, the abrasion patterns are described in Figure 1.



Key

- 1 Impact on the sample surface = Putting on the fingertip when using display = short tap or touch motion
- 2 Friction path with defined force and speed / transition between static and sliding friction = Swipe movement
- 3 Reaching the end point of the friction movement; then the test cylinder moves back to the starting position = Finger stops the swipe movement
- 4 Short area where the test piston moves bidirectionally on the surface = Retraction of the piston

Figure 1 — Fingertip abrasion zone and movement pattern

The complete test procedure for testing the resistance against fingertip and hand abrasion for cabin touch screens shall be done according to EN 4860. The complete test fabric options and test media options are described in Annex C and in EN 4860.

Additional speed options, differing from the 60 ± 5 mm/s specified in EN 4860, such as 200 cm/s shall be used to simulate realistic stress conditions.