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Test methods for machine readable travel documents (MRTD) and associated devices —

Part 1: Physical test methods for passport books (durability)

Méthodes d'essais pour documents de voyage lisibles par machine et dispositifs associés —

Partie 1: Méthodes d'essais physiques pour livrets de passeport (durabilité)

Reference number
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Contents

Page

Foreword ..... **vii**
Introduction ..... **viii**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **2**
4 Abbreviated terms **3**
5 Methodology **3**
6 Guidance to the tester **5**
6.1 Number of samples 5
6.2 Preparation 5
6.3 Sampling 6
6.4 Storage 6
7 Common method information **6**
7.1 Default environment 6
7.2 Climatic conditions 6
7.3 Tolerances 6
7.4 Default MRP holder 6
8 Stress methods **7**
8.1 Conditioning stress method 7
8.1.1 General 7
8.1.2 Input Parameters 7
8.1.3 Apparatus 7
8.1.4 Method 7
8.2 Thermal cycling stress method 8
8.2.1 General 8
8.2.2 Input parameters 8
8.2.3 Apparatus 8
8.2.4 Method 8
8.3 Storage temperature stress method 9
8.3.1 General 9
8.3.2 Input parameters 9
8.3.3 Apparatus 9
8.3.4 Method 9
8.4 Operational climate stress method 9
8.4.1 General 9
8.4.2 Input Parameters 9
8.4.3 Apparatus 9
8.4.4 Method 9
8.5 Impact stress method 10
8.5.1 General 10
8.5.2 Input parameters 10
8.5.3 Output parameters 10
8.5.4 Apparatus 10
8.5.5 Method 12
8.5.6 Alternate method 13
8.6 Book bend stress method (back pocket) 13
8.6.1 General 13
8.6.2 Input parameters 13
8.6.3 Output parameters 13
8.6.4 Apparatus 13
8.6.5 Method 14

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8.7 Dynamic bend stress method 15
8.7.1 General 15
8.7.2 Input parameters 15
8.7.3 Output parameters 15
8.7.4 Apparatus 15
8.7.5 Calibration of movement method 16
8.7.6 Method 17
8.8 Torsion stress method 18
8.8.1 General 18
8.8.2 Input parameters 18
8.8.3 Output parameters 18
8.8.4 Apparatus 18
8.8.5 Calibration 19
8.8.6 Method 19
8.9 Sheet turning stress method 19
8.9.1 General 19
8.9.2 Input parameters 19
8.9.3 Output parameters 19
8.9.4 Apparatus 19
8.9.5 Method 20
8.9.6 Bending parameters 21
8.10 Sheet pull stress method 21
8.10.1 General 21
8.10.2 Input parameters 21
8.10.3 Output parameters 21
8.10.4 Apparatus 21
8.10.5 Method 21
8.11 Abrasion stress method 22
8.11.1 General 22
8.11.2 Input parameters 22
8.11.3 Output parameters 22
8.11.4 Apparatus 22
8.11.5 Method 23
8.12 Pen stress method 23
8.12.1 General 23
8.12.2 Input parameters 23
8.12.3 Output parameters 23
8.12.4 Apparatus 23
8.12.5 Method 23
8.13 Resistance to chemicals stress method 24
8.13.1 General 24
8.13.2 Input parameters 25
8.13.3 Output parameters 25
8.13.4 Apparatus 25
8.13.5 Short term contamination test 25
8.13.6 Long term contamination test 26
8.14 Artificial daylight exposure stress method 26
8.14.1 General 26
8.14.2 Input parameters 27
8.14.3 Output parameters 27
8.14.4 Apparatus 27
8.14.5 Method 27
8.15 X-ray stress method 27
8.15.1 General 27
8.15.2 Input parameter 27
8.15.3 Output parameter 27
8.15.4 Apparatus 28
8.15.5 Method 28

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9 Evaluation methods **28**
9.1 Functional PIC evaluation method 28
9.1.1 General 28
9.1.2 Input parameters 28
9.1.3 Output parameters 28
9.1.4 Apparatus 28
9.1.5 Method 28
9.2 Physical damage evaluation method 28
9.2.1 General 28
9.2.2 Input parameters 29
9.2.3 Output parameters 29
9.2.4 Apparatus 29
9.2.5 Method 29
9.3 Peel strength evaluation method 29
9.3.1 General 29
9.3.2 Input parameters 29
9.3.3 Output parameters 30
9.3.4 Apparatus 30
9.3.5 Method 30
9.4 Colour fastness evaluation method 30
9.4.1 General 30
9.4.2 Input parameters 30
9.4.3 Output parameters 31
9.4.4 Apparatus 31
9.4.5 Method 31
9.5 Datapage and cover warpage evaluation method 31
9.5.1 General 31
9.5.2 Input parameters 31
9.5.3 Output parameters 31
9.5.4 Apparatus 31
9.5.5 Method 31
9.6 Book warpage evaluation method 33
9.6.1 General 33
9.6.2 Input parameters 33
9.6.3 Output parameters 34
9.6.4 Apparatus 34
9.6.5 Method 34

10 Test sequences **35**
10.1 General 35
10.2 Instructions for using the sequence table 35
10.3 Sheet binding sequence 35
10.3.1 General 35
10.3.2 Input parameters 35
10.3.3 Output parameters 35
10.3.4 Sequence 36
10.4 Storage climate sequence 36
10.4.1 General 36
10.4.2 Input parameters 36
10.4.3 Output parameters 36
10.4.4 Sequence 36
10.5 Operational climate sequence 36
10.5.1 General 36
10.5.2 Input parameters 37
10.5.3 Output parameters 37
10.5.4 Sequence 37
10.6 Impact sequence 37
10.6.1 General 37
10.6.2 Input parameters 37

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10.6.3 Output parameters ... 37
10.6.4 Sequence ... 37
10.7 Back pocket sequence ... 38
10.7.1 General ... 38
10.7.2 Input parameters ... 38
10.7.3 Output parameters ... 38
10.7.4 Sequence ... 38
10.8 Torsion fatigue sequence ... 38
10.8.1 General ... 38
10.8.2 Input parameters ... 38
10.8.3 Output parameters ... 38
10.8.4 Sequence ... 39
10.9 Delamination sequence ... 39
10.9.1 General ... 39
10.9.2 Input parameters ... 39
10.9.3 Output parameters ... 39
10.9.4 Sequence ... 39
10.10 Bending fatigue sequence ... 39
10.10.1 General ... 39
10.10.2 Input parameters ... 39
10.10.3 Output parameters ... 40
10.10.4 Sequence ... 40
10.11 Thermal cycling sequence ... 40
10.11.1 General ... 40
10.11.2 Input parameters ... 40
10.11.3 Output parameters ... 40
10.11.4 Sequence ... 40
10.12 Colour fastness sequence ... 41
10.12.1 General ... 41
10.12.2 Input parameters ... 41
10.12.3 Output parameters ... 41
10.12.4 Sequence ... 41
10.13 Resistance to chemicals sequence ... 41
10.13.1 General ... 41
10.13.2 Input parameters ... 41
10.13.3 Output parameters ... 42
10.13.4 Sequence ... 42
10.14 Pen sequence ... 42
10.14.1 General ... 42
10.14.2 Input parameters ... 42
10.14.3 Output parameters ... 42
10.14.4 Sequence ... 42
10.15 Datapage abrasion sequence ... 42
10.15.1 General ... 42
10.15.2 Input parameters ... 43
10.15.3 Output parameters ... 43
10.15.4 Sequence ... 43
10.16 X-ray sequence ... 43
10.16.1 General ... 43
10.16.2 Input parameters ... 43
10.16.3 Output parameters ... 43
10.16.4 Sequence ... 43

11 Test plans ... 43
11.1 General ... 43
11.2 Minimum level test plan ... 44

Bibliography ... 45

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 17, *Cards and security devices for personal identification*.

This second edition cancels and replaces the first edition (ISO/IEC 18745-1:2014), which has been technically revised.

The main changes compared to the previous edition are as follows:

— test definitions have been detailed;

— instructions to evaluate test results have been clarified;

— the definition of the foam to be used in 8.6.4 book bend stress method has been changed to enhance the accessibility to the foam needed;

— test sequences have been updated to create more realistic test results;

— references have been updated.

A list of all the parts in the ISO/IEC 18745 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

0.1 General

ICAO Doc 9303 provides the basic functional specification for Machine Readable Travel Documents (MRTDs) and, together with the Supplement, which is published from time to time, describes all relevant properties of MRTDs. Machine Readable Passports (MRPs) are a subset of all MRTDs. The publication of Part 1 of the 6th edition of Doc 9303 introduces the contactless integrated circuit to the MRP. Such a passport containing a contactless integrated circuit is commonly referred to as an e-Passport.

This document provides a set of instructions for the evaluation of MRPs which may incorporate contactless integrated circuits. This document is a companion to ICAO Doc 9303. It specifies the minimum criteria to be achieved in order to meet ICAO's expectations for durability of fully personalized MRPs. Therefore, by its existence, and endorsement by ICAO, this document implicitly defines additional requirements for passports above and beyond ICAO Doc 9303. Some of the tests described herein are also intended to serve as an instrument for the assessment of the ageing behaviour of the MRP and its components.

This document updates and replaces the document "ICAO Technical Report – Durability Of Machine Readable Passports" published by ICAO (International Civil Aviation Organization).

0.2 Future considerations

Where technologies or combinations of technologies are to be applied in an MRP, which are not covered by the test methods described below, it is recommended to define such test methods based on available methods described in ISO/IEC standards or any other accepted standards from other international standard organizations in cooperation with the suppliers of such technologies.

Today, there is no stable state of the art regarding the correlation between stress and ageing, neither for previously existing nor for oncoming types of MRPs. The tests that can be described at the present stage may contribute to improving such knowledge but need to be considered preliminary. It is important to notice that ultimately, reliable and predictably useful correlations can only be achieved by continuously comparing the ageing behaviour of documents in real use to the predictions made. Such predictions are based on assumptions that, in particular if novel and unusual technologies and components are used, they are in many cases unproven and preliminary in nature.

It is one of the aims of this document to help in the task of establishing sound correlations. This is done by providing tools for executing tests with comparable results for a multitude of acting parties. Comparable results are a prerequisite to encourage the execution of field surveys in quality related research and their use for a continuous improvement not only of this document but also of the quality of MRPs on a global basis.

0.3 Other uses for this document

The tests defined in this document may also be appropriate for other forms of MRTDs, however, they may require modification before use.

Where applicable, tests may be used to evaluate characteristics of non-personalized MRPs or materials used to make MRPs.

Type evaluation is usually a one-time exercise in the life cycle of a specific type of document. However the same test procedures may be useful for the proper definition of quality assurance procedures during the regular production of MRTDs. In the framework of the contractual relationship between a manufacturer and its customer(s) it is common practice to establish an expected quality level for the MRTDs in the delivery contract, and also to specify acceptance criteria for individual deliveries in executing the contract. On the other hand, it is good practice to leave it with the manufacturer to decide on the production quality measures to assure this quality level.

This document has been carefully designed to provide the user with a set of tools for evaluating MRPs, whether it be prototype evaluation, delivery acceptance or any other purpose.

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Test methods for machine readable travel documents (MRTD) and associated devices —

Part 1:
Physical test methods for passport books (durability)

1 Scope

This document provides a set of instructions for evaluation of MRPs which may incorporate contactless integrated circuits. This evaluation is an instrument to establish the ability in principle of a specific type of document to fulfil the requirements of use. It supplies a structured approach to evaluate MRPs by:

— defining reproducible stress methods to submit the document(s) under evaluation to specific stress or environmental conditions;

— defining reproducible evaluation methods to measure numerical values for specific document properties;

— defining test sequences that specify the order in which stress methods and evaluation methods are to be performed;

— defining test plans to link specific user requirements to test sequences and related parameters.

It specifies the minimum criteria to be achieved in order to meet ICAO's expectations for durability of fully personalized MRPs.

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.

ISO 105-A02, *Textiles — Tests for colour fastness — Part A02: Grey scale for assessing change in colour*

ISO 105-B02, *Textiles — Tests for colour fastness — Part B02: Colour fastness to artificial light: Xenon arc fading lamp test*

ISO 105-E04, *Textiles — Tests for colour fastness — Part E04: Colour fastness to perspiration*

ISO 2439:2008, *Flexible cellular polymeric materials — Determination of hardness (indentation technique)*

ISO/IEC 7810, *Identification cards — Physical characteristics*

ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests*

ISO/IEC 10373-1:2006, *Identification cards — Test methods — Part 1: General characteristics*

ISO 12757-2, *Ball point pens and refills — Part 2: Documentary use (DOC)*

ISO/IEC 18745-2:2016, *Information technology — Test methods for machine readable travel documents (MRTD) and associated devices — Part 2: Test methods for the contactless interface*

ASTM E 832-81*(Reapproved 2003), Standard Specification for Laboratory Filter Papers*

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3 Terms and definitions

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

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 https://www.iso.org/obp

3.1
chip sheet
sheet containing a chip

3.2
constant
fixed values that can be given to parameters (within methods) when defining a sequence or test plan

3.3
evaluation method
method to measure numerical values for specific document properties

3.4
evaluation result
all numerical values related to document properties measured upon performing a test sequence

3.5
method
instruction or set of instructions defining equipment and related tools and materials in an experimental setup, including general advice on their use in a specific test procedure

3.6
page
any single side of an individual sheet of the MRP

3.7
parameter
variable quantity within a test procedure that is not part of the instructions describing the procedure; in particular, experimental parameters that need to be controlled during the test sequence but whose values and/or tolerances are not explicitly defined in a specific stress or evaluation method or sequence

3.8
sheet
any structure having a free edge and an opposite edge attached to the spine making up the MRP including covers, datapage, visa pages, observation pages and chip sheet

Note 1 to entry: Each sheet has two pages.

3.9
stress method
experimental setup and procedure that may or may not deteriorate or destroy the document under examination

3.10
test instruction
distinct piece of information required within the framework of test execution

3.11
test plan
list of test sequences and their specific test parameters and expected evaluation results

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3.12
test procedure
set of instructions to be followed in order to obtain a test result

3.13
test sequence
test procedure that comprises a number of different methods in a defined order of execution

3.14
type evaluation
type approval
process of testing a design (type of documents produced while using a common material and component basis and the same manufacturing processes, including same production quality assurance process) to ensure it is compliant-in-principle with the specifications

4 Abbreviated terms

IC	Integrated Circuit
ICAO	International Civil Aviation Organization
MRP	Machine Readable Passport
MRTD	Machine Readable Travel Document
MRZ	machine-readable zone
NSS	Neutral Salt Spray
PCD	Proximity Coupling Device
PIC	Proximity Integrated Circuit NOTE ICAO 9303 uses CIC (contactless integrated circuit) and PIC interchangeably.
RH	relative humidity
VIZ	Visual Inspection Zone

5 Methodology

The systemic approach used in this document provides three structural levels to define a complete test specification for MRPs.

The first level deals with methods to exert defined stresses to documents and to evaluate the results of such stresses. The second level deals with predefined sequences of stresses and related evaluations using the methods defined in level 1. The third level specifies the lists of test sequences and the individual quantities of test specimens to be subject to each sequence. The purpose is to include in such lists all sequences that are considered necessary to achieve type approval for a specific type of MRP with specific lifetime and usage expectations. This is referred to as a test plan.

This approach provides flexibility in creating individual test plans appropriate for varying user requirements and MRP specifications without increasing the variety of basic testing methods beyond a strict minimum. It also allows the use of a parameterized method description; parameters, which may be explicitly specified on the sequence and/or test, plan level.

In this way this document provides the entire toolset for prototype evaluation of MRPs.

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