ICUBE TESTING CENTER

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TEST REPORT

Physical tests ISO/IEC 18745-2 for eMRTD

REFERENCE:	IC.E.RE.2106.004
VERSION:	v1.1
ISSUE DATE:	25/06/2021
APPLICANT:	Polska Wytwórnia Papierów Wartościowych (PWPW) SA & “UAB „LODVILA“
PRODUCT*:	Lithuania ID – Lodvila Sample MT2.5 – V21_1.0

REPORT AUTHORIZED BY:
Laboratory manager

The present test report cancels and replaces the test report IC.E.RE.2106.004 v1.0.

SUMMARY

1 VERSION HISTORY

Version	Date	By	Description/Explanation
1.0	18/06/2021	S.CERDA	Initial version
1.1	23/06/2021	L.DUPAYS	Add “UAB „LODVILA“ in applicant information.

2 GENERAL INFORMATION

2.1 LABORATORY IDENTIFICATION

ICUBE TESTING CENTER
707 chemin du Quintin
13300 Salon de Provence
FRANCE

Contact: contact@icube-tc.com

2.2 TEST IDENTIFICATION

2.2.1 REFERENCE DOCUMENTS

The tests reported in the present document are performed according to the following reference document:

[R1] 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
First edition - Date: 2016-08-15

2.2.2 ACCREDITATION

The tests are performed under ISO/IEC 17025 Cofrac accreditation.

2.2.3 UNCERTAINTIES

The test results are declared without taking into account the uncertainties.

2.3 TESTING INFORMATION

Date of the test: 10th to 21st of June 2021
Test performed by: S.CERDA
Report written by: S.CERDA

2.4 TEST RESULT TERMINOLOGY

Result	Description
PASS	Result conforms to the expected result specified in the reference documents.
FAIL	Result does not conform to the expected result specified in the reference documents.
NA	Test not applicable. For example, for an optional function that is not supported by the product under test.
NE	Test not executed.
NI	Test not implemented.
INC	Inconclusive test.
INF	Informative test.

3 OBJECT UNDER TEST

3.1 GENERAL

The information provided by the applicant that cannot be verified are identified with an asterisk (*). The laboratory is exempt from responsibility for the information provided by the applicant.

3.2 APPLICANT INFORMATION

Company name: Polska Wytwórnia Papierów Wartościowych SA (PWPW SA) & "UAB „LODVILA"

Contact name: Marcin Zakrzewski
Address: Sanguszki 1 street
00-222 Warszawa
POLAND
Phone: + 48 603 875 950
Email address: m.zakrzewski@pwpw.pl

3.3 PRODUCT IDENTIFICATION

This tests report relates to the tested samples as received.

Product name*: Lithuania ID – Lodvila Sample MT2.5
Product version*: V21_1.0

Sample reception date (dd/mm/yyyy): 03/06/2021
Form factor: Card
Quantity: 9

Test	Objects under test reference
Class -1 verification test	7K560A
	8K560A
	9K560A
Electricity Static discharge (ESD) test	4K560A
	5K560A
	6K560A
Alternating magnetic Field test	1K560A
	2K560A
	3K560A

Figure 1 – Sample overview

3.4 IMPLEMENTATION CONFORMANCE STATEMENT

Implementation conformance statement	Applicant declaration
Physical size of product*	ID-1
Claimed PICC class*	Class 1
Sample shielded or not and how (*blindage*)*	NO
Communication signal interface	Type B

4 FUNCTIONALITY CHECK TEST

The functionality verification is performed according to chapter 5.6.2 of document **[R1]**.

The purpose of this test is to check the eMRTD's mandatory LDS application data. It shall be verified that this LDS data has not been altered by the tests.
The LDS data are read before the tests. If the same data is obtained after the stress tests, it is considered as a PASS result for the Functional Evaluation method.
The evaluation is performed with PC/SC contactless reader (SCM Microsystems SDI010) and Software tool (Universal Reader Tool v3.1).

5 TEST RESULTS

5.1 CLASS-1 VERIFICATION TEST (CONDITIONAL)

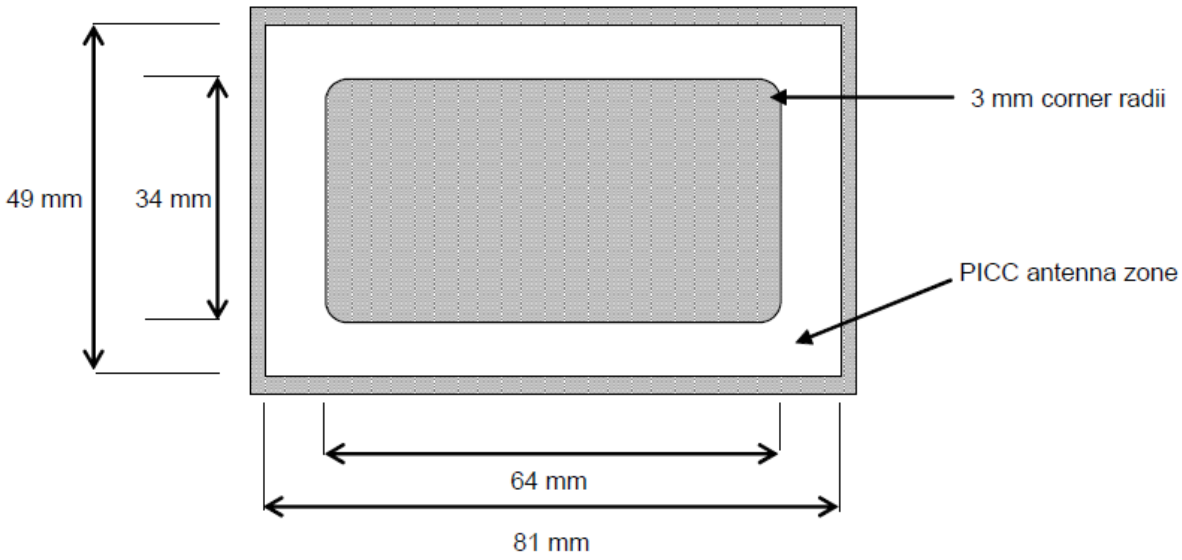
5.1.1 PURPOSE

The test is performed on 3 samples according to chapter 5.2.1 of document **[R1]**.

The purpose of this test is to check if the physical coil dimensions meet the requirements of ISO/IEC 14443-1. The sample antenna shall be entirely located within a zone defined by two rectangles:

- external rectangle: 81mm x 49mm
- internal rectangle: 64mm x 34mm, 3mm radius

except for the connections to the ends of the antenna coil, with a maximum area of 300 mm^2.



5.1.2 METHOD

The measurements are performed with a digital caliper CD-15CPX (Manufacturer: Mitutoyo) on a silver halide photography of the sample/ the antenna coil visible.

5.1.3 TEST CONDITIONS

Test environment:

- Temperature: 23°C ± 3°C
- Relative humidity: 50% ± 25%

5.1.4 RESULTS

➔ Object under test: 7K560A

Dimensions	Expected results according to document [R1]	Observed results	Result
External rectangle	≤ 81 x 49 mm	74.4 x 42.8 mm	**PASS**
Internal rectangle	≥ 64 x 34 mm 3mm radius	71.0 x 38.9 mm	**PASS**
Area for the connections to the ends of the antenna coil	≤ 300 mm^2	126 mm^2	**PASS**

➔ Object under test: 8K560A

Dimensions	Expected results according to document [R1]	Observed results	Result
External rectangle	≤ 81 x 49 mm	74.4 x 42.9 mm	**PASS**
Internal rectangle	≥ 64 x 34 mm 3mm radius	71.0 x 38.9 mm	**PASS**
Area for the connections to the ends of the antenna coil	≤ 300 mm^2	125 mm^2	**PASS**

➔ Object under test: 9K560A

Dimensions	Expected results according to document [R1]	Observed results	Result
External rectangle	≤ 81 x 49 mm	74.4 x 42.9 mm	**PASS**
Internal rectangle	≥ 64 x 34 mm 3mm radius	71.0 x 38.9 mm	**PASS**
Area for the connections to the ends of the antenna coil	≤ 300 mm^2	126 mm^2	**PASS**

5.2 STATIC ELECTRICITY (ESD) TEST

5.2.1 PURPOSE

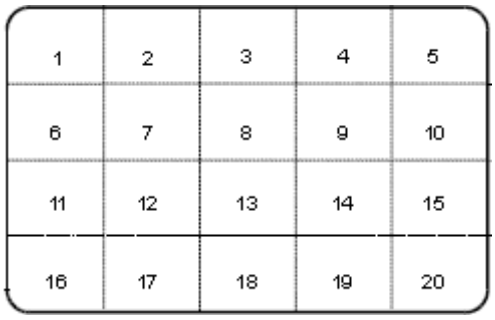
The purpose of this test is to check the behavior of the sample after an electrostatic discharge (ESD) on the test sample. The device under test is exposed to a simulated electrostatic discharge (ESD, human body model). Its basic operation is checked after the exposure.

5.2.2 METHOD

The test is performed according to the test described in the chapter 5.2.2 of document **[R1]**.
The test is performed according to **[R1]** document and ISO/IEC 10373-6:2016, §6.2.2. A discharge is applied to each of the 20 test zones, in normal polarity +6kV, and then a new discharge is applied in reverse polarity -6kV.

Sample under the electrostatic discharges

The ESD generator is approached as fast as possible until touching the sample. The test is applied on 20 zones of the sample:



The functionality check test defined in chapter 4 is done after this test to check whether the sample operates as intended after exposure to the electrostatic discharge.

Test equipment description:

- DITO ESD gun with air discharge tip, compliant to NF EN 61000-4-2 (Manufacturer: EMTEST)

Test environment:

- Temperature: 23°C ± 3°C
- Relative humidity: 30% Hr to 60% Hr
- Atmospheric pressure: 96 kPA ± 10 kPA

Legend:

Y	Area tested
N	Area not tested (presence of direct contacts)

5.2.3 RESULTS

Object under test	Test area																				Result
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
4K560A	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	PASS
5K560A	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	PASS
6K560A	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	PASS

5.3 ALTERNATING MAGNETIC FIELD

5.3.1 PURPOSE

The purpose of this test is to check the behavior of the sample in relation to alternating magnetic field exposure.

The test is performed on 3 samples according to chapter 5.2.3 of document **[R1]**. The functionality check test defined in chapter 4 is done after the exposure.

5.3.2 METHOD

Test environment:

- Temperature: 23°C ± 3°C
- Relative humidity: 50% ± 25%

Test bench:

Tools	Identification and version
Software test environment	SCRIPTIS V01.03.07
Software test suite	ISO/IEC 14443 Test Suite for PICC Analog V05.03 + PATCH_02.12
PICC Contactless Reader	KEOLABS RGPA V3.07.14.409 KEOLABS ProxiLAB V3.24.15.1117
Test PCD Assembly	KEOLABS PCD Assembly ISO/IEC 10373-6
Probe	2 LeCroy PP008
Amplifier	Smartware M02.30.70
Attenuator 10dB	R412.710.124
Oscilloscope	LeCroy WaveRunner 604Zi

5.3.3 RESULTS

Object under test	Information	Result
1K560A	Alternating Magnetic Field for sample 1	**PASS**
2K560A	Alternating Magnetic Field for sample 2	**PASS**
3K560A	Alternating Magnetic Field for sample 3	**PASS**

6 CONCLUSION

Summary of the tests results performed according to the documents listed in section 2.2.1.

Object under test	Test	Result
7K560A	Class -1 verification test (conditional)	**PASS**
8K560A	Class -1 verification test (conditional)	**PASS**
9K560A	Class -1 verification test (conditional)	**PASS**
4K560A	Static Electricity (ESD) test	**PASS**
5K560A	Static Electricity (ESD) test	**PASS**
6K560A	Static Electricity (ESD) test	**PASS**
1K560A	Alternating Magnetic Field Test	**PASS**
2K560A	Alternating Magnetic Field Test	**PASS**
3K560A	Alternating Magnetic Field Test	**PASS**

END OF DOCUMENT