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**Information technology — Biometric  
performance testing and reporting —  
Part 7:  
Testing of on-card biometric comparison  
algorithms**

*Technologies de l'information — Essais et rapports de performance  
biométriques —*

*Partie 7: Essais des algorithmes de comparaison biométrique sur carte*

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# Contents

Page

Foreword .....	vi
Introduction.....	vii
1 Scope .....	1
2 Conformance .....	2
3 Normative references .....	2
4 Terms and definitions .....	2
5 Abbreviations.....	2
6 Requirements on test planning.....	3
6.1 Fundamental concept of the test .....	3
6.2 Specification of interface hardware and software .....	4
6.3 Specification of the data formats.....	4
6.3.1 Format for comparison data.....	4
6.3.2 Format for off-card images and templates .....	4
6.4 Profiling of the BIT .....	4
6.5 Card-comparison subsystem combinations .....	4
6.6 Phased testing .....	5
6.7 Options for participation.....	5
6.8 Metrics .....	5
6.9 Comparison results .....	5
7 Requirements on test execution.....	6
7.1 General .....	6
7.2 Conditions for demonstrating equivalence of on-card and off-card algorithms .....	6
7.3 BIT Processing .....	6
7.4 Measurement of speed of execution .....	6
7.4.1 Quantities to be measured .....	6
7.4.2 Methods for measuring duration .....	7
7.4.3 Methods for measuring uncertainty .....	7
8 On-card biometric comparison interface specification.....	7
8.1 Overview.....	7
8.2 Approach to the use of ISO/IEC 7816 .....	7
8.3 Establish Communications .....	8
8.4 Selection of the test application .....	8
8.5 Store enrollment template on the card.....	8
8.6 Read of the BIT .....	9
8.7 Use of the BIT .....	9
8.8 Verification .....	11
8.8.1 APDU specifications .....	11
8.8.2 Locking of the card .....	11
8.8.3 Locking of the PC-based algorithm.....	12
8.8.4 Comparison scores .....	12
8.8.5 Prohibition of stateful behavior .....	12
8.9 Reading card identifier.....	12
8.10 Reading comparison subsystem identifier.....	13
Annex A (informative) Conversion of ISO/IEC 19794-2 record to compact size templates.....	14
A.1 Background.....	14
A.1.1 Purpose .....	14
A.1.2 Overview.....	14

- A.1.3 The record format ..... 14
- A.1.4 The compact-size format ..... 15
- A.2 Minutia uniqueness ..... 16
- A.3 Presence of BITs on card..... 17
- A.4 Use of BITs ..... 17
- A.5 Number of minutiae ..... 17
- A.5.1 Limits on number..... 17
- A.5.2 Effect of the BIT ..... 18
- A.5.3 Pruning mechanism..... 18
- A.5.4 Pruning center..... 19
- A.6 Sort order of minutiae ..... 19
- A.6.1 Support for ordering..... 19
- A.6.2 Modulo sorting for large images ..... 19
- Annex B (informative) Standardized Finger-Position Codes ..... 20
- Annex C (informative) Example Material on Planning for a Test Plan ..... 21
- C.1 Purpose..... 21
- C.2 PC-based API specification ..... 21
- C.2.1 Testing interface ..... 21
- C.2.2 Data format profile and conformance..... 21
- C.2.3 Submission..... 21
- C.2.4 Testing interface ..... 21
- C.2.5 Runtime behavior..... 23
- Annex D (informative) API for Fingerprint Minutia Template Generation and Matching ..... 24
- D.1 Minutiae extraction ..... 24
- D.2 Minutiae matching ..... 25
- D.3 Implementation identifiers ..... 25
- Bibliography ..... 26

**Figures**

Figure A.1 – Conversion of INCITS 378 data to ISO/IEC 19794-2 data 17

**Tables**

- Table 1 – Classes of participation..... 5
- Table 2 – Command APDU for selection of on-card comparison application ..... 8
- Table 3 - Example Application ID ..... 8
- Table 4 – Response APDU from selection of comparison application ..... 8
- Table 5 – Command APDU for storage of reference template..... 8
- Table 6 – Response APDU from storage of reference template ..... 9
- Table 7 – Command APDU for retrieval of biometric information template..... 9
- Table 8 – Response APDU from retrieval of biometric information template..... 9
- Table 9 - Biometric Information Template based on ISO/IEC 19785-3 and ISO/IEC 19794-2 (EXAMPLE)..... 10
- Table 10 – Command APDU for comparison of biometric templates ..... 11
- Table 11 – Response APDU from comparison of biometric templates ..... 11
- Table 12 – Command APDU for retrieval of verification comparison score ..... 12
- Table 13 – Response APDU for retrieval of verification comparison score..... 12
- Table 14 – Command APDU for retrieval of Card identifier..... 12
- Table 15 – Response APDU for retrieval of Card identifier ..... 13
- Table 16 – Command APDU for retrieval of Comparison subsystem identifier..... 13
- Table 17 – Response APDU for retrieval of Comparison subsystem identifier ..... 13
- Table A.1 – Record profile of ISO/IEC 19794-2:2005 standard ..... 15
- Table A.2 – Card profile of ISO/IEC 19794-2:2005 standard ..... 15
- Table A.3 – ISO/IEC 19794-2 minutiae template DO ..... 16
- Table A.4 – ISO/IEC 19794-2 zonal quality DO ..... 16
- Table A.5 – ISO/IEC 19794-2 zonal quality data..... 16

Table B.1 – ISO/IEC 19794-2 and ISO/IEC 19785-3 finger position codes .....	20
Table D.1 – API create_template function.....	25
Table D.2 – API match_templates function .....	25
Table D.3 – API get_pids function.....	25

## 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

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.

ISO/IEC 19795-7 was prepared by Joint Technical Committee ISO/IEC JTC 1, Subcommittee SC 37, *Biometrics*.

ISO/IEC 19795 consists of the following parts, under the general title *Information technology — Biometric performance testing and reporting*:

- *Part 1: Principles and framework*
- *Part 2: Testing methodologies for technology and scenario evaluation*
- *Part 3: Modality-specific testing [Technical Report]*
- *Part 4: Interoperability performance testing*
- *Part 5: Access control scenario and grading scheme*
- *Part 7: Testing of on-card biometric comparison algorithms*

The following part is under preparation:

- *Part 6: Testing methodologies for operational evaluation*

## Introduction

Biometric recognition algorithms have been ported to ISO/IEC 7816 integrated circuit cards to realize the privacy enhancing benefits asserted for the on-card biometric comparison paradigm. While the most common commercial realization of this capability has been the comparison of fingerprint minutiae templates on card, comparison of data from other modalities has been implemented also. Indeed the relevant card standards have been explicitly drafted to support arbitrary biometric modalities. Further information on modality-specific aspects can be found in ISO/IEC 19795-3. In any case, while the computational capability of such cards has increased in recent years, there remains the question of whether verification accuracy needs to be traded off for speed or data size or both. For fingerprint templates, the goal of improved efficiency has led to the development of the ISO/IEC 19794-2:2005 compact-size card formats specifically for on-card biometric comparison.

This part of ISO/IEC 19795 specifies a mechanism for measuring both accuracy and speed of ISO/IEC 7816 integrated circuit cards processing data from arbitrary modalities. It includes examples for the data structures and commands needed to match conformant ISO/IEC 19794-2:2005 minutiae templates on cards.

# Information technology — Biometric performance testing and reporting —

## Part 7: Testing of on-card biometric comparison algorithms

### 1 Scope

This part of ISO/IEC 19795 establishes a mechanism for measuring the core algorithmic capabilities of biometric comparison algorithms running on ISO/IEC 7816 integrated circuit cards. Specifically, this part of ISO/IEC 19795

- instantiates a mechanism for on-card biometric comparison testing;
- standardizes procedures for the measurement of the accuracy of on-card biometric comparison implementations running on object-based, test-specific sample cards;
- standardizes procedures for the measurement of durations of the various operations; and
- gives examples for matching ISO/IEC 19794-2:2005 compact card minutiae templates.

The following are specifically not within the scope of this part of ISO/IEC 19795:

- procedures for securing the communications channel, including cryptographic protection of the biometric templates;
- procedures for protection of sample or template integrity using digital signatures;
- authentication of the card and reader;
- selection or use of transmission protocols (e.g. contactless);
- profiles of specific data interchange standards;
- procedures for evaluation of readers, including performance, conformance and interoperability;
- procedures for evaluation of ruggedness or durability of the card;
- on-card template generation (e.g. extraction of minutiae from images),
- template update or adaptation;
- formal conformance tests of ISO/IEC 7816-4 and ISO/IEC 7816-11;
- testing of devices not conforming to ISO/IEC 7816, including all system-on-card devices.



## 2 Conformance

A test is conformant to this part of ISO/IEC 19795 if it conforms to the normative requirements of Clauses 5 and 6.

An on-card comparison implementation is conformant to the test specification of Clause 7 if it supports all the requirements of Clause 7.

## 3 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.

ISO/IEC 7816-4:2005, *Identification cards — Integrated circuit cards — Part 4: Organization, security and commands for interchange*

ISO/IEC 7816-6:2004, *Identification cards — Integrated circuit cards — Part 6: Interindustry data elements for interchange*

ISO/IEC 7816-11:2004, *Identification cards — Integrated circuit cards — Part 11: Personal verification through biometric methods*

ISO/IEC 19785-3:2007, *Information technology — Common Biometric Exchange Formats Framework — Part 3: Patron format specifications*

ISO/IEC 19795-1:2006, *Information technology — Biometric performance testing and reporting — Part 1: Principles and framework*

ISO/IEC 19795-2:2007, *Information technology — Biometric performance testing and reporting — Part 2: Testing methodologies for technology and scenario evaluation*