
**Information technology — Machine
readable test data for biometric
testing and reporting —**

**Part 1:
Test reports**

iTeh STANDARD PREVIEW
*Technologies de l'information — Données d'essai lisibles par machine
pour les rapports et les essais biométriques —
Partie 1: Rapports d'essai*
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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 meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: [Foreword – Supplementary information](#).

The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, SC 37, *Biometrics*.

ISO/IEC 29120 consists of the following parts, under the general title *Information technology — Machine readable test data for biometric testing and reporting*:

— *Part 1: Test reports*

Introduction

This International Standard will enhance the usability of biometric test data by providing them in a common and machine readable form. This International Standard is intended to provide

- documentary evidence that a product has been tested,
- a statement of authenticity of the test report,
- an ability to maintain of registry of products,
- a clear mechanism for maintaining product availability and certification status, and
- an ability for a relying system to depend on a biometric product used in a remote authentication context.

This International Standard is not intended to replace traditional biometric test reports. Indeed, because such texts are essential to the complete documentation of a test, they are viewed as parents of the machine readable content defined in ISO/IEC 29120 and are explicitly referenced in these reports.

Accordingly, the parts of this International Standard establish requirements for, and define formats for, signed test reports and biometric datasets as follows.

This part of ISO/IEC 29120 establishes machine readable records for documenting the output of a biometric test. This supports the documentary reporting requirements of some parts of ISO/IEC 19795. This part of ISO/IEC 29120 is primarily intended to support scenario and technology tests. Additionally, interoperability tests can be documented by a collection of ISO/IEC 29120-1 test reports (one for each tested combination of components). The International Standard also includes mechanism to protect the integrity of the test report. This assures a receiving system that the test information (date, laboratory, accreditation body, manner of testing, conformance, test size, accuracy) can be relied upon and used appropriately.

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As the parts of ISO/IEC 19795 have been developed and testing standards have been published, there is an increasing reliance on the correct conduct of tests and their documented outputs. Although the ISO/IEC 19795 standards include extensive disclosure and reporting requirements, they do not establish definitive data formats for those pieces of information. Other data concerning the commissioning, accreditation, and conduct of the test can also be valuable to consumers of the test reports. In addition, this International Standard will benefit users of biometric tests via improved

- conformance to testing standards,
- reliability (via automation of relevant activities), and
- comparability of test results.

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Information technology — Machine readable test data for biometric testing and reporting —

Part 1: Test reports

1 Scope

This part of ISO/IEC 29120 establishes

- machine readable records for documenting the output of a biometric test,
- formats for data that ISO/IEC 19795 tests are required to report, and
- an ASN.1 syntax for test reports.

This standard specifically does not

- require, prohibit, or otherwise specify, the format of biometric samples or templates used in a test,
- require, prohibit or otherwise specify, the encapsulation of biometric samples or templates used in a test, or
- regulate metrics for tests.

NOTE ISO/IEC 19795-1 establishes the reportable metrics.
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2 Conformance

A test report shall be conformant to this part of ISO/IEC 29120 if it meets all normative requirements of this part of ISO/IEC 29120.

3 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 8601:2004, *Data elements and interchange formats — Information interchange — Representation of dates and times*

ISO/IEC 8825-1:2008, *Information technology — ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER) — Part 1*

ISO/IEC 8825-4:2008, *Information technology — ASN.1 encoding rules: XML Encoding Rules (XER) — Part 4*

ISO/IEC 9594-2, *Information technology — Open Systems Interconnection — The Directory — Part 2: Models*

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

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

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RFC 3852, *Cryptographic Message Syntax (CMS)*

RFC 5911, *New ASN.1 Modules for Cryptographic Message Syntax (CMS) and S/MIME*

4 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 19795-1 apply.

5 Symbols and abbreviated terms

For the purposes of this part of ISO/IEC 29120, the following abbreviations apply.

ASN	Abstract Syntax Notation
BDB	Biometric Data Block
CDF	Cumulative Distribution Function
CMC	Cumulative match characteristic
DET	Detection error tradeoff
FAR	False accept rate
FTA	Failure to acquire rate
FTE	Failure to enrol rate
FMR	False match rate
FNIR	False-negative identification error rate
FNMR	False non-match rate
FPIR	False-positive identification error rate
FRR	False reject rate
ROC	Receiver operating characteristic
IUT	Implementation under test

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6 ASN.1 format

6.1 Encoding rules

The test reports specified in this part of the International Standard shall be encoded using the XML Encoding Rules (XER) [ISO/IEC 8825-4:2008] or the Basic Encoding Rules (BER) [ISO/IEC 8825-1:2008] of ASN.1.

6.2 ASN.1 object identifier for test report

```
MachineReadableBiometricTestingAndReportingTestReport {
    iso(1) standard(0) MRTDBTR(29120) testReport(1) module(1) rev(0)
}
```

6.3 BiometricTestReport type

```
BiometricTestReport ::= SEQUENCE {
    contentType      CONTENT-TYPE.&id({ContentTypeBiometricTestReport}),
    content           [0] EXPLICIT CONTENT-TYPE.&Type
```



```

    ({ContentTypeBiometricTestReport}{@contentType})
}

```

Type `BiometricTestReport` is composed of two components, `contentType` and `content`. The first component `contentType` is an object identifier, which indicates the type of content in the second component `content`. The value of `contentType` takes one of the following three values; `id-estReportTechnology`, `id-testReportScenario`, and `id-signedTestReport`. This is done by the following definition of `ContentTypeBiometricTestReport` and those of `testReportTechnology`, `testReportScenario`, and `signedDataBTR`.

```

ContentTypeBiometricTestReport CONTENT-TYPE ::= { testReportTechnology |
testReportScenario |
                                                    signedTestReport }

testReportTechnology CONTENT-TYPE ::= {
    TestReportTechnology
    IDENTIFIED BY id-testReportTechnology
}
testReportScenario CONTENT-TYPE ::= {
    TestReportScenario
    IDENTIFIED BY id-testReportScenario
}
signedTestReport CONTENT-TYPE ::= {
    SignedTestReport
    IDENTIFIED BY id-signedTestReport
}

```

Each of these content types corresponds to report of technology test, scenario test, and signed test report.

The object identifiers are defined as follows.

```

id-testReportTechnology OBJECT IDENTIFIER ::=
    iso(1) standard(0) MRTDBTR(29120) testReport(1) contentType(2)
testReportTechnology(1)
}
id-testReportScenario OBJECT IDENTIFIER ::=
    iso(1) standard(0) MRTDBTR(29120) testReport(1) contentType(2)
testReportScenario(2)
}
id-signedTestReport OBJECT IDENTIFIER ::= {
    iso(1) standard(0) MRTDBTR(29120) testReport(1) contentType(2) signedTestReport(3)
}

```

6.4 Data types for technology tests

6.4.1 Overview

Type `TestReportTechnology` is a type to express results of technology test. The first field `version` is the version of this test report format of type `MRTDBTRVersion`. The second field `targetInfo` is of type `ProductInformation` and gives information of the evaluated product. The third field `testReportInfo` gives the information about the test report of type `TestReportInformation`. The fourth part is a sequence `testReports` of type `TestReportTechnologyForOneCondition`. Each element of this sequence corresponds to a test result under a specific condition.

```

TestReportTechnology ::= SEQUENCE {
    version                MRTDBTRVersion          DEFAULT v0,
    targetInfo             ProductInformation,
    testReportInfo        TestReportInformation,
    testReports            SEQUENCE OF TestReportTechnologyForOneCondition
}
MRTDBTRVersion ::= INTEGER { v0(0) } ( v0, ... )

```

6.4.2 Product information

Type `ProductInformation` has six fields and gives information about the tested product.

```

ProductInformation ::= SEQUENCE {
    provider              Provider,

```

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```
nameProduct      NameProduct,
description       VisibleString OPTIONAL,
functionProduct   SEQUENCE OF Function,
outputProduct     DataType OPTIONAL,
modalityProduct  Modality
}
```

6.4.2.1 Provider information

The first field `provider` is of type `Provider` and gives information about the provider of the tested biometric product.

```
Provider ::= SEQUENCE {
    nameProvider      Name,
    typeProvider      TypeProvider,
    roleProvider      RoleProvider,
    contactInformation VisibleString OPTIONAL
}
```

The first field `nameProvider` identifies the name of the provider. The type `Name` for this field is specified in ISO/IEC 9592-2:2005.

The second field `typeProvider` shows the type of the provider, and shall take a value chosen from the values of type `TypeProvider`: `non-profit`, `university`, `corporation`, `individual`, `government`.

```
TypeProvider ::= ENUMERATED {
    non-profit(1),
    university(2),
    corporation(3),
    individual(4),
    government(5)
}
```

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The third field `roleProvider` shows the role of the provider, and shall take a value chosen from the values of type `RoleProvider`: `manufacturer`, `reseller`, `integrator`, `other`. `manufacturer` is for the role of the entity responsible for the design or creation of the component. `reseller` is for the role of the entity which packages or resells the component. `integrator` is for the role of the entity which may combine components into a single atomic component.

```
RoleProvider ::= ENUMERATED {
    manufacturer(1),
    reseller(2),
    integrator(3),
    other(4)
}
```

The fourth field `contactInformation`, which is optional, shows the contact information of the provider, such as the mail address of the provider, in `VisibleString`.

6.4.2.2 Other information in product information

The second field `nameProduct` in type `ProductInformation` is of `NameProduct` and gives basic information about the product.

```
NameProduct ::= SEQUENCE {
    modelName      Name,
    productCBEFF   Product OPTIONAL,
    version        VersionProduct,
    softwareVersion VersionProduct,
    firmwareVersion VersionProduct
}
VersionProduct ::= INTEGER { v0(0) } ( v0, ... )
```

The first field `modelName` in `NameProduct` is of type `Name` and identifies the product. The second field `productCBEFF` is an optional field of type `Product` imported from 19785-3 CBEFF Part 3. If the product is registered to a certain biometric organization, this field may be used to identify the product. The third, fourth, and fifth field `version`, `softwareVersion`, and `firmwareVersion` are all of type

VersionProduct and indicate the version of the product, the version of the software of the product, the version of the firmware of the product respectively.

The third field description in type ProductInformation gives a complete unique description of the component under the test in VisibleString. This field should be used to describe prototypes, experimental models, use of biometric modalities not listed in ISO/IEC 19785-3, or to give additional information about the biometric modality (e.g. for iris recognition in the visible spectrum).

The fourth field functionProduct in type ProductInformation expresses the function of the tested product with type Function.Type Function is specified as follows:

```
Function ::= ENUMERATED {
    acquisition(1),
    enrolment(2),
    verification(3),
    identification(4),
    ...
}
```

The fifth field outputProduct in type ProductInformation expresses the data type of the output of the tested product with type DataType. Type DataType consists of two fields, processedLevel and purpose. The former takes a value which corresponds to raw data, intermediate data, processed data, comparison score, or comparison decision. The latter takes a value which corresponds to biometric reference or biometric sample.

```
DataType ::= SEQUENCE {
    processedLevel          ProcessedLevel,
    purpose                 Purpose OPTIONAL
}
ProcessedLevel ::= ENUMERATED {
    raw-data(1),
    intermediate-data(2),
    processed-data(3),
    comparison-score(4),
    comparison-result(5),
    ...
}
Purpose ::= ENUMERATED {
    reference(1),
    sample(2)
}
```

The sixth field modalityProduct in type ProductInformation indicate the modality of biometric data which the tested product processes, with type Modality. Type modality consists of a pair of fields type and subtype. type is mandatory if processedLevel in outputProduct takes neither comparison-score nor comparison-result. The types BiometricType and BiometricSubtype are defined in ISO/IEC 19785-3:2007, Clause 6.2.

```
Modality ::= SEQUENCE {
    type          BiometricType,
    subtype       BiometricSubtype OPTIONAL
}
```

6.4.3 Information about test report

Type TestReportInformation has four fields and gives information about the test report.

```
TestReportInformation ::= SEQUENCE {
    testLabInformation          TestLabInformation,
    compliantStandard           StandardDescription,
    testReportIssuanceDate     Date,
    parentTestReport           ExternalDocument
}
```

The first field testLabInformation in type TestReportInformation identifies the test laboratory conducting the test, with type TestLabInformation. Type TestLabInformation consists of two fields: identificationTestLab of type IdentificationTestLab and accreditationStatus of type AccreditationStatus.

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```
TestLabInformation ::= SEQUENCE {
    identificationTestLab IdentificationTestLab,
    accreditationStatus AccreditationStatus
}
```

Type IdentificationTestLab has five fields of type VisibleString : nameLab to show the name of the responsible laboratory, location to show location of the laboratory, optional testImplementor to show the employee or representative who executed the test, testReportSignatory to show the employee or representative assuring the integrity, correctness and completeness of the test, and contactInformation to show the contact information for enquiries concerning the test report.

```
IdentificationTestLab ::= SEQUENCE {
    nameLab VisibleString,
    location VisibleString,
    testImplementor VisibleString OPTIONAL,
    testReportSignatory VisibleString,
    contactInformation VisibleString
}
AccreditationStatus ::= SEQUENCE {
    accreditingBodies SEQUENCE OF AccreditingBody,
    scopeAccreditation ScopeAccreditation OPTIONAL
}
AccreditingBody ::= SEQUENCE {
    nameAccreditingBody VisibleString,
    identifierCertificate OBJECT IDENTIFIER,
    signatory OCTET STRING
}
```

The second field compliantStandard in type TestReportInformation indicates which testing standards were used for the test with type StandardDescription. Type StandardDescription has four fields: standardName in VisibleString to show the name of the standard such as Biometric Testing and Reporting – Principles and Framework, standardNumber in VisibleString to show the number of the standard such as 19795, standardPart in VisibleString to show the part number of the standard, and standardPublicationDate of type Date to show the publication date of the standard.

Type Date is expressed in VisibleString with fixed length of 8 of form YYYYMMDD, which conforms to ISO 8601.

```
StandardDescription ::= SEQUENCE {
    standardName VisibleString,
    standardNumber VisibleString,
    standardPart VisibleString,
    standardPublicationDate Date
}
Date ::= VisibleString
-- conforms to ISO 8601
-- length = 8
-- fixed
-- YYYYMMDD
```

The third field testReportIssuaranceDate in type TestReportInformation encodes the date on which the test report was signed by the test laboratory official with type Date.

The fourth field parentTestReport in type TestReportInformation gives the information about the non-machine readable, traditional test report for complete human-readable documentation of the test with type ExternalDocument. Type ExternalDocument consists of three mandatory fields and five optional fields. The first field link of type URI expresses the URL where the document can be referenced. The second field title of type VisibleString shows the title of the document. The third and optional field authors of type SEQUENCE OF VisibleString shows the author or the group of authors of the document. The fourth and optional field publisher of type VisibleString shows the publisher of the document. The fifth and optional field editor of type VisibleString shows the editor of the document. The sixth and optional field typeDocument of type TypeDocument shows the type of the document: article, technical report, in proceedings, abstract, book, in book, or collection. The seventh and optional field publicationDate of type Date shows the publication date

of the document. The eighth field availability of type Availability shows the availability of the document: public, restricted, unavailable, or superseded.

```
ExternalDocument ::= SEQUENCE {
    link          URI,
    title         VisibleString,
    authors       SEQUENCE OF VisibleString OPTIONAL,
    publisher     VisibleString OPTIONAL,
    editor        VisibleString OPTIONAL,
    typeDocument  TypeDocument OPTIONAL,
    publicationDate Date OPTIONAL,
    availability   Availability
}
TypeDocument ::= ENUMERATED {
    article(1),
    technical-report(2),
    in-proceedings(3),
    abstract(4),
    book(5),
    in-book(6),
    collection(7)
}
Availability ::= ENUMERATED {
    public(1),
    restricted(2),
    unavailable(3),
    superseded(4)
}
```

6.4.4 Test report under a specific condition

6.4.4.1 Overview

Type TestReportTechnologyForOneCondition gives a set of information for a result of technology test under a given condition. TestReportTechnologyForOneCondition consists of four fields; corpusInfo of type CorpusInformation, dateStarted of type Date, dateEnded of type Date, and testResult of type SEQUENCE OF TestResult. The second and third are optional fields.

```
TestReportTechnologyForOneCondition ::= SEQUENCE {
    corpusInfo      CorpusInformation,
    dateStarted     Date OPTIONAL,
    dateEnded       Date OPTIONAL,
    testResult      SEQUENCE OF TestResult
}
```

6.4.4.2 Corpus information

Type CorpusInformation represents the information of the corpus which was used in the evaluation with two fields; composition of type CorpusComposition and environInfo of type EnvironmentalInformation.

```
CorpusInformation ::= SEQUENCE {
    composition     CorpusComposition,
    environInfo     EnvironmentalInformation
}
```

In type CorpusComposition, the corpus is identified with the first field identifier of type OBJECT IDENTIFIER. The second field nameCorpus of type VisibleString gives the name of the corpus. The third field corpusStatistics of type CorpusStatistics gives statistical information of the corpus.

```
CorpusComposition ::= SEQUENCE {
    identifier      OBJECT IDENTIFIER,
    nameCorpus     VisibleString,
    corpusStatistics CorpusStatistics
}
```