ISO 22387:2022 Conformant Test-Specification

<Template>

<Test Names> Tests for <Test Target>

Revision 1.0.0.0000
13 November 2026

National Institute of Advanced Industrial Science and Technology (AIST)
CPSEC Technical Report, CPSEC-TR-2026003

Table of contents

1. Introduction 3
2. Deployment team 4
3. Test options 4
3.1. Requirements 4
3.2. Definition of the artefact or range of artefacts that are supported 4
3.3. Characteristic or range of characteristics to be measured 4
3.4. Number and selection method of artefacts to be used for assessment 4
3.5. Method to be used for acquisition of an artefact metric from these characteristics 5
3.6. The range of data capture environments to be supported 5
3.7. System configuration options to be used for assessment 5
4. Tests to be considered 6
4.1. Artefact metric acquisition and enrolment testing 6
4.2. Artefact metric comparison performance testing 6
4.3. Artefact metric verification testing 7
4.4. Closed-set identification testing 7
4.5. Open-set identification testing 8
4.6. Throughput performance testing 8
Appendix 1 Terms and definitions 10
Change history 11
References 12

Foreword and Disclaimer

<This is a template for test specifications required in ISO 22387:2022 [1]. The parts where customizations are needed or explanations are written in red in angle brackets, such as <need to customize>.

This template was co-created by the following members:

<table>
<tr><th colspan="2">Affiliation</th><th>Name</th></tr>
<tr><td colspan="2" rowspan="4">National Institute of Advanced Industrial Science and Technology (AIST)
Cyber-Physical Security Research Institute (CPSEC)</td><td>MATSUMOTO Tsutomu</td></tr>
<tr><td>KOBARA Kazukuni</td></tr>
<tr><td>HOGA Morihisa</td></tr>
<tr><td>SUMIYA Kaoru</td></tr>
<tr><td colspan="2" rowspan="3">LINTEC Corporation
Next Generation Innovation Office</td><td>TAKANO Ken</td></tr>
<tr><td>TAKYU Shinya</td></tr>
<tr><td>YAMADA Tadatomo</td></tr>
<tr><td colspan="2" rowspan="2">Mitsubishi Electric Corporation
Information Technology R&D Center
Data Management System Department</td><td>HASEGAWA Hiroki</td></tr>
<tr><td>NAKASHIMA Daiki</td></tr>
<tr><td rowspan="2">Yokohama National University</td><td>Organization for the Promotion of Education</td><td>KUZUYA Naoki</td></tr>
<tr><td>Faculty of Environment and Information Sciences /
Institute for Multidisciplinary Sciences</td><td>YOSHIOKA Katsunari</td></tr>
<tr><td colspan="2">Kyushu University
Faculty of Information Science and Electrical Engineering
Information Photonics Laboratory</td><td>TATE Naoya</td></tr>
</table>

>

This document is licensed under a Creative Commons Attribution 4.0 International License, WITHOUT WARRANTIES OF CONDITIONS OF ANY KIND, either express or implied.

Acknowledgment

The template [2] of this test specification is based on results obtained from a project, JPNP23013, commissioned by the New Energy and Industrial Technology Development Organization (NEDO).

1. Introduction

This ISO 22387:2022 [1] conformant test specification is of <test names> for <test target>, which corresponds to <Phase X> where <more specific the situation, such that acquisition conditions are the same for both references and probes> among the following phases specified in [1]:

- Phase 1: The presence of one or more capturable distinguishing characteristics of the artefact is tested.
- Phase 2: Comparison decision performance is tested to ensure that it is sufficiently accurate.
- Phase 3: Influences of acquisition conditions are considered and tested.
- Phase 4: Reliability of the system in the environment where deployment is intended is tested.

2. Deployment team

The deployment team members of this test specification are as follows:

<

Representative from the artefact metric system provider:

●

●

Representative from the organizations planning to deploy the system:

●

●

>

<

For your reference, requirements to a deployment team are as follows [1]:

- The deployment team shall be appointed before artefact metric systems are tested.
- The test specification shall be produced, before the start of testing, for each test in consultation with the deployment team and agreed by all deployment team members.
- This test specification shall be produced and agreed by the deployment team before the start of testing.
- In case additional tests appear to be necessary, the modifications shall be agreed, and the specification shall be updated.
- One or more testers responsible for conducting the testing shall be appointed by the deployment team.

>

3. Test options

3.1. Requirements

Test specifications shall clarify the following test options in エラー! 参照元が見つかりません。3.2 to 3.7, respectively. <Details of any other test options required shall be added.>

3.2. Definition of the artefact or range of artefacts that are supported

<Add descriptions>

3.3. Characteristic or range of characteristics to be measured

<Add descriptions>

3.4. Number and selection method of artefacts to be used for assessment

3.5. Method to be used for acquisition of an artefact metric from these characteristics

<Add descriptions>

3.6. The range of data capture environments to be supported

<

For environments, [1] requires the following:

- The deployment team shall identify the operational environment and record important aspects.
- In cases where variations in operating conditions are likely and where deployment will include more than one operational environment, any differences between them shall be clearly indicated.
- The environment for enrolment can be different from the environment for identification and verification. In such cases, the operating conditions for each environment shall be indicated.

>

3.7. System configuration options to be used for assessment

<Where open-set identification is used, “not enrolled” shall be considered a valid database response. [1]>

4. Tests to be considered

This test specification is for the following <test or tests>:

< Remove irrelevant testings for this test specification.

- Artefact metric acquisition and enrolment testing
- Artefact metric comparison performance testing
- Artefact metric verification testing
- Closed- set identification testing
- Open-set identification testing
- Throughput performance testing

>

The reason for this choice is as follows:

<reason>

4.1. Artefact metric acquisition and enrolment testing

This test shall report the following:

- The failure to acquire rate, FTAR (R_{FTA}), and the number of acquisition attempts (N_{AA});
- The failure to enrol rate, FTER (R_{FTE}), and the total number of enrolment attempts (N_{EA}).

R_{FTA} shall be calculated using N_{FA}, the number of failed acquisitions of either references or probes, in the following Formula:

$$\boldsymbol{R}_{\mathrm{FTA}} = \frac{\boldsymbol{N}_{\mathrm{FA}}}{\boldsymbol{N}_{\mathrm{AA}}} \tag{1}$$

and R_{FTE} shall be calculated using N_{FE}, the number of failed enrolments, in the following Formula:

$$\boldsymbol{R}_{\mathrm{FTE}} = \frac{\boldsymbol{N}_{\mathrm{FE}}}{\boldsymbol{N}_{\mathrm{EA}}} \tag{2}$$

<Add supplementary explanations regarding error judgment criteria, acquisition systems, registration systems, and their parameters, such as threshold values for error judgment.>

4.2. Artefact metric comparison performance testing

This test shall report the following:

- The false non-match rate, FNMR (R_{FNM}), and the number of mated comparison trials (N_{NM});
- The false match rate, FMR (R_{FM}), and the number of non-mated comparisons (N_{NMC}).

R_{FNM} shall be calculated using N_{NM}, the number of non-match results, in the following Formula:

$$\boldsymbol{R}_{\mathrm{FNM}} = \frac{\boldsymbol{N}_{\mathrm{NM}}}{\boldsymbol{N}_{\mathrm{MC}}} \tag{3}$$

and $\boldsymbol{R}_{\mathrm{FM}}$ shall be calculated using $\boldsymbol{N}_{\mathrm{M}}$, the number of matched results, in the following Formula:

$$\boldsymbol{R}_{\mathrm{FM}} = \frac{\boldsymbol{N}_{\boldsymbol{M}}}{\boldsymbol{N}_{\mathrm{NMC}}} \tag{4}$$

4.3. Artefact metric verification testing

This test shall report the following:

- The false reject rate, FRR (R_{FR}), and the number of mated verification transactions (N_{NT});
- The false accept rate, FAR (R_{FA}), and the number of non-mated verification transactions (N_{NMT}).

R_{FR} shall be calculated using N_{NM}, the number of non-match or rejection results, in the following Formula:

$$\boldsymbol{R}_{\mathrm{FR}} = \frac{\boldsymbol{N}_{\mathrm{NM}}}{\boldsymbol{N}_{\mathrm{MT}}} \tag{5}$$

and $\boldsymbol{R}_{\mathrm{FA}}$ shall be calculated using $\boldsymbol{N}_{\mathrm{M}}$, the number of matched or accepted results, in the following Formula:

$$\boldsymbol{R}_{\mathrm{FA}} = \frac{\boldsymbol{N}_{\boldsymbol{M}}}{\boldsymbol{N}_{\mathrm{NMT}}} \tag{6}$$

4.4. Closed-set identification testing

This test shall report the following:

- the false-negative identification rate, FNIR (R_{FNI}), and the number of identification trials (N_{IT}) of enrolled test subjects;
- the number of enrolled artefacts and the rank of the candidate list.

R_{FNI} shall be calculated using N_{c}, the number of transactions where the candidate list does not include the identifier of the artefact being tested, in the following Formula:

$$R_{\mathrm{FNI}} = \frac{N_{\mathrm{c}}}{N_{\mathrm{IT}}} \tag{7}$$

4.5. Open-set identification testing

In addition to the items in 4.4, this test shall report the following:

- the false-positive identification rate, FPIR (R_{FPI}), and the number of identification trials (N_{IT}) of non-enrolled test subjects where non-enrolled test subjects shall not be test-subjects who failed enrolment.

R_{FPI} shall be calculated using N_{d}, the number of transactions where an identifier is included in the candidate list where the test artefact has not been enrolled, in the following Formula:

$$R_{\mathrm{FPI}} = \frac{N_{\mathrm{d}}}{N_{\mathrm{IT}}} \tag{8}$$

4.6. Throughput performance testing

This test <for enrolment, verification, and identification> shall report the following three items at least:

< Remove the irrelevant testing for this test specification.

For enrolment:

- System throughput per <unit time, such as, minute> : <XX> transactions
- Start point: <presentation to the sensor (details of how the specific start point was determined)>
- End point: <successful enrolment indicated (details of how the specific end point was determined)>

For verification and identification:

- System throughput per <unit time, such as, minute> : <XX> transactions
- Start point: <presentation to the sensor (details of how the specific start point was determined)>
- End point: <the outcome is returned by the system (details of how the specific end point was determined)>

>

<Throughput performance shall be tested before deployment.>

Appendix 1 Terms and definitions

For the purposes of this document, the terms and definitions not defined in ISO 22387:2022 [1] are given below:

Term	Definition

Change history

＜revision 1.0.0.0000＞

13 November 2026 First edition

References

[1] ISO 22387:2022, "Security and resilience — Authenticity, integrity and trust for products and documents — Validation procedures for the application of artefact metrics," 2022.

[2] AIST CPSEC, “ISO 22387:2022 Conformant Test-Specification <Template>,” CPSEC-TR-2026003, 2026.