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Standard for Proficiency Testing in Friction Ridge Examination

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410 North 21st Street
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Foreword

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This document was revised, prepared, and finalized as a standard by the Friction Ridge Consensus Body of the AAFS Standards Board. The draft of this standard was developed *[to be inserted, if appropriate]*.

Questions, comments, and suggestions for the improvement of this document can be sent to AAFS-ASB Secretariat, asb@aafs.org or 401 N 21st Street, Colorado Springs, CO 80904.

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Standard for Proficiency Testing in Friction Ridge Examination

1 Scope

This standard sets minimum requirements for proficiency tests used to assess the personnel performance and the overall quality system of the Forensic Service Provider (FSP) related to friction ridge examination. Included are requirements for the selection, development, validation, administration, evaluation and documentation of all proficiency tests regardless of source. This document does not address requirements related to the specific method(s) for conducting friction ridge examination, or for validation of novel methods prior to implementation.

2 Normative References

There are no normative reference documents, Annex A, Bibliography, contains informative references.

3 Terms and Definitions

NOTE The assigned value provides the basis for which participant results are expected to conform and performance is evaluated

3.1

competent friction ridge examiner

An individual who has successfully completed their FSP's training program and has demonstrated to the FSP that they possess the knowledge, skills, and abilities to perform the tasks required of their current position.

3.2

consultation

A significant interaction, prior to the initiation of verification or technical review process, between qualified FSP personnel regarding one or more impressions in question.

NOTE An interaction is considered "significant" when it involves a partial or complete examination of the impression(s) in question.

3.3

corrective action

An action to eliminate the cause of a non-conformity and to prevent recurrence.

3.4

examination

The act or process of observing, searching, detecting, recording, prioritizing, collecting, analyzing, measuring, comparing, and/or interpreting.

3.5

forensic services provider

FSP

Organization or individual that conducts and/or supplies forensic services.

3.6

friction ridge detail/features

The combination of ridge flow, ridge characteristics, and ridge structure of friction ridge skin, as observed and reproduced in an impression. A large subset of the observed data used to compare and interpret similarity or dissimilarity between two impressions.

3.7

ground truth

The actual or true state of affairs concerning the source or type of items submitted for evaluation.

3.8

observed data

Any information seen within an impression that an examiner may rely upon to reach a decision, conclusion, or opinion. This not only includes minutiae, but attributes such as clarity, scars, creases, edge shapes, pore structure, and other friction ridge features.

3.9

participant

Laboratory, organization or individual that receives proficiency test items and submits results for review by the proficiency test provider.

3.10

proficiency testing

Evaluation of participant performance against pre-established criteria.

3.11

test sample

A subset of items included as part of a test which are subject to examination by FSP personnel.

3.12

test specimen

A single item of the test sample.

3.13

verification

Independent examination by one or more examiners to ascertain if a decision, conclusion, or opinion is reproduced or is in conflict with the decision, conclusion, or opinion of another examiner.

NOTE 1 Verification may be implemented in multiple ways including blind verification, open verification and consensus review. The general term verification is inclusive of these various types.

NOTE 2 Verification is a quality assurance measure for friction ridge examination.

NOTE 3 The use of the term “independent” indicates an autonomous examination but not necessarily one without knowledge of a prior decision, conclusion or opinion.

4 Requirements

4.1 Test Selection

4.1.1 Tests shall be selected which have been developed and validated in accordance with the requirements set forth in this Standard.

4.1.2 Where available and applicable for the job function(s) being tested, tests shall be obtained from an external source through participation in a proficiency testing program offered by a provider accredited to the ISO/IEC 17043 international standard. Where not available or not applicable for the specific job function(s) being tested, tests may be obtained from an external source or developed internally by the Forensic Service Provider (FSP).

4.1.3 Test Development

4.1.4 Tests shall be developed to assess the performance of the examiner. Tests should encompass perishable skill job functions, but are not required to encompass every job function. These job functions may include but are not limited to the following.

- a) Detection of friction ridge impressions through optical, physical, and chemical processing/development techniques.
- b) Preservation of friction ridge impressions through techniques such as lifting, photography and/or digital capture.
- c) Enhancement of friction ridge impressions through digital processing.
- d) Recording exemplar impressions.
- e) Examination (Analysis, Comparison, and Evaluation) of friction ridge impressions, including donor sources chosen randomly and/or based on similarity to each other.
- f) Encoding, searching, and retrieving friction ridge impressions using ABIS.

4.1.5 The methodology used for the selection of test samples shall be recorded. Selected samples shall represent the job function(s) being tested as much as possible, to the extent the test design is able.

4.1.6 Where applicable for the job function(s) being tested test samples shall include a variety of different substrate types (e.g., porous, non-porous, semi-porous, curved, pliable), friction ridge development techniques (e.g., optical, chemical, and physical processes), and deposition matrices (e.g., sweat, oils, blood, livescan, ink).

4.1.7 For internally developed tests, FSPs shall decide which conclusions are included in the allowable in response choices.

4.1.8 Test samples shall only include impressions for which the ground truth state is known. Tests may be graded to ground truth only or to a combination of ground truth and criteria.

4.1.9 Expected responses to tests shall be documented by the test creator, including documentation of the expected criteria for reaching each response.

4.1.10 Neither the ground truth nor expected responses for test specimens shall be disclosed to the participants to which the test is administered until after the test is completed.

4.2 Test Validation

4.2.1 Tests shall be validated prior to administration to participants.

Tests shall have a description of how they were developed and validated in accordance with the requirements specified in this Standard. Documentation of the validation completed by the external provider or by the FSP can serve as evidence of conformity.

4.2.2 Test validation shall include the following.

- a) Ensuring that test samples represent the job function(s) being tested to the extent possible in the test design.
- b) Verification that the test can be completed using the materials included in the test by pre-distribution administration of the test to participants independent of the test development and in the same conditions as the proposed test. Personnel participating in the pre-distribution administration of the test shall be competent friction ridge examiners.

NOTE For tests developed or validated by the FSP, the personnel participating in the pre-distribution administration of the test can be internal or external to the FSP.

- c) Verification that the pre-distribution test results correspond to the expected responses.

4.2.3 The results of the validation—with sufficient detail to demonstrate that the test conforms to the requirements set forth by this Standard—shall be documented and maintained by the FSP.

4.3 Test Administration

4.3.1 All FSP personnel shall participate in a proficiency test for the highest risk job function(s) annually. All FSP personnel shall additionally participate in a proficiency test for lower risk job function(s) periodically.

4.3.2 Tests shall only be administered to FSP personnel approved to perform independent casework.

4.3.3 Tests shall be administered in conditions reflecting casework (e.g., environmental conditions, equipment, time constraints) and in accordance with applicable FSP policies and procedures.

4.3.4 The FSP Shall decide which tools and resources individual examiners are allowed to utilize during test administration. Tests shall be administered in such a way that the results produced by the individual are arrived at utilizing the tools and resources allowed by the FSP.

4.3.5 Tests shall be administered such that participants are not exposed to cues—no matter how subtle—that may hint at or guide them to the expected results without direct examination of the test specimen.

4.3.6 Tests shall be administered in one of two formats:

- a) Non-blind testing: Participants are aware they are being tested.
- b) Blind testing: Participants are not aware they are being tested.

4.4 Evaluation of Performance

4.4.1 Prior to test administration the FSP shall have documented criteria for evaluating acceptable performance for individual FSP personnel *and* overall FSP quality system, which minimally addresses:

- a) agreement of participant results to the expected responses;
- b) parameters for which disagreement to expected responses is allowed (e.g., the expected response is source identification but a conclusion of inconclusive is allowed, or a missed identification is allowed but an erroneous source identification is not);
- c) expected documentation of observed data to support the participant's results (where documentation is required);
- d) to what extent the completion of the test will follow FSP policies and procedures for typical casework.

NOTE Performance of individual FSP personnel is evaluated based on the results produced *prior* to the application of quality controls involving influence by other participants, such as Consultation, Verification or Reviews. Performance of the overall FSP quality system is evaluated based on the results produced *after* the application of quality controls involving influence by other participants, such as Consultation, Verification, or Reviews.

4.4.2 The FSP shall have a written policy regarding actions to be taken when a test result does not correspond to expected responses nor allowable disagreement (e.g., actions such as root cause analysis, corrective action, etc.).

4.5 Documentation of Records

4.5.1 The FSP shall have documentation that is sufficient to enable a third party to interpret and evaluate the test used. The FSP shall maintain records documenting the following:

- a) The identity of the individual(s) responsible for the selection, validation, administration, and evaluation of tests within the FSP.
- b) The source of the test (for tests obtained from external sources) or identity of the personnel responsible for developing the test along with their qualifications (for tests developed internally).
- c) The job function(s) being tested.
- d) Assurance that the test has been developed and validated in accordance with the requirements set forth in this document.

- e) A description of the types of substrates included in the development of the test.
- f) A description of the development techniques included in the development of the test.
- g) A description of the deposition matrices of the test samples included in the development of the test.
- h) Criteria for determining the expected responses for each test specimen.
- i) A list of the FSP personnel to which the test was administered.
- j) The date the test was administered to participant(s) and the date the test was completed by the participant(s).
- k) Conditions under which the test was administered to the participants (e.g., environmental conditions, equipment, time constraints).
- l) Format of the test administered to the participants (non-blind or blind).
- m) Participant responses.
- n) Criteria for acceptable performance as it relates to individual FSP personnel.
- o) Results of participant performance as it relates to individual FSP personnel.
- p) Root cause analysis and applicable corrective action(s).

Annex A **(informative)**

Bibliography

This is not meant to be an all-inclusive list as the group recognizes other publications on this subject may exist. At the time this standard was drafted, these were the publications available for reference. Additionally, any mention of a particular software tool or vendor as part of this bibliography is purely incidental, and any inclusion does not imply endorsement.

- 1] ISO/IEC 17043:2010, *Conformity assessment — General requirements for proficiency testing*¹

¹ Available from: <https://www.iso.org/standard/29366.html>

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