

**Standard for Proficiency Testing in Friction Ridge
Examination**

DRAFT



ASB
AAFS STANDARDS BOARD

Standard for Proficiency Testing in Friction Ridge Examination

ASB Approved Xxxxx 202X

ANSI Approved Xxxxx 202X



410 North 21st Street
Colorado Springs, CO 80904

This document may be downloaded from: www.aafs.org/academy-standards-board

This document is provided by the AAFS Academy Standards Board. Users are permitted to print and download the document and extracts from the document for personal use, however the following actions are prohibited under copyright:

- *modifying this document or its related graphics in any way;*
- *using any illustrations or any graphics separately from any accompanying text; and,*
- *failing to include an acknowledgment alongside the copied material noting the AAFS Academy Standards Board as the copyright holder and publisher.*

Users may not reproduce, duplicate, copy, sell, resell, or exploit for any commercial purposes this document or any portion of it. Users may create a hyperlink to www.aafs.org/academy-standards-board to allow persons to download their individual free copy of this document. The hyperlink must not portray AAFS, the AAFS Standards Board, this document, our agents, associates and affiliates in an offensive manner, or be misleading or false. ASB trademarks may not be used as part of a link without written permission from ASB.

The AAFS Standards Board retains the sole right to submit this document to any other forum for any purpose.

Certain commercial entities, equipment or materials may be identified in this document to describe a procedure or concept adequately. Such identification is not intended to imply recommendations or endorsement by the AAFS or the AAFS Standards Board, nor is it intended to imply that the entities, materials, or equipment are necessarily the best available for the purpose.

Proper citation of ASB documents includes the designation, title, edition, and year of publication. (See Annex I, ASB Guide 001)

*This document is copyrighted © by the AAFS Standards Board, LLC. 202X All rights are reserved.
410 North 21st Street, Colorado Springs, CO 80904, www.aafs.org/academy-standards-board*

Foreword

The American Academy of Forensic Sciences established the Academy Standards Board (ASB) in 2015 with a vision of safeguarding Justice, Integrity and Fairness through Consensus Based American National Standards. To that end, the ASB develops consensus based forensic standards within a framework accredited by the American National Standards Institute (ANSI), and provides training to support those standards. ASB values integrity, scientific rigor, openness, due process, collaboration, excellence, diversity, and inclusion. ASB is dedicated to developing and making freely accessible the highest quality documentary forensic science consensus Standards, Guidelines, Best Practices, and Technical Reports in a wide range of forensic science disciplines as a service to forensic practitioners and the legal system.

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 by the Friction Ridge Subcommittee of the Organization of Scientific Area Committees (OSAC) for Forensic Science.

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.

All hyperlinks and web addresses shown in this document are current as of the publication date of this standard.

ASB procedures are publicly available, free of cost, at www.aafs.org/academy-standards-board.

Keywords: *proficiency testing, quality control, performance, documentation*

Table of Contents *[to be updated when the document is finalized]*

- 1 Scope.....
- 2 Normative References.....
- 3 Terms and Definitions.....
- 4 Requirements.....
- 4.1 Test Selection.....
- 4.2 Test Development.....
- 4.3 Test Validation.....
- 4.4 Test Administration.....
- 4.5 Evaluation of Performance.....
- 4.6 Documentation of Records.....
- Annex A (informative) Bibliography.....

DRAFT

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

3.1 consultation

A discussion or interaction initiated by an examiner seeking guidance for the purpose of interpreting an image or comparison.

3.2 corrective action

Action to eliminate or mitigate the cause of a nonconformity and to prevent recurrence.

NOTE A corrective action is taken to prevent recurrence whereas preventive action is taken to prevent occurrence.

ISO 9000:2015¹ (modified "or mitigate" added)

3.3 Forensic Service Provider FSP

Organization that performs all or part of the forensic process.

NOTE A forensic service provider can be a large or small organization, including an organization consisting of a single examiner.

ISO 21043-1²

3.4 friction ridge detail (synonym of friction ridge features) See 3.5 friction ridge features

¹ ©ISO. This material is reproduced from ISO 9000:2015 with permission of the American National Standards Institute (ANSI) on behalf of the International Organization for Standardization. All rights reserved.

² ©ISO. This material is reproduced from ISO 21043-1:2018 with permission of the American National Standards Institute (ANSI) on behalf of the International Organization for Standardization. All rights reserved.

- 37 **3.5**
 38 **friction ridge features (synonym of friction ridge detail)**
 39 The combination of ridge flow, ridge characteristics, and ridge structure of friction ridge skin, as
 40 reproduced and observed in an impression. The observed data used to compare and interpret
 41 similarity or dissimilarity between impressions.
- 42 **3.6**
 43 **ground truth**
 44 The actual or true state of nature concerning the source or type of items submitted for evaluation.
- 45 **3.7**
 46 **observed data**
 47 Any information seen within an impression that an examiner may rely upon to reach a decision,
 48 conclusion, or opinion. This not only includes minutiae, but attributes such as clarity, scars, creases,
 49 edge shapes, pore structure, and other friction ridge features.
- 50 **3.8**
 51 **participant (in proficiency test)**
 52 Laboratory, organization, or individual that receives proficiency test items and submits results for
 53 review by the proficiency test provider.
- 54 **3.9**
 55 **proficiency testing**
 56 Evaluation of participant performance against pre-established criteria.
- 57 **3.10**
 58 **verification (phase of examination process)**
 59 Quality assurance measure consisting of independent examination by one or more examiners to
 60 ascertain if a decision, conclusion, or opinion is reproduced or is in conflict with the decision,
 61 conclusion, or opinion of another examiner.
 62
 63 NOTE Verification may be implemented in multiple ways including blind verification, open (non-blind)
 64 verification and consensus review. The general term verification is inclusive of these various types.
- 65 **4 Requirements**
- 66 **4.1 Test Selection**
- 67 **4.1.1** Prior to test selection, the FSP shall determine the types, qualities, and conditions which are
 68 representative of casework for each job function that is subject to proficiency testing. Such an
 69 assessment may include, for example, the representation or range of anatomical sources,
 70 substrates, deposition matrices, development techniques, conclusions, and complexity of both
 71 impressions and comparisons encountered in casework.
- 72 **4.1.2** FSPs shall determine which types, qualities, and conditions are considered minimum
 73 representation requirements for the purposes of proficiency testing (e.g., for the examination of
 74 friction ridge impressions, the expected responses must include both Source Identification and
 75 Source Exclusion conclusions; for the detection of friction ridge impressions, both porous and non-
 76 porous substrates must be included).

77 **4.1.3** Where available and applicable for the job function(s) being tested, tests shall be obtained
78 from an external source through participation in a proficiency testing program offered by a
79 provider accredited to the ISO/IEC 17043 international standard. Where not available or not
80 applicable for the specific job function(s) being tested, tests may be obtained from an external
81 source or developed internally by the Forensic Service Provider (FSP).

82 **4.1.4** Tests shall be selected which have been developed and validated in accordance with the
83 requirements set forth in this Standard and that meet all minimal representation requirements
84 established by the FSP. FSPs should select proficiency tests that most-closely align with their
85 documented representation of casework at the FSP.

86 **4.1.5** If no test meeting all minimum requirements is located, the FSP shall perform a risk-based
87 analysis of available tests to determine which test will be selected.

88 **4.2 Test Development**

89 **4.2.1** Tests shall be developed to assess the performance of the participant. Tests should
90 encompass perishable skill job functions, but are not required to encompass every job function.
91 These job functions may include but are not limited to the following.

- 92 a) Detection of friction ridge impressions through optical, physical, and chemical
93 processing/development techniques.
- 94 b) Preservation of friction ridge impressions through techniques such as lifting, photography
95 and/or digital capture.
- 96 c) Enhancement of friction ridge impressions through digital processing.
- 97 d) Recording exemplar impressions.
- 98 e) Examination (Analysis, Comparison, and Evaluation) of friction ridge impressions, including
99 donor sources chosen randomly and/or based on similarity to each other.
- 100 f) Encoding, searching, and retrieving friction ridge impressions using an Automated Biometric
101 Identification System (ABIS).

102 **4.2.2** The methodology used for the selection of test samples shall be recorded.

103 **4.2.2.1** Selected samples shall represent the job function(s) being tested as much as possible, to
104 the extent the test design is able.

105 **4.2.3** Where applicable for the job function(s) being tested, test samples shall include a variety of
106 different substrate types (e.g., porous, non-porous, semi-porous, curved, pliable), friction ridge
107 development techniques (e.g., optical, chemical, and physical processes), and deposition matrices
108 (e.g., sweat, oils, blood, livescan, ink).

109 **4.2.4** The test creator shall assess the range of the types, qualities, and conditions of test samples
110 that are included in developed proficiency tests according to the job function(s) being tested (e.g.,
111 for a test developed for the examination of friction ridge impressions, assessment may include the
112 representation of anatomical sources, substrates, deposition matrices, development techniques,
113 conclusions, and complexity of both the impressions and comparisons).

114 NOTE Standards for friction ridge examination conclusions and best practice recommendations for assessing
 115 the complexity of both friction ridge impressions and the comparison of friction ridge impressions are
 116 available.

117 **4.2.5** For internally developed tests, FSPs shall decide which conclusions are included in the
 118 allowable response choices.

119 **4.2.6** Test samples shall only include impressions for which the ground truth state is known.

120 **4.2.7** Expected responses to tests shall be documented by the test creator, including
 121 documentation of the expected criteria for reaching each response.

122 **4.2.8** Neither the ground truth nor expected responses for test samples shall be disclosed to the
 123 participants to which the test is administered until after the test is completed.

124 **4.3 Test Validation**

125 **4.3.1** Tests shall be validated prior to administration to participants.

126 **4.3.1.1** Tests shall have a description of how they were developed and validated in accordance
 127 with the requirements specified in this Standard. Documentation of the validation completed by the
 128 external provider or by the FSP can serve as evidence of conformity.

129 **4.3.2** Test validation shall include the following.

130 a) Ensuring that test samples represent the job function(s) being tested to the extent possible in
 131 the test design.

132 b) Confirmation that the test can be completed using the materials included in the test by pre-
 133 distribution administration of the test to participants independent of the test development and
 134 in the same conditions as the proposed test. Personnel participating in the pre-distribution
 135 administration of the test shall be competent in the job function being tested.

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

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

139 **4.3.3** The results of the validation—with sufficient detail to demonstrate that the test conforms to
 140 the requirements set forth by this Standard—shall be documented and maintained by the FSP.

141 **4.4 Test Administration**

142 **4.4.1** All FSP personnel shall participate in a proficiency test for the highest risk job function(s),
 143 as determined by the FSP, annually.

144 **4.4.1.1** All FSP personnel shall additionally participate in a proficiency test for other job
 145 function(s) periodically.

146 **4.4.2** Tests shall only be administered to FSP personnel approved to perform independent
 147 casework.

148 **4.4.3** Tests shall be administered in conditions reflecting casework (e.g., environmental
 149 conditions, equipment, time constraints) and in accordance with applicable FSP policies and
 150 procedures.

151 **4.4.4** The FSP shall decide which tools and resources individual examiners are allowed to utilize
 152 during test administration, excepting those that are specifically prohibited by the test provider.

153 **4.4.4.1** Tests shall be administered in such a way that the results produced by the individual are
 154 arrived at utilizing the tools and resources allowed by the FSP.

155 **4.4.5** Tests shall be administered such that participants are not exposed to cues that may hint at
 156 or guide them to the expected responses without direct examination of the test sample.

157 **4.4.6** Tests can be administered in one of two formats:

158 a) non-blind testing: participants are aware they are being tested;

159 b) blind testing: participants are not aware they are being tested.

160 **4.5 Evaluation of Performance**

161 **4.5.1** Prior to test administration the FSP shall have documented criteria for evaluating
 162 acceptable performance for individual FSP personnel *and* overall FSP quality system, which
 163 minimally addresses:

164 a) agreement of participant results to the expected responses;

165 b) parameters for which disagreement to expected responses is allowed (e.g., the expected
 166 response is source identification but a conclusion of inconclusive is allowed, or a missed
 167 identification is allowed but an erroneous source identification is not);

168 c) expected documentation of observed data to support the participant's results (where
 169 documentation is required);

170 d) to what extent the completion of the test will follow FSP policies and procedures for typical
 171 casework.

172 **4.5.2** The performance of individual FSP personnel shall be evaluated based on the results
 173 produced *prior* to the application of quality controls involving influence by other participants, such
 174 as Consultation, Verification or Reviews.

175 **4.5.3** The performance of the overall FSP quality system shall be evaluated based on the results
 176 produced *after* the application of quality controls involving influence by other participants, such as
 177 Consultation, Verification, or Reviews.

178 **4.5.4** The FSP shall have a written policy regarding actions to be taken when a test result does not
 179 correspond to expected responses nor allowable disagreement (e.g., actions such as root cause
 180 analysis, corrective action, etc.).

181 **4.5.5** The FSP shall evaluate the administered test for representativeness based on the prior
182 assessment of types, qualities, and conditions which are representative of casework (see Section
183 4.1.1).

184 **4.6 Documentation**

185 **4.6.1** The test creator shall retain records documenting the range of types, qualities, and
186 conditions of test samples that are included within proficiency tests.

187 **4.6.2** The FSP shall retain sufficient documentation to enable a third party to interpret and
188 evaluate the test used.

189 **4.6.3** The FSP shall retain records documenting:

- 190 a) the type, qualities, and conditions which are representative of casework for each job function;
- 191 b) the minimum required types, qualities, and conditions that shall be represented in a proficiency
192 test;
- 193 c) if no test was located that met all minimum requirements, the risk-based analysis of available
194 tests;
- 195 d) the identity of the individual(s) responsible for the selection, validation, administration, and
196 evaluation of tests within the FSP;
- 197 e) the source of the test (for tests obtained from external sources) or identity of the personnel
198 responsible for developing the test along with their qualifications (for tests developed
199 internally);
- 200 f) the job function(s) being tested;
- 201 g) that the test has been developed and validated in accordance with the requirements set forth in
202 this document;
- 203 h) the evaluation of the representativeness of the administered proficiency test;
- 204 i) criteria for determining the expected responses for each test sample;
- 205 j) a list of the FSP personnel to which the test was administered;
- 206 k) the date the test was administered to participant(s) and the date the test was completed by the
207 participant(s);
- 208 l) conditions not typical of normal casework under which the test was administered to the
209 participants (e.g., environmental conditions, equipment, time constraints);
- 210 m) format of the test administered to the participants (non-blind or blind);
- 211 n) participant responses;

- 212 o) criteria for acceptable performance as it relates to individual FSP personnel and the overall FSP
213 quality system;
- 214 p) results of participant performance as it relates to individual FSP personnel and the overall FSP
215 quality system;
- 216 q) root cause analysis and applicable corrective action(s).
- 217
- 218

DRAFT

219
220

Annex A
(informative)

221

Bibliography

222
223
224

The following bibliography is not intended to be an all-inclusive list, review, or endorsement of literature on this topic. The goal of the bibliography is to provide publications cited informationally, and publications relevant to the standard.

225

1] ISO/IEC 17043:2010, *Conformity assessment — General requirements for proficiency testing*³

226

DRAFT

³ Available from: <https://www.iso.org/standard/29366.html>

DRAFT



ASB
AAFS STANDARDS BOARD

Academy Standards Board
410 North 21st Street
Colorado Springs, CO 80904

www.aafs.org/academy-standards-board