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Terminology Related to Friction Ridge Examination

DRAFT



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Terminology Related to Friction Ridge Examination

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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 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@aaafs.org or 410 N 21st Street, Colorado Springs, CO 80904.

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

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DRAFT

Terminology Related to Friction Ridge Examination

1 Scope

This document provides a consolidated list of standardized technical report defines terms and definitions related to for forensic science professionals actively engaged in friction ridge examination. ~~It is not intended to define every term potentially applicable to friction ridge examination, but define commonly used terms in the discipline.~~

2 Normative References

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

2.3 Terms and Definitions

2.3.1

ABIS

The acronym for Automated Biometric Identification System. A generic term for a computer-based system which is a primary repository of individuals' biometrics (such as fingerprints, palm prints, facial and/or iris images) and secondary repository of associated demographic data, equipped with functionality to process biometric searches, store and retrieve records for identification purposes.

2.3.2

ACE (an examination ~~method~~ process)

An ~~examination method~~ acronym used to refer to the Analysis, Comparison and Evaluation phases of an examination process.

2.3.3

administrative information

Records—such as evidence receipts, chain of custody, and submission forms (electronic or hard copy)—that do not constitute data or information resulting from examination work.

2.3.4

administrative review

~~An evaluation of the report and supporting documentation for~~ Evaluation of records to verify consistency with ~~organizational~~ administrative policies and ~~for~~ editorial correctness.

OSAC Preferred Term ISO 21043-1^a

3.5

AFIS

agreement (synonym of correspondence and corresponding friction ridge detail)

A decision that an accumulation of observed similarities in pattern type, ridge flow, and friction ridge features in sequence, of the same or similar type, in the same relative position to each other, with associated intervening ridge counts suggests overall conformity.

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3.6

analysis (phase of the examination process)

~~The acronym for interpretation of observed data in a friction ridge impression in order to categorize its suitability/utility.~~

2.53.7

Automated Fingerprint Identification System-

AFIS

A generic term for a computer-based system which is a primary repository of individuals' friction ridge detail (such as fingerprints and/or palm prints) and secondary repository of associated demographic data, equipped with functionality to process biometric searches, store and retrieve records for identification purposes.

1.1

agreement

correspondence

corresponding friction ridge detail

~~Observation of pattern type, ridge flow, and friction ridge features in sequence, of the same or similar type, in the same relative position to each other, with associated intervening ridge counts. An accumulation of similarities between two impressions resulting in overall conformity.~~

1.2

amended report

~~A report used to document any modifications from a previously issued report, particularly those that affect or correct an original result or interpretation.~~

1.3

analysis (phase of the Examination method)

~~The interpretation of observed data in a friction ridge impression in order to categorize its utility.~~

2.63.8

blind verification

A type of verification in which at a minimum the subsequent examiner(s) has no knowledge of any other examiner's suitability decisions, conclusions or observed/documented data used to support the conclusion.

1.4

case record

~~A type of file (electronic or hard copy) in which all documentation and case relevant information is kept and maintained.~~

3.9

case file

Forensic Service Provider's collection of all records detailing the forensic process including reports related to a case.

ISO 21043-1^b (case file)

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2.73.10

chain of custody

Chronological record of the transfer, handling and storage of an item from its point of collection to its final return or disposal.

ISO 21043-1^c

NOTE Chain of custody is one element that contributes to the integrity of an item.

ISO 21043-1^d, OSAC Preferred Term

1.5

clarity

The fidelity and coherence with which the anatomical details of friction ridge skin are reproduced in a friction ridge impression, and are able to be visualized.

Hicklin paper^e

3.11

clarity

Assessment of the quality of a friction ridge impression, describing an examiner's opinion as to how easily the friction ridge features are visually observed in an impression. Sometimes referred to as an examiner's confidence in the presence of an observed feature, that can be discerned from the background.

2.83.12

cognitive bias

A set of Unconscious deviation from rationality in human judgment caused by influences that may affect the reliability and validity of one's observations and conclusions.

OSAC Preferred Term, and limitations of human information processing.

ISO 21043-1^f

2.93.13

comparison (phase of the Examination method examination process)

The search for and detection of similarities and dissimilarities in observed data between friction ridge impressions.

2.103.14

competency

Possessing and demonstrating the requisite knowledge, skills and abilities to successfully perform a specific task.

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^e Kalka, N.D., Beachler, M., Hicklin, R.A. (2020), LQMetric: A Latent Fingerprint Quality Metric for Predicting AFIS Performance and Assessing the Value of Latent Fingerprints, JFI 70(4): 443-463.

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2.143.15

competency testing

Evaluation of a person's knowledge and ability to perform work before authorization to do so independently.

OSAC Preferred Term

2.123.16

complete friction ridge exemplars (synonym of major case prints)

See 3.62

~~competent friction ridge examiner (refer to examiner-friction ridge)~~

~~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. major case prints.~~

3.17

complexity (of a comparison)

A characteristic of a comparison in which the attributes of one or both impressions may require additional consideration and quality assurance measures relating to the evaluation of a source conclusion. Usually refers to the quality, clarity, and completeness of at least one of the impressions in the comparison set, affecting the difficulty of the comparison.

NOTE Refer to ANSI/ASB BPR 166 for more detailed explanation, particularly of attributes.

2.133.18

complexity (of an impression)

A characteristic of an impression whose attributes may require additional consideration and quality assurance measures. Usually refers to the quality, clarity, and completeness of the impression being analyzed, having the potential to affect the difficulty of a subsequent comparison.

NOTE Refer to ANSI/ASB BPR 165 for more detailed explanation, particularly of attributes.

2.143.19

conclusion

(synonym of source conclusion)

See 3.87

~~Opinion stated by an examiner after interpretation of observed data. The opinion is the personal judgment that the observed data can offer support for one proposition over another. A source conclusion is distinct from a "proposition."~~

2.153.20

confirmation bias

~~The~~^A tendency to search for ~~data, collect, perceive,~~ or interpret information in a manner that supports ~~one's~~ preconceptions, expectations, or desires.

NOTE This is a type of cognitive bias.

OSAC Preferred Term

2.163.21

conflict

A condition in which two or more examiners disagree on a suitability decision or source conclusion.

2.173.22**consensus review****~~consensus opinion~~**

A type of examination in which a reported decision or conclusion is determined that reflects the collective judgment of a group of examiners.

2.183.23**consultation**

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

2.193.24**contextual bias**

A ~~deviation in human judgment caused by tendency for~~ exposure to ~~or knowledge of case-specific information that is either irrelevant to~~ affect the judgmental task or inappropriate for consideration impartial collection, perception, or interpretation of evidence.

NOTE This is a type of cognitive bias.

OSAC Preferred Term

3.25**control (material)**

Material of established origin used to evaluate the performance of a test or comparison. ~~Or a~~

OSAC Preferred Term

2.203.26**control (test)**

A test performed to demonstrate that a test method works correctly and to ensure that data are valid. ~~Positive controls confirm that the procedure will produce the expected result. Negative controls confirm that the procedure does not produce an unintended result.~~

OSAC Preferred Term

OSAC Preferred Term

1.6**corrective action**

Action to eliminate or mitigate the cause of a ~~non-conformity~~ nonconformity and to prevent recurrence.

2.213.27

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

ISO 9000:2015^g (modified “or mitigate” added)

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3.28

correspondence (synonym of agreement)

See 3.5 agreement.

3.29

corresponding friction ridge detail (synonym of agreement)

See 3.5 agreement.

2.223.30

customer

~~Client, authority~~ Authority, organization or person(s) requesting ~~the~~ forensic services.

ISO 21043-1^h (~~"the" deleted~~)

2.233.31

disagreement

A ~~decision that~~ dissimilarity, ~~or an accumulation of dissimilarities, that~~ is deemed to be ~~sufficiently~~ outside of expected variations in the appearance of impressions from the same source, ~~resulting that it results~~ in overall nonconformity. Not to be confused with "dissimilarity".

2.243.32

discriminability

The degree to which information in an impression can be used to distinguish it from impressions made by different sources. The discriminability of an impression is a combination of the quantity, spatial arrangement, clarity, and rarity of features observed.

2.253.33

dissimilarity

An observation that two impressions have a general difference of appearance when comparing an individual feature or detail. Not to be confused with "*disagreement*."

2.263.34

enhancement

~~process~~ Process to reveal, intensify, magnify, or clarify a property of an observation or result item.

ISO 21043-1ⁱ

2.273.35

evaluation (phase of the ~~Examination method~~ examination process)

The weighting of the aggregate strength of the evidence (observed similarities and dissimilarities when considering two competing propositions) between the observed data in the friction ridge impressions being compared in order to formulate a source conclusion.

2.283.36

examiner (friction ridge)

An individual who has successfully completed their FSP's training program, and is authorized to conduct independent friction ridge examinations for the ~~forensic service provider~~ FSP by observing

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and interpreting data, making decisions, forming conclusions and opinions, issuing reports and/or providing testimony. ~~Use of the term “examiner” in these documents refers to a “competent friction ridge examiner” and not a “trainee.”~~

NOTE Use of the term “examiner” in these documents refers to a “friction ridge examiner” and not a “trainee”.

1.7

exemplar impression

(synonym of exemplar or known and exemplar prints)

exemplar or known (synonym of exemplar impression and exemplar prints)

exemplar prints (synonym of exemplar impression and exemplar or known)

The deliberately recorded images or impressions from the friction ridge skin of an individual.

2.293.37

NOTE Examples may include, but are not limited to, inked tenprints, inked palm prints, Livescan prints, powder and lift prints, casted/moulded/molded prints, or photographs of friction ridge skin.

3.38

forensic light source

A light source that may be fixed, filtered or tunable to a variety of spectral ranges.

3.39

forensic process

Set of interrelated or interacting forensic activities including methods, techniques and processes used to establish conclusions and/or opinions, facts and findings, which can be used for legal proceedings.

2.303.40

forensic service provider

FSP

Organization or individual that conducts and/or supplies forensic services 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 21043-1^j

3.41

friction ridge detail

(synonym of friction ridge features)

See 3.42 friction ridge features.

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2.313.42

friction ridge features (synonym of friction ridge detail)

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

3.43

friction ridge impression (synonym of impression)

A reproduction of an area of friction ridge skin produced on a substrate by contact or transfer. Impressions may be referred to as 1.1 exemplar impressions, 3.57 latent impressions, or 3.77 questioned impressions.

2.323.44

friction ridge skin

The skin found on the palms of the hands (full palmar surface including fingers) and soles of the feet (full plantar surface including toes).

3.45

ground truth

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

3.46

impartiality

Objectivity, neutrality and fairness along with the reduction of the risk of bias.

NOTE It is important for impartiality that possible conflicts of interest are declared, resolved or do not exist. ISO 21043-1^k

1.8

impression (synonym of friction ridge impression)

See 3.43

high quality impression

An impression with observed data that are unambiguous and self-evident due to high clarity and quantity

1.9

impression

friction ridge impression

A reproduction of an area of friction ridge skin produced on a substrate by contact or transfer. Impressions may be referred to as *exemplar impressions*, *latent impressions*, or *questioned impressions* (refer to those definitions for further clarification).

3.47 **friction ridge impression.**

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2.333.48**inconclusive****INC**

The conclusion that the observed data doesdo not provide more support for one proposition over the other.

2.343.49**inconclusive with dissimilarities**

The conclusion that the observed data provide more support for the proposition that the impressions originated from different sources rather than the same source; however, there is insufficient support for a Source Exclusion.

2.353.50**inconclusive with similarities**

The conclusion that the observed data provide more support for the proposition that the impressions originated from the same source rather than different sources; however, there is insufficient support for a Source Identification.

3.51**independent examination**

Independent examination indicates an autonomous examination, but not necessarily one without knowledge of a prior examiner's decision, conclusion or opinion.

3.52**interested party (synonym of stakeholder)**

See 3.90 stakeholder.

2.363.53**interlaboratory comparison**

Organization, performance, and evaluation of measurements or tests on the same or similar items by two or more laboratories in accordance with predetermined conditions.

OSAC Preferred Term

1.10**interpretation**

Explanations for the observations, data and calculations.

OSAC Preferred Term

3.54**interpretation**

Part of the examination that uses professional judgement, logic, expertise, and relevant data and information and, if applicable, statistical models to infer the meaning of observations so as to provide opinions with respect to questions asked.

ISO 21043-1¹

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2.373.55

intralaboratory comparison

Organization, performance, and evaluation of measurements or tests on the same or similar items within the same laboratory in accordance with predetermined conditions.

OSAC Preferred Term

2.383.56

item

Object, substance ~~or~~, material or mark that is collected, derived or sampled as part of the forensic process.

ISO 21043-1^m

2.393.57

latent impression

(synonym of latent ~~or~~, synonym of unknown fingerprint (as opposed to fingerprint))

An impression from an unknown source of friction ridge skin, ~~usually deposited on a substrate unintentionally~~. Typically, latent impressions are not readily visible and can be developed or enhanced by optical, physical, and/or chemical processing techniques.

3.58

likelihood ratio

Expression of an examiner's assessment of the ratio of the probabilities of the observations if one of two competing propositions were true versus if the other proposition were true.

NOTE 1 The likelihood ratio gives the probative value of the observations for the competing propositions.

NOTE 2 Only the term "likelihood ratio" is used in the present standard. This is not intended to exclude the calculation of Bayes factors instead of likelihood ratios. Likelihood ratios are described in terms of "probability". If the data are continuously valued, the numerator and denominator of the likelihood ratio will involve probability density functions rather than probabilities.

ISO 21043-1ⁿ

3.59

limited examinations

Examinations of latent friction ridge evidence that are not complete as defined by Standard Operating Procedures (SOPs).

3.60

limited processing

The selective application of sequential processing without exhausting the full capabilities of the Forensic Service Provider (FSP).

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2.403.61**livescan impression**

An inkless, electronic means of capturing impressions from the friction ridge skin of an individual associated with a known source or claimed identity in a digital format.

3.62**major case prints (synonym of complete friction ridge exemplars)**

A complete recording of all friction ridge detail appearing on the friction ridge skin of an individual. This includes the extreme sides of the palms, joints, tips, and sides of the fingers, as well as the extreme sides of the soles, joints, tips, and sides of the toes where required.

3.63**matrix**

Transfer medium that is deposited or removed by the friction ridge skin when making an impression.

NOTE For example, grease/oil, sweat, blood, etc.

2.413.64**minutia**

The point where a friction ridge terminates, or splits into two or more ridges. A subset of the friction ridge detail/features traditionally consisting of ridge endings, bifurcations, and dots, or any combination thereof, used to compare and interpret similarity and dissimilarity between two impressions.

1.11—**nonconforming work****Worknegative controls**

Controls that confirm that the procedure does not comply with FSP policies and procedures.

2.423.65**observation**

Recognizing and notingproduce an occurrence.
OSAC Preferred Termunintended result.

2.433.66**observed data**

Any information seen within an impression that an examiner ~~relies~~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.

2.443.67**open (non-blind) verification**

A type of verification in which the subsequent examiner knows the identity of the other examiner(s) and has ~~access to~~been provided with their decisions, conclusions and/or ~~observed~~documented data used to support their conclusion.

1.12—

opinion

View, judgment, belief—takes into consideration other information in addition to observations, data, calculations and interpretations.

OSAC Preferred Term

3.68

participant (in proficiency test)

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

2.453.69

pattern force area

A region of friction ridge skin in which ~~in theory~~, minutiae were forced to form due to pattern type and existing ridge fields during friction ridge formation. As these minutiae form more predictably, their configurations are more common and less random.

NOTE For example, in the outflow of a loop, many ridges converged during formation, which forced many ridge endings to form as space ran out.

2.463.70

peer review

An independent evaluation of a scientific, professional, or academic manuscript or publication, by a qualified second party, to evaluate the claims, methods, interpretations, and conclusions.

OSAC Preferred Term

3.71

positive controls

Controls that confirm that the procedure will produce the expected result.

1.13—

preventive action

Action to eliminate the cause of a potential ~~non-conformity~~nonconformity or other potential undesirable situation.

2.473.72

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

ISO 9000:2015^o

2.483.73

probability

An expression of the chance that a particular event occurs. A probability may be empirically, classically, or subjectively derived.

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2.493.74

proficiency testing

Evaluation of participant performance against pre-established criteria ~~by means of interlaboratory comparisons.~~

OSAC Preferred Term.

1.14

propositions

Hypotheses about the actual state of nature or an event, which is unknown or unknowable. Not to be confused with “conclusions,” nor “source conclusions” (refer to those definitions for further clarification).

3.75

propositions

A statement that is either true or false, the truth of which is uncertain.

ISO 21043-1[mod]^p

2.503.76

quality assurance measures

Steps taken by an FSP to detect, correct, minimize and/or prevent ~~non-conforming~~nonconforming work.

NOTE This may include, but is not limited to, root cause analysis, additional verification, ~~non-conformity~~nonconformity assessment, audits and corrective and/or preventive actions.

2.513.77

questioned impression ~~(also questioned image or questioned item)~~

An impression or image of friction ridge skin whose source or identity is unknown; ~~it can include latent impressions, impressions from an unknown source or~~

NOTE The questioned impression may be a “known ~~source~~impression” or “exemplar impression” in tenprint to tenprint examinations.

2.523.78

rarity (of a feature ~~type~~)

The frequency or prevalence of a friction ridge feature, either in isolation or in conjunction with other information about its local context.

NOTE For example, the prevalence of a type of feature could be affected by its proximity to a pattern force area, the finger number or palmar region on which it is located, or the pattern type in which it is located.

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2.533.79

record

Document providing information on ~~observations or~~ activities performed ~~during examination as part of the forensic process.~~

ISO 21043-1^q (*"during examination" added for clarification*)

1.15—

reliability, evidentiary/legal

Credibility and trustworthiness of proffered evidence.

OSAC Preferred Term

1.16—

reliability, statistical

~~Consistency of results as demonstrated by reproducibility or repeatability.~~

OSAC Preferred Term

2.543.80

repeatability

Extent of agreement between more than one result determined in the same place, by the same person, on the same equipment, in the same way at similar times.

OSAC Preferred Term

1.17—

report

~~communication of outcomes of the forensic process.~~

~~EXAMPLE observations, findings, interpretations, conclusions and/or opinions.~~

~~ISO 21043-1^r~~

2.553.81

reproducibility

(synonym of replicability)

Extent of agreement between ~~more than one result~~ repeated results determined under any combination of different conditions.

OSAC Preferred Term

1.18—

result

~~The product of the forensic service provider. This term is broad and includes observations, data, calculations, interpretations and opinions.~~

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2.563.82

risk assessment

Systematic process of ~~the identification~~identifying and ~~evaluation of~~evaluating perceived or potential risks throughout the forensic process.

ISO 21043-1^s

3.83

sample

~~Portion drawn from a whole~~semi-porous

~~Partially but not freely or population~~wholly permeable (e.g., glossy paper).

2.573.84

sequential processing

~~The application of chemical and/or physical friction ridge development techniques in a specific order to target specific constituents of friction ridge impressions which may be visualized for the purpose of examination/testing, not necessarily representative and to maximize the preservation of the whole~~friction ridge detail during each process.

NOTE This includes biological material taken from a person (e.g., hair blood, saliva).

ISO 21043-1^t

1.19

scene

~~Place or object that is subject to and/or requires forensic examination.~~

~~2.581.1 NOTE A crime scene is a common description of a scene where a presumed crime has been committed. The scene can be a person or an animal.~~

ISO 21043-1^u

2.593.85

similarity

An observation that two impressions share a general likeness when comparing an individual feature or detail. Not to be confused with "~~correspondence~~agreement."

2.603.86

source

An area of friction ridge skin of an individual from which an impression originated.

The Fingerprint Sourcebook^v

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^v National Institute of Justice (U.S.). *The Fingerprint Sourcebook*. Washington DC: U.S. Dept. of Justice Office of Justice Programs National Institute of Justice; 2011. <http://purl.fdlp.gov/GPO/gpo18039>. Accessed November 11 2022.

3.87**source exclusion****EXC****The conclusion (synonym of conclusion)**

Opinion stated by an examiner after interpretation of observed data. The opinion is the professional judgment that the observed data ~~provide substantially stronger~~ can offer support for ~~the one~~ proposition ~~over another~~.

2.613.88**source exclusion (friction ridge)**

Source exclusion is the conclusion that ~~the questioned impression originated from a different source than the exemplar~~ two friction ridge impressions ~~compared~~. ~~did not originate from the same source~~.

2.623.89**source identification****ID**

The conclusion that the observed data ~~provide~~ provides substantially stronger support for the proposition that the two impressions originated from the same source rather than different sources.

2.633.90**stakeholder (synonym of interested party)**

A ~~person~~ Person or organization that can affect, be affected by, or perceive itself to be affected by a decision or activity.

ISO 9000:2015^w

1.20—**standard operating procedure****SOP**

Authorized, documented, specified way to carry out an activity or process.

ISO 21043-1^x

2.643.91**strength of the evidence**

A ~~means of describing the~~ The relative support ~~or extent to which~~ the evidence ~~leads to~~ supports one proposition over another. It may be described verbally or numerically.

2.653.92**substrate**

Surface or material upon which ~~a substance~~ an item of interest is deposited.

ISO 21043-1^y

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1.21—

suitability decision

(synonym of utility decision)

A decision made by an examiner in accordance with FSP policy and/or procedure as to whether or not

The usefulness of an impression will proceed to the next for a further step in the examination process.

1.22—

suitability for, such as comparison or Automated Biometric Identification System (ABIS) searches utility for Automated Biometric Identification System (ABIS) searches

A decision made by an examiner in accordance with FSP policy and/or procedure as to whether or not an impression will proceed to an ABIS database search.

NOTE This designation is often referred to as “suitable for ABIS/AFIS” or “of value for ABIS/AFIS”.

2.663.93

supplemental report

A report used to document additional work performed with subsequent reporting of results entry.

2.673.94

target group

A specific set of friction ridge features selected as a starting point during comparison.

2.683.95

technical review

A qualified second party's evaluation of reports, notes, data, and other documentation to ensure there is appropriate and sufficient support for the actions, results, conclusions, opinions, and interpretations.

OSAC Preferred Term

NOTE Technical review can also be applicable to observations and opinions that are communicated other than by way of report (see ISO 21043-5) ISO 21043-1^z.

3.96

unknown (synonym of latent, synonym of latent impression)

See 3.57 latent impression.

1.23—

utility (synonym of suitability)

See 1.1

trainee

An individual not yet authorized to conduct independent friction ridge examinations for the FSP; usually still in training.

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~~1.24~~

utility

~~The usefulness of an impression for a further step in the examination process, such as comparison or Automated Biometric Identification System (ABIS) entry.~~

3.97 suitability.

~~2.69~~3.98

validation

A process of evaluating a system, method or component to determine that requirements for an intended use or application have been fulfilled.

OSAC Preferred Term

~~2.70~~3.99

verification (phase of examination ~~method~~)

~~Independent~~**process)**

Quality assurance measure consisting of 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(~~non-blind~~) verification and consensus review. The general term verification is inclusive of these various types.

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 document was drafted, these were some publications available for reference.

- 1] ANSI/ASB Best Practice Recommendation 165, *Best Practice Recommendation for Analysis of Friction Ridge Impressions*, 1st Edition, 2024. ^{aa}
- 2] ANSI/ASB Best Practice Recommendation 166, *Best Practice Recommendation for Comparison and Evaluation of Friction Ridge Impressions*, 1st Edition, 2024. ²⁵
- ~~1]3]~~ ISO 9000:2015, *Quality management systems — Fundamentals and vocabulary*, Fourth Edition^{bb}
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- ~~1] Kalka, N.D., Beachler, M., Hicklin, R.A. (2020), LQMetric: A Latent Fingerprint Quality Metric for Predicting AFIS Performance and Assessing the Value of Latent Fingerprints, JFI 70(4): 443-463.~~
- 5] National Institute of Justice (U.S.). *The Fingerprint Sourcebook*. Washington DC: U.S. Dept. of Justice Office of Justice Programs National Institute of Justice; 2011. ^{dd}
- ~~3]6]~~ OSAC Preferred Terms. ^{ee}

^{aa} Available from: <https://www.aafs.org/academy-standards-board>

^{bb} Available from: <https://www.iso.org/standard/45481.html>

^{cc} Available from: <https://www.iso.org/standard/69732.html>

^{dd} Available from: <http://purl.fdlp.gov/GPO/gpo18039>. Accessed November 11 2022.

^{ee} Available from: <https://www.nist.gov/osac/osac-lexicon>

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