

## Terminology Related to Friction Ridge Examination

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## Terminology Related to Friction Ridge Examination

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## Foreword

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.

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](mailto: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.

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**Keywords:** *terms, definitions, friction ridge, examination*

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# Terminology Related to Friction Ridge Examination

## 1 Scope

This document provides a consolidated list of standardized terms and definitions related to friction ridge examination.

## 2 Terms and Definitions

### 2.1

#### **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.

### 2.2

#### **ACE (an examination method)**

An examination method used to refer to Analysis, Comparison and Evaluation.

### 2.3

#### **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.

### 2.4

#### **administrative review**

An evaluation of the report and supporting documentation for consistency with organizational policies and for editorial correctness.

*OSAC Preferred Term*

### 2.5

#### **AFIS**

The acronym for Automated Fingerprint Identification System. 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.

### 2.6

#### **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.

### 2.7

#### **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.

**2.8  
analysis (phase of the Examination method)**

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

**2.9  
blind verification**

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

**2.10  
case record**

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

**2.11  
chain of custody**

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

NOTE Chain of custody is one element that contributes to the integrity of an item.  
*ISO 21043-1<sup>a</sup>, OSAC Preferred Term*

**2.12  
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<sup>b</sup>*

**2.13  
cognitive bias**

A set of influences that may affect the reliability and validity of one's observations and conclusions.  
*OSAC Preferred Term*

**2.14  
comparison (phase of the Examination method)**

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

**2.15  
competency**

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

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<sup>b</sup> 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.

**2.16**

**competency testing**

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

*OSAC Preferred Term*

**2.17**

**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.

**2.18**

**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.

**2.19**

**complexity (of an impression)**

A characteristic of an impression whose attributes may require additional consideration and quality assurance measures.

**2.20**

**conclusion**

**source conclusion**

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 conclusion is distinct from a "*proposition*."

**2.21**

**confirmation bias**

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

*OSAC Preferred Term*

**2.22**

**conflict**

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

**2.23**

**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.

**2.24**

**consultation**

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

**2.25****contextual bias**

A deviation in human judgment caused by exposure to information that is either irrelevant to the judgmental task or inappropriate for consideration.

*OSAC Preferred Term*

**2.26****control**

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

**2.27****corrective action**

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

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

*ISO 9000:2015<sup>c</sup> (modified “or mitigate” added)*

**2.28****customer**

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

*ISO 21043-1<sup>d</sup> (“the” deleted)*

**2.29****disagreement**

A dissimilarity, or an accumulation of dissimilarities, that is deemed to be outside of expected variations in the appearance of impressions from the same source, resulting in overall nonconformity.

**2.30****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.

**2.31****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*.”

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**2.32****enhancement**

process to reveal, intensify, magnify, or clarify an observation or result.

*ISO 21043-1<sup>e</sup>*

**2.33****evaluation (phase of the Examination method)**

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.

**2.34****examiner (friction ridge)**

An individual authorized to conduct independent friction ridge examinations for the forensic service provider by observing 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*.”

**2.35****exemplar impression****exemplar or known****exemplar prints**

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

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

**2.36****forensic service provider****FSP**

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

*ISO 21043-1<sup>f</sup>*

**2.37****friction ridge detail****friction ridge features**

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.

**2.38****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).

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**2.39**

**high quality impression**

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

**2.40**

**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).

**2.41**

**inconclusive**

**INC**

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

**2.42**

**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.

**2.43**

**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.

**2.44**

**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*

**2.45**

**interpretation**

Explanations for the observations, data and calculations.

*OSAC Preferred Term*

**2.46**

**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*

**2.47****item**

Object, substance or material that is collected, derived or sampled as part of the forensic process.  
*ISO 21043-1<sup>g</sup>*

**2.48****latent impression****latent or 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.

**2.49****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.

**2.50****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 used to compare and interpret similarity and dissimilarity between two impressions.

**2.51****nonconforming work**

Work that does not comply with FSP policies and procedures.

**2.52****observation**

Recognizing and noting an occurrence.

*OSAC Preferred Term*

**2.53****observed data**

Any information seen within an impression that an examiner relies 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.

**2.54****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 their decisions, conclusions or observed data used to support their conclusion.

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**2.55****opinion**

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

*OSAC Preferred Term*

**2.56****pattern force area**

A region of friction ridge skin 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.

**2.57****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*

**2.58****preventive action**

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

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

*ISO 9000:2015<sup>h</sup>*

**2.59****probability**

An expression of the chance that a particular event occurs.

**2.60****proficiency testing**

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

*OSAC Preferred Term*

**2.61****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).

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## 2.62

### **quality assurance measures**

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

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

## 2.63

### **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 a known source.

## 2.64

### **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.

## 2.65

### **record**

Document providing information on observations or activities performed during examination.  
*ISO 21043-1<sup>i</sup> (“during examination” added for clarification)*

## 2.66

### **reliability, evidentiary/legal**

Credibility and trustworthiness of proffered evidence.  
*OSAC Preferred Term*

## 2.67

### **reliability, statistical**

Consistency of results as demonstrated by reproducibility or repeatability.  
*OSAC Preferred Term*

## 2.68

### **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*

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**2.69**  
**report**

communication of outcomes of the forensic process.

EXAMPLE observations, findings, interpretations, conclusions and/or opinions.  
*ISO 21043-1<sup>j</sup>*

**2.70**  
**reproducibility**  
**replicability**

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

*OSAC Preferred Term*

**2.71**  
**result**

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

*OSAC Preferred Term*

**2.72**  
**risk assessment**

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

*ISO 21043-1<sup>k</sup>*

**2.73**  
**sample**

Portion drawn from a whole or population for the purpose of examination/testing, not necessarily representative of the whole.

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

*ISO 21043-1<sup>l</sup>*

**2.74**  
**scene**

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

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<sup>m</sup>*

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**2.75**

**similarity**

An observation that two impressions share a general likeness when comparing an individual feature or detail. Not to be confused with “*correspondence*.”

**2.76**

**source**

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

*The Fingerprint Sourcebook*

**2.77**

**source exclusion**

**EXC**

The conclusion that the observed data provide substantially stronger support for the proposition that the questioned impression originated from a different source than the exemplar impressions compared.

**2.78**

**source identification**

**ID**

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

**2.79**

**stakeholder (interested party)**

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

*ISO 9000:2015<sup>n</sup>*

**2.80**

**standard operating procedure**

**SOP**

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

*ISO 21043-1<sup>o</sup>*

**2.81**

**strength of the evidence**

A means of describing the relative support the evidence lends to one proposition over another. It may be described verbally or numerically.

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**2.82**

**substrate**

Surface or material upon which a substance is deposited.

*ISO 21043-1<sup>p</sup>*

**2.83**

**suitability decision**

**utility decision**

A decision made by an examiner in accordance with FSP policy and/or procedure as to whether or not an impression will proceed to the next step in the examination process.

**2.84**

**suitability for 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”.

**2.85**

**supplemental report**

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

**2.86**

**target group**

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

**2.87**

**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*

**2.88**

**trainee**

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

**2.89**

**utility**

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

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**2.90  
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*

**2.91  
verification (phase of examination method)**

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.

**2.92  
verification (analytical)**

Performing subsequent testing to ascertain if the results are concordant.

*OSAC Preferred Term*

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<sup>q</sup> Available from: <https://www.iso.org/standard/45481.html>

<sup>r</sup> Available from: <https://www.iso.org/standard/69732.html>

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