

Information

Fingerprint Examination - Terminology, Definitions and Acronyms

FSR-I-402

This is a consultation issued to allow comments from interested parties; all comments will be given consideration when finalising the fingerprint comparison Appendix FSR-C-128 and this information document prior to publication. Comments should be sent to FSRConsultation1@homeoffice.gsi.gov.uk and should be submitted by 20 January 2014. This mailbox is not for general correspondence and is not routinely monitored so no acknowledgement will normally be sent.

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1. INTRODUCTION

- 1.1.1 This Information document was compiled under the auspices of the Forensic Science Regulators' Fingerprint Quality Standard Specialist Group (FQSSG) and provides terminology, definitions and abbreviations used in fingerprint examination.
- 1.1.2 This document compliments the Forensic Science Regulators' Fingerprint Comparison appendix FSR-C-128 to his Codes.
- 1.1.3 The document avoids where possible terminology used in international standards and legal definitions (other than to translate meaning applicable to fingerprint examination).

2. DEFINITIONS

ACCIDENTAL: A pattern that does not conform to that of the arch, loop or whorl and yet possesses characteristics common to all three types. This may be a pattern type that possesses some of the requirements for two or more different types of patterns. This may also be a pattern type that conforms to none of the definitions of a pattern. An accidental will have two or more deltas in a fully rolled impression.

ACCREDITATION: Third-party attestation related to a conformity assessment body conveying formal demonstration of its competence to carry out specific conformity assessment tasks.

ACETATE SHEET: Clear, flexible acetate plastic sheets that a mark lifted by tape or other medium e.g. gel, will be placed on to become a lift. This acetate sheet can be written on to identify from which scene it has come. One brand name of acetate sheet is **COBEX**

ACE: The acronym used to describe the main elements that comprise the fingerprint examination test process - Analysis, Comparison and Evaluation. Although this is a process with defined steps, when making a 'Comparison' it becomes a cyclic or iterative process, rather than a linear process.

ACID BLACK: See **Chemical Treatments**.

ACID YELLOW: See **Chemical Treatments**.

ACID VIOLET: See **Chemical Treatments**.

AGREEMENT: The ridge flow, characteristics and / or details appear in the same relative position with the same intervening ridge count, allowing for explainable differences, so to enable the practitioner to reach their conclusion.

ALUMINIUM POWDER: The most commonly used development powder used extensively since the 1970's. Aluminium powder is a low cost dusting powder that is used for many non-porous surfaces for example on glass, metallic surfaces, highly varnished wooden surfaces, enamelled articles etc. The wearing of an appropriate dust respirator is recommended, especially during lengthy examinations or in confined and poorly ventilated areas

AMPUTATED: The removal of a limb or other body extremity by trauma, prolonged constriction or surgery.

ANALYSIS: The first step of the ACE test process. This is the assessment of an impression to determine suitability for comparison. The practitioner examines and analyses all variables influencing the friction ridge detail in question. When examining friction ridge detail, several factors must be taken into account. Some of these factors are the material upon which the impression has been deposited, the enhancement process or processes involved, deposition pressure when the impression was left, clarity, if the impression reaches the practitioners threshold - this list is not exhaustive but will be dependent on the impression being analysed. The quantity and quality of the friction ridges are also analysed and the practitioner decides whether the impression has sufficient information to proceed to the next phase – comparison.

ANCHOR POINT: A clearly defined characteristic or cluster of characteristics that is the starting point for the analysis and comparison. Also known as a **Reference Point** and see **Salient Ridge Characteristics**.

ANTE MORTEM FINGERPRINTS: Fingerprint or mark information collected to aid the identification of deceased person(s). This information can be sourced from documents known to belong to the deceased that have been 'signed' with an inked impression from one of their digits, or

from examination of items known to have been handled by them whilst living. This data is often collected in conjunction with DNA samples.

APPROXIMATING ARCH: In Approximating Arch Patterns , the ridges run from side to side making no backward turn, but there is an appearance of a delta. If there is a staple, which is separated from the upper limb of the delta, and a friction ridge count can be obtained, then the pattern must be designated as a loop. Approximating arches can appear to flow in either a radial or ulnar direction.

ARCH (PLAIN): A pattern type in which the friction ridges enter on one side of the impression and flow out the other side with a rise or wave in the centre, there are no up thrusts, twists or backward turns in the friction ridges.

AREA NOT REVEALED: When an individual's friction ridge detail is recorded as a control print, not every bit of friction ridge detail will be recorded, as there is limited size and space on the form. A mark retrieved from a scene or an exhibit may be from one of the areas not revealed on the 'Tenprint', but may appear on another set. Alternatively a set might have to be retaken focusing on the area that needs to be recorded. To overcome this in more serious cases, such as terrorism, additional sets may be taken rolling the tips of the fingers, phalanges and palm to obtain the maximum amount of friction ridge detail and limiting the areas not revealed. This phrase is most used when a 'Tenprint' set has been poorly taken.

BACKGROUND DISTURBANCE / INTERFERENCE: A feature of the background (such as the texture or pattern) of the substrate (surface) that the mark is left on, which affects the appearance and resultant interpretation of the friction ridge flow or ridge details.

BASAL LAYER: The deepest layer of the epidermis and is the generating layer in the skin. If this layer is damaged it leads to the cells being unable to reproduce and replace themselves. This damage results in a permanent scar.

BIAS: Influence based on preferences, dislikes and/or irrelevant information rather than objective data, such as extraneous contextual details surrounding an event.

BIFURCATION: A ridge characteristic, which occurs when a friction ridge splits into two and the friction ridges on either side diverge to make room for it.

BLACK POWDER: A development powder. This is particularly useful on white surfaces such as uPVC. This can also be used on wood.

BLURRED: When there is movement in the friction ridge detail caused by the movement of the hand / foot or the surface the impression has been left on. The friction ridge detail may become hard to analyse due to decrease in the clarity of the friction ridges.

FRAGMENTED/BROKEN UP: The mark appears to be broken up due to either the surface it was left on or the development process or a skin condition.

BY40: Basic Yellow 40. See **Chemical Treatments**.

CADAVER: A deceased person.

CADAVER PRINTS: See **Post Mortem Set**.

CARPAL DELTA: A delta formation nearest the wrist on the palm. The positioning can differ from person to person. The position of the carpal delta may help with the orientation of an impression.

CASTING: Covering the surface of the skin with a malleable material which when set will form a cast of the ridge detail present. There are many commercially available materials suitable for this process.

CENTRAL POCKET: A pattern type that has two deltas and at least one friction ridge that makes, or tends to make, one complete circuit, which may be spiral, oval, circular, or any variant of a circle - that is it possess all the attributes of a whorl. A central pocket is a very lopsided type of whorl where the two deltas are of varying distances from the core. One delta is typically quite close to the core, while the other is much further away.

CERTIFIED COPY: A copy of a control set of friction ridge detail that has been authenticated.

CHARACTERISTICS: During the formation of friction ridge detail, the ridges may develop breaks or deviations which practitioners refer to as characteristics. The sequencing and position of the characteristics allow the friction ridge detail to be used as a means of human identification. Characteristics include:

Ridge Ending*

Bifurcation*

Short Independent ridge*

Lake*

Crossover*

Spur*

(*See each individual term for a definition)

CHEMICAL TREATMENTS¹: The exhibit or surface of an object is subjected to an application of chemicals to develop or enhance areas of friction ridge detail.

CLARITY: The visual quality of the friction ridge detail.

CLOSED DELTA: The delta is formed when a single ridge forks in to two arms, opens out and tries to enclose the core area. See **Delta**.

CNA: The abbreviation for Cyanoacrylate (Super Glue). See **Chemical Treatments**.

COBEX: Is a brand name. See **Acetate Sheet**.

COGNITIVE PROFILE: Science has found that the real cause of a person's ability to perform a function lies in the strength, or weakness, of that person's relevant cognitive skills. The capacity to form and manipulate accurate images in your mind is a core visual acuity and cognitive skill for fingerprint analysis.

COINCIDENT SEQUENCE: This occurs when the same friction ridge characteristics are in the same relative position with the same intervening friction ridge count, in sufficient quantity and allowing for explainable differences in both impressions. The ability or inability to establish a coincident sequence will assist the practitioner with their conclusion..

COLLABORATIVE EXERCISE: An inter-laboratory comparison exercise to determine the performance characteristics of a method or procedure, to establish the effectiveness and comparability of new tests or measurement methods, or to assign values to reference materials and assess their suitability for use in specific test or measurement procedures.

COMPARISON: The second step of the ACE test process. It is when two or more impressions are compared to determine the level of agreement between two areas of friction ridge skin and to establish the existence of discrepancies or similarities. The comparison can be either manual (using hard copy images) or computer based (using electronic/digital/on screen images)

COMPETENCE: The skills, knowledge and understanding required to carry out tasks within a role, evidenced and assessed consistently over time through performance in the workplace.

COMPLEX MARK: A mark is classed as ‘complex’ if there are any difficult or unusual aspects to it. Complexity is subjective and dependant on individual practitioner opinion.

Difficult aspects may include orientating the impression, determining the area of the hand or foot a mark was deposited from, or difficulty in seeing and establishing the existence of characteristics. Other aspects may include high distortion, dissimilarities or low quality or quantity of characteristics. A mark may also be complex due to the substrate it has been left in, for example blood.

COMPOSITE: A Composite friction ridge pattern consists of a combination of patterns and possesses three or more deltas.

CONCLUSION: A result stemming from the examination and assessment of all available data within an impression whilst removing and / or limiting bias as much as is possible. The examiner will weigh up of all of the available information and come to their final conclusion about the origin or otherwise of the unknown mark. An evaluation decision will result in one of the following outcomes:

‘Identified’*

‘Excluded’*

‘Unidentified’*

‘Inconclusive’*

‘Insufficient’*

See also **Reporting Outcomes**

(*See each individual term for a definition)

CONTAMINATION: The undesirable introduction of substances or trace material; for fingerprint examination is the disruption of the true image of a mark from a secondary (physical) matrix source, for example blood, grease etc.

CONTEMPORANEOUS NOTES: This is defined as an accurate record, made at the time, or as soon after the event as practicable. It is a record of relevant evidence which is seen, heard or done, by the maker of the note.

CONTINUITY: A chronological record of events with regards to either a case or an exhibit.

Demonstrating the continuity of a case is to show the signed, dated actions of all individuals involved, such as when a case arrives, who has worked on it, who has identified it, who confirmed and verified the identification etc. The signing and dating of the record demonstrates chronology of the case.

The continuity of an exhibit shows secure custodianship and handover of responsibility, from the time and place of collection to the time and place of each further stage the exhibit may have to undergo.

CONTROL PRINT:

See also **Known Prints, Ten Prints, Plantar Prints or Scan**

CORE: The approximate centre of a friction ridge pattern

CREASE: A linear depression on the surface of the hand or foot. These may be grooves at the joints of the phalanges, at the junction of the digits and across the palmar and plantar surfaces that allow flexion. The flow and the appearance of the creases can be useful for orientating a mark.

CRITICAL FINDINGS: An outcome that meets one or more of the following criteria:

- i. has a significant impact on the conclusion reached and the interpretation and opinion provided;
- ii. cannot be repeated or checked in the absence of the exhibit or sample;
- iii. could be interpreted differently.

CRO NUMBER: A unique Criminal Record Office number assigned to an individual.

CROSS HATCHING: A term that describes the crease pattern that is generally found in the thenar area of the palm. These creases intersect other creases running in a perpendicular direction, giving a 'grid' like appearance.

CROSSOVER: Is a connecting friction ridge made up of two bifurcations.

DACTYLOSCOPY: The science of fingerprint identification, this phrase is not generally used within the UK.

DATABASES: Collections of data and associated material designed to provide information rather than for archive, which are stored systematically in hard copy or electronic format and are, e.g. used for:

- a. providing information on the possible origin of objects or substances found in casework; and/or
- b. providing statistical information.

DEAD SET: The term used for a post mortem set of finger and palm prints - See **Post Mortem Set** and **Cadaver Prints**.

DE-GLOVED / DE-GLOVING: The process where the epidermis becomes loose and finally detached during the decomposition of a cadaver

DELTA: A triangular type formation in the friction ridge flow, where ridges flowing in the different directions meet. Deltas are usually found in the bottom half of the finger impressions, offset to either the left or right (or both). Two of the 'branches' of the delta will usually open out to enclose the core area. Deltas appear in all patterns except arches and also appear

on various parts of the palm. Delta's can be classified as either Open or Closed - See **Open Delta** and **Closed Delta**.

DEPOSITION PRESSURE: The downward pressure exerted when a mark or print is left, for example heavier deposition pressure may result in the friction ridges appearing thicker and the furrows appearing very narrow when compared to that of a print left under controlled conditions.

DERMAL LAYER/DERMIS: The layer of the skin that sits under the regenerative cells of the basal layer. If this layer is damaged the friction ridges in the damaged area cannot replicate and a scar will form on the surface of the skin.

DETAIL: Information from within a friction ridge which is used when making comparisons or searching. It can include anything that assists the practitioner to reach their conclusion. This can include scars, creasing, pore position, pore shape, thinness and thickness of friction ridges, friction ridge shape etc.

DEVELOPED: When a latent mark is subjected to chemical and / or physical treatments and an impression is made visible then the mark is said to have been developed.

DEVELOPMENT POWDERS: A substance used to develop friction ridge detail. The powders are applied with a brush in the case of aluminium powder or black powder, or in the case of magna powder, a magnetized applicator is used. The powder adheres to the constituents of the latent mark. The type or colour of powder used is often dependent on the surface type. The developed impressions can then either be lifted or photographed. For development powders available and their uses please refer to the CAST or HOSDB handbook

DEVIATION: An interruption in the friction ridge path caused by a bifurcation or ridge ending.

DFO: See **Chemical Treatments**.

DIFFERENCE OF OPINION: Where two practitioners examining the same area of friction ridge detail do not arrive at the same opinion; this

should not be confused with an error in the first instance, as it may or may not be an error.

DIFFERENTIAL GROWTH: The random variation in the development of cells. During foetal development in the womb the stresses and strains affect the development of the friction ridges. This randomness in development leads to the different ridge flows, patterns and sequences of characteristics. Even in identical twins the friction ridge development for each twin is different.

DIGIT: A finger or a toe.

DIGIT DETERMINATION: For marks suitable for comparison or search, the practitioner will consider whether it is possible to determine from which finger or area of friction ridge detail the mark originated. This may be due to the presence of fault ridges, the direction a pattern flows in or the type of friction ridge flow (especially in the case of palm) or multiple marks in certain positions such as a sequence.

DISAGREEMENT: Where the friction ridge flow between impressions differ, the ridge characteristics and / or details do not appear in the same relative position, do not have the same intervening ridge count and / or there may be differences that cannot be explained.

DISCREPANCY: The apparent presence of friction ridge detail in one impression that does not exist in the corresponding area of another impression..

DISTAL: This refers to something that is the farthest away from the centre or point of attachment. For example the distal flexures of the finger are the creases in the fingers furthest away from the palm, between the top and middle phalanges of the finger.

DISTORTION: Variances in the reproduction of friction skin caused by factors such as pressure, movement, force, and contact surface (i.e. stretching of carrier bag).

DOTTED: The chemical treatment or the age of the mark can affect the appearance of the friction ridges. The impression may have friction ridges that have a dotted appearance, where the ridges are broken up. This appearance means the ridge flow is difficult to interpret and may have a direct impact on the outcome - See **Granulated**.

DOWN TWICE / DOWN MORE THAN ONCE: The friction ridge detail has been deposited more than once in a similar position, but the impressions may overlap in some areas. Each impression must be treated separately when being compared.

DYSPLASIA: A condition which arises because of problems in the genes that control the normal development of the skin. The friction ridges have a fragmented (broken up) appearance; sometimes referred to as Epidermal Dysplasia.

EDGEOSCOPY: Study of the contour or shape of the edges of friction ridges.

ELASTICITY: The ability of skin to stretch, compress, or distort and be able to return to its natural appearance.

ELIMINATION PRINTS: The controlled recording of friction ridge detail of person(s) known to have had legitimate access to an object or location. See **Control Prints, Known Prints, Ten Prints**

ELONGATED WHORL: An elongated whorl has all the attributes of a whorl, but the ridge flow at the centre is elliptical.

ENLARGEMENTS: The mark, print or both are magnified so that the detail can be easily seen. Generally the enlargements are made to a known scale, either using photography or electronically. It can be especially useful in cases involving complex marks, to show clearly the findings of the practitioner.

EPIDERMIS: The outermost layer of the skin, featuring the friction ridge detail.

EQUALISED: A function on the NAFIS (IDENT1), where a temporary enhancement can be made to the friction ridge detail. The computer tries to adjust the different levels of colour of the friction ridges produced by the variance of the deposition pressure and other factors, to the same level so the detail can be more easily analysed.

ERROR: An outcome that is unexpected or wrong when the true answer is known. Errors can be categorised into various types, such as technical and administrative errors. If an error occurs then it can have a detrimental effect on the outcome of a comparison or search. There are various

processes that can be used to minimise the different types of errors occurring, but these processes may vary from bureau to bureau.

ADMINISTRATIVE ERROR: The incorrect data or information is recorded or assigned.

TECHNICAL ERROR: The incorrect result or reported outcome derived by the practitioner's judgment and opinion from the examination of the mark and print, e.g. a false inclusion /exclusion.

ERROR RATE: The rate at which errors occur. The error rate of fingerprint conclusions will vary depending on the methods, processes and quality assurance measures used. See [Measurement of Uncertainty](#)

ETCHED MARKS: Certain constituents of sweat (or other contaminants that may be present on the friction ridges) may chemically react with particular surfaces to produce a mark which is far more durable than would normally be expected..

EVALUATION: The third step of the ACE test process. This is where a practitioner assesses the value of the details observed during the analysis and the comparison steps and reaches a conclusion resulting in a reporting outcome.

EXCLUSION/EXCLUDED: Is the opinion of a practitioner that there are sufficient features in disagreement to conclude that two areas of friction ridge impressions did not originate from the same donor or person.

BUREAU: The opinion that two friction ridge impressions consist of different ridge flows and / or differing relative positions and sequence of ridge characteristics and / or details to conclude that they were not made by the same person.

STATEMENT: The unknown friction ridge impression has been compared to the friction ridge detail for a known individual and due to differences in the details within the impressions, it is the expert's opinion that they were not made by the same person.

The mark may remain **UNIDENTIFIED** - that is it has not been attributed to an individual.

EXHIBIT: An object or document presented or identified as evidence in a court of law

EXPERT (WITNESS): An appropriately qualified and/or experienced person called to answer questions in a court of law in order to provide specialized information relevant to the case being tried.

EXPLAINABLE DIFFERENCES: These are differences in appearance of the mark or print that doesn't interfere with the identification process. These differences can include such things as size, thickness of ridges, distortion and some of the microscopic detail (pores & ridge shapes) being absent in one impression. They can all be explained, which can be annotated on the photographs and / or on the practitioners notes.

FACT: Knowledge or information based on something that has occurred or exists and can be confirmed by observation.

FAINT: The lack of visual definition and subsequent difficulty in examining the friction ridge flow.

FAULT RIDGES: The friction ridges at the tips of the thumbs deviate from the normal semi-circular flow and take on a diagonal sloping appearance towards an ulnar direction. These friction ridges are known as fault ridges. When they slope downwards to the right, then the impression will be that of a right thumb, and when they slope downwards towards the left then the impression will be that of a left thumb.

FEATURES: These are any notable part of the friction ridge detail. All information assisting with establishing the identification of an area of friction ridge detail can be termed as 'features'.

FINGER MARK: An impression from the finger deposited under non-controlled conditions - Also see **Mark**.

FINGERPRINT: An impression of the friction ridges of all or any part of the finger. Also see **Print**

FINGERTIPS: The extreme end or 'tip' of the finger.

FIRST LEVEL DETAIL: First level detail refers to the friction ridge flow and / or pattern type.

FIXED POINTS: The core and any deltas.

FLEXION CREASE: These are creases that are formed during friction ridge formation, completely lacking of any ridge detail. Flexion creases

are unique and permanent. These creases allow for movement in the surface of the hand and foot. The flexion creases can be useful for orientating a mark and with the digit / palm / plantar determination. See also **CREASES**

FLEXURE: The act of moving the finger, which is assisted by having Flexion Creases on the surface of the skin - See **Flexion Crease**.

FLIPPED: Term used on IDENT1 and the lift printer software to reverse the direction of an image.

FLUORESCENCE EXAMINATION: See **Light Source**.

FRAGMENTED: Where the friction ridge flow of the mark appears broken up, making it difficult to interpret the detail present. This can be a result of chemical development and / or the surface the mark was left on. See **Broken Up**

FRICTION RIDGE(S): During foetal development in the womb, individual friction ridge units join together to form ridges. This process occurs at random - See **Differential Growth**. The friction ridges flow across the surface of the hands and feet to form friction ridge detail. The friction ridges may deviate instead of flowing constantly (See - **Deviation**). The friction ridges have sweat pores along their summit.

FRICTION RIDGE DETAIL: An area comprised of the combination of friction ridge flow, friction ridge characteristics, and friction ridge structure to include creases.

FRICTION RIDGE FLOW: The path and arrangement of the friction ridges across the surface of the hands and feet. The friction ridge flow on the top section of the fingers flows into patterns - See **First Level Detail**.

FRICTION RIDGE SKIN: The fingers, palm of the hand and the sole of the foot are comprised of an intricate system of friction ridges and furrows which is known as friction ridge skin. The arrangement and sequencing of characteristics within friction ridge skin are unique to each individual, persist throughout life and are accepted as a reliable means of human identification. This type of skin is present to aid grip and elevate the pores to aid temperature control.

FRICTION RIDGE THICKNESS: The width of the friction ridge. It can aid with the analysis and comparison stages. The deposition pressure can affect the friction ridge thickness, with a heavier pressure making thicker ridges. The thickness of the friction ridges and the furrows may also indicate if an impression is reverse colour.

FURROWS: These are valleys or depressions between friction ridges.

GEL LIFT: A thin film of gel used to lift and transfer friction ridge detail from a surface (substrate) onto a piece of flexible plastic.

GENTIAN VIOLET: See **Chemical Treatments**.

GRANULATED: The chemical treatment or the age of the mark can affect the appearance of the friction ridges. The impression may have friction ridges that have a dotted appearance, where the friction ridges are broken up. This appearance means the friction ridge flow is difficult to interpret and could have an impact on the outcome - See **Dotted**.

GROUND TRUTH: A dataset made up of known source material, such as marks produced by known donors, used for validation, proficiency and competency testing purposes.

HENRY CLASSIFICATION: A manual fingerprint classification system historically used for filing, searching and retrieving 'Tenprint' forms

HIGH COUNT LOOP: A loop will have a high ridge count if there are a large number of intervening ridges between the delta and core, when completing a ridge count - See **Ridge Count**.

HYPOTHENAR: The friction ridge detail on the palm, below the triradiate inter-digital area on the ulnar side of the palm between the little finger and wrist.

IDENT1: The current name for the computerised UK Automated Fingerprint Identification System (AFIS).

IDENTIFICATION: See **Identified**

IDENTIFIED/IDENTIFICATION (IDENT): A practitioner term used to describe the mark as being attributed to a particular individual. It is the opinion of the practitioner that there is sufficient quality and quantity of ridge flow, ridge characteristics and / or detail in agreement with no

unexplainable differences to conclude that two areas of friction ridge detail were made by the same person.

IDENTITY VALIDATION: The comparison of a full set of fingerprints against a previously taken set of known prints to determine the identity of the person based on the personal data previously recorded, i.e. ten print to ten print comparison.

IMMUTABILITY: This refers to the persistence of fingerprints as they are not subject or susceptible to change unless injured at the basal / dermal layer.

IMPRESSION: This is friction ridge detail deposited on a surface. This can refer to a mark or print. See **Mark**, see **Print**.

INCIPIENT RIDGE: An immature friction ridge which will appear as a thinner and shallower ridge than those surrounding it. The incipient ridge may or may not contain pores. Due to deposition pressure the incipient ridges may not appear in every impression, but they can be used when making comparisons. They are also known as nascent ridges, rudimentary ridges or subsidiary ridges.

INCONCLUSIVE: The determination by a practitioner that the level of agreement and / or disagreement is such that, it is not possible to conclude that the areas of friction ridge detail originated from the same donor, or exclude that particular individual as a source for the unknown impression.

The outcome may be **inconclusive** for a number of reasons:

The quantity and quality of the ridge flow, ridge characteristics and / or the detail present in the two areas of friction ridge detail is not sufficient to conclude that they were made by the same person, but there is nothing in disagreement to conclude that they were not made by the same person. The practitioner is unable to exclude an individual because some similarity exists;

or

The quantity and quality of the ridge flow, ridge characteristics and / or the detail present in two areas of friction ridge detail is not sufficient to conclude that they were made by the same person or

sufficient disagreement to conclude that they were not made by the same person. There may be some disagreement that maybe difficult to rationalize and therefore the person cannot be excluded;

or

The area of ridge detail cannot be compared as the corresponding area of ridge detail on the known impressions (print) is not revealed or not fully revealed.

INDENTED MARKS: An impression left in a soft pliable surface, such as clay, putty, wax, etc.

INKED PRINT: The finger and palm prints of an individual, associated with a known or claimed identity, and recorded by ink under controlled conditions on a fingerprint form.

INNER TRACING: See **Ridge Tracing**. A tracing is classified as an Inner tracing when the friction ridge being traced from the left delta passes inside the right delta and there are at least three friction ridges intervening between the point on the friction ridge where the tracing stops and the delta ridge.

INTERFERENCE: A factor affecting the appearance and resultant interpretation of the friction ridge flow or ridge details - For example See **Background Disturbance**.

INTERSPACE: See **Furrows**.

INTERVENING RIDGES: The number of friction ridges between two characteristics. The intervening ridge count is used when creating a coincident sequence.

INSUFFICIENT: The opinion that the ridge flow and / or ridge characteristics revealed in the area of friction ridge detail (mark) are of such low quantity and/or poor quality that a reliable comparison cannot be made. The area of ridge detail contains insufficient clarity of ridges and characteristics or has been severely compromised by extraneous forces (superimposition, movement etc) to render the detail present as unreliable and not suitable to proffer any other decision.

IODINE: See **Chemical Treatments**.

JOINT (of the finger): The hinged areas that divide the sections of the finger. There is a flexure on the surface of the hand in front of each joint.

KNOWN PRINT: The prints of a person, associated with a known or claimed identity, and recorded either electronically, by ink, or by another medium under controlled conditions. See **Control Prints, Ten Prints**

LAKE: A friction ridge characteristic. Lakes are formed when a single friction ridge bifurcates then converges back to a single friction ridge, thus forming a generally small, elliptical shape or “lake”.

LASER: *Light Amplification by Stimulated Emission of Radiation.* A LASER is a device that generates wavelengths of light that can be used on exhibits, at scenes and on chemically treated items to detect latent marks. See **Light Source**.

LATENT MARK: Friction ridge detail not generally visible to the eye and must either be enhanced by development powders or by physical and / or chemical treatments.

LATERAL POCKET: Lateral Pockets are patterns that possess two loops which have the same directional slope, the uppermost loop being nutant, and forming a pocket which is filled by the friction ridges of the underlying loop. There are two deltas, both of which must be on the same side of the underlying loop. In some patterns, the pocket formed by the nutant loop is filled by friction ridges conforming to the tented arch pattern.

LIFT / LIFT EXHIBIT: An adhesive tape or other medium (e.g. gel) is used to transfer friction ridge detail from a surface (substrate) onto a piece of flexible clear plastic. The lift is endorsed with details from the crime scene, the date of examination and information from the crime scene examiner including signature. The lift is allocated an exhibit number which is referred to in all subsequent documentation.

LIGHT SOURCING / SOURCE: The use of light to detect friction ridge detail. It can be a simple white light or could include laser, ultra violet light and other type of lights (i.e. Crime-lite). For full details of light sources and their uses please refer to the CAST or HOSDB handbook - Fluorescence Examination (Weblink in Useful Pages of Reference).

LIKELIHOOD RATIO: The likelihood ratio is the ratio of the answers to two questions: (a) what is the probability those observations would have

been made if the prosecution proposition were true; (b) what is the probability of those observations if the defence proposition were true. A likelihood ratio of 1 is neutral ; a large likelihood ratio means that the observations support the prosecution proposition; conversely, a small or negative likelihood ratio means that the observations support the defence proposition.

LIVESCAN: ‘Livescan’ is an electronic biometric platform for capturing, storing and transmitting friction ridge detail.

LIVESCAN DISTORTION: Blurring or distortion of the images of the friction ridges of the fingers and palms taken on the Livescan system. The system continually captures the friction ridge detail as it is rolled across the glass plate of the Livescan terminal. Any jolting during the rolling process, as well as dirt, grease etc on the donor’s hand or Livescan plate could affect the appearance of the impressions generated, giving the ridges a straight, angular or even wavy appearance. As the technique relies on digital capture technology the final image may also appear pixelated or blurred. See **Spurious Minutiae**

LOOP: A pattern type in which one or more friction ridges enter upon one side of the pattern area, re-curve and flow out on the same side the friction ridges entered. They may be described as radial or ulnar.

MAGNA FLAKE/POWDER: Magnetic powder is a type of development powder. A fine magnetic powder is held by a magnetic applicator, which is moved across the surface being examined. See **Chemical Treatments**

MARK: The term used to refer to an area of friction ridge detail from an unknown donor. Usually recovered, enhanced or imaged from a crime related item, or directly retrieved from a crime scene.

MARK STATUS: This is the description or standing of an area of ridge detail following comparisons and/or searching. It describes the status of an area of ridge detail when all actions have been completed. The mark may be **Identified Unidentified** or **Insufficient**. Where a mark is **Unidentified** it may be **Excluded** for certain individuals.

MATRIX: This refers to what the mark is made up of (or left in). This is the substance that is actually deposited by the finger and eventually developed, i.e. sweat, ink, foreign material (drugs), blood, etc.

MEASUREMENT OF UNCERTAINTY: The estimation of the uncertainty of measurement is a BS EN ISO/IEC 17025:2005 requirement and is based upon the principle that all measurements are subject to uncertainty and that a value is incomplete without a statement of accuracy. Sources of uncertainty can include unrepresentative samples, rounding errors, approximations and inadequate knowledge of the effect of external factors. See **Error Rate**

MEDIAL / MIDDLE: The centre or middle, for example the medial section of phalange.

MEETING TRACING: See **Ridge Tracing** - The friction ridge being traced from the left delta either meets the right delta or there are no more than two friction ridges intervening between the point on the friction ridge where tracing stops and the delta ridge.

METAL DEPOSITION: Vacuum Metal Deposition (V.M.D.). See **Chemical Treatments**.

MINUTIAE: Minutiae are small details. They can be events along a friction ridge path, including bifurcations, ending ridges, and dots - See **Characteristics**.

MOVEMENT: The disruption to the friction ridge flow or friction ridge detail within the impression due to movement of the finger/phalange/palm at the time of the deposition of the impression. Movement may make the friction ridge details appear blurred or distorted.

MULTIPLE CORE: Fingerprint patterns may have more than one core - See **Accidentals, Composite**.

NINHYDRIN: See **Chemical Treatments**.

NOTE TAKING: A contemporaneous record of the practitioner's observations and findings when undertaking certain aspects of their work, for example noting areas with information such as 'movement' or 'background interference'. See **Contemporaneous Notes**

NUTANT LOOP: Also referred to as a lazy loop or a drooping loop. A nutant Loop has the same basic attributes of a loop but in addition at least one of the staples at the core bends, turns down or droops towards the

delta. In the 'pocket' formed by the loop, there is the appearance of a plain arch.

OBJECTIVE: Undistorted by emotion or personal bias; based on impartial, transparent, observable phenomena.

OPEN DELTA: The delta is formed when two ridges running side by side then diverge and open out, trying to enclose the core area. See **Delta**.

OPEN FIELD: A large area of ridge detail, in an impression where there are no characteristics

OPINION: The matter of an opinion is the conclusion of the practitioner, who by study or experience has specialist knowledge and would be able to form a sound judgement on that subject matter to render his/her opinion of value.

The opinion forms part of a body of knowledge or experience which is sufficiently organized or recognized to be accepted as a reliable body of knowledge or experience.

The opinion is the conclusion of the practitioner established at the evaluation stage of the ACE process.. If necessary the opinion will be supported and evidenced by demonstrating their decision making process by the use of working notes.

ORIENTATION: The logical direction of the friction ridge detail if it had been deposited under controlled conditions. Information from the Scene Examiners examination report or the laboratory disposition sheets can assist the practitioner with the orientation of the impression. The ridge flow, position of the delta's and other detail such as creases are also used to orientate the mark.

OUTCOME: See **Reporting Outcome**

OUTER TRACING: See **Ridge Tracing**. The friction ridge being traced from the left delta passes outside the right delta and there are at least three friction ridges intervening between the point on the friction ridge where tracing stops and the delta.

OVER INKED: The application of excessive ink onto the friction ridge skin during the taking of a control set of prints; excess ink may cover the friction ridges and also fill the adjacent furrows. When applied to the paper 'Tenprint' form the friction ridge detail will appear dark and the characteristics may not be visible. This might hinder the comparison and may affect the outcome.

OVER POWDERED: Where an excessive amount of powder is used to develop a latent mark and it is not cleaned out before the mark is lifted. Friction ridge detail will not be clearly seen due to the excess powder filling up the furrows and obscuring the natural deviations on the friction ridges. The mark will appear dark and thick.

PALM MARK: An impression from the palm left under non-controlled conditions - Also see **Mark**.

PALM PRINT: An impression of the friction ridges of all or any part of the palmar surface of the hand, taken under controlled conditions. - Also see **PRINT**

PATTERN: The arrangement of friction ridges formed during foetal growth. The pattern is classified into one of a number of types of pattern:

ACCIDENTAL*

APPROXIMATING ARCH*

ARCH (PLAIN)*

CENTRAL POCKET*

COMPOSITE*

ELONGATED WHORL*

LATERAL POCKET*

LOOP*

NUTANT LOOP*

TENTED ARCH*

TWINNED LOOP*

WHORL*

(*See each individual term for a definition)

PEDb: The abbreviation for the Police Elimination Database. This is a database of finger and palm prints of police officers, and members of police staff. It can be used to identify marks inadvertently left at scenes or on exhibits by police or police staff. Copies of the finger and palm print forms are stored electronically and as paper sets, enabling manual comparisons or electronic searches to be carried out as appropriate. The database acts as an elimination database and if 'Tenprint' sets or the database are to be used in other way, then permissions should be obtained following the procedures set out in the relative Home Office directive.

PERSISTENCE: The continuous production of new friction ridge cells results in friction ridge skin and patterns being persistent and unchanged throughout life. Injury that does not penetrate the regenerative layer is repaired by the constant proliferation of the basal cells erasing the surface damage. The friction ridge system is not permanently affected. However if the basal layer is damaged this may lead to scarring and some loss of detail in the affected area. The fact that the friction ridge detail does not change is one of the principles behind why fingerprints are a reliable method of human identification

PHALANGE: Any bone in a finger is referred to as a phalanx (or phalange). The fingers have three:

- Distal phalanx - the portion of finger containing the 'pattern'.
- Medial or middle phalanx - the central or middle portion of finger.
- Proximal phalanx - the portion of finger immediately above the palm.

The thumb has two: the distal phalanx and the proximal phalanx.

PHYSICAL DEVELOPER: See **Chemical Treatments**.

PLAIN IMPRESSION: The friction ridge detail is recorded by being placed straight down onto a surface, without any rolling. Primarily these impressions are taken to ensure that the rolled impressions have been taken in the correct order on the fingerprint form. They can also be very useful in providing extra information to the Fingerprint Examiner, which may have been missed or poorly recorded when taking the rolled impressions.

PLANTAR: The friction ridge detail on the underside of the foot.

PLANTAR MARK: An impression from the foot left under non-controlled conditions - Also see **Mark**.

PLANTAR PRINTS: An impression of the friction ridges of all or any part of the foot taken under controlled conditions.

POLYDACTYLISM: The hand or foot has more than five digits.

PORES: Small openings on friction ridges through which sweat is released - See **Sweat Pores**.

POROSCOPY: A study of the size, shape, and arrangement of pores on the friction ridges. This was previously referred to under Third Level Detail - See Third Level Detail.

POST MORTEM SET: The controlled recording of the friction ridge detail from a cadaver. The set is taken under controlled conditions, usually at a mortuary. Generally the finger and palm prints are taken, but in certain cases it may also be necessary to take plantar sets as well. Also referred to as a **DEAD SET**.

PRACTITIONER: An individual providing a forensic science service at any level or stage in the criminal investigation and trial process.

PRESSURE DISTORTION: Pressure distortion may be described as deposition pressure (downward pressure on the object), directional pressure (vertical, horizontal, or twisting), or a combination of both deposition and directional pressure.

PRINT: An impression of the friction ridges left under controlled conditions. See **Finger Print, Palm Print, Plantar Print, Tenprint, Elimination Print, Inked Print**.

SUBJECTIVE: The opposite of objective, activity taking place within the mind that is modified by an individual's personal

PROFICIENCY TESTS: Is the determination of the calibration or testing performance of a laboratory by means of inter laboratory comparison, i.e.,

tests to evaluate the competence of analysts and the quality performance of a laboratory.

Open or declared proficiency test: a test in which the analysts are aware that they are being tested.

Blind or undeclared proficiency test: a test in which the analysts are not aware that they are being tested.

External proficiency test: a test conducted by an agency independent of the analysts or laboratory being tested.

PROPOSITION: A statement about the state of the world that may be true or false. In the context of fingerprint comparison there may be two propositions such as: the impression was made by the same area of friction ridge detail that made the control print, and; the impression was made by some unknown area of friction ridge detail.

PROXIMAL: Situated at the closest point of attachment; direction toward the body.

QUALITY: The totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs. For Fingerprint examination this also applies to the clarity of information contained within an area of friction ridge detail.

QUANTITY: The amount of information contained within an area of friction ridge detail.

RADIAL: See **Loops - Radial Loops**.

RADIOACTIVE SULPHUR DIOXIDE: See **Chemical Treatments**.

REFERENCE POINT: See **Anchor Point**.

REGENERATIVE LAYER: See **Basal Layer**.

REPEATABILITY: The ability to obtain consistent results when repeatedly undertaking the same task. This repeatability is required in order to validate a process. It should be possible for a process to be repeated with the same result achieved each time.

REPORTING OUTCOME: The conclusion reached after the analysis and comparison of marks in a case has been completed. This is the decision that is communicated to the investigator or officer in the case and is currently recorded as one of the four following possibilities - See: **Identified, Excluded, Insufficient** and **Inconclusive**. Where a mark is excluded the Mark's Status is also given as either Unidentified or Insufficient.

REVERSE COLOUR/TONAL REVERSE: An effect that renders the ridges to appear as white lines and the furrows as black lines (the opposite of a mark left under controlled conditions).

Partial Reverse Colour: In a particular area friction ridges appear as white lines and corresponding furrows as black lines (the opposite of a mark left under controlled conditions).

REVERSE DIRECTION: The friction ridge detail in the impression appears as a mirror image of its true appearance. This may be due to the transference of a mark from one surface to another, or the incorrect labelling and photography of a mark from the opposite side of the exhibit.

RIDGE COUNT: The number of friction ridges between the core of the impression and the delta in a straight line.

RIDGE DETAIL: An area comprised of the combination of friction ridge flow, friction ridge characteristics, and friction ridge structure to include creases. See - **Friction Ridge Detail**.

RIDGE ENDING: A friction ridge characteristic that comes to a natural stop or finish. The adjacent ridges on either side converge to take its place. It is a characteristic that a practitioner will use when searching or making a comparison.

RIDGE FLOW: - See **Friction Ridge Flow**.

RIDGE TRACING: A method of subdividing whorls. To determine the trace of a whorl you locate the starting point which is the lower ridge on the left delta. If the delta is closed, the starting point is the point of bifurcation, but if the delta is open, the starting point is at the point of divergence of the two inflowing ridges. If the ridge being traced forks, tracing continues along the lower arm of the fork. If the ridge being traced stops short, tracing continues on the ridge immediately below. From this

starting point, the course of the ridge forming the lower limb of the delta is followed or traced to the right. This process continues until a point is reached either inside, meeting, or outside the lower limb or the right delta. See **Inner Tracing**, **Meeting Tracing** and **Outer Tracing**.

ROLLED IMPRESSION: The recording of the friction ridge detail by rolling the digit to capture the maximum surface of the friction ridge skin. When completing a rolled impression of a finger, the whole pad of the finger should be rolled across the surface, i.e. from nail edge to nail edge. The sides of palm can be rolled to capture the detail there. In sets of Fingerprint taken under the Prevention of Terrorism Act, 2000, finger tips and phalanges are rolled to obtain the maximum amount of friction ridge detail.

ROTATED: A circular movement in an area of the friction ridge detail, seen when a point stays fixed and the impression moves in a circular movement. This could be due to the elasticity of the skin or movement by the surface. This may cause distortion / movement in the observed ridge flow.

SALIENT RIDGE CHARACTERISTICS: A 'focus' group of characteristics or details that a practitioner will look for when making a comparison. The small group of characteristics is what the practitioner will initially look for in both the mark and the print. If they are unable to locate them (i.e. there may be areas not revealed on the 'Tenprint') then the practitioner will select another group of characteristics and the comparisons will be remade. Also know as a Target Group. See **Anchor Points**.

SCAR: A scar may be temporary or permanent. If the injury is superficial e.g. a paper cut or similar, then this injury will be repaired because of the regenerating nature of the skin. However, if the injury is of a more serious nature such as a burn or laceration and the basal layer of the dermis is penetrated, then a permanent scar will occur as a result of damage to the tissue and the regenerative cells. If apparent in two impressions under comparison this information once again may prove useful in the identification process.

SCOPE OF ACCREDITATION: The range of examinations or tests for which the organization has been accredited by the national accreditation organization.

SEARCH: A comparison of friction ridge detail against other friction ridge detail held in files or databases. Searches can be manual or automated.

SECOND LEVEL DETAIL: Second level detail refers to ridge characteristics, such as ridge endings and bifurcations.

SEQUENCE/SIMULTANEOUS IMPRESSIONS: The friction ridge detail appearing in the same relative order and position that you would expect to see them on the hand or the foot.

SEQUENTIAL TREATMENT: Where an exhibit is subjected to all suitable physical, chemical treatments and light sources to maximize the development of friction ridge detail. Types of treatment will vary depending on the material composition of the exhibit. If necessary an exhibit may be split if different components require different treatments.

SET: An abbreviation referring to a 'Tenprint' set of finger and palm prints, which are taken under controlled conditions. See **Control Set, Tenprint, Dead Set, Inked Set.**

SHORT INDEPENDENT RIDGE: A characteristic that is a short small friction ridge that is not connected to another friction ridge. It is also sometimes called an Island.

SLIPPAGE / SLIPPED: The interruption to friction ridge flow due to movement within a fluid matrix, for example, excessive sweat or blood. This may also be interpreted as movement.

SMALL PARTICLE REAGENT: See **Chemical Treatments.**

SMUDGED: Movement in an area of friction ridge detail causing blurring to all or part of it; this could be from movement of the hand / foot or the surface. The friction ridge detail may become hard to analyse due to decrease in the clarity of the friction ridges.

SPLIT MARK: The mark appears to split up due to either the surface when the mark was left or the development process. For example the mark could be left on a plastic bag which was screwed up but when chemical treatments have been used and the bag has been flattened for examination the mark is split into smaller sections.

SPUR: A bifurcation with one short friction ridge branching off a longer friction ridge.

SPR: Small Particle Reagent. See **Chemical Treatments**

SPURIOUS MINUTIAE: A situation that can occur in a friction ridge impression where additional friction ridges and / or characteristics can appear but are not a true copy of the digit leaving the impression. It usually occurs in a 'Tenprint' that is captured by the Livescan system or captured digitally.

STAPLE: Cores of Loops consist basically of a staple or 'hairpin', which may or may not enclose other friction ridges, may be plain or may have other friction ridges branching from it. To be construed as a staple, the backward turning friction ridge must be rounded at the top.

STARBURST: Originating from the same area as the thenar crease is the 'Starburst', or a number creases flowing in different directions. These are seen with varying amounts of clarity, depending on the position of the thumb and whether it is far or near from the rest of the hand. It can help to orientate a mark.

SUBJECTIVE: The opposite of objective, activity taking place within the mind that is modified by an individual's personal experiences and bias.

SUBSIDIARY RIDGE(S): Subsidiary ridges, also called incipient ridges, appear in some areas of friction ridge detail as smaller, finer, fragmented ridges - the summits of which lie below and between the summits of the primary ridges. These are undeveloped, immature ridges whose pore formations may also have remained undeveloped - See **Incipient Ridges**.

SUBSTRATE: The surface upon which friction ridge detail is deposited.

SUFFICIENT: The quantity and quality of characteristics and / or detail present in an area of friction ridge detail reaches the practitioners threshold and a conclusion / outcome can be made.

SUITABILITY: The determination that there is sufficiency in an impression to be of value for further analysis or comparison.

SUPERGLUE: CNA. See **Chemical Treatments**

SUPERIMPOSITION: The overlapping of two or more areas of ridge detail. The impressions must be treated separately. Indicators of superimposition may include; ridges running at 90 degrees to each other,

variances in ridge / furrow thickness and tonal value and unnaturally shaped impressions.

SWEAT: Sweat is a clear, colourless, neutral or slightly alkaline fluid, its constituent vary from person to person and even hour by hour, but is basically composed of 98.0% - 99.5% water. The remaining 0.5% - 2.0% is composed of solids in various forms, consisting mainly of fats and oils, urea, chlorides (salts), amino-acids etc.

SWEAT PORES: Along the tops of the friction ridges are pores which serve to secrete sweat. When an article with a surface capable of retaining a finger mark is touched, the sweat that runs along the summit of the ridges of the skin may be transferred to and adheres to these surfaces, leaving behind an impression of the friction ridge detail and of the characteristics.

TACT SETS: A controlled set of friction ridge detail impressions recorded in ink usually as a result of an individual's detention on suspicion of involvement in terrorism. The set is taken to record as much of the friction ridge skin as possible to maximise the opportunities for identification due to the serious nature of the offence. The set includes multiple impressions of virtually all areas of friction ridge detail including phalange, plantar and the tips of fingers. The term TACT derives from Prevention of **T**errorism **A**ct.

TARGET GROUP: See **Salient Ridge Characteristics**.

TENPRINT: A generic reference to a controlled recording of an individual's fingers and palms using ink, electronic imaging, or other medium.

TENTED ARCH: Ridges flow from side to side as per a plain arch but with a prominent upward thrust at the (near) centre of the impression. However if on one side of the axis there is a separated staple, the impression is a loop, provided a friction ridge count can be obtained.

THENAR: The large cushion of the palm located at the base of the thumb.

THIRD LEVEL DETAIL: Third level detail refers to friction ridge shape, relative pore location, edge details and ridge width.

THRESHOLD: There are three different types of threshold:

PRACTITIONER THRESHOLD: The outcome of a fingerprint examination is based on the practitioners' objective observations and subjective interpretations of the ridge flow, features and characteristics observed in areas of friction ridge detail. This objective approach, defined as the ACE process, is also affected by an individual's rules, ideas and beliefs, which form part of their dynamic decision framework. The threshold is the point or boundary at which a practitioner observes, interprets and considers enough detail to reach a particular conclusion that satisfies their decision framework and rejects all others

QUANTITATIVE-QUALITATIVE THRESHOLD: The quantitative–qualitative threshold (QQ) can be explained simply as the balance between the level of detail and the quality of the mark , this is a matter that has to be assessed on an individual basis of number of minutiae versus quality of the mark Sufficiency for same source determinations depends on a quality/quantity relationship.

SYSTEM THRESHOLD: This is a limitation imposed by a system. For example in order to be able to search a mark on the electronic database a minimum of 8 characteristics must be plotted - the system will not permit searching of multiple records below this threshold.

TIP: See **Fingertip**

TOLERANCE: The acceptance of dissimilarity caused by distortion, usually involving an individualisation; the opposite of the rejection of differences caused by different friction ridge sources involving an exclusion. Generally expressed as "within tolerance" or "out of tolerance" for the level of clarity that is present in both impressions.

TRAMLINES / TRAMLINING: Creases running in parallel to each other to give the appearance of tramlines or train tracks. This may assist in the orientation of the impression.

TRANSFERENCE: The action of an area of friction ridge detail being transferred from one surface to another by touch.

TRIRADIATE: A delta is a triradiate. The area on the palm towards the top underneath the fingers, which contains a number of deltas, is also called the triradiate area.

TWINNED LOOP: Twinned Loops possess two well-defined loops, one super incumbent upon, surrounding or embracing the other. Where both loops are formed by a continuous unbroken friction ridge, (an 'S' formation), a single friction ridge must appear in the core of at least one of the loops. There are two deltas and the pattern is sub-divided by friction ridge tracing. As with ordinary loops, both loops in a twinned loop pattern must be well defined and have proper staples rounded at the head.

TWISTED: The friction ridge flow is altered or distorted from the true friction ridge detail by some factor. These factors could include movement in the surface, movement in the digit leaving the impression, the impression being left in a matrix such as blood which could cause slippage etc. There could be differing levels of twisting movement. See **Rotated**.

ULNAR: See **LOOPS - Ulnar Loops**

UNABLE TO COUNT THROUGH: The inability to form a coincident sequence across the full area of friction ridge detail due to one or more factors of interference including background interference, such as printing on a surface.

UNCLEAR: The friction ridges, characteristics and / or detail in an impression are not clearly defined or are ambiguous, so hindering the analysis and comparison.

UNCERTAINTY OF MEASUREMENT: The estimation of the uncertainty of measurement is a BS EN ISO/IEC 17025:2005 requirement and is based upon the principle that all measurements are subject to uncertainty and that a value is incomplete without a statement of accuracy. Sources of uncertainty can include unrepresentative samples, rounding errors, approximations and inadequate knowledge of the effect of external factors. See **Error Rate**

UNIDENTIFIED: The status of a mark after it has been compared to a nominated individual (elimination or suspect) or has been searched on a database and has not been attributed to any individual.

VALIDATION: The process of providing objective evidence that a method, process or device is fit for the specific purpose intended. It is a method to

check the reliability of a process and the outcomes of that process. The validation should demonstrate that the same result should be obtained to show that the process works.

VERIFICATION: In fingerprint examination it is the final step of the ACE-V process. It can be defined as the independent application of the ACE process, utilised by a subsequent examiner to either support or refute the conclusions of the original examiner. This independent examination by another examiner or examiners, using the ACE process provides a cross check to ensure that the outcome decision is not based on a subjective judgment of one individual but acceptance as the consensus conclusion of more than one examiner.

Blind verification: Is the independent application of the ACE process conducted by another examiner who has no prior knowledge of the findings of previous examiners, the information on which any previous conclusions have been based and any further information relating to case context or stakeholder communications. Blind verification can form part of a risk management approach adopted to mitigate risks associated with cognitive bias.

Open verification: Is conducted by another examiner who has knowledge of the conclusions proffered by the original examiner in the previous examination.

VESTIGE: An unusual configuration of ridge flow that is most often found in the thenar area of palm. In the thenar the formation often includes two opposing 'square-nosed' loop patterns separated by ridges which run perpendicular to the prevailing ridge flow.

VISIBLE MARK(S): Friction ridge detail that is visible to the naked eye.

VOLAR PADS: Foetal tissue growths / swellings that affect friction ridge skin development and patterns on both the ventral surfaces of the hands and soles of the feet. There are 11 volar pads on each hand of a foetus, upon which friction ridge units develop into friction ridges.

WET POWDER: See **Chemical Treatments**.

WET SET: A set of 'Tenprints' that has been taken using ink and rolled onto paper - See **Inked Set**.

WET / WETTED MARKS: The friction ridges do not appear as distinct structures, but rather as wet impressions, often prevalent in blood marks. This can make the detail appear watery or have the appearance of feathering.

WHORL: A fingerprint pattern type that consists of one or more friction ridges that make, or tend to make, a complete circuit, with two deltas, between which, when an imaginary line is drawn, at least one recurving friction ridge within the inner pattern area is cut or touched. They can be sub-divided by completing a Ridge Tracing (See **Ridge Tracing**).

3. **ABBREVIATIONS AND ACRONYMS**

ACE	- Analysis, Comparison and Evaluation ,
ACPO	- Association of Chief Police Officers
ACPOS	- Association of Chief Police Officers of Scotland
AFIS	- Automated Fingerprint Identification System
AFR	- Automatic Fingerprint Recognition
AS	- Arrest Summons Number
BTP	- British Transport Police
BTR	- Bailed to Return
BY40	- Basic Yellow 40
CAD	- Computer Aided Dispatch
CC	- Collection Copy
CJU	- Criminal Justice Unit
CNA	- Cyanoacrylate
COO	- Central Operations Office
COSHH	- Control of Substances Hazardous to Health
CPD	- Continued Professional Development

- CPS - Crown Prosecution System
- CRB - Criminal Records Bureau
- CRIMINT - Criminal Intelligence System
- CRIS - Crime Reporting Information System
- CRO - Criminal Records Office
- CSE - Crime Scene Examiner
- CSM - Crime Scene Manager
- CT - Counter Terrorism
- DDO - Designated Detention Officer
- DNA - Deoxyribonucleic Acid
- DFO - 1, 8-Diazafluoren-9-One
- DVI - Disaster Victim Identification
- ELIM - Elimination
- EPI - Epidiascope
- ERU - Evidence Recovery Unit
- FIN - Form Identification Number
- FBI - Federal Bureau of Investigation
- FE - Fingerprint Examiner
- FFU - Forensic Firearms Unit
- FLO - Family Liaison Officer
- FOI - Freedom of Information
- FP - Fingerprints
- FPTS - Fingerprints

- FSS - Forensic Science Service
- HIDO - Higher Identification Officer
- HOLMES - Home Office Large Major Enquiry System (Computerised)
- IABS - Immigration and Asylum Biometric System
- IAI - International Association for Identification
- IDENT - Identified
- IDENT1 - A brand name for the current NAFIS system
- IDO - Identification Officer
- INTERPOL- International Criminal Police Organisation
- IPCC - Independent Police Complaints Commission
- ISO - International Organisation for Standardisation
- LASER - Light Amplification by Stimulated Emission of Radiation
- MIT - Major Investigation Team
- MD - Metal Deposition
- NaBIS - National Ballistics Intelligence Service
- NAFIS - National Automated Fingerprint Identification System
- NCALT - National Centre for Applied Learning Technology
- NFA - No Further Action
- NFB - National Fingerprint Board
- NFO - National Fingerprint Office
- NI - Not Identified
- NIN - Ninhydrin
- NPIA - National Policing Improvement Agency

- NSPIS - National Strategy for Police Information Systems
- NUM - No Useful Marks
- OIC - Officer in Charge or Officer in the Case
- OP NAME- Operation Name
- O/S - Outstanding
- PACE - Police and Criminal Evidence Act 1984
- PEDB - Police Elimination Database
- PD - Physical Developer
- PITO - Police Information Technology Organisation
- PNC - Police National Computer
- QA - Quality Assurance
- QQ - Quantitative Qualitative
- SCC - Serious Crime Cache
- SCD - Specialist Crime Directorate
- SC & O - Specialist Crime and Operations
- SFR - Streamlined Forensic Reporting
- SFS - Specialist Forensic Services
- SOCO - Scenes of Crimes Officer
- SOIT - Sexual Offences Investigation Team
- SOP - Standard Operating Procedure
- SPOC - Single Point of Contact
- SSU - Scientific Support Unit
- TFE - Trainee Fingerprint Examiner

UIDB - Unidentified Marks Database (IDENT1)

UV - Ultra Violet

VMD - Vacuum Metal Deposition

VIS - Visible

VRM - Vehicle Registration Mark

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